

FINAL REPORT
PRESENTED TO THE EUROPEAN COMMISSION

WiRES
Women in Renewable Energy Sector

Modena, 2009-2010

**ADAPT Association for International and Comparative Studies
in Labour Law and Industrial Relations (Italy)**

Partners involved:



**UNION
FOR PRIVATE
ECONOMIC ENTERPRISE**

UPEE (Bulgaria)



University of Szeged – Faculty of
Law (Hungary)



Co-funded by the European Commission
Agreement n. VS/2010/0197 Addendum title No 1 to VS/2009/0441

The project is jointly organized in consortium with



**Union for private
economic
enterprise**



**University of Szeged
Faculty of Law
Hungary**

Supporters of the project are:

BUSINESSEUROPE, CISL, City of Chemnitz -Zwickau (Germany), Enel Green Power (Italy), Etech Germany, FLAEI-CISL, ISTUR – Institute for Social and Trade Union Research (Bulgaria), LIFE – Genanet (Germany), National Counsellor for Gender Equality at Work (Italy), Sardinia Region-Labour Department (Italy), VBFF-Verein zur beruflichen Förderung von Frauen (Germany)

With support from the European Union

WiRES (Women in Renewable Energy Sector) is a project co-funded by the European Commission, DG Employment, Social Affairs and Equal Opportunities (budget heading 04.03.03.01, Industrial Relations and Social Dialogue).

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Part I

SUMMARY OF THE PROJECT

1.

WiRES – WOMEN IN RENEWABLE ENERGY SECTOR

1. The network

Adapt – Association for International and Comparative Studies in Labour Law and Industrial Relations – headed and carried out the project with WiRES partners, namely: the University of Szeged from Hungary and UPEE – Union for Private Economic Enterprise – from Bulgaria.

The project has been supported by an international and interdisciplinary network, which gradually expanded over time, since the project attracted the interest of experts and stakeholders in the fields of social dialogue, renewable energies, equal opportunities and labour policies. The experts involved represent a number of institutions and authorities, namely: European and Italian social partners such as BUSINESSEUROPE, the Italian national trade union CISL and its national sectoral affiliate of the electricity branch FLAEI-CISL, a Bulgarian labour association at the National level (ISTUR – Institute for Social and Trade Union Research). Likewise, the project was supported by local and regional authorities such as the City of Chemnitz-Zwickau in Germany and the Labor department of the Sardinia Region. Companies, including Enel Green Power, one of the leading players in renewables, also gave their active support to the project, together with other actors in the same field, namely ETech Germany, an international network developing green technologies and research in related fields. Sound experience in the gender mainstreaming approach has been provided by a network dealing with gender and Energy issues – LIFE-Genanet – and also the project network VBFF – Verein zur beruflichen Förderung von Frauen (Germany). The National Counsellor for Gender Equality at Work in Italy considerably contributed to the

European project development by also involving the National network of Gender Equality Counsellors: besides fostering an information exchange, the National Counsellor for Gender Equality at Work actively and widely supported and sponsored the project.

2. The project

WiRES' main objective has been to investigate the role of social dialogue in boosting female employment rates and improving working conditions of women workers in the renewable energy sector in Europe.

The idea of the project stemmed from the analysis of the impact of a new regulatory framework – at a European and national level – in the field of environmental protection, on employment and labour market and the fight against climate change. The European Climate and Energy Package, adopted by the EU Commission in 2008, set new binding standards aimed at tackling climate change. One of the ambitious objectives was to increase the use of renewables (wind, solar, biomass, etc) to 20% of the total energy production (currently it is around 8.5%). Among the benefits of these measures, the Citizens' summary of the EU Climate and Energy Package highlighted that about 1 million jobs will be created in the European renewable energy industry by 2020. While the employment impact is a controversial and debated issue around the world, experts agree that environmental legislation is going to significantly affect national economies, particularly production methods and processes. On the side of labour demand, the so called “job churn” effect is likely to be experienced, both across sectors and within the same industry: new jobs will be created; some occupations may be replaced; others will disappear without any replacement, while still different ones will change in terms of job content, required skills and work methods. Business-restructuring processes often entail potentially high costs, not only for the local or regional economies but also for the workers they concern, especially when the most vulnerable groups on the labour market, including women, are involved.

Besides, in many European countries low female employment rates remain a challenging issue – especially in traditionally male-dominated sectors, such as the energy sector, where “non-traditional” occupations prevail. Scarce participation of women to the labour market goes hand in hand with the challenge of equal opportunities promotion, entailing issues such as fair treatment, recruitment, equal access to employment, gender pay gap, career paths and family friendly policies. These issues are likely to represent a relevant bargaining ground also in eco-industries like renewables, although, as our research points out, awareness still needs to be raised in this regard. The research question that inspired the WiRES project is whether social dialogue and industrial relations can support the restructuring processes related to the implementation of EU climate change policies, turning them into a driver for the creation of new and better employment opportunities for women. According to WiRES project, the overarching objective that social dialogue could fulfil is to ensure the participation of trade unions and employers’ organizations in the elaboration and monitoring of EU Climate and Energy Package implementation with regard to its impacts on competitiveness, employment opportunities and social cohesion in the renewable energy sector. In particular this should be carried out through a gender mainstreaming approach, considering gender-related issues namely: equal opportunities, work-life balance, career ladders (with a special focus on glass-ceiling) and pay gap, balanced representation of social partners and industrial relations stakeholders. As far as work-life balance is concerned, flexible time arrangements, policies for care services and workload sharing in the private sphere, deserve particular attention. The assumption underpinning the WiRES research is that adaptation to change is a constant phenomenon in the life of companies and workers. Social dialogue at the European, national and company level can help preventing or limiting possible negative social consequences. In the broader framework of restructuring processes linked to climate change policies, collective bargaining can play a critical role in tackling emerging issues related to equal opportunities by consequently preparing workers and companies to cope with current and future labour market challenges.

3. Policy context

The Climate and Energy Package, issued by the EU Commission in January 2008 and adopted by the EU Parliament and Council in October 2008 ¹, sets new binding standards aimed at tackling climate change. One of the ambitious objectives is to increase the use of renewables (wind, solar, biomass, etc) to 20% of the total energy production (currently it is around 8.5%). Among the benefits of these measures, Citizens' summary of the EU Climate and Energy Package highlights that about one million jobs will be created in the European Renewable Energy Industry by 2020. However, these directives, decisions and regulations are considerably affecting national economies, especially industrial policies, companies' production methods and processes. On the side of labour demand, the so called "job churn" effect is likely to be experienced, both across sectors and within the same industry. This has been described as the diverse impact of the green economy on the labour market, which needs to become greener: new jobs will be created; some occupations may be replaced, others will disappear without any replacement, while still different ones – probably all occupations – will change in terms of job content, required skills and work methods.

The restructuring of enterprises often entails costs that can be very high, not only for workers but also for the local or regional economies. It is therefore essential to ensure that restructuring is well-managed, so that the competitiveness of enterprises is maintained and employment preserved while facilitating the transition of workers to other jobs of equivalent or even better quality. In order to face such transformations adequately, social partners and other stakeholders should be involved in the restructuring processes taking place across the industries belonging to the broader energy sector, including Renewable Energy (RE) industries. As an example, new participation and consultation rights related to the

¹ The package comprises a set of directives, decisions and regulations. For the aims of this project, the focus will be on Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

adaptation to climate change could be identified; roundtables addressing the impacts on the labour market should be encouraged either at sectoral or regional level; social partners and other stakeholders could join sectoral councils and on field researches aimed at anticipating and identifying future skill needs at the regional, local, sectoral and also company level.

At the same time, low participation of female workforce to the labour market is a key issue in most European Union countries. Although female employment rates in many European Member States have recently increased, they remain lower than male ones. According to a survey carried out by Eurofound, which analyzed the major outcomes of the fourth European Working Conditions Survey, «What is not so widely appreciated is that the majority of this net employment growth was amongst female workers. From 1995 – 2006, female employment rates for the whole EU increased by eight percentage points (from 50 – 58%), while the employment rate for men grew from 70 – 72%. As a result, while a substantial gap persists between women's and men's employment rates, the difference did narrow appreciably over this period. [...] However, it is important to note the disproportionate increase in female employment in lower paid jobs. Were the levels of women in lower paid jobs to further increase, a troubling dichotomy could emerge within women's employment with an over-concentration at either end of the job quality spectrum»². Similar conclusions were reached in similar and more recent reports, like the European Commission Report on equality between women and men, and the most updated Eurostat data (see the Statistical Annex of this report).

Hence, a possible hypothesis is that restructuring processes related to the enactment of climate change policies could turn into a driver for the creation of new and better employment opportunities, also for women, especially in new Member States and other specific geographical areas, where women are over-represented in low-paid jobs³. If RE can be part of the solution, it is also true that

² European Foundation for the Improvement of the Living and Working Conditions, Patterns of recent employment growth in the EU: implications for gender equality, 2009.

³ Ibid.

there are still challenges to be faced concerning female employment, from the access to employment, to their working conditions and the safeguard and promotion of equal opportunities, also taking into account the traditional prevalence of male-workforce in the energy industry ⁴. This situation might be replicated without considerable changes also in new green businesses, due to several factors.

Firstly, female labour participation in these sectors could be hindered on the basis of cultural grounds. Among other reasons, gender stereotype may lead women to select general, and non-technical studies and jobs, as engineering, math and science. This contributes to an unbalanced gender representation in labour market occupations, especially in highly technical industries. For instance, the typical value chain of a company in the renewable energy sector includes core businesses where mainly engineers, technicians and specialized workers are employed. But these are professional profiles where women have traditionally been underrepresented, also as a consequence of a lack of skills and qualifications in hard sciences, at a macro level. Nevertheless, as the WiRES research showed, a number of multinational companies are developing gender-neutral and highly-qualified professional profiles, where women, whose qualification levels have noticeably increased and outpaced those of men, can gain considerable job opportunities. A possible role for social partners and stakeholders would be supporting the transition to low-emitting economies by guaranteeing that female labour force, typically employed in services, does not lose their jobs. Similarly, women who have been a long time out of the labour market, could be accompanied by information and awareness raising activities, as well as by targeted educational and training opportunities for requalification, promoted jointly by local institutions and social partners.

⁴ Green jobs are mostly so-called Non-traditional Occupations (also known as occupations where women represent 25% or less of the total workforce employed, according to the US Bureau of Labour Statistics). There is a lack of scientific literature on the issue, since debates are still in progress.

Secondly, certain working arrangements – such as shift work, side-spread in the manufacturing plants of wafers and rows materials used in the photovoltaic sector – may not match with specific gender-related needs. Our research addressed also this topic providing evidence from literature.

4. Methodology and means employed to conduct the research

The adopted methodology varied according to the different research phases and to the national situation analysed, but it included:

1. Descriptive analysis of female employment trends across the EU (to be carried out through Eurostat data analysis, but also through qualitative and non-structured consultations and interviews with employers and trade unions, with relevant associations promoting gender equality, with relevant associations promoting renewable energy and relevant Government Bodies and agencies, including local authorities);
2. Selection of a set of indicators relevant to the analysis, ranking and clustering of EU regions, according to both gender equality and productivity potential, referred to the specific RE industries.
3. Literature reviews of available articles, books, documents and conference proceeding, on the topics of the project from contractual and working time arrangements, to family-friendly policies and work-life balance instruments, to professional development and female entrepreneurship.
4. Consultations and interviews with employers and trade unions involved in the project. The WiRES team identified and contacted by e-mail policy officers, project managers in charge of environmental or gender issues within the European and national social partners organizations. They were asked to provide information concerning the project.
5. Consultations and interviews with relevant associations, organizations and stakeholders promoting gender equality;

6. Consultations and interviews with representatives of associations promoting renewable energy, including companies and multinationals;
7. Consultations and interviews with relevant Government Bodies and agencies, including local authorities and their representatives.
8. Dissemination of the project's initiatives, results, events, deliverables by means of continuous contacts at the national and international level with relevant stakeholders and institutions.

5. Results

Outcomes

The most important WiRES expected result, i.e. increased awareness on gender issues related to green jobs, was achieved. A number of relevant stakeholders were involved in the project as partners, supporters or participants in the WiRES related events. Social partners, Institutions' representatives and prominent academics joined the network, bringing different perspectives and contributing to the debate concerning women in renewable energy sector.

During the WiRES project, the European Parliament issued two important resolutions emphasizing the negative impact the crisis will have on women (EUROPEAN PARLIAMENT, *Resolution of 17 June 2010 on gender aspects of the economic downturn and financial crisis*) and calling on the EU and the Member States to give higher priority to "green jobs" for women, taking into account the fact that the European Social Fund finances training projects in areas such as renewable energy (EUROPEAN PARLIAMENT, *Resolution of 7 September 2010 on developing the job potential of a new sustainable economy*).

The wide coverage of the project contributed to make it appreciated in many countries. The WiRES coordinator was invited by the Belgian Presidency of the Council to present the project in the Energy session of the Ministerial Conference "Promoting Green Employment: a Major and Indispensable Driver behind a Successful Transition towards a Competitive Low Carbon and Green Economy",

which took place in Brussels on 28th -29th September 2010. A WiRES researcher was invited to present the project in Hungary.

Moreover, a number of Adapt special newsletter and dossiers (see Annexes to this report) were issued concerning the WiRES project. They include contributions by Ms Elisabeth Schroedeter, member of the European Parliament, and Joelle Milquet, deputy Prime Minister and Minister for Employment and Equal Opportunities in Belgium as well as an interview on WiRES topics released by Mr Raymond Torres, Director of the International Institute for Labour Studies at the International Labour Organization. The WiRES outcomes are also published in the EURELECTRIC blog, where electricity industry stakeholders can express their opinions, share information and exchange their views.

During the WiRES project a consultation of social partners operating in the energy sector, both at a national and European level, was launched. Around one hundred e-mails were sent to advertise the project and, at the same time, received useful feedbacks. Representatives from employers and trade unions' organizations were requested to provide information about best practices on the role of social partners in initiating and influencing gender-oriented policies and practices in the field of Renewable Energy Sector. In order to have a full picture of the research objective, the WiRES team also asked national social partners for support in gathering information about the collective agreement covering the renewable energy sector in each country. Unfortunately few and slight feedbacks were received, except from the British employers and trade unions representatives and EURELECTRIC officials. The WiRES research team regrets to record scant support from the ETUC for the whole project.

2. FINDINGS

1. Facts on the renewable energy sector

a) Effects of ecological conversion of the economy on employment

Most of the articles and literature reviews concerning the WiRES project are based on the assumption that the rise in green jobs is a consequence of the positive relationship between environmental policies and the expansion of the renewable energy sector. Nonetheless empirical research is not univocal on this argument (Part II of this report). The lack of a shared definition of green jobs, together with different approaches to data create difficulties in making a quantitative or qualitative assessment of the effects of the green economy. Most of the studies make a slightly positive assessment, alternatively opting for a neutral position, suggesting that negative effects are less likely.

As far as the comparison between traditional energy sector and renewable energy sector is concerned, a study issued by UNEP in 2008 shows that, compared to fossil-fuel power plants, *renewable energy* generates more jobs per unit of installed capacity, per unit of power generated and per dollar invested (UNEP, *Green Jobs: towards decent work in a sustainable, low-carbon world*, Nairobi 2008). The research explains this as a result of three concurrent effects (Part II of this report). One can define the first effect as the *spin-off effect*. It is generally reported that employment tends to grow more quickly in the field of Renewable Energy as a consequence of the EU energy and climate policies. The second effect might be named the *substitution effect*, according to which there will be a certain degree of substitution of employment, owing for instance to the shift from fossil fuels to renewable energy sources. The third effect might be called the *catch-up*

effect. The catch-up effect is commonly used to describe the economic growth of developing countries but, in a sense, it could also apply to single sectors. Hence, we can derive that economic sectors that start off poor generally grow faster than the economic sectors that start off rich.

b) EU labour market and employment composition

Women may face challenges in accessing “green jobs” in RES, as these tend to concentrate in traditionally male-dominated industries and occupations. Women often lack the necessary skills, qualifications and experience to take advantage of opportunities in the green economy.

Unlike the US labour market, where green jobs may be seen in terms of “green-collar jobs” – that is to say well qualified occupations providing opportunities in terms of career advancement and wages – trends in the European labour market over the last decade suggest that the green sector includes both low-paid unskilled jobs, and highly skilled occupations (Part II of this report).

At a European level, policies could be adopted to create new forms of green employment, to cope with the increasing polarisation of the labour market, and to mitigate the impact of such measures on women in the workforce. According to the literature, green jobs are increasing in male-dominated industries and occupations.

c) EU-wide indicators on women and the environment

The research acknowledges that there is a lack of specific data related to the gender issue (see Part II of this report). EU-wide indicators on women and environment have not been developed yet; in fact, the EU presents a very limited array of sex-disaggregated data in general due to the absence of regular surveys among the Member States (Part IV of this report). Eurostat presents a very limited array of gender-disaggregated data, especially regarding employment in renewables, since this topic is only recently being investigated and awareness about gender imbalances in the energy sector and in the green economy is not considered a priority yet. However, a set of indicators for WiRES has been

developed within this research (Part IV of this report). These facts and figures demonstrate that women in the renewable energy sector face similar challenges of those employed in other sectors.

2. Women in renewable energy sector: psychological perception and stereotypical views

Some researchers suggested that the energy sector has a highly masculine image which deters women (Part II of this report). Moreover there is a stereotype that women are not technologists and that they are not capable (even when provided with appropriate support) of building, operating and maintaining sophisticated technologies (Part IV of this report). This idea seems to be confirmed by the workforce gender composition in the energy sector. The share of female technical staff is at most 6%, in decision-making positions it is about 4%, and in the top-management the share is less than 1% (Part II of this report).

- On the other hand, according to studies issued by the OECD, women are most inclined to green issues compared to men (OECD, Gender and Sustainable Development: Maximising the Economic, Social, Environmental Role of Women, OECD, Paris, 2008). As the *Renewable Energy Sector* is a privileged window of sustainable economic growth, this should also be a leading example of decent work, with remarkable standards of gender equality, work-life balance, fair wages, health and safety (Part IV of this report).

The research outlines several reasons to overcome the stereotypical view of women in the renewable energy sector and to incentive women to have a positive look to green careers (Part II of this report):

- A green job can provide the chance to earn more.
- Women can start with any skill level.
- Green jobs appeal to workers with a diversity of skills and interests.
- There are multiple ways to get started in a green job.

- Green job opportunities are available for workers of any age.
- Green employers are looking to hire.

3. Social dialogue for women in the renewable energy sector: the role of social partners

The WiRES research is mainly focused on the role of social dialogue in easing and possibly shaping the transition to a greener economy. In particular, the purpose of this research is to show how social partners might contribute to make the renewable energy sector more gender-friendly. This can be achieved by providing women with better access to the sector and by improving their working conditions.

In one year, the WiRES research highlighted that there is a lack of specific social dialogue experiences in RES. Although it is part and parcel of the macro sector of energy, the renewable energy sector needs to be addressed with proper instruments, owing to its expanding production capacity. This also means that trade unionists and employers' representatives should be trained to cope with the problems related to the emerging of new jobs, anticipating future skills needs and bridging the current skills gap. It is not a surprise that there are still significant barriers hindering both access and participation of women in RES. As the research pointed out, the female workforce often lacks the skills and expertise required to filling the related job profiles. In addition to these access difficulties, traditional, cultural and organizational hurdles – in terms of work-life balance, gender pay gap, occupational segregation, glass ceiling, work-related-stress etc. – lead to a scant interest on the part of women in this sector, as well as in those characterized by the same employment conditions. As a result, women are not always ready to take advantages of the opportunities offered by the ecological conversion/evolution of the economy.

Nevertheless, social partners will have increasing opportunities to make the sector more gender-friendly, by promoting equal opportunities in a perspective of gender

mainstreaming. Particular attention should be paid to education and training and skills development for WiRES.

a) Skills for the green economy

Unlike the US labour market, where green jobs may be seen in terms of “green-collar jobs”, trends in the European labour market over the last decade suggest that RES is going to include both low-paid unskilled jobs, and highly skilled occupations (Part II of this report).

Women risk finding themselves without the necessary qualifications to take advantage of the opportunities in the green economy, due to a lack of skills and expertise. The empirical study conducted within WiRES (Part IV of this report) suggests that the requirements for occupations in renewable energy tend to exclude women. A survey of the gender of graduates in different subjects (Part IV of this report) found that women were underrepresented in science, technology, engineering and mathematics. Vocational training programmes are seen as traditionally increasingly male-oriented especially in some countries. At the same time, the renewable energy sector requires workers with a certain level of expertise in the electric/energy sector who are willing to travel, both factors that tend to discourage working women. In the coming years, the demand for vocational training and retraining in the green economy will increase significantly, together with the need to provide effective guidance on the skills needed in the labour market (Part IV of this report). It will be necessary to increase and adapt the workforce, providing workers with higher levels of qualifications, also in an attempt to reduce gender inequalities. Some of the emerging job profiles, such as the energy manager, could be appealing and affordable also for women.

Without qualified entrepreneurs and skilled workers, the available technology and resources for investments cannot be used or cannot deliver the expected environmental benefits and economic returns. Endeavours to close the current skills gap and anticipate future needs are essential for a transition to a green and low carbon economy.

Creating a map of skill requirements is a vital first step as it can inform ad hoc programmes for potential skills upgrading. Assessments of the potential of green jobs and the monitoring of such skill needs, would constitute an ideal basis for ad hoc measures and for the adaptation of national vocational training and education systems over the medium term. This would allow skills development to tie in directly with policies and investments, as reflected by the experiences reported by Ecorys *Overview of the links between the skills profile of the labour force and environmental factors*, 2008, concerning the identification of skills analysis methodologies (this report is available on WiRES virtual cooperation area).

b) Work-life balance for green economy

The raise in women participation in the field of green jobs, and the guarantee of the quality of the work, are part of a process aiming at overcoming the obstacles hindering a wider female participation in the workforce.

According to EMCEF (2007), among the existing barriers for female participation, a relevant role is played by flexible working hours, childcare needs and the culture of organization. For example, women often pay a price for flexible working hours by missing out on promotion or on other career development opportunities while they have care responsibilities. Managers are not always equipped to respond effectively to women workers' needs and preferences. In such dynamic industry, as renewable energy, company work-life balance policies should be developed and should be targeted both to women and men. In particular, if long working hours or shift turns are requested (e.g. for PV cells manufacturing), some measures and innovative working arrangements are needed in order not to disadvantage working parents. In some companies women with childcare responsibilities face significant difficulties in combining work and family life and this is often a barrier to their progression. As a consequence of the unequal care burden and the inability to prioritize income commitment within the family, women are often obliged to search for shorter and more flexible working hours. The result is often a hindrance to entry into occupations featuring high or irregular working hours and workload, or a re-segregation into occupational

niches that tend to be more hour-friendly. This tends to be true especially among qualified women. In some cases the need for shorter working hours leads to part-time work, which is likely to further restrict the choice of occupation. Furthermore, formal childcare is often unavailable, unaffordable or of poor quality. An important role is played by paid parental leave, which allows both women and men to take care of children in agreed periods, without suffering adverse income and employment effects.

It is usually believed that having more women in the workforce creates internal pressures associated with the development of work–family policies (Part IV of this report). However, findings on the influence of the proportion of women in the workforce are mixed. On the one hand, some studies find this factor is associated with the likelihood of adopting flexible working time arrangements and work–family policies such as childcare. This may depend on the position of women as there is evidence that organizations with a relatively large share of women managers seem to provide work–family arrangements more often than organizations where women’s employment consists mainly of lower skilled jobs. On the other hand, the choice of part-time jobs in order to better reconcile work and family responsibilities, makes it almost impossible to reach top managerial positions. Moreover, being the principal care givers, women are often unavailable to offer the kind of flexibility that companies would require. They are unavailable for long travelling and unplanned overtime.

c) Reducing gender pay gap

Increasing the share of women in the renewable sector and, at the same time, reducing pay gap will certainly require a combination of innovative and traditional strategies, overcoming discriminatory and organizational barriers (Part IV of this report). Mandatory pay audits are reported to reduce gender pay gap as they would provide transparency in relation to pay systems, thus enabling employees and unions to engage in deliberative learning processes with employers over narrowing the pay gap (Part IV of this report). Mandatory pay audits should be introduced by collective bargaining.

4. Social dialogue for women in the renewable energy sector: problems

The results of the research show that the Renewable Energy Sector is still playing a secondary role within the macro sector of Energy, which continues to be characterized by higher investments in non-renewable energies. A major impediment to greening economies and jobs is that unsustainable business practices are still prevalent and often remain more profitable (Part II of this report). Early adopters of green technologies and business practices among enterprises have to cope with pressure from financial markets for quick returns and with other firms competing to attract customers through low prices, albeit on the back of externalized environmental and social costs.

A report issued by the EUROFOUND acknowledges that:

- There are a lot of examples of tripartite structures dealing with green issues.
- Both employers and trade unions have been active in raising awareness of the main green issues among their members.
- There are a number of examples of bilateral dialogue on green issues between management and labour.
- Many employer and trade union organisations have put in place training programmes for their members on green issues.

Nonetheless the report confirms that «no formal social dialogue is yet in place that deals specifically and only with the renewable energy sector as such». The role of social partners seems therefore to be restricted within the wider area of environmental and sustainable development. As regards European countries there are no agreements in place to cover this sector as such. In this framework, it is rare to find specific social dialogue experiences in the field of alternative energies. As a result, proper gender-oriented initiatives are still lacking.

As far as the EU level is concerned, the European Sectoral Social Partners have made steps forward to prepare a “fair” Energy market, although proper social dialogue initiatives for the Renewable Energy Sector are not in place yet.

3. EVALUATION OF THE PROJECT

1. The project contribution to the objectives and priorities of the budget heading

In this research, social dialogue has been conceived as the privileged method to ensure participation of trade unions' and employers' organizations in the implementation of the EU Climate and Energy Package standards at the local and company level, with reference to their impact on competitiveness, employment opportunities and social cohesion in the RE sector. In this connection, social dialogue practices should regulate and ease change, especially in the case of those restructuring processes experienced by a wide array of industries due to the implementation of the EU Climate and Energy Package, through a gender mainstreaming approach. Thus, social dialogue could suggest that the challenging objectives as set up by the package – especially the increase in renewables up to 20% of the total energy production – can be pursued by ensuring a more inclusive labour market and better working conditions.

This project indeed aimed at raising awareness on gender issues related to green employment development in Europe (primarily in the countries involved in the project), among social partners, as they are acknowledged as protagonists of a fair transition to a greener economy. The project brought about more information and increased awareness, as fundamental prerequisite for furthering and enhancing social dialogue on these topics, at cross-industry and sectoral level – in accordance with Article 138 of the EC Treaty – as a force for innovation and change as highlighted also in COM(2002) 341 (final).

Unfortunately, as the paragraph on results (*infra*, chapter 1) points out, from a gender perspective, most European social dialogue experiences seem far from such achievements in the field of renewable energies. The business of renewables is still booming in Europe and, in a scenario where companies themselves often struggle to attract investments, trigger restructuring processes and create new jobs, time and resources are often too scarce to bargain on gender issues. Another crucial variable should be also taken into account: the project was developed from November 2009 to November 2010, a period of international economic turmoil. This helped focussing on the need for a broader approach to the transition to a greener economy, which does not only consider gender as a key variable. As some case studies revealed, diversity-management might be a successful solution.

However, in order to encourage the cooperation and involvement of social actors in envisaging the potential social costs stemming from the transition to a low-carbon economy, WiRES prepared the ground for the creation of an international network of social actors active in these fields. A major contribution consisted in increased information and greater awareness on gender challenges, not only in renewable energies, but in all green jobs. Debates spread considerably across sectors and social parts showed their interest in developing research and positive actions in this direction. WiRES also identified the tools for easing the exchange of information, monitoring, follow up and dissemination of European social dialogue activities and outcomes. As for the latter, a number of policy recommendations are given (see Policy recommendations and good practices).

2. The transnational dimension of the project and role of partners and supporters

The variety of actors taking part in the project has been critical for its success. Given the relevance of the topics, WiRES has been widely supported: a number of letters of support were signed by social partners from several countries, as well as

by other stakeholders at a national and international level, contributing to the project in terms of theoretical development and practical realization.

As regards the European dimension, for example, the Belgian Presidency of the European Council included a presentation of the WiRES project in the Energy session of the Ministerial Conference “Promoting Green Employment: a Major and Indispensable Driver behind a Successful Transition towards a Competitive Low Carbon and Green Economy”, held in La Hulpe (Brussels) on 28th and 29th September 2010; a special newsletter was issued after the event (see Annexes to this report). A Member of the European Parliament, Ms Elisabeth Schroedeter, accepted to intervene during the final conference of the project, held on 23rd November 2010 in Brussels, and she contributed to a Special Bulletin published by Adapt about the project (see Annexes to this report). A representative from Cedefop, Mr. Peter Szovics was guest speaker during the first conference organized by Adapt in Rome on 4th February. On the side of European social partners, EURELECTRIC joined WiRES final conference in Brussels; moreover, a post regarding the WiRES project was published on EURELECTRIC on-line blog, where large debate was raised, eventually moderated by the WiRES team. Finally, Mr Raymond Torres, Director of the International Institute for Labour Studies at the International Labour Organization, released an interview on WiRES topics, published in an Adapt Special Bulletin (see Annexes to this report).

At a national level, the project was appreciably relevant especially in the partners’ countries, namely Italy, Bulgaria and Hungary but it received attention also at international level.

Debate increasingly spread in Italy, where Adapt mainly operates. Italy hosted the kick-off WiRES conference in Rome, where the Minister of welfare, Mr Maurizio Sacconi took part as guest speaker together with prominent Professors and experts at an international level. After the event, a number of articles, comments and interviews were published on the Italian press (see Annexes to this report). Adapt also organized one workshop in Milan on 16th July, joined by the National Counsellor for Gender Equality at work, by a representative of the electricity branch of CISL (FLAEI), Ms. Manuela Lupi, and by one responsible for

Industrial Relations in Enel Green Power, Dr. Antonella Lanaro. A considerable number of stakeholders, informed and involved through the Adapt network, actively supported the project, by posting WiRES news on their websites, by writing articles, making interviews and recording videos on the project. A heated debate in the Italian press followed, consisting in the publication of articles on the topic of women and green jobs, also in important newspapers like the economic daily “Il Sole 24 Ore”, and in the inclusion of the gender variable on the most recent books on green economy. The National trade union CISL, especially its Women Department in Italy, and CISL sectoral affiliate in the electricity branch (FLAEI) continuously participated in the debate, they spread WiRES deliverables to their international network, and they massively intervened in the WiRES concluding conference. The FLAEI-CISL also repeatedly invited their representative Confederation at a European level, the ETUC, to take part in the WiRES events, although without success. Furthermore, Enel Green Power, a multinational enterprise operating in various continents in the field of renewables, based in Italy, agreed to play an active role in the research development. Besides the obligations defined by the letter of support signed by the company, not only did Enel Green Power financially contribute to the realization of the first international event in Rome. But representatives of the company took part in both the international conferences organized within the scope of the project and in one workshop, always bringing evidence and sound contributions for fuelling the debate and research development. Finally, Adapt wrote a case study report on Enel Green Power, resulting from a number of interviews, focus groups and also from data selection and analysis, carried out thanks to the intense cooperation with Enel Green Power employees and experts.

In Bulgaria, the Union for Private Economic Enterprise (WiRES partner) organized a workshop inviting also a representative of the Bulgarian Energy Efficiency Association. They took part in both international conferences and in two workshops. The workshop also gathered together representatives of the present, emerging and potential organisations of social partners in Bulgaria and journalists. The UPEE took part in both international conferences and in two

workshops. Finally, UPEE realized a massive case study on social dialogue and employment of women in the field of biomass utilization in Bulgaria. One of the authors of the survey – Teodor Detchev – reported the results during the Academic conference “The new challenges for employment and labour markets: labour, gender, mobility”, organised in Sofia (Bulgaria) by the University for National and World Economy (UNWE) and the Center for Women’s Studies and Policies Foundation. The conference took place on 21st – 22nd October 2010 in the UNWE. In Hungary, the Law faculty of the University of Szeged provided sound theoretical insights for research development throughout the whole project development. They wrote an article for the Hungarian press and took part in a conference in Budapest, where the project was presented. They ensured full and active participation in both international conferences and in all the three workshops. They efficiently met the internal organization of the WiRES team. Finally, the Hungarian partner developed a case study on the Hungarian situation, also analysing the Energy Centre of Hárskút.

Central and Eastern European Countries were strongly represented also by ISTUR, a non-governmental research organization in the Confederation of Independent Trade Unions in Bulgaria, whose representative participated in the WiRES kick off conference and also in the second workshop in Karlsruhe. The mission of ISTUR is to provide research outputs tailored to the needs of social partners and the development of industrial relations in the country according to the best EU countries practices.

Germany, as one of the leading players in Europe in the development of renewables, was strongly involved: the city of Chemnitz-Zwickau (Germany) was supposed to provide an active link to other European regions. In addition, the dissemination of the outcomes was meant to be supported by the European network involved in gender justice and sustainability, LIFE-Genanet. This is an international non-governmental organization headquartered in Berlin, which promotes environmental protection and equal opportunities for women and men in skilled trades, science and technology, develops new educational concepts focusing on environmental protection and forming integral part of all areas of

training; it also creates connections between environmental and feminist politics. It organizes women's networks supporting equality of opportunity in the environmental sector and on the labour market, and cooperates with many countries in Europe. The project was supported also by VBFF, a German professional association for the promotion of women involved in professional issues, such as research over reorientation, training to coaching professionals and executives, consulting services, training projects and additional projects for women returning. Finally, ETech Germany considerably supported WiRES, by hosting three workshops in Karlsruhe during the one-year project and disseminating information about the WiRES project and events also by means of their website and cooperated in editing Adapt electronic publications within the WiRES projects.

The main working language has been English, although deliverables were also translated in French in order to be distributed to social partners. The three partners contributed to disseminate information about the project also in their national languages, namely: Bulgarian, Hungarian and Italian, by means of articles, papers, interviews and participation to national or local events.

3. The added value, innovativeness and efforts to ensure the projects a lasting impact

This project promoted an integrated approach to the analysis of three distinct but equally critical policy fields for Europe, namely: employment, environmental change and gender equality. In other words, innovation of the project mainly lied in the unprecedented contamination of different policy areas, leading to a possible direction for developing social dialogue and industrial relations, in a time of constant change of the labour market.

Building on a holistic view, the debate stemming from WiRES involved a vast range of social actors and relevant stakeholders in the three domains touched upon by the study. Coherently, consultations and interviews included in the project

methodology, contributed in attracting the attention of governmental bodies and key actors responsible for the political agenda at a national and European level, on WiRES topics. There is no sound evidence this objective was reached but a number of facts show that the project addressed particularly relevant issues for Europe. At a European level, after months of complete silence on this topic, on 17th June 2010 the European Parliament passed a Resolution on gender aspects of the economic downturn and financial crisis (2009/2204(INI)), pointing out that women might be excluded from the occupational potential triggered by the ecological conversion of the economy and the transition to a low-carbon economy. The resolution referred to the fact that female workers are strongly under-represented in the renewables sector and especially in science and technology-intensive jobs. On this basis, the European Parliament therefore asked the other EU institutions and Member States to make sure that female workers are more included in training projects and programmes on ecological transformation. Likewise, on 17th September 2010 the European Parliament released a Resolution on developing the job potential of a new sustainable economy (2010/2010(INI)), where a whole paragraph was dedicated to “Job potential for women and men in the new sustainable economy”. At a national level, the Italian Ministry of Economic Development intends to set up a task force for “Women in green jobs”. Moreover, the network of Counsellors for Gender Equality at Work, sponsored by the Ministry of Labour, showed active interest in these issues and requested for more information and training. In Bulgaria, with the beginning of 2011, the UPEE started preparations for a discussion on the issues of the renewable energy industries, together with a list of ecological organisations. It is expected that the conference will be attended by representatives of social partners, representatives of different renewable energy businesses, journalists and ambassadors of EU countries and the US ambassador.

In order to better ensure a long-lasting impact of the project, continuous monitoring and evaluation on the research development have been carried out by electronic publications and on-line activities (dossiers, forum, etc.). This allowed the research team to proceed with a try-and-go methodology, and to adapt to

reality, answer to emerging needs and therefore be more effective. For instance, as soon as the research showed that the gender variable was not only absent from social dialogue in the energy sector, but also in many other experiences of social dialogue in green sectors, a specific and intentional effort was made to widen the WiRES debate to other green industries. Moreover, the research team elaborated concrete policy recommendations and indicated good practices so that social partners can be more easily involved in developing social dialogue for achieving the goals of the WiRES project.

In all activities of the project, the WiRES team declared to be prone to assist government actors who contribute to address the issue of gender mainstreaming in the renewable energy industry as consultants in the follow-up of the research.

4. FOLLOW UP

1. Arrangements to publicize the operation and dissemination of results

For each of the project's phases and activities, different arrangements were set up for publicizing the project and disseminating its results, with a view at informing, raising awareness and engaging social partners and actors in industrial relations in a lively debate at a European, national and company level. To these end, a number of activities and tools were organized and set up:

1. A number of **events were organized:**

1.1. A kick-off international conference, organized by Adapt on 4th February in Rome. The event hosted the presentation of the project to partners, supporters and relevant stakeholders. Among the important guests intervened in the conference was the Minister of Welfare Maurizio Sacconi.

1.2. Three thematic workshops, dedicated to the research stages:

- The first workshop, organized by UPEE, was held in Sofia, on 13th May and it presented the results of the quantitative research on female employment in renewable energy sector;
- Adapt with the collaboration of Etech Germany, set up the second workshop (27th and 28th May, Karlsruhe), focusing primarily on women's human capital development for the green economy;
- A closer look at social dialogue experiences was taken during the third workshop, organized by Adapt in Milan on 16th July.

- 1.3. Four partners' meetings, organized after the first international conference and after each workshop, aimed at sharing the research outcomes and the planning of future steps in the project;
- 1.4. A final international conference for the presentation of the results was organized by Adapt on 23rd November 2010 in Brussels, to present the results of the research.
2. A **web page** at <http://www.adapt.it/wires> was designed and implemented with the purpose of disseminating information on the project. Moreover, a **virtual on-line** – freely accessible – **cooperation area** was set up, hosted within the Adapt e-Learning platform at <http://moodle.adapt.it>, where all the project deliverables are published. Special sections of this cooperation area, including forums for debate, were made accessible only to the project partners.
3. A number of **electronic publications**, issued by Adapt:
 - 3.1. An electronic dossier was published after each conference and workshop, to collect proceeding and summarize its main results and interventions. Partners and supporters have contributed to the realization of each dossier, providing for articles and comments;
 - 3.2. A number of Adapt Special Bulletins and Dossiers were published to collect relevant materials on the topics tackled by the WiRES project, but also to give evidence to WiRES events and to disseminate its results;
 - 3.3. Publication of relevant material concerning WiRES by project partners and bodies supporting WiRES or that are interested in the project, in their institutional journals, newspapers and other channels of communication (newsletters and websites);
4. Among the others, a consultation of social partners operating in the energy sector, both at a national and European level, was launched in order to advertise the project and, at the same time, receive useful feedbacks.
5. Publication of this **final Report**, containing the summary of the project, the research development and outcomes, three case studies, and the scientific research work made by Adapt to develop the research, including one statistical annex and five thematic literature reviews;

6. Publication of **a guide for social partners and stakeholders**, including a set of policy recommendations, drawn from the evidence collected throughout the analysis of case studies and good practices.
7. Furthermore, some **papers** from various meetings have been peer-reviewed by the Marco Biagi Centre for International and Comparative Studies and published in the Journal “Diritto delle Relazioni Industriali” (Giuffrè, Italy’s leading publisher of law books) and in “The International Journal of Comparative Labour Law and Industrial Relations” (Kluwer Law International).
8. All the activities, materials and the reports produced have been constantly spread, publicized and updated through the **Adapt website, e-Learning platform, and newsletter**, that include more than 10.000 contacts. Furthermore the organizations supporting the project have offered their contribution in disseminating information about the project through their websites and mailing.

2. Lessons learnt

From an organizational point of view, the WiRES project showed the considerable potential impact of electronic tools for project management and for information and dissemination purposes. In particular, Adapt, as project leader, experimented the use of an e-Learning platform, namely <http://moodle.it>, for management and organizational purposes, i.e. to keep in touch with project partners, scheduling events, collecting materials, communicating both within the project consortium’s members and to a wider public. In particular, this turned out to be a very effective tool for briefly communicating the project topics, its structure and its outcomes. We also learnt that, to ensure more active interaction on the platform, an e-tutor would be needed, in charge of stimulating and moderating virtual discussions, solving technical problems and keeping track of the most interesting contributions to the debate. However, more telephone contacts could be useful to directly

involve social partners, as they often revealed scepticism in engaging in complicated topics, as those addressed by WiRES.

As regards research methodology, data analysis was particularly difficult as little or no gender-disaggregated data were available in employment issues, and in particular at the sectoral level. Desk research was also particularly difficult, since the topic addressed by WiRES had never been investigated before. A few scientific articles and some reports but no doctrinal papers were found in the several literature reviews realized by the WiRES research team. Despite the lack of available data and information, we found out that such new topics represent a precious opportunity for developing research.

As far as the content of the project is concerned, WiRES shed light on a historical shift that might occur in the field of social dialogue. Briefly, many sectoral social partners showed little or no interest in the topic of women in renewable energy sector, as it appeared too complicated and/or secondary, with respect to other bargaining issues in the national member states, like jobs creation, particularly relevant in the moment when WiRES was developed. However, this was an opportunity to reflect upon the redefinition of the role and the scope of actions of social partners. Social dialogue in Europe can provide a major contribution to the implementation of the green agenda, also in fields that have traditionally been disregarded, like vocational education and training, guidance, skill needs analysis, all aimed at preparing today's workers for the jobs of tomorrow. In general, social partners and industrial relations actors could increasingly play an active role in supporting and orientating the reorganization and the restructuring of industries, with particular attention to the most vulnerable workers.

3. Follow up of the operation

In order to follow up progress of the operation, the WiRES consortium remains available and willing to continue cooperating with supporters and stakeholders encountered during the project, aiming at further debates, information, awareness

and evidence about the role of social dialogue in facilitating the transition to a greener economy with particular reference to the occupational impact of the green economy on female workforce.

With a view to keep the research outcomes visible, Adapt opened up the virtual cooperation area, so that all project deliverables are made available on-line. This working area also hosts forum for discussions, so that relevant stakeholders can share their views and opinions on the conference topics.

In order to follow up progress of the WiRES project, Adapt and the University of Szeged, together with the Hamburg University of Applied Sciences (Germany) designed a new project proposal under the Call for proposals VP/2010/005 (Budget heading 04.04.01.01, projects contributing to exchange of good practices, Domain b) Supporting good practices in providing training for new skills in green technologies). The project proposal, named **STRENGTH – Skills, Training, Education in New Green Technologies**, aims at promoting research, analysis, support and dissemination of good practices set up to develop new skills for women working in green technologies in the renewable energy sector. Particular attention will be devoted to the role of social dialogue and industrial relations. The project focuses in particular on skills development, through education and training, which the WiRES project acknowledged as the two major levers for preparing women workers to cope with the challenges and opportunities opened up by a low-carbon economy. In general, having learnt that a more active attitude towards social dialogue is needed, STRENGTH means to stress that, in view of the EU2020 agenda, Europe should rely on a renewed culture of social dialogue and industrial relations, able to actively promote green values, lifelong learning opportunities and gender equality at various governance levels.

Part II

RESEARCH DEVELOPMENT AND OUTCOMES

1.

THEORETICAL FRAMEWORK

A)

THE EMPLOYMENT PERSPECTIVES OF THE GREEN ECONOMY BETWEEN MYTH AND REALITY

1. Framing the issue

The issues related to the employment opportunities provided by the “green economy” have been extensively discussed among experts in recent years ¹. In this respect, the 1997 *White Paper* on renewables issued by the European Commission marked a turning point at a European level ². In planning a set of measures aimed at promoting renewable energy, policy makers were aware of its potential in terms of employment, although the concept of the green economy was not yet widely established.

While in the past green jobs were not widely promoted, except in Spain ³ and Germany ⁴, they have now become a key objective, and public awareness has been

¹ For literature review about green jobs, see Adapt, *Employment perspectives of the green economy and the impact on the labour market – Literature review updated in 2010*, www.adapt.it, Green Jobs.

² European Commission, Communication from the Commission, *Energy for the future: Renewable sources of energy. White Paper for a Community strategy and action plan*, 1997, at www.adapt.it, Green Jobs. The European Commission argues that “the development of renewable energy sources can actively contribute to job creation, mainly among small and medium enterprises” p. 4, and that “a proactive move towards such energy sources will lead to significant new employment opportunities” p. 13.

³ With reference to Spain, see Fundación Biodiversidad, Observatorio de la Sostenibilidad en España, *Empleo Verde en una Economía Sostenible*, 2010, at www.adapt.it, Green Jobs. The

raised. The US administration ⁵ publicly acknowledged the importance of the green economy as an instrument to tackle the financial crisis started in 2008, and since then, more and more consideration has been given to the sector, viewed also as a means to promote employment.

In addition to its potential in terms of employment, the green economy responds to other major concerns to be faced by policy makers in the coming years, such as the need for renewable energy sources and the control of pollution, reflecting their commitment to combat climate change.

Accordingly, the measures included in the Kyoto Protocol, as well as those laid down in the 2000 *Millennium Development Goals* of the United Nations, focus on the environment at a global level. In Europe, the “20-20-20” provision contained in the *Climate and Energy Package* ⁶ lays down mandatory norms aimed at reducing greenhouse gas emissions and encouraging a more efficient use of energy, as specified also by the Directive on energy from renewable sources in 2009 ⁷. In addition, with the European institutions ⁸ renewing their commitment in

Spanish government started to address the issue of the employment impact of sustainable development policies about 10 years ago. See the study commissioned by the Spanish Ministry of Environment in 1998 when Spain had more than 219,382 employees in “green” activities, 1.55% of the Spanish working population at that time: Ministerio de Medio Ambiente y Medio Rural y Marino, *Estimación del Empleo Ambiental en España*, 2000.

⁴ DB Climate Change Advisors, *Creating Jobs and Growth - the German Green Experience*, at www.sustainableprosperity.ca/files/German%20Green%20Experience%20Jobs%20and%20Growth.pdf, last accessed: 30 September 2010.

⁵ See the *American Recovery and Reinvestment Act 2009*. See also A. Barboni, M. Zagordo (eds.), *Gli effetti della crisi economica sul mercato del lavoro statunitense. Proposte e soluzioni per il rilancio dell'occupazione*, Special Adapt Bulletin, 5 February 2009, no. 3. For an assessment of the effects of the Clean Energy Jobs and American Power Act on the labour market, see Congressional Budget Office, *S. 1733, Clean Energy Jobs and American Power Act*, 16 December 2009, www.adapt.it, Green Jobs.

⁶ The Energy and Climate Package, adopted by the European Parliament on 17th December 2008, responds to the commitment undertaken by the European Council to tackle climate change and promote renewable energies. The Package, based on a EU system of exchange emissions quotas, sets binding targets in terms of CO2 emissions reduction in the sectors that are not included in the European emissions quota exchange system, and utilisation of the renewable energy sources.

⁷ Directive 2009/28/EC of the European Parliament and the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, in GUUE, 5 June 2009, L 140/16, at www.adapt.it, Green Jobs. The Directive sets a common framework for the promotion of renewable energy sources and

this respect, national governments have made an effort to harmonize environmental policies and employment programmes ⁹, also with regard to taxation ¹⁰.

In the coming years, environmental policies are expected to promote the creation of high quality jobs and the setting up of green companies using either traditional or innovative technology ¹¹. However, differences in the implementation of standards can cause a widening in cost differentials among European countries.

establishes binding national targets for the share of energy from renewables in relation to gross energy consumption and for the share of energy from renewables in transport.

⁸ The Commission started promoting climate actions and strategies some 20 years ago, and the first Community strategy to limit CO₂ emissions and improve energy efficiency dates back to 1991. However, Member States and the European Union are called to significant efforts to comply with the Kyoto Protocol's requirements and those set out by the Commission in 2000 and 2005, through the "Climate Change European program", in <http://ec.europa.eu/environment/climat/eccp.htm>. See also Green Paper from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, *Adapting to climate change in Europe – options for EU action*, COM2007 354, 29 June 2007; European Commission, White Paper, *Adapting to climate change: towards a European framework for action*, COM 2009 147, 1 April 2009.

⁹ European Commission, *Commission Staff Working Document on the links between employment policies and environment policies*, SEC 2005, 1530, 17th November 2005, at www.adapt.it, Green Jobs. See also European Commission, *Environment and employment: Building sustainable Europe*, COM 97 592 final. The key points of this communication were later transposed into the Employment Guidelines of 1998. European Council, *Employment Guidelines, Resolution of 15.12.1997*.

¹⁰ On this point the Commission, by regarding the environmental tax reform as possible driver for the creation of new jobs, used the expression "double dividend" to highlight the trade-off between employment and environmental targets; in European Commission, *Commission Staff Working Document on the links, etc., cit.* On the relation between environmental/energy taxation and job creation, see C.J. Heady, A. Markandya, W. Blyth, J. Collingwood, P.G. Taylor, *Study on the relationship between environmental/energy taxation and employment creation*, Study prepared for the European Commission, Directorate General XI, 2000, at www.adapt.it, Green Jobs. The *Environmental Programme* of the United Nations defines "double dividend" as the positive result of reaching environmental targets and creating employment. See UNEP, ILO, *op. cit.*, 10. The International Labour Organization adopted the same expression with reference to environment and employment. Cfr. Green policies and jobs: A double dividend? in ILO, *World of Work Report 2009. The Global Jobs Crisis and Beyond*, ch. IV, 97 et seq, at www.adapt.it, Green Jobs.

¹¹ See, among many, N. Stern, *The Economics of Climate Change: The Stern Review*, Cambridge, Cambridge University Press, 2007, esp. Summary of conclusions p. xvii, on the basis of which "action on climate change will also create significant business opportunities, as new markets are created in low-carbon energy technologies and other low-carbon goods and services. These markets could grow to be worth hundreds of billions of dollars each year, and employment in these sectors will expand accordingly".

In this connection, the European Trade Union Confederation (ETUC) ¹² estimates that a considerable number of businesses that are more exposed to international competition will resort to outsourcing, with negative effects on employment and the quality of work.

However, a number of studies undermine this argument. Spain, for instance, is regarded as a reference point in the quest for renewable energies, despite some critical research findings. According to a survey carried out by the Rey Juan Carlos University in Madrid on the effects that alternative sources of energy have on employment, every “green job” created in Spain resulted in the elimination of 2.2 other jobs ¹³. The research also showed that in 2000 the Spanish government allocated 0.5 million Euros to fund the creation of each job in the green economy, and one million Euros for each new job in the wind energy sector.

The promotion of “green” job opportunities has been widely supported by public funding and by a number of measures aimed at tackling the international financial crisis ¹⁴. It will soon entail growing competition, affecting not only all levels of employment, but also pay scales and work regulating legislation. As pointed out by the International Labour Organization ¹⁵, major concerns about green jobs refer to developing countries and the ongoing phenomenon of dumping, that might lead to an increase in social inequalities within industrialized countries. As a result,

¹² ETUC, ISTAS, SDA, Syndex, Wuppertal Institute, *Climate Change and Employment* 2007. *Impact on employment in the European Union-25 of climate change and CO2 emission reduction measures by 2030*, www.adapt.it, Green Jobs. See also ITUC, *Trade unions and climate change. Equity, justice & solidarity in the fight against climate change*, 2009; *Les syndicats et le changement climatique*, November 2009, www.adapt.it, Green Jobs.

¹³ G.A. Calzada, R.M. Jara, J.R. Rallo Julià, *Study of the effects on employment of public aid to renewable energy sources*, Universidad Rey Juan Carlos, Madrid, 2009, www.adapt.it, Green Jobs.

¹⁴ In relation to measures in response to the economic crisis, see UNEP, *Global Trends in Sustainable Energy Investment*, 2009; HSBC, *A Climate for Recovery*, February 2009; Deutsche Bank, *Investing in Climate Change 2009. Necessity and opportunity in turbulent times*, October 2008; O. Edenhofer, N. Stern, *Towards a Global Green Recovery Recommendations for Immediate G20 Action*, Foreign Office of the German government, April 2009; UNEP, *Global Green New Deal*, March 2009. See also OECD, *Green Growth: Overcoming the Crisis and Beyond*, OECD, Paris, 2009.

¹⁵ See, among the others, the United Nations Environment Program report, UNEP, ILO, *Green Jobs: Towards decent work in a sustainable, low-carbon world*, 2008, www.adapt.it, Green Jobs.

future research ¹⁶ should focus on the real employment impact of the green economy.

In order to lay the foundations for further investigation, the aim of this paper is to provide an overview of the debate taking place at international level on the relationship between the green economy and the labour market, also considering industrial relations perspectives.

2. The problem of the definition of green jobs and their impact on the labour market

The expression “green jobs” is used to refer to occupations that promote the protection of the environment. This also means considering the effects on the labour market of company restructuring as the result of investment in the green economy and the subsequent process of adaptation ¹⁷. The International Labour Organization and the United Nations Environment Programme adopt the following definition of green jobs:

“positions in agriculture, manufacturing, construction, installation, and maintenance, as well as scientific and technical, administrative, and service-related activities, that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect and restore ecosystems and biodiversity; reduce energy, materials,

¹⁶ See G. Rossi, *Premesse economiche: perché investire nei settori eco-sostenibili? Presentazione delle ragioni economiche che promuovono l'occupazione nei settori verdi*, www.adapt.it, Green Jobs.

¹⁷ It is important to note the difference between, on the one hand, “mitigation” strategies, which include all measures addressed to the mitigation of the negative impact that human activities have on the environment, by reducing the intensity of the coal energy use for instance, establishing industrial standards to increase energy efficiency in production processes; definition taken from OECD, *Climate Change Mitigation*, OECD, Paris, 2008, 11; and on the other hand, “adaptation” strategies, including actions undertaken to reduce the inevitable negative consequences of climate change and to exploit positive opportunities e.g. the use of scarce water resources; definition taken from OECD, *Economic Aspects of Adaptation to Climate Change: Costs, Benefits and Policy Instruments*, OECD, Paris, 2008, 1.

and water consumption through high-efficiency and avoidance strategies; decarbonize the economy; and minimize or altogether avoid generation of all forms of waste and pollution. But green jobs [...] also need to be good jobs that meet long-standing demands and goals of the labour movement, i.e., adequate wages, safe working conditions, and worker rights, including the right to organize labour unions”¹⁸.

The international literature¹⁹ shows that green jobs can be classified on the basis of the area and the sector, with a focus on building, transport, and manufacturing²⁰, as well as food, agriculture and forestry. However, the literature does not provide a universally recognized definition of the term, covering all production sectors and employment grades, and a wide range of skills relating to environmental protection²¹, also due to a blurring of boundaries²² between some occupations.

The lack of a shared definition, together with different approaches to the data²³, highlights the difficulty of making a quantitative or qualitative assessment of the effects of the green economy on employment. Most of the studies make a positive

¹⁸ UNEP, ILO, *Green Jobs: Towards decent work*, cit, 36.

¹⁹ See literature review in footnote 1.

²⁰ For an in-depth examination of the eco-industry, see European Commission, DG Environment, *Eco-industry, its size, employment, perspectives and barriers to growth in an enlarged EU*, Ernst and Young, September 2006.

²¹ The US Bureau of Labor Statistics has recently undertaken a series of interviews with researchers and experts, aimed at defining green jobs on the basis of the firm’s economic activity, evaluating whether and how the economic outcome of work can be aimed at the protection or restoration of the environmental balance.

²² Some authors talk of an “irradiation” effect for which “green” economic activities have the potential of *greening* other economic sectors. In other words: “the creation of green employment in key parts of the economy has the potential to ‘radiate’ across large swaths of the economy, thus greening commensurately large sections of the total workforce”, in UNEP, ILO, *op. cit.*, 38.

²³ For a comprehensive analysis of the environmental impact assessment measures see G. Rossi, *Job creation and job losses related to green investments: an overview of the current debate*, in C. Stagnaro ed., *The impact of green investments on labour market*, Dossier Adapt n. 9, 16 July 2009, www.adapt.it, Green Jobs.

assessment ²⁴, alternatively opting for a neutral position ²⁵, suggesting that negative effects are less likely.

The OECD has conducted a series of studies ²⁶ that are worthy of note, focusing on the outcomes of a more recent investigation dealing with the employment impact of the green economy, according to which the effects of the environmental policies were slightly significant ²⁷. A 2004 survey ²⁸ highlighted the fact that, though they have a considerable impact in the short run at sectoral level, the results of CO2 reduction policies are uncertain ²⁹.

According to International Labour Organization estimates ³⁰ in 2005 restructuring associated with mitigation policies involved 38% of workers in high energy intensity sectors ³¹, for a total of 600,000 workers worldwide. In confirming the existing data, the study found that green policies could increase employment rates

²⁴ In this perspective see WWF, *Low Carbon Jobs for Europe. Current Opportunities and Future Prospects*, 2009. See also among many, S. Fankhauser, F. Seheiler, N. Stern, Climate Change, Innovation and Jobs, 2008, in *Climate Policy*, Vol. 8, 421-429.

²⁵ See, for a different view, among many, see R.D. Morgestern, W.A. Pizer, J.S. Shih,, Jobs Versus the Environment: an Industry-Level perspective, 2002, in *Journal of Environmental Economics and Management* 43, 412-436; see also the OECD's outcomes, *Environmental policies and Employment*, 1997, confirmed in OECD, *Environment and Employment: An assessment*, Working Party on National Environmental Policy, ENV/EPOC/WPNEP200311/FINAL, 17 May 2004, www.adapt.it, Green Jobs.

²⁶ Since the 1970s, the OECD has carried out a number of studies on the employment impact of environmental policies: the first literature studies date back to 1978 OECD, *Employment and environment*, 1978. In the 1990s, Member States encouraged a new study, due to the high employment rates
http://www.oecd.org/document/55/0,3343,en_2649_34405_35142967_1_1_1_1,00.html

²⁷ OECD, *Environmental policies and Employment*, OECD, Paris, 1997, the outcomes of which are confirmed in OECD, *Environment and Employment, etc.*, cit., where the lack of macroeconomic studies that consider employment as an important indicator for the evaluation of environmental policies is also highlighted.

²⁸ This research considers the results of a 1997 study, further developing the analysis of the environment effects on employment, distinguishing between positive and negative effects, direct and indirect effects, short or long-term effects, temporary and sustainable effects, effects leading to part-time or full-time jobs, effects that create new jobs while maintaining the old ones, OECD, *Environment and Employment, etc.*, cit., 9.

²⁹ OECD, *Environment and Employment, etc.*, cit., 73.

³⁰ International Labour Organization, Institute of Labour Statistics, *World of Work Report 2009. The Global Jobs Crisis and Beyond*, ILO, ILS, Geneva, 2009, 100.

³¹ For a classification of the high carbon intensity sectors see ILO, ILS, *Annex A. Estimating the size of the high carbon intensive sectors*, in ILO, ILS, cit.

by 0.5 to 1.1 percentage points over a period of five years³², thus having only a marginal impact. However, the combination of environmental policies and measures supporting innovation in technology could provide higher levels of employment: 2.6 million new jobs in the most industrialized countries, 14.3 million worldwide³³.

The adoption of legislative provisions³⁴, as well as the allocation of public funds, should drive innovation further. It could also contribute to raising aggregate demand for goods and services, and to a positive effect on employment³⁵. In this connection, the energy sector seems to offer the brightest prospects in terms of job opportunities³⁶.

The United Nations Environment Programme³⁷ provided different figures, suggesting that in 2030 there will be 20 million workers employed in the energy sector worldwide, compared to 2.3 million in the sector in 2006, 300,000 of which in wind energy, 170,000 in photovoltaic energy, 600,000 in solar thermal energy, 1.2 million in the biomass sector.

³² Ibid., 102.

³³ Ibid., 104.

³⁴ On the risks arising from the interaction of different instruments in environmental policy packages, see OECD, *Green Growth: Overcoming the Crisis and Beyond*, OECD, Paris, 2009, 11, www.adapt.it, Green Jobs.

³⁵ See R. Torres, The social impact of policies to address climate change: A review of the issue, in *International Labour Review*, Vol. 147, No. 2-3, 2008.

³⁶ Among the studies on the energy sector, see D. Kammen, K. Kapadia, M. Fripp, *Putting Renewables to Work: How many Jobs can the Clean Energy Industry Generate?*, 2004, Energy Resources Group, Goldman School of Public Policy, University of California, Berkeley. For the wind energy sector see M.I. Blanco, G. Rodrigues, *Direct employment in the wind energy sector: An EU study*, Energy Policy, 2009, vol. 37, 2847-2857. However, econometric analysis underlines the moderate impact of renewable energy sector policies on economic growth in Europe, attributing positive employment effects to the increase of energy costs caused by a greater technology use to produce energy from renewable sources. See Fraunhofer ISI Germany, Ecofys the Netherlands, Energy Economics Group EEG Austria, Rütter + Partner Socioeconomic, Européenne d'Économie SEURECO France, EmployRES. *The impact of renewable energy policy on economic growth and employment in the European Union*, Karlsruhe, 27 April 2009, www.adapt.it, Green Jobs.

³⁷ UNEP, ILO, *cit.* 127.

According to the European Commission ³⁸, the number of employees in the renewable energy sector was 1.4 million, with 640,000 in the biomass sector, 180,000 in wind energy, and 55,000 in photovoltaic energy, amounting to 0.64% of the total workforce. In Europe, a million new jobs are expected to be created in renewable energy sector by the end of 2010 ³⁹.

Other studies by European institutions have predicted that 240,000 additional jobs will be created by 2020, taking into account a number of factors including higher levels of unemployment in the traditional energy sectors, together with 0.24% growth in GDP ⁴⁰. However, research by Greenpeace and the European Renewable Energy Council suggests that technological innovation in renewable energy production will contribute to the creation of 2.7 million new jobs in the sector over the next 20 years ⁴¹.

Despite these optimistic forecasts, there is still a good deal of scepticism about the impact of the green economy on employment. A research group set up at the Rey Juan Carlos University in Madrid and supported by the Bruno Leoni Institute ⁴² recently published some statistics questioning the overall impact of the green economy on employment growth ⁴³. The study found that certain “green” programmes actually destroy more jobs than they create. In Spain, renewable energy resulted in the loss of 2.2 jobs for every green job created in the traditional sectors, without taking into account the jobs that might have been created by

³⁸ European Commission, *Meeting the Targets & Putting Renewables to Work. Overview Report*, MITRE—Monitoring & Modelling Initiative on the Targets for Renewable Energy, at www.ewea.org/fileadmin/ewea_documents/documents/policy/external_documents/040330_MITRE_overview_-_Meeting_the_targets_and_putting_renewables_to_work.pdf; MITRE, <http://mitre.energyprojects.net>.

³⁹ European Commission, EU Citizens’ summary

⁴⁰ Fraunhofer ISI, Ecofys, EEG, Rütter+partner, LEI, SEURECO, *EmployRES*, cit.

⁴¹ J. Rutovitz, A. Atherton, *Energy sector jobs to 2030: a global analysis*, prepared for Greenpeace International by the Institute of Sustainable Future, University of Technology, Sydney, 2009

⁴² See L. Lavecchia, C. Stagnaro, *Are Green Jobs Real Jobs?*, Istituto Bruno Leoni, Milan, May 2010, here 8.

⁴³ See G.A. Calzada, R.M. Jara, J.R. Rallo Julià, *Study of the effects on employment*, cit. For a comprehensive explanation of the Spanish debate started after the publication of this study see G. Rossi, *Job creation and job losses related to green investments: an overview of the current debate*, in C. Stagnaro edited by, *The impact of green investments on labour market*, Dossier Adapt n. 9, 16 July 2009, in www.adapt.it, Green Jobs.

private investment ⁴⁴. In France, the employment prospects provided by the government, according to which 600,000 jobs would be created by 15 environmental protection programmes under the *Grenelle de l'Environnement*, have attracted considerable criticism ⁴⁵, mainly because of shortcomings in data collection methodology. In Italy, the Bruno Leoni Institute has cast doubt on the potential of the green economy to make a significant contribution to employment growth ⁴⁶. The Institute takes the issue with the optimistic view that the green economy will increase employment rates in Italy, maintaining that investments of this kind are not part of an effective policy for the creation of jobs.

In the same vein, a number of studies conducted in the US have focused on the risks of overestimating employment predictions ⁴⁷, pointing out scholars' concerns ⁴⁸. Despite a very strong public support for the green economy, the jobs that are created in this sector are not necessarily of good quality ⁴⁹. There has even been talk of a "green bubble" ⁵⁰ and some researchers have argued that environmental protection measures may result in a loss of jobs ⁵¹. Even when shifting from a

⁴⁴ See G.A. Calzada, R.M. Jara, J.R. Rallo Julià, *Study of the effects on employment*, cit., 29.

⁴⁵ The study commissioned by the Minister of the Environment Jean-Louis Borloo and carried out by the Boston Consulting Group BCG, has been criticized by M.B. Beaudet, *Doutes sur la création des 600 000 emplois verts*, in *Le Monde*, 30 July 2009. However, the focus on the employment impact of environmental policies is not present in the most recent French government strategy for sustainable growth; see Premier Ministre, *Stratégie nationale de développement durable 2010-2013. Vers une économie verte et équitable*, 2009, in Adapt Bulletin, September 2010.

⁴⁶ L. Lavecchia, C. Stagnaro, *Are Green Jobs Real Jobs?*, cit. 40

⁴⁷ See R. H. Bezdek, American Solar Energy Society, *Estimating the Jobs Impacts of Tackling Climate Change*, 21 October 2009, www.adapt.it, Green Jobs.

⁴⁸ R. Michaels, R. Murphy, *Green Jobs Fact or Fiction? An assessment of the literature*, Institute for Energy Research, January 2009, www.adapt.it, Green Jobs.

⁴⁹ A. Morriss, W. Bogart, A. Dorchak, R. Meiners, *Green Jobs Myths*, University of Illinois, Law & Economics Research Paper No. LE09-001 and Case Western Reserve University, Research Paper Series No. 09-15, 12 March 2009, www.instituteeforenergyresearch.org/issues/green-jobs-resources.

⁵⁰ R. Bell, *Speech at the Brooklyn College*, City University of New York, 2009, <http://robertibell.com/thegreenbubble.html>.

⁵¹ See M. Babiker, R.S. Eckaus, *Unemployment Effects of Climate Policy*, MIT Joint Program on the Sciences and Policy of Global Change, Report No. 137, MIT, Cambridge, 2006. The authors argue that emission restrictions would have a negative effect on employment and on growth rates in the United States.

quantitative to a qualitative approach, the doubts remain. The influential study by the International Labour Organisation and the United Nations Environment Program ⁵² looked at four possible outcomes. In some cases, new jobs will be created in occupations dealing with technological instruments related to pollution control, or updating existing tools and machinery. In other cases, the workforce will be replaced, as a result of the shift from fossil fuels to renewable power, or in order to comply with waste management guidelines. In other cases, some jobs will no longer be regarded as necessary. This is particularly true for those occupations relating to materials and procedures that are no longer allowed under the most recent regulations. Finally, the provision of further training for existing occupations also needs to be considered, as well as the emergence of new occupations to meet the market demand and to comply with new environmental protection rules.

As for the classification of workers, in the US green jobs may be seen in terms of “green-collar jobs”, that are reasonably well qualified occupations providing opportunities in terms of career advancement and wages ⁵³. However, trends in the European labour market over the last decade suggest that the green sector includes both low-paid unskilled jobs, and highly skilled occupations ⁵⁴.

At a European level, policies could be adopted to create new forms of green employment, to cope with the increasing polarisation of the labour market, and to mitigate the impact of such measures on women in the workforce. According to the literature ⁵⁵, green jobs are increasing in male-dominated industries and occupations.

Another aspect to consider is the skills mismatch, i.e. the lack of qualifications that means that workers are unable to keep up with changes and innovation in the economy. Several studies highlight a lack of “green” competencies: see *infra*,

⁵² See UNEP, ILO, cit., pp. 43-44.

⁵³ ILO, UNEP, cit., qui 288. See literature review in footnote 1.

⁵⁴ OECD, *Environment and Employment*, cit., 20-21; see also the European Commission in ECORYS, *Environment and labour force skills. Overview of the links between the skills profile of the labour force and environmental factors*, 2008, 27.

⁵⁵ See literature review in footnote 1.

Section 4 ⁵⁶. In the green economy, there is a need for new vocational skills and occupations ⁵⁷. With many European countries adopting measures to tackle climate change, unskilled and unqualified workers may not see any benefit in terms of employment.

3. Implications for women workers

While the impact of green jobs on employment is uncertain, the need to evaluate the risks and the difficulties for women in gaining access to the green economy is widely acknowledged. This is because most green sectors, such as renewables, transport, building and agriculture, are traditionally male-dominated ⁵⁸. The different needs of male and female workers in the green economy were given scant consideration ⁵⁹. At an international level, there is a lack of reliable data

⁵⁶ See ECORYS, *Environment and labour force skills. Overview of the links between the skills profile of the labour force and environmental factors*, 2008; for an overview of the relation between skills, productivity, employment growth and development, ILO, *Report V. Skills for improved productivity, employment growth and development*, International Labour Conference, 97th Session, 2008.

⁵⁷ See L. Rustico, *Le competenze: focus sui fabbisogni formativi dei lavoratori impiegati nei settori eco-sostenibili. Presentazione delle strategie per l'analisi delle competenze nei settori verdi*, www.adapt.it, Green Jobs.

⁵⁸ See the WiRES project, *Women in Renewable Energy Sector*, co-financed by the European Commission, DG Employment, Social Affairs and Equal Opportunities budget heading 04.03.03.01, Industrial Relations and Social Dialogue, promoted by Adapt together with UPEE, Union for Private Economic Enterprise Bulgaria and the Faculty of Law of the University of Szeged Hungary. The project analyses and promotes social dialogue to raise the employment rates of women employed in renewable energy in Europe and to improve the working conditions in a perspective of gender mainstreaming. See www.adapt.it/acm-online/Home/Progetti/WiRES/articolo1494.html. See also A. Rab, L. Rustico, S. Terzimehic eds., *Women in the green economy. A human capital perspective*, Adapt Dossier no. 12, 7 July 2010; G. Rossi, S. Terzimehic ed., *Social dialogue, renewable energy, female employment*, Adapt Dossier, no. 4, 4 June 2010; R. Gospodinova, J. Hajdú, L. Rustico eds., *Green jobs: nuove opportunità o nuovi rischi?*, Dossier Adapt n. 4, 25 February 2010; G. Rossi ed., *The economic and occupational impact of green economy*, Dossier Adapt no. 2, 1° February 2010; F. Mattioli (ed.), *Green Economy and Female Employment: More and Better Jobs?*, Special Adapt Bulletin no. 3, 15 January 2010.

⁵⁹ In the EU-27 from 2000 to 2008 the female employment rate increased by 5.2%, reaching 59.1% in 2008.

about the gender impact of the green economy⁶⁰, except for a survey in Spain⁶¹ that pointed out the risks of women's exclusion in the transition to the green economy, even if women appear to have more awareness of green issues⁶² compared to men. Most new green jobs will be created in the industrial sector⁶³, where women are underrepresented. In the energy industry, for which encouraging employment statistics were recorded in 2007, 20% of the workforce were women: 6% of them were employed in technical occupations, 4% in decision-making positions, and less than 1% in management⁶⁴. More generally, recent statistics show that women still tend to be employed in (or relegated to) clerical work⁶⁵.

⁶⁰ In the United States, good practices have been developed for the promotion of the female employment in green jobs; see Wider Opportunities for Women – WOW, *Women and the Green Economy. An opportunity for Economic Security*, WOW, Washington, March 2009. In Europe, some research has dealt with the relation between women and environmental issues, mainly referring to access to resources by women; with reference to energy resources see J. Clancy, S. Oparaocha, U. Roehr, *Gender equity and renewable energies*, paper discussed during the International Conference for Renewable Energies, 2004. Other studies have proposed a gender analysis of the mitigation and adaptation policies to climate change See G. Terry, *No climate justice without gender justice: an overview of the issues*, in *Gender and Development*, 2009, Vol. 17, no. 1, 5-18.

⁶¹ International Labour Foundation for Sustainable Development Sustainlabour, *Green Jobs and Women Workers. Employment, Equity, Equality*, Sustainlabour, 2009.

⁶² OECD, *Gender and Sustainable Development: Maximising the Economic, Social, Environmental Role of Women*, OECD, Paris, 2008.

⁶³ Sustainlabour, *Green Jobs and Women Workers*, cit., 8. In particular, one third of the total employment will be created in the building trade sector through reconstruction and building activities in accordance with environmental standards and will contribute to the fulfilment of the energy efficiency targets. In the same way, the transport system will contribute to green employment growth, in particular through the planning and the production of low-emission vehicles, infrastructure, and public transport. Finally, new occupations will be created in the manufacturing sector in relation to low environmental impact technologies, materials, instrumentation and techniques. These sectors employed less than 25% women workers in 2009, with peaks of 38% in agriculture and 30% in manufacturing, on the basis of EUROSTAT data. For an overview of the European labour market see G. Rossi, *The state of the art in the European labour markets*, in G. Rossi, S. Terzimehic eds., *Social dialogue, renewable energy, female employment*, Adapt Dossier, no. 4, 4 June 2010.

⁶⁴ Sustainlabour, *Green Jobs and Women Workers*, cit., 9.

⁶⁵ For a recent classification and analysis of women segregation in the labour market, useful to understand the trends also in green jobs, see European Commission Expert Group on Gender and Employment EGGE, *Gender segregation in the labour market: Root causes, implications and policy responses in the EU*, 2009.

Women risk finding themselves without the necessary qualifications to take advantage of opportunities in the green economy, due to a lack of skills and expertise. A recent empirical study ⁶⁶ suggests that the requirements for occupations in renewable energy tend to exclude women. A survey of the gender of graduates in different subjects ⁶⁷ found that women were underrepresented in science, technology, engineering and mathematics ⁶⁸. Vocational training programmes are seen as increasingly male-oriented. At the same time, the renewable energy sector requires workers with a certain level of expertise in the electric/energy sector who are willing to travel, both factors that tend to discourage working women.

The needs of women workers ⁶⁹ are not limited to the access to the labour market, but also concern other factors, such as working conditions, career paths, wage differentials, access to training contracts, and health and well-being in the workplace, that may be a male-dominated environment.

All the factors mentioned above may increase the level of female employment in the green economy, as long as effective support is provided. The need to adopt measures aimed at promoting equality between men and women in the labour market is widely acknowledged. This is particularly true in the emerging sectors of the economy, where there is an attempt to move beyond gender equality in theoretical terms.

In Italy, an initiative launched by the Minister for Equal Opportunities together with the Minister of Labour, Health and Social Policy ⁷⁰, aims to promote the

⁶⁶ L. Rustico, S. Terzimehic, *Women in the green economy: a snapshot*, in A. Rab, L. Rustico, S. Terzimehic (eds), cit., 2-9.

⁶⁷ This refers to data from the OECD database in L. Rustico, S. Terzimehic, cit., 4-5.

⁶⁸ This trend excludes the more highly qualified female workforce; UNESCO, Institute for Statistics, *Global Education Digest: Comparing Education Statistics Across the World*, 2009. The green jobs challenge might result in the promotion of equal opportunities in high profile positions.

⁶⁹ Recent European studies continue to highlight the challenges and the problems connected to the quality of the women's work. See European Commission, *Report on equality between women and men*, 2010; Eurofound, *Patterns of recent employment growth in the EU: implications for gender equality*, 2009.

⁷⁰ Ministry of Labour, Health and Social Policy, Ministry for Equal Opportunities, *Italia 2020: Programma di azioni per l'inclusione delle donne nel mercato del lavoro*, www.lavoro.gov.it, 1

social inclusion of women and facilitate their access to the labour market by means of green employment. The programme focuses on two main objectives. First, it aims to encourage greater participation by women in non-traditional employment, e.g. the energy sector, promoting working conditions allowing for work-life balance, supporting programmes to ensure equal opportunities in terms of vocational training and retraining in line with the needs of the labour market, and providing information about job opportunities in these fields. Second, it aims to strengthen female employment in the sectors traditionally employing a high percentage of women, such as education, health and social services, by creating high-profile positions to promote energy saving and environmental protection. In order to cope with the challenges posed by the labour market, gender issues should be dealt with by means of gender mainstreaming, that appears to be the only approach reflecting the complexity of the problems associated with gender equality.

4. Skills for the green economy: towards a new concept of education and training

One of the major challenges in the green economy is to provide a practical evaluation of quantitative and qualitative factors associated with green jobs, particularly the skills needed in the labour market to achieve a better match between supply and demand. The need to develop skills for employment in the green economy is widely acknowledged at international level, as shown by the reports issued by the European Commission ⁷¹, the United Nations Environment

December 2009, in Adapt Bulletin no. 37, 7 December 2009. See also M. Bettoni, C. Bizzarro (eds.), *Parità di genere: i progressi e le sfide*, Special Adapt Bulletin, n. 8, 8 March 2010.

⁷¹ European Commission, *New Skills for New Jobs - Anticipating and matching labour market and skills needs*, COM2008 868, 16 December, www.adapt.it, Green Jobs. Also EMCO Working Group, *The employment dimension of tackling climate change, Progress report, draft*, 24 June 2010.

Program ⁷², and the Organization for Economic Co-operation and Development ⁷³. The literature on the issue is extensive ⁷⁴. The demand for specific green skills has also been analyzed in a more general view, in terms of the ability to deal with restructuring and ongoing changes ⁷⁵.

An aspect that is not given much consideration in Europe is the harmonization between the education and training system, and the green labour market, though an increasing number of authors are focusing on the strategic role of social dialogue and industrial relations in providing innovative placement services ⁷⁶.

Climate change is expected to have two main consequences in terms of skills development. First, policy-makers will come under pressure to develop new policies, and to assess the skills needs of the labour market, as well as the effects of environmental policies on employment ⁷⁷. The definition of green skills have been the subject of heated debates at international level, with scholars holding divergent positions, giving rise to considerable uncertainty.

If the focus is on the content of the work performed, a widely used definition is the one adopted by the OECD, according to which skills and qualifications for

⁷² UNEP, ILO, *Green Jobs: Towards decent work in a sustainable, low-carbon world*, 2008, www.adapt.it, Green Jobs.

⁷³ OECD, *Environment and Employment*, cit.; *Seminar Social and Environment Interface Proceedings*, OECD, Paris, 1999, www.adapt.it, Green Jobs.

⁷⁴ TNO Netherlands Organization for Applied Scientific Research, SEOR Erasmus University Rotterdam, ZSI Centre for Social Innovation, *Investing in the Future of Jobs and Skills Scenarios, implications and options in anticipation of future skills and knowledge needs. Sector Report: Electricity, Gas, Water and Waste*, May 2009, www.adapt.it, Green Jobs.

⁷⁵ I. Turok, P. Taylor, *A Skills Framework for Regeneration and Planning*, 2006, in *Planning Practice and Research*. Vol. 21, No. 4, 497-509

⁷⁶ P. Szovics, M. Tessaring, A. Zukersteinova – CEDEFOP, *Skills for green jobs: the pathway is green*, in R. Gospodinova, J. Hajdú, L. Rustico eds., *Green jobs: nuove opportunità o nuovi rischi?*, Adapt Dossier no. 4, 25 February 2010. American experiences in the construction of network and shared paths for the workers' green jobs training in the *green economy*. See S. White, J. Walsh, *Greener Pathways. Jobs and Workforce Development in the Clean Energy Economy*, Center on Wisconsin Strategy, University of Wisconsin, Madison, 2008, www.adapt.it, Green Jobs.

⁷⁷ J. Scott, *Future skills needs for the green economy: some starting points*, Third Generation Environmentalism, 3G, London, 5 October 2008, www.adapt.it Green Jobs. For a bibliography review on the impact of climate change on skills policies, GHK, *The Impacts of Climate Change on European Employment and Skills in the Short to Medium-Term: A Review of the Literature. Final Report – Volume 2*, 2009, www.adapt.it, Green Jobs.

green jobs are similar to those required in more traditional occupations⁷⁸. This view is confirmed if we consider the US labour market, taken as a reference model in this connection. In this case, occupational requirements comprise basic skills that do not differ from traditional ones, in terms of education and working experience⁷⁹. In the same vein, studies in Australia suggest that green skills should be acquired at the same time or soon after the main skills needed for a given occupation⁸⁰.

Green skills may be regarded as generic, as argued by the OECD, since they are difficult to define and acquire, but at the same time they are essential⁸¹, considering in particular the concept of sustainability, its implementation in management and production, an awareness of innovative technology and standards and green manufacturing processes, as well as sustainable procurement, that has been promoted by the European Commission by means of a specific programme⁸².

Soft skills refer to a range of skills, such as the ability to ensure compliance with safety standards during production, a willingness to change jobs, teamworking skills, the ability to strengthen motivation in the workplace, to raise awareness of environmental issues, to carry out a product life-cycle analysis, and to adopt to environmentally friendly technology, as well as the ability to communicate and to sell goods and services within the eco-business. More generally, those taking up

⁷⁸ OECD, *Seminar Social and Environment Interface Proceedings*, cit. See also: Institut für Wirtschaft und Umwelt & AK Wien, *Environment and employment: sustainability strategies and their impact on employment*, 2000, www.adapt.it, Green Jobs.

⁷⁹ J. Clearly, A. Kopicki, *Preparing the Workforce for a "Green Jobs" Economy*, John J. Eldrich Center for Workforce Development, Rutgers, February 2009, 2, www.adapt.it, Green Jobs. For case studies, see Environmental Defense Fund, Ella Baker Center for Human Rights, Apollo Alliance, Oakland Partnership, *Green Jobs Guidebook. Employment Opportunities in the New Clean Economy*, 2009.

⁸⁰ This approach, by significantly reducing the costs in terms of economic and time resources for green skills training, could also make the business world, for which environmental protection is mainly a cost, aware of the need to upgrade the skills of the workforce in view of environmental challenges. D. Goldney, T. Murphy, J. Fien, J. Kent, *Finding the common ground: Is there a place for sustainability education in VET?*, NCVER, 2007, 27

⁸¹ C. Down, *Employability skills: Revisiting the key competencies or a new way forward?*, Australian Academic Press, Brisbane, 2004.

⁸² European Commission at http://ec.europa.eu/environment/gpp/index_en.htm.

new occupations in green employment require various kinds of knowledge, that should include an awareness of the legal provisions and instruments dealing with environmental issues, and the ability to determine resource availability on the basis of the sector and the geographic area. Furthermore, depending on the economic background, further skills should be gained to ensure and manage sustainable development, and to become aware of the processes associated with sustainability, in economic, environmental, political terms ⁸³.

In recent publications, however, the OECD seems to move away from its initial position, maintaining that the green economy calls for traditional and new skills ⁸⁴, including an understanding of sustainable materials, an ability to carry out environmental impact assessments, and an understanding of carbon footprinting, as stated by the European Commission.

According to a survey carried out by Cedefop ⁸⁵ skills in the green economy will be characterized by their interdisciplinary nature, moving beyond a particular position or sector. Communication and problem-solving in relation to environmental issues, as well as the use of appropriate technology, are key instruments for employees in the green economy ⁸⁶.

Communication skills play a significant role in the green economy, as there will be a growing need for professionals who are able to explain to managers, enterprises, and consumers how to implement and benefit from new technologies, on the basis of a process known as cascade communication. Researchers from Cedefop and ILO ⁸⁷ argue that green skills have given rise to a new concept that

⁸³ M. Rigg, *Skills for sustainable development: necessary but not sufficient?*, Policy Study Institute, October 2008, 12

⁸⁴ C. Martinez Fernandez, C. Hinojosa, G. Miranda OECD, *Greening Jobs and Skills. The local labour market implications of addressing climate change*, OECD, Paris, February 2010.

⁸⁵ CEDEFOP, *Skills for green jobs. European synthesis report*, Luxembourg: Publications Office of the European Union, 2010.

⁸⁶ P. Szovics, M. Tessaring, C. Walmsley, J. McGrath, *Identification of future skill needs for the green economy*, Cedefop, 2009.

⁸⁷ Cedefop, *Skills for green jobs*, cit. The International Labour Organization, together with CEDEFOP, is carrying out research on skills needs in the green economy. The research, to be published in 2010, is based on 15 countries, outlines good practices and highlights the fact that

moves beyond the traditional distinction between “basic” and “transversal” competences. The new approach highlights the need for a wealth of knowledge that combines traditional and new skills, consisting of “shades of green”⁸⁸. While some experts point out the innovative nature of green skills, such as the assessment of environmental impact and knowledge of environmental protection laws⁸⁹, the majority maintain that these are existing skills that have been adapted to sustainability and new trends in the labour market, to build a new society based on information and knowledge. In this connection, a UNEP report⁹⁰ states that a wider range of skills will be required in the green economy, with an educational background and training also in green-related activities, not only in eco-industries strictly speaking.

The level of employment is another matter to consider in defining green skills, with the OECD⁹¹ and the European Commission⁹² arguing that employment is becoming more and more polarized. The International Labour Organization, in its research on decent work, points out that the risks arising from low-qualified occupations in the green economy are closely related to inadequate education and training⁹³.

national policies for green energy are inevitably integrated with the identification of vocational needs and effective responses to these requirements.

⁸⁸ The expression is mainly used with reference to the different extent to which product sectors, in different regions, are affected by the economic and political change arising from the green economy; this term was adopted in UNEP, ILO, *cit.*, 40. Further considerations about the political implications of stimulus packages can be found in M. Nikolova, *Light shades of green. Climate-friendly policies in times of crisis*, ETUI, 2009.

⁸⁹ CEDEFOP, *Future skill needs for the green economy*, Seminar 6-7 October 2008 Papers available at www.cedefop.europa.eu/etv/news/default.asp?idnews=3800.

⁹⁰ UNEP, ILO, *cit.*, 4.

⁹¹ OECD, *Environment and Employment*, *cit.*

⁹² European Commission, *Commission Staff Working Document on the links between employment policies and environment policies*, 2005.

⁹³ C. Evans-Klock, P. Poschen, *ILO Green Jobs Initiative and implications for skills development. On decent work and climate change*, cfr., International Labour Office, *The social and decent work dimensions of a new Agreement on Climate Change*, ILO, Geneva, June 2009.

The US case shows that workers in the green economy may be classified as having low to mid-range qualifications ⁹⁴, generally provided by community colleges, offering higher vocational education, usually over a period of two years.

A United Nations survey suggests that all occupations may be regarded as green, and that skills associated with such positions will affect unskilled workers, professionals, business people, engineers, craftsmen, managerial staff, and so on ⁹⁵. There may also be a positive impact on female employment, considering that skills development and adaptation will be required in all economic sectors.

Research carried out by Cedefop ⁹⁶ points out that all working activities should somehow be characterized by a “green factor”, with a need for training programmes and courses for those who are willing to acquire new skills. In this connection, there is a need to distinguish between human resource management taking into account sustainable development ⁹⁷ and the need to (re)train adult workers on the basis of labour market needs.

Training needs have been investigated in a number of studies, including those on Education for Sustainable Development and the 1987 Bruntland Report, which examined evidence from national cases in Europe ⁹⁸. A new field of research, the green economy, is now developing, focusing on academic programmes, teaching methods, and bio-construction, on the assumption that environmentally-related education and training programmes might result in a new learning approach

⁹⁴ R. Pinderhughes, *Green collar jobs*, cit.; Workforce Alliance, *Oregon's forgotten middle-skill jobs. Meeting the demands of a 21st century economy*, February 2009.

⁹⁵ C. Degryse, P. Pochet, *Paradigm shift: social justice as a prerequisite for sustainable development*, ETUI, February 2009.

⁹⁶ CEDEFOP, *Skills for green jobs-European Synthesis Report*, 2010. Available at: www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_143855.pdf.

⁹⁷ D. Renwick et al., *Green HRM: A review, process model, and research agenda*, University of Sheffield Management School, Discussion Paper No. 2008, 1 April 2008; J. Haddock, J. Jeffrey, D. Miles, M. Muller-Camen, A. Yamen, P. Critten, M. Hartog, *Green HRD: The Potential Contribution of HRD Concepts and Theories to Environmental Management*, Education Against Climate Change Programme, Middlesex University, 2009.

⁹⁸ Danish Ministry of Education, Department of Higher Education and International Cooperation, *Education for Sustainable Development. A strategy for the United Nations Decade 2005-2014*, February 2009.

leading to a more sustainable society, supporting the individual in the transition from school to university and in lifelong learning.

Moreover, several international forums ⁹⁹ and some studies in Australia ¹⁰⁰ have predicted that, especially in the short run, vocational training in the green economy will have a decisive impact on educational policies ¹⁰¹. This will concern not only entry-level workers, but also experienced workers in need of retraining due to company restructuring, and therefore at risk of being forced out of the labour market. In Europe, training and retraining programmes may also be a means to increase the levels of flexibility, save jobs and tackle gender inequalities, as in the case of the electrical power industry ¹⁰².

With regard to sustainable development, further research may be carried out on the impact of occupational skills on productivity, competitiveness, organizational models, and health and safety in the workplace ¹⁰³.

It has been suggested ¹⁰⁴ that this impact is dependent on the way skills are developed, on the effectiveness of education and vocational training programmes, and on the provision of alternative solutions in terms of skills development, including networks and partnerships. This approach appears to be useful in promoting social dialogue and innovation in industrial relations, providing a contribution to the setting up of research centres in the field of greening education and training in the workplace ¹⁰⁵ based on the principle of subsidiarity.

⁹⁹ See World Summit on Sustainable Development, 2002.

¹⁰⁰ D. Goldney, T. Murphy, J. Fien, J. Kent, *Finding the common ground: Is there a place for sustainability education in VET?*, NCVER, 2007

¹⁰¹ The potential widening of the focus of vocational training deserves further consideration. See D. Goldney, T. Murphy, J. Fien, J. Kent, *Finding the common ground*, cit., 19 et seq.

¹⁰² D. Tarren, H. Potter, S. Moore, *Restructuring in the Electricity Industry: A Toolkit for Socially Responsible Restructuring with a Best Practice Guide. A report for EURELECTRIC, EPSU and EMCEF*, Working Lives Research Institute, March 2009.

¹⁰³ A possible skills classification for green jobs, with reference to their potential for reducing carbon emissions, distinguishes between leadership, innovation, process and technical application skills.

¹⁰⁴ New South Wales Department of Education and Training, *Skills for sustainability*, 2007.

¹⁰⁵ See Lloyd C. & Payne J., Developing a political economy of skill, in *Journal of Education and Work*, Vol.15, 4, 365-90, 2002. See also N. Stern, *The Economics of Climate Change: The Stern Review*, Cambridge University Press, Cambridge, 2007.

On the basis of these considerations, the question arises as to whether the traditional education and training system will prove effective in responding to the challenges posed by the changing labour market in the green economy. An increasing awareness of the inadequacy of formal learning for occupations regarded as “green” points to the need for innovation in learning strategies, focusing on the acquisition of soft skills, which include more general knowledge, that is decisive in green employment. The acquisition of these skills should take place in the workplace, regarded as the most suitable environment for the acquisition of further abilities ¹⁰⁶, allowing for economically sustainable on-the-job experience.

The implementation of alternative education strategies should be associated with a different perception of learning methods, in order to respond to market demand while promoting a sound pedagogical approach to environmental issues ¹⁰⁷.

Following the example of US and Australia, a solution might be found in the setting up of networks and partnerships among educational bodies, training providers, universities, enterprises, and the actors involved in social dialogue and industrial relations, to develop sector-specific skills and to share new ideas on training programmes responding to market needs ¹⁰⁸. Green employment can make a major contribution in terms of environmental protection, as in every occupation there is a “green factor”. In addition, awareness of green issues begins in primary school, as shown by the research focusing on greening education, and continues throughout life. Green skills are the result of a lifelong learning process, with the concept of workplace learning or work-based learning becoming increasingly relevant. In addition, work-based learning serves as a response to

¹⁰⁶ C. Virgona, P. Waterhouse, *Two Dimensional Work: Workplace literacy in the aged care & call centre industries*, 2004. In Italy, in the *White Paper* of 2009, at www.adapt.it, Welfare, the Ministry of Labour considered the enterprise as the most appropriate place for learning and skills development

¹⁰⁷ In the Italian case, the traditional approach to vocational training, connected with state-sector education, should be replaced by the modern concept of learning based on skills and learning outcomes, closer to production processes and to technological innovation.

¹⁰⁸ P. Newman, N. Wiseman, C. Pepper, K. Kelly, *Training for sustainability: The vocational education and training sector*, Green Skills Inc., Centre for Learning, Change and Development and Institute for Sustainability and Technology Policy, Murdoch University, 2004.

changes in the green sector in terms of job opportunities, which development is difficult to predict ¹⁰⁹, especially in a financial downturn, when it becomes harder to plan production in the medium and long term.

5. The role of industrial relations and social dialogue

In the coming years, the demand for vocational training and retraining in the green economy will increase significantly, together with the need to provide effective guidance on the skills needed in the labour market ¹¹⁰. It will be necessary to increase and adapt the workforce, providing workers with higher levels of qualifications, also in an attempt to reduce gender inequalities. To be effective, this strategy should not involve state intervention, often ambitious and unrealistic, to oversee and manage the reorganization and restructuring process.

Rather, based on the principle of subsidiarity, it should involve the participation of all those actors, including social partners, who can help to address the mismatch between supply and demand in the green economy.¹¹¹ The industrial relations system can play a leading role in an economy with a lower environmental impact, supporting the reorganization and the restructuring of production. Particular attention should be paid to the most vulnerable workers, who are more exposed in the event of restructuring and the transition to a more sustainable economy.

Collective bargaining could develop further techniques providing incentives to support the transition towards the green economy, vocational training and

¹⁰⁹ C. Degryse, *What's in the sustainable development strategy for workers?*, in *ETUI Benchmarking Working Europe 2009*, Brussels, ETUI 2009.

¹¹⁰ See Cedefop, *European guidelines for validating non-formal and informal learning*, 1 June 2009; Mike Campbell et al. for the European Commission, *New skills for new jobs*, February 2010. See the Italian agreement on the *Linee guida per la formazione nel 2010* signed by the Government and Region representatives and social partners on 17 February 2010, in E. Bellezza, L. Rustico (eds.), *2010: l'anno della formazione*, Adapt Bulletin, no. 6, 18 February 2010. See also E. Bellezza, L. Rustico (eds.), *Formazione e dialogo sociale: l'intesa Governo, Regioni e parti sociali del 17 febbraio 2010*, in *Diritto delle Relazioni Industriali*, n. 2/2010.

¹¹¹ See ETUC, *Climate Change and Employment*, cit.

retraining (also for women workers) and inclusion in the green sector ¹¹². Although regarded as a priority in the green agenda of many countries ¹¹³, measures encouraging good practices are still rare (see Table 1), especially with regard to the employment and gender impact of environmental policies ¹¹⁴.

Table 1: Initiatives by the social partners at European level in the field of vocational training and retraining in the green economy

Country	Practices
Ireland	The employers' confederation IBEC provides environmental training for members; this includes a Foundation Course in Environmental Management for managers wishing to speed up current environmental performance trends, standards legislation and solutions.
Norway	The Norwegian Association of Local and Regional Authorities along with the Confederation of Unions for Professionals and the Norwegian Union of Municipal and General Employees have organized a conference for safety representatives and trade union representatives, in order to develop their knowledge and expertise in relation to green issues. The trade union confederation LO and its member unions have set up courses on climate change for shop stewards.
Belgium	Regional plans: research and training in green technologies. National social dialogue structures – namely, the National Labour Council and the Central Economic Council – are currently active in relation to environmental issues and are preparing a joint statement on green jobs. An innovative scheme exists in Belgium, whereby long-term jobseekers are trained to carry out energy assessments and help advice on energy-saving measures. These people are called 'energy trimmers' and help to implement energy-saving measures in buildings through 'energy trimming companies', which are not-for-profit organisations. The schemes exist in all regions of the country.
Spain	Social dialogue on green issues is carried out within the framework of the country's standard tripartite social dialogue structures and is linked to the debate on the modernisation of the economy.

¹¹² J. Scott, *Future skills needs for the green economy: some starting points*, E3G, 5 October 2008, www.adapt.it, Green Jobs.

¹¹³ Eurofound, *Greening the European economy: Responses and initiatives by Member States and social partners*, 2009, www.adapt.it, Green Jobs. See ETUC, *Climate change and employment, Impact on employment in the European Union-25 of climate change and CO₂ emission reduction measures by 2030*, 2007, www.tradeunionpress.eu/Web/EN/Activities/Environment/Studyclimatechange/rapport.pdf; ETUC, *Mid-term review of the 6th Community Environment Act Programme. Position of the European trade union confederation ETUC*, 2006, www.etuc.org/IMG/pdf/6th_EAP_mid-term_Review11.pdf.

¹¹⁴ A review of <http://ec.europa.eu/social/main.jsp?catId=521&langId=en> shows the lack of joint texts, documents and agreements on the topic.

THEORETICAL FRAMEWORK

Italy	<p>The government has set up a fund to finance research projects on energy efficiency and the use of renewable energy sources in urban areas.</p> <p>The trade fair SolarExpo and the employment agency Adecco have developed training and retraining courses for technicians in the solar panel and wind farm industry. Under this scheme, skills that are particularly relevant to these industries are taught.</p> <p>The Association of Energy Producers from Renewable Sources organises company training and information courses on European and national regulations in the energy and environment sector.</p>
Finland	<p>The National Commission on Sustainable Development acts as an important tripartite forum where different stakeholders can present their ideas, goals and programmes, as well as engage in a broad debate about ecological sustainability.</p> <p>The employer organisation EK has published a guide on corporate responsibility, which contains tools for self-evaluation and development for companies.</p> <p>The construction industry branch and the biotechnology industry association Finnish Bioindustries have also published their own principles on corporate social responsibility, business ethics and sustainable development.</p>
Hungary	<p>Regional operational programmes, provisions for the setting up of regional crisis-management funds to help in cases of company restructuring and to support vulnerable enterprises by providing exemptions from payroll taxes to enable companies to maintain their workforce.</p>
Denmark	<p>Environmental Economic Council – economic advisory body, established by law in 2007. 24 members representing trade unions, employers, non-governmental organisations NGOs, independent experts and the Danish government.</p>
Slovenia	<p>Seminars have been held for business representatives to help them prepare for legislative changes related to the green economy.</p>
Austria	<p>National and local governments have launched a joint initiative, known as Masterplan Environmental Technology, aiming to set up a joint strategy for policymakers, business and relevant research institutions to improve the competitiveness of the Austrian environmental technology industry.</p> <p>The government is looking at reforming the country's vocational training scheme in order to meet increasing business demand for skilled workers in the environmental technology sector.</p> <p>On the employer side, courses are run by the Austrian Federal Economic Chamber to help members reduce energy consumption.</p>
Luxembourg	<p>A conference to debate climate protection and economic and employment prospects was organised by government ministries and the Chamber of Employees in February 2009.</p>
Estonia	<p>Much effort has been invested in raising public and consumer awareness of green issues through a variety of means – including the development of a network of local environmental education centres, the provision of training days and seminars, and the holding of national and international conferences.</p>
Poland	<p>The celebration of Earth Day on 22nd April 2009 included information campaigns, educational initiatives and workshops.</p> <p>Government training courses are offered in order to train technicians in environmental management, as well as in health, safety and environment at the workplace.</p>
Portugal	<p>The General Workers' Union is preparing to introduce environmental issues into its training activities for collective agreement negotiators.</p>
The UK	<p>The employers organization, the Confederation of British Industry CBI, highlights that skills are needed in areas such as science, technology, engineering and maths,</p>

	<p>technical competencies and a range of new business skills. The CBI makes a range of recommendations on how to increase the number of workers with these skills: these include encouraging a greater focus on such skills in schools and proposing ways to encourage education providers to work with business to meet the demand for these types of skills.</p> <p>The CBI has been running regular events on issues related to climate change for its members. For example, in 2009, it is running a series of three breakfast seminars on the subject of environmental legislation for people involved in property management and leasing.</p> <p>The TUC operates a range of courses for trade union representatives, helping them to address the following issues: identify environmental changes that affect the workplace; research and identify appropriate environmental legislation, policies and information; and identify environmental problems and opportunities for trade union action.</p>
Germany	<p>The Confederation of German Trade Unions and affiliates participate in two working groups – one on energy and the other on the environment – within the country's tripartite 'Alliance for jobs, training and competitiveness' initiative.</p> <p>A joint body has been established to provide information and training to works councils on environmental protection issues.</p> <p>The trade union confederation DGB, in cooperation with the educational institution DGB Bildungswerk and the German Ministry for the Environment, Nature Conservation and Nuclear Safety, runs a project in German entitled 'Resource efficiency in firms'. The project trains works council members and employees in detecting and implementing ways to improve energy efficiency. Training is part of a programme that leads to a certified degree as 'efficiency expert'. The metalworking trade union IG Metall cooperates with the employers' association of the aluminium industry in implementing this project at workplace level.</p>

Source: Eurofound, *Greening the European economy: Responses and initiatives by Member States and social partners*, 2009.

Although it is clearly difficult to identify a common instrument to manage the economic crisis, social partners have agreed on some priorities, even in times of recession ¹¹⁵. Apart from the recognition of workers' rights to information, consultation, and participation in the green economy and at company level, there is also a need to provide employees with adequate training to face employment transition and changes in the labour market. Effective skills retraining should help respond to economic fluctuations during recession ¹¹⁶.

¹¹⁵ J. Hurley, I. Mandl, D. Storrie, T. Ward (Eurofound), *Restructuring in recession*, European Restructuring Monitor ERM, 2009, in P. de Vita, M. Giovannone (eds.), *Elder employees during restructuring: stress and well-being*, Special Adapt Bulletin no. 7, 2 March 2010.

¹¹⁶ On the importance of investing in education and training in times of crisis see Cedefop, *Learning in crisis times*, November 2009, www.adapt.it, Green Jobs. See also *Council decision on guidelines for the employment policies of the Member States*, 7 July 2008 10614/2/08 REV 2.

Social dialogue in Europe can provide a major contribution to the implementation of the green agenda, also in terms of training and retraining programmes ¹¹⁷, as shown by the initiatives of employers' associations and trade unions in Table 1.

More generally, social dialogue and industrial relations have to focus on rethinking education and training in the light of future occupational requirements. Educational institutions, with the social partners, should promote a multidisciplinary learning environment within the company, including internships to help young people gain access to the labour market. Trade unions and employers' associations could provide written certification of the skills acquired in non-formal and informal contexts, with the support of educational experts. Training should be provided also for teachers, with a special focus on the specific needs of women teachers.

The European Commission and Cedefop have highlighted the need to establish a stronger link between the needs of the enterprise and the education and training system, in order to raise awareness of environmental issues, that is essential for sustainability in the green economy. Accordingly, the industrial relations actors should fully develop the potential of the green economy, transforming risks into opportunities for all those involved.

¹¹⁷ Eurofound, *Greening the European economy*, cit.

B)

SOCIAL DIALOGUE FOR WOMEN IN RENEWABLE ENERGY SECTOR: NEW SCENARIOS, OLD STORIES

1. Challenges for green job and green employment

1.1. EU sustainable development strategy

In 2006 the EU adopted a renewed sustainable development strategy. The key objectives to set up in this strategy are: environmental protection, social equity and cohesion, economic prosperity and meeting international responsibilities ¹.

The policy guiding principles are the promotion and protection of fundamental rights, solidarity within and between generations, open and democratic society, involvement of citizens, involvement of businesses and social partners, policy coherence and governance, use of the best available knowledge, precautionary principle and make polluters pay ².

Towards a green and innovative economy

Europe faces major structural challenges – globalisation, climate change and an ageing population. The economic downturn has made these issues even more pressing. The Lisbon strategy addressed these challenges – aiming to stimulate growth and create more and better jobs, while making the economy greener and more innovative. Before the financial and economic crisis hit the EU, the strategy had helped create more than 18m new jobs. When the economy slumped, the EU

¹ www.euractiv.com/en/sustainability/european-leaders-renew-sustainable-development-commitments/article-156183.

² <http://register.consilium.europa.eu/pdf/en/06/st10/st10117.en06.pdf>.

acted to stabilise the financial system and adopted a recovery plan to boost demand and restore confidence. The plan is delivering a major fiscal stimulus, with measures to keep people in work and public investment in infrastructure, innovation, new skills for the workforce, energy efficiency and clean technologies to meet the goals of the Lisbon strategy. On 3rd March 2010, the European Commission launched the Europe 2020 Strategy to overcome the crisis and prepare EU economy for the next decade ³.

The first priority must be to hasten the exit from the crisis, but the strategy must also provide the building blocks for a sustainable growth in the future. Europe is recognised the world over for its high quality of life, underpinned by a unique social model. The strategy should ensure that these benefits are sustained and even further enhanced, while employment, productivity and social cohesion are optimised ⁴.

The EU 2020 strategy: A strategy for smart, sustainable and inclusive growth

Over the last two years, EU Member States faced the world's worst economic crisis since the 1930s. This crisis has reversed much of the progress achieved in Europe since 2000. Member States are now facing high levels of unemployment, sluggish structural growth and excessive levels of debt. The economic situation is slowly improving, but the recovery is still fragile. At the same time, the world is moving fast and long-term challenges – globalisation, pressure on resources, climate change, ageing – are intensifying ⁵.

The concept of globalisation v. regionalisation. Europe can succeed if it acts collectively, as a Union. Single states are not strong enough to recover from recession. They need a regional alliance to combine their effort and power (globalisation versus regionalisation)⁶. The Europe 2020 strategy put forward by

³ <http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf>.

⁴

www.eurofound.europa.eu/areas/industrialrelations/dictionary/definitions/EUROPEANSOCIALMODEL.htm.

⁵ www.efesme.org/europe-2020-a-strategy-for-smart-sustainable-and-inclusive-growth.

⁶ www2.warwick.ac.uk/fac/soc/csgr/.

the Commission sets out a vision of Europe's social market economy for the 21st century. It shows how the EU can come out stronger from the crisis and how it can be turned into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion. To deliver rapid and lasting results, stronger economic governance will be required. The EU strategy sets out to boost competitiveness and productivity without hampering social cohesion. To reach this objective, five headline targets have been established:

1. reduction of poverty;
2. an employment rate of 75 % of the working age population;
3. meeting the EU's climate and energy targets: reduction of greenhouse gas emissions, increased share of renewables in energy consumption and improved energy efficiency;
4. reduction of school drop-out rates and more students in higher education; and
5. 3% of the EU's GDP should be invested in research and innovation.

These headline targets should be converted into national goals by Member States⁷.

Burning questions relating to green jobs

When somebody talks about green job there are, at least, the following pressing questions:

- 1) How many green jobs have already been created in the early stages of the transformation to a green economy?
- 2) How many can be expected in the future?
- 3) Where are these jobs being created and who is likely to have access to them? Will every MS benefit from it?
- 4) What kind of jobs are they? Are they decent and if not what can be done to remedy this?
- 5) Which jobs are at risk because of the transformation? Will there be more winners than losers? What actions are required to help losers achieve a just transition?

⁷ www.eurunion.org/eu/images/stories/eufactsh-eur2020-8-10.pdf.

- 6) What are the obstacles to be overcome on the road to a more sustainable future?
- 7) What are the pathways and policies leading to a sustainable economy and society ⁸?

Smart spending for a low carbon future: one possible way to overcome the crisis in CEE

Nicholas Stern, the former chief economist of the World Bank, predicts that the global economy is likely to shrink by between 5% and 20% or more every year, not because of supreme or toxic funds but because of economic impacts of climate change. “Green” recovery is therefore not an option but the only option to overcome the current economic crisis. Furthermore, green investments stand up economically on their own merits. They create new business niches and new job opportunities ⁹ both for technology-skilled and low-skilled labour ¹⁰.

Energy efficiency in CEE countries. There is huge long-term job creation potential especially in sectors such as EE and RES, the separation and recycling of waste, water supply and sanitation, sustainable transport, research and consulting services – and support from EU funding is essential especially during a deep recession. The European Social Fund should also be utilised to promote “green-collar” jobs, achievable by increased support for training and the pre-qualification of workers towards green services and products in various sectors. Furthermore, many sectors can have an indirect job creation effect – for instance, jobs can be created not only around the actual retrofitting and insulation for energy efficiency but also for trainers for pre-qualification of workers and consultancies ¹¹.

Rather than providing easy money to dubious and climate intensive projects, the economic crisis offers an opportunity for the EU to demonstrate leadership that can ensure progressive decisions on EU spending – this can get the new Member

⁸ www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---webdev/documents/publication/wcms_098487.pdf.

⁹ Just for information: Currently, appr. 3.4 million people in the EU have green jobs.

¹⁰ www.bankwatch.org/billions/projects-crisis.html.

¹¹ www.sustainableeufunds.org/files/documents/31.pdf.

States onto a more sustainable development path in the medium term. President Barroso called for “smart spending” in energy efficiency (EE), renewable energy sources (RES) and integrated urban developments as a way out of the crisis towards a low-carbon future. EU funds regulations will now allow that all Member States can use up to 4% of the ERDF for EE/RES in housing. The EIB is also set to increase such investments by up to €6 billion per year ¹².

Member States should seize this opportunity and reshuffle EU funds allocations towards direct support for clean and efficient energy and transport and also guarantee horizontal efficiency measures in other programmes and projects – rapid, positive effects for the economy, employment and climate will result.

Some good examples: In the Czech Republic, for instance, the Ministry of Environment is set to reallocate €470 million towards EE/RES. In Latvia, EU funds support will increase from €20 million to €73 million for the improvement of heat insulation in multi-apartment residential buildings. Other countries make a step further by contemplating additional ‘high-value’ stimulus measures – in Poland, the government has proposed €333 million for wind turbines and highly effective co-generation energy facilities. Slovakia will allocate more funds for EE/RES from the Bohunice Nuclear Power Plant International Decommissioning Support Fund and will develop soft measures such as a new programme in support of EE ¹³.

1.2. RES as a decent work

A very important issue in relation to renewable energy is decent work. According to the ILO, **decent work** is defined as opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity. Decent work sums up the aspirations of people in their working lives – their aspirations for opportunity and income; rights, voice and recognition; for

¹² www.foeeurope.org/billions/Letter_European_Spring_Council%20_JBarroso-060309.pdf.

¹³ www.bankwatch.org/billions/projects-crisis.html.

family stability and personal development; for fairness and gender equality. Ultimately these various dimensions of decent work underpin peace in communities and society. Decent work is central to reduce poverty, and is a means for achieving equitable, inclusive and sustainable development ¹⁴.

What kinds of green jobs are being created?

Green jobs include a wide array of occupational profiles, of skills and of educational backgrounds. Some constitute entirely new types of jobs, but most build on traditional professions and occupations, albeit with more or less modified job contents and competencies. This is true for direct green jobs as well as for indirect ones in upstream supplier industries. Even in the case of new industries and technologies, such as wind and solar power generation, the supply chains consist largely of traditional industries, like iron and steel and the manufacture of machine parts.

There is evidence of the viability and potential for green jobs across the entire workforce, from manual labourers through skilled workers, craftsmen and entrepreneurs to highly qualified technicians, engineers and managers. Green jobs currently exist and can develop further in many economic sectors both in urban and rural economies.

The contribution that green jobs will make to clean economic growth, development and poverty reduction will ultimately depend on the quality of these jobs. Many existing green jobs are of poor quality and those in recycling, construction or biofuels for example, are dangerous and often informal in nature. Serious labour and human rights violations have been recorded in relation to feedstock production for biofuels. While there are clearly constraints and obstacles, however, the potential for green jobs is still enormous ¹⁵.

¹⁴ Source: www.ilo.org/global/About_the_ILO/Mainpillars/WhatisDecentWork/index.htm.

¹⁵ www.ilo.org/wcmsp5/groups/public/---dgreports/---integration/documents/publication/wcms_107815.pdf.

Another issue is OSH (Occupational Safety and Health)

EU-OSHA's European Risk Observatory aims at anticipating new and emerging risks in occupational safety and health (OSH). It is necessary to start to analyse new and emerging risks in green jobs by 2020. The impetus to "green" economy provides the opportunity to anticipate potential new risks in developing green jobs and make sure their design integrates workers' safety and health. Green jobs should not only be good for the environment but also for workers. There are already enough examples of so-called green jobs where workers' health was damaged. There is an initiative on "making green jobs safe". There is a need to integrate workers' safety and health into green jobs, which cannot be defined as sustainable otherwise. The need for systematic workplace risk assessment is also fully in line with the European prevention approach - and an employer's duty under European law.

The analysis of green jobs is limited to emerging risks associated with new technologies, in the context of political, economic and societal trends. The so-called more "traditional" risks in green jobs are equally important ¹⁶.

1.3. Reinforce the competences for the different target groups

The creation of a ***Chain of Inclusion*** requires the integration of several actors such as employment agencies, social partners, social workers, teachers, trainers, enterprises with the aim to facilitate competitiveness, to enhance the chances of integration for unemployed people into green labour market and fight against discrimination ¹⁷.

Professions in the environmental field (water, waste, recycling, energy efficiency, alternative transportation, maintenance, management of natural areas) could play a role in integrating and training unemployed people, even with low

¹⁶ http://osha.europa.eu/en/riskobservatory/index_html.

¹⁷ www.shivaa-greenjob.eu/.

qualifications. (Unemployed, 45 years and +, people with no or low qualifications, women, disabled people).

There is an increasing demand for changing requirements in existing occupations and for brand new occupations. Green jobs are diverse, rewarding, and overwhelmingly male-dominated.

Job balance: The number of green jobs already reported and expected to be created is substantial, but modest in relation to the total size of the global (world) labour force of over 3 billion ¹⁸. In addition, not all these jobs are additional jobs, as major gains and losses can take place in other parts of the economy. The significance of green jobs therefore can only be appreciated by taking a broader look at the transformation to a green economy.

Dynamic changes in labour markets: to some extent newly created green jobs replace existing jobs and net gains in employment are smaller than the overall number of direct green jobs would suggest. This is the case, for example, when jobs in renewable energy replace those depending on fossil fuels. Other jobs are likely to be eliminated because of the slowing demand for products and services with a high environmental impact. The overall balance of available jobs will depend on those created and lost in the sector concerned, such as energy, transport or building, the balance of jobs in sectors contributing to these sectors and on employment gained or lost due to higher or lower consumer spending.

On final balance: available studies of these labour market dynamics for both sectors and entire economies suggest that, on average, there will be more jobs in green economies. Not everybody will gain from such a change, however. A positive job balance deriving from the greening economy is the result of major shifts often within sectors. While some groups and regions are gaining significantly, others incur substantial losses. These losses raise questions of

¹⁸ www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---webdev/documents/publication/wcms_098487.pdf.

equity, which if not properly addressed, can make green economy policies difficult to sustain ¹⁹.

1.4. Shortcomings and impediments for green jobs

A first set of shortcomings relates to the pace of progress, to access green jobs and job quality. Generally, the creation of green jobs is advancing too slowly to contribute substantially to the reduction of unemployment and underemployment in the world. Moreover, too few of the green jobs that are being created go to those who need them most: young people, women, poor segments of society and those who suffer from climate change. Finally, it is difficult to create good quality and decent work in the face of rising informality and inequality in the global economy.

A second issue on which specific and quantitative information is urgently needed but remains unavailable, is the transition for enterprises and workers who will be adversely affected by the transformation to a green economy and those who will have to adapt their jobs and income generating activities to climate change.

A major impediment to greening economies and jobs is that unsustainable business practices are still prevalent and often remain more profitable. Early adopters of green technologies and business practices among enterprises have to contend with pressures from financial markets for quick returns and with competing firms luring customers with low prices, albeit on the back of externalized environmental and social costs ²⁰.

¹⁹ www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---webdev/documents/publication/wcms_098487.pdf.

²⁰ www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf.

1.5. Challenges: possible issues to solve

- 1) Turning the vision of a sustainable economy and new green jobs into a reality will require a strong, coherent and stable policy framework and government leadership.
- 2) There is the need to achieve energy efficiency and a bigger share of sustainable sources of energy more rapidly. Progress in key sectors like transport, basic industries, recycling and agriculture has been slow and patchy. Investment is rising fast in some sectors, but from a low base.
- 3) There is a massive need to create a conducive policy framework and sustained increases in investment.
- 4) The potential of green jobs is universally significant. Furthermore, it shows that opportunities vary from country to country, between sectors, regions and communities, and also between urban and rural areas ²¹.
- 5) Particular attention should be paid to gender dimensions and to the social inclusion of disadvantaged groups and regions.
- 6) Without qualified entrepreneurs and skilled workers, the available technology and resources for investments cannot be used or cannot deliver the expected environmental benefits and economic returns. Endeavours to close the current skills gap and anticipate future needs are essential for a transition to a green and low-carbon economy. An emphasis on the high end of skills and education would be misplaced. Training those who might be called “green-collar” workers is important.
- 7) Creating a map of skill requirements is a vital first step as it can inform ad hoc programs for potential skills upgrading. Assessments of the potential of green jobs and the monitoring of such jobs, would constitute an ideal basis for ad hoc measures and for the adaptation of national vocational training and education systems over the medium term. This would allow skills development to tie in directly with policies and investments.

²¹ www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---webdev/documents/publication/wcms_098487.pdf.

8) The business sector accepts and recognizes the need and shares the responsibility for a fair transition. Government assistance to both workers and enterprises will be a necessary complement in many cases. Meaningful social dialogue will be essential to ease tensions and to arrive at effective cost-sharing and resource allocations. (Workers and trade unions emphasize that far too little is known about both the risks and opportunities in a transition to a greener economy.) The task is complex but can be tackled by involving the main stakeholders: employers, workers and Governments.

9) Effective approaches are well-known, but success is not automatic. It depends on the adoption and implementation of coherent policies which integrate the three pillars of sustainable development: economy, environment and society ²².

2. Social dialogue

2.1. Players of social dialogue at EU level

The consultations between social partners began in the mid-60s within the consultative committees, the permanent committee on employment and tripartite conferences on economic and social questions. However, it was in 1985, with the launch of a bipartite social dialogue, promoted by Jacques Delors, the President of the Commission at the time, that social dialogue at the Community level evolved into a genuine European negotiating forum ²³.

As a part of the Treaty establishing the European Community (TEC), the ***European social dialogue*** is a fundamental element in the European social model. It encompasses the discussions, negotiations and joint actions undertaken by European social partners.

²² www.pri.org/business/social-entrepreneurs/environmentally-sustainable-economic-model1504.html.

²³ www.etuc.org/a/1751.

At Community level, workers are represented by the *European Trade Union Confederation* (ETUC). European employers are represented by three different organisations: the *European Centre of Enterprises with Public Participation and of Enterprises of General Economic Interest* (CEEP), created in 1961; *BUSINESSEUROPE* (formerly the Union of the Industrial Federations of the EEC countries - UNICE), founded in 1958; and, following a cooperation agreement signed in 1998, the *European Association of Craft Small and Medium-Sized Enterprises* (UEAPME), which participates in the social dialogue as a member of the BUSINESSEUROPE delegation.

The involvement of the social partners at the European level is organised around three different types of activities:

- *tripartite consultation*, which describes the exchanges between social partners and the European public authorities;
- *consultation of the social partners*, which covers the activities of the consultative committees and the official consultations in the spirit of Article 153 of the Treaty on the functioning of the European Union (TFEU);
- the *European social dialogue*, which is the name given to the bipartite work of the social partners, whether or not it stems from the official consultations of the Commission based on Articles 153 and 154 of the Treaty on the functioning of the European Union (TFEU).

The *European social dialogue* brought so far many results, notably the adoption of some 60 joint texts by the interprofessional social partners: this process adds up to national social dialogues existing within the majority of Member States.

The European dialogue, which is now structured within the governance of the Union, allows social partners to make a significant contribution to the definition of European social standards.

Social dialogue also takes place in different industrial sectors, coordinated on the trade union side by the European Industry Federations. This is an important tool to tackle industry-specific questions at a European level. Sectorial social dialogue

committees deal with, for example, training, working time and conditions, health and safety, sustainable development, and free movement of workers ²⁴.

2.2. Role of social dialogue

The Green Paper on Modernising Labour Law (2006) assesses the role of social dialogue at national and EU level in modernising labour law. Improving the quality of work and safeguarding working conditions is an issue that must be regulated by national legislation, while at EU level the social acquis (EU body of law) supports and complements the actions of the Member States. Social dialogue at national, sectoral and company level demonstrates how workplace rules can be adapted to changing economic realities and be applied to new categories of workers, such as temporary agency workers, or later green collar workers. The Green Paper points to a new role for collective agreements, which no longer merely supplement working conditions already defined by law but serve as important tools in adjusting legal principles to specific economic or sectoral circumstances.

Involving social partners: the benefits of social dialogue

Social dialogue among those most affected by these transitions – workers, employers and Governments – with a view to working towards fair policies that are efficient and balanced in their costs and benefits is essential because that is the way to make such transitions sustainable.

Examples of effective dialogue designed to guide the transformation and to facilitate the transition in both enterprises and labour markets include national sectoral round tables established in Spain for the implementation of the Kyoto commitments, the consultations of social partners on projects to be funded through the Clean Development Mechanism in Belgium.

²⁴ www.etuc.org/a/1751.

The large untapped potential of social dialogue and alliances at national, sectoral, company and workplace levels is to mobilize economic actors and to facilitate the formation of better informed and more integrated policy responses ²⁵.

European social partners discuss economic recovery plan for EU

In the debate about the measures needed to face the current financial and economic crisis, European social partners have expressed their views. While BusinessEurope, representing the employers' side, calls for a renewal of the European social market economy, the European Trade Union Confederation proposes a ***new green deal*** seeking 'to end "casino capitalism" and base growth and jobs on sustainable investment, fair wages and distributive justice'.

European Economic Recovery Plan. In response to the current financial and economic crisis, the Council of the European Union expressed its approval of the European Commission's European Economic Recovery Plan at the summit on 12th December 2008. The plan has earmarked €200 billion for economic recovery, which is equivalent to 1.5% of the EU's gross domestic product (GDP). The main portion of this amount – €170 billion or 1.2% of GDP – would come from the Member States' national budgets, while the rest would be sourced from the EU budget and the European Investment Bank (EIB) ²⁶.

BusinessEurope proposes to rebuild social market economy. While social partners both on the employees' and employers' side agree that the current crises need a complete rethinking of economic policies and cannot be solved by taking a "business as usual" approach, BusinessEurope underlined the need "to rebuild the European Social Market Economy". This proposal does not differ that much from the "business as usual" approach: reaffirming the principles of the market economy, carefully using the flexibilities embedded in the Stability and Growth Pact, strengthening the role of the European Central Bank (ECB), and reducing non-wage labour costs ²⁷.

²⁵ http://ec.europa.eu/employment_social/esf/docs/tp_social_partners_en.pdf.

²⁶ http://ec.europa.eu/economy_finance/publications/publication13504_en.pdf.

²⁷ www.eurofound.europa.eu/eiro/2009/02/articles/eu0902069i.htm.

Trade unions call for a “new green deal”. In its response to the crisis, the European Trade Union Confederation (ETUC) referred to a term used by the new President of the United States (US), Barack Obama, in his presidential campaign – namely, the proposal for a ‘new green deal’. This proposal is part of the Resolution on a European Recovery Programme, adopted by ETUC’s Executive Committee on 5 December 2008 ²⁸.

With this plan there is an opportunity to reorient European economy towards sustainability. There is a strong need to invest in renewable energy, sustainable engines and new lifestyles. Make Europe genuinely the world leader in environmental engineering, in reducing carbon emissions and sustainability. It is an important opportunity. This programme would be aimed at ‘investing in the development of new industries, rational and sustainable energies, European networks and social housing’; it would also encompass a European low-carbon economy adaptation fund in order to accompany the transitions imposed on workers who lost their jobs due to climate change measures.

A closer look at these proposals reflects the traditional preoccupations of trade unions – such as the call for financial aid for workers affected by the transition to a low-carbon economy. Sustainable investment, fair wages and distributive justice are inextricably linked. Moreover, the ‘new green deal’ is also being viewed as a ‘new social deal’ ²⁹.

There is a necessity to change the way of thinking. A closer look on the proposals by Business Europe and ETUC reveals that most of them reflect traditional employer and trade union views. Hence, both sides are a long way off from the new thinking that they demand from others. Nevertheless, at least ETUC’s call for a ‘new green deal’ is a departure from traditional trade union thinking. By linking the ‘new green deal’ to a ‘new social deal’, they are offering an original contribution to the current debate. The common effort to develop a sustainable and environmentally friendly economy can now be viewed as a new common

²⁸ www.cleantechblog.com/2009/02/new-green-deal-direction-for-economic.html.

²⁹ www.opendemocracy.net/article/beyond-the-triple-crisis-a-green-new-deal.

ground for social dialogue, which may be able to overcome traditional differences between social partners ³⁰.

2.3. A new approach: Social dialogue and energy/climate package

The European Trade Union Confederation (ETUC), the European Environmental Bureau (EEB) and the Platform of European Social NGOs (Social Platform) have joined forces since 2001 to campaign for a social and sustainable development of Europe. Every year, on the occasion of the Spring Summit, the three organisations issue common recommendations to EU leaders on how to maintain a balanced approach between economic, environmental and social objectives.

In their annual joint message to the EU Spring Summit in March 2008, the European Trade Union Confederation (ETUC), European Environmental Bureau (EEB) and Platform of European Social NGOs (Social Platform) welcome the EU's proposed energy/climate package, but call on EU leaders to adopt a coherent policy approach giving equal weight to social, employment and environmental objectives.

Fighting climate change and energy security are political priorities for Europe. The ETUC, EEB and Social Platform call on the European Council to respect the key principles of the EU 2006 strategy for sustainable development and in particular social equity and social cohesion, the precautionary principle and involvement of citizens, businesses and workers' organisations.

Well-designed climate and energy policies have the potential to reduce energy poverty and create hundreds of thousands of new jobs, but Member States must prioritise energy efficiency investments for low-income households and offer good quality work and training programmes to make the most of fresh market

³⁰ www.eurofound.europa.eu/eiro/2009/02/articles/eu0902069i.htm (Stefan Lücking, Technical University Munich).

opportunities. To this effect the ETUC, EEB and Social Platform put forward proposals for a **European Finance Plan** for sustainable growth ³¹.

«We welcome the proposed energy and climate proposals as a good starting point for enhancing the EU's continuing global environmental leadership,” declared EEB Secretary General John Hontelez. “However, the 20% target for reducing emissions is insufficient. Industrialised countries will need cuts of between 25% and 40% by 2020 to halt dramatic global warming».

ETUC General Secretary John Monks said «The European Council must respond decisively if other industrialised countries refuse to join the fight against climate change, and it must take steps to protect EU-based industry from unfair competition. We therefore support the adoption of border tax adjustments».

«Rising energy prices must not be allowed to threaten social cohesion and social inclusion» added Social Platform President Fintan Farrell. «Universal and affordable access to basic energy supply must be offered to everyone living in Europe. Investment in public transport and in green social housing must play a key role in decreasing energy consumption and at the same time promote people's well being and reinforce local communities» ³².

Responding decisively to refusal of other industrialized countries to join in

ETUC, EEB and Social Platform call upon the European Council to combine an ambitious climate policy with measures that protect the EU-based industry from *unfair competition* based on the refusal from other industrialised states to take similar climate measures.

Energy efficiency and energy savings are the absolute priorities

ETUC, EEB and Social Platform insist that the core of the EU Strategy for Energy and Climate should be energy efficiency and energy savings. This requires a combination of standard setting for products, the right price signals through taxation and levies, training programmes for new jobs and ambitious public and

³¹ http://ec.europa.eu/internal_market/finances/actionplan/index_en.htm.

³² www.etuc.org/a/4670 (03/03/08).

private investment strategies in particular in the housing and transport sector. The EU has a non-binding strategy for a 20% increase in energy efficiency by 2020 (leading to a 1% absolute reduction in energy use per year), but the recent Lisbon report by the Commission shows that some Member States are not meeting this target³³ and others³⁴ are taking more ambitious increases.

Energy as a public good and a basic necessity

EEB, ETUC and Social Platform call for measures to prevent negative social impacts of rising energy prices. A universal and affordable access to basic energy supply needs to be secured to all people living in Europe. However, here again the objective should be to reduce energy needs by efficiency improvements and affordable low-energy alternatives. In addition, the availability and development of social data needs to be improved across the EU to better measure the accessibility of energy services for people on low incomes³⁵.

ETUC, EEB and the Social Platform call on public authorities to design energy policies that include social cohesion/inclusion and environmental objectives. They believe that public transport and investment in green social housing must play a key role in decreasing energy consumption and at the same time promote people's well-being and reinforce local communities.

Creating quality jobs

EEB, ETUC and Social Platform see great opportunities for meaningful job-creation in well-designed climate/energy policies. Energy efficiency alone can create hundreds of thousands of jobs in the renewable energy sectors.

For example, pro-active ecological modernisation policies, such as the German Alliance for labour and environment launched in 2003, can make the EU world leader in renewable energy technologies and energy efficient products (including

³³ www.euractiv.com/en/energy-efficiency/brussels-propose-mandatory-eu-energy-savings-goal/article-186330.

³⁴ For example, France, Germany, etc.

³⁵ http://wolfweb.unr.edu/~cevrenosoglu/res/Lecture-9_Energy_as_Public_Good.pdf.

in the car industry). Shortage of skilled workforce is currently hampering the scaling up of EU-wide energy efficiency.

EEB, ETUC and Social Platform call upon to agree on coordinated national actions for creating quality jobs and training programmes to respond to new market opportunities in the field of energy efficiency ³⁶.

A European finance plan for sustainable growth initiative

Massive public and private investments will be required in a short period of time to renew the EU-capital stock in order to address the challenge of climate change. A significant part of these investments, such as railway infrastructure, public transport, thermal renovation of buildings or early replacement of fossil fuel based power plants by renewable energy production, can not be financed by financial markets alone as they have long payback periods. These investments could temporarily increase public deficit but they will also stimulate a sustainable growth, contribute to respond to environmental challenges, create quality jobs and defend low and middle income purchasing power and standards of living. According to ETUC, EEB and Social Platform the European finance plan for sustainable growth initiative will partly finance these investments.

Governance and involvement of civil society

The EEB, ETUC and Social Platform coalition – which brings together trade unions and social and environmental NGOs – show that civil society can be united and mobilised in responding to new challenges. Global warming, environmental degradation and the raise in social inequalities are of direct concerns for many active citizens engaged in the voluntary sector or/and in trade union movements. Their energy, ideas and expertise need to be recognised and used by decision makers. ETUC, EEB and Social Platform call for an increased involvement of all stakeholders through a more structured civil and social dialogue with public

³⁶

www.etuc.org/IMG/pdf_Joint_declaration_EEB_ETUC_Social_Platform_Spring_Summit_2008.pdf.

authorities on the design and implementation of the climate policies (both at national and European level) ³⁷.

Third multiannual work programme

In May 2009, the European social partners adopted their third multiannual work programme, lasting until 2010, identifying areas of joint action. They include, but are not limited to, joint work on flexicurity, climate change and the so called “EU2020” strategy. Through this new programme social partners intend to reinforce their commitment to jointly address Europe’s major social, economic and environmental challenges ³⁸.

The new work programme of ETUC will cover a two-year period (2009–2010) so as to be synchronised with the Growth and Jobs strategy. It will build upon the work already carried out jointly, such as the joint analysis of labour market challenges, the economic and social change agenda, reconciliation between private and professional life, capacity building for social dialogue in EU member states and candidate countries and the implementation of social dialogue instruments.

The work programme also contains a number of new initiatives which will be carried out by the European social partners.

These include:

- 1) a joint recommendation aimed at contributing to the definition of the Post – 2010 Lisbon Agenda, also in the context of the current economic and financial crisis;
- 2) the development of a joint approach to the social and employment aspects and consequences of climate change policies with a view to maximising opportunities and minimising negative effects and to identify possible joint actions;

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http://siteresources.worldbank.org/INTRANETSOCIALDEVELOPMENT/Resources/SDCCWorkingPaper_Conflict.pdf.

³⁸ www.etuc.org/r/656.

- 3) Jointly monitoring the implementation of the common principles of flexicurity, notably in order to evaluate the role and involvement of the social partners in the process and to draw joint lessons;
- 4) Jointly addressing mobility and economic migration issues and promoting the integration of migrant workers in the labour market and at the workplace in order to identify possible joint actions.

The ETUC believes that sustainable development and environmental protection must have equal importance to social and economic policies, at the heart of the Lisbon Agenda. These are not conflicting demands but complementary elements. Given the global dimensions of problems like climate change and poverty, the ETUC also works with international actors to press for change. And it pursues corporate responsibility, and social dialogue on sustainable development issues in the EU.

2.4. ETUC standpoint: development of new jobs and transformation of existing jobs

While it supports these ambitions, the ETUC is realistic as to the difficulty posed by the transformation of such objectives into political realities. This makes it all the more necessary to carefully define just what is, or should be, covered by the underlying notions in the policies to be developed. The notion of green employment is one of these. The ETUC, believing that the pursuit of the objective of green growth will imply that virtually all jobs will gradually become classified as green jobs, recalls that this classification currently refers all too often to precarious, low-intensity jobs involving low skills levels, and lacking in attractiveness.

Many industrial sectors represent essential underpinnings for the transition. They must be safeguarded to move towards a low-carbon economy bringing to market new and innovative products which offer improved energy efficiency and generate low carbon emissions. It is illusory, pointless or even actually counterproductive

to make distinctions, or worse, conflicts, between what is dubbed the ‘green’ economy and the conventional economy, because crucial links, both economic and industrial, bind them unshakeably together. The new “green” economic sectors in the field of renewable energies could not exist without the participation or the products of the conventional industrial sectors and also depolluting procedures dismantling and recycling industries. Solar technology would be inconceivable without the chemical industry, just as wind power would be inconceivable without steel.

Some resistance to the measures necessary to protect the climate within the trade union movement is largely attributable to fears of job losses in certain sectors or certain regions. Workers should not have to choose between their jobs and the protection of the environment. This is the reason why ETUC is strongly against such a pressure by enterprises. However, the figures available show that the fights against climate change can potentially have a positive overall effect on employment. The ETUC considers that this fight against climate change needs to be grasped for the opportunities it offers for both the development of new jobs and the transformation of old ones.

- 1) A just transition may be a real opportunity, but it is important to explore the conditions making it possible to move to protected mobility in the context of a deeper social dialogue incorporating the sectoral and territorial dimensions.
- 2) The point is to create sustainable jobs and high-quality jobs as part of the new economy. A fair transition will guarantee, for example, the creation of bridges designed to help workers in shrinking sectors to find jobs in expanding sectors, while protecting their wages, their working conditions and their trade union organisations.
- 3) Every workplace can be a green workplace. There is mounting evidence that unions are taking action to tackle climate change. Unions have the proven ability to deliver progressive change on working conditions, safety and equality. Their effectiveness would be greatly strengthened with the provision of more basic entitlements. Therefore, we ask for new and extended rights relating to the

protection of health and of the environment at work, and for the provision of training and skills related.

4) The priority should be given to energy efficiency, as stated in the ETUC resolution from March 2008 and more recently in the Manifesto of the Spring Alliance (2009). The targets for the reduction of emissions will be hard to attain at a reasonable cost, if energy consumption continues to grow. That is why the ETUC regrets the absence of binding energy savings objectives in the legislative package. Given the insufficient results of the Action Plan for Energy Efficiency adopted in 2006, the European authorities and the Commission should set a legally binding target for energy efficiency by 2020, broken down into national targets, and promote ambitious policies in the transportation and building sectors through a European Renovation and Restoration Plan and a sustainable Mobility Directive.

The need for a new industrial policy is making itself felt today in all the countries in the Union: in those countries which are lagging behind and need major investments in order to modernise, in the powerful industrialised countries which are big exporters but are hit hard by the crisis in some very volatile sectors, in the States with a policy of industrial ‘laissez-faire’, which chose to pin their hopes to sectors which today are permanently tainted with suspicion and mistrust; in industrial States long faced with the need to upgrade their productive apparatus and address the territorial management of its malleability. In this context, countries should be able to activate public investments in order to facilitate the creation of new markets and new employment, investment in European energy and energy intensive industries, to secure their long-term future.

a) The European Union must demonstrate leadership and make sure that it has access to the instruments necessary to the organisation of R&D, innovation and investments, education and training, at both sectoral and national level. In many cases it is SMEs within industrial supply chains that bear the greatest burden for R&D and innovation (e.g. over 70% of R&D spending in the automotive sector alone).

- b) Far greater use should be made of binding standards, public-private partnerships for research, development and demonstration, greater use of green and social procurement criteria to create market access for new technologies, and state aid rules.
- c) European training programmes on low-carbon technologies need to be swiftly rolled out so as to give workers, technicians and engineers the skills they need. A veritable Erasmus programme should be directed to this end ³⁹.

Moving towards a real anticipation agenda in the social dialogue

Social dialogue needs to move beyond a quality threshold, assert itself as a serious and decisive instrument enabling the interests of all the stakeholders to be brought into a constructive, creative balance. The information/consultation/negotiation procedures and processes at both company and sector level need to be as rich as possible and to interact to deliver mechanisms for anticipation and controlled regulation of the industrial changes and all the elements of industrial policy, as well as verification of the application of the concerted policies.

On the basis of the fact that the European Union was born out of a transitional Treaty (the ECSC), the ETUC underscores the necessity and the feasibility of setting up procedures and instruments to allow a socially fair and negotiated transition to a low-carbon economy.

- 1) National, regional and sectoral studies on the policies linked to climate change and their impact on employment and labour markets need to be systematically conducted, by consultation with the social stakeholders, and based on widely accepted criteria for assessing the vulnerability of workers, countries and regions.
- 2) Skills monitoring and matching policies should be reoriented towards the anticipation of these changes.
- 3) Creation of a permanent instrument to ensure the anticipation of socio-economic transition is urgently needed, to coordinate existing instruments such as

³⁹ www.etuc.org/r/656.

sectoral councils and reinforce dialogue between the social partners and public authorities. The aim being:

- a) to catalogue the areas at risk across all industrial sectors;
- b) to prioritise these areas from an economic and social policy perspective;
- c) to develop means of professional and territorial transition as part of a developed social dialogue;
- d) to respond to socio-economic warnings coming from the social partners.

It will be made up of the social partners and the public authorities, and would receive sustainable development impact studies and will be able to participate in the definition of the specification of legislation as well as the implementation and follow-up⁴⁰.

The “just transition principle” and high quality jobs

A European low-carbon transition strategy must be based on Just Transition principles: dialogue between Government, industry, trade unions and others on the economic and industrial changes involved; green and decent jobs; investment in low-carbon technologies; new green skills.

National, regional and sectoral studies on the policies linked to climate change and their impact on employment and labour markets need to be systematically conducted, by consultation with the social stakeholders.

At European level the creation of a permanent instrument to ensure the anticipation of socio-economic transition is urgently needed, to coordinate existing instruments such as sectoral councils and reinforce dialogue between the social partners and public authorities. In this framework the EU must commit itself to the challenges of industrial restructuring with which the new Member States are confronted. This coordinating instrument would receive sustainable development impact studies and will be able to participate in the definition of the specification of legislation as well as the implementation and follow-up⁴¹.

⁴⁰ www.etuc.org/a/6594.

⁴¹ www.brettonwoodsproject.org/doc/G20progressreview.pdf.

The creation of an international fund and of an European fund to facilitate the development of technologies producing low carbon emissions and of technologies based on energy efficiency and renewable energies in the developing countries, as well as to develop employment policies based on social protection, the promotion of decent work and public services.

Green growth based on maintaining and creating high quality jobs and social progress, across the whole economy:

In sum:

- 1) A much stronger social dimension in European policies towards the development of low carbon industrial strategies and the development of industrial policies is urgently needed through a modern demand-side European *employment* strategy guaranteeing job creation and protected mobility not a strategy based solely on labour market deregulation.
- 2) Skills monitoring and matching policies should be reoriented towards the anticipation of these changes.
- 3) A fair transition guaranteeing the creation of bridges designed to help workers in shrinking sectors to find jobs in expanding sectors, while protecting their wages, their working conditions and their trade union organisations.
- 4) Every workplace can be a green workplace. There is mounting evidence that unions are taking action to tackle climate change. Therefore, they ask for new and extended rights relating to the protection of health and of the environment at work, and for the provision of training and skills related.

The ETUC would reiterate that the new directive must include an import adjustment system for energy-intensive industries that are exposed to international competition (whether a carbon tax or the inclusion of importers/exporters in the carbon market) with the possibility of activating such a mechanism from 2013 if the other industrialised countries do not regulate emissions in an equivalent way. The impact of carbon pricing on the electricity prices paid by those industries should also be taken into account ⁴².

⁴² ETUC Resolution March 2008.

3. Gender issue

3.1. Why is a gender perspective relevant in the energy sector?

Men and women play different roles, have different needs, and face different constraints on a number of different levels. Gender analysis is a methodology that seeks to understand the distinct culturally and socially defined roles and tasks that women and men assume both within the family and household system and in the community. A number of texts and training manuals are available on gender analysis, which has been used for many years by organizations ranging from Oxfam to the World Bank ⁴³.

Why has gender analysis not been adopted more extensively in the energy sector? Not only women, but people, and socio-economic perspectives such as indigenous knowledge and people's participation, in general have largely been ignored in energy planning and policy until fairly recently. The energy sector has been defined as capital-intensive, large-scale and commercial activities; high tech requiring professional expertise; and inanimate fuels, not human energy. New trends both in energy policy and in gender analysis are now facilitating increased attention to gender analysis in the energy sector: attention to energy, environment and development relationships; gender analysis viewing women as active participants; more women in energy professions; the higher visibility of women's organizations internationally; gender training in the energy sector; and the rise of international and national networks on gender and energy ⁴⁴.

3.2. Are women really interested in renewable energy technologies?

There is a stereotype that women are not technologists and that they are not capable (even when provided with appropriate support) of building, operating and

⁴³ www.unescap.org/esd/energy/cap_building/integration/egm/documents/Soma_D_paper.pdf.

⁴⁴ www.earthsummit2002.org/workshop/Gender%20%26%20Energy%20N%20UR.pdf.

maintaining sophisticated technologies. While women do experience a number of constraints in their involvement with technology, the reality is that women's role in technology has been largely overlooked. First, women's indigenous technology innovations, often highly sophisticated, have not been considered as real "science". Evidence shows that supporting women's own innovation abilities could be a rich source of improving renewable energy technologies, while at the same time increasing women's own capacities and confidence. Second, women are more and more adopting non-traditional work roles in the energy sector, due to the rising number of female-headed households globally, and to the increasing access by women to science and technology education. A lesson for renewable energy projects is that "male" roles are not fixed but are increasingly being undertaken by women household heads, as well as by other women. Hence, non-traditional roles for women could also be considered in renewable energy projects. The increasing numbers of professional women in the energy sector can be a source of support and role models in efforts to increase the role of women in renewable energy.

1) As *microentrepreneurs*, women have used renewable energy to increase profits and efficiency in their informal sector enterprises, and have proven themselves capable of operating and also constructing renewable energy technologies on their own, when provided with the appropriate training and support. Women may be effective renewable energy entrepreneurs, due to their experience as users of energy in households and their own enterprises; in some countries women are already marketing solar home systems successfully.

2) As *extension workers*, women could be effective in operation and maintenance roles of biogas, hydroelectric and solar installations. Though some costs may be higher, due to women's need for training and their restricted mobility, others are lower, due to less staff turnover and greater reliability.

3) As *leaders, networkers and lobbyists*, women could successfully influence energy policy decisions at the local, national and international levels. Women do not necessarily have to build, operate or maintain renewable energy installations alone. More important is that women have a role in determining the use and

benefits of the project and in managing these arrangements, and that they receive and control benefits ⁴⁵.

3.3. Women involvement in green economy: selected highlights

- 1) A greener labor market is not necessarily gender-neutral.
- 2) Women are underrepresented in most green job categories.
- 3) Need to be proactive in ensuring that women are a part of the green economy.
- 4) Use public policy and legislation to ensure that funding opportunities include goals for women's participation and require appropriate measures of progress/success.
- 5) Helping women/girls see the value of math, science, technology, and engineering is critical.
- 6) Encourage women to go into the skilled trades; provide specific information on nontraditional jobs and how career ladders lead to well-paying jobs.
- 7) Identifying and supporting entrepreneurship opportunities for women in the green economy; promoting state certification programs.
- 8) Overcoming societal issues – women don't think they belong here / how do we change thinking/ support women to enter and succeed at nontraditional occupations.
- 9) Crucial role that workplace flexibility and supports play in retaining women in the workplace. (Family friendly workplace, etc.)
- 10) Set up supports to overcome workplace isolation. Focus on retention strategies.
- 11) Establish Green Jobs Directive/ ensuring women are not left behind.
- 12) Trying to build an economy and make the environment better and safer for a new generation.

⁴⁵ <http://www.nrel.gov/docs/fy00osti/26889.pdf>.

- 13) Some jobs are new, but many what we have been doing – not unfamiliar occupations or skill sets.
- 14) Many green jobs are middle-skill jobs -- jobs that require more education/training than a high school diploma, but not a four or even more year degree. [Naturally, there are some exceptions.]
- 15) Slogan: Growing green industries and making existing industries greener – this is the key.
- 16) “Rather be clean than green” – many workers want only clean jobs (don’t want jobs where they have to get their hands dirty/bias against skilled trades jobs).
- 17) Need better marketing about advantages of skilled trades and jobs – career ladders, earn while you learn opportunities, family supporting salaries, completion of an apprenticeship earns an associate degree.
- 18) Need for people to work while developing skills – need for income on interim basis.
- 19) Ensure that industry, community-based organizations, education and training systems and public programs are all working together in identifying and delivering training/workforce development around green industries and occupations^{46 47}.

3.4. Employability

The Green Economy holds a clear promise to build sustainable communities that are energy efficient, safe and healthy. This movement also holds the promise of moving more women into career paths that will offer them the opportunity to become economically secure and support themselves and their families.

The basic aim of this movement: well-paid, career-track jobs that contribute directly to environmental quality represent a potential new face of the European economy.

⁴⁶ www.wowonline.org/publicpolicy/documents/GreenJobsFactSheetReformatteddfeb05.pdf.

⁴⁷ www.womensfundingnetwork.org/wesc/our-issues-and-programs/green-jobs.

Some green-collar jobs (e.g. wind turbine technician, solar collector plan manager, etc.) are new occupations. However, most are similar to existing jobs but demand new skills and knowledge. Current and emerging green jobs are in the skilled trades: manufacturing, construction, operation and maintenance, and installation. Many require more education than a high school diploma but less than a higher education (university) four-year degree.

The shortage of skills and training was identified as one of the leading barriers to renewable energy and energy efficiency growth. In many countries women remain underrepresented in the major categories of jobs going green. Even though women have made great strides in some male-dominated occupations, yet they still represent only a small portion of the workers in green occupations.

Targeted efforts on the part of policymakers, funders, employers, workforce professionals, training and education providers, and advocates are needed to ensure that women recognize the opportunity presented by green occupations, and are able to fully participate in and benefit from the new green economy ⁴⁸.

Seven Reasons for Women to Consider a Green Job

1. *A green job can provide the chance to earn more.* Many green jobs offer better wages and benefits than jobs traditionally held by women.
2. *Women can start with any skill level.* Women with a high school education to those with advanced degrees can find a place in the green economy. Not every job will put women on a career ladder, but each job can be used as a stepping stone to improve skills and move women toward their next career goal.
3. *Green jobs appeal to workers with a diversity of skills and interests.* Women with diverse interests and aptitudes ranging from mathematics to mechanics to management can find a rewarding green career. For example, home insulators do hands-on work, while recycling coordinators supervise operations and set collection schedules by remote. Green jobs can be indoors or outdoors. Women need to understand all of the opportunities that are available to them.

⁴⁸ www.wowonline.org/publicpolicy/documents/GreenJobsFactSheetReformatteddfeb05.pdf.

4. *There are multiple ways to get started in a green job.* Training for green occupations is offered in a variety of forms, including on-the-job, paid union apprenticeships, programs sponsored by nonprofit organizations, and formal degree programs. For some occupations, such as electricians, workers can begin their training with a high school or vocational school education, and then go on to a college, trade school, apprenticeship, or certification program. Other career paths, like engineering, require minimum a BA (bachelor's) degree for entry-level positions. Sometimes, unions offer a good starting point for finding training opportunities.

5. *Green job opportunities are available for workers of any age.* The pathways into green jobs are for all workers – those just starting out or those in need of a career change. There are ample opportunities for younger workers to get started and for more seasoned workers to use their skills in new ways.

6. *Green jobs can give women greater satisfaction.* Research shows that job satisfaction is a key ingredient for success in other areas of life, and that it contributes to a general sense of fulfillment. In taking a green job, women can have satisfaction knowing that they are contributing to a healthier environment for the present and future generations. Also, green jobs often offer career paths so that women can grow professionally. When women consider a broad range of occupations, including green jobs, they are likely to find closer “occupational fits” with their skills and interests.

7. *Green employers are looking to hire.* In many Member States, green jobs are in demand and future growth is projected. According to the EU 2020 Programme requirement every Member State should experience growth in the green industry by 2020. In addition, despite the economic recession, companies are still looking to develop green technologies and they are identifying a skills shortage as they do so. For example, the lack of a skilled and well-trained workforce was a barrier to growth in the solar power or in other RE sector ⁴⁹.

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www.dol.gov/wb/media/reports/Why%20Green%20is%20Good%20for%20Women_fact%20sheet_revised032310_2.pdf.

3.5. Key elements should be considered when placing women in non-traditional/ green jobs recruitment

It is necessary to dispel myths about gender, race, and sexual orientation for staff or members, and the women being recruited. Women must be given specific information about nontraditional jobs, such as job titles and salary ranges, as many women are unfamiliar with nontraditional work. Employers must assess skills, abilities, and aptitudes for nontraditional work by incorporating information on transferable skills into the hiring process and utilizing aptitude tests that are as bias-free as possible.

Orientation

Information must be provided to all employees on the formal and informal rules and regulations on the job, including company policies supporting women in non-traditional jobs and prohibiting discrimination and sexual harassment.

Problems of isolation and stalled skill development by assigning several women to the same work environment must be avoided. A buddy or mentor who will teach skills and be supportive and who will identify appropriate skill assignments must be identified.

Access to training opportunities must be provided for women to learn skills through occupationally-specific math training, pre-vocational training such as tool identification and safety, and physical conditioning.

Retention/discrimination

The company or union must have strong policy statements that prohibit unlawful discrimination and support women in non-traditional jobs.

Key issues that commonly affect women should be addressed, such as: a) job assignment and promotion, b) fair (equal) pay, c) family care (family friendly environment) and transportation, and d) health and safety concerns.

Employers should offer benefits and supports to attract qualified entry-level women workers including: a) health care, b) child care referral services and c) housing assistance, etc.

It is important to promote the development of on-the-job support mechanisms for women, such as placing more than one woman on a worksite, encouraging support groups, and setting up online networks that are essential to keeping women in these jobs. As simple as it sounds, ensuring that there are proper facilities and equipment for women on the job is a key issue.

It also helps to monitor the progress of the union or company in preparing the workplace for women on an ongoing basis through nontraditional task forces and by conducting exit interviews.

Sexual Harassment

A strong written policy prohibiting illegal discrimination against any employee that specifically addresses sexual harassment as a prohibited conduct and describes steps to be taken if harassment occurs should be created. Formal and informal problem-solving mechanisms, grievance procedures, investigative measures, and disciplinary procedures to resolve sexual harassment complaints have great importance.

Regularly providing awareness training for supervisors to review organizational policy, build problem-solving skills, review relevant law, and discuss their responsibility to create a harassment-free workplace are all valuable tools. Providing ongoing sexual harassment awareness training for every level of employee or union member should be part of every business plan ⁵⁰.

⁵⁰ www.wowonline.org/publicpolicy/documents/GreenJobsFactSheetReformattedd4feb05.pdf.

2. EMPIRICAL RESEARCH

A) FEMALE EMPLOYMENT IN GREEN JOBS: THE STATE OF THE ART IN EUROPEAN LABOUR MARKETS

1. Female employment in Europe

Combating gender inequalities and discrimination in labour markets is one of the main challenges in the European Union. It was one of the key elements of the Lisbon Strategy, and its relevance has been underlined also in the EU 2020 Strategy ¹.

Over the last decade, European labour markets have seen an increasing participation of women. The female employment rate has increased by 5.2 percentage points in the period 2000-2008, reaching for the EU27 59.1% in 2008, which was close to the Lisbon target (60% in 2010). Although in general women have been relatively well protected during the last financial and economic crisis compared to men, a little decline has been registered in the first three quarters of 2009 (-0.5 percentage points) as a consequence of the economic downturn. Between May 2008 and September 2009, the unemployment rate in the EU27 rose more rapidly for men (from 6.4% to 9.3%) than for women (7.4% to 9%), mostly because the crisis hit hard male-dominated sectors such as the manufacturing

¹ European Commission, *EU 2020 strategy. A strategy for smart, sustainable and inclusive growth*, 3 March 2010, at www.adapt.it, Green Jobs.

industry and construction. However, in recent months, female and male unemployment rates have been increasing at the same pace, reflecting an extension of the crisis to other sectors, more gender-mixed than the ones first hit ². Experience from past crises suggests that great attention should be given to vulnerable groups, also after the economy has begun to recover. This is particularly true for young (both women and men) and female labour force as a whole. For persons who become unemployed, the risk of not being re-employed is higher for women, while men's employment generally recovers more quickly than women's. Moreover women are more at risk of falling in the so-called inactivity trap (they represent more than two thirds of the 63 million persons between 25-64 who are inactive in the EU) or among part-time unemployed (part-timers who would like to work more) ³.

According to the last *Report on equality between women and men* ⁴ women are more likely to have a disadvantaged position on the labour market, mainly because of the higher incidence of precarious contracts, involuntary part-time and a persistent negative pay gap ⁵. In 2008, in the EU27 the average gender pay gap was about 18%, reaching much higher levels in Czech Republic (26.2%), Germany (23.2%), Greece (22%), Austria (25.5%). This significantly impacts women's earnings during the entire lifecycle, social security protection and pensions, resulting in higher at-risk-of-poverty rates, especially among elderly women.

Tackling gender equality in the labour market should be considered a long-term challenge, since it requires structural and behavioral changes, in addition to a redefinition of the role of women and men in society. Women continue to be concentrated in traditionally feminized – and often low-paid – sectors (e.g. health

² European Commission, *Report on equality between women and men 2010*, 24 February 2010, p.10 at www.adapt.it, Adapt Bulletin n.8, 10 March 2010.

³ Ibid.

⁴ Ibid.

⁵ The gender pay gap represents the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees (Eurostat).

and care service, education) and are under-represented among senior and managerial positions. Women occupational choices are still dependent on family responsibilities, in particular childcare. Women with children work less (-11.5 p.p. in the employment rate) than women without children, while the opposite trend is registered among men. These differences are mainly linked to traditional gender roles and the lack of childcare facilities in many Member States. Despite an increase in the provision of childcare over the last few years – in line with the European targets to provide childcare by 2010 to at least 90% of children between 3 years old and the mandatory school age and at least 33% of children under 3 years of age – the coverage rates remain below these targets in many countries, especially for children under 3 years of age ⁶.

To what concerns educational aspects instead, there is evidence that women's qualifications are now higher than men's both in second- and third-level education, but these generally high skill levels of women have not been fully reflected in their employment outcomes. In fact, even if the gender gap in employment rates is lower among women and men having a tertiary education (compared to women and men having a lower level of education), gender gaps seem also to follow a life-cycle pattern, with the level of education having a limited influence. Gender gaps in employment, part-time work and pay tend to rise between the age of 25 and the age of 35, again reflecting the high impact of family responsibilities on female employment ⁷. At present the issue about gender equality in education relates mainly to equal cultivation of different capacities and the elimination of gender stereotypes. The definition of the 2010 EU benchmark on the increase of women graduating in Mathematics, Science and Technology (MST) addresses this kind of concerns ⁸. According to the 2006 PISA results, it seems that there are no particular reasons for the exclusion of women in MST in terms of performance. These results show that the overall gender difference in

⁶ European Commission, cit. note 2, p.11.

⁷ Ibid., p.19.

⁸ European Commission, *Progress towards the Lisbon objectives in education and training. Indicators and benchmarks 2009*, 2009.

mathematics was less than one third as large as for reading and in all Member States boys outperformed girls or there was no significant difference. At the same time, girls and boys showed no significant differences in average science performance in the majority of countries. Looking at the university education, the student population as a whole shows an imbalance in favour of women. In 2000 57% of graduates in the EU27 were female and their share increased further to 59% in 2007 ⁹. However, when considering only graduates in MST, males predominate. Despite policy efforts to encourage women in these sectors, the female share of MST graduates has increased only by 1.2 percentage points between 2000 and 2007. The highest shares of female MST graduates are registered in Greece and Romania (over 40%), while the lowest proportions were in Czech Republic, Germany, Spain, France, Netherlands, Austria, Slovenia and Finland (less than 30%). When considering the specific field of engineering, in 2007 on average in the EU27 only 18.4% of graduates were female. Gender imbalance is also pronounced in computing (19%) and to a lesser extent in architecture and building (36%).

In the economic literature it is possible to find confirm of the relevance of tackling gender equality not only for social justice reasons, but also for improving sustainable economic growth. It is reasonable to suppose in fact that a high proportion of employed women can boost the long-term growth curve (all else being equal), thus having a favorable impact on GDP level. As stated by Löfström ¹⁰ a higher level of gender equality in the labour market has a positive effect on the average levels of productivity and the innovation process. The Author calculated a maximum value of these gains, showing a potential GDP increase of between 15% and 45% in the EU Member States.

Moreover, the ageing workforce and the need for replacement is a common problem in many sectors. According to Eurostat, the share of persons in the EU aged 50 or more will increase dramatically until 2015, resulting in general

⁹ Ibid., p.57.

¹⁰ Ä. Löfström (2009) in European Commission, cit. note 2, p. 13-18.

replacement challenges. In many sectors, the huge need for replacement also generates challenges in terms of securing transfer of skills and knowledge from experienced retiring workers to the new generations. A major inclusion of women in labour market should be of support in this process.

When approaching to a gender mainstreaming analysis it should be useful to consider the two main aspects that policies must take into account: equality and diversity. Gender equality means giving equal visibility, empowerment and participation to women and men in all spheres of public life. Therefore it is important to create a fairer labour environment, where both women and men can participate equally and where everyone has the possibility to fulfill their potential. Diversity instead is about the recognition and valuing of differences in its broadest sense. It means creating a work culture and workplace practices that recognize, value, respect and harness the contributions and talents of all for the benefit of the individual and the organization. Equality and diversity need to be progressed together, since there is no equality of opportunities if difference is not recognized and valued.

1.1. Gender occupational segregation

As it has been previously argued, women workers are not equally distributed among occupations and economic activities. In the literature different phenomenon of gender-based segregation have been identified: occupational versus sectoral segregation, horizontal versus vertical, vertical versus hierarchical. According to EGGE¹¹, vertical segregation refers to the under (over) representation of women in occupations or sectors at the top of an ordering based on desirable attributes – income, prestige, job stability, etc. Horizontal segregation

¹¹ European Commission's Expert Group on Gender and Employment (EGGE), *Gender segregation in the labour market – Root causes, implications and policy responses in the EU*, 2009, p. 9, at www.adapt.it, Adapt Bulletin n.31, 27 October 2009.

is instead the under (over) representation of women in occupations or sectors not ordered by any criterion. Finally, hierarchical segregation stands for under (over) representation of women at the top of occupation-specific ladders.

According to the European Commission ¹² there has not been much positive evolution in aggregate levels of segregation in sectors and occupations since 2003. Segregation, which is commonly measured by the Karmel and MacLachlan Index ¹³ (IP index), is relatively high in Europe, reaching 25.3% for occupational segregation and 18.3% for sectoral segregation ¹⁴. In 2008 segregation reached the highest levels in Estonia, Slovakia, Lithuania, Latvia and Finland, both in sectors and occupations, while much lower levels are registered in the Mediterranean countries. However, in these countries, especially in Italy and Spain, segregation has constantly increased in the last 10 years. The same trends are registered in Ireland, Bulgaria, Latvia and Romania. Viceversa, Austria, Czech Republic, Denmark, Norway, Sweden and United Kingdom have experienced relatively fast de-segregation, with decreases in the IP Index ranging from 2.8 to 1.5 p.p. between 1997 and 2007.

The choice of study field certainly impacts the gender segregation within the labour market, as regards both occupations and economic sectors. Gender occupational segregation implies that women are under-represented in certain private sectors that are crucial for economic growth. Moreover it is expected that in the medium-long run, skill and labour shortages will affect mixed occupations, thus requiring more balanced distribution of occupations. This concerns for instance female-dominated occupations, such as service workers and sales assistants, clerical staff and care workers and male-dominated occupations, such as engineers, plant and machine operators and assemblers.

In the particular case of engineering, several studies have examined the causes of the female under-representation. Many have targeted the stereotype of engineering

¹² European Commission, cit. note 2, p. 19.

¹³ The IP Index can be interpreted as the share of the employed population that would need to change occupation (sector) in order to bring about an even distribution of men and women among occupations or sectors.

¹⁴ European Commission's Expert Group on Gender and Employment (EGGE), cit. note 11, p. 9.

as a male domain and several empirical studies partially support this hypothesis. Stereotypes have been defined by Lippman in 1922 as “pictures in our head”¹⁵, which simply are expectations of what people will be like and what they can and cannot do, and are usually generalized to all members of the group, without considering individual differences¹⁶. Negative stereotypes might have psychological consequences for those who are targeted, interfering with individual performances. In addition to educational paths of choice, organization and job structures, it seems that female engineers must also contend with “the men who dominate the organization, and who have an interest in maintaining their position of power and privilege”¹⁷. McIlwee and Robinson in 1992 have called this the “culture of engineering”¹⁸, reflecting male interactional styles and emphasizing tinkering or displays of technical/mechanical competences. Thus, a cultural analysis in organizations is needed, dealing with those values, beliefs and norms embedded in workplaces, symbolically and practically. This concept seems to be confirmed also by more recent analyses, strengthening the need to act not only on normative and economic incentives for female inclusion, but also on cultural factors.

¹⁵The modern conceptualization of stereotype largely draws upon the journalist and political thinker Walter Lippmann and his book *Public Opinion* published in 1922.

¹⁶ For a comprehensive review of the literature on stereotype threat theory see Delise M-L., Guay F., Senécal C., Larose S., *Predicting stereotype endorsement and academic motivation in women in science programs: a longitudinal model*, *Learning and Individual Differences*, 19, 468-475, 2009.

¹⁷ McIlwee J.S., Robinson J.G., *Women in engineering: gender, power, and work place culture*, SUNY Press, 1992.

¹⁸ Ibid.

2. Female employment in green jobs

2.1. Definition of green jobs

The fight against climate change is considered one of the major challenges of the twenty-first century, especially since the last report by the Intergovernmental Panel on Climate Change (IPCC) has warned against the environmental and economic risks of inaction and it is today widely accepted that climate change can no longer be addressed only from a standpoint of environmental policy. Environmental degradation is threatening the quality of life and the potential for sustainable development in societies across the world. Stronger mitigation policies – e.g. well-designed tax and spending measures over the long run – are required to improve the allocation of resources and allow a transition into a low-carbon economy.

As these policies will entail structural economic changes, they are not costless. Many studies by international agencies, national governments, business, labour unions, consultancies have started to analyse mitigation policies' economic and occupational impact, showing that they might also represent significant opportunities for employment and competitiveness. In this context the so-called "green jobs" phenomenon has been introduced.

According to OECD ¹⁹, green jobs are those jobs that contribute appreciably to maintaining or restoring environmental quality and avoiding future damage to the Earth's ecosystems, while «environmental protection consists of activities to measure, prevent, limit, minimize, or correct environmental damage to water, air, and soil, as well as problems related to waste, noise, and ecosystems». This definition includes activities, cleaner technologies, products, and services that reduce environmental risk and minimize pollution and resource use. UNEP *et al.*

¹⁹ C. M. Fernandez, C. Hinojosa, G. Miranda (OECD), *Greening jobs and skills. The local labour market implications of addressing climate change*, 8 February 2010, p. 49-50, at www.adapt.it, Green Jobs.

²⁰ instead define green jobs as those jobs in «agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality». Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity, reduce energy, materials, and water consumption through high-efficiency strategies, de-carbonize the economy; and minimize or altogether avoid generation of all forms of waste and pollution.

The definition of green jobs is useful to obtain a wealth of information. Firstly, it identifies those economic sectors which will be substantially affected by climate change and related risks, namely agriculture and forestry, tourism, finance-insurance, health, energy, construction and transport. However, the identification of the interested economic sector is not sufficient in order to evaluate the green jobs' phenomenon. In fact, according to UNEP ²¹, green jobs encompass a wide array of skills, educational backgrounds, occupational models, and they can be found at any point on the supply chain of what are considered to be green firms or businesses. As a result, green jobs “come in a variety of shades as some are more far-reaching and transformational than others” when it comes to the environmental benefit they provide ²². As an example many indirect jobs occur in research and development; professional fields such as engineering and architecture; project planning and management; auditing; administration, marketing, retail, and customer services; and in many traditional blue-collar areas such as plumbing or electrical wiring. A relevant point is the definition of requested skills in relation to changes in new and changing occupational profiles, the greening of existing occupations and the identification of obsolescent skills and occupations. Therefore, identifying the right skills for green jobs is a

²⁰ UNEP, ILO, IOE, ITUC, *Green jobs – Towards decent work in a sustainable, low-carbon world*, report produced by Worldwatch Institute and commissioned by UNEP, ILO, IOE, ITUC, Nairobi, 2008, p. 25 , at www.adapt.it, Green Jobs.

²¹ Ibid., p. 26.

²² Ibid.

prerequisite for the transition to a greener economy, avoiding any mismatches between demand and supply on the labour market.

2.2. Overview of employment by gender in “green sectors”

Several studies analyse the impact of green economy on employment and offer a wide range of theoretical and empirical tools. However, the majority of them do not consider the relevant qualitative aspects related to green jobs. UNEP *et al.*²³ emphasize that they also need to be decent jobs, pairing concerns like efficiency and low emissions with traditional labour concerns including wages, career prospects, job security, occupational health and safety as well as other working conditions, and workers’ rights²⁴. People’s livelihoods, rights and sense of dignity are connected tightly to their jobs, as they should reflect people’s aspirations in terms of opportunities and income, but also in terms of personal development and family stability, voice and recognition, and fairness and gender equality. For this reason a job that is exploitative, harmful, or fails to pay a living wage (or worse, condemns workers to a life of poverty) can hardly be called green. According to Sustainlabour²⁵, achieving sustainability in fact depends on equal attention to economic, environmental and social factors and their integration through sustainable development strategies.

Moreover, until now, the political and academic debate shows a general lack of gender mainstreaming approach. Economic sectors dealing with green investments generally present low share of female employment and entail mostly “Non-Traditional Occupations”. The majority of green jobs are expected to be created in the secondary sector (construction, manufacturing and energy production) where women are historically under-represented. In the EU27, the

²³ Ibid.

²⁴ Ibid.

²⁵ Sustainlabour, *Green jobs and women workers. Employment, equity, equality*. September 2009, p. 3, at www.adapt.it, Green Jobs.

female employment rate reaches only 11% in construction and 23% in the electricity sector. At the same a relevant gender employment gap is registered also in agriculture and transport, where women represent only 28% and 24% of the labour force ²⁶. Even if, until some years ago, the need for significant inputs of muscular labour in those sectors has discouraged women, today technological progress has reduced significantly the need for physical strength as a working input.

In this framework, policies which favour the entry of women, such as equal opportunities specific laws, measures encouraging work-family balance and female participation in specific training courses, are fundamental to overcome gender segregation in green sectors.

3. Female employment in renewable energy sector

3.1. Employment in renewable energy sector

The energy sector is one of the largest producers of CO₂ and consequently it will be greatly affected by environmental policies. Among the proposed instruments, the promotion of renewable energy is probably the most interesting measure. In fact, renewable energy might reduce climate change's risks and improve energy security. Moreover their promotion might also significantly contribute to the competitiveness and growth of the EU economy through technological innovations and the development of a new industry.

As official statistics do not provide data on labour force related to renewable energy, many studies have tried to estimate the occupational impact of renewable energy investments in a particular country or by a specific technology. Among the

²⁶ Eurostat, *Agricultural statistics. Main results 2007-08*, 2009, p. 21 .

most relevant contributions, interesting results have been provided by UNEP *et al.*²⁷, Greenpeace and EREC²⁸ and Fraunhofer *et al.*²⁹.

The aforementioned UNEP's report argues that the renewable energy sector has created 2.3 million jobs around the world and it could reach 20 million jobs by 2030. In Europe, under current policies, there would be about 950,000 direct and indirect full-time jobs at the end of 2010 and 1.4 million by 2020. Under an "Advanced Renewable Strategy" there could be 1.7 million net jobs by 2010 and 2.5 million by 2020. These are "net" numbers, taking into account job losses in conventional energy and relating to renewables support mechanisms, which may result in lower spending elsewhere in the economy³⁰.

The European Renewable Energy Council (EREC), jointly with Greenpeace, focused on renewable energy sources' growth potential in the sectors of electrical generation, heat production and transportation. Two different scenarios have been considered: the reference scenario, based on projections of the World Energy Outlook 2007 by 2030 and 2050, and the so-called Scenario Energy [R] evolution, characterized by a higher production of renewable energy. Under the second one, the development of renewable technologies could help create about 2.7 million more jobs in the energy sector over the next 20 years all over the world, compared to the reference scenario. The estimations of the potential job creation associated with the two scenarios to 2030 are based on a system of employment multipliers and do not include indirect job creation.

Another analysis of the economic and occupational impact of renewable energy in the European Union has been proposed by Fraunhofer *et al* (2009) in their report, *Employ RES. The impact of renewable energy policy on economic growth and*

²⁷ UNEP, cit. note 20.

²⁸ Greenpeace and EREC, *Working for the climate. Renewable energy and the green job revolution*, September 2009, at www.adapt.it, Green Jobs.

²⁹ Fraunhofer *et al.*, *The impact of renewable energy policy on economic growth and employment in the European Union*, April 2009, at www.adapt.it, Green Jobs.

³⁰ UNEP, cit. note 20, p. 118.

employment in the European Union ³¹. According to the simulation carried out, the achievement of the European targets by 2020 can lead to an increase in employment of 240,000 additional jobs (calculated net of losses in traditional energy sectors) and to a GDP growth of 0.24%.

Depending on the used methodology and the hypotheses on the development of renewables, we can find in the literature different results on employment impact. However, there seems to be a consensus on the relevant role played by innovation policies, in order to ensure competitiveness and costs' minimization and create jobs. Renewable energies are more expensive than conventional forms of energy. In strictly economic terms, this means that the latter are typically more efficient than the former and this aspect might be a disadvantage in terms of competitiveness. However, looking more deeply at this issue, several factors in favour of renewable energies investments emerge, as they entail three kinds of advantages. Firstly, they could help to overcome the employment crisis which is affecting traditional sectors, especially manufacturing; secondly, they incorporate an intrinsic value in terms of environmental conservation, whose economic relevance has not yet been precisely calculated; thirdly, they allow for a redistribution of resources in favour of future generations.

Two fundamental aspects should be considered: any mismatches between demand and supply in the labour market, due to a shortage of some skills and qualifications, and the gender issue. Labour market bottlenecks, given the massive growth of certain sectors such as the wind and photovoltaic ones, may get worse in future generations, and in the long run a real mismatch between demand and supply of labour may occur. For the renewable energy in general, and for wind and photovoltaic in particular, these shortages seem less difficult to overcome than for other sectors.

³¹ To estimate the impact, I-O models were used with the reference models at EU level are PRIMES and Green-X, Employment and GDP interactions are given by ASTRA.

3.2. Solar energy industry

Energy from the sun can be used in two main ways: photovoltaic (PV) energy (the energy from the sun is used to create electricity) and solar thermal (the sun's heat is used to provide hot water or heating).

Reaching EU climate change and energy objectives entails a dramatic increase in energy production from renewables and this is unlikely without greatly accelerating the deployment of solar energy. In fact, PV and solar thermal are among the main fastest-growing energy technology, which could offer substantial future employment opportunities.

The worldwide PV market has been growing at over 35% per annum in the last decade and competition among major manufacturers has become increasingly intense, with new players entering the market as the potential for PV opens up. China still dominates the market, but Europe as a whole counts for a 25% share. Germany continues to dominate the installation's market, with almost half the global total, followed by Spain, Italy and France. Europe's share of cumulative capacity, currently at slightly more than half the world's total, will decline to 40% by 2020 and 20% by 2030, as other regions of the world increase their installations.

The European Renewable Energy Council put global PV industry employment at more than 70,000 people and it expects the industry will create 1.9 million full-time jobs globally by 2020. A total of 50-53 jobs may be created per MW of installed capacity, though over time rising labour productivities will reduce these numbers. Much of the employment creation (about 65%) is at the point of installation (installers, retailers and service engineers), giving a boost to local economies. About 19% of jobs are instead related to cell producers and modules manufacturing, while the remaining 16% in commercialization and trading. Forecasts have assumed that 10 jobs are created per MW during production and about 33 jobs per MW during the process of installation (wholesaling of systems and indirect supply, 3-4 jobs each and research 1-2 jobs). In the coming decades these numbers will decrease as the use of automated machines will increase,

especially in jobs involved in the production process. According to the results provided by a joint study by the European Photovoltaic Industry Association (EPIA) and Greenpeace International, about 10 million jobs will be created in the solar PV sector worldwide by 2030. Even though Europe's share of global production and installations is widely expected to decline, the continent's PV employment will nonetheless continue to grow. Jobs may expand to 727,000 in 2020 and 1.4 million in 2030.

In the solar thermal field, China is again the global leader in terms of market size, even if the EU market doubled in less than three years. Total solar thermal capacity in operation reached 15.4 GW in the EU and Switzerland at the end of 2007. Germany contributes to the 35% of the European market share, followed by Greece, Austria, Spain, France, and Italy with about 10% each.

Nearly half of the industry's employment is generally in retail, installation, and maintenance. In 2007, EREC estimated employment in the European solar thermal sector at more than 20,000 full time jobs. This figure still appears highly conservative in light of the combined national estimates for Germany, Spain, and Italy, which alone would indicate 30,000 jobs.

Germany's solar thermal employment grew from an estimated 12,100 jobs in 2007 to 17,400 in 2008. Spain is in second place in Europe, with currently about 9,000 jobs. In 2006, the Italian solar thermal industry provided almost 2,000 full time (direct and indirect) jobs, and 3,000 jobs were expected for 2007 (assuming one full time job per 70 kilowatts-thermal -100 square metres - installed).

In a few decades, the industry may employ more than half a million people. Although jobs in the manufacturing sector will be exposed to global competition, retail, installation, and maintenance jobs are local, typically in small and medium-sized enterprises.

3.3. Wind Energy Industry

The world market for wind energy technologies has also grown dramatically in recent years, and it is increasingly dominated by international companies and markets. European companies are particularly relevant in the production of wind turbines.

The Global Wind Energy Council (GWEC) assumes that wind energy creates 15 jobs per MW of annual installation, through turbine manufacturing, component manufacturing, wind farm development, installation and indirect employment. In addition, operations and maintenance work provided an additional 0.33 jobs per MW of total installed capacity. Based on these assumptions, the wind energy sector in 2007 employed directly and indirectly 329,000 people in the world, and 147,000 in the UE (18,500 of them in operations and maintenance).

According to the European Wind Energy Association (EWEA) the EU wind energy sector employed around 108,600 people in 2007. Including also indirect jobs, the sector employed 154,000 people in the EU. Among the European countries, Denmark, Germany and Spain contributed in 2007 for 75% of direct wind energy employment. When compared to the situation in 2003, however, data show a relevant decrease in the employment's concentration (in 2003 they contributed for 88% of EU employment). According to EWEA projections, there will be 180 GW of capacity installed by 2020, and 300 GW by 2030, which will increase wind employment in the EU to 329,000 and 377,000, respectively. These projections are based on 15.1 jobs per new MW (manufacturing) and 0.4 jobs per cumulative MW (operations and maintenance), declining gradually with rising labour productivity to 11 and 0.29 jobs, respectively, by 2030 ³².

Specifically, wind turbine and component manufacturers are responsible for the lion's share of direct employment (59%). Wind energy employment figures can be measured against overall employment statistics provided by Eurostat ³³. The

³² EWEA, *Wind at work. Wind energy and job creation in the EU*, January 2009, p. 9.

³³ Eurostat, *Labour market: structural indicators*, 2007.

energy sector provides jobs for 2.69 million people, accounting for 1.4% of total EU employment. This figure, however, does not include the construction of power plants and therefore cannot be compared to the analysis of direct and indirect employment in wind energy manufacturing. Approximately half of all energy sector workers are involved in the production of electricity, gas, steam and hot water.

According to Blanco and Rodrigues ³⁴, males make up 78% of the industry's workforce. The large proportion of men in the wind energy industry clearly corresponds with their traditional predominance in the production, building and engineering sectors.

3.4. Biomass Energy Industry

Among renewable energy technologies, important job creation benefits are also expected to be gained from the development of bioenergy. Employment is created at different levels, from research and manufacturing to services, such as installers and distributors. There are many jobs available in the service industries, from sales to consulting, research, engineering, and installation through to maintenance. According to available information, 515,000 new European jobs from biomass fuel production are expected to be created by 2020 ³⁵. The relevance of the employment potential from biomass technologies is also linked to the opportunities for development in rural areas. According to US National Renewable Energy Laboratory's calculations, for every MW of biomass power produced, 4.9 jobs are created; at the same time the US Department of Agriculture predicts that 17,000 jobs will be created per every million gallons of ethanol produced. Given the rapid growth demonstrated in biofuels this can only be good

³⁴ M.I. Blanco, G. Rodrigues, *Direct employment in the wind energy sector. An EU study*, 2009, p. 5.

³⁵ Green jobs. Industry background. www.greenjobs.com/Public/info/industry_background.aspx?id=13

news for the employment prospects. The U.S. Department of Energy predicts that advanced technologies currently under development will help the biomass power industry install over 13,000 megawatts of biomass power by the year 2010, with over 40% of the fuel coming from four million acres of energy crops and the remainder from biomass residues, and create an additional 100,000 jobs. This would significantly help rural economies.

In Europe, some optimistic predictions estimate that the increase in energy provided by biomass fuel production could result in the creation of over 515,000 new jobs by 2020. This prediction took account of the direct, indirect and subsidy effects on employment, and jobs displaced in conventional energy technologies. In the Biomass action plan of 2005, calculations concerning possible new jobs, as a result of the utilization of biomass, assume that 250 000-300 000 persons could be employed on this basis, mostly in rural areas. Unfortunately, different studies give widely different results. The forecast about 250 000-300 000 new jobs assume that 70-90 % of the necessary biomass is produced in the EU. In the Communication we find the following remark: “In terms of direct employment, biofuels are typically 50-100 times as employment intensive in the EU as fossil fuel alternatives; biomass electricity 10-20 times as employment intensive; biomass heating twice as employment intensive. Commentators are also divided on the indirect effects. Some point to multipliers or export opportunities, which could double the size of the direct effect. Others argue that jobs in bio-energy will replace other jobs, and the net employment effect will be zero”³⁶.

4. Challenges and opportunities for women in renewable energy sector

Although there are no gender-disaggregated data on employment in renewable energy sector as a whole, it is generally considered a male-dominated sector.

³⁶ Commission of the European Communities, Brussels, 07. 12. 2005, COM(2005) 628 final, Communication from the Commission, Biomass action plan, {SEC(2005) 1573}, the full text in English is available at: www.mee.government.bg/geoterm/docs/biomass_action_plan_en.pdf.

When considering energy and electricity industry, most managers and employees are male. In developed countries, the share of female employees in the energy industry is estimated at 20%, most working in non-technical fields such as administration and public relations³⁷. Some researchers have suggested that the energy sector has a highly masculine image which deters women³⁸. It is also true that there is a stereotype that women are not technologists and that they are not capable of building, operating and maintaining sophisticated technologies. This idea seems to be confirmed by the occupational composition by gender in the energy sector. The share of female technical staff is at most 6%, in decision making positions it is about 4% and in the top-management the share is less than 1%³⁹.

Identifying challenges to improve female employment in this sector requires an analysis of those jobs expected to be created in the renewable energy industry. Generally, the first question researchers should respond to refers to the definition and delimitation of the sector. Before going beyond specific professional profiles and policy implications in terms of gender, it is worth asking what the characteristics of the technological value chain are, in order to better define the involved activities and companies.

According to a recent analysis conducted by the Italian Social and Economic Research Institute (IRES), in order to define the structure, professional profiles in the industry of renewables might be classified according to the different stages of the value chain's. A central aspect to consider is that value chain's single units are often not located within the same company (in-house) but are located outside of it (outsourced), also in very distant places and countries. The length and complexity of the value chain has been significantly influenced by globalization processes and it is strictly connected to the degree of importation of foreign systems and

³⁷ Sustainlabour, cit. note 25, p. 6.

³⁸ J.S Clancy, M. Stienstra, J. Gregory, and D.Cornland, *Gender and energy --*

Women's concerns in energy: background and state of the art, Working Paper 1, study carried out for the European Commission Research Directorate, 2001.

³⁹ Sustainlabour, cit. note 25, p. 6.

technological equipment. Generally the value chain in the area of renewable energy is composed by the following steps ⁴⁰:

- Research and Development (R&D);
- Manufacturing;
- Project Development (engineering, design & project management) and commercialization (sales and marketing) ;
- Authorization procedures;
- Financing;
- Installation;
- Operating and Maintenance (O&M) .

Furthermore, three additional dimensions should be added in order to better identify new professional figures related to the development of renewable:

- Regulation;
- Trading and green certificates;
- Smart grid.

Generally, an overall high increase in high-skilled jobs is forecasted in Europe, due to the fact that European production goes towards specialization and excellence. In general, emerging skills are related to new materials and new processes, but in the specific field of renewable energy some health and green skills (related to health and climate and environmental solutions) might also be identified.

Increasing the share of women workers in this sector will certainly require a combination of innovative and traditional strategies, overcoming discriminatory and organizational barriers women might face. According to EMCEF ⁴¹, among the existing barriers for female participation, a relevant role is played by flexible working hours, childcare needs and the culture of organization. Concerning

⁴⁰ IRES, Filctem Cgil, *Verso la green economy. Lotta ai cambiamenti climatici e fonti rinnovabili*, 2010, p. 126 at www.adapt.it, Green Jobs.

⁴¹ EMCEF, Eurelectric, EPSU, *Equal opportunities and diversity toolkit/Best practices guide*. A report for Eurelectric, EPSU, and EMCEF by J. Pillinger, Dublin, March 2007, p. 15.

flexible working hours, women often pay a price for flexible working hours by missing out on promotion or on other career development opportunities while they have care responsibilities. Managers are not always equipped to respond effectively to women workers' needs and preferences. In such dynamic industry, as renewable energy, company work-life balance policies should be developed and should be targeted both to women and men. In particular, if long working hours or shift turns are requested (e.g. for PV cells manufacturing), some measures and innovative working arrangements are needed in order not to disadvantage working parents.

In some companies women with childcare responsibilities face significant difficulties in combining work and family life and this is often a barrier to their progression. As a consequence of the unequal care burden and the inability to prioritize income commitment within the family, women are often obliged to search for shorter and more flexible working hours. The result is often a hindrance to entry into occupations featuring high or irregular working hours and workload, or a re-segregation into occupational niches that tend to be more hour-friendly. This tends to be true especially among qualified women. In some cases the need for shorter working hours transforms into a choice for part-time work, which is likely to further restrict the choice of occupation. Furthermore, formal childcare is often unavailable, unaffordable or of poor quality. Positive examples of childcare enrolment rates are found in Scandinavian countries (Denmark, Finland, Norway and Sweden) and in France due to public spending on childcare services, resulting in higher levels of women in the workforce. An important role is played by paid parental leave, which allows both women and men to take care of children for prescribed periods, without suffering adverse income and employment effects ⁴².

Another barrier that may arise is more related to the cultural environment of the organization, and it is connected to the fact that women are not always seen as a long-term resource for the organization. Legal barriers to women's participation

⁴² OECD, *Gender and sustainable development. Maximising the economic, social and environmental role of women*, 2008, p. 13 and European Commission's Expert Group on Gender and Employment (EGGE), cit. note 11.

or restrictive practices have long been outlawed, but often career paths and prospects for women are being hindered by covert biases or other forms of impediments operating in organizations. Special importance for vertical or hierarchical segregation is given to closer rungs on ladders in feminised jobs' career tracks, which yield less advancement at each promotion; mechanisms of co-optation and discretionary managerial practices for selection, hiring and promotions that de facto favour men because of poorer networking resources among women.

The electricity sector in Europe has undergone rapid changes and restructuring and this has brought with it new challenges and new possibilities for promoting equality in the industry and for integrating equality into the strategic development of companies and into an effective human resource planning. This sector seems to have a great potential in generating green jobs as renewable energy becomes more competitive and attracts new investments, but the fact is that it is strongly dominated by men, as the most managers and employees are male. Targeted policies are needed to increase female participation in many new technical and non-technical positions.

In general, many sector studies point to the importance of improving the ability to recruit more women in order to meet future skills and recruitment challenges. According to Cedefop⁴³, on average women are expected to be better qualified than men in the future, although, at the medium qualification level, the rates of increase are higher for men than for women. At the same time, the fall in the number of people with low-level qualifications is expected to be sharper among women than men. The better qualifications of women reinforce the need for measures to better use their potential and provide concrete opportunities to reconcile work and family.

⁴³ Cedefop, *Jobs in Europe to become more knowledge- and skills-intensive*, Briefing note, February 2010.

4.1. Solar Energy Industry

Despite the lack of specific data related to the gender issue, it is necessary to assess professional profiles in a gender mainstreaming perspective, in order to highlight the main obstacles to women's entry into this sector. Although the above introduced chain value is more appropriate when considering big plants, e.g. wind plants, while PV plants are usually smaller, it could be useful to emphasize different professional profiles of the solar sector.

Two stages of the solar energy sector value chain that could create more jobs are design and installation. In these fields new job profiles will be mainly characterised by high levels of knowledge, specially related to new technologies and specific software. Throughout the value chain other professionals are emerging (i.e. in stages project development, O&M, installation and manufacturing).

In general, new jobs will require skills in fields like engineering, chemistry and physics, where women are traditionally underrepresented. The combination of low female presence in renewable energy and demand for skills in areas where women are traditionally underrepresented could create a gender disadvantage. Therefore gender policies should reduce gender gap in employment and encourage greater information in the school system to facilitate the entry of women in more technical fields of study.

4.2. Wind Energy Industry

As it has been previously argued, the wind energy sector has experienced a significant growth in Europe since the end of the 1990s, both in terms of installed capacity and job creation. However, relevant studies at the academic and institutional level ⁴⁴ report a shortage of skilled workers in certain fields

⁴⁴ M.I. Blanco, G. Rodrigues, cit. note 34 and EWEA, cit. note 32.

demanding for a better understanding of the specific employment types required by the wind industry. Considering that in 2008 only 22% of the total workforce in the sector were women, it is reasonable to conduct this analysis of the requested professional profiles in a gender mainstreaming prospective, highlighting the main obstacles women may encounter in the sector.

Generally speaking, the shortage in the wind energy sector is more acute for positions that require a high degree of experience and responsibility. In particular, manufacturers report a shortage in engineers and in O&M and site management activities. As an example, an engineering degree is in fact requested for wind farms' designers or for wind turbines' electrical engineers. In addition to the educational requirements some profiles might also demand for some previous experience in the energy field. This is the case of managerial positions related to the management of the wind industry's commercial applications where in addition to previous management experience, technical experience in the field of wind energy is generally required.

Wind energy promoters need more project managers, which are mainly responsible for obtaining building permits in the country where the wind farm is going to be installed. This role requires a specific knowledge both of the country in question and of wind energy, along with negotiating skills. Also in this case, some technical requirements might be identified. Wind power stations' project managers are generally requested to hold a degree in engineering or physics, in addition to relevant experience in the energy sector. The same applies to wind farms' designers which are requested to design and project wind turbines in those places where the environmental impact must be minimized, in respect to landscape legislation.

Technical requirements also characterize those profiles requiring secondary level education, i.e. technical staff for O&M and repairing wind turbines. All these examples show how the low participation in technical educational field might be an obstacles for women to be recruited in wind energy industry. Labour market policies which address gender discrimination and increase female employment in the sector must take into account that part of the problem is the fields women

typically chose to enter. Rectifying this gender gap depends also on school systems to give information, counselling and financial incentives to female students to enter more technical fields of study.

4.3. Biomass Energy Industry

Also in the case of bioenergy industry and biomass utilization, jobs cut across a wide spectrum of specialties and skills. In particular, it is possible to find three levels of jobs which will be created in the future, through the development of the biomass utilization: “super high quality” jobs, including chemists, agricultural specialists, microbiologists, biochemists and engineers (mechanical, electrical and chemical); “high quality” jobs, including electrical, electronic and mechanical technicians, mechanics and equipment operators and operators of facilities; “middle quality” jobs, including farmers, foresters, truckers, construction workers, etc.; and “low quality” jobs, including all types of low-skilled workers, which could be involved in the biomass utilization industry.

Currently gender segregation mainly characterizes “high quality” and “middle quality” jobs. However, strong presence of women can also be expected in “super high quality” jobs and in the “low quality” jobs. There are some stereotypes – that women are more accurate, they are better for some routine occupations, they are ready to draw conclusions from their employers’ criticism, they agree to make compromises over the payment of their work. On the other hand, a number of employers are of the strong opinion that women are psychologically more durable and more adaptive than men, they are “more difficult to break” in stress and sophisticated situations. The employers’ attitude is that women communicate better than men ⁴⁵.

⁴⁵ R. Gladicheva, R. Zheleva, T. Detchev, *Bulgarian employers and women at the labour market (Diagnosis of gender equality)*, Centre for women studies and policies, Sofia, 2004 (in Bulgarian), 37-39.

Women can compete for the jobs of the necessary experts - chemists, agricultural specialists, microbiologists, biochemists and engineers (mechanical, electrical and chemical). Women, who have graduated at university in the above-listed specialties are absolutely competitive to men with regard to their scientific knowledge and practical skills. On the other hand, it is probable that the majority of the potential “low quality” jobs are going to be taken by women with low education.

The big chance of women with high education relies in the expanding activities of universities, scientific laboratories and R&D departments of industrial enterprises in the fields of production of biomass and its utilization, particularly its use for producing electrical energy and heat. According to the point of view of EREC (Energy Efficiency and Renewable Energy Clearinghouse) and the National Renewable Energy Laboratory, “these R&D efforts require chemists, agricultural specialists, microbiologists, biochemists and engineers, just to name a few”⁴⁶. Biomass utilization and bioenergy are already integrated in the “knowledge-based” economy. «Some enterprises may even require individuals cross-trained in different areas, such as engineering and biology, or chemistry and agriculture. And if R&D and industrial efforts succeed in making bioenergy more commercially profitable, we may see a dramatic increase in the number of bioenergy – related jobs»⁴⁷. Of course, these bioenergy related jobs won’t need only high sophisticated knowledge and skills. With the development and commercialization of R&D in the biomass utilization industry, there will be a strong need for more farmers and more foresters to produce and harvest the necessary biomass resources. The industry will need more truckers to transport raw materials to the bioenergy power plants and to the biomass fuel plants. The industry will need more operators to run facilities.

Experts in the field of biomass energy emphasize again and again the positive effect of the biomass industry on the rural regions and on the job creation there.

⁴⁶ Energy Efficiency and Renewable Energy Clearinghouse, *Careers in renewable energy*, DOE/GO-102001-1130, FS123, January 2001, www.nrel.gov/docs/fy01osti/28369.pdf, p. 5.

⁴⁷ Ibid.

«Biofuel, biopower and biobased product plants are more cost-effective when located near their source of biomass. The bioenergy industry development has therefore a special appeal, because it creates direct and indirect jobs in rural areas of the country and may prove to be a profitable complement for many existing agricultural and forestry businesses⁴⁸».

5. Concluding remarks

According to many institutional and academic studies, renewable energy promotion might significantly contribute to create new occupations in Europe. As the energy sector as a whole, is generally considered male-dominated, inclusion of women in these sectors is strongly recommended.

Looking at the different points in the supply chain where more jobs are expected to be created, a strong role, in improving female participation, is definitely played by women's educational choices. Many of the expected jobs will be characterised by a high level of knowledge, requiring specific skills (e.g. in the field of engineering) and calling for women's inclusion in specific training courses.

Moreover, increasing female participation in the sector requires a combination of innovative and traditional strategies, overcoming discriminatory and organizational barriers women might face. Three of them seem to be particularly relevant in the renewable energy industry: flexible working hours, childcare needs and the culture of organizations. In some European countries, female activity rates are still lower than men's, highlighting specific difficulties in entering the labour market but also the existence of stereotypes.

Among European countries is possible to identify in Southern and Eastern Europe countries those which require stronger interventions. Female activity rate is quite low in 2009 in Italy (51.1% compared to 73.1% of men), Greece (56.5%), Malta (40.8%), Hungary (55.3%) and Romania (55.4%). East European countries are

⁴⁸ Ibid.

also characterized by the highest levels of gender occupational segregation, measured by the IP Index. The existence of a more evident gender question in these countries is also confirmed by the analysis of flexible working hours and work-life balance indicators which show a low percentage of part-time diffusion in these countries, also among women with a child less than 6 years old. At the same time working from home is still not so common. While the percentage of women working from home reaches 11.9% in France, 11.8% in Luxembourg and 10.8% in Austria, in southern and eastern countries levels are much lower. In Italy women working from home were 2.9% of the total female work-force, 1.3% in Portugal and 2.6% in Greece and much lower levels are registered in Bulgaria (0.7%) and Romania (0.5%).

However these countries might also benefit of the diffusion of renewable energy technologies and industry's growth. Solar energy industry might have some great opportunities of development in Southern Europe, in particular in Italy and Spain, while wind energy and biomass industry might offer interesting opportunities in terms of growth and employment in Eastern countries.

B)

SOCIAL DIALOGUE FOR WiRES

1. Introduction

Since the *Rio declaration on Environment and Development*, the transition to a low-carbon economy has been considered one of the defining challenges that the International community and single national governments are called to face in the 21st century.

In addition to environmental and climate implications of industrialization, the rise of new economies on the global market called for the attention of both policy makers and general public to focus on issues such as the need for a more equitable allocation of the available energy resources, the need to limit energy dependence while ensuring secure energy supply and, consequently, to carry out research in alternative energy sources. The ecological conversion of the economy is therefore not only a matter of sustainable development, but also a geopolitical concern. In this situation the increasing number of investments in the sector of renewable energy led to a rapid expansion in its production capacities.

2. The green economy and employment

As a consequence, employment in the green job market rose significantly in the last decade and, according to studies, this growth is likely to accelerate in the forthcoming years. Some research focuses on the relation between environmental policies and job creation. Although these issues are widely described in the

previous sections of this report as well as in the literature review, the following scheme is intended to define the complex policy framework that social partners must take into account.

A study issued by UNEP in 2008 shows, for example, that, compared to fossil-fuel power plants, *renewable energy* generates more jobs per unit of installed capacity, per unit of power generated and per dollar invested (UNEP, *Green Jobs: towards decent work in a sustainable, low-carbon world*, 2008 in www.adapt.it A-Z Index, word *Green Jobs*). Basically, this might be seen as the result of three concurrent effects.

The first effect can be defined as the *spin-off effect*. It is generally reported that employment tends to grow more quickly in the field of renewable energy as a consequence of the EU energy and climate policies. A WWF report issued in 2009 (WWF, *Low carbon jobs for Europe. Current opportunities and future prospects*, 2009 in www.adapt.it A-Z Index, word *Green Jobs*) describes the findings of a study supported by the European Commission according to which under current policies there could be a net gain of 950,000 direct and indirect full-time equivalent (FTE) jobs by 2010 and 1.4 million by 2020. Under an “Advanced Renewable Strategy”, there could be 1.7 million net jobs by 2010 and 2.5 million by 2020. About 60-70 percent of the jobs would be in renewables industry (primarily biofuels, biomass processing and wind power), the remaining in agriculture (European Commission, *Meeting the Targets & Putting Renewables to Work. Overview Report*, MITRE – Monitoring & Modelling Initiative on the Targets for Renewable Energy, www.ewea.org). Likewise the European Renewable Energy Council (EREC) forecasts that by raising the share of renewable energy to 20 percent of the EU’s energy consumption by 2020, the number of green jobs could rise to more than 2 million (European Renewable Energy Council (EREC), *Renewable Energy Technology Roadmap up to 2020*, 2007).

The second effect could be named the *substitution effect*. This is supported by a 2008 European Commission report on environment and labour force skills (European Commission, *Environment and labour force skills: Overview of the*

links between the skills profile of the labour force and environmental factors, Final report, Ecorys for the European Commission, 2008 in www.adapt.it Observatory *Green Jobs*) that points out the following facts: i) «there will be a certain degree of substitution of employment, owing for instance to the shift from fossil fuels to renewable energy sources, from truck manufacturing to rail car manufacturing, or from land filling and waste incineration to recycling»; ii) «particular jobs may be eliminated without direct substitution (e.g. when the production of packaging material comes to an end because of its use being discouraged or forbidden)»; iii) «many existing jobs (i.e. plumbers, electricians, metal workers, and construction workers) may be altered because of the greening of day-to-day skill sets, work methods and profiles».

The third effect might be called the *catch-up effect*. The catch-up effect is commonly used to describe the economic growth of developing countries but, in a sense, it could also apply to single sectors. Hence, we can derive that economic sectors that start off poor generally grow faster than the economic sectors that start off rich.

3. Social dialogue in the renewable energy sector: potential

Against this background social partners are expected to play two complementary roles in easing and somehow shaping the ecological conversion of the economy.

First, governments and institutions commonly recognize social partners as main players in addressing climate change and environment-related issues. They have so far made a valuable contribution in influencing green policies and in driving the energy sector towards more sustainable pathways: a number of reports and statements on sustainability and energy efficiency have been published by management and labour organizations, both at a national and European level. Remarkably the Electricity sector has been very dynamic in the field of Renewable Energies, as the presence of many different businesses operating in the sector shows. For instance, EURELECTRIC, which is the European social partner

for the Electricity industry, published the *EURELECTRIC Environmental Guidelines* in 2003 and, in 2004, launched the *Roadmap for Sustainable Development*, an initiative aimed at providing EURELECTRIC members and staff with an approach to the core sustainable development values that should guide the organisation's strategic choices, the commitment to resources, activities and publications. Most recently, EURELECTRIC issued its 4th *Environment and Sustainable Development Report* (EURELECTRIC 2010), which shows trends in environmental performance and the significant emission reductions made by the Electricity Industry during the last two decades. The report contains a special feature on *Power Choices*, a project that sets out EURELECTRIC's vision on how to establish pathways to carbon-neutral electricity generation in Europe by 2050 (EURELECTRIC, *Power Choices: Pathways to Carbon-Neutral Electricity in Europe by 2050*, Brussels 2009). As for the gas sector, EUROGAS has so far issued as many as twelve papers on the role natural gas plays in a sustainable energy market, such as the EUROGAS views (S/EUR)/87/806) on the Commission strategy paper for reducing methane emissions (COM(96)557), the EUROGAS Comments (S/EUR/97/924) on the Commission Communication on the energy dimension of climate change (COM(97)146), Climate Change / the road to Kyoto (COM(97)481) issued in 2007 and the 2008 *Position Paper on The role of natural gas in a sustainable energy market*. On the union side, for instance, the EMCEF-European Mine, Chemical and Energy Workers' Federation (EMCEF energy policy, 2006) underlines the need to promote renewable energies as they are essential to guarantee supply security in Europe.

Second, social partners are also key drivers towards decent work in the renewable energy sector, which is expected to make the shift to a low-carbon and sustainable society as fair as possible. Since the renewable energy sector will play a leading role in bringing about sustainable economic growth, it should also become a good example of decent work, with remarkable standards of gender equality, work-life balance, fair wages, health and safety. Moreover, the current dynamism of the renewable energy sector within the traditional energy sector requires proper social dialogue initiatives. While guaranteeing equal opportunities and overall labour

rights in green jobs and in workplaces, social partners are expected to take action in governing the green labour market. They are called to steer the workforce towards the needs of enterprises, by challenging stereotypical views about the image of the energy sector, often perceived as exclusively male-dominated, thus having negative consequences on the renewables sector. Social partners are therefore called to organizing training programmes and workshops as well as outlining future occupational requirements. Definitely they should be a source of information about the potential of green jobs, as many women are unfamiliar with the opportunities of a green career.

4. Social dialogue in the renewable energy sector: state of the art

Despite the positive future prospects, alternative energies remain at an early stage of development in comparison to the energy sector as a whole: the renewable energy sector is still playing a secondary role within the macro sector of energy, which continues to be characterized by higher investments in non-renewable energies. This entails the following effects at a national level:

- a. As regards European countries there are no agreements in place to cover this sector as such.
- b. In this framework, it is rare to find specific social dialogue experiences in the field of alternative energies.
- c. As a result, proper gender-oriented initiatives have not been implemented yet, thus undermining the creation of a gender-friendly sector as described above. This is the reason why the role of social dialogue is considered to be vital in preventing gender discrimination from spilling over into the renewable energy sub-sector.

The latest *Commission staff working document* on the functioning and potential of European sectoral social dialogue (SEC (2010) 964 final) reaffirms Social Dialogue as *one of the pillars of the European social model, and as a tool of social cohesion and resilience*.

European sectoral social dialogue takes place within the European sectoral social dialogue committees, which the European Commission defines as *fora for consultations on European policies*. They are also defined as tools for autonomous social dialogue among European social partners who may develop joint actions and conduct negotiations on issues of common interest, thereby contributing directly to shaping EU labour legislation and policies (<http://ec.europa.eu/social/main.jsp?catId=329&langId=en>).

The energy sector is currently covered by four *European Sectoral Social Dialogue Committees* (namely Chemical Industry, Electricity, Extractive Industry, Gas) (for further information, see the literature review annexed to this report). With reference to the *WiRES* research field, this report does not take into account social dialogue within the Extractive Industry, which is not representative of the renewable energy context.

The European Sectoral Social Partners (for more information, see the literature reviews at the end of the report) made steps forward to promote a “fair” energy market, although proper social dialogue initiatives for the renewable energy sector have not been put in place yet. In fact, social partners are mostly inclined to discuss cross-sectoral issues (e.g. Demographic changes, Restructuring, Corporate Social Responsibility, Health and Safety, Gender Equality and Work Life Balance).

However, this should be seen as an efficient way to make their national affiliates familiar with the European policies and, at the same time, to facilitate the implementation process of those cross-industry social policies developed by cross-sectoral European social partners, such as the agreements and framework of actions on *Lifelong Development of Competencies and Qualifications* (2002), *Work Related Stress* (2004), *Gender Equality* (2005) and *Harassment and Violence at Work* (2007) (for more information, see the literature reviews at the end of the report).

As far as gender issues are concerned, the European social partners representing the electricity industry are notably committed to equality and diversity and have worked together on these topics. This led to the publication in December 2006 of

the Equal Opportunities & Diversity – Toolkit/Best Practices Guide, which aims at promoting understanding and awareness of the management of equality and diversity in the workplace (for more information, see the literature reviews annexed to this report). This is, undoubtedly, an example of good practice, but a lot remains to be done. First of all, because this is the sole specific reported case. Second, when it comes to equal opportunities and gender equality it is important to look outside and beyond the companies as well. Indeed a major issue is represented by the labour market and, in this case, the green labour market. Owing to its expanding production capacity, the renewable energy sector will create new employment opportunities and jobs. As stated in the previous paragraph, the dynamism of the renewable energy sector within the traditional energy sector requires actions aimed at promoting vocational education and training as well as anticipating future skill needs. Social partners are definitely the most suitable stakeholder to move in this direction.

Looking at the EU Member States, the Renewable Energies landscape at national level refers to four industrial fields included in the macro sector of energy, namely Chemical Industry, Gas, Electricity and Water, with the exception of the Extractive Industry. Renewable Energies are therefore covered at least by two different Collective Agreements, i.e. the *collective agreement for Chemical Industry*, as chemical products are used in many green technologies, and the *collective agreement for Utilities* or, where applicable, *Services* (Gas, Electricity and Water). Moreover, several companies operating in the field of Renewable Energies fall within the *Metalworkers' collective agreement*, as a result of their particular business.

As a consequence of its wide scope, the Renewable Energy Sector is subject to different regulations. Indeed, it could be defined as a cross-industry sector. Consequently the lack of a delimited sector regarding alternative energies leads to the absence of proper social dialogue initiatives. This could be seen as a paradox, since the renewable energy sector exists, but it is not managed with proper tools.

A report issued by the *Dublin Foundation* (EUROFOUND, *Greening the European Economy*, 2009 in *www.adapt.it* Observatory, *Green Jobs*) shows that:

- *There are a lot of examples of tripartite structures dealing with green issues, ranging from the Environmental Councils and ad hoc Committees established in Denmark and Finland, to the Romanian National Standing Committee on Sustainable Development and the Slovenian Council for Sustainable Development.* Elsewhere, in Spain, social dialogue on green issues is carried out within the framework of the country's standard tripartite social dialogue structures and is linked to the debate on the modernisation of the economy. The report also shows recent development in France where a range of ad hoc working groups have been created and the *Economic and Social Council* (Conseil économique et social) has now become the *Economic, Social and Environmental Council* (Conseil économique, social et environnemental).
- *There are a number of examples of bilateral dialogue on green issues between management and labour.* In Denmark, for instance, a bilateral initiative called the “*Energy Camp*” brings together social partners and businesses associations to develop practical initiatives and identify common goals on environmental and climate change issues. Elsewhere, in Norway, the trade union confederation (LO) and the Confederation of Norwegian Enterprise (Næringslivet) (Hovedorganisasjon, NHO) published a joint statement encouraging their members to join green campaigns and highlighting the importance of challenges related to climate change.
- *Both employers and trade unions have been active in raising awareness of the main green issues among their members:* on the employers' side, activities focus on issues concerning compliance with environmental legislation, reducing emissions, enhancing competitiveness in the green economy, and making the most of the business opportunities presented by the new green economy. Among other things, the following examples have been reported: the *Malta Chamber of Small and Medium-sized Enterprises* (GRTU) has organised a number of public meetings to explain the obligations and opportunities arising from the EU Directive on waste management and the Directive on waste collection of packaging to its members; in the UK, the CBI (Confederation of British Industry) holds regular events on issues related to

climate change for its members; an innovative competition organised by the *Association of Building Entrepreneurs of the Czech Republic* (Svazvpodnikatelů a stavebnictví ČR, SPS ČR) aims to inform the Czech public about construction projects that are environmentally friendly, but which are also modern and affordable. On the other hand, trade unions encourage social dialogue, negotiation, seminars and overall disseminations of good practices within companies or public organisations on the subject of environment, as well as promoting the use of renewable energy. In this framework, the report highlights, among other things, the following good practices: the German trade union federation, DGB, is providing experts to give information and assistance to local authorities wishing to carry out energy-efficient refurbishment of buildings; the TUC (Trade Union Confederation) in the UK has issued a guide for trade union representatives and members who are interested in becoming involved in green issues at the workplace.

- *Many employers' and trade union organisations have put in place information and training programmes for their members on green issues.*

Nonetheless the report confirms that no formal social dialogue is yet in place that deals specifically and only with the renewable energy sector. The role of social partners seems therefore to be restricted within the wider area of environmental and sustainable development. They are key stakeholders in implementing the “green agenda”, although they have failed to create formal structures of social dialogue for the renewable energy sector. This means that the second role that they are expected to play – i.e. addressing the existing mismatch between skills supply and demand in the green economy, anticipating future skills needs as well as ensuring fair working conditions for green jobs – has been overshadowed.

These considerations might suggest that gender policies in the specific renewable energy context remain limited and are only tackled at a company level. Energy companies that operate in the EU market can be divided into two groups. The first group includes traditional big energy companies (e.g. Shell, Eni, Total, Statoil etc.) which are developing their capacity to take advantage of the opportunities

offered by the renewables sector. These companies continue to invest in non-renewable energies in order to face the need to modernize the transmission and distribution grids as well as investing in the construction of new low-carbon generation power stations. The second group includes new generation businesses specifically set up in field of renewable energies.

All these companies interact with a universe of smaller enterprises, encouraging the development in the green economy. Accordingly, so far the sector has been dominated, at least from a quantitative point of view, by smaller independent companies (SUSTAINLABOUR, *Desarrollando las renovables, Renovando el desarrollo*, 2010 and Ires, Filctem Cgil, *Lotta ai cambiamenti climatici e fonti rinnovabili. Gli Investimenti, le Ricadute Occupazionali, le Nuove Professionalità*, 2010) which probably have no agreements with the trade unions, especially those falling within the second group and in countries where company or territorial social dialogue is not fully developed. In those contexts, experiences of social dialogue are likely to be limited to the core issues of employment law and gender equality is not addressed in any systematic way.

5. Conclusion

The conclusion that can be drawn from this analysis is that social dialogue in the renewable energy sector is still weak. Renewables are not yet playing a leading role within the macro sector of energy. But the renewable energy sector is definitely part and parcel of the sector. But it has been said that, owing to its dynamism and employment potential, the renewable energy sector requires proper social dialogue initiatives. The social partners involved, both at the national and international level, are the same for the two sectors. This, perhaps, could also explain some considerations pointed out by the Eurofound (EUROFOUND, *Greening the European Economy*, 2009 in *www.adapt.it* Observatory, *Green Jobs*) according to which:

- 1) «in some countries, employers still fear that transition to a greener economy will increase costs and therefore reduce competitiveness».
- 2) «While in some countries trade unions see the emergence of new green industries as a recruitment opportunity, in other countries they fear the decline of more traditional industries with strong trade union membership and recognise that it may be harder to recruit members in new green industries».

Therefore there seems to be a sort of competition between the two sectors, which the national and European environmental and green policies contribute to amplify. This is certainly a central reason behind the scant development of social dialogue in the renewable energy sector.

The road map to change should move from a consideration: although the energy sector continues to be characterized by higher investments in non-renewable energies, it has been widely reported that the production capacity of alternative energies is increasing towards non-renewable energies. This is expected to produce two effects:

- 1) Acquisition of relevance of the renewable energy sector within the macro sector of energy. Social partners in the renewable energy sector will have more opportunities to make their voice heard within the energy landscape in the years ahead.
- 2) Self-determination of social partners within the field of renewable energies. Collective bargaining as well as new distinct national social dialogue structures, strictly relevant to the emerging employment issues related to the green economy, will start to be arranged in the forthcoming years. This will allow new social partner organisations or sub-sections of existing organisations to fully accomplish their role, widely described in this article, within companies and, notably, in the labour market.

Part III
CASE STUDIES

1.

SOCIAL DIALOGUE AND EMPLOYMENT OF WOMEN IN THE FIELD OF BIOMASS UTILIZATION IN BULGARIA

1. Introduction

The objective of this survey was to demonstrate that social dialogue is a key factor influencing women's employment in the Renewable Energy (Sub)sector and especially in the field of biomass utilization for electrical energy producing purposes.

Starting from a brief overview of the role of women in the Bulgarian labour market, the work identified the most significant renewable energy companies and groups in Bulgaria.

In fact, although for a long period of time, the only renewable energy companies in Bulgaria have been water power stations, a radical change occurred over the last few years: a great variety appeared, related to the introduction of co-generation, development of big wind farms, photovoltaic parks and companies that use biomass.

It is worth noting that, in consideration of EU's needs in terms of production of hydrogen (ENCOURAGED project that aims to an economy completely relying on renewable sources), Bulgaria is expected to be one of the most important supplier. The production of hydrogen in Bulgaria is likely to be a result of the use of water power stations and biomass.

Considering that the National Statistical Institute does not provide any systematic information on the Renewable Energy Subsector in Bulgaria, in this work, we

adopted a specific approach, in order to identify the “organised” enterprises and employers in the Renewable Energy Subsector of Bulgaria.

Through the use of the techniques of “legal business intelligence”, we prepared two lists of the full membership of the associations focused on renewables, from which two matrices of the Organised Enterprises in the Renewable Energy (Sub)sector have been built.

The BIOMASS matrix was built through a similar approach, representing (almost) all the companies operating somehow in the field of biomass utilization.

In the case of companies operating in the biomass utilization, specific techniques (like “scientific investigations” and “legal business intelligence”) had been necessary to identify the elements of “MATRIX BIOMASS” due to their tendency to handle parallel activities.

The work proceeded with an attempt to provide a general evaluation of human resources in renewable energy production companies, taking into account the socio-economic context of the Power Engineering Sector, the Renewable Energy Subsector and the groups of companies involved in the utilization of biomass.

As there was not information about statistics on human resources in companies of the Renewable Energy (Sub)sector, or their management and development until the beginning of the survey, we had to create an original survey to get the necessary information on the human resources of the Renewable Energy (Sub)sector, including all the companies involved in some way in the utilization of biomass for energy producing purposes.

The survey was carried out in a comparative way, using all the three matrices mentioned above, composed for the research process.

The information required for this part of the survey was provided by the National Social Security Institute (NSSI), on the basis of a special assignment of the Union for Private Economic Enterprise (UPEE). For this purpose new operational modules were developed in the information system of the NSSI.

The social partners’ organizations were represented in the sector of production of renewable energy and engaged (actually and potentially) in social dialogue.

The case study concluded with a final overview of social dialogue within enterprises, involved in the utilization of biomass and some remarks about the expectations for new “female” jobs that could be produced through the development of biomass utilization.

1.1. Background presentation of the case-study

There are important job creation benefits deriving from the increased use of renewable energy technologies. Employment is created at different levels, from research and manufacturing to services, such as installers and distributors. There are many jobs available in the service industries, from sales to consulting, research, engineering, and installation to maintenance.

One study funded by the European Union indicates the creation of 515,000 new European jobs in the field of biomass fuel production by 2020. The study found that renewable energy technologies are more labour intensive than conventional technologies for the same energy output. In Brazil, over 700,000 rural jobs have been created in the sugar-alcohol industry.

As state above, in Europe, some optimistic predictions estimate that the increase in energy provided by biomass fuel production could result in the creation of over 515,000 new jobs by 2020. This prediction takes account of the direct, indirect and subsidy effects on employment, and of jobs displaced in conventional energy technologies.

In the Biomass action plan started in 2005, the forecast for the possible new jobs created by the utilization of biomass, is that 250.000-300.000 persons could be employed in this sector, mostly in rural areas. Unfortunately, different studies give widely different results. 250.000-300.000 new working jobs will be created assuming that 70- 90% of the necessary biomass is produced in the EU. In the Communication there is the following remark: “In terms of direct employment, biofuels are typically 50-100 times as employment intensive in the EU as fossil fuel alternatives; biomass electricity 10-20 times as employment intensive;

biomass heating twice as employment intensive. Commentators are divided on the indirect effects. Some point to multipliers or export opportunities, which could double the size of the direct effect. Others argue that jobs in bio-energy will replace other jobs, and the net employment effect will be zero”¹.

What type of jobs the bioenergy industry offers to the public ? Nowadays, jobs in the bioenergy industry and in biomass utilization cut across a wide spectrum of specialties and skills.

The big chance that women with high education have relies in the expanding activities of universities, scientific laboratories and R&D departments of industrial enterprises in the fields of production of biomass and its utilization, particularly its use for producing of electrical energy and heat. According to the point of view of EREC (Energy Efficiency and Renewable Energy Clearinghouse) and the National Renewable Energy Laboratory, “these R&D efforts require chemists, agricultural specialists, microbiologists, biochemists and engineers, just to name a few”².

Biomass utilization and bioenergy are already integrated in the “knowledge based” economy. “Some enterprises may even require individuals cross-trained in different areas, such as engineering and biology, or chemistry and agriculture. And if R&D and industrial efforts succeed in making bioenergy more commercially profitable, we may see a dramatic increase in the number of bioenergy – related jobs”³. Of course, these bioenergy related jobs won’t need only high sophisticated knowledge and skills. With the development and commercialization of R&D in the biomass utilization industry, there will be a strong need for more farmers and foresters to produce and harvest the necessary biomass resources. The industry will need more truckers to transport the raw

¹ Commission of the European Communities, Brussels, 07. 12. 2005, COM(2005) 628 final, *Communication from the Commission, Biomass action plan*, {SEC(2005) 1573}, the full text in English is available at: www.mee.government.bg/geoterm/docs/biomass_action_plan_en.pdf.

² Energy Efficiency and Renewable Energy Clearinghouse, *Careers in Renewable Energy*, DOE/GO-102001-1130, FS123, January 2001, www.nrel.gov/docs/fy01osti/28369.pdf, 5.

³ Ibid.

materials to the bioenergy power plants and to the biomass fuel plants. The industry will need more operators to run facilities.

Experts in the field of biomass energy emphasize again and again the positive effect of the biomass industry on the rural regions and the related job creation. «Biofuel, biopower and biobased product plants are most cost-effective when located near their source of biomass. Thus, bioenergy industry development has a special appeal, because it creates direct and indirect jobs in rural areas of the country and may prove to be a profitable complement for many existing agricultural and forestry businesses⁴».

Local communities will benefit from the development of the biomass utilization industry as well. «Engineers and construction workers are needed to design and build bioenergy plants, while electrical/electronic and mechanical technicians, engineers (mechanical, electrical and chemical), mechanics and equipment operators are needed to run and maintain these plants⁵».

There are great expectations for the possible role of biomass utilization as a “job creator” in Bulgaria.

Basing on the available data, we can conclude that the empirical formula for the correlation “1 MWh of bioenergy produced – number of jobs created”, proposed by the National Renewable Energy Laboratory for the United States, could be hardly implemented in the Bulgarian reality. It is even harder to make forecasts for the number of working places, which could be created with the development of the biomass utilization. Anyway, we can make an absolutely “general” forecast, that the development of biomass utilization industry in Bulgaria (including bioenergy), could create about 11,000 jobs in an optimistic scenario.

Referring to the quality of the potential jobs created in the future through the development of the biomass utilization, four level of jobs can be identified:

- level of “super high quality” jobs, including chemists, agricultural specialists, microbiologists, biochemists and engineers (mechanical, electrical and chemical);

⁴ Ibid.

⁵ Ibid.

possibly, even cross-trained individuals in areas, such as engineering and biology, or chemistry and agriculture, could be “head hunted” by the employers.

- level of “high quality” jobs, including electrical, electronic and mechanical technicians, mechanics and equipment operators and operators of facilities.
- level of “middle quality” jobs, including farmers, foresters, truckers, construction workers, etc.
- level of “low quality” jobs, including all types of low-skilled workers, which could be involved in the biomass utilization industry.

It deserves to be mentioned that the structure of “potential jobs”, expected to appear in the process of development of the bioenergy industry, corresponds well enough to the structure of the “core, basic economic activities for the enterprises involved in the utilization of biomass” (Table 25).

The levels of “high quality” jobs and of “middle quality” jobs are a “man’s world”. A strong presence of women can be expected in the “super high quality” jobs and in the “low quality” jobs.

There are some stereotypes among Bulgarian employers – that women are more accurate, they are better for some routine occupations, they are ready to draw conclusions from their employers’ criticism, they agree to make compromises with the payment of their work.

On the other hand, employers are of the strong opinion that women are psychologically more durable and adaptive than men, they are “more difficult to break” in stress and sophisticated situations. The employers’ general attitude is that women communicate better than men⁶.

We can expect that the listed employers’ stereotypes will affect the employment rate of women both on the “super high quality” level of jobs and on the “low quality” level of jobs in a positive way.

From our point of view, Bulgarian universities as a whole can prepare the necessary experts – chemists, agricultural specialists, microbiologists, biochemists

⁶ R. Gladicheva, R. Zheleva, T. Detchev, *Bulgarian Employers and women at the labour market (Diagnosis of gender equality)*, (in Bulgarian), Centre for women studies and policies, Sofia, 2004, 37-39.

and engineers (mechanical, electrical and chemical). Women, who have graduated in the above-listed areas are absolutely competitive to men with regard to their scientific knowledge and practical skills.

On the other hand, as it has already been mentioned, less than 9 per cent of women with primary education (4-th class and lower) are employed. It is not hard to predict that the majority of the potential “low quality” jobs are going to be taken by women with low education.

The average number of employed persons in the power engineering sector remains stable, with a slight raise through the period 2001-2009. (Here we must mention that statistical data are gathered for the activities – production and distribution of electricity, heat and gaseous fuels).

In fact, in 2001, there were 31,635 people employed in the Power Engineering Sector in Bulgaria, while in 2008 just 34,706, representing 1.41% of the total Bulgarian workforce.

In 2009, the share of employees in the Power Engineering Sector was equal to the previous year but the employees of the sector were 32,498. As regards to the average annual salary for the Power Engineering, in 2009 it was 15,437 Bulgarian leva – 17,435 for the public sector and 13,121 for the private sector, while the average annual salary for the Bulgarian economy as a whole was 6,538 Bulgarian leva – 7,811 for the public sector and 6,114 for the private sector: the average annual salary for the Power engineering sector was 200% higher (186% for the public sector and 189% for the private sector), while in 2009 even much higher (218%). More detailed information on the socio-economic context of the Power Engineering (electricity) Sector in Bulgaria is available in Appendix 6.

1.2. Outlook on social dialogue

1.2.1. Terminological specifications

When we talk about social dialogue at sectoral level in Bulgaria, we should first of all specify a few terms. In Bulgaria two terms are used, which in general correspond to the ones used in the Anglo-Saxon tradition – sector and sub-sector.

In Bulgaria, the notions of sector and subsector have no legal definition. According to some social partners, this is a huge problem, which hinders the sectoral social dialogue. In fact, the notions of sector and subsector play the role of initial “axiomatic” notions in the Bulgarian industrial relationships similar to plane, straight line and point in geometry.

The claims for the huge problem caused by the lack of the above-mentioned two definitions mostly arise when someone is interested in slowing down or even sabotaging a certain discussion related to the sectoral social dialogue or to the subsectoral organisations in general.

1.2.2. Levels of the social dialogue in Bulgaria

In short, there are different forms of social dialogue, regulated at different levels. These levels are: national, sectoral (subsectoral), single enterprise and territorial level – the municipal level of social dialogue. According to Bulgarian labour legislation, only the social partners’ organisations that are representative at the national level can participate in the social dialogue at national, sectoral (subsectoral) and municipal levels.

At the national level, a tripartite (trilateral) cooperation was introduced through the setting up of the National Council for Tripartite Cooperation NCTC.

At the sectoral (subsectoral) level, both tripartite (trilateral) and bipartite (bilateral) forms of social dialogue are regulated. Different sectoral and subsectoral councils for tripartite cooperation have been established. As a rule, they meet with the respective ‘sectoral’ ministries as far as we can call in this way the Ministry of Education and Science together with the Ministry of Healthcare.

In the sectoral (subsectoral) councils, the general rule is that the representatives of the executive power (the president of the respective council is appointed by the minister of the sector, and he or she could act on behalf of the government and on behalf of the rest of the social partners), of trade unions and of the employers' organizations can participate.

In the majority of cases, trade unions and employers' organizations in the sectoral councils are either subsectoral federations of national trade union confederations, or subsectoral employers' organizations. However, in some cases employers are represented by their representatives at national level. These are the cases of sectors like agriculture and forestry, healthcare and higher education.

The sectoral (subsectoral) councils work in different ways. They vary from very well-structured organizations, as in the transport sector (where there is a functioning sectoral council and five more functioning subsectoral councils) to the trade sector where the council's work is almost non-existing, and the so called trade union density is around 0,5%.

Referring to the bipartite cooperation, the Labour Code regulates the manner and the order of signing collective agreements at sectoral (subsectoral) level. A clarification is needed to specify that, while in the Anglo-Saxon countries the term is "collective agreement", in Bulgaria there is a major difference between "collective agreements" and "agreements". Generally speaking, agreements are of less binding character and that is why here it is used the term "collective labour contract", although it is not quite accepted in the Anglo-Saxon countries, instead of the one which is common outside Bulgaria - "collective agreement".

1.2.3. Content of the sectoral (subsectoral) collective labour contracts and of the collective labour contracts at enterprise level

In the recent past, the Bulgarian Labour Code required that the scope and content of the sectoral (subsectoral) collective labour contracts should be agreed upon in a special national bipartite agreement between all the social parents' organizations that are representative at national level. Unfortunately, no agreement of this kind

was signed so far ⁷, but this did not prevented the players involved from signing a large number of sectoral (subsectoral) collective labour contracts up to now.

As a rule, sectoral (subsectoral) collective labour contracts contain the following sections:

1. Employment, vocational qualification and vocational training, human resources development and motivation of workers;
2. Working time, leaves, breaks, etc.
3. Safety and health at work;
4. Salaries, payments, compensations, social benefits, social security;
5. Trade union activities in the sector (subsector) enterprises, solving labour disputes and collective arguments, reconciliation and arbitration;
6. "Others".

The suggested national agreement, which has never been signed, should contain the same sections.

The content of the collective labour contracts at sectoral and subsectoral levels corresponds precisely to the content of the collective labour contracts at company level, and generally have the following sections:

1. General matters;
2. Employment, vocational qualification and vocational training;
3. Working time, leaves, breaks, etc.
4. Salaries, payments and other payments;
5. Healthy and safe labour conditions ;
6. Social security and insurance;
7. Trade union activities in enterprises;
8. Voluntary settling of collective labour disputes;
9. Procedure of joining the collective labour contract;
10. Conclusions.

When we consider sectoral and subsectoral collective contracting in Bulgaria, we should bear in mind the specificity of the collective contracts which are concluded

⁷ Finally this article of the Labour Code was cancelled as a useless anachronism.

as a result of the negotiations. We could classify the sectoral and subsectoral collective labour contracts that have been signed in Bulgaria so far in three groups:

- *first group* – collective labour contracts signed between the trade unions and employers' sectoral and subsectoral organizations;
- *second group* – collective labour contracts, signed between the trade unions and the directors of agencies (we mean government agencies and ministries' executive agencies) and directorates. These contracts cover a large number of employed all over the country and this is the reason why they are treated as sectoral (subsectoral) collective labour contracts.
- *third group* – collective labour contracts signed between the trade unions and the managements of different companies (as a rule – state-owned), which cover with their activity all sectors or subsectors. As a typical example we can cite the already privatised Bulgarian Telecommunication Company (BTC). From a legal point of view, these collective labour contracts are signed according to the Labour Code provisions for collective contracting at company level, but many of the researchers of the industrial relationships in Bulgaria treat them as sectoral (subsectoral) collective labour contracts.

For the above-mentioned reason such contracts can be signed by some subsectoral structures of trade union formations, which are not nationally representative. For instance, the Association of Democratic Trade Unions (ADTU – non-representative at national level) is a party in a number of collective labour contracts with the Bulgarian Telecommunication Company (signed on 14 May 2002) and in Bulgarian Post – single joint stock company, state property (signed on 27 April 2002). (Some researchers with trade union background, treat as a subsectoral collective labour contract even the contract for the Trade Bank Biochim, signed on 31st May 2001 where ADTU is also a party of the contract.)

When referring to sectoral (subsectoral) collective contracting in Bulgaria, researchers consider it almost obligatory to emphasise its weakness. But for us, weakness is a relative notion. If we adopt as a criterion the number of sectoral

collective labour contracts, as well as their “coverage”, we will ascertain the following:

- their number is unexpectedly large and there is even a tendency for signing collective labour contracts in sectors (subsectors), where social dialogue is just about to develop – for instance in the private security sector.
- the range of the coverage is wide – from insignificant (as in the trade sector) to very high – over 90% (as in energy sector).

If we consider experts’ assessment to what extent the sectoral (subsectoral) collective labour contracts are being observed, it could turn out that they have a relatively general character and that is why conflicts are rare, due to the non-observance of the sectoral (subsectoral) collective labour contract. The general and at times wishful character of the sectoral (subsectoral) collective labour contracts is interpreted by some researchers as a weakness.

At the same time, an important thing to take into account is that this format of sectoral (subsectoral) collective labour contracts can facilitate in a certain way the collective bargaining at the single enterprise level. They are doing an excellent job giving the framework of the collective labour contract in a single company and facilitating the definition of the bargaining “agenda”.

1.2.4. Tripartite concertation in the power engineering (electricity) sector

In most sectors of Bulgaria, tripartite concertation at sector and branch (sub-sector) levels seems not to be developed in the best possible way; anyway, tripartite concertation in the electricity sector is an established practice. The Labour Code provides a place for tripartite concertation at sectorial and sub-sectorial (branch) levels. Tripartite concertation takes place within the so-called “Sector / Branch Councils for Tripartite Cooperation”. This concertation is organised by the State and depends on the relevant ministry – the Ministry of Economics, Energy and Tourism. In the past, before the merging of several ministries and agencies in a “super ministry” – Ministry of Economics, Energy and Tourism (MEET), responsible for the social dialogue in the power engineering (electricity) sector, it was the Ministry of Energy and Energy

Resources (MEER) that was responsible. The actors that participated in this concertation are:

- Two representatives of the relevant Ministry or another State institution responsible for the sector or the branch;
- Two representatives of every representative trade union federation;
- Two representatives of each representative employers' organisation.

The criteria for representativeness of employers' and trade union organisations at branch / sectorial levels is their affiliation with nationally representative trade union confederations and employers' organisations. These criteria can be applied both for tripartite concertation and bipartite collective bargaining.

The parties involved in the work of the Branch Council for Tripartite Cooperation (BCTC) in the power engineering (electricity) branch are the following:

- the Bulgarian Branch Chamber of Energy, on the employers' side;
- the National Federation of Energy Workers (member of the Confederation of Independent Trade Unions in Bulgaria, CITUB, at national level) ;
- the Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (member of the CITUB at national level) ;
- the Federation of Energy Workers Podkrepa (member of the Confederation of Labour PODKREPA at national level), on the trade union's side;
- representatives from the Ministry of Energy and Energy Resources (MEER), on the Government's side.

The BCTC is a consultative body. Its activities focus on labour relations in the branch, salaries and incomes, employment, social assistance, social insurances, health and safety at work, social consequences of privatisation, etc. In the past, there often were overlaps between the tripartite concertation and bipartite social dialogue in the power engineering (electricity) sector. It was due to the fact that most enterprises in the sector were state-owned, and the tasks of the State administration, responsible for state-owned enterprises and the Bulgarian Branch Chamber of Energy were not well delimited. Actually, after the "sweeping" privatization in the electricity sector, the situation is pretty different.

Besides the BCTC, a Consultative Council in the power engineering (electricity) sector was established in 2001 but its work does not involve trade unions. It consists of representatives of the MEER and of the Bulgarian Branch Chamber of Energetics. This council overlaps to some extent with the prerogatives of the tripartite BCTC.

1.2.5. Bipartite social dialogue in the power engineering (electricity) sector

Collective bargaining in Bulgaria takes place at branch (sub-sector) and enterprise levels. The Branch Collective Labour Contract (BCLC) gives the minimum framework for further negotiations at enterprise level. Enterprise Collective Labour Contracts can only entail provisions that are more advantageous for workers than those included in the Branch Collective Labour Contract. Both levels have been considered as well-functioning in the power engineering (electricity) branch over recent years. For the moment, branch and company levels are equally developed in terms of coverage rate. The companies engaged in the BCLC conduct, as a “not written” rule, collective bargaining at enterprise level.

Trade unions and employers’ organisations which are allowed to negotiate at branch level are those affiliated with the representative organisations at national level. The BCLCs apply to all the companies which are members of the signatory employers’ organisations.

According to the Bulgarian Branch Chamber of Energy, in 2003-2004, 13% of the enterprises were covered by BCLC. These enterprises are the largest enterprises in the sector. About 50-55% of employees (estimate of trade unions) are covered by BCLC. BCLC would cover 17000 employees, of which 75% are blue-collar workers. Coverage rate in the electricity sector has been very high compared with most of other sectors in Bulgaria.

The Labour Code gives the right to the Ministry of Labour and Social Policy to make extensions of BCLC to the whole branch. This procedure has started to be used in Bulgaria in 2009.

All trade union organisations can negotiate with the employer at enterprise level, no matter whether they are sections of representative organisations at national

level or not. In some cases, it may happen that the trade union sections of nationally representative confederations use different techniques to “eliminate other small trade unions” from the collective bargaining process.

The duration of enterprise level collective labour contracts can not be shorter than one year and can not be longer than two years.

In 2003, at least 13% of companies in the sector have signed collective agreements at enterprise level. These were the 14 large-scale companies - members of the Bulgarian Branch Chamber of Energy. However, there is no information about companies that are not members of the Branch Chamber. According to the estimates proposed by employers and trade unions organisations, at least 55-60% of employees (about 20,000 employees) are covered by an enterprise level collective labour contract (ECLC). At least 75% of them are blue-collar workers. Actually, the parameters of the situation are almost the same.

Collective labour contracts at enterprise level can not be extended to parties that are not signatory of the agreement. However, there is a legal procedure for joining an ECLC on a personal basis: non-unionised employees and employees who are members of trade unions that are not parties in the collective labour contract have the possibility to join it by paying a “solidarity fee”. This procedure is effectively used by individual employees.

1.2.6. Outcomes of social dialogue at branch level

In the period 2002-2003, 10 collective agreements were concluded, 3 of which are the most important. They were concluded within the BTCT:

- the first one is the Branch Collective Agreement that regulates the work of the BTCT. It contains provisions that establish obligations of information and consultation of employers’ and employees’ organisations by the government on issues such as the restructuring of enterprises, the privatisation, alternative employment, etc. It was signed on 2nd June 2003 by the afore-mentioned three trade unions and the employers’ chamber. It is valid for two years.
- The second one, also signed on 2nd June 2003, is a separate agreement dealing with the consequences of privatisation (protective mechanisms for employees,

collective negotiations planned after the privatisation). It was concluded by the same signatories.

- The third one is a Memorandum concluded on 24th July 2003 by three relevant trade unions, the Ministry of Energy and Energy Resources and the Agency of Privatisation. It contains some articles regulating the process of privatisation, the social consequences of privatisation (employment, incomes, training, working conditions, social policy of enterprises, etc.) The parties agreed on the involvement of trade unions in the discussions and negotiations dealing with the “social chapter” of privatisation. On the other hand, trade unions committed themselves to keeping social peace.

A typical BCLC in the electricity sector has the following structure:

- general issues;
- implementation of collective agreements;
- obligations of the parties;
- employment issues;
- professional recruitment;
- working time, rest periods, days off, leave and holidays;
- payments, salaries, additional payments and compensations;
- health and safety;
- social assistance and social insurance;
- social cooperation and partnership;
- general provisions, techniques for changing and amending the branch labour collective contract;
- final provisions.

Detailed information on the Branch collective labour contracts in the power engineering (electricity) sector, signed in the period 2003-2009 is given in Appendix No. 6. It consists of data about the full list of BCLCs in the electricity sector and also on the enterprise level collective labour contracts (ECLCs) for the National Electricity Company, which reasonably can be treated as branch (sub sectoral) collective labour contracts. (Look at 1. 2. 3. The enterprise level

collective contracts in the National Electricity Company definitely belong to the type of group 3 branch collective labour contracts).

1.2.7. Employers' organisations in the power engineering (electricity) sector

The Bulgarian Branch Chamber of Energetic, BBCE (Bulgarska branshova kamara na energetizite / Българска браншова камара на енергетиците). The BBCE is the only employers' organisation that plays a role in social dialogue in the electricity branch. The Chamber was founded in 1993. It covers the following fields: all activities of production and distribution of electricity (NACE E40.1), as well as branches like the heating branch (E40.3), building (installation of electrical wiring and fitting, F45.31), nuclear energy (DF23.3) and manufacture of electrical equipment (DL31.62).

In 2003-2004 the Chamber represented 116 enterprises, 14 of which in the electricity branch (13% of the companies in the electricity industry). These companies employed more than 15,000 employees in the electricity industry – more than 47% of the total employment (estimate of the organisation). More than 50% of its members were SMEs and more than 50% of its members belonged to the private sector.

At present time, the only significant change in the quantitative data can be found in the share of the private companies. After the privatization, this share has increased visibly. Unfortunately the Chamber did not publish the current list of its members (the members list in the organization web site was last updated in 2004).

The organisation concludes collective labour contracts at branch level and it participates in the tripartite concertation for the branch of electricity.

Funding is provided by membership fees. The services provided by the Chamber to its member are training, technical support and legal advice.

1.2.8. Trade unions in the power engineering (electricity) sector

Actually, the organisations that take part in social dialogue in the power engineering (electricity) sector are the following:

- the National Federation of Energy Workers (member of CITUB at national level);
- the Independent Trade Union Federation of Workers in Energy Industry in Bulgaria (member of CITUB at national level);
- the Federation of Energy Workers Podkrepa (member of Podkrepa at national level).

The only source for quantitative data about trade unions is the internal statistics of the organisations themselves. However, they can be considered reliable, since two counting procedure were set up in October 2003 and at the end of 2007 by the Government in order to check the representativeness of the organisations.

The National Federation of Energy Workers (Nazionalna Federatzia na Enegetizite, NFE / Национална федерация на енергетиците). The National Federation of Energy Workers (NFE) was established in 1992. It covers all activities of NACE E40.1 (production and distribution of electricity), as well as other branches such as the heating branch (E40.3), building (installation of electrical wiring and fitting, F45.31) and manufacture of electrical equipment (DL31.62).

The NFE has 3,690 members, 3,000 of which in the electricity sector. It corresponds to 9.1% of the employees working in the sector; 18% of its members are white-collar staff and 91% are manual / blue-collar workers.

The organisation concludes collective labour contracts at sectorial and branch levels. Its company sections conclude collective labour contracts at enterprise level. It takes part in tripartite concertation.

The organisation employs 7 people. It is funded through membership fees. The services provided by the organisation to its members include training, legal protection and technical support.

The Independent Trade Union Federation of Workers in Energy Industry in Bulgaria (Nezavisima Syndikalna Federazia na Enegetizite v Bulgaria/ Независима синдикална федерация на енергетиците в България). The Independent Trade Union Federation of Workers in the Energy Industry in

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Bulgaria was founded in 1990. It covers all activities of NACE E40.1 (production and distribution of electricity), as well as other branches such as the heating branch (E40.3), building (installation of electrical wiring and fitting, F45.31) and manufacture of electrical equipment (DL31.62).

The organisation represents 4,200 employees, 4,000 of which in the electricity sector (12.1% of the employment in the sector). 30% of its members are white-collar workers and 70% blue-collar workers.

It participates in collective bargaining at sectorial and branch levels. Its enterprise level sections conclude collective labour contracts at this level. It takes part in tripartite concertation.

The organisation employs 5 people. It is funded through membership fees. It offers the following services to its members: training, legal protection and technical support.

The Federation of Energy Workers Podkrepa (Federatzia “Energetika” – Podkrepa / Федерация “Енергетика” - Подкрепа). The Federation of Energy Workers Podkrepa was set up in 1990. It covers all activities of production and distribution of electricity (NACE E40.1) and the heating branch (E40.3).

The Federation has 6,103 affiliates, 5,818 of which are members of the electricity sector (3,188 work in the production of electricity). It represents 17.7% of the employment in the sector; 25% of its members are white-collar workers, 70% are blue-collar workers and 5% are retired workers.

It concludes collective labour contracts at sectorial and branch levels, and at enterprise level, via its company sections. It participates in branch tripartite concertation in the electricity branch.

The Federation employs 3 people. It is financed through membership fees. It provides the following services to its members: training, legal protection and technical support.

CASE STUDIES

Employers' organizations in Bulgaria, representative in the electricity sector:

Organisation	Sub-sectors covered	National affiliations	European affiliations	International affiliations
Balgarska branshova kamara na energetizite (Bulgarian Branch Chamber of the Energetics, BBCE)	E40.1, E40.3, F45.31, DF23.3 and DL31.62.	Balgarska stopanska kamara (Bulgarian Industrial Association – BIA) BIA is a full member of BusinessEurope	No	No

Trade union organizations in Bulgaria, representative in the electricity sector:

Organisation	Type of salaried workers	National affiliations	European affiliations	International affiliations
Nacionalna Federatzia na energetizite (The National Federation of Energy Workers)	Blue-collar workers prevail	CITUB	EMCEF EPSU	ICEM PSI
Nezavisima syndikalna fedetazia na energetizite v Bulgaria (The Independent Trade Union Federation of Workers in Energy Industry in Bulgaria)	Blue-collar workers prevail	CITUB	EPSU	PSI
Federatzia "Energetika" - Podkrepa (The Federation of Energy Workers Podkrepa, FEW Podkrepa)	Blue-collar workers prevail	LC Podkrepa	EMCEF EPSU	ICEM PSI

The survey of the actual situation of the social dialogue in the enterprises involved in the utilization of biomass, did not add anything new to the facts and ideas already mentioned. Here, we have to point out some specific problems, which are important both for the group of enterprises, involved in the utilization of biomass, and for the Renewable Energy (Sub)sector.

At first glance, we agree on the fact that the core, basic economic activities of the enterprises in the two groups are situated into branches, where social dialogue is developed and collective bargaining already exists. Anyway, we must obligatory take into account at least two specific issues:

- first, social dialogue in the enterprises whose basic economic activities are the activities given in Table 25, is not situated on the "platform" of Renewable Energy production or biomass utilization, as a consolidating factor. It is based on

traditional social dialogue, which takes place in the machine building, power engineering and heat production, paper production and manufacturing of furniture. In the process of collective bargaining the negotiated problems are treated within the listed traditional industries and activities. Among the enterprises with a longer history, collective bargaining does not take place in the context of Renewable Energy production or utilization of biomass. In the new enterprises of the Renewable Energy (Sub)sector, the process of establishing social dialogue is in the best case in its very beginning.

- secondly, we must take into account that the prevailing number of enterprises, both in the Renewable Energy (Sub)sector and in the cluster of enterprises, involved in the utilization of biomass, are small and medium enterprises. It is well known that social dialogue as a rule is better developed in big enterprises, because of their strong industrial tradition, better representation of trade unions etc. In small and medium-sized enterprises, much more innovative approaches are needed in order to develop social dialogue and collective bargaining. The content of these innovative approaches could be the topic of another report.

Here, we just mention it for the development of social dialogue in small enterprises, the key role that can be played by local and regional trade union structures in addition to branch trade unions. Possible innovative forms could be some specific collective agreements, based on a hybrid level, like “regional – branch agreements” or local and regional agreements for specific economic activities. These forms of collective agreements are not regulated by the Bulgarian Labour Code and their developing, concluding and keeping in action depends only on the good will of the parties.

The possibility to negotiate women’s rights and women issues with the instruments of social dialogue varies a lot. We can say, without any hyperbole or exaggeration, that the potential for negotiating women issues with the instruments of social dialogue is different at enterprise level.

The idea of using of social dialogue to reach higher employment rates of women in the Renewable Energy (Sub)sector and in the sphere of utilization of biomass, could become reality if two conditions are fulfilled.

The first one is the necessity of an innovative approach towards social dialogue. Here we cannot consider “social dialogue” and “collective bargaining” the same thing. The tripartite cooperation at sectorial and subsectorial levels could be an useful instrument. The sectorial (and subsectorial) tripartite cooperation is not so binding as collective bargaining is, but it gives a possibility for a closer and much more creative interaction between employers’ organizations, trade unions and government representatives, which must not be excluded from such negotiation processes.

The second condition is the need for mutual trust and readiness of employers and trade unionists to work in one and the same direction for reaching objectives, which are of national and supranational importance.

1.3. A gender mainstreaming perspective

The changes in the level of economic activities, employment and unemployment and the reduction of gender differences for these parameters, are the common result of economic development and general and particular specific policies carried out in the field of employment, which limit discrimination and social isolation in the labour markets and the employment sphere.

What is important to mention is that the policies of reducing gender differences in the economic activity, employment and unemployment rates in the last years were carried out with an active effort to increase women’s employment from several specific social groups – aged women, single mothers, etc. The objectives, established by the EU in Lisbon and Stockholm, were targeted to reach a community average employment rate for women of over 57% by 2010 and over 60% by 2010 respectively, despite the lower level of employment in some European countries, including Bulgaria. The achievement of these objectives means an increase in the economic activity, the reduction of unemployment and the carrying out of economic, social and education policies in favour of employment, taking into account the different possibilities by gender.

Among the main factors that can affect the economic activity and employment of the population, we can cite the following ones:

- demographic (sex, age, marital status, location) and economic (development and structure of the economy, labour cost, etc.);
- level of education and vocational education and training; matching of the occupational structure of labour demand and offer;
- the economic and social policies, including the so called active measures for the labour market and the achievement of gender equality and equal treatment of the other social groups.

The role of women in the Bulgarian labour market is essential. It is measured by their share in the economically active population and with their participation to all economic sectors and industries of Bulgarian economy. The share of women in the economically active population and in employment has fallen significantly in the early 90s. After that, it stabilized and began to increase again after 2000, especially over the last years until the beginning of the global financial crisis. Today, women are almost 47% of the officially employed in all economic activities and sectors.

Many efforts are necessary in the development of economic and social policies in order to reach the established goals for the general levels of employment (employment ratios) and for the level of employment of women as well. In a pretty high degree, the chance to reach the general level of employment strongly depends on women employment.

From an historical point of view, the highest levels of economic activity and employment in Bulgaria (in general and by sex) were reached in the 80s. In the mid-80s the economic activity rate for women reached its maximum. It was very close to the economic activity rate for men, especially for the group with the best working potential (25 – 49 years) – 95% for women in comparison with 98.2% for men. This was a difference of only 3.2%. The employment rates were very close to these values as well (of course – because of the total absence of unemployment).

In comparison, the level of economic activity and the employment rates decreased significantly in the 90s both for men and women, although these parameters decreased much more for women. The reason could be found not only in the fact that unemployment, which appeared on the scene at the beginning of the transition period, remained high, but also because of the number and the share of the so called “discouraged” persons in working age.

At the end of 2000 the employment rates, both for women and men, was 46%. For women it was 37% - in comparison with the EU countries, where the employment rates were 61% for men and 51% for women ⁸.

In the third quarter of 2003 (before the start of the Employment strategy of Bulgaria) the general level of employment (employment rate) for men was 48,5%. For women it was 39,7% - the difference was 8,8%. We must mention that the highest employment rates for men and women was for the age group 35 – 44 years – they were 78,5 for men and 74,5% for women. The difference between men and women was 4,5%. The increased difference is mainly due to the lower activity of women in two basic age groups – the group 55 – 64 and the group 25 – 34 years old. Furthermore the employment and unemployment are strongly differentiated by both gender and education. Only for people with a very high education the difference in employment by gender for the age group 35 – 44 is insignificant. The same is for youth.

During the years of operation of the Employment Strategy and the development and application of national employment plans, there was an existing trend to increase the economic activity. The gender difference in the economic activity rates remained high (in 2005 it was almost 16%!). In the second quarter of 2007 the gender difference in the economic activity has decreased, but still remained 8,3 per cent (see table 1). These differences were due to some extent to the remaining difference in the retirement age –5 years at the beginning and 3 years in 2009. But for sure this is not the only reason.

⁸ K.Vladimirova, *Employment Policies in Eastern Europe: Policies for Two Transitions*, in N. Parsons, Y. Zhigang (Eds.), *Economic Globalisation and Employment Policy*, Shanghai, 2004, 55-80.

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Table 1. Economic activity, employment and unemployment of the 15-64 years old population by sex(in%).

Year	LEA	LEA	LEA	LEMP	LEMP	LEMP	LUNEMP	LUNEM	LUNEM
	Total	Men	Women	Total	Men	Women	Total	Men	Women
2003	49,2	54,5	44,0	42,4	46,8	38,4	13,7	14,1	13,2
2004	49,7	55,3	44,6	43,7	48,4	39,5	12,0	12,5	11,5
2005	49,7	55,4	39,5	44,7	49,7	40,0	10,0	10,3	9,8
2006	51,3	56,7	46,3	46,7	51,8	42,0	9,0	8,6	9,3
2007	66,1	70,3	62,0	61,6	65,5	57,7	6,9	6,8	6,9
2008	67,8	72,5	63,1	64,0	68,5	59,5	5,7	5,6	5,8
2009 II	67,6	72,3	63,0	63,3	67,7	59,9	6,4	6,3	6,4

Source: *Employment and unemployment, National Statistical Institute, Sofia, 2006, 2/2007 second quarter; 2008 4/2009. Remark: Level of economic activity – LEA; Level of employment – LEMPL; Level of unemployment – LUNEM.*

The level of employment (the employment rate) increased in the period 2003 – 2008, but remained low in the EU context. This makes it very hard for Bulgaria to reach the Lisbon goal – an employment rate higher than 70%. It is worth mentioning that the difference with the Lisbon goal for the general employment rate is even more significant – 4.5%. The difference in the level of women in employment (employment rate) is 2.3%.

The level of unemployment decreased in the period 2003-2008 – in general and both for men and women. It decreased both in absolute numbers and as a rate.

Due to a plenty of methodological, information and institutional contradictions, unemployment as a scale and rate is quite relative and disputable. That is why here we put an accent on employment.

We can conclude that the improvement in the general economic situation of the country in the period 2003-2008, the higher and stable economic growth, the increased demand for workforce from businesses and the policy of active measures on the labour market, had a positive effect on the general level of employment and even much more on the employment rate for men.

For women these positive circumstances were not so useful. This is reflected in the increasing gender differences in employment and unemployment and in the speed of changes in the last years. This confirms the hypothesis, launched by the

author (prof. Katya Vladimirova) in relation with similar changes in the other countries of Eastern Europe, that the economic growth does not give always the same contribution to the employment and unemployment rates for men and women. With an acceleration and development in economic activity, we often observe an increase in the gender difference in employment and unemployment. In other words, the effect of the accelerated economic growth contributes much more to men than to women.

Over these years, the enlarged scale of the active employment policies and active measures on the labour market could not contribute to a better development of the situation.

1.3.1. Age and sex as factors of economic activity and employment

The dramatic decrease in the industrial production after 1990 (and of agricultural as well), was the basic “contributor” to the decrease in the economic activity and general employment. To some extent, it is hard to understand why the appearance of a number of factors that were expected to strongly motivate the workforce did not work. It was expected that the permanent threat of becoming unemployed, the visible reduction of the household incomes, the development of different atypical forms of employment, the possibility to work as self-employed or as a freelancer, were going to reduce the negative effects on the economic activity and employment rates. Unfortunately, it did not happen. Women’s employment was influenced in a much more negative way than general employment. Women’s employment was differentiated according to various factors – age, education, marital and health status etc. The differentiation is even stronger in the case of women’s employment in comparison with men’s one.

We can conclude that the decrease in the general rates of economic activity and employment is mainly due to the economic factors and to the dramatic reduction of industrial production. On the other hand, the lower rates of women economic activity and employment in comparison with men, are due to a great extent to the age as a demographic factor.

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Table 2. Level of employment (employment rate) by sex and age(in%).

	Total		15-24		25-34		35-44		45-54		55-64		> 65	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
2003	44,5	36,9	21,1	19,3	67,7	59	70,7	72,5	65,7	64,2	37	17,5	4,9	1,2
2004	46,2	39,7	21,9	18,7	69,7	56,9	74,5	71,2	67,6	57,9	39,5	22,2	5,2	1,8
2005	47,2	38,2	22,5	18,3	71,6	60,9	74,6	71,9	69,9	69,2	42	23,6	4,3	1,4
2006	49	39,7	23,5	18,3	74,4	61,7	76,6	75,5	73,1	71	46,9	27,7	3,9	1,1
2007	54,2	44,2	27	22,1	80,4	70	84,8	79,8	79,9	77,8	51,9	34,5	5	1,4
2008 II	56,5	45,8	30	23	85,2	71,9	88,1	82,1	82,2	79,9	55	37,9	6,2	2,3
2008IV	56,8	45,3	29,3	22,8	84,9	71	87,6	81,7	83,4	78,9	56,8	38,6	6	1,9

Source: *Employment and unemployment, National Statistical Institute, Sofia, 2003-2007 second quarter.*

For the period 2003- 2008, the employment of women was 19.2-14.5% lower than the employment of men for the age group 55-64 years. Womens' employment was 8.7-12.8% lower than the employment of men for the age group 25-34 years. In comparison with the previous period (1995-2003), there is a substantial reduction of these differences (from 19.4 to 25.6%) for the first group (55-64 years), while in the case of the second age group there is an increase of these gender differences (from 7.6 to 9.8%).

The age plays a major role for the lower employment of women who are 55 and more years old. The other reason for gender differences in employment rates in this age group is the fact that old age is a discriminatory factor for women much more than for men.

Thirdly, we must point out that the traditions and the expectations of society and family that when women reach retirement age, will focus mainly on household labour, on household production for family needs and on the care of their grandchildren. The popular expectation is that they must focus on the support for their families and their children.

For the second age group (25 – 34 years old), in which the gender difference in the employment rates is higher than the average, the reason seems to be found in the demographic origin – as this is the age for bearing and raising of children. But

this is just a standard expectation. First of all, in the period of the survey, the majority of women had children at the age of 25 or before. Then, the period of the survey was characterised by a decrease in the birthrate. There were strong trends towards cohabitation without marriage, delay of the conclusion of marriage, and delay in having children.

The basis of these demographic changes depended on the uncertainty of the youth about their employment and incomes. The positive attitude towards emigration abroad is closely connected to the same reasons.

Moreover, there is one more reason, valid for the surveyed period, which influences directly lower women employment in this age. It is the reluctance (unwillingness) of employers to hire young women. The main reason of this attitude is that they have small children (or they potentially are future mothers of small children) and they can use parental leave, they could be often absent from their workplace because of the need to take care of their children. Moreover, young women can not be at the employers' disposal like the other employees for a much more continuous daily or weekly work. Following the actual legislation in Bulgaria, fathers can use parental leave as well, but in the social practice this is a rarity yet. A future survey on the effect of these leaves on the employment for both men and women would be necessary. This kind of survey should focus on the balance between professional and family life. Depending on the results of this survey, new policies and measures could be developed. The inclusion of the employers in the policy making process is of particular importance.

Table 3. Differences in the level of employment (employment rate) by sex and age (in%)

	Total	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	> 65
2003	7,6	1,8	8,7	2,5	1,5	14,5	3,7
2004	6,5	3,2	12,8	3,3	9,7	17,3	3,4
2005	9	4,2	10,7	2,7	0,7	18,4	2,9
2006	9,3	5,2	12,7	1,1	2,1	19,2	2,8
2007	10	4,9	10,4	5	2,1	17,4	3,6
2009 II	10,5	5,5	16,2	5	2,8	14,4	3,3

Source: Employment and unemployment, National Statistical Institute, Sofia, 2003 - 2009 second quarter.

The smallest difference in the economic activity and employment rates is identified for the age group 15 – 24 years old (the youngest on the labour market) and for what is considered the most productive age group – 35-44 years old. For the first group the difference is 1.8 – 4.2%. For the second age group above mentioned, the difference is 1.1 – 3.7%.

The rates of economic activity and employment are very low for both men and women in the age up to 24 years, because of two main reasons:

- too many young men keep on their studies;
- limited access to employment for young people, mainly due to the lack of vocational education and training and / or professional experience.

The gender difference in the employment is lowest for the age group up to 24 years old, because the share of young women who continue their education is very high. Anyway, we must mention that, in comparison with the previous period (1995-2003), there is an increase in this difference (in the period 1995-2003 it was 0,6-3,3%).

The gender differences in the economic activity and employment rates for the age group 35-54 years old are lower than the average as well. The age group 35-44 is considered as the most productive one. The children of the people in this age group are already grown and independent.

The economic activity and the employment of women reach their highest values – close to the values measured for men in the age group 35-44. The existing differences are insignificant. The explanation of the phenomenon of high women employment of that age group could be found in several directions:

- high educational level of women in Bulgaria;
- accelerated development of different services, where plenty of women are employed.

Men employment remains high and there is an existing trend towards an increase in these differences.

We can conclude that the level of employment in Bulgaria (the employment rate) is strongly dependent on the age. This dependence is much more visible for women than for men. This fact, together with the big share of women who are not

economic active, is a serious challenge for active employment policies and for the developing of active measures on the labour market.

1.3.2. Marital status and employment by sex

The participation of women in the labour market is determined by a plenty of factors: the structure of economy and the economic cycles; the level of education and vocational education and training; the created work opportunities and their legislative guarantees; the marital status; the household incomes, etc. Other important factors are traditions, the developed stereotypes for the roles of women and men in the family, for the growing up of children and for the participation in the social, economic and political life.

The employment rates of married and divorced women are the highest. They are high above the average rate of employment of women who are 15 years old and more. In these two particular groups of women the household incomes are lower – especially in the case when the number of children is higher. In this case, women's employment is almost obligatory, while the competitiveness of these women on the labour market is relatively lower, due to their marital status. The threat of poverty and / or insecurity is the reason why women make a plenty of compromises concerning their professional careers (to accept any work for pay), and in compliance with their work and social rights (including the compliance with the statutory working hours per week, the work under a written employment contract, the payment of social securities, etc.).

Table 4. Odds of economic activity, employment and unemployment of the population 15 and over years old by sex and marital status – 2006 (in%).

	ECACT	ECACT	ECACT	EMPL	EMPL	EMPL	UNEMPL	UNEMPL	UNEMPL
	Total	Men	Women	Total	Men	Women	Total	Men	Women
TOTAL	51,3	56,7	46,3	46,7	51,8	42	9	8,6	9,3
Not Married	47,8	52,5	41,2	41,8	46,1	35,8	12,5	12,2	13,1
Married	59,3	61,7	56,9	54,8	57,4	52,2	7,7	7	8,4
Divorced	66,2	65,3	66,7	59,6	57,8	60,7	9,9	11,5	8,9

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Widowed	12,4	13,6	12,1	11,4	12,7	11	8,5	6,5	9,1
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Source: Employment and unemployment. Annual data for 2006, National Statistical Institute, Sofia, 2007.

Remark: ECACT – Economic activity; EMPL – Employment; UNEMPL – Unemployment.

The highest motivation for economic activity and employment is identified in the strata of divorced women. Their motivation is too much higher than the motivation of divorced men. The level of unemployment of divorced women is even lower. Economic activity and employment in the case of married women is quite lower. Women's economic activity and employment rates are higher than the same parameters for men only in the case of divorced women (1.4 – 2.9%). The gender difference in the economic activity rates for widows (widowers) and married is visibly lower than the average.

When we survey the economic activity rates, we find out that these differences are not significant (from 1.5% for widows up to 4.8 in the case of married). This reflects the desire of these women to look for a job and the data on employment shows the possibilities for a success in these efforts. The employment rate of married women is 5.2%, higher than the same rate of married men. In the case of divorced this difference is 1.7.

The highest gender differences, concerning economic activity and employment, can be found when we compare non-married women with non-married men – the women parameters are 10 – 11 per cent lower. This fact gives an indirect evidence of the existing problems for young women to find a formal, official job and / or for the high level of informal employment and the occasional character of the jobs for most of them.

1.3.3. Education as the most significant factor to increase employment and reduce social differences and exclusions

The level of employment is mainly determined by the level of education and vocational education and training. They determine both the access to the labour market and the nature of employment. As a matter of fact, in the last years the employment rate of women with a better education remained relatively high, pretty higher than the average. This confirms the concept, contained in the human

capital theory, that investment in better education is redeemed by reaching higher levels of employment and incomes. Women with better education and vocational training are much more economic active, they have a higher motivation for work and are more active on the labour market. Their level of paid employment is too much higher in comparison with other groups. The last conclusion is particularly valid for women with higher education.

Table 5. Level of employment (employment rates) for men and women 15 and over years old by education level (in%).

	Total	Total	Higher education	Higher education	Secondary education 12-th class	Secondary education 12-th class	Primary education 8-th class	Primary education 8-th class	Primary education 4-th class and lower	Primary education 4-th class and lower
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
2003	48,5	39,7	70,4	67,1	61,4	51,4	28,5	19,8	16,9	8,8
2004	49,1	40,2	70,2	69,2	69,6	56,4	28,4	19,8	16,5	7,8
2005	50,1	40,5	70,8	69,4	64,5	52,9	28,1	18,8	15,8	7,9
2006	49	39,7	68,6	69,5	63,9	52,5	26,3	16,2	13,7	4,9
2007	54,2	44,2	72,3	72,5	69,5	56,1	27,8	18,8	15,5	8
2008	56,5	45,5	75	72,9	70,7	57,7	28,8	19	20	8,5

Source: *Employment and unemployment, National Statistical Institute, Sofia, quarterly for 3/2003; 2/2005; 1/2006; 2/2008.*

The education level is not only an important factor on which both economic activity and employment depend, but also a significant factor for the differentiation by sex. With the increase in the level of education, the difference in the employment rates of men and women decreases. Women with higher education often have an employment rate which is higher than the employment level of men; the last statement can be found in the table above (Table 5). For the period after 2003, the highest employment rate was reached by women with higher education in the first quarter of 2007. Women's employment rate in that moment was 73.6%, compared to the men employment rate, which was 71.7%. (Generally for the state it was 52.4%).

For the whole period 2003 – 2008, the difference in the employment rates of the persons with higher education has been less than one per cent in the majority of

cases. There was one exception – 3.3%, which means that the difference is symbolic. Anyway, we must mention that the higher employment rate of women is due to their much more specific behaviour towards the labour market: they are more flexible and ready to make much more compromises concerning their occupational position and their payment.

There are some reasons why to expect a greater differentiation in the employment rates not only of men and women, but also inside the aggregates of women and men. The analysis of data by sex, given by the National Statistical Institute, for the persons who study and graduate at different levels within the education system seriously justify this kind of expectations.

Table 6. Secondary and higher education by sex (in thousands of persons).

	2003		2004		2005	
	Men	Women	Men	Women	Men	Women
Secondary education – vocational education high school	27,8	16,6	25,9	16,3	25,7	16,9
Higher education – TOTAL	13,7	16,6	13,4	17,3	13,1	17,2
Higher education – graduated college (specialist degree)	1	1,6	1	1,8	1,1	1,6
Graduated university – bachelor's and master's degrees	12,6	14,9	12,3	15,4	11,9	15,5

Source: Education in the Republic of Bulgaria, National Statistical Institute, Sofia, 2006.

The different studies of women's employment clearly confirm that better education leads to greater certainty regarding the types of job contract, the preservation of the working place and the development of professional career. Education is a crucial factor much more for women than for men. Generally, women's better education determines their higher employment and certainty on the labour market. But on the other hand, women are often forced to accept jobs which require lower education for they need to have a job and an income. Behind the higher employment rate for women with secondary and especially higher education, there are very often hidden compromises and dispersion of human capital.

1.3.4. Employment status and restructuring of the employment of women and men by sectors

The presence of women in the public sector is much more significant than the presence of men. For the last several years their employment in the public sector has reduced considerably. Their share in the private sector increased, which is due to the deep restructuring of the economy, with the change of the forms of property. Women have a bigger share than men in the total number of the employed persons.

These two facts explain why women are hired a little bit more than men with employment contracts without a fixed term and with full working time. Also, they give an explanation on why in Bulgaria part time work and atypical forms of employment are not so popular. Moreover, different surveys show that a number of women in the private sector work without any employment contracts or very often with an extended or scattered working time. The last fact is hard to be taken into account by the official statistics, due to understandable reasons.

Table 7. Employment by gender and employment status.

	ESEP			TOTAL			EEPRE			EEPUE			NPFW		
	Total	Men	Wom.	Total	Men	Wom.	Total	Men	Wom.	Total	Men	Wom.	Total	Men	Wom.
2003	12	15,7	7,9	86	82,8	89,6	49,2	49,1	49,4	36,8	33,8	40,1	1,6	1,1	2,3
2004	12	15,7	7,9	86	82,9	89,6	54,1	54	54,3	31,9	28,8	35,3	1,6	1,1	2,1
2005	11,5	15,2	7,4	86,9	83,9	90,4	56,7	57,6	55,7	30,2	26,3	34,7	1,4	0,8	2
2006	11,5	14,7	8	87,3	84,6	90,4	58,5	60,7	56,1	28,8	23,9	34,3	1,1	0,7	1,6
2007	10,9	13,8	7,5	88,1	85,6	91	61,3	63,8	58,5	26,8	21,8	32,5	1	0,6	1,5

Source: *Employment and unemployment*, National Statistical Institute, Sofia, for the quarters 3/2003; 2/2004; 1/2006; 1/2007. Remark: ESEP - Employers and self employed persons; EEPRE - Employees – including employed in private enterprises; EEPUE - Employees – including employed in public enterprises; Non- paid family workers – NPFW.

1.3.5. Differentiation in the employment of women and men by economic activities and occupational classification

The gender segregation by economic activities and sectors remains stable and high. In many countries, including Bulgaria, the vertical segregation is much more

stable, while the horizontal segregation falls, albeit slowly. The segregation by economic activities often appears to be much more stable. This stability is hard to be shaken, even after the adoption of a list of antidiscrimination policies, policies for equal payment and for equal access to the labour market, developed to stop gender segregation in employment.

The transition to the market economy and the reforms, targeted to ensure this transition, together with the collapse of the industrial production, were the reason of a deep restructuring of employment, including women's employment. Employment of women in the industry and in the sphere of scientific surveys was reduced. Also the number of working places for women with high vocational education and training was reduced. Women's employment in the sphere of services and economic activities, which do not need high educational level and vocational training (mainly in commerce, tourism, hotels, restaurants and cafes – “horeca”), was increased. Women dominate in the sectors where the payment level is traditionally low, even for high qualified labour – like education, healthcare, sewing industry and other activities, financed by the municipalities or by the state budget.

Data contained in table 8, visibly show that men are employed mainly in the industry and agriculture (49.8 – 50%), while women in the services (63 – 67%). The prevailing part of men (more than 78%) are employed in economic activities considered traditionally as “men's” activities like: processing industry, trade, repair of motor vehicles, motorcycles, personal and household goods, agriculture, hunting, forestry and fishing, transport and communications and construction and state government.

Women (more than 70%) are employed in the processing industry (sewing, textile, food and beverages, etc.), Commerce, Education, Healthcare and social activities, Hotels and restaurants. The employment of men in the industrial sectors has been increasing over the last years – mainly in the processing industry and construction and in the real estate services. Women's employment has increased in the services, in the processing industry, commerce, education, real estate services and in the state government and compulsory social securities.

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The share of both women and men decreased in the agriculture, transport and communications, healthcare and social activities.

Table 8. Distribution of employed men and women in economic activities (structure -%).

	2003	2003	2004	2004	2005	2005	2006	2006	2007	2007
	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom
Total	100	100	100	100	100	100	100	100	100	100
Agriculture, hunting, forestry, fishing	13,5	9,1	12,9	8,3	11	7,4	8,2	4,7	8,6	4,5
INDUSTRY	36,3	28	36,7	28,5	38,4	29,2	40,2	28,8	41,4	28,4
Extractive industry	2	0,4	2	0,4	1,9	0,2	2,1	0,5	1,6	0,5
Processing industry	22	25,6	22,1	25,8	22,9	26,5	23,5	26,4	23	25,3
Production and distribution of electricity, gaseous fuels and water	3	0,9	3	1,1	3,1	1,2	2,7	1	2,9	0,9
Construction	9,3	1,1	9,6	1,2	10,5	1,3	11,9	0,9	14,9	1,7
SERVICES	50,2	62,9	50,4	63,2	50,6	63,4	51,6	66,5	50	67,1
Trade, repair of motor vehicles, motorcycles, personal and household goods	13,5	15,2	13,7	16,1	13,3	16,3	14,9	17,4	14	17,9
Hotels and restaurants	3,3	6,5	3,5	5,9	3,8	6,5	3,3	6,2	3	6,7
Transport, storage and communications	10,3	4,4	10,1	4	10,3	4,1	10,4	4,2	9,7	3,7
Financial intermediation	0,7	1,5	0,7	1,7	1,1	1,5	0,7	1,4	0,7	2,2
Real Estate and business services	4,3	3,6	5	4,3	5,4	4,4	5,4	4,3	5,5	4,5
State government; compulsory social securities	9,2	6,6	8,3	5,8	8,3	6,1	7,5	6,4	8	6,8
Education	3,2	11,6	3,1	12,2	2,7	11,6	3	12,4	2,6	12
Healthcare and social activities	2,4	8,9	2,2	8,1	2,2	8,6	2,3	9,3	2,3	8,5
Other community and personal services	3,3	4,6	3,8	5,1	3,5	4,3	3,4	4,8	3,2	4,8

Source: Calculated, using Employment and unemployment, National Statistical Institute, Sofia, 3/2003, 2/2004, 2/2005, 1/2006, 1/2007.

In the last years the ratio men / women in employment changed. This trend gives us the opportunity to conclude that gender segregation is increasing, instead of falling. The share of employed men increases, while the share of employed women falls. The ratio is changing this way: 53/47 until 2004 turned to 53.2/46.8 in the beginning of 2007.

Men dominate in construction (more than 90% of the employed in the sector), in the extracting industry (more than 80%), the production and distribution of electricity, gaseous fuels and water (more than 78%), transport and communications (about 75%), agriculture (more than 67% of the employed), state government and real estate and business services (about 58%).

Women dominate in education. They are already more than 80% of the employed in the sector. Women dominate also in healthcare (more than 75%), financial intermediation (67% in 2003 – 72% in the beginning of 2007).

Gender segregation remains a significant problem within the labour market. The majority of the employed women remain concentrated in a narrow group of economic activities – mainly in education, healthcare and in the sewing industry. The gender segregation by economic activities is determined with the help of the differences between the average national share of of the employment of women and men and their corresponding share by the different economic activities. These differences, compared with the total value, give an idea about the gender imbalance.

The trend for men (up to the end of 2008) was to work in the expanding industrial activities of the processing industries and construction, where working places were created relatively more intensively, while women traditionally work in sectors where the increase in the employment rate is more moderate. Women with lower education are concentrated in economic activities, which require less skills and which guarantee a low payment and a more limited access to vocational education and training.

The activities with the highest gender segregation are: education, especially primary, secondary education and kindergartens; sewing industry; healthcare the nurses profession; transport; construction; metallurgy and coal mining. In a very

limited range of activities we can observe trends of convergence in the employment rates by sex. An example can be found in the case of state government.

Table 9. Ratio between employed men and women by economic activity (total employed = 100,0).

	2003	2003	2004	2004	2005	2005	2006	2006	2007	2007
	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom
Total	53	47	53	47	53,3	46,7	53,2	46,8	53,2	46,8
Agriculture, hunting, forestry, fishing	62,6	37,4	63,7	36,3	62,9	37,1	68,1	31,9	68,4	31,6
Extractive industry	84,6	15,4	85,1	14,9	90,1	9,9	84,1	15,9	79,6	20,4
Processing industry	49,2	50,8	49,2	50,8	49,7	50,3	50,2	49,8	50,9	49,1
Production and distribution of electricity, gaseous fuels and water	78,4	21,6	76,1	23,9	74,5	25,5	74,6	25,4	78,1	21,9
Construction	90,6	9,4	90	10	90,3	9,7	93,3	6,7	91	9
Trade, repair of motor vehicles, motorcycles, personal and household goods	50,1	49,9	49,1	50,9	48,2	51,8	49,2	50,8	47,1	52,9
Hotels and restaurants	36,5	63,5	40,2	59,8	40,2	59,8	37,5	62,5	33,4	66,6
Transport, storage and communications	72,6	27,4	74,1	25,9	74,3	25,7	73,5	26,5	74,7	25,3
Financial intermediation	33,2	66,8	31,5	68,5	44,9	55,1	36	64	27,2	72,8
Real Estate and business services	57,4	42,6	56,7	43,3	58,2	41,8	58,7	41,3	58,6	41,4
State government; compulsory social securities	61	39	61,5	38,5	60,7	39,3	57,2	42,8	57,2	42,8
Education	23,5	76,5	22,4	77,6	21,1	78,9	21,6	78,4	19,7	80,3
Healthcare and social activities	33	77	23,5	76,5	22,3	77,7	22,1	77,9	23,5	76,5
Other community and personal services	52	48	45,3	54,7	48,3	51,7	45,5	54,5	41,8	58,2

Source: Calculated, using Employment and unemployment, National Statistical Institute, Sofia, 3/2003, 2/2004, 2/2005, 1/2006, 1/2007.

A similar study of gender segregation could be conducted in respect of employment by occupational classification. To some extent, it gives an idea of the vertical gender segregation.

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Table 10. Employed by occupational classification and gender (structure -%).

	2003	2003	2004	2004	2005	2005	2006	2006	2007	2007
	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom
Total	100	100	100	100	100	100	100	100	100	100
Managers	9,7	4,7	8,9	5,3	8,1	5	8,1	4,5	8,6	4,4
Analytical specialists	7,6	15,6	7,5	11,3	7,8	15,8	7,6	18,3	8,2	18,6
Applied professionals	9,5	12,7	9,5	13,5	9,7	13,4	7,3	10,7	8,4	11,8
Support staff	3,3	10,3	3,1	10	3,6	9,5	1,3	11,5	3,4	11,8
Staff employed in services for the population, security and trade	8,9	19,3	9,5	13,5	9,5	21,1	12,3	20,9	11,8	20,9
Producers in agriculture, forestry and fishing	8,5	7,4	8,2	6,7	6,6	5,9	0,5	3,4	4,6	3,5
Skilled workers	18,7	8,9	19,4	8,3	19,9	7,9	21,3	8,7	21,8	8,5
Operators of facilities, machinery and transport equipment	19,1	9,7	18,4	9,8	20,1	10,6	20,1	11,1	18,8	9,4
Low skilled workers	13,6	11,2	13,6	11,3	13,1	10,7	13,3	10,7	13	10,7

Source: Calculated, using Employment and unemployment, National Statistical Institute, Sofia, 3/2003, 2/2004, 2/2005, 1/2006, 1/2007.

Table 11. Ratio between employed men and women by occupational classification (Total employed = 100,0).

	2003	2003	2004	2004	2005	2005	2006	2006	2007	2007
	Men	Wom	Men	Wom	Men	Wom	Men	Wom	Men	Wom
Total	53,0	47,0	53,0	47,0	53,3	46,7	53,2	46,8	53,2	46,8
Managers	69,8	30,2	65,6	34,4	65,1	34,9	67,1	32,9	69,1	30,9
Analytical specialists	35,5	64,5	35,7	64,3	36,0	64,0	32,2	67,8	33,2	66,8
Applied professionals	45,8	54,2	44,3	55,7	45,3	54,7	43,5	56,5	44,5	55,5
Support staff	26,7	73,3	26,0	74,0	30,1	69,9	25,3	74,7	24,4	75,6
Staff employed in services for the population, security and trade	34,2	65,8	35,3	64,7	33,9	66,1	40,0	60,0	39,1	60,9
Producers in agriculture, forestry and fishing	56,5	43,5	58,0	42,0	56,0	44,0	62,0	38,0	59,8	40,2
Skilled workers	70,4	29,6	72,6	27,4	74,2	25,8	73,6	26,4	80,5	19,5
Operators of facilities, machinery and transport equipment	68,9	31,1	67,9	32,1	68,4	31,6	67,3	32,7	69,5	30,5
Low skilled workers	57,9	42,1	57,6	42,4	58,3	41,7	58,5	41,5	58,1	41,9

Source: Calculated, using Employment and unemployment, National Statistical Institute, Sofia, 3/2003, 2/2004, 2/2005, 1/2006, 1/2007.

In the hierarchical structure of the working staff, women prevail in the positions of support staff, services for the population and commerce (more than 60%), applied professionals (more than 60%) and analytical specialists (about 67%). Women have more than 40% of the working places for low skilled workers and 30% of the managers positions.

The distribution of men and women by occupational classification well explains the difference in the level of payment by sex. Men dominate in the managers group (more than 60%), in the group of the high skilled workers (70 – 80%), operators of facilities, machinery and transport vehicles. As stated above, women dominate in the support staff, in the staff occupied in providing services to the population, in commerce, in the groups of applied professionals and analytical specialists.

The development in the employment of men and women by economic activities, occupational classification and status shows the deepening social and gender differentiation on the labour market, about the different interests and opportunities, which men and women have in the sphere of paid labour, about the access of women to employment and to self employment and own business.

These developments prove how slowly stereotypes and socially constructed notions on the gender of the entrepreneur and the manager change. How slowly stereotypes and socially constructed notions change on the persons who work in the sphere of services (skilled and low skilled) and on the idea about who must operate in the low-paid sectors and positions. Finally – who is going to do the non paid labour? Who is going to do the work for the members of the family and the household?

1.3.6. Payment of labour for women and for men: differentiation in payment by economic activities and by occupational classification

Among the basic guidelines for lowering of inequalities between women and men there is the idea of reducing the differences in the incomes they get and especially in the payment gap for equal work.

In Bulgaria, the actual legislation ensures equal pay for equal or equivalent work. The existing payment systems in the country, including the additional payments and the motivating payments (bonuses), do not provide for any differences in wage by sex. The situation in the collective bargaining is absolutely the same. Unfortunately, data from the monitoring of the National Statistical Institute and from other surveys, show that significant differences in the level of payment by sectors and by occupational classification still exist. To a significant extent, these differences are due to the positions of the persons, the form of employment, etc. For some sectors and professions these differences depend on the rate of non formal employment or of extra work, which is not declared and not paid. Differences can even depend on the rejection from employers' side to implement differentiation of payment, taking into account the level of education and vocational training.

Table 12. Wages by gender and economic activities (Gross salary per month - 2002).

ECONOMIC ACTIVITIES	TOTAL	MEN	WOMEN	WWPSM (%)
Total	283	312	255	81,7
Extractive industry	463	482	379	78,6
Processing industry	259	302	220	72,8
Production and distribution of electricity, gaseous fuels and water	456	474	403	85,0
Construction	255	254	258	101,6
Trade, repair of motor vehicles, motorcycles, personal and household goods	198	207	186	89,9
Hotels and restaurants	187	188	186	98,9
Transport, storage and communications	359	373	333	89,3
Financial intermediation	567	623	536	86,0
Real Estate and business services	247	237	266	112,2
State government; compulsory social securities	343	365	328	89,9
Education	272	312	261	83,7
Healthcare and social activities	263	324	246	75,9
Other community and personal services	226	239	213	89,1

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RATIOS BETWEEN THE HIGHEST AND THE LOWEST GROSS SALARY	3,03	3,31	2,88	72,8 – 112,2
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Source: Calculated, using “Salary Structure 2002”, National Statistical Institute, Sofia, 2004. Remark: WWPSM - Women’s wages as a percentage of salary for men.

The situation by occupational classification is almost the same: just in one of the groups of professions or other positions – supporting staff, the monthly gross salary of women is 4.8% higher than the salary of men. Relatively close are the monthly gross salaries of women and men for workers in agriculture, forestry and fishing and for low-skilled workers.

Table 13. Wages by gender and occupational classification (Gross salary per month in Bulgarian leva – October 2002).

	TOTAL	MEN	WOMEN	WWPSM (%)
Total	283	312	255	81,7
Managers	564	603	503	83,4
Analytical specialists	376	443	345	77,9
Applied professionals	330	390	298	104,8
Support staff	240	231	242	104,8
Staff employed in services for the population, security and trade	166	177	157	88,7
Producers in agriculture, forestry and fishing	190	195	186	95,4
Skilled workers	267	307	180	58,6
Operators of facilities, machinery and transport equipment	273	296	228	77,0
Low skilled workers	169	174	164	94,3
RATIOS BETWEEN THE HIGHEST AND THE LOWEST GROSS SALARY	3,3	3,47	3,06	58,6 – 104,8

Source: Calculated, using “Salary Structure 2002”, National Statistical Institute, Sofia, 2004. Remark: WWPSM - Women’s wages as a percentage of salary for men (WWPSM).

Using the data presented in the table above, we can reach the conclusion that, although the level of education is a key factor in determining the level of employment, the level of payment is much more determined by the respective

economical activity or sector. This conclusion explains the demotivation and the migration of young people with good education. Moreover, women with prestigious education can hope to get a job, but not necessarily better remuneration, corresponding to their high educational level. This situation puts in an even more unfavorable position lonely parents, which are mostly women.

Table 14. Wages by gender and education (Gross salary per month in Bulgarian leva – October 2002).

EDUCATION	TOTAL	MEN	WOMEN	WWPSM (%)
TOTAL	283	312	255	81,7
Primary education – 4-th class and lower	225	265	185	69,8
Primary education – 8-th class	219	251	178	70,9
Secondary education – 12-th class	244	271	212	78,2
Vocational education – graduated after high school	310	337	281	83,4
Higher education – graduated college (specialist degree)	284	351	260	74,1
Graduated university – bachelor's and master's degrees	408	479	362	75,6
Higher education – philosophy doctor's degree	544	570	505	88,6
RATIOS BETWEEN THE HIGHEST AND THE LOWEST GROSS SALARY	2,48	2,27	2,84	69,8 – 88,6

Source: Calculated, using "Salary Structure 2002", National Statistical Institute, Sofia, 2004. Remark: WWPSM - Women's wages as a percentage of salary for men.

Data (see table 14) show a very low differentiation in the level of payment by education. The payment of the highest educational and scientific degree – Philosophy Doctor (Ph. D.), which means about 20 years of studying is 2,5 times higher than the salary of the employed persons with the lowest educational level or without education (0-4 years at school).

At all educational degrees, women are with lower salaries – from 30 to 12%. The lower is the educational level, the higher is the difference in payment by sex. The conclusion is that prestigious education and high professional skills are factors that determine the respective higher employment rate and to some extent – the

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higher income level. In other words – in this case gender segregation is lower in favour of women, but at a higher price.

If we analyse the ratio of the gross salaries per hour, the situation is the same.

Table 15. Ratio women /men, (full time employed) by economic activities and occupational classification (Average gross salaries per hour – in levs, October 2002).

	GSPH - TOTAL	GSPH - MEN	GSPH – WOMEN	RATIO: WOMEN / MEN
Total	1,57	1,72	1,42	0,83
Managers	3,08	3,30	2,74	0,83
Analytical specialists	2,07	2,45	1,90	0,78
Applied professionals	1,82	2,14	1,65	0,77
Support staff	1,34	1,29	1,35	1,05
Staff employed in services for the population, security and trade	0,94	1,00	0,89	0,89
Producers in agriculture, forestry and fishing	1,04	1,05	1,03	0,98
Skilled workers	1,47	1,68	0,99	0,59
Operators of facilities,machinery and transport equipment	1,49	1,63	1,25	0,77
Low skilled workers	0,95	0,97	0,92	0,95

ECONOMIC ACTIVITIES	GSPH - TOTAL	GSPH - MEN	GSPH - WOMEN	RATIO: WOMEN / MEN
Extractive industry	2,53	2,64	2,06	0,78
Processing industry	1,42	1,66	1,21	0,73
Production and distribution of electricity, gaseous fuels and water	2,50	2,59	2,22	0,86
Construction	1,39	1,39	1,43	1,03
Trade, repair of motor vehicles, motorcycles, personal and household goods	1,11	1,16	1,04	0,90
Hotels and restaurants	1,05	1,06	1,05	0,99
Transport, storage and communications	2,01	2,06	1,91	0,93
Financial intermediation	3,19	3,49	3,02	0,87

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Real Estate and business services	1,40	1,36	1,48	1,09
State government; compulsory social securities	1,90	2,01	1,83	0,91
Education	1,52	1,73	1,45	0,84
Healthcare and social activities	1,45	1,78	1,36	0,76
Other community and personal services	1,26	1,32	1,19	0,90

Source: Calculated, using "Salary Structure 2002", National Statistical Institute, Sofia, 2004. Remark: GSPH - Gross salary per hour.

1.3.7. Reconciling work and family life. The distribution of the total work (paid and unpaid), between men and women – partnership or stereotypes?

The achievement of the objectives in this sphere requires the implementation and promotion of policies, which are in favour of families, including feasible, affordable and high quality child-care and care for other dependant members of the family, as well as parental leave and other leave schemes. National targets should be set in line with the situation of the country. It would be necessary to increase the accessibility of services, which provide care for children and for other dependent relatives. It would be necessary to pay particular attention to women and men, who return to paid employment after being absent and to take adequate measures.

The need for policies that really work in the field of childcare is determined by the dominant for the country practice of full-time work, extended hours and overtime work, work on several job contracts and others, that make it difficult to find a job for future mothers and mothers of small children (spoiling the access to employment) and make it impossible the reconciliation of work and family life not only for women, but even for men.

The analysis of the problem shows that men take two or more jobs in their life, much more than women.⁹ Men work until later in life after retirement. The results

⁹ "Working time, working conditions, demographic behavior", representative survey conducted in 2003 by a team of CPS at BAS, The Employment Agency in MLSP and prof. K. Vladimirova under the methodological guidance of French researchers, led by D. Kergoat from the laboratory "Gender and Social Relations" (GERS) in the Institute for Study of Contemporary Society (IRESO) at the National Center for Scientific Research (CNRS), Paris, France")

of the carried sociological surveys show that a significant part of respondents – men and women- work daily almost over eight hours and to most of them overtime is not paid and they are not compensated for the extended operating time. Payment in Bulgaria is most often per month and the price per hour falls significantly. The high occupational workload, fatigue and inability to recover energy to work and to develop must also be taken into account. Under these working conditions, women have significant problems. Some of them are over occupied and overloaded. They don't have enough time or don't have time at all to recover and to develop their energy to work. On their turn, these problems increase the stress at work, occupational diseases and other health issues. Fatigue and the health status, connected with it, reflect on the certainty in paid employment and on the status of the employee in it. Their high involvement in the sphere of unpaid labour, including birth and rearing of small children, limits their opportunity to remain at their workplaces for extra work and, for this reason, to keep their job. On the other hand, the high uncertainty in the sphere of paid employment was the reason for the development in domestic production, of work in the informal sector and of employment in more than one place.

The policies for reconciling family life and professional career of women and men should include work in domestic farms and similar occupations. In Bulgaria domestic farms are much more widespread than in other European countries.

The significant involvement of women in unpaid labour destroys the professional career of a number of them. One example is the situation of women in domestic farms, that are very common in Bulgaria. This kind of work occupies a significant part of the amount of time of the members of the household, especially of women. Besides, women's involvement in unpaid labour limits their access to the labour market and to other economic resources. Even at the beginning of the 21st century, there is still the traditional idea that work in the household, upbringing and education of children and many other obligations are primarily the responsibility of women, including employed women, even when the husband is unemployed or has retired. In the best case, men "help". The so called "double loading" of women is in practice "triple". Most of the home and household

activities are done by women. The last is valid mainly for women in villages and in the small towns.

Finally, we can conclude that the differentiation between women and men increases both in paid employment and in unpaid labour. The inequality by sex increases. The discrimination by sex differs by groups of age. The uncertainty in employment is higher for women in comparison with men.

1.4. Public policies for renewable energy in Bulgaria

On 12th June 2008, The Council of Ministers voted a National Long Term Program for promoting the utilization of biomass for the period 2008 – 2020.

It is specified in the program that the share of biomass in the final consumption of electrical energy in 2020 must reach 10.7%. The biggest users are going to be the households – 55.8%, followed by the transport sector – 25.4%.

One of the main prescriptions of the program is that until 2020, about 38% of the utilized biomass will be used for producing of electrical energy and heat. This quantity of biomass corresponds to 837,000 tons of oil equivalent or about 9.7 TWh electrical and thermal energy. 70% of the above-mentioned quantity of biomass will be used for the production of heat, while 30% to produce electrical energy.

Taking into account the provisions of the EU legislation, related to the promotion of biofuels in the transport sector, national objectives for consumption of biofuels in Bulgaria are given in the National long term program for the promotion of the use of biofuels in transport for the period 2008 – 2020. In the determination of the national objectives, Bulgaria must take into account the Directive 2003/30/EC and the new objectives to increase the share of renewable energy, particularly biofuels, adopted by the European Council (08 – 09 March 2007).

The objectives defined for biofuels in these documents are:

- indicative objective of 5.75 percent for 2010;

- binding objective of 10 percent for biofuels, from the total consumption of gasoline and diesel fuel in the EU transport, until 2020. This binding objective has to be achieved in an economic effective manner.

According to some reliable surveys, Bulgaria has sufficient space to ensure the biofuel production with the necessary raw materials for this purpose, without adversely affecting the food industry.

2. Social dialogue for female employment in renewables

2.1. Description of the case study

The National Statistical Institute does not provide any systematized information on the Renewable Energy Subsector in Bulgaria. We adopted a specific approach, which is suitable for the survey from our point of view. Our idea was to identify the “organised” enterprises and employers in the Renewable Energy Subsector in Bulgaria.

This is why we prepared a list of the organizations, focused on the issues of renewable energy. These are not social partners’ organizations (yet) – their activities are concentrated on the technical and economic issues of the implementation of Renewable Energy Sources. The list of these organizations consists of:

- ASSOCIATION OF PRODUCERS OF ECOLOGICAL ENERGY – APEE (Асоциация на производителите на екологична енергия - АПЕЕ);
- BULGARIAN PHOTOVOLTAIC ASSOCIATION – BFA; (Българска фотоволтаична асоциация- БФА);
- “ALLIANCE OF THE PRODUCERS OF ECOLOGICAL ENERGY – BG” (SPEE-BG); (Съюз на производителите на екологична енергия - БГ);
- BULGARIAN UNION OF THE PRODUCERS OF PREFABRICATED HOUSES (BSPSK) (Съюз на производителите на сглобяеми къщи).

Using the techniques of “legal business intelligence”, we prepared two lists of the full membership of these associations, including all the necessary data about member companies – names of the companies, addresses, the so-called Unified Information Codes (*Единни информационни кодове*).

The full list of the companies and enterprises – that are members of the organizations and focusing on the issues of renewable energy forms a matrix of the “Organized Enterprises in the Renewable Energy Sector in Bulgaria” (OERES in BG). This matrix was called “MATRIX OERES in BG – 120”. It consists of enterprises and companies that are members of APEE, BFA, SPEE-BG and BSPSK.

A second matrix, quite similar to the first one, called “MATRIX OERES in BG – 106” was composed of enterprises and companies – members of APEE, BFA and SPEE-BG. The main difference between the two matrices is in the inclusion of the enterprises – members of BSPSK. They are included in “MATRIX OERES in BG – 120” but excluded from “MATRIX OERES in BG – 106”. This is the reason why the first matrix consists of 120 enterprises and companies, while the second one consists of 106 enterprises and companies.

The survey for the Renewable Energies (Sub)sector was carried out using both matrices, in a comparative way. The information for this part of the survey was provided by the National Social Security Institute (NSSI), on the basis of a special assignment of the Union for Private Economic Enterprise (UPEE).

From the described survey, we got the following important results, which provide a picture of the socio-economic context of the organized employers in the Renewable Energies (Sub)sector:

- Number of employees in organized enterprises in the Renewable Energy (Sub)sector in Bulgaria 2009-2010.
- Distribution of the enterprises, following the number of the insured persons.
- Distribution of the ensured persons, following their age.
- Distribution of the insurance income (without taking into account the cases of zero incomes).

- Distribution of employees (with labour contracts or civil servants), following their incomes.

All data, obtained through the survey of the Renewable Energies (Sub)sector are provided in Appendix No. 8.

The survey of the socio economic context and human resources in the enterprises and companies, which are involved in the biomass utilization, was based on a similar (but not exactly the same) approach like the one adopted for enterprises in the Renewable Energy Subsector. It has been already mentioned in the introduction of this paper that, in the case of biomass utilization, the point was not to get a list of enterprises, representative for the subsector, but to manage to prepare a list which consists of all of the companies, which really operate in it. For this reason, the matrix of enterprises, which operate in the field of biomass utilization, is not a “representative sample” - it is almost a full list of all the companies involved in the mentioned activity.

Here we have to give explanations on the method of composing of the matrix of enterprises, which operate in the field of biomass utilization – “MATRIX BIOMASS”. Different approaches have been used for the identification of these companies, due to the specific fact that in Bulgaria the companies which operate in the field of biomass utilization are not focused only on this activity. While the prevailing share of the enterprises, included in “MATRIX OERES in BG – 120” and in “MATRIX OERES in BG – 106” are focused mainly on the production of electrical energy from renewable sources (it is their basic activity), the companies which operate in the field of biomass utilization have as a rule parallel activities.

That is why specific techniques - something like “scientific investigations” and “legal business intelligence” were necessary to identify the list of the elements of “MATRIX BIOMASS”.

Three main sources of information were used while composing “MATRIX BIOMASS”.

The first one is the list of the founders of the “Association for utilization of biomass for energy producing purposes” (Association ERATO - *Асоциация за енергийно оползотворяване на биомасата*). The list of the fourteen founders of

the Association is given in Appendix No 4, attached to the case study. A number of companies, where the founders of the Association are either managers or owners, operate in the field of biomass utilization.

The second one is the list of companies, involved in biomass utilization, which have received so called BEERECL loans and grants (Bulgarian Energy Efficiency and Renewable Energy Credit Line). The list of the enterprises, which have borrowed such BEERECL loans is given in Appendix No 5, attached to the case study.

The BEERECL has been established to support industrial energy efficiency and small renewable projects in the private sector. From April 2004 till January 2010, the €100 million BEERECL facility has developed 149 sustainable energy projects, disbursed loans for €81.4 million and provided incentive grants for €13.7 million to project developers. These projects have annually reduced Bulgaria's CO₂ emissions by over 570,000 Mt CO₂ eq. and replaced 891,324 MWh of electrical capacity from the Kozloduy Nuclear Power Plant with green energy sources, enough to cover the electricity consumption of about 282,000 homes.

The EBRD funds are complemented by the Kozloduy International Decommissioning and Support Fund (KIDSF) grant funding. Contributors are the European Union, Austria, Belgium, Denmark, France, Greece, Ireland, Spain, Switzerland, the Netherlands and the United Kingdom. KIDSF provides grant support to overcome barriers still faced by borrowers in developing/financing and implementing sustainable energy investments.

The KIDSF grants provide: a completion fee to borrowers ranging up to 15% of the BEERECL loan amount. The grant funds also provide free consulting services to borrowers. The KIDSF also focuses international support on essential investment projects within the Bulgarian energy sector. These investments help achieve the country's strategic energy objectives, as outlined in the 2003 Bulgarian Energy Law, e.g., securing supplies, guaranteeing nuclear safety and improving energy efficiency.

The EBRD has agreed to a second extension of the BEERECL facility through 30 June 2011 to continue on-lending through local banks to private industrial

companies in Bulgaria to finance energy efficiency and small renewable energy projects. The extension adds up to €55 million to the existing BEERECL portfolio. Discussions are currently taking place with potential participating banks. To date United Bulgarian Bank and UniCredit-Bulbank have agreements with EBRD to participate in the extended credit line. (<http://beerecl.com/cms/?q=en/about>)

The third source was the advertising of different companies, involved in biomass utilization. A number of such companies advertised using different techniques, including advertising on the Internet.

The results derived from “MATRIX BIOMASS” are really quite representative, because the enterprises and companies included in it, are almost all the companies working in the field of utilization of biomass in Bulgaria and were familiar to the staff that carried out this survey.

All the data, obtained through the survey of the cluster of enterprises, involved in biomass utilization is given in Appendix No. 9. The data obtained consist exactly of the same parameters obtained above for the Renewable Energies (Sub)sector.

Every single enterprise in Bulgaria declares its basic economic activity. The practice is that enterprises operate in several economic activities. This is the reason why enterprises have to declare their basic economic activities. This is necessary for statistical reasons and because of the necessity of setting social security thresholds.

If we make a comparison between the types of basic economic activities in the case of the Renewable Energy (Sub)sector and of the cluster of the identified enterprises (those involved in the utilization of biomass), we found out that there are significant structural differences between the two cases.

Some significant basic economic activities in the case of the Renewable Energy (Sub)sector are: Construction of electric transmission and distribution and telecommunication networks; Generation, transmission and distribution of electricity; Manufacture of engines and turbines, except aircraft, vehicle and motorcycle.

We must add to this list also some other important activities, although not exactly “core” ones: Mining of metal ores, Manufacture of products from other non-metallic mineral non-processed materials; Manufacture of computer and communication equipment, electronic and optical products; Manufacture of electrical equipment and Activities financed by the state budget.

On the other hand, the significant basic economic activities in the case of the identified enterprises, which are involved in the utilization of biomass are: Production and distribution of heat; Manufacture of paper and paper board and articles thereof; Manufacture of machinery and equipment with general and particular purpose; Manufacture of furniture.

There is a list of basic economic activities, declared for both enterprises in the Renewable Energy (Sub)sector and in the cluster, involved in the utilization of biomass. These are as follows: Agriculture, livestock breeding, hunting, forestry and fishing; Production of timber and timber products, except furniture; Manufacture of chemical products; Production of metal articles, except machinery and equipment; Construction; Wholesale and retail trade with motor vehicles and motorcycles, maintenance and repair; Hotels, restaurants, travel agents and tourist operators activity; Financial and insurance activities; Activities in the field of information technologies. Information services; and Research and development activities.

Finally, we can not ignore some basic activities that are insignificant from the employment point of view: Wholesale of pharmaceutical goods, medical equipment and apparatuses; Air transport; Production and distribution of gaseous fuels through mains.

Some comparisons of the socio-economic contexts of the Renewable Energy (Sub)sector and of the cluster of enterprises, involved in biomass utilization in Bulgaria were carried out, based on the data described above. These comparisons include:

- Comparison between the number of employees in the organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and the number of employees in

the list of identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

- Comparison between the distribution of enterprises, following the number of ensured persons in organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.
- Comparison between the distribution of the ensured persons according to their age in the organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and the identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.
- Comparison between the distribution of the insurance income in the case of the organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and the identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.
- Comparison between the distribution by income of the employees (with labour contracts or civil servants), in organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and in identified enterprises, which are involved in the utilization of biomass in Bulgaria 2009-2010.
- Comparison of the distribution of ensured persons by basic economic activities in the enterprises from the Renewable Energy (Sub)sector and in the identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

All the results of the comparisons carried out are given in details in Appendix No. 10.

The social partners involvement (effective or potential) in promoting equal opportunities and gender equality is analysed in the case study. Special attention is paid to:

- the positive and negative effects of industrial relations, social dialogue and collective bargaining on the gender pay gap.
- Trade union project activities in search of best practices in gender mainstreaming in Bulgaria.

- some Bulgarian Trade union views on the relationship “sector collective bargaining – women employees’ rights”.
- the use of collective bargaining for protection of women rights in the framework of the Bulgarian industrial relations. Collective bargaining in the Power Engineering Sector and protection of women rights.
- the potential of social dialogue for accelerating training for green jobs in Bulgaria.
- the possibility of tackling the gender pay gap through revising job classifications with the existing social dialogue instruments.
- the possibility to adopt legislation, in support of collective bargaining focusing on gender issues.
- gender equality and representation, specially the issue on promoting equal opportunities through increasing women union membership.
- social partners participation in a specialized body for ensuring equal treatment of women and men.

Also a picture of the social dialogue in the Renewable Energies (Sub)sector is presented. It includes the identification of current, potential and emerging social partners in the Renewable Energies (Sub)sector. Moreover, this overview includes some possible scenarios on the institutional building of the social dialogue in the renewable energy (sub)sector. Three possible scenarios are presented and discussed:

- Zero scenario.
- An option for incorporating Social Dialogue for the Renewables in the current system of Social Dialogue in the Power Engineering (electricity) sector.
- An option for institutionalizing a relatively independent system of social dialogue in the Renewable Energies (Sub)sector.

Finally the case study proposes some significant conclusions, based on the data obtained through the surveys carried out and on the comparisons made.

2.2. Social partners involvement (effective or potential) in promoting equal opportunities and in promoting gender equality.

2.2.1. On the positive and negative effects of industrial relations, social dialogue and collective bargaining on the gender pay gap.

We agree with those researchers who specify that: “Trade union membership, industrial relations and collective bargaining are believed to affect the gender pay gap. The potential influence of social partners can be of a direct nature through negotiations over pay or of an indirect nature through the creation of working conditions and a social environment that is favourable to a more equal share of work and pay. The presence of a collective agreement or works council at company level is expected to narrow the gender pay gap by compressing the wage distribution within the economic sectors or the company. The centralised wage bargaining, rather than company-level bargaining, as well as the introduction of minimum wages should narrow the gender pay gap by reducing pay differences between economic sectors and occupations”¹⁰.

There is still some doubt about the fact that: “Segregation of representation however – such as the high presence of trade unions in male-dominated sectors – exerts a reverse impact on the gender pay gap”¹¹. In this sense, when we speak about the total economy of the state, the fact that the biggest sector trade unions in Bulgaria are the teachers’ unions (which are female dominated) possibly softens

¹⁰ A.M. Ponzellini, Ch. Aumayr, F. Wolf, *Addressing the gender pay gap: Government and social partner actions*, European industrial relations observatory on-line, Id.: TN0912018S, 27. 04. 2010, www.eurofound.europa.eu/eiro/studies/tn0912018s/tn0912018s_5.htm

¹¹ Ibid. Only a few national studies produced empirical results in this respect. In Ireland, a quantitative study found that centralised wage bargaining – and specifically the implementation of a national wage agreement – benefited women working full time and part time. However, high levels of trade union membership among men widened the gender pay gap.

In Sweden, the Swedish Trade Union Confederation (*Landsorganisationen i Sverige*, LO) tries to level out wages, while the industrial collective agreement (*Industriavtalet*) sets the standard for all other sectors in the economy.

Finland reports that dispersed negotiation and local agreements result in women not possessing enough negotiating power. A German study found that if a company is bound to a collective agreement or has a works council, the gender pay gap is reduced substantially – by five percentage points in the case of a works council.

to some extent the gender pay gap, or at least blocks the reverse impact on the gender pay gap. But on the other hand, the power engineering sector, the renewable energy (sub)sector and the industry for utilizing of biomass are a “man’s world”. So we can not be sure that the development of social dialogue in the renewable energy (sub)sector and in the industry for utilizing of biomass, will not contribute to the widening of the gender pay gap¹².

Some evidence shows, for instance in Bulgaria and in UK, that the introduction of minimum wages or social security thresholds seems to narrow the gender pay gap. However, if this minimum rate is set at very low levels – such as the Interprofessional Minimum Salary in Spain, which amounted to 35% of the average salary in 2001 – it may fail to exert an impact on the level of the overall gender pay gap¹³.

Anyway, we must always take into account that apart from bargaining over pay, collective bargaining over other topics, as well as other related instruments, have the potential to indirectly influence the gender pay gap: the creation of working conditions favourable to both women and men – and helping to reconcile family and work duties – lies at the heart of these policies. At company level, transparency over pay, overcoming horizontal segregation at workplaces, the support of work–life balance, the organisation of working time and the existence of some family-friendly policies, such as career breaks, have the potential to reduce the gender pay gap.

¹² A Hungarian adjustment study found that having a collective agreement in the organisation correlates with a wider gender pay gap. This result might be explained by the prevalence of collective agreements in male-dominated sectors. Look at: A. Rigler and M. Vanicsek, *Gender inequalities in the labour market. Decomposition of the gender pay gap in Hungary*, BérBarométer project – Equal H 005, 2008.

¹³ A. M. Ponzellini, Ch. Aumayr and F. Wolf, *Addressing the gender pay gap: Government and social partner actions*, European industrial relations observatory on-line, Id.: TN0912018S, 27. 04. 2010, www.eurofound.europa.eu/eiro/studies/tn0912018s/tn0912018s_5.htm

2.2.2. Trade union project activities in search of best practices in gender mainstreaming in Bulgaria.

Speaking about gender mainstreaming and bipartite social dialogue in Bulgaria, we are obliged to mention some serious trade union project activities. In the frame of a common project ¹⁴, carried out by Italian, Bulgarian, Romanian and Turkish trade unions ¹⁵, was prepared a “Guide to Negotiation and Organisation”¹⁶ for the trade union organizations. The aim of the guide is to be used, on one hand to improve negotiations by adapting them to women, and on the other hand to help trade unions to create an internal culture and practice of equal opportunities.

In the mentioned “Guide to Negotiation and Organisation” we can identify one example of best practice in the field of Bulgarian bipartite social dialogue. (Unfortunately, this is the only one best practice example from Bulgaria). This is the case of the negotiations in CUMERIO MED AD (AD is the Bulgarian abbreviation for a joint stock company - JSC).

The best practice example presented below, gathers in one place all the different good practices, which could be identified in the Bulgarian industrial relations and collective bargaining practice.

The description of the best practice is as follows ¹⁷:

BEST PRACTICE from CITUB, Bulgaria

Company: CUMERIO MED AD

The owner of CUMERIO MED AD is the German company “Aurubis”. The CUMERIO MED AD is the only company in Bulgaria, with metallurgy production, refinery of cathode copper, production of sulphuric acid and ore dressing. The total number of workers is 800, 15% of which are women. The members of the Trade Union Federation “Metalitsi” are made up of 447 workers of which 15% are women. The trade union

¹⁴ ISCOS-Cisl, “*Improving Gender mainstreaming within Trade Union Organisations in Bulgaria, Romania and Turkey*”, Co-financed by European Union, DG employment and Social Affairs VS/2007/0380

¹⁵ Partner organisations in the project are: (1) BULGARIA : Istur-CITUB, (2) ROMANIA: BNS, Cartel-Alfa, CSDR, CNSRLFRATIA, (3) TURKEY: CNI, representing DISK, KESK, HAK-is, TURK-is (3) ITALY: FIM-Cisl and CISL National Women’s Coordination.

¹⁶ The guide was written by Giuseppina Cazzaniga (FIM-Cisl)

¹⁷ ISCOS-Cisl, *Guide to Negotiation and Organisation*, Project “Improving Gender mainstreaming within Trade Union Organisations in Bulgaria, Romania and Turkey”, Co-financed by European Union, DG employment and Social Affairs VS/2007/0380, 2008, 9.

<p>density is 55.9%.</p> <p>Territorial level: Pirdop, Sofia region</p> <p>Organisation: Trade union organisation “Metalitsi” of CITUB (“Metalitsi” – metal workers).</p> <p>Action description:</p> <p>1) Objectives:</p> <ul style="list-style-type: none"> - Establishment and maintenance of social harmony on the basis of equality and mutual recognition and balance of interests. - Achievement of Collective labour contract terms, aiming to combine family interests with occupational development. <p>2) Activities (target groups): Inclusion in the Collective labour contract (CLC at company level) of additional measures and social activities, besides those defined by the law as means for improving quality of life and attracting women to trade unions in the workplace.</p> <p>Mothers and single parents with two children under 18 years old use 2 days additional paid leave.</p> <ul style="list-style-type: none"> - When children begin school mothers with children use reduced (4 hours) working day. - Employers cover kindergarten expenses of their workers as it is in the CA: for the second child 75%; and for the third – 50%; for fourth and every subsequent child – 25%; - The employer ensure free breakfast for free for pregnant women to a value of BGN 2 per day - Each year employers organise and pay for summer camp for children under 16 years old. - Employers pay additional amounts for national holidays and leave, guarantee free medical examinations, ensure monthly meal vouchers, compulsory and additional insurance is paid for by the employer. <p>3) Results and resources involved:</p> <ul style="list-style-type: none"> - Establishment of good corporate environment in the company - Lower absenteeism rate of employees with family obligations - Increasing labour productivity and company productivity balance <p>Obstacles encountered:</p> <ul style="list-style-type: none"> - Insufficient exchange of good practice with other organisations in order to increase the information of the CA parties.
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2.2.3. Some Bulgarian Trade union views on the relationship “sector collective bargaining – women employees’ rights”

The problems of the relationship “sector collective bargaining – women employees’ rights” in the Bulgarian context can be illustrated by the text of the resolution of the National Round Table “Protection of women specific rights in the collective labour contracts”. (The National Round Table took place on June 18-th 2003 in Sofia, Bulgaria). The resolution, called “APPEAL”, consists of nine requests, that can be classified as follows: four out of nine requests are connected with the reinforcement of collective bargaining at sector level in general. These

requests are focused on the strengthening of sector bargaining as a procedure and as an element of social dialogue. This requires the urgent signing of a National agreement on the scope and the procedure framework of sector and branch collective labour contracts.

A quite similar request is the one for passing a “Law on collective bargaining in Bulgaria”. It does not affect directly the issue of women employees specific rights protection through the collective bargaining process.

Exactly of the same type is the request for “including collective bargaining as a fundamental right of the employees in the Constitution of the Republic of Bulgaria.

Again of the same type is the request to the Minister of Labour “to outspread the negotiated issues in the sectoral and branch collective labour contracts which concern the protection of women employees’ specific rights and interests”. The point is that the possibility of “outspreading” sectorial collective labour contracts was adopted in the Labour Code in 2001, but the first “extension” took place in 2009. For years, there was no precedent of “outspreading”, which can trigger the adoption of the idea of outspreading the negotiated issues in sectorial and branch collective labour contracts, which concern with the protection of women employees’ specific rights and interests.

Another two points from the “APPEAL” are formulated as requests, focused on the rights of women employees, but “de facto” their implications concern social dialogue as a whole. These two points do not concern specific women employees’ rights, but important issues related to the implementation of labour legislation.

In reality, the request for “effective control of the authorized government bodies for ensuring the implementation of the prescriptions of the labour legislation and of negotiated collective labour contracts concerns the protection of women employees’ rights”. The truth is that through the whole “transition period”, trade unions were pressing (and still go on pressing) the government to reinforce the General Labour Inspectorate and to ensure health and safety at work. This activity of the trade unions concerns a global problem of Bulgarian industrial relation:

employers support the requests for ensuring health and safety at work, but their potential to invest in improving working conditions is quite limited.

We can say almost the same for the next request to “develop and implement step by step Systems for the evaluation of work and salary mechanisms, as a factor which can guarantee equal pay for equal work”.

Only the last two points from “APPEAL” concern the specific problems of women employees. Unfortunately, they are not directly connected to the protection of specific women employees’ rights in the process of collective bargaining.

The first request is for “developing a legal mechanism, which can guarantee equal opportunities for both men and women in the field of employment and professional career”. The developing process must be accelerated with the participation of the social partners in the National Council for Tripartite Cooperation.

The second request is for “establishing a civic forum for discussing the problems of women employees, maternity, family and children”. The forum must be attached to the National Assembly (the Parliament). Trade unions, employers’ organizations and NGO-s have to be represented in the Forum, which is going to support the work of the standing committees in the National Assembly.

Visibly the last two requests are mainly concerned with the legal regulation of specific problems of women employees, but not with the collective bargaining processes at sectorial, branch or enterprise levels.

The presented comments on the “APPEAL” by participants in the National Round Table “Protection of the specific rights of women employees in the collective labour contracts”, illustrate the relatively moderate requests of the Bulgarian trade unions in the field of protection of women employees rights in the collective labour contracts.

2.2.4. The use of collective bargaining for protection of women's rights in the framework of the Bulgarian industrial relations. Collective bargaining in the Power Engineering Sector and protection of women rights.

It is out of doubt that the most concrete measures for the protection of women employees' rights within the framework of the Bulgarian industrial relations, take place in the section "Working hours, breaks and holidays" of collective labour contracts at sectorial and enterprise levels.

A special attention is paid to agreements for the use of leave under Article 168 of the Bulgarian Labour Code. The peculiarity in this case is that the right to use leave for industrial workers and office employees – mothers of two or more living children up to the age of 18, provided in Article 168, is valid only if it is negotiated in the collective labour contract at company level.

The agreements about the implementation of Article 168 are provided in the Labour Code: "a woman employee with two living children up to the age of 18 has the right to use two additional days of leave; a woman employee with 3 or more living children up to the age of 18 has got the right to use four additional days of leave for every year ...".

There are both positive and negative exceptions. For example, in one analysis of sector and branch collective labour contracts signed in the period 2002 – 2003 in Bulgaria, 9 sector and 50 branch collective contracts were checked, with a focus on the negotiated issues negotiated concerning Article 168¹⁸. The analysis shows that in 8 cases out of 9 of sector labour contracts an agreement on the right to use the leave, following Article 168 was included. The leave corresponds to the number of days, specified in the Labour Code. Only in the "Electronics and electrical" sector the parties have not reached any agreement on Article 168.

From the 50 branch collective labour contracts surveyed, an agreement which follows exactly Article 168 is reached in 34 branches. In 12 branches an

¹⁸ E. Markova, *The Collective Labour Contract at sectoral and Branch Level – an Instrument for protection the rights of women employees*, National Round Table "Protection of the specific rights of women employees in the collective labour contracts", Proceedings, ILO Project "Promoting of Fundamental Rights at the workplace and reinforcing of the trade union structures in Bulgaria and Romania", financed by the German government, Sofia, June 2003, 12.

agreement on the additional leave of mothers – employees was not reached and the issue remained to be discussed on enterprise level.

In several sector / branch collective labour contracts the parties have reached agreements with number of days for additional mothers leave, which is lower than the prescription of the Labour Code. Surely, such kind of agreements are not legal and binding.

In several sectors and branches employers were much more cooperative and the parties reached agreements with better conditions than for the text of Article 168 in the Labour Code. These are the cases in the Building sector and in the “Water supply, sewerage and water processing” branch. Better conditions are negotiated in the “Processing of fruits and vegetables” branch, in the system of the Central Co-operative Union and in the “Hail Suppression” Executive Agency of the Ministry of Agriculture.

There are much more detailed surveys on the terms on women employees rights, negotiated in sectorial and branch collective contracts¹⁹. Here, we can find detailed comparisons of the terms negotiated in sectorial and branch collective labour contracts for the period 2001 – 2004. Three detailed comparative clusters are presented:

- *Cluster 1* – Branch and sectoral collective labour contracts – terms negotiated, concerning Article 168 of the Labour Code. The table is based on 46 collective labour contracts, signed in the period September 09th 2001 – June 01st 2004.
- *Cluster 2* – Collective labour contracts at agency and directorate level in the State Administration – terms negotiated, concerning Article 168 of the Labour Code. This kind of collective labour contracts in Bulgaria are treated as sectoral (branch) as well. The table is based on 14 collective labour contracts, signed in the period March 21st 2001 – March 11th 2004.
- *Cluster 3* – Collective labour contracts at company level – terms negotiated, concerning Article 168 of the Labour Code. These are collective labour contracts

¹⁹ R. Gladicheva, R. Zheleva, T. Detchev, *Bulgarian Employers and women at the labour market (Diagnosis of gender equality)*, Centre for women studies and policies, Sofia, 2004 (in Bulgarian), 22 – 36 and 44 - 86.

in big state companies, which can be treated as whole branches (Bulgarian State Railroads, Bulgarian Telecommunication Company (before being privatized and before the development of private telecommunications), Bulgarian Posts, etc.) The table is based on 19 collective labour contracts, signed in the period May 31-st 2001 – June 01st 2004.

We must take into account that the second survey, based on three comparative clusters, is much more detailed. It covers 79 sectoral and branch collective labour contracts, classified in three categories. These collective labour contracts cover the whole period March 21st 2001 – June 01st 2004.

The comparative analysis, carried out on the basis of the prepared three clusters of collective labour contracts, does not contradict, but confirm to a great extent, the conclusions reached above in E. Markova's work.

In this way, we can address the issue dealing with the results from the bipartite social dialogue in the Power Engineering (electricity) sector, which concern women rights.

Table No 16. Additional days leave for women with 2, 3 and more children, negotiated following article 168 of the labour code.

No.	COLLECTIVE LABOUR CONTRACT, ADDITIONAL AGREEMENT, ANNEX	Signed on:	Agreed for women with 2 children	Agreed for women with 3 or more children
1	BRANCH COLLECTIVE LABOUR CONTRACT No. 08 / 05. 06. 2003.	02. 06. 2003	2 days leave	4 days leave
2	COLLECTIVE LABOUR CONTRACT No. 24 / 04. 06. 2004.	01. 06. 2004	2 days leave	4 days leave
3	BRANCH COLLECTIVE LABOUR CONTRACT No. 16 / 11. 10. 2005.	30. 09. 2005	2 days leave	4 days leave
4	COLLECTIVE LABOUR CONTRACT No. 19 / 12. 06. 2006.	29. 05. 2006	2 days leave	4 days leave
5	BRANCH COLLECTIVE LABOUR CONTRACT No. 20 / 30. 10. 2007.	25. 10. 2007	2 days leave	4 days leave
6	COLLECTIVE LABOUR CONTRACT No. 22 / 10. 07. 2008.	03. 07. 2008	2 days leave	4 days leave
7	BRANCH COLLECTIVE LABOUR CONTRACT No. 21 / 19. 10. 2009.	06. 10. 2009	2 days leave	4 days leave

We can conclude that, in the Power Engineering Sector, there is a more than sustainable trend, to negotiate additional days of leave for women with 2, 3 and

more children, following article 168 of the Labour Code. It is almost guaranteed that, if collective bargaining in the Renewable Energy (Sub)sector starts functioning in the future, the approach on this type of women rights will be the same.

2.2.5. On the potential of Social dialogue for accelerating training for green jobs in Bulgaria

From our point of view, Bulgarian social dialogue is a good means to negotiate the issues of vocational education and training, including training for green jobs (e. g. specialized apprenticeship and other training initiatives).

There is an enormous potential and possibility for vocational education and training to appear as one of the most substantial issues in social dialogue, concerning the renewable energy (sub)sector.

First of all, the issue is quite important for both trade unionists and employers.

Secondly, there is an established tradition of social partners' cooperation in the field of vocational education and training. The National Agency for Vocational Education and Training (NAVET) is an example of the good practices of social dialogue at national level, which can facilitate social dialogue at sectorial and subsectorial levels.

The Managing Board of the NAVET ²⁰ is a tripartite body, with an equal number of seats of the Government (representatives of various ministries and agencies), of the national representative trade unions and of the national representative employers' organizations.

On the other hand, the Expert Commissions²¹ of the NAVET are numerous and there is a strong presence of trade union and employers' representatives from the representative sector and branch organisations.

²⁰ NAVET – Managing Board - www.navet.government.bg/en/nappo/navet_struct_en/managing_board_en.

²¹ NAVET – Expert Commissions - www.navet.government.bg/en/nappo/navet_struct_en/exp_comm_en.

2.2.6. On the possibility of tackling the gender pay gap through revising job classifications with the existing social dialogue instruments

It has been acknowledged that, in some countries, the gender pay gap may be a consequence of men's and women's jobs being evaluated differently, with 'typical' female occupations being undervalued. In order to address this possibly unfair and stereotyped job analysis and evaluation, social partners of a number of countries have tackled the issue of revising job classifications.

In Belgium, the Institute for the Equality of Women and Men²² was constituted to reform the system of classifying jobs under the federal EVA project²³, with the aim of reducing pay differences between women and men. At the level of social partners, Belgium's equal pay policy has been primarily targeted to discrimination in occupational classification.

An increased number of sectoral joint committees have been addressing the issue of an analytical job classification scheme, which is considered as a key element for enlarging gender neutrality in pay schemes.

In the UK, two agreements, called the 'Single Status' and the 'Agenda for Change' agreements, were respectively negotiated in local government and the National Health Service (NHS). The underlying aim of the agreements is to bring all employees within a common and equal grading and pay structure. However, the partial implementation of these agreements has led to large numbers of equal pay claims²⁴.

A further example of how to address gender neutral job classification can be found in Lithuania, where a 'model collective agreement' is used as a basis for drawing up collective agreements in enterprises and organisations. In relation to the implementation of the principle of fair remuneration for work, national social

²² Institut de l'égalité des femmes et des homes / Instituut van de Gelijkheid van Vrouwen en Mannen - <http://igvm-iefh.belgium.be/>.

²³ IEFH – IGVM, *Classification de fonctions sexuellement neutres afin de supprimer l'inégalité salariale*, Projet EVA 2001-2006 pour une classification de fonctions sexuellement neutres, www.igvm.be/eva/index.php?fr_intro.

²⁴ M. Hall, *Landmark court on equal pay bargaining*, European industrial relations observatory on-line, Id.: UK0808029I, 22. 09. 2008, <http://www.eurofound.europa.eu/eiro/2008/08/articles/UK0808029I.htm>

partners recommend applying the Methodology for the Assessment of Jobs and Positions. This methodology is based on the assessment of a job (position) using eight main factors: education, professional experience, levels of positions and management, scope of decision making and freedom of action, autonomy and creativity at work, responsibility, work complexity, and conditions of work²⁵.

Referring to the Bulgarian case, on the one hand we have the tripartite managed National Agency for Vocational Education and Training (NAVET), with its tripartite Managing Board and Expert Commissions. Even these institutions are enough powerful and motivated to propose a revision of job classifications if such a step can help bridge the gender pay gap. On the other hand the possible establishing of tripartite concertation at subsectorial level (Subsectoral Council for Tripartite Concertation) for the Renewable Energy (Sub)sector could be a powerful instrument for putting on the agenda of the Bulgarian industrial relations the issue of revising job classifications in the Renewables.

2.2.7. On the possibility to adopt legislation, in support of collective bargaining focusing on the issues of gender equality

An interesting option can be the idea of an innovative approach – the adoption of legislation in support of collective bargaining. This kind of idea could appear if the potential developing social dialogue in the Renewable Energy (Sub)sector is really focused on the issues of gender equality. The focusing of social dialogue on the equal treatment of women and men, could possibly facilitate the reaching of consensus on the proposal and adoption of a legislation in support of collective bargaining on gender issues. This idea sounds as really exotic, as far as it is quite innovative even in the European context, but it could be a real breakthrough in the gender issues approach in the Bulgarian industrial relations.

In just two countries – namely, France and Italy – legislation supporting collective bargaining has been reported. France adopted a new law to supplement existing

²⁵ I. Blaziene, *Signing of the first national bilateral agreement*, European industrial relations observatory on-line, Id.: LT0507102N, 05. 07. 2005, <http://www.eurofound.europa.eu/eiro/2005/07/inbrief/LT0507102N.htm>

measures – that is, the 2001 ‘Génisson law’ – which obliges companies with more than 50 employees to carry out collective bargaining on occupational equality. The law also provides for a multi-industry agreement on gender balance and gender occupational equality, which was signed by all social partners in 2004. The law seeks to be innovative by imposing time constraints on negotiators. It requires the abolition of pay gaps by the end of 2010 – in the framework of mandatory annual pay bargaining in sectors and companies – and makes results compulsory²⁶.

In Italy, Law No. 69 of 2009²⁷, Article 38 (*‘Misure per conciliare tempi di vita e tempi di lavoro’*) provides grants to employers that promote, in agreement with the trade unions, some positive actions for life–work reconciliation to the benefit of dependent and self-employed workers.

2.2.8. Gender equality and representation. Promoting equal opportunities through increasing women union membership

Since the matter of trade union membership and trade union density in Bulgaria is extremely delicate, we are going to present a long analysis from a survey, carried out by the trade union think tank ISTUR – Institute for Social and Trade Union Research. The survey²⁸ comments on trade union strategies for recruiting new groups of workers in Bulgaria. The text is quite informative about the priorities of the trade unions in their campaigns for membership reinforcing:

“In Bulgaria, there is no active public debate on trade union representation and membership and their recent developments. The issue has usually gained momentum in periods when the official censuses of trade union members, national

²⁶ A. M. Ponzellini, Ch. Aumayr and F. Wolf, *Addressing the gender pay gap: Government and social partner actions*, European industrial relations observatory on-line, Id.: TN0912018S, 27. 04. 2010, http://www.eurofound.europa.eu/eiro/studies/tn0912018s/tn0912018s_6.htm

²⁷ Parlamento Italiano, Legge 18 giugno 2009, n. 69 “Disposizioni per lo sviluppo economico, la semplificazione, la competitività nonché in materia di processo civile”, pubblicata nella *Gazzetta Ufficiale* n. 140 del 19 giugno 2009 - Supplemento ordinario n. 95, <http://www.parlamento.it/parlam/leggi/09069l.htm>

²⁸ N. Daskalova, *Trade union strategies to recruit new groups of workers – Bulgaria*, European industrial relations observatory on-line, Id.: BG0901029Q, 14. 05. 2010, www.eurofound.europa.eu/eiro/studies/tn0901028s/bg0901029q.htm.

negotiations or industrial action and strikes are conducted. In these cases, usually the media and the public have been divided on the advantages and disadvantages of individual trade unions and their representativeness. Increasingly, voices of liberal research argue that trade unions are an anachronism of the industrial era which is not adequate to meet new realities and values.

Ongoing debates on representation and membership are typical for trade union organisations, especially for CITUB and the Confederation of Labour ‘Podkrepa’. During most of their forums and organisational events, they discuss these issues.

Trade union debates and activities are mostly focused on the membership declining and the reasons for this situation. They underline the need for further organisational development and restructuring to face with the challenges of dynamic development and reforming the economy and labour market, as well as changing employees’ attitudes to trade unions and solidarity. CITUB and CL Podkrepa emphasise the need to reform their organisations from top to bottom in order to overcome the membership decline and to expand trade union activities to sectors and specific groups with a low union presence, such as small enterprises, companies in the private sector, the information and communication technologies (ICT) industry, minority workers, young workers and ‘atypical’ workers.

In fact, trade union representation in private companies – especially the new established enterprises and small and medium-sized enterprises (SMEs) – is considered the weakest link, requiring special organisational measures. A particular attention is also devoted to the recruitment of young people in trade unions and their training and capacity building, as well as the need for generational change and the promotion of young people into leadership positions. Following the discussions in the organisations, both trade union confederations include organising measures in their programmes and resolutions (CITUB – “Programme 2007–2011”, CL Podkrepa “Strategy and Programme 2007 - 2011”) and other policy documents.

CITUB considers the enlargement of its social base and organisation as a main priority. Along with the more general discussion on the declining membership and action needed at all forums, CITUB devoted two of its national conferences to the

issues of membership and organising. At its fourth conference ‘Motivation for membership and organising: New reality – new responses’, CITUB emphasised the need to overcome the mismatch between the structure of the organisation and the new structure of employment. The main points of the debate are the following: the questionable effectiveness of some of the actions undertaken; the inadequacy of the structures and mechanism of organisations; the internal and external challenges requiring changing policy; the need to establish the right balance between organisational trade unionism and trade unionism based on services; and how to make best use of scarce financial and human resources at all levels of the system”.

Our observations coincide with the findings of the above mentioned survey. Increasing women union membership is not a priority for Bulgarian trade unions. This is the reason why we do not expect that the trade unions are going to rely on the “representation instrument” – to promote equal opportunities and gender equality through increasing women union membership.

2.2.9. Social partners participation in a specialized body for ensuring equal treatment of women and men

In Bulgaria social partners have access to the National Council for equal treatment of women and men. It is a consultative body, attached to the Council of Ministers. The Council:

- consults the Council of Ministers;
- gives opinion on legal regulations and other acts and documents, which regard the equal treatment of women and men;
- gives opinion on acts of the Council of Ministers on their correspondence with the aims of the followed policies on the equal treatment of women and men;
- coordinates the actions of the state institutions and the non-government organizations, following the national policies of equal treatment of women and men and the international legal obligations of Bulgaria in this field;

- alone or together with Commission for Protection Against Discrimination, proposes measures to follow national policies on equal treatment of women and men in Bulgaria;
- contacts similar bodies abroad and international organizations with similar aims and spheres of action;
- supports important national and regional level projects of social partners and the non-government organizations in the field of equal treatment of women and men and of reconciling work and family life and reports the achieved results;
- organizes research work, concerning issues connected with the activities of the Council.

The National Council coordinates its activities with the Commission for Protection Against Discrimination, with the National Ombudsman and with the Presidents Council for National Development.

The National Council for equal treatment of women and men consists of:

- Chairman – the minister of labour and social policy;
- Members.

The members of the National Council for equal treatment of women and men are permanent and associated.

Permanent members are representatives (one person per each institution) of: Ministry of Labour and Social policy; Ministry of Education and science; Ministry of foreign affairs; Ministry of Justice; Ministry of Interior; Ministry of Defense; Ministry of Finance; Ministry of Healthcare; Ministry of Economics, Power Engineering and Tourism; Ministry of Agriculture and Forestry; Ministry of Regional Development and Public Works; Ministry of culture; Ministry of Environment and Water Resources; Ministry of Transport; The State Agency for Protection of Children; The State Agency for Refugees, The National Social Securities Institute; The National Statistical Institute; The Directorate “Ethnical and Demographic Issues” of the Council of Ministers.

The associated members of the National Council for Equal Treatment of Women and Men are representatives of other organizations, scientific institutes, the national representative organizations of social partners and other non-

governmental organisations invited by the chairman of the National Council. The associated members have only consultative voice in the activity of the National Council.

Visibly, the role of the representative organisations of social partners in the work of the National Council is deeply underestimated. This can explain why, in different comparative studies, researchers do not consider the National Council for Equal Treatment of Women and Men as a “body, which deals with gender equality in employment”.

2.3. A vision on social dialogue in the Renewable Energies (Sub)sector

We can try to make a hypothetic picture of social dialogue in the Renewable Energies (Sub)sector in the future. Such a vision needs:

- to point out the current, potential and emerging social partners;
- to formulate different possible scenarios on the institutional building of the social dialogue in the renewable energy (subsector).

2.3.1. Current, potential and emerging social partners in the Renewable Energies (Sub)sector

We can start with a simple formula:

CURRENT SOCIAL PARTNERS IN THE POWER ENGINEERING SECTOR =
CURRENT SOCIAL PARTNER IN THE RENEWABLE ENERGY
SUBSECTOR

Also we must take into account the presence of emerging social partners in the Renewable Energy Subsector. Such organizations are social partners' organizations, which operate in other sectors and branches, but due to some developments in the economy and in the Power Engineering Sector, they can become real social partners in the Renewable Energy Subsector. Such organizations come mainly from the forestry, wood processing and agriculture,

due to the big potential of the use of biomass in the Bulgarian Renewable Energy Subsector.

The third interesting category in our analyses is the one of the potential social partners in the Renewable Energy Subsector. These organizations are actually focused on the technical aspects of the implementation of the Renewable Energy Industries. There is a big possibility for such organizations to evolve in the direction of joining social dialogue, mainly as employers' organizations.

2.3.1.1. Actual social partners in the Power Engineering Sector

- Bulgarian Branch Chamber of Power Engineers – BBKE (*Българска бранишова камара на енергетиците - ББКЕ*). It is an employers' organization, representative at sectoral level, member of the Bulgarian Industrial Association.
- National Federation of Power Engineers in Bulgaria – NFE (*Национална федерация на енергетиците в България - НФЕ*). It is a trade union organization, representative at sectoral level, member of the Confederation of Independent Trade Unions in Bulgaria.
- Independent Trade Union Federation of Power Engineers in Bulgaria (*Независима синдикална федерация на енергетиците в България*). It is a trade union organization, representative at sectoral level, member of the Confederation of Independent Trade Unions in Bulgaria.
- Federation “Power Engineering” – CL “Podkrepa” (Федерация „Енергетика” – КТ „Подкрепа”). It is a trade union organization, representative at sectoral level, member of the Confederation of Labour “Podkrepa”.

2.3.1.2. Emerging social partners in the Renewable Energy Subsector

- Federation of Trade Unions in Forestry and Wood Processing Industries – FSOGSDP (Федерация на синдикалните организации от горското стопанство и дървопреработващата промишленост - ФСОГСДП). It is a trade union organization, representative at sectoral level, member of the Confederation of Independent Trade Unions in Bulgaria.

2.3.1.3. Potential social partners in the Renewable Energy Subsector

- Association of Producers of Ecological Energy – APEE (Асоциация на производителите на екологична енергия - АПЕЕ). Potential employers' organization in the social dialogue in the Renewable Energy Subsector.
- Bulgarian Photovoltaic Association – BFA (Българска фотоволтаична асоциация -БФА). Potential employers' organization in the social dialogue in the Renewable Energy Subsector.
- Alliance of the Producers of Ecological Energy – BG (SPEE-BG) (Съюз на производителите на екологична енергия - БГ). Potential employers' organization in the social dialogue in the Renewable Energy Subsector.
- Bulgarian Union of the Producers of Prefabricated Houses – BSPSK (Български съюз на производителите на сглобяеми къщи - БСПСК). Potential employers' organization in social dialogue in the Renewable Energy Subsector.

2.3.1.4. Other organizations, which can play role in the sector

There are some organizations that, although they will not become social partners for sure, can play a definite role in the development of the Renewable Energy Subsector as a whole. Such organizations are:

- The Association of Bulgarian Energy Agencies – ABEA (Асоциация на българските енергийни агенции - АБЕА).
- Passive Buildings Information Group (Сдружение „Информационна група пасивни сгради България”).

2.3.2. Possible scenarios on the institutional building of the social dialogue in the renewable energy (subsector)

It is important to underline that many enterprises in the Bulgarian Power Engineering Sector, although theoretically belonging to the Renewable Energy (Sub)sector, promote social dialogue at sectoral level, either through collective bargaining at sectorial level or through the collective bargaining at enterprise level in the National Electric Company.

These are mainly old enterprises - state owned hydropower plants. The National Electric Company JSC is the owner of 29 hydro power plants with a total installed capacity of 2563 MW in turbine regime and 943 MW in pumping mode²⁹.

These hydropower plants are deeply integrated in the traditional social dialogue at sectorial and company levels. The level of protection of women rights in these enterprises corresponds to the state of the art as presented above for the Power Engineering Sector and for the National Electricity Company³⁰.

Due to these specific reasons, these power plants to a big extent stay away from the discussions, related to the Renewable Energies (Sub)sector. We cannot say that we have identified specialized social dialogue for the Renewable Energies (Sub)sector, notwithstanding the participation of these hydropower plants, especially in collective bargaining at the National Electricity Company.

Therefore, we acknowledge that social dialogue in the renewable energy sector still needs to be developed and institutionalized.

2.3.2.1. Zero scenario

There are many factors which can slow down or even stop for a period of time the process of social dialogue in the Renewable Energy (Sub)sector. In fact, most of the enterprises in the Renewable Energy (Sub)sector are new and private.

A big part of them are small enterprises. The share of the enterprises, without employees in January 2010 is 26.42 – 25.00%³¹.

²⁹ The basic production of electric power for the company is generated by fourteen relatively big hydro power plants, with total installed capacity of 2480 MW. They are grouped into four cascades: Belmeken – Sestrimo – Chaira, Batak, Vacha and Lower Arda. They are intended to cover the peak loads and to regulate the parameters of the electrical power system.

The efforts of the National Electricity Company are focused mainly on rehabilitation and modernization of the big power plants, on the building of new ones and on the expansion of the existing ones.

³⁰ Look at the table “ADDITIONAL DAYS LEAVE FOR WOMEN WITH 2, 3 AND MORE CHILDREN, NEGOTIATED FOLLOWING ARTICLE 168 OF THE LABOUR CODE”.

³¹ In the case of the Renewable Energies (Sub)sector, we give two values, due to the fact that we take into account two matrices (data bases) - MATRIX OERES in BG – 106 and MATRIX OERES in BG – 120. In the case of the cluster of enterprises, involved in the utilization of biomass, we give one value, because we take into account one matrix (data base) - MATRIX BIOMASS.

The share of enterprises with 1 to 10 employees is between 46.23 and 43.33%. For the last year (January 2009 – January 2010) the share of these enterprises increased of more than 10%.

The share of enterprises with 11 to 50 employees is 18.87 – 22.50%. The share of enterprises with 51 to 100 employees is 2.83 – 3.33% and the share of the enterprises with more than 101 employees is 5.66 – 5.83%.

The domination of the small, medium and micro- enterprises in the Renewable Energies (Sub)sector is visible.

Usually in such enterprises, trade union structures do not exist, wages are relatively high and legal labour and insurance standards are followed in a proper way by employers.

It is symptomatic that there is not a substantial gap between the average insurance income of the employees, working with a labour contract and the average insurance income of managers. For one year, the average insurance income of the employees increased from 950,69 levs to 1084,44 levs in January 2010. On the other hand, the average insurance income of managers is almost one and the same – from 1373, 67 levs it reached 1392,22 levs. In July 2009 there was even a decrease of the managers' average insurance income – it was 1369,86 levs. The number of managers is small in comparison with the number of the employees – 45 managers for 4746 employees, or less than one per cent.

The employees in the Renewable Energies (Sub)sector, with an income going from 500.01 to 1000 levs in January 2010 are between 32.92 and 35.00%. On the other hand, employees with incomes in the interval 1000.01 - 2000 levs are between 46.95 and 46.84% (!). The share of employees with an income per month in the interval 1500.01 - 2000 levs increased in one year from 15.95 to 29.06% (16.01 to 28.93%).

These circumstances are not favourable to the trade unionisation of the Renewable Energies (Sub)sector and to the development of social dialogue. The combination of enterprises, which are largely new, private, small or medium-sized (even micro-) companies, with relatively well paid workforce is not a favourable environment for establishing trade union structures. This combination creates the

conditions for the realization of a “zero scenario” in the future of social dialogue in the Renewable Energies (Sub)sector.

Much different is the picture of the enterprises, which are involved in the utilizing of biomass. This sector is dominated by small and medium-sized enterprises, just like in the Renewable Energies (Sub)sector, but here the share of enterprises without hired workers is much larger and impressive – 48.86% (the good news are that for one year, their share decreased with 5.69%).

The share of the enterprises with 1 to 10 employees is 26.14% - for one year it increased by 7.96%. The enterprises with 11 to 50 hired employees are 14.77%. Relatively higher, in comparison with the Renewable Energies (Sub)sector, is the share of enterprises with 51 to 100 employees – 7.95%. The share of enterprises with more than 100 employees is 2.27% - for one year it decreased with 3.41%.

The picture of the incomes of the people employed in the enterprises, involved in the utilization of biomass, is very different in comparison with the Renewable Energies (Sub)sector. While the average insurance income of managers is 1410 levs (in one year it increased with 116.51 levs), the average insurance income of employees is 695.19 levs. For one year it increased by only 24.25 levs.

If we give a look at the real incomes of employees in enterprises involved in biomass utilization, we see that the majority of them are positioned in the interval of incomes from 500.01 to 1000 levs – 49.91%.

The group of employees, who earn 1000,01 – 1500 levs is visibly smaller – 10.75%. The group of employees, who earn 1500.01 – 2000 levs is incomparably smaller – 5.16%, which contrasts sharply with the situation in enterprises from the Renewable Energies (Sub)sector. The group of employees with low incomes – from 240.01 to 500 levs is too big – 29.72%.

At first glance, it could be said that there are better possibilities for the development of trade union structures, respectively – of social dialogue, in the cluster of enterprises involved in the utilization of biomass. But we cannot forget the following facts:

- the cluster of enterprises involved in the utilization of biomass, just like the Renewable Energies (Sub)sector, is dominated by private, small and medium-sized (even micro-) enterprises.
- the enterprises involved in the utilization of biomass have another field of economic activity, which very often is their basic business. Usually, the utilisation of biomass is a parallel activity or one of several economic activities of the enterprise.

In this sense, in these enterprises the motivation for trade unionization could be high. On the other hand, in some of these enterprises, bipartite social dialogue is established – there is collective bargaining at enterprise level. Employers of these enterprises participate in the activities of branch organizations, which are parties in the sector social dialogue – tripartite and bipartite. But, these enterprises are incorporated in social dialogue on the basis of their core business.

For this reason, we can be sure that the cluster of enterprises, involved in the utilization of biomass, will be strongly fragmented with regard to its participation in social dialogue – real or potential.

Therefore it is possible to experience a lack of social dialogue (tripartite or bipartite) in the Renewable Energies (Sub)sector and in the cluster of enterprises involved in the utilization of biomass.

2.3.2.2. The option for incorporating Social Dialogue for the Renewables in the current system of Social Dialogue in the Power Engineering (electricity) sector

At first glance, development in enterprises involved in the production of electricity from renewable sources is expected to simply bring the expansion of social dialogue at tripartite and bipartite levels in the Power Engineering sector.

Following this way of thinking, we can expect that these enterprises could find their place in the already existing and experienced Bulgarian Branch Chamber of Energetic - BBCE (Bulgarska branshova kamara na energetizite / Българска браншова камара на енергетиците), or create new employers' organisations.

These organizations will have to enter the functioning system of tripartite concertation in the Power Engineering Sector and in the bipartite social dialogue.

On the other hand, the branch federations of the trade unions will have to search for approaches, how to “get a step” in the new enterprises for production of electricity from renewable sources (and to some extent – in the enterprises, which utilize biomass) and to create trade union sections there.

Such forecasts seem to be acceptable, as far as such a development looks feasible with minimum efforts. But in this scenario some substantial circumstances, which could be considered serious obstacles to its implementation, have been omitted.

The most important factor is the profound contradiction between the current members of the BBCE, covered by social dialogue in the Power Engineering Sector and enterprises involved in the production of electricity from renewable sources. The BBCE is strongly dominated by enterprises belonging to the spheres of nuclear power engineering and to thermo power engineering. Their managers are almost hostile towards “green energy” enterprises, although they are tempted to launch such projects themselves.

An additional obstacle is the fact that, the social dialogue at enterprise level in Bulgaria is used as a channel for lobbying on different issues and problems of the respective businesses. The creation of the Consultative Council, with the participation of the BBCE and the executive power, was already mentioned. The possible expansion of social dialogue in the direction of covering enterprises for producing electricity from renewable sources and companies involved in the utilization of biomass, will lead to the inclusion of their representatives in the Consultative Council and in other similar bodies. Such an option will not be tolerated by the current members of the BBCE.

For these reasons, we can conclude that social dialogue in the Renewable Energies (Sub)sector, as well as in the enterprises using biomass, is unlikely to be institutionalized within the existing framework of social dialogue (tripartite and bipartite) in the Power Engineering Sector.

2.3.2.3. The option to institutionalize a relatively independent system of social dialogue in the Renewable Energies (Sub)sector

The most probable scenario seems to be the one in which the institutionalization of social dialogue will be initiated within the frame of the industry to produce electricity from renewable sources and possibly in some of the enterprises involved in the utilization of biomass.

A possible model could be the approach adopted in the Transport Sector, where instead of a sector tripartite council, five additional subsector councils have been creating, thus reflecting the presence of different types of transports. In the same way it could be reasonable (and to a great extent - possible) to initiate the creation of several subsectoral councils for the Renewables:

- for enterprises producing electricity with the help of photovoltaic devices;
- for enterprises producing electricity in micro hydro power plants;
- for enterprises producing electricity through the exploitation of wind power generators;
- for enterprises producing electricity by utilizing biomass for energy purposes.

On the other hand, reaching subsector collective labour contracts for the four types of enterprises is pretty possible. Here we must consider that a substantial part of the enterprises producing electricity through the utilization of biomass, are involved in the bipartite social dialogue in other sectors. For this reason, collective bargaining in enterprises producing electricity through the utilization of biomass, will be hard to achieve.

If we take once again into account the experience of the Transport sector, a “mega” collective labour contract, with a broad framework nature for all kinds of “green energy” could be possible, but it is certainly not the most suitable tool.

From the standpoint of protection of women rights, the third option for the institutionalization of social dialogue in the subsector of “green energies” is the most promising. The creation of separate subsector tripartite councils, following the types of renewable energies, will create possibilities for a more differentiated approach to the specific problems of women and especially to possible measures for addressing the gender pay gap.

Such an architecture of social dialogue in the Renewable Energies (Sub)sector and in the cluster of enterprises using biomass, would contribute to a better cooperation and coordination in taking measures against the gender pay gap at national level.

3. Conclusions

We can draw some significant conclusions on the basis of the data obtained through the surveys and the comparisons which were made.

C. 1. Women are better represented in the identified enterprises, involved in the utilization of biomass in Bulgaria than in the organized enterprises of the Renewable Energy (Sub)sector.

It is visible from the comparisons carried out so far that the ratio women / men is more favourable for women in the case of the identified enterprises involved in the utilization of biomass in Bulgaria. On the 1st January 2009, women in these enterprises were 31.19% of the total number of employed persons in this particular cluster.

The difference between the ratio women / men was the highest on 1st January 2009. At that moment, women in the Renewable Energy (Sub)sector were 25.73% of the total compared to the above-mentioned 31.19% of women in enterprises involved in the utilization of biomass. The difference is 5.46%, in favour of women in enterprises involved in the utilization of biomass.

On the 7th January 2009 the difference was reduced to 1.22% (26.37% - women RES in comparison with 27.59% - women biomass).

After that, there is a slight increase in the difference in favour of women in enterprises involved in the utilization of biomass. On the 10th January 2010, the difference is 2.79%.

Unfortunately, employment of women in the cluster of enterprises involved in the utilization of biomass, appeared to be more sensitive to the crisis in comparison with women in the Renewable Energy (Sub)sector.

C. 2. The effect of the financial and economic crisis on the enterprises from the Renewable Energy (Sub)sector and the identified enterprises involved in the utilization of biomass in Bulgaria.

The organized enterprises of the Renewable Energy (Sub)sector and the list of identified enterprises, which are involved in the utilization of biomass in Bulgaria are very different groups. It may look strange but enterprises involved in the utilization of biomass, are not exactly a part or sub level of the Renewable Energy (Sub)sector. The activities of the prevailing majority of the organized enterprises of the Renewable Energy (Sub)sector are focused on the production of electricity from renewable sources. Vice versa, the activities of the identified enterprises involved in the utilization of biomass in Bulgaria, are spread in a plenty of directions; the utilization of biomass is an additional, parallel activity for the prevailing part of the identified enterprises, who work in this field. Due to these particular reasons, enterprises involved in the utilization of biomass, can be treated as a specific extension of the Renewable Energy (Sub)sector.

In Bulgaria, in the period January 2009-July 2010, the economy was affected by the financial crisis in the worst way. We can make an exact comparison of the reduction of working places in the cluster of the identified enterprises involved in the utilization of biomass, for the period January 2009 – July 2010 (see the tables below).

Table 17. Reduction in the working places in the renewable energy (sub)sector and in the cluster of enterprises, involved in the utilization of biomass in the period January 2009 – July 2010.

MATRIX OERES in BG - 106

	Total	Reduction	MEN	Reduction	WOMEN	Reduction
01. 2009	5471	-	4048	-	1423	-
07. 2009	5233	4,35%	3842	5,09%	1391	2,25%
01. 2010	5040	7,88%	3715	8,23%	1325	6,89%

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MATRIX OERES in BG - 120

	Total	Reduction	MEN	Reduction	WOMEN	Reduction
01. 2009	6023	-	4473	-	1550	-
07. 2009	5727	4,91%	4217	5,72%	1510	2,58%
01. 2010	5550	7,85%	4107	8,18%	1443	6,90%

MATRIX BIOMASS

	Total	Reduction	MEN	Reduction	WOMEN	Reduction
01. 2009	1930	-	1328	-	602	-
07. 2009	1392	27,88%	1008	24,10%	384	36,20%
01. 2010	1247	35,39%	888	33,18%	359	40,37%

It is easy to find out that the total number of jobs in the two clusters has reduced for the whole period by 7.88% for enterprises in the Renewable Energy (Sub)sector, but by 35.39% (!) for the enterprises involved in the utilization of biomass. In the Renewable Energy (Sub)sector, women were hit by the crisis a little bit less than men. Jobs for women were reduced by 6.89%, while jobs for men were cut by 8.23%. The situation in the cluster of the identified enterprises involved in the utilization of biomass is exactly the opposite. The reduction in working places for women is dramatical – 40.37% in comparison with 33.18% for men.

We can conclude that employment in the cluster of the identified enterprises involved in the utilization of biomass was influenced by the crisis in a very negative way. Such an evaluation is valid both in absolute terms and in comparison with the Renewable Energy (Sub)sector. The reduction in the total number of working places by 35.39% can be evaluated as dramatical. Women in the cluster perceived the effect of the crisis in a quite severe way.

C. 3. Small, medium-sized and micro- enterprises dominate both in the Renewable Energy (Sub)sector and in the cluster of the identified enterprises, which are involved in the utilization of biomass.

This conclusion is visible from the comparisons carried out so far. The first phenomenon we want to underline is the big proportion of enterprises without employees. On the 1st January 2010, 25% of the enterprises in the Renewable Energy (Sub)sector and 48.86% (almost one half !) of the identified enterprises involved in the utilization of biomass were without employees.

There could be plenty of reasons for which an enterprise has zero employees.

- The worst hypothesis is that the enterprise has frozen its activities.
- Another purely negative reason could be if the enterprise has “plunged” in the “grey economy”, avoiding the prescriptions of the labour legislation.
- A possible and acceptable reason could be the total outsourcing of the company’s activities.
- Another possible reason could be to avoid signing of job contracts (labour contracts) using some form of civil relationship between employer and workers. Similar possible reason could be the use of some form of atypical employment.

The good news is that the number of enterprises with zero employment is falling, both for the Renewable Energy (Sub)sector and for the cluster of the identified enterprises involved in the utilization of biomass.

Table 18. Percentage of enterprises with zero employment.

	January 2009	July 2009	January 2010
Renewable Energy (Sub)sector	33,33%	26,66%	25,00%
Biomass utilization	54,55%	51,14%	48,86%

The share of enterprises with 1 to 10 employees and with 11 to 50 employees is lower for the enterprises involved in the utilization of biomass in comparison with the Renewable Energy (Sub)sector. A simple reason could be the fact that the cluster of the enterprises involved in the utilization of biomass was hit by the crisis harder than the Renewable Energy (Sub)sector and the number of enterprises with zero employment is pretty higher in it.

Anyway, we can conclude that small, medium-sized and micro- enterprises visibly dominate both the Renewable Energy (Sub)sector and the cluster of the enterprises involved in the utilization of biomass.

Table 19. Percentage of small, medium and micro- enterprises (with o - 50 employees).

	January 2009	July 2009	January 2010
Renewable Energy (Sub)sector	89,99%	90,83%	90,83%
Biomass utilization	88,64%	87,51%	89,77%

The share of small, medium-sized and micro- enterprises is a little bit higher in the case of the Renewable Energy (Sub)sector, but we can really consider this difference as insignificant.

C. 4. The age structure of the Renewable Energy (Sub)sector and of the cluster of enterprises involved in the utilization of biomass is quite similar.

This conclusion is based on the comparison between the distribution of the ensured persons according to their age in the case of the organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and the identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

We can make the results of the comparison even more visible by presenting the differences between the percentage of the different age groups for the Renewable Energy (Sub)sector and for the cluster of enterprises involved in the utilization of biomass.

Table 20. Differences in the percentage of the different age groups.

	RES - BIOMASS 01. 2009	RES - BIOMASS 07. 2009	RES - BIOMASS 01. 2010
Age 19 – 30 years	3,90%	2,83%	2,51%
Age 31 – 40 years	3,27%	3,97%	2,77%
Age 41 – 50 years	4,37%	4,45%	4,48%
Age 51 – 60 years	- 9,15%	- 8,49%	- 6,67%
Age more than 60 years	- 2,41%	- 2,81%	- 3,09%

Differences are not significant for all age groups, with the exception of the group of employees aged 51 to 60 years. Anyway, we can conclude that the age structure of enterprises from the Renewable Energy (Sub)sector and the enterprises from the cluster, which are involved in the utilization of biomass is quite similar.

C. 5. There are some significant differences between the average insurance income for different categories of economic active persons in the Renewable Energy (Sub)sector and in the cluster of enterprises involved in the utilization of biomass – self-employed, persons with management contracts, persons with contracts following a civil relationship and employees with labour contracts (or civil servants).

This conclusion is visible from the comparison between the distribution of the insurance income in the case of the organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and the identified enterprises, which are involved in the utilization of biomass.

There is a visible instability in the differences between the average insurance income for the Renewable Energy (Sub)sector and for enterprises involved in the utilization of biomass in the case of self-employed and in the case of relationships which are not employment contracts.

Table 21. Instability in the trends regarding the differences between the average insurance income for the renewable energy sector and for enterprises involved in the utilization of biomass.

	DIFFERENCE 01. 2009 Average insurance income	DIFFERENCE 07. 2009 Average insurance income	DIFFERENCE 01. 2010 Average insurance income
Self Employed	-25,87%	-15,58%	17,93%
Contract following a civil relationship (not employment relationship)	-25,06%	33,18%	40,48%

On the other hand, we find more stability in the differences between the average insurance income for the Renewable Energy (Sub)sector and for enterprises involved in the utilization of biomass in the case of the management contracts and in the case of employees with labour contracts and civil servants.

Table 22. Stability in the trends regarding the differences between the average insurance income for the renewable energy sector and for enterprises involved in the utilization of biomass.

	DIFFERENCE 01. 2009 Average insurance income	DIFFERENCE 07. 2009 Average insurance income	DIFFERENCE 01. 2010 Average insurance income
Management Contract	4,02%	-0,29%	-5,41%
Employee with a labour contract or civil servant	28,68%	36,87%	35,19%

The significant differences in the average insurance income, prove again that enterprises involved in the utilization of biomass in Bulgaria are not simply a “sublevel” of the Renewable Energy (Sub)sector.

VI. 6. The distribution of the employees (with labour contracts or civil servants), by income, is different for the Renewable Energy (Sub)sector and for the cluster of identified enterprises involved in the utilization of biomass.

This conclusion is derived from the comparison between the distribution of employees (with labour contracts or civil servants), according to their incomes in the case of the organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and the identified enterprises, which are involved in the utilization of biomass in Bulgaria, given in V. 5. 2.

If we make a comparison, we can easily see that the structure of the workforce according to employees’ salaries is more favourable for employees in the Renewable Energy (Sub)sector.

Table 23

	RES 01. 2009 Number of employees	BIOMASS 01. 2009 Number of employees	RES 07. 2009 Number of employees	BIOMASS 07. 2009 Number of employees	RES 01. 2010 Number of employees	BIOMASS 01. 2010 Number of employees
Up to 240 levs	3,52%	4,80%	5,72%	7,63%	5,02%	4,46%
From 240,01 to 1000 levs	60,97%	78,94%	50,73%	79,03%	48,14%	79,63%
From 1000,01 to 2000 levs	35,51%	16,25%	43,54%	13,34%	46,84%	15,96%

It is easy to point out that, in the case of the Renewable Energy (Sub)sector, the number of employees with salaries between 240.01 – 1000 levs is decreasing, while the number of employees with salaries in the interval 1000.01 – 2000 levs, is increasing. Both trends are stable in the surveyed period.

Table 24. Differences in the distribution of the employees according to their income for the renewable energy (sub)sector and for the cluster of enterprises involved in the utilization of biomass.

	RES - BIOMASS 01. 2009	RES - BIOMASS 07. 2009	RES - BIOMASS 01. 2010
Up to 240 levs	- 1,28%	- 1,91%	0,52%
From 240,01 to 500 levs	- 18, 12%	- 15,98%	- 14,5%
From 500,01 to 1000 levs	0,15%	- 12,32%	- 16,99%
From 1000,01 to 1500 levs	7,72%	6,5%	7,16%
From 1500,01 to 2000 levs	11,54%	23,70%	23,77%

Also the significant differences in the distribution of the employees, according to their income, prove again that enterprises involved in the utilization of biomass in Bulgaria, are not simply a “sublevel” of the Renewable Energy (Sub)sector.

C. 7. The comparison of the distribution of ensured persons by basic economic activities in the enterprises from the Renewable Energy (Sub)sector

and in the identified enterprises involved in the utilization of biomass, shows that there are significant structural differences between them.

This fact has been already discussed and proved. In this way we can come to the final observation that the core, basic activities, typical for the two surveyed cases are:

Table 25

CORE, BASIC ECONOMIC ACTIVITIES FOR THE RENEWABLE ENERGY (SUB)SECTOR	CORE, BASIC ECONOMIC ACTIVITIES FOR THE ENTERPRISES, INVOLVED IN THE UTILIZATION OF BIOMASS
Construction of electric transmission and distribution and telecommunication networks;	Production and distribution of heat;
Generation, transmission and distribution of electricity;	Manufacture of paper and paper board and articles thereof;
Manufacture of engines and turbines, except aircraft, vehicle and motorcycle.	Manufacture of machinery and equipment with general and particular purpose;
	Manufacture of furniture

Remark: Activities carried out both by companies in the Renewable Energy (Sub)sector and in enterprises involved in the utilization of biomass are not included in the table.

APPENDIX No. 1

List of the organized enterprises in the Renewable Energy (Sub)sector in Bulgaria 2009 – 2010, which form MATRIX OERES in BG – 106.

№	Name	Address
1	“Alpha Energy Holding” JSC „Алфа Енерджи Холдинг” ЕАД	Sofia, Bulgaria, 7 Sheynovo str. София, ул. „Шейново” №7
2	“Arco Solar Bulgaria” Ltd. „Арко Солар България” ООД	Sofia, Bulgaria, 23 Nikola Slavkov str. София, ул. „Никола Славков” №23
3	“Arni - Brothers” Ltd. „Арни - Братърс” ООД	1408 Sofia, Bulgaria, zh. k. Strelbishte, bl. 12, entr. A, floor 6, ap. 20 София-1408, ж.к. „Стрелбище”, бл. 12, вх. А, ет. 6, ап.20

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4	“BCI” Ltd. „Би Си Ай” ООД	Sofia, Bulgaria, 25 Vitosha blvd. София, бул. „Витоша” №25
5	“B Sys” Ltd. „Би Сис” ООД	Sofia, Bulgaria, 5 Prof. Milko Bichev str., entr. B, floor 6, ap. 18 София, ул. „Проф. Милко Бичев” №5 , вх. Б, ет. 6, ап.18
6	“Bio Power” JSC „Био Пауър” АД	Sofia, Bulgaria, 8 Kaloyan str., floor 4 София, ул. „Калоян” №8, ет.4
7	“BN Consult” Ltd. „БН Консулт” ЕООД	Sofia, Bulgaria, 23 Moskovska str., floor 4, ap. 12 София, ул. „Московска” №23 , ет. 4, ап.12
8	“BNRG Bulgaria” Ltd. „БНРГ България” ООД	Plovdiv, Bulgaria, 9B Lyuben Karavelov blvd., floor 2, ap. 4 Пловдив, бул. „Любен Каравелов” №9Б , ет.2, ап.4
9	“Brest Energy” Ltd. „Брест Енерджи” ООД	Gulyantzi municipality, Bulgaria, 5971 Brest village, 1 Stopanski dvor Общ. Гулянци, с. Брест-5971, Стопански двор №1
10	“Varna Solar” Ltd. „Варна Солар” ООД	Avren municipality, Bulgaria, Zdravetz village, 7 Parva str. Общ. Аврен, с. Здравец, ул. „Първа” №7
11	“JB Solar” Ltd. „Джей Би Солар” ООД	Sofia, Bulgaria, 51 Evlogi Georgiev blvd., floor 5 София, „Евлоги Георгиев” №51, ет. 5
12	“General Leasing” JSC „Дженерал Лизинг” АД	Sofia, Bulgaria, 27B Moskovska str., floor 2, ap. 4 София, ул. „Московска” № 27Б , ет. 2, ап.4
13	“GLB - Bulgaria” Ltd. „Джи Ел Би - България” ООД	Sofia, Bulgaria, Kukush str., bl. 60 София, ул. „Кукуш”, бл.60
14	“Euro Energy Consulting” Ltd. „Евро Енерджи Консултинг” ООД	Sofia, Bulgaria, 101 Georgi Sava Rakovski str., София, ул. „Г.С. Раковски” №101
15	“ECOEL BG” Ltd. „ЕКОЕЛ БГ” ООД	Burgas, Bulgaria, 19 Batak str., floor 2, ap. 5 Бургас, ул. „Батак” №19, ет. 2, ап.5
16	“Electrolux – Tabakov & sons” Ltd. „Електролюкс – Табаков и синове” ООД	Plovdiv, Bulgaria, 9 Sedyanka str. Пловдив, ул. „Седянка” №9
17	“Energospetyavashti sistemi” JSC „Енергоспестяващи Системи” АД	Sofia, Bulgaria, 56 Madrid blvd., floor 6 София, бул. „Мадрид” №56, ет.6
18	“Enprom” Ltd. „Енпром” ООД	Sofia, Bulgaria, Sharl Shampo str., bl. 18, floor 1, ap. 1 София, ул. „Шарл Шампо”, бл. 18, ет. 1, ап.1
19	“IDS Solar” Ltd. „ИДС Солар” ЕООД	Sofia, Bulgaria, 43 Cherni vrah blvd. София, бул. „Черни връх” №43
20	“Interservice Uzunovi” JSC „Интерсервиз Узунови” АД	Sofia, Bulgaria, 6 “20-ti April” str. София, ул. „20-ти Април” №6
21	“Kalvacha Engineering” JSC. „Кълвача Инженеринг” АД	Stara Zagora, Bulgaria, Zavod “Kalvacha”, zh. k. “Kolyo Ganchev”

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		Стара Загора, Завод "Кълвача", ж.к. "Кольо Ганчев"
22	"Lintek" Ltd. „Линтек” ООД	Sofia, Bulgaria, 133 Tzarigradsko shoes blvd. София, бул. „Цариградско шосе” №133
23	"MAT" Ltd. „МАТ” ООД	Razgrad, Bulgaria, 6 Volov str. Разград, ул. „Волов” №6
24	"MTK Partners" Ltd. „МТК Партньърс” ООД	Sofia, Bulgaria, zh. k. Dianabad, bl. 53, floor 7, ap. 40 София, ж.к. „Дианабад”, бл. 53, ет. 7, ап.40
25	"Naturcraft" Ltd. „Натуркрафт” ЕООД	Plovdiv, 37 Hristo G. Danov str. Пловдив, ул. „Христо Г. Данов” №37
26	"Oxal International" Ltd. „Оксал Интернешънъл” ООД	Sofia, Bulgaria, 1 Krum Popov str. София, ул. „Крум Попов” №1
27	"Power Grid Lane" Ltd. „Пауър Грид Лейн” ООД	Sofia, Bulgaria, 24 Stefan Karadzha str., floor 5, ap. 20 София, ул. „Стефан Караджа” №24 , ет.5, ап.20
28	"Plane Energy Bulgaria" Ltd. „Плейн Енерджи България” ЕООД	Sofia, Bulgaria, 164 Vitosha str., floor 4, ap. 4 София, ул. „Витоша” №164, ет. 4, ап.4
29	"Prista Green" Ltd. „Приста Грийн” ООД	Ruse, Bulgaria, 3 Tzarkovna nezavisimost str., floor 6, ap. 2 Русе, ул. „Църковна независимост” №3, ет.6, ап.2
30	High School for vocational education and training in the field of electronics "John Atanasov", Sofia Професионална гимназия по електроника „Джон Атанасов”, София	Sofia, Bulgaria, 46 Rayko Alexiev str. София, ул. „Райко Алексиев” №46
31	"Profile - I" Ltd. „Профил - И” ООД	Maritza municipality, Bulgaria, Kostievo village, "Pazardzhishko shose" – 6-ti kilometer Обш. Марица, с. Костиево, „Пазарджишко шосе” – 6-ти километър
32	"RA Ehergy" Ltd. „РА Енерджи” ЕООД	Elhovo, Bulgaria, 4B Targovska str., floor 2, ap. 2 Елхово, ул. „Търговска” №4Б , ет. 2, ап.2
33	"Renergy" Ltd. „Ренърджи” ООД	Sofia, Bulgaria, 164 Vitosha blvd., floor 4, ap. 4 София, бул. „Витоша” №164 , ет.4, ап.4
34	"Solar System VT" Ltd. „Солар Систем ВТ” ООД	Veliko Tarnovo, Bulgaria, 6 Filip Totyu str. Велико Търново, ул. „Ф. Тотю” №6
35	"Saninvest Training" JSC „Санинвест Трейдинг” АД	Suvorovo, Bulgaria, 8 Shipka str., entr. B, floor 2, ap. 13 Суворово, ул. „Шипка” №8, вх. Б, ет. 2, ап.13
36	"Simens" Ltd. „Сименс” ЕООД	Sofia, Bulgaria, 2 Kukush str. 2 София, ул. „Кукуш” №2
37	"Sin Care" Ltd.	Sofia, Bulgaria, zh. k. Hladilnika, 1B Srebarna str.

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	„Син Кеар” ЕООД	София, ж.к. „Хладилника”, ул. „Сребърна” №1Б
38	“Solar Bulgaria” JSC „Солар България” АД	Sofia, Bulgaria, 7 Shipchenski prohod str., ap. 9 София, ул. „Шипченски проход” №7, ап.9
39	“Solar Vision” Ltd. „Солар Вижън” ООД	Sofia, Bulgaria, 60V Bulgaria blvd., floor 6 София, бул. „България”, бл. 60В ет.6
40	“Solar Systems” Ltd. „Солар Системс” ООД	Sofia, Bulgaria, 38 Ivan Denkoglu str., floor 2 София, ул. „Иван Денкоглу” №38 , ет.2
41	“Solarpro Holding” JSC „Соларпро Холдинг” АД	Sofia, Bulgaria, 7 Sheynovo str. София, ул. „Шейново” №7
42	“SOLEL-S” Ltd. „СОЛЕЛ-С” ООД	Sofia, Bulgaria, zh. k. Mladost 3, bl. 325, entr. A2, floor 6, ap. 32 София, ж.к. „Младост” 3, бл. 325, вх. А2, ет. 6, ап.32
43	“STS Solar” JSC „СТС Солар” АД	Gabrovo, Bulgaria, 14 Stantzionna str. Габрово, ул. „Станционна” №14
44	“Sun Service” Ltd. „Сън Сървиз” ЕООД	Ihtiman municipality, Bulgaria, Vakarel village, 68 Vasil Levski str., floor 3 Общ. Ихтиман, с. Вакарел, ул. „Васил Левски” №68 , ет. 3
45	“Sunflower - Ugarchin” Ltd. „Сънфлауър-Угърчин” ООД	Sofia, Bulgaria, 9 Pirotska str., floor 4. София, ул. „Пиротска” №9, ет. 4
46	“Futekova, Hristova & Tomeshkova” Ltd. „Футекова, Христова и Томешкова” ЕООД	Sofia, Bulgaria, 22 Patriarch Evtimiy blvd., floor 2, ap. 3 София, бул. „Патриарх Евтимий” №22 ет.2 ап.3
47	“Helios Power” Ltd. „Хелиос Пауър” ЕООД	Peshtera, Bulgaria, 10 Petar Tzikalov str. Пещера, ул. „Петър Цикалов” №10
48	“PEVI – Petar Dobrev” ЕТ „ПЕВИ – Петър Добрев”	Veliko Tarnovo, Bulgaria, 5 Nish str. Велико Търново, ул. „Ниш” № 5
49	“Whirlwind” Ltd. „Уърлуинд” ЕООД	Ruse, Bulgaria, 11 Dragan Tzankov blvd. Русе, бул. „Драган Цанков” №11
50	“Elana Holding” JSC „Елана Холдинг” АД	Velingrad, Bulgaria, 47 Chan Krum str. Велинград, ул. „Хан Крум” № 47
51	“Re-Engineering” Ltd. „Ре-Инженеринг” ЕООД	Varna, Bulgaria, 310 Vladislav Varnenchik blvd. Варна, бул. „Владислав Варненчик” № 310
52	“Borko” Ltd. „Борко” ЕООД	Plovdiv, Bulgaria, 1 Gladston str. Пловдив, ул. „Гладстон” №1
53	“Vertical – Petkov & Co.” General partnership СД „Вертикал – Петков и С-ИЕ”	Sofia, Bulgaria, 81A Arsenalski blvd. София, бул. „Арсеналски” №81А
54	“Evclips” Ltd. „Евклипс” ООД	Sofia, Bulgaria, 32 Chan Krum str. София, ул. „Хан Крум” №32

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55	“Koeler Legal Consulting” Ltd. „Кьолер Легал Консултинг” ЕООД	Varna, Bulgaria, 6 Mir str., floor 4, ap. 10 Варна, ул. „Мир” №6, ет.4, ап.10
56	“Faxioma Consulting” Ltd. „Факсиома Консултинг” ООД	Pazardzhik, Bulgaria, 24 Balgariya blvd. Пазарджик, бул. „България” №24
57	“Geo Power” Ltd. „Гео Пауър” ООД	Sofia, Bulgaria, “Krasno selo” district, 21 Kyustendil blvd. София, кв. „Красно село”, бул. „Кюстендил” №21
58	“Wind Flower” Ltd. „Уинд Флауър” ООД	Sofia, Bulgaria, zh. k. Mladost 4, 1 Business Park Sofia str., building 12B, floor 2, office 203 София, ж.к. „Младост” 4, ул. „Бизнес Парк-София” №1, сграда 12Б, ет. 2, офис 203
59	“Eli – Emil Fenev” ЕТ „Ели – Емил Фенев”	Haskovo, Bulgaria, 15 Rakovski str. Хасково, ул. „Раковски” №15
60	“Stealit” Ltd. „Стеалит” ООД	Sofia, Bulgaria, 15-17 Vasil Levski blvd. София, бул. „Васил Левски” №15-17
61	“Jetstream” Ltd. „Джетстрийм” ЕООД	Pazardzhik, Bulgaria, 8B Gurko str. Пазарджик, ул. „Гурко” №8Б
62	“Dev Wind” Ltd. „Див Уинд” ООД	Razgrad, Bulgaria, 5 Balgariya blvd. Разград, бул. „България” №5
63	“Eco Energy Project” Ltd. „Еко Енерджи Проджект” ООД	Sliven, Bulgaria, 1 Georgi Sava Rakovski str. Сливен, ул. „Г.С.Раковски” №1, ет.10, ап.60
64	“Asarel - Medet” JSC „Асарел-Медет” АД	Sofia, Bulgaria, 112A Opalchenska str., floor 8 София, ул. „Опълченска” №112А, ет.8
65	“Argos” SAD – Branch Electra Varna „Аргос” ЕАД – Клон Електра Варна	Gabrovo, Bulgaria, 2 Stefan Karadzha str. Габрово, ул. „Стефан Караджа” №2
66	“Elatzite Med” JSC „Елаците Мед” АД	Panagyurishte, Bulgaria, “20-ti April” square, GUM – floor 3 Панагюрище, пл. „20-ти април”, ГУМ – ет. 3
67	“Metal - Contact” Ltd. „Метал – Контакт” ООД	Ruse, Bulgaria, 73 Nikolaevska str. Русе, бул. „Николаевска” №73
68	“Varna Green Energy” Ltd. „Варна Грийн Енерджи” ООД	Sofia, Bulgaria, zh. k. Mladost 3, bl. 353, entr. 6, floor 7, ap. 27 София, ж.к. „Младост” 3, бл. 353, вх. 6, ет. 7, ап. 27
69	“Windcraft Simonsfeldt” JSC „Уиндрафт Симонсфелд БГ” АД	Rakitovo, Bulgaria, 3A Hristo Botev str. Ракитово, ул. „Христо Ботев” №3А
70	“Delog” Ltd. „Делог” ЕООД	Yambol, Bulgaria, 16 Targovska str. Ямбол, ул. „Търговска” №16
71	“New Europe Corporate Advisers” Ltd.	Nova Zagora, Bulgaria, 3 Al. Stamboliyski blvd. Нова Загора, бул. „Ал. Стамболийски” №3

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	„Ню Юрп Корпорит Адвайзъри” ООД	
72	“Eco Energy Group” Ltd. „Еко Енерджи Груп” ООД	Stara Zagora, Bulgaria, 30 Ruski blvd. Стара Загора, бул. „Руски” №30
73	“AIS Geo Energy” Ltd. „А И С Гео Енерджи” ООД	Peshtera, Bulgaria, 10 Petar Tzikalov str. Пещера, ул. „Петър Цикалов” №10
74	“PT - Holding” JSC „ПТ – Холдинг” АД	Veliko Tarnovo, Bulgaria, 5 Nish str. Велико Търново, ул. „Ниш” № 5
75	“Enel Maritza Iztok 3” JSC „Енел Марица Изток 3” АД	Ruse, Bulgaria, 11 Dragan Tzankov blvd. Русе, бул. „Драган Цанков” №11
76	“Recom” Ltd. „Реком” ЕООД	Velingrad, Bulgaria, 47 Chan Krum str. Велинград, ул. „Хан Крум” № 47
77	“Energoprject - Hydroenergetica” Ltd. „Енергопроект – Хидроенергетика” ООД	Sofia, Bulgaria, 65 Shipchenski prohod blvd., floor 4 София, бул. „Шипченски проход” № 65, ет. 4
78	“Avers” Ltd. „Аверс” ООД	Plovdiv, Bulgaria, 1 Gladston str. Пловдив, ул. „Гладстон” №1
79	“Aqua Vac” Ltd. „Аква-Вак” ООД	Sofia, Bulgaria, 81A Arsenalski blvd. София, бул. „Арсеналски” №81А
80	“Aquaforce” Ltd. „Аквафорс” ЕООД	Sofia, Bulgaria, 32 Chan Krum str. София, ул. „Хан Крум” №32
81	“Ara” Ltd. „Ара” ООД	Varna, Bulgaria, 6 Mir str., floor 4, ap. 10 Варна, ул. „Мир” №6, ет.4, ап.10
82	“Ariel-TN” Ltd. „Ариел-ТН” ЕООД	Pazardzhik, Bulgaria, 24 Balgariya blvd. Пазарджик, бул. „България” №24
83	“BNNS” Ltd. „БННС” ООД	Sofia, Bulgaria, “Krasno selo” district. 21 Kyustendil blvd. София, кв. „Красно село”, бул. „Кюстендил” №21
84	“Bulgaria Engineering” Ltd. „България Инженеринг” ЕООД	Sofia, Bulgaria, zh. k. Mladost 4, 1 Business Park str., building 12B, floor 2, office 203 София, ж.к. „Младост” 4, ул. „Бизнес Парк-София” №1, сграда 12Б, ет. 2, офис 203
85	“VAP Hydro” Ltd. „ВАП Хидро” ЕООД	Haskovo, Bulgaria, 15 Rakovski str. Хасково, ул. „Раковски” №15
86	“Energiya HPS” Ltd. „ВЕЦ Енергия” ЕООД	Sofia, Bulgaria 15-17 Vasil Levski blvd. София, бул. „Васил Левски” №15-17
87	“Svoge HPS” Ltd. „ВЕЦ Своге” ООД	Pazardzhik, Bulgaria, 8B Gurko str. Пазарджик, ул. „Гурко” №8Б
88	“Vodemil” Ltd. „Водемил” ЕООД	Razgrad, Bulgaria, 5 Balgariya blvd. Разград, бул. „България” №5

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89	“Dani-M-97” Ltd. „Дани-М-97” ЕООД	Sliven, 1 Georgi Sava Rakovski str., floor 10, ap. 60 Сливен, ул. „Г.С.Раковски” №1, ет.10, ап.60
90	“Delectra” Ltd. „Делектра” ЕООД	Sofia, Bulgaria, 112A Opalchenska str., floor 8 София, ул. „Опълченска” №112А, ет.8
91	“Electro Com” Ltd. „Електро Ком” ЕООД	Gabrovo, Bulgaria, 2 Stefan Karadzha str. Габрово, ул. „Стефан Караджа” №2
92	“Elpro-ES” Ltd. „Елпро-ЕС” ООД	Panagyurishte, Bulgaria, “20-ti April” square, GUM – floor 3 Панагюрище, пл. „20-ти април”, ГУМ – ет. 3
93	“Kresna - Electric” Ltd. „Кресна-Електрик” ООД	Ruse, Bulgaria, 73 Nikolaevska blvd. Русе, бул. Николаевска” №73
94	“Mivabo” Ltd. „Мивабо” ООД	Sofia, Bulgaria, zh. k. Mladost 3, bl. 353, entr. 6, floor 7, ap. 27 София, ж.к. „Младост” 3, бл. 353, вх. 6, ет. 7, ап. 27
95	“Parallel 2000” Cooperative Кооперация „Паралел 2000”	Rakitzovo, Bulgaria, 3A Hristo Botev str. Ракитово, ул. „Христо Ботев” №3А
96	“PIM Electric” Ltd. „П И М Електрик” ООД	Yambol, Bulgaria, 16 Targovska str. Ямбол, ул. „Търговска” №16
97	“Pogledetz - Lesinvest” Ltd. „Погледец-Лесинвест” ЕООД	Nova Zagora, Bulgaria, Нова Загора, бул. „Ал. Стамболийски” №3
98	“Polytransfer” Ltd. „Политрансфер Електрик” ЕООД	Stara Zagora, Bulgaria, 30 Ruski blvd. Стара Загора, бул. „Руски” №30
99	“ROUD - Energy” Ltd. „РОУД-Енерджи” ООД	Peshtera, Bulgaria, 10 Petar Tzikalov str. Пещера, ул. „Петър Цикалов” №10
100	“Snabdyavane, Zagotovki & Montazh” Ltd. „Снабдяване, Заготовки и Монтаж” ООД	Veliko Tarnovo, Bulgaria, 5 Nish str. Велико Търново, ул. „Ниш” № 5
101	“Slava – K.I.S. – Spas Andonov” „Слава-К.И.С.-Спас Андонов” ЕТ	Ruse, Bulgaria, 11 Dragan Tzankov str. Русе, бул. „Драган Цанков” №11
102	“Hermes – Alisman Kambach” „Хермес – Алисман Камбач” ЕТ	Velingrad, Bulgaria, 47 Chan Krum str. Велинград, ул. „Хан Крум” № 47
103	“Hydrowatt” JSC „Хидроват” АД	Blagoevgrad, Bulgaria, 23 Todor Alexandrov str. Благоевград, ул. „Тодор Александров” № 23
104	“Hydroecoenepo - TAS” Ltd. „Хидроекоенерго-ТАС” ООД	Sofia, Bulgaria, 60 Patriarch Evtimiy blvd., floor 1, ap. 7 София, бул. „Пагриарх Евтимий” № 60р ет. 1, ап. 7
105	“Hydro energy company” Ltd. „Хидроенергийна компания” ООД	Plovdiv, Bulgaria, 1 Gladstone str. Пловдив, ул. „Гладстон” №1
106	“Hydroenergostroy” Ltd. „Хидроенергострой” ООД	Sofia, Bulgaria, 81A Arsenalski blvd. София, бул. „Арсеналски” №81А

APPENDIX No. 2

**List of the organized enterprises in the Renewable Energy (Sub)sector in
Bulgaria 2009 – 2010 which form MATRIX OERES in BG – 120**

№	Name	Address
1	“Alpha Energy Holding” JSC „Алфа Енерджи Холдинг” ЕАД	Sofia, Bulgaria, 7 Sheynovo str. София, ул. „Шейново” №7
2	“Arco Solar Bulgaria” Ltd. „Арко Солар България” ООД	Sofia, Bulgaria, 23 Nikola Slavkov str. София, ул. „Никола Славков” №23
3	“Arni - Brothers” Ltd. „Арни - Братърс” ООД	1408 Sofia, Bulgaria, zh. k. Strelbishte, bl. 12, entr. A, floor 6, ap. 20 София-1408, ж.к. „Стрелбище”, бл. 12, вх. А, ет. 6, ап.20
4	“BCI” Ltd. „Би Си Ай” ООД	Sofia, Bulgaria, 25 Vitosha blvd. София, бул. „Витоша” №25
5	“B Sys” Ltd. „Би Сис” ООД	Sofia, Bulgaria, 5 Prof. Milko Bichev str., entr. B, floor 6, ap. 18 София, ул. „Проф. Милко Бичев” №5 , вх. Б, ет. 6, ап.18
6	“Bio Power” JSC „Био Пауър” АД	Sofia, Bulgaria, 8 Kaloyan str., floor 4 София, ул. „Калоян” №8, ет.4
7	“BN Consult” Ltd. „БН Консулт” ЕООД	Sofia, Bulgaria, 23 Moskovska str., floor 4, ap. 12 София, ул. „Московска” №23 , ет. 4, ап.12
8	“BNRG Bulgaria” Ltd. „БНРГ България” ООД	Plovdiv, Bulgaria, 9B Lyuben Karavelov blvd., floor 2, ap. 4 Пловдив, бул. „Любен Каравелов” №9Б , ет.2, ап.4
9	“Brest Energy” Ltd. „Брест Енерджи” ООД	Gulyantzi municipality, Bulgaria, 5971 Brest village, 1 Stopanski dvor Общ. Гулянци, с. Брест-5971, Стопански двор №1
10	“Varna Solar” Ltd. „Варна Солар” ООД	Avren municipality, Bulgaria, Zdravetz village, 7 Parva str. Общ. Аврен, с. Здравец, ул. „Първа” №7
11	“JB Solar” Ltd. „Джей Би Солар” ООД	Sofia, Bulgaria, 51 Evlogi Georgiev blvd., floor 5 София, „Евлоги Георгиев” №51, ет. 5
12	“General Leasing” JSC „Дженерал Лизинг” АД	Sofia, Bulgaria, 27B Moskovska str., floor 2, ap. 4 София, ул. „Московска” № 27Б , ет. 2, ап.4
13	“GLB - Bulgaria” Ltd. „Джи Ел Би - България” ООД	Sofia, Bulgaria, Kukush str., bl. 60 София, ул. „Кукуш”, бл.60
14	“Euro Energy Consulting” Ltd. „Евро Енерджи Консултинг” ООД	Sofia, Bulgaria, 101 Georgi Sava Rakovski str., София, ул. „Г.С. Раковски” №101
15	“ECOEL BG” Ltd.	Burgas, Bulgaria, 19 Batak str., floor 2, ap. 5

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	„ЕКОЕЛ БГ” ООД	Бургас, ул. „Батак” №19, ет. 2, ап.5
16	“Electrolux – Tabakov & sons” Ltd. „Електролюкс – Табаков и синове” ООД	Plovdiv, Bulgaria, 9 Sedyanka str. Пловдив, ул. „Седянка” №9
17	“Energospetyavashiti sistemi” JSC „Енергоспестяващи Системи” АД	Sofia, Bulgaria, 56 Madrid blvd., floor 6 София, бул. „Мадрид” №56, ет.6
18	“Enprom” Ltd. „Енпром” ООД	Sofia, Bulgaria, Sharl Shampo str., bl. 18, floor 1, ap. 1 София, ул. „Шарл Шампо”, бл. 18, ет. 1, ап.1
19	“IDS Solar” Ltd. „ИДС Солар” ЕООД	Sofia, Bulgaria, 43 Cherni vrah blvd. София, бул. „Черни връх” №43
20	“Interservice Uzunovi” JSC „Интерсервиз Узунови” АД	Sofia, Bulgaria, 6 “20-ti April” str. София, ул. „20-ти Април” №6
21	“Kalvacha Engineering” JSC. „Кълвача Инженеринг” АД	Stara Zagora, Bulgaria, Zavod “Kalvacha”, zh. k. “Kolyo Ganchev” Стара Загора, Завод “Кълвача”, ж.к. “Кольо Ганчев”
22	“Lintek” Ltd. „Линтек” ООД	Sofia, Bulgaria, 133 Tzarigradsko shoes blvd. София, бул. „Цариградско шосе” №133
23	“MAT” Ltd. „МАТ” ООД	Razgrad, Bulgaria, 6 Volov str. Разград, ул. „Волов” №6
24	“MTK Partners” Ltd. „МТК Партньърс” ООД	Sofia, Bulgaria, zh. k. Dianabad, bl. 53, floor 7, ap. 40 София, ж.к. „Дианабад”, бл. 53, ет. 7, ап.40
25	“Naturcraft” Ltd. „Натуркрафт” ЕООД	Plovdiv, 37 Hristo G. Danov str. Пловдив, ул. „Христо Г. Данов” №37
26	“Oxal International” Ltd. „Оксал Интернешънъл” ООД	Sofia, Bulgaria, 1 Krum Popov str. София, ул. „Крум Попов” №1
27	“Power Grid Lane” Ltd. „Пауър Грид Лейн” ООД	Sofia, Bulgaria, 24 Stefan Karadzha str., floor 5, ap. 20 София, ул. „Стефан Караджа” №24, ет.5, ап.20
28	“Plane Energy Bulgaria” Ltd. „Плейн Енерджи България” ЕООД	Sofia, Bulgaria, 164 Vitosha str., floor 4, ap. 4 София, ул. „Витоша” №164, ет. 4, ап.4
29	“Prista Green” Ltd. „Приста Грийн” ООД	Ruse, Bulgaria, 3 Tzarkovna nezavisimost str., floor 6, ap. 2 Русе, ул. „Църковна независимост” №3, ет.6, ап.2
30	High School for vocational education and training in the field of electronics “John Atanasov”, Sofia Професионална гимназия по електроника „Джон Атанасов”, София	Sofia, Bulgaria, 46 Rayko Alexiev str. София, ул. „Райко Алексиев” №46
31	“Profile - I” Ltd.	Maritza municipality, Bulgaria, Kostievo village,

CASE STUDIES

	„Профил - И” ООД	“Pazardzhishko shose” – 6-ti kilometar Обш. Марица, с. Костиево, „Пазарджишко шосе” – 6-ти километър
32	“RA Ehergy” Ltd. „РА Енерджи” ЕООД	Elhovo, Bulgaria, 4B Targovska str., floor 2, ap. 2 Елхово, ул. „Търговска” №4Б, ет. 2, ап.2
33	“Renergy” Ltd. „Ренърджи” ООД	Sofia, Bulgaria, 164 Vitosha blvd., floor 4, ap. 4 София, бул. „Витоша” №164, ет.4, ап.4
34	“Solar System VT” Ltd. „Солар Систем ВТ” ООД	Veliko Tarnovo, Bulgaria, 6 Filip Totyu str. Велико Търново, ул. „Ф. Тотю” №6
35	“Saninvest Training” JSC „Санинвест Трейдинг” АД	Suvorovo, Bulgaria, 8 Shipka str., entr. B, floor 2, ap. 13 Суворово, ул. „Шипка” №8, вх. Б, ет. 2, ап.13
36	“Simens”Ltd. „Сименс” ЕООД	Sofia, Bulgaria, 2 Kukush str. 2 София, ул. „Кукуш” №2
37	“Sin Care” Ltd. „Син Кеар” ЕООД	Sofia, Bulgaria, zh. k. Hladilnika, 1B Srebarna str. София, ж.к. „Хладилника”, ул. „Сребърна” №1Б
38	“Solar Bulgaria” JSC „Солар България” АД	Sofia, Bulgaria, 7 Shipchenski prohod str., ap. 9 София, ул. „Шипченски проход” №7, ап.9
39	“Solar Vision” Ltd. „Солар Вижън” ООД	Sofia, Bulgaria, 60V Bulgaria blvd., floor 6 София, бул. „България”, бл. 60В ет.6
40	“Solar Systems” Ltd. „Солар Системс” ООД	Sofia, Bulgaria, 38 Ivan Denkoghlu str., floor 2 София, ул. „Иван Денкоглу” №38, ет.2
41	“Solarpro Holding” JSC „Соларпро Холдинг” АД	Sofia, Bulgaria, 7 Sheynovo str. София, ул. „Шейново” №7
42	“SOLEL-S” Ltd. „СОЛЕЛ-С” ООД	Sofia, Bulgaria, zh. k. Mladost 3, bl. 325, entr. A2, floor 6, ap. 32 София, ж.к. „Младост” 3, бл. 325, вх. А2, ет. 6, ап.32
43	“STS Solar” JSC „СТС Солар” АД	Gabrovo, Bulgaria, 14 Stantzionna str. Габрово, ул. „Станционна” №14
44	“Sun Service” Ltd. „Сън Сървиз” ЕООД	Ihtiman municipality, Bulgaria, Vakarel village, 68 Vasil Levski str., floor 3 Общ. Ихтиман, с. Вакарел, ул. „Васил Левски” №68, ет. 3
45	“Sunflower - Ugarchin” Ltd. „Сънфлауър-Угърчин” ООД	Sofia, Bulgaria, 9 Pirotska str., floor 4. София, ул. „Пиротска” №9, ет. 4
46	“Futekova, Hristova & Tomeshkova” Ltd. „Футекова, Христова и Томешкова” ЕООД	Sofia, Bulgaria, 22 Patriarch Evtimiy blvd., floor 2, ap. 3 София, бул. „Патриарх Евтимий” №22 ет.2 ап.3
47	“Helios Power” Ltd. „Хелиос Пауър” ЕООД	Peshtera, Bulgaria, 10 Petar Tzikalov str. Пещера, ул. „Петър Цикалов” №10
48	“PEVI – Petar Dobrev”	Veliko Tarnovo, Bulgaria, 5 Nish str.

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	ЕТ „ПЕВИ – Петър Добрев”	Велико Търново, ул. „Ниш” № 5
49	“Whirlwind” Ltd. „Уърлуинд” ЕООД	Ruse, Bulgaria, 11 Dragan Tzankov blvd. Русе, бул. „Драган Цанков” №11
50	“Elana Holding” JSC „Елана Холдинг” АД	Velingrad, Bulgaria, 47 Chan Krum str. Велинград, ул. „Хан Крум” № 47
51	“Re-Engineering” Ltd. „Ре-Инженеринг” ЕООД	Varna, Bulgaria, 310 Vladislav Varnenchik blvd. Варна, бул. „Владислав Варненчик” № 310
52	“Borko” Ltd. „Борко” ЕООД	Plovdiv, Bulgaria, 1 Gladston str. Пловдив, ул. „Гладстон” №1
53	“Vertical – Petkov & Co.” General partnership СД „Вертикал – Петков и С-ИЕ”	Sofia, Bulgaria, 81A Arsenalski blvd. София, бул. „Арсеналски” №81А
54	“Evclips” Ltd. „Евклипс” ООД	Sofia, Bulgaria, 32 Chan Krum str. София, ул. „Хан Крум” №32
55	“Koeler Legal Consulting” Ltd. „Кьолер Легал Консултинг” ЕООД	Varna, Bulgaria, 6 Mir str., floor 4, ap. 10 Варна, ул. „Мир” №6, ет.4, ап.10
56	“Faxioma Consulting” Ltd. „Факсиома Консултинг” ООД	Pazardzhik, Bulgaria, 24 Balgariya blvd. Пазарджик, бул. „България” №24
57	“Geo Power” Ltd. „Гео Пауър” ООД	Sofia, Bulgaria, “Krasno selo” district, 21 Kyustendil blvd. София, кв. „Красно село”, бул. „Кюстендил” №21
58	“Wind Flower” Ltd. „Уинд Флауър” ООД	Sofia, Bulgaria, zh. k. Mladost 4, 1 Business Park Sofia str., building 12B, floor 2, office 203 София, ж.к. „Младост” 4, ул. „Бизнес Парк-София” №1, сграда 12Б, ет. 2, офис 203
59	“Eli – Emil Fenev” ЕТ „Ели – Емил Фенев”	Haskovo, Bulgaria, 15 Rakovski str. Хасково, ул. „Раковски” №15
60	“Stealit” Ltd. „Стеалит” ООД	Sofia, Bulgaria, 15-17 Vasil Levski blvd. София, бул. „Васил Левски” №15-17
61	“Jetstream” Ltd. „Джетстрийм” ЕООД	Pazardzhik, Bulgaria, 8B Gurko str. Пазарджик, ул. „Гурко” №8Б
62	“Dev Wind” Ltd. „Див Уинд” ООД	Razgrad, Bulgaria, 5 Balgariya blvd. Разград, бул. „България” №5
63	“Eco Energy Project” Ltd. „Еко Енерджи Проджект” ООД	Sliven, Bulgaria, 1 Georgi Sava Rakovski str. Сливен, ул. „Г.С.Раковски” №1, ет.10, ап.60
64	“Asarel - Medet” JSC „Асарел-Медет” АД	Sofia, Bulgaria, 112A Opalchenska str., floor 8 София, ул. „Опълченска” №112А, ет.8
65	“Argos” SAD – Branch Electra Varna „Аргос” ЕАД – Клон Електра	Gabrovo, Bulgaria, 2 Stefan Karadzha str. Габрово, ул. „Стефан Караджа” №2

CASE STUDIES

	Варна	
66	“Elatzite Med” JSC „Елаците Мед” АД	Panagyurishte, Bulgaria, “20-ti April” square, GUM – floor 3 Панагюрище, пл. „20-ти април”, ГУМ – ет. 3
67	“Metal - Contact” Ltd. „Метал – Контакт” ООД	Ruse, Bulgaria, 73 Nikolaevska str. Русе, бул. „Николаевска” №73
68	“Varna Green Energy” Ltd. „Варна Грийн Енерджи” ООД	Sofia, Bulgaria, zh. k. Mladost 3, bl. 353, entr. 6, floor 7, ap. 27 София, ж.к. „Младост” 3, бл. 353, вх. 6, ет. 7, ап. 27
69	“Windcraft Simonsfeldt” JSC „Уиндрафт Симонсфелд БГ” АД	Rakitovo, Bulgaria, 3A Hristo Botev str. Ракитово, ул. „Христо Ботев” №3А
70	“Delog” Ltd. „Делог” ЕООД	Yambol, Bulgaria, 16 Targovska str. Ямбол, ул. „Търговска” №16
71	“New Europe Corporate Advisers” Ltd. „Ню Юрп Корпорит Адвайзъри” ООД	Nova Zagora, Bulgaria, 3 Al. Stamboliyski blvd. Нова Загора, бул. „Ал. Стамболийски” №3
72	“Eco Energy Group” Ltd. „Еко Енерджи Груп” ООД	Stara Zagora, Bulgaria, 30 Ruski blvd. Стара Загора, бул. „Руски” №30
73	“AIS Geo Energy” Ltd. „А И СГео Енерджи” ООД	Peshtera, Bulgaria, 10 Petar Tzikalov str. Пещера, ул. „Петър Цикалов” №10
74	“PT - Holding” JSC „ПТ – Холдинг” АД	Veliko Tarnovo, Bulgaria, 5 Nish str. Велико Търново, ул. „Ниш” № 5
75	“Enel Maritza Iztok 3” JSC „Енел Марица Изток 3” АД	Ruse, Bulgaria, 11 Dragan Tzankov blvd. Русе, бул. „Драган Цанков” №11
76	“Recom” Ltd. „Реком” ЕООД	Velinograd, Bulgaria, 47 Chan Krum str. Велинград, ул. „Хан Крум” № 47
77	“Energoobject - Hydroenergetica” Ltd. „Енергопроект – Хидроенергетика” ООД	Sofia, Bulgaria, 65 Shipchenski prohod blvd., floor 4 София, бул. „Шипченски проход” № 65, ет. 4
78	“Avers” Ltd. „Аверс” ООД	Plovdiv, Bulgaria, 1 Gladston str. Пловдив, ул. „Гладстон” №1
79	“Aqua Vac” Ltd. „Аква-Вак” ООД	Sofia, Bulgaria, 81A Arsenalski blvd. София, бул. „Арсеналски” №81А
80	“Aquaforce” Ltd. „Аквафорс” ЕООД	Sofia, Bulgaria, 32 Chan Krum str. София, ул. „Хан Крум” №32
81	“Ara” Ltd. „Ара” ООД	Varna, Bulgaria, 6 Mir str., floor 4, ap. 10 Варна, ул. „Мир” №6, ет.4, ап.10
82	“Ariel-TN” Ltd. „Ариел-ТН” ЕООД	Pazardzhik, Bulgaria, 24 Balgariya blvd. Пазарджик, бул. „България” №24

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83	“BNNS” Ltd. „БННС” ООД	Sofia, Bulgaria, “Krasno selo” district. 21 Kyustendil blvd. София, кв. „Красно село”, бул. „Кюстендил” №21
84	“Bulgaria Engineering” Ltd. „България Инженеринг” ЕООД	Sofia, Bulgaria, zh. k. Mladost 4, 1 Business Park str., building 12B, floor 2, office 203 София, ж.к. „Младост” 4, ул. „Бизнес Парк-София” №1, сграда 12Б, ет. 2, офис 203
85	“VAP Hydro” Ltd. „ВАП Хидро” ЕООД	Haskovo, Bulgaria, 15 Rakovski str. Хасково, ул. „Раковски” №15
86	“Energiya HPS” Ltd. „ВЕЦ Энергия” ЕООД	Sofia, Bulgaria, 15-17 Vasil Levski blvd. София, бул. „Васил Левски” №15-17
87	“Svoge HPS” Ltd. „ВЕЦ Своге” ООД	Pazardzhik, Bulgaria, 8B Gurko str. Пазарджик, ул. „Гурко” №8Б
88	“Vodemil” Ltd. „Водемил” ЕООД	Razgrad, Bulgaria, 5 Balgariya blvd. Разград, бул. „България” №5
89	“Dani-M-97” Ltd. „Дани-М-97” ЕООД	Sliven, 1 Georgi Sava Rakovski str., floor 10, ap. 60 Сливен, ул. „Г.С.Раковски” №1, ет.10, ап.60
90	“Delectra” Ltd. „Делектра” ЕООД	Sofia, Bulgaria, 112A Opalchenska str., floor 8 София, ул. „Опълченска” №112А, ет.8
91	“Electro Com” Ltd. „Електро Ком” ЕООД	Gabrovo, Bulgaria, 2 Stefan Karadzha str. Габрово, ул. „Стефан Караджа” №2
92	“Elpro-ES” Ltd. „Елпро-ЕС” ООД	Panagyurishte, Bulgaria, “20-ti April” square, GUM – floor 3 Панагюрище, пл. „20-ти април”, ГУМ – ет. 3
93	“Kresna - Electric” Ltd. „Кресна-Електрик” ООД	Ruse, Bulgaria, 73 Nikolaevska blvd. Русе, бул. „Николаевска” №73
94	“Mivabo” Ltd. „Мивабо” ООД	Sofia, Bulgaria, zh. k. Mladost 3, bl. 353, entr. 6, floor 7, ap. 27 София, ж.к. „Младост” 3, бл. 353, вх. 6, ет. 7, ап. 27
95	“Parallel 2000” Cooperative Кооперация „Паралел 2000”	Rakitovo, Bulgaria, 3A Hristo Botev str. Ракитово, ул. „Христо Ботев” №3А
96	“PIM Electric” Ltd. „П И М Електрик” ООД	Yambol, Bulgaria, 16 Targovska str. Ямбол, ул. „Търговска” №16
97	“Pogledetz - Lesinvest” Ltd. „Погледец-Лесинвест” ЕООД	Nova Zagora, Bulgaria, Нова Загора, бул. „Ал. Стамболийски” №3
98	“Polytransfer” Ltd. „Политрансфер Електрик” ЕООД	Stara Zagora, Bulgaria, 30 Ruski blvd. Стара Загора, бул. „Руски” №30
99	“ROUD - Energy” Ltd. „РОУД-Енерджи” ООД	Peshtera, Bulgaria, 10 Petar Tzikalov str. Пещера, ул. „Петър Цикалов” №10
100	“Snabdyavane, Zagotovki & Montazh” Ltd. „Снабдяване, Заготовки и	Veliko Tarnovo, Bulgaria, 5 Nish str. Велико Търново, ул. „Ниш” № 5

CASE STUDIES

	Монтаж” ООД	
101	“Slava – K.I.S. – Spas Andonov” „Слава-К.И.С.-Спас Андонов” ЕТ	Ruse, Bulgaria, 11 Dragan Tzankov str. Русе, бул. „Драган Цанков” №11
102	“Hermes – Alisman Kambach” „Хермес – Алисман Камбач” ЕТ	Velingrad, Bulgaria, 47 Chan Krum str. Велинград, ул. „Хан Крум” № 47
103	“Hydrowatt” JSC „Хидроват” АД	Blagoevgrad, Bulgaria, 23 Todor Alexandrov str. Благоевград, ул. „Тодор Александров” № 23
104	“Hydroescoenergo - TAS” Ltd. „Хидроескоенерго-ТАС” ООД	Sofia, Bulgaria, 60 Patriarch Evtimiy blvd., floor 1, ap. 7 София, бул. „Пагриарх Евтимий” № 60р ет. 1, ап. 7
105	“Hydro energy company” Ltd. „Хидроенергийна компания” ООД	Plovdiv, Bulgaria, 1 Gladstone str. Пловдив, ул. „Гладстон” №1
106	“Hydroenergostroy” Ltd. „Хидроенергострой” ООД	Sofia, Bulgaria, 81A Arsenalski blvd. София, бул. „Арсеналски” №81А
107	“Aniyak 2001” Ltd. „Аниак 2001” ЕООД	Sofia, Bulgaria, 32 Chan Krum str. София, ул. „Хан Крум” №32
108	“Pashkulevi Brothers” Ltd. „Братя Пашкулеви” ООД	Varna, Bulgaria, 6 Mir str., floor 4, ap. 10 Варна, ул. „Мир” №6, ет.4, ап.10
109	“Byal bor” JSC „Бял бор” АД	Pazardzhik, Bulgaria, 24 Bulgaria blvd. Пазарджик, бул. „България” №24
110	“Byal bor project” Ltd. „Бял бор проект” ЕООД	Sofia, Bulgaria, “Krasno selo” district, 21 Kyustendil blvd. София, кв. „Красно село”, бул. „Кюстендил” №21
111	“Euro Holtz” Ltd. „Евро Холц” ООД	Sofia, Bulgaria, zh. k. Mladost 4, 1 Business Park str., building 12B, floor 2, office 203 София, ж.к. „Младост” 4, ул. „Бизнес Парк-София” №1, сграда 12Б, ет. 2, офис 203
112	“Ecozid” Ltd. „Екозид” ООД	Haskovo, Bulgaria, 15 Rakovski str. Хасково, ул. „Раковски” №15
113	“Iliya Iliev” ЕТ „Илия Илиев”	Sofia, Bulgaria, 15-17 Vasil Levski blvd. София, бул. „Васил Левски” №15-17
114	“Incoms – Electronic and communication technics – Milin Kamak” JSC „Инкомс-Електронна и съобщителна техника – Милин камък” АД	Pazardzhik, Bulgaria, 8B Gurko str. Пазарджик, ул. „Гурко” №8Б
115	“Knauff Bulgaria” Ltd. „Кнауф България” ЕООД	Razgrad, Bulgaria, 5 Balgariya blvd. Разград, бул. „България” №5
116	“Nolina” Ltd. „Нолина” ЕООД	Sliven, Bulgaria, 1 Georgi Sava Rakovski str., floor 10, ap. 60 Сливен, ул. „Г.С.Раковски” №1, ет.10, ап.60

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117	“Noriva” Ltd. „Норива” ЕООД	Sofia, Bulgaria, 112A Opalchenska str., floor 8 София, ул. „Опълченска” №112А, ет.8
118	“Nortop” Ltd. „Нортоп” ООД	Gabrovo, Bulgaria, 2 Stefan Karadzha str. Габрово, ул. „Стефан Караджа” №2
119	“Ondulin – Building materials” Ltd. „Ондулин – Строителни материали” ООД	Panagyurishte, Bulgaria, “20-ti April” square, GUM – floor 3 Панагюрище, пл. „20-ти април”, ГУМ – ет. 3
120	“Ranovi” Ltd. „Ранови” ЕООД	Ruse, Bulgaria, 73 Nikolaevska str. Русе, бул. „Николаевска” №73

APPENDIX No. 3

**List of identified enterprises involved in the utilization of biomass in Bulgaria
2009-2010**

№	Name		Address
1	ERATO HOLDING ЕРАТО ХОЛДИНГ	JSC АД	6300 Haskovo, Bulgaria, 67 Saedinenie blvd. гр. Хасково-6300, бул. СЪЕДИНЕНИЕ 67
2	ERATO ЕРАТО	JSC АД	6300 Haskovo, Bulgaria, 67 Saedinenie blvd. гр. Хасково-6300, бул. СЪЕДИНЕНИЕ 67
3	ERATO-LES ЕРАТО-ЛЕС	Ltd. ООД	6300 Haskovo, Bulgaria, 67 Saedinenie blvd. гр. Хасково-6300, бул. СЪЕДИНЕНИЕ 67
4	MODUS МОДУС	JSC АД	6300 Haskovo, Bulgaria, Okolovrastno shoes str. 6300 гр.Хасково, област Хасково, община Хасково ул. ОКОЛОВРЪСНО ШОСЕ
5	ASSOCIATION FOR UTILIZATION OF BIOMASS FOR ENERGY PURPOSES СДРУЖЕНИЕ “АСОЦИАЦИЯ ЗА ЕНЕРГИЙНО ОПОЛЗОТВОРЯВАНЕ НА БИОМАСАТА”	NGO НПО	1592 Sofia, Bulgaria, post box 27, Gara Iskar – Sever, Promishlena zona, 10 Poruchik N. Bonchev str. 1592 гр.София, област София -столица, община Столична п.к. 27 ГАРА ИСКЪР-СЕВЕР, ПРОМ. ЗОНА , ул. ПОРУЧИК Н. БОНЧЕВ № 10
6	ERATO-PRODUCT ЕРАТО-ПРОДУКТ	Ltd. ООД	6300 Haskovo, Bulgaria, 19 Chan Asparuchstr. Област: Хасково, Община: Хасково, гр. Хасково-6300, ул. ХАН АСПАРУХ 19
7	Psi Co Пси Ко	Ltd. ЕООД	1421 Sofia, Bulgaria, 10-14 Lozenetz str., entr. B, floor 3, ар. 21

CASE STUDIES

			Област: София (столица), Община: Столична, гр. София-1421, ул. ЛОЗЕНЕЦ N 10-14 , вх. Б, ет. 3, ап.21
8	FOUNDATION “ECOSAPIENCE” ФОНДАЦИЯ “ЕКОСАПИЕНС”	NGO НПО	1618 Sofia, Bulgaria, 63 Boryana str., bl. 5A, floor 6, ap. 22 1618 гр.София, област София -столица, община Столична ул. БОРЯНА № 63 бл. 5А ет.6 ап.22
9	DALKIYA-VARNA ДАЛКИЯ-ВАРНА	JSC ЕАД	9020 Varna, 5 Yanosh Huniadi blvd., zh. k. Vazrazhdane Област: Варна, Община: Варна, гр. Варна-9020, БУЛ.ЯНОШ ХУНЯДИ N 5 , ж.к. ВЪЗРАЖДАНЕ
10	ASSOCIATION OF HEAT PRODUCTION COMPANIES IN BULGARIA СДРУЖЕНИЕ “АСОЦИАЦИЯ НА ТОПЛОФИКАЦИОННИТЕ ДРУЖЕСТВА В БЪЛГАРИЯ”	NGO НПО	Sofia, Bulgaria, 23B Yastrebetz str. гр.София, област София -столица, община Столична ул. ЯСТРЕБЕЦ N 23Б
11	SOKOLITZA-SMOLYAN СОКОЛИЦА-СМОЛЯН	JSC ЕАД	4700 Smolyan, Bulgaria, 47 Parvi May str. Област: Смолян, Община: Смолян, гр. Смолян-4700, ул. ПЪРВИ МАЙ N 47
12	VEGA ВЕГА	Ltd. ООД	4700 Smolyan, Bulgaria, 47 Parvi May str. Област: Смолян, Община: Смолян, гр. Смолян-4700, ул. ПЪРВИ МАЙ N 47
13	CLIMATECHNICA BG КЛИМАТЕХНИКА БГ	Ltd. ООД	4700 Smolyan, Bulgaria, 47 Parvi May str. Област: Смолян, Община: Смолян, гр. Смолян-4700, ул. ПЪРВИ МАЙ N 47
14	“TOPLIVO-DOSPAT BRANCH” “ТОПЛИВО - КЛОН ДОСПАТ”	Ltd. ЕООД	4831 Dospat, Bulgaria, Smolyan region, municipality Dospat, 28 Kapitan Petko Voyvoda str. 4831 гр.Доспат, област Смолян, община Доспат ул. КАП. ПЕТКО ВОЙВОДА № 28
15	“ORION-3SH-BORINO BRANCH” “ОРИОН-ЗШ - КЛОН БОРИНО”	Ltd. ЕООД	4824 Borino, Bulgaria, Smolyan region, municipality Borino 4824 с.Борино, област Смолян, община Борино
16	ТОПЛИВО 6 ТОПЛИВО 6	Ltd. ЕООД	1797 Sofia, 5 Kliment Ohridski blvd., entr. V, floor 4, ap. 42 1797 гр.София, област София -столица, община Столична бул. КЛИМЕНТ ОХРИДСКИ № 5 вх.В ет.4 ап.42
17	CHINAR-2000 ЧИНАР-2000	Ltd. ООД	4700 Smolyan, Bulgaria, 6 Oborishte str. Област: Смолян, Община: Смолян, гр. Смолян-4700, ул.

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			ОБОРИЩЕ 6
18	ERATO HOLDING – SOFIA ЕРАТО ХОЛДИНГ - КЛОН СОФИЯ	JSC АД	Sofia, Bulgaria, 10 “705” str., zh. k. “Lyulin”, Moderno predgradie – III sastav, Yuzhna tangenta Област: София (столица), Община: Столична, гр. София-, ул.”705” N 10 , ж.к. “Люлин”, м. Модерно предградие-III състав, Южна тангента
19	Toplomarket – Burgas Топломаркет - Бургас	Ltd. ЕООД	6300 Haskovo, Bulgaria, 67 Saedinenie blvd., Област: Хасково, Община: Хасково, гр. Хасково-6300, бул. “Съединение” N 67
20	Toplomarket – Sofia Топломаркет - София	Ltd. ЕООД	6300 Haskovo, Bulgaria, 67 Saedinenie blvd., Област: Хасково, Община: Хасково, гр. Хасково-6300, бул. “Съединение” N 67
21	ERATERM-ENGINEERING ЕРАТЕРМ-ИНЖЕНЕРИНГ	Ltd. ЕООД	6300 Haskovo, Bulgaria, 67 Saedinenie blvd., Област: Хасково, Община: Хасково, гр. Хасково-6300, бул. “Съединение” N 67
22	RA ENERGY GROUP РА ЕНЕРДЖИ ГРУП	Ltd. ООД	6297 Pomoshtnik, Bulgaria, Stara Zagora region, municipality Galabovo, Parva str., zh. k. Shesti Област: Стара Загора, Община: Гълъбово, с. Помощник-6297, ПЪРВА , ж.к. КВ. ШЕСТИ
23	ASSOCIATION OF POWER ENGINEERS – BULGARIA СДРУЖЕНИЕ “АСОЦИАЦИЯ НА ЕНЕРГИЙНИТЕ ИНЖЕНЕРИ /АЕИ/ - БЪЛГАРИЯ”	NGO НПО	1505 Sofia, Bulgaria, 75 Cherkovna str., floor 4, ap.11 1505 гр.София, област София -столица, община Столична ул. ЧЕРКОВНА № 75 ет.4 ап.11
24	TETIVA ТЕТИВА	Ltd. ООД	1000 Sofia, Bulgaria, 3 Leonardo da Vinci str, 1000 гр.София, област София -столица, община Столична ул. ЛЕОНАРДО ДА ВИНЧИ № 3
25	GEOMASH ГЕОМАШ	JSC АД	9600 Balchik, Dobrich region, municipality Balchik, 51 Varnenska str. Област: Добрич, Община: Балчик, гр. Балчик-9600, ВАРНЕНСКА N 51
26	SINERGIYA 2000 СИНЕРГИЯ 2000	Ltd. ЕООД	1164 Sofia, 2 Kokiche str. Област: София (столица), Община: Столична, гр. София-1164, ул.КОКИЧЕ 2
27	ECOWATT ENGINEERING ЕКОВАТ ИНЖЕНЕРИНГ	Ltd. ЕООД	1700 Sofia, Bulgaria, 172 Dragan Tzankov blvd. Област: София (столица), Община: Столична, гр. София-1700, бул. ДРАГАН ЦАНКОВ N 172
28	КЕМА CONSULTING КЕМА КОНСУЛТИНГ	ТП	1670 Sofia, Bulgaria, Balgariya blvd., bl. 60 G 1670 гр.София, област София -столица, община

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			Столична бул. БЪЛГАРИЯ бл. 60Г
29	PROMISHLENA ENERGETIKA ПРОМИШЛЕНА ЕНЕРГЕТИКА	JSC АД	8600 Yambol, Bulgaria, 30 Yambolen str. Област: Ямбол, Община: Ямбол, гр. Ямбол-8600, ул. ЯМБОЛЕН N 30
30	BADESHTNOST БЪДЕЩНОСТ	JSC АД	6200 Chirpan, Bulgaria, Stara Zagora region, Industrialen district Област: Стара Загора, Община: Чирпан, гр. Чирпан-6200, ИНДУСТРИАЛЕН
31	CHROM ХРОМ	JSC АД	7500 Silistra, Bulgaria, 18 Tutrakan str. Област: Силистра, Община: Силистра, гр. Силистра-7500, ул. ТУТРАКАН N 18
32	ASSOCIATION "LESHTEN – GORNO DRYANOVO" СДРУЖЕНИЕ "ЛЕЩЕН - ГОРНО ДРЯНОВО"	NGO НПО	2969 Kovachevitz, Blagoevgrad region, municipality Garmen, Belicheva Kashta 2969 с.Ковачевица, област Благоевград, община Гърмен БЕЛИЧЕВА КЪЩА
33	"BULGARIAN UTILISING AND RECYCLING ASSOCIATION" СДРУЖЕНИЕ "БЪЛГАРСКА ОПОЛЗВОТВОРЯВАЩА И РЕЦИКЛИРАЩА АСОЦИАЦИЯ"	NGO НПО	1303 Sofia, Bulgaria, zh. k. Zona B-5, Parteniy Nishavski str., Business center Blue Papas, floor 2 1303 гр.София, област София -столица, община Столична ж.к. ЗОНА Б-5 ул.ПАРТЕНИЙ НИШАВСКИ Б.Ц. БЛУ ПАПАС ет.2
34	MAPE DEVELOPMENT МЕЙП ДИВЕЛЪПМЪНТ	Ltd. ЕООД	1421 Sofia, Bulgaria, 1 Tzvetna gradina, entr. B, floor 4, ap. 30 гр. София-1421, ул. Цветна градина N 1 , вх. Б, ет. 4, ап.30
35	BULPLAN БУЛПЛАН	Ltd. ООД	1000 Sofia, Bulgaria, 22 Slavyanska str., floor 2, ap. 7 гр. София-1000, ул. "Славянска" N 22 , ет. 2, ап.7
36	WHINMAPE УИНМЕЙП	Ltd. ООД	1421 Sofia, Bulgaria, 1 Tzvetna gradina, entr. B, floor 4, ap. 30 гр. София-1421, ул. Цветна градина N 1 , вх. Б, ет. 4, ап.30
37	DAZY TECHNOLOGY ДЕЙЗИ ТЕХНОЛОДЖИ	Ltd. ООД	Sofia, Bulgaria, zh. k. Tolstoy, bl. 38, entr. A, floor 6, ap. 18 гр. София - ж.к. ТОЛСТОЙ, бл. 38, вх. А, ет. 6, ап.18
38	ELTECH ЕЛТЕХ	Ltd. ООД	5700 Teteven, Bulgaria, Lovech region, municipality Teteven, 79 Varshetz str. Област: Ловеч, Община: Тетевен, гр. Тетевен-5700, ул.Вършец N 79

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39	EVROETIL ЕВРОЕТИЛ	JSC АД	7570 Alfatar, Bulgaria, Silistra region, Alfatar municipality, REZERVEN PROMISHLENO – SKLADOV TEREN Област: Силистра, Община: Алфатар, гр. Алфатар-7570, РЕЗЕРВЕН ПРОМИШЛЕНО-СКЛАДОВ ТЕРЕН
40	VIVA AGROTEX ВИВА АГРОТЕКС	Ltd. ЕООД	7500 Silistra, Bulgaria, Silistra region, municipality Silistra, 1 Dobrudzha str., floor 5 Област: Силистра, Община: Силистра, гр. Силистра- 7500, ул. ДОБРУДЖА N 1 , ет. 5
41	GREEN ENERGY ENGINEERING ГРИЙН ЕНЕРДЖИ ИНЖЕНЕРИНГ	JSC АД	7500 Silistra, Bulgaria, Silistra region, municipality Silistra, 2A Lyuben Karavelov str., office 7 Област: Силистра, Община: Силистра, гр. Силистра- 7500, ул. ЛЮБЕН КАРАВЕЛОВ N 2А, ОФИС 7
42	ECO ENERGY ЕКО ЕНЕРДЖИ	Ltd. ЕООД	7500 Silistra, Bulgaria, Silistra region, municipality Silistra, 1 Dobrudzha str., floor 5 Област: Силистра, Община: Силистра, гр. Силистра- 7500, ул. ДОБРУДЖА N 1 , ет. 5
43	EUROTHIL ЕУРОЕТИЛ	Ltd. ЕООД	7570 Alfatar, Bulgaria, Silistra region, Alfatar municipality, REZERVEN PROMISHLENO – SKLADOV TEREN Област: Силистра, Община: Алфатар, гр. Алфатар-7570, РЕЗЕРВЕН ПРОМИШЛЕНО-СКЛАДОВ ТЕРЕН
44	VITA 02 ВИТА 02	Ltd. ЕООД	1186 Sofia, Bulgaria, 38 Star lozenski pat str. гр. София-1186, ул. СТАР ЛОЗЕНСКИ ПЪТ N 38
45	PROMETHEUS ENERGY COMPANY ЕНЕРГИЙНО ДРУЖЕСТВО ПРОМЕТЕЙ	JSC АД	1618 Sofia, Bulgaria, Vitosha district, 85 Bratya Buxton blvd. София-1618, район Витоша, бул. БРАТЯ БЪКСТОН N 85
46	TEMPERA – PLAMEN STANCHEV ТЕМПЕРА - ПЛАМЕН СТАНЧЕВ	ЕТ	1202 Sofia, Bulgaria, 40 Vesletz str. 1202 гр.София, област София -столица, община Столична ул. ВЕСЛЕЦ № 40
47	TOPLOFIKATZIYA BANSKO ТОПЛОФИКАЦИЯ БАНСКО	JSC АД	2770 Bansko, Bulgaria, Blagoevgrad region, municipality Bansko, ОТОПЛИТЕЛНА TZENTRALA NA BIOMASA Област: Благоевград, Община: Банско, гр. Банско-2770, ОТОПЛИТЕЛНА ЦЕНТРАЛА НА БИОМАСА
48	BUL ECO ENERGY БУЛ ЕКО ЕНЕРГИЯ	Ltd. ООД	1421 Sofia, Bulgaria, 25 Vezhen str., entr. 3, floor 2, ap. 2 гр. София-1421, ул. ВЕЖЕН N 25 , вх. 3, ет. 2, ап.2
49	MONDY STAMBOLIYSKI МОНДИ СТАМБОЛИЙСКИ	JSC ЕАД	4210 Stamboliyski, Bulgaria, Plovdiv region, municipality Stamboliyski, 1 Zavodska str. Област: Пловдив, Община: Стамболийски, гр. Стамболийски-4210, ул. ЗАВОДСКА N 1
50	SVILOZA	JSC	5250 Svishtov, Bulgaria, Veliko Tarnovo region,

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	СВИЛОЗА	АД	municipality Svishtov, ZAPADNA INDUSTRIALNA ZONA Област: Велико Търново, Община: Свищов, гр. Свищов-5250, ЗАПАДНА ИНДУСТРИАЛНА ЗОНА
51	A.R.U.S. HOLDING А.Р.У.С. ХОЛДИНГ	JSC АД	5250 Svishtov, Bulgaria, Veliko Tarnovo region, municipality Svishtov, Ekzarch Antim I str., zh. k. Nadezhda I, entr. V, floor 1, ap. 32 Област: Велико Търново, Община: Свищов, гр. Свищов-5250, ул. "Екзарх Антим I", ж.к. "НАДЕЖДА" I, вх. В, ет. 1, ап.32
52	ASSOCIATION OF BULGARIAN TIMBER USERS СДРУЖЕНИЕ "АСОЦИАЦИЯ НА БЪЛГАРСКИТЕ ПОЛЗВАТЕЛИ НА ДЪРВЕСИНА"	NGO НПО	1113 Sofia, Bulgaria, 30A Elemag str. 1113 гр.София, област София -столица, община Столична ул. ЕЛЕМАГ № 30А
53	ASSOCIATION "TECHNOLOGICAL PLATFORM OF THE BULGARIAN FORESTRY" СДРУЖЕНИЕ "ТЕХНОЛОГИЧНА ПЛАТФОРМА НА ГОРСКИЯ СЕКТОР В БЪЛГАРИЯ"	NGO НПО	1404 Sofia, Bulgaria, Bulgariya blvd., zh. k. BOKAR, bl. 18 1404 гр.София, област София -столица, община Столична бул. БЪЛГАРИЯ ж.к. БОКАР бл. 18
54	ECO – RAY – AGRO ЕКО-РАЙ-АГРО	Ltd. ЕООД	1504 Sofia, Bulgaria, 13 Veliko Tarnovo str., entr. 1, floor 1, ap.1 гр. София-1504, ул."Велико Търново" N 13 , вх. 1, ет. 1, ап.1
55	ECO – RAY – SYSTEMS ЕКО - РАЙ - СИСТЕМС	Ltd. ООД	1504 Sofia, Bulgaria, 13 Veliko Tarnovo str., entr. 1, floor 1, ap.3 гр. София-1504, ул. Велико Търново N 13 , ет. 1, ап.3
56	ZGK – ECO – RAY – GARANT ЗГК - ЕКО - РАЙ - ГАРАНТ	JSC АД	1517Sofia, Bulgaria, 113 a Konstantin Fotinov str. гр. София-1517, ул.Константин Фотинов N 113а
57	NG-GROUP НГ-ГРУП	ДЗЗД	1000 Sofia, Bulgaria, 38B Hristo Botev blvd., floor 2, ap. 8 1000 гр.София, област София -столица, община Столична бул.ХРИСТО БОТЕВ № 38Б ет.2 ап.8
58	ECORAY-ENERGY	Ltd.	1517 Sofia, Bulgaria, 113 Konstantin Fotinov str., zh. k.

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	ЕКОРАЙ-ЕНЕРДЖИ	ЕООД	Suhata reka, entr. A, floor 2, ap. 6 гр. София-1517, КОНСТАНТИН ФОТИНОВ N 113 , ж.к. КВ.СУХАТА РЕКА, вх. А, ет. 2, ап.6
59	ECO-RAY-CONSULT ЕКО-РАЙ-КОНСУЛТ	Ltd. ЕООД	1504 Sofia, Bulgaria, 13 Veliko Tarnovo str., entr. 1, floor 1, ap.3 гр. София-1504, ВЕЛИКО ТЪРНОВО N 13 , вх. 1, ет. 1, ап.3
60	ЕКО ENERSYST ЕКО ЕНЕРСИСТ	Ltd. ООД	1517 Sofia, Bulgaria, 113 Konstantin Fotinov str., zh. k. Suhata reka гр. София-1517, КОНСТАНТИН ФОТИНОВ N 113 , ж.к. СУХАТА РЕКА
61	ЕСОЕFFECT BULGARIA ЕКООЕФЕКТ БЪЛГАРИЯ	Ltd. ООД	2300 Pernik, Bulgaria, Petko Karavelov str., bl. 20, ap. 11 Област: Перник, Община: Перник, гр. Перник-2300, ул.ПЕТКО КАРАВЕЛОВ , бл. 20, ап.11
62	TERMA EXPERT PLUS ТЕРМА ЕКСПЕРТ ПЛЮС	Ltd. ООД	4000 Plovdiv, Bulgaria, 37 A Mariya Luiza str. Област: Пловдив, Община: Пловдив, гр. Пловдив-4000, КНЯГИНЯ МАРИЯ ЛУИЗА N 37A
63	TERMA EXPERT – YORDANKA MARKOVA ТЕРМА ЕКСПЕРТ - ЙОРДАНКА МАРКОВА	ЕТ	4003 Plovdiv, Bulgaria, 13A Pobeda str. 4003 гр.Пловдив, област Пловдив, община Пловдив ул. ПОБЕДА № 13А
64	DISTRICT HEATING COMPANY ДИСТРИКТ ХИЙТИНГ КЪМПАНИ	JSC АД	1164 Sofia, Bulgaria, 23 Hristo Smirnenski str. гр. София-1164, ХРИСТО СМИРНЕНСКИ N 23
65	BALCHIK CENTRAL HEATING COMPANY БАЛЧИК СЕНТЪРЪЛ ХИЙТИНГ КЪМПАНИ	JSC АД	7000 Ruse, Bulgaria, 2 a Mitropolit Grigoriy str. Област: Русе, Община: Русе, гр. Русе-7000, ул.МИТРОПОЛИТ ГРИГОРИЙ N 2а
66	МЕТА MIX МЕТА МИКС	Ltd. ООД	1303 Sofia, Bulgaria, 66 Bulgarska Morava str. гр. София-1303, УЛ.БЪЛГАРСКА МОРАВА N 66
67	J SYSTEMS ДЖЕЙ СИСТЕМИ	Ltd. ЕООД	1113 Sofia, Bulgaria, 10 Kosta Lulchev str., entr. V, ap. 29 гр. София-1113, ул.КОСТА ЛУЛЧЕВ N 10 , вх. В, ап.29
68	ALSYSTEMS АЛСИСТЕМС	Ltd. ЕООД	1113 Sofia, Bulgaria, zh. k. Geo Milev, bl. 142, entr. G, floor 3, ap. 9 гр. София-1113, , ж.к. ГЕО МИЛЕВ, бл. 142, вх. Г, ет. 3, ап.9
69	LUXUR ENERGIES ЛУКСУР ЕНЕРДЖИС	JSC ЕАД	1618 Sofia, Bulgaria, 58 Balgariya, bl. C, floor 8, ap. 27 гр. София-1618, България N 58 , бл. С, ет. 8, ап.27
70	LUXUR BIOMASS	Ltd.	1618 Sofia, Bulgaria, 58 Balgariya, bl. C, floor 8, ap. 27

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	ЛУКСУР БИОМАС	ООД	гр. София-1618, България N 58 , бл. С, ет. 8, ап.27
71	ELECTRA HOLDING ЕЛЕКТРА ХОЛДИНГ	JSC АД	1618 Sofia, Bulgaria, 58 Balgariya, bl. С, floor 8, ap. 27 гр. София-1618, България N 58 , бл. С, ет. 8, ап.27
72	ECO EL INVEST ЕКО ЕЛ ИНВЕСТ	Ltd. ООД	6600 Kardzhali, Bulgaria, 9 Pirin str., entr. В, floor 4, ap. 8 Област: Кърджали, Община: Кърджали, гр. Кърджали-6600, ул. ПИРИН N 9 , вх. Б, ет. 4, ап.8
73	ТОПЛОФИКАТЗИЯ BOURGAS ТОПЛОФИКАЦИЯ БУРГАС	JSC ЕАД	8000 Bourgas, Bulgaria, zh. k. Lozovo Област: Бургас, Община: Бургас, гр. Бургас-8000, , ж.к. Лозово
74	VDC ВДЦ	Ltd. ООД	8600 Yambol, Bulgaria, 76 Graf Ignatiev str., entr. D, ap. 94 Област: Ямбол, Община: Ямбол, гр. Ямбол-8600, ул. ГРАФ ИГНАТИЕВ N 76 , вх. Д, ап.94
75	PRESTA TERMAL ПРЕСТА ТЕРМАЛ	Ltd. ЕООД	1111 Sofia, Bulgaria, 9 Nemus str., bl. 1, entr. 1, floor 3, ap. 5 гр. София-1111, ул. Хемус N 9 , бл. 1, вх. 1, ет. 3, ап.5
76	ISOTHERM STYLE ИЗОТЕРМ СТИЛ	Ltd. ЕООД	4400 Pazardzhik, Bulgaria, 57 Balgariya blvd. 4400 гр.Пазарджик, област Пазарджик, община Пазарджик бул. БЪЛГАРИЯ № 57
77	VAPRES ВАПРЕС	Ltd. ЕООД	5800 Pleven, Bulgaria, 6 Grivishko shose str. Област: Плевен, Община: Плевен, гр. Плевен-5800, ул.ГРИВИШКО ШОСЕ N 6
78	DR. ENERGY SYSTEMS Д-Р ЕНЕРЖИ СИСТЕМС	Ltd. ООД	1421 Sofia, Bulgaria, 27 Dimitar Hadzhikotzev str., floor 1, ap. 3 гр. София-1421, ул. ДИМИТЪР ХАДЖИКОЦЕВ N 27 , ет. 1, ап.3
79	SPIKA – RUMYANA DIMITROVA СПИКА - РУМЯНА ДИМИТРОВА	ЕТ	2020 Govedartzi, Bulgaria, Sofia region, municipality Samokov, 4 Svoboda str. Област: София, Община: Самоков, с. Говедарци-2020, СВОБОДА N 4
80	BIOENERGOTECH БИОЕНЕРГОТЕХ	Ltd. ЕООД	9000 Varna, Bulgaria, 49 Strandzha str., floor 4, ap. 7 Област: Варна, Община: Варна, гр. Варна-9000, Странджа N 49 , ет. 4, ап.7
81	BIO POWER БИО ПАУЪР	JSC АД	1000 Sofia, Bulgaria, 8 Kaloyan str., floor 4 гр. София-, ул."Калоян" N 8 , ет. 4
82	ECO EL ЕКО ЕЛ	Ltd. ООД	9003 Varna, Bulgaria, 10 Professor Ivan Shishmanov str. Област: Варна, Община: Варна, гр. Варна-9003, ул. ПРОФЕСОР ИВАН ШИШМАНОВ N 10
83	BENEKO VB	Ltd.	1124 Sofia, Bulgaria, 16 Yantra str.

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	БЕНЕКО ВБ	ЕООД	гр. София-1124, ул. ЯНТРА 16
84	BENEKO – VLADIMIR BENEV БЕНЕКО - ВЛАДИМИР БЕНЕВ	ЕТ	1124 Sofia, Bulgaria, 16 Yantra str. гр. София-1124, ул. ЯНТРА 16
85	HODZHA YURT ХОДЖА ЮРТ	Ltd. ООД	1000 Sofia, Bulgaria, 53 Gladston str. гр. София-1000, ул. ГЛАДСТОН N 53
86	MAYR- MELNHOFF – NIKOPOL МАЙР-МЕЛНХОФ - НИКОПОЛ	JSC АД	5800 Pleven, Bulgaria, 43 Radetzki str., floor 2, ap. 4 Област: Плевен, Община: Плевен, гр. Плевен-5800, ул.РАДЕЦКИ N 43 , ет. 2, ап.4
87	BULGARIAN RENEWABLE ENERGY COMPANY БЪЛГЕРИЪН РЕНЮАБЪЛ ЕНЕРДЖИ КЪМПЪНИ	Ltd. ЕООД	1700 Sofia, Bulgaria, Prof. Hristo Vakarelski str., bl. 5, entr. V, ap. 5 гр. София-1700, проф. Христо Вакарелски , бл. 5, вх. В, ап.5
88	ESD – BULGARIA И ЕС ДИ - БЪЛГАРИЯ	Ltd. ООД	1595 Sofia, Bulgaria, 14 Professor Giovanni Gorinr str., floor 2, ap. 4 гр. София-1595, ПРОФЕСОР ДЖОВАНИ ГОРИНИ N 14 , ет. 2, ап.4

APPENDIX No. 4

List of the founders of the “Association for utilization of biomass for energy producing purposes” (Association ERATO - Асоциация за енергийно оползотворяване на биомасата)

FOUNDERS:

1. Georgi Stoyanov Muzaifirov (Георги Стоянов Музафиров)
2. Valentin Ivanov Tzerovski (Валентин Иванов Церовски)
3. Metodi Yordanov Konstantinov (Методи Йорданов Константинов)
4. Iliya Angelov Nikolaev (Илия Ангелов Николаев)
5. Zahari Nevelinov Shumkov (Захари Невелинов Шумков)
6. Krasimir Dimitrov Stanchev (Красимир Димитров Станчев)
7. Dimitar Genev Dimitrov (Димитър Генев Димитров)

8. Nikola Borisov Stankov (Никола Бориславов Станков)
9. Plamen Dimitrov Delkov (Пламен Димитров Делков)
10. Teodor Dimitrov Ivanov (Теодор Димитров Иванов)
11. Dimitar Konstantinov Mladenov (Димитър Константинов Младенов)
12. Dimcho Anastasov Dimchev (Димчо Анастасов Димчев)
13. Plamen Metodiev Stoimenov (Пламен Методиев Стоименов)
14. Stefan Stefanov Lazarov (Стефан Стефанов Лазаров)

APPENDIX No. 5

List of companies involved in biomass utilization which have received so called BEERECL (Bulgarian Energy Efficiency and Renewable Energy Credit Line) loans and grants

№	Name	Address
1	ERATO HOLDING JSC ЕРАТО ХОЛДИНГ АД	6300 Haskovo, Bulgaria, 67 Saedinenie blvd. гр. Хасково-6300, бул. СЪЕДИНЕНИЕ 67
2	ERATO JSC ЕРАТО АД	6300 Haskovo, Bulgaria, 67 Saedinenie blvd. гр. Хасково-6300, бул. СЪЕДИНЕНИЕ 67
3	ERATO HOLDING – SOFIA BRANCH JSC ЕРАТО ХОЛДИНГ - АД КЛОН СОФИЯ	Sofia, Bulgaria, 10 “705” str., zh. k. Lyulin, Moderno predgradie – III sastav, Yuzhna tangenta Област: София (столица), Община: Столична, гр. София-, ул.”705” N 10 , ж.к. “Люлин”, м. Модерно предградие-III състав, Южна тангента
4	BADESHTNOST JSC БЪДЕЩНОСТ АД	6200 Chirpan, Bulgaria, Stara Zagora region, municipality Chirpan Област: Стара Загора, Община: Чирпан, гр. Чирпан-6200, ИНДУСТРИАЛЕН
5	DAZY TECHNOLOGY ДЕЙЗИ Ltd.ООД ТЕХНОЛОДЖИ	Sofia, Bulgaria, zh. k. Tolstoy, bl. 38, entr. A, floor 6, ap. 18 гр. София-, , ж.к. ТОЛСТОЙ, бл. 38, вх. А, ет. 6, ап.18
6	EUROETHYL JSC ЕВРОЕТИЛ АД	7570 Alfatar, Bulgaria, Silistra region, municipality Alfatar, REZERVEN PROMISHLENO – SKLADOV TEREEN Област: Силистра, Община: Алфатар, гр. Алфатар-7570, РЕЗЕРВЕН ПРОМИШЛЕНО-СКЛАДОВ ТЕРЕН

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7	VIVA AGROTEX ВИВА АГРОТЕКС	Ltd. ЕООД	7500 Silistra, Bulgaria, Silistra region, municipality Silistra, 1 Dobrudzha str., floor 5 Област: Силистра, Община: Силистра, гр. Силистра-7500, ул. ДОБРУДЖА N 1 , ет. 5
8	ECO ENERGY ЕКО ЕНЕРДЖИ	Ltd. ЕООД	7500 Silistra, Bulgaria, Silistra region, municipality Silistra, 1 Dobrudzha str., floor 5 Област: Силистра, Община: Силистра, гр. Силистра-7500, ул. ДОБРУДЖА N 1 , ет. 5
9	EUROETHYL ЕУРОЕТИЛ	Ltd. ЕООД	7570 Alfatar, Bulgaria, Silistra region, municipality Alfatar, REZERVEN PROMISHLENO – SKLADOV TEREN Област: Силистра, Община: Алфатар, гр. Алфатар-7570, РЕЗЕРВЕН ПРОМИШЛЕНО-СКЛАДОВ ТЕРЕН
10	VITA 02 ВИТА 02	Ltd. ЕООД	1186 Sofia, Bulgaria, 38 Star Lozenski pat str. гр. София-1186, ул. СТАР ЛОЗЕНСКИ ПЪТ N 38
11	PROMETEUS ENERGY COMPANY ЕНЕРГИЙНО ДРУЖЕСТВО ПРОМЕТЕЙ	JSC АД	1618 Sofia, Bulgaria, Vitosha district, 85 Bratya Buxton blvd. София-1618, район Витоша, бул. БРАТЯ БЪКСТОН N 85
12	BUL ECO ENERGY БУЛ ЕКО ЕНЕРГИЯ	Ltd. ООД	1421 Sofia, Bulgaria, 25 Vezhen str., entr. 3, floor 2,ap. 2 гр. София-1421, ул. ВЕЖЕН N 25 , вх. 3, ет. 2, ап.2
13	MONDY STAMBOLIYSKI МОНДИ СТАМБОЛИЙСКИ	JSC ЕАД	4210 Stamboliyski, Plovdiv region, municipality Stamboliyski, 1 Zavodska str. Област: Пловдив, Община: Стамболийски, гр. Стамболийски-4210, ул. ЗАВОДСКА N 1

APPENDIX No 6.

Some information on the socio-economic context of the Power Engineering Sector in Bulgaria.

APP. 6.1. The average number of employed persons in the power engineering sector remains stable, with a slight raise in the period 2001 – 2009. (Here we must mention that statistical data are gathered for the activities – production and distribution of electricity, heat and gaseous fuels). In 2001 31,635 persons were employed in the Power Engineering Sector in Bulgaria. In 2002 the number of the employed in the sector increased to 33,005. (The number of the employed in the

sector in 2001 includes 124 owners of companies and self employed. In 2002 it included 129 owners and self-employed) The big difference is in the ratio between the persons employed in the public sector and those employed in the private one. In 2001 the ratio “public sector / private sector” is 31,189 / 322. In 2002 it is 32492 / 384. In 2008 we can already find a dramatic difference in comparison with 2001 – 2002. The ratio “public sector / private sector” is 17,761 / 16,945. In 2009 it is 17,442 / 15,056.

Table 26. Average number of employed persons in the power engineering sector (Production and distribution of electricity, heat and gaseous fuels) -2001, 2002, 2008, 2009.

Year	Total employed	Employed in the public sector	Employed in the private sector
2001	31635*	31189	322
2002	33005**	32492	384
2008	34 706***	17 761	16 945
2009	32 498***	17 442	15 056

* Includes 124 owners of companies and self employed.

** Includes 129 owners of companies and self employed.

*** No data available for owners of companies and self employed.

Source: National Statistical Institute (NSI).

APP. 6.2. In 2008 the share of the employed in the Power Engineering Sector (production and distribution of electricity, heat and gaseous fuels) was 1.41% - 34,706 employed in the sector in comparison with a total of 2,466,852 employed in Bulgaria as a whole. In the public sector the share of the employed in power engineering was 2.89% - 17,761 out of 614,768. In the private sector the share of the employed in power engineering was 0.91% - 16,945 out of 1,852,084.

In 2009 the share of the employed in the Power Engineering Sector was 1.41% again – 32,498 employed in the sector in comparison with a total of 2,295,196 employed in Bulgaria as a whole. In the public sector the share of the employed in power engineering was 2.86% - 17,442 out of 609,604. In the private sector the share of the employed in power engineering was 0.89% - 15,056 out of 1,685,592.

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Table 27. Share of the employed in the production and distribution of electricity, heat and gaseous fuels – 2008.

Economic activities	Total	Public sector	Private Sector
Total	2 466 852	614 768	1 852 084
Production and distribution of electricity, heat and gaseous fuels	34 706	17 761	16 945
%	1,41	2,89	0,91

Source: National Statistical Institute (NSI).

Table 28. Share of the employed in the production and distribution of electricity, heat and gaseous fuels – 2009.

Economic activities	Total	Public sector	Private Sector
Total	2 295 196	609 604	1 685 592
Production and distribution of electricity, heat and gaseous fuels	32 498	17 442	15 056
%	1,41	2,86	0,89

Source: National Statistical Institute (NSI).

APP. 6.3. The average annual salary for persons employed in the Power Engineering Sector in 2002 was 5,724 Bulgarian leva. In 2008 it was already 13,061 Bulgarian leva (14 497 in the public sector and 11,555 in the private sector). In 2009 the average annual salary for the persons employed in the Power Engineering Sector was 15,437 Bulgarian leva – 17,435 for the public sector and 13 121 for the private sector.

Table 29. Average annual salary of persons employed in the power engineering sector (production and distribution of electricity, heat and gaseous fuels) – 2001, 2002, 2008, 2009 (Bulgarian leva).

Year	Total	In the public sector	Employed in the private sector
2001	n. d. a	n. d. a	n. d. a
2002*	5724	n. d. a	n. d. a
2008**	13 061	14 497	11 555
2009**	15 437	17 435	13 121

n. d. a. – no data available

* "Life Standard" magazine, issued by the Confederation of Independent Trade Unions of Bulgaria, No. 3, 2003, p. 26.

** Source – The National Statistical Institute.

APP. 6.4. If we draw a comparison among the average annual salaries in 2008 for employed persons with labour contracts and for civil servants – the highest salary,

the lowest salary and the salary for the Power engineering sector, we shall find out the following:

- The average annual salary for the Bulgarian economy as a whole was 6,538 Bulgarian leva – 7,811 for the public sector and 6114 for the private sector. The lowest annual average salary was in the sector “Hotels and restaurants” – 3,963 Bulgarian leva (5,667 for the public sector and 3 879 for the private sector).
- The highest average annual salary was in the “Financial and insurance activities” sector – 14,582 (17,584 for the public and 14,460 for the private sector). Quite close to the highest average salary for 2008 are the salaries in the “Creation and dissemination of information and creative products; telecommunications” economic activities – 13,984 (10,787 for the public and 14,295 for the private sector) and in the Power engineering sector (Production and distribution of electricity, heat and gaseous fuels) – 13,061 (14,497 for the public and 11,555 for the private sector).
- In comparison with the average annual salary for the total Bulgarian economy, the average annual salary for the Power engineering sector was 200% higher (186% for the public sector and 189% for the private sector).

Table 30. Comparison among the average annual salaries of employed persons with labour contracts and civil servants in 2008 (Highest salary, lowest salary and the salary for the “Production and distribution of electricity, heat and gaseous fuels” economic activity) (Bulgarian leva).

Economic activities	Total	Public sector	Private Sector
Total	6 538	7 811	6 114
%	100	100	100
Production and distribution of electricity, heat and gaseous fuels	13 061	14 497	11 555
%	200	186	189
Hotels and restaurants	3 963	5 667	3 879
%	61	73	63
Creation and dissemination of information and creative products; telecommunications	13 984	10 787	14 295
%	214	138	234
Financial and insurance activities	14 582	17 584	14 460
%	223	225	237

Source: National Statistical Institute (NSI).

If we make the same comparison for the average annual salaries in 2009 we shall find out the following:

- The average annual salary for the Bulgarian economy as a whole was 7,094 Bulgarian leva – 8,534 for the public sector and 6,566 for the private sector. The lowest annual average salary was in the sector “Hotels and restaurants” – 4,535 Bulgarian leva (6,262 for the public sector and 4 436 for the private sector).
- The highest average annual salary was in the “Financial and insurance activities” sector – 15,456 (17,692 for the public and 15,358 for the private sector). Extremely close to the highest average salary for 2009 are the salaries in the Power engineering sector (Production and distribution of electricity, heat and gaseous fuels) – 15,437 (17,435 for the public and 13,121 for the private sector).
- In comparison with the average annual salary for the total Bulgarian economy, the average annual salary for the Power engineering sector was 218% higher (204% for the public sector and 200% for the private sector).

Table 31. Comparison among the average annual salaries for the employed persons – with labour contracts and civil servants in 2009 (Highest salary, lowest salary and the salary for the “Production and distribution of electricity, heat and gaseous fuels” economic activity) (Bulgarian leva).

Economic activities	Total	Public sector	Private Sector
Total	7 094	8 534	6 566
%	100	100	100
Production and distribution of electricity, heat and gaseous fuels	15 437	17 435	13 121
%	218	204	200
Hotels and restaurants	4 535	6 262	4 436
%	64	73	68
Financial and insurance activities	15 456	17 692	15 358
%	218	207	234

Source: National Statistical Institute (NSI).

APP. 6.5. We can make a very informative comparison for the gross payment per hour by sex and economic activities (in Bulgarian leva) for the year of 2004:

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Table 32.

No	Economic activities	Total	Men	Women
1	Total	2.04	2.20	1.87
2	Extractive industry	3.48	3.64	2.76
3	Processing industry	1.79	2.11	1.49
4	Production and distribution of electricity, gaseous fuels and water	3.86	4.02	3.36
5	Construction	1.69	1.70	1.65
6	Trade, repair of motor vehicles, motorcycles, personal and household goods	1.48	1.60	1.38
7	Hotels and restaurants	1.23	1.33	1.18
8	Transport, storage and communications	2.43	2.47	2.35
9	Financial intermediation	4.62	5.37	4.23
10	Real Estate and business services	1.81	1.79	1.85
11	State government; compulsory social securities	3.23	3.43	3.08
12	Education	2.40	2.78	2.30
13	Healthcare and social activities	2.34	2.93	2.18
14	Other community and personal services	1.41	1.44	1.38

Source: National Statistical Institute (NSI).

APP. 6.6. Comparison of employers' labour costs per employee with labour contract (or civil servants) in 2008 (in Bulgarian levs).

Table 33.

Economic activities	Total	Public sector	Private Sector
Total	8 246	10 317	7 556
%	100	100	100
Extractive industry	14 315	23 192	11 324
%	174	225	150
Production and distribution of electricity, heat and gaseous fuels	20 101	23 083	16 976
%	244	224	225
Hotels and restaurants	4 873	7 368	4 752
%	59	71	63
Creation and dissemination of information and creative products; telecommunications	16 682	13 329	17 008

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%	202	129	225
Financial and insurance activities	17 783	22 110	17 608
%	216	214	233
Administrative and supporting activities	4 885	4 096	5 222
%	59	40	69
State Government	11 800	11 800	X
%	143	114	X

Source: National Statistical Institute (NSI).

APP. 6.7. Comparison of the structure of employers' payment for labour costs in 2008 (in Bulgarian leva).

Table 34.

Economic activities	Total	Salaries	Compensations	Social and health insurance, paid by the employers	Other social costs and allowances	Tax upon the social costs
Total	100.00	79.29	1.53	16.92	2.20	0.06
Agriculture, forestry and fishing	100.00	80.42	1.13	17.08	1.34	0.03
Production and distribution of electricity, heat and gaseous fuels	100.00	64.97	2.93	19.72	12.15	0.23
Transport, storage and communications	100.00	73.22	2.42	17.35	6.80	0.21
Hotels and restaurants	100.00	81.32	0.90	17.00	0.74	0.04
Creation and dissemination of information and creative products; telecommunications	100.00	83.83	1.46	13.57	1.09	0.05
State Government	100.00	77.37	1.74	19.66	1.19	0.04

Source: National Statistical Institute (NSI).

APP. 6.8. In the period 2002 – 2007, we can evaluate the pay gap by sex as follows:

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Table 35.

No	Economic activities	2002	2006	2007
1	Total	17,8	10,8	10,7
2	Extractive industry	21,7	27,7	29,5
3	Processing industry	27,5	23,4	23,6
4	Production and distribution of electricity, gaseous fuels and water	14,3	9,2	7,7
5	Construction	-2,9	-14,9	-17,8
6	Trade, repair of motor vehicles, motorcycles, personal and household goods	10,2	11,5	12,1
7	Hotels and restaurants	0,7	5,9	7,6
8	Transport, storage and communications	7,8	2,7	1,3
9	Financial intermediation	13,7	22,5	26,6
10	Real Estate and business services	-10,4	-17,1	-17,9
11	State government; compulsory social securities	9,5	2,1	2,6
12	Education	16,3	14,7	14,3
13	Healthcare and social activities	23,9	28,5	28,1
14	Other community and personal services	10,1	6,8	13,9

Source: National Statistical Institute (NSI).

APP. 6.9. The number of persons, employed or occupied in the Power Engineering Sector and the ratio men / women for the period are available in the table below:

Table 36.

Economic activities	Year	Total	Men	Women	Ratio (M/W)
E.40.1. Production, transfer and distribution of electricity (Persons occupied in the sector including owners and self employed)	2001	31 635	n. d. a.	n. d. a.	n. d. a.
E.40.1. Production, transfer and distribution of electricity (Persons with labour contracts or civil servants)	2001	31 511	n. d. a.	n. d. a.	n. d. a.
E.40.1. Production, transfer and distribution of electricity (Persons occupied in the sector including owners and self employed)	2002	33 005	n. d. a.	n. d. a.	n. d. a.
E.40.1. Production, transfer and distribution of electricity (Persons with labour contracts or civil servants)	2002	32 876	23 852	9 024	73 / 27
Production and distribution of electricity, heat and gaseous	2008	34 706	n. d. a.	n. d. a.	n. d. a.

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fuels (Persons with labour contracts or civil servants)					
Production and distribution of electricity, heat and gaseous fuels (Persons with labour contracts or civil servants)	2009	32 498	n. d. a.	n. d. a.	n. d. a.
Production and distribution of electricity, heat and gaseous fuels (Persons occupied in the sector including owners and self employed)	2009	41 200	31 100	10 100	75 / 25

Source: National Statistical Institute (NSI).

APPENDIX No. 7

Branch Collective Labour Contracts in the Electricity Sector and in the National Electricity Company (2003 - 2009)

BRANCH COLLECTIVE LABOUR CONTRACT No. 08 / 05. 06. 2003.

Signed on June 02nd 2003.

Registered at the General Labour Inspectorate on June 05th 2003 - № 08.

Parties:

The Bulgarian Branch Chamber of Energy (*Българска бранишова камара на енергетиците*) - sectoral employer's organization.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

Covers the following economic activities:

Nuclear Power Engineering

Producing of Electricity

The National Electricity Company

Distribution of Electricity

Heat

Developing of Electricity Infrastructure

Repair, Maintenance and Modernization; Efficient Use of Energy Resources

ANNEX

TO

BRANCH COLLECTIVE LABOUR CONTRACT №. 08 / 05. 06. 2003.

Signed on November 11th 2003.

Registered in the General Labour Inspectorate on November 25th 2003, attached to CLC June 05th 2003 - № 08.

Parties:

The Bulgarian Branch Chamber of Energy (*Българска браншова камара на енергетиците*) - sectoral employer's organization.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

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The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

Covers the following economic activities:

Nuclear Power Engineering

Producing of Electricity

The National Electricity Company

Distribution of Electricity

Heat

Developing of Electricity Infrastructure

Repair, Maintenance and Modernization; Efficient Use of Energy Resources

COLLECTIVE LABOUR CONTRACT No. 24 / 04. 06. 2004.

Signed on June 01st 2004.

Registered in the General Labour Inspectorate on June 04-th 2004 - № 24.

Parties:

National Electric Company (*Национална електрическа компания*) – employer.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

Covers the following economic activities:

The National Electricity Company

**ADDITIONAL AGREEMENT
TO
COLLECTIVE LABOUR CONTRACT No. 24 / 04. 06. 2004.**

Signed on July 16th 2004 .

Registered in the General Labour Inspectorate on July 28th 2004 – attached to CLC № 24 / 04. 06. 2004.

Parties:

High Voltage Network - National Electric Company (*Мрежи високо напрежение - Национална електрическа компания*) – employer.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

Covers the following economic activities:

High Voltage Network in the National Electricity Company.

**ADDITIONAL AGREEMENT
TO
BRANCH COLLECTIVE LABOUR CONTRACT No. 08 / 05. 06. 2003.**

Signed on May 20th 2005.

Registered at the General Labour Inspectorate on May 30th 2005, attached to
CLC June 05th 2003 - № 08.

Parties:

The Bulgarian Branch Chamber of Energy (*Българска браншова камара на енергетиците*) - sectoral employer's organization.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Federation of Atomic Energy Workers – Podkrepa (*Федерация „Атомна енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Union of Energy Workers (*Съюз на енергетиците в България*) – member of the Union of Syndicates affiliated to the “Promyana” Unification.

Covers the following economic activities:

Nuclear Power Engineering

Producing of Electricity

The National Electricity Company

Distribution of Electricity

Heat

Developing of Electricity Infrastructure

Repair, Maintenance and Modernization; Efficient Use of Energy Resources

BRANCH COLLECTIVE LABOUR CONTRACT No. 16 / 11. 10. 2005.

Signed on September 30th 2005.

Registered at the General Labour Inspectorate on October 11th 2005 - № 16.

Parties:

The Bulgarian Branch Chamber of Energy (*Българска браншова камара на енергетиците*) - sectoral employer's organization.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

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The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Federation of Atomic Energy Workers – Podkrepa (*Федерация „Атомна енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Union of Energy Workers (*Съюз на енергетиците в България*) – member of the Union of Syndicates affiliated to the “Promyana” Unification.

Covers the following economic activities:

Nuclear Power Engineering

Producing of Electricity

The National Electricity Company

Distribution of Electricity

Heat

Developing of Electricity Infrastructure

Repair, Maintenance and Modernization; Efficient Use of Energy Resources

COLLECTIVE LABOUR CONTRACT No. 19 / 12. 06. 2006.

Signed on May 29th 2006.

Registered at the General Labour Inspectorate on June 12th 2006 - № 19.

Parties:

National Electric Company (*Национална електрическа компания*) – employer.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Federation of Atomic Energy Workers – Podkrepa (*Федерация „Атомна енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Union of Energy Workers (*Съюз на енергетиците в България*) – not affiliated.

The National Professional Federation of Energy Workers (*Национална федерация на енергетиците*) – member of National Trade Union “Promyana”.

Association of Democratic Syndicates (*Асоциация на демократичните синдикати*) – the section of the Association, which operates in the power engineering sector.

Covers the following economic activities:

The National Electricity Company

**ADDITIONAL AGREEMENT
TO
COLLECTIVE LABOUR CONTRACT No. 19 / 12. 06. 2006.**

Signed on October 02nd 2007.

Registered in the General Labour Inspectorate on 11. 10. 2007, attached to CLC
June 12th 2006 - № 19.

Parties:

National Electric Company (*Национална електрическа компания*) – employer.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Federation of Atomic Energy Workers – Podkrepa (*Федерация „Атомна енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Union of Energy Workers (*Съюз на енергетиците в България*) – not affiliated.

The National Professional Federation of Energy Workers (*Национална федерация на енергетиците*) – member of National Trade Union “Promyana”.

Association of Democratic Syndicates (Асоциация на демократичните синдикати) – the section of the Association, which operates in the power engineering sector.

Covers the following economic activities:

The National Electricity Company

BRANCH COLLECTIVE LABOUR CONTRACT №. 20 / 30. 10. 2007.

Signed on October 25th 2007.

Registered at the General Labour Inspectorate on October 30th 2007 - № 20.

Parties:

The Bulgarian Branch Chamber of Energy (*Българска бранишова камара на енергетиците*) - sectoral employer's organization.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

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The Federation of Atomic Energy Workers – Podkrepa (*Федерация „Атомна енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

Covers the following economic activities:

Nuclear power engineering and radioactive waste treatment.

Producing of electricity

The National Electricity Company

Distribution and selling of electricity

Heat

Developing of electricity infrastructure

Repair, maintenance and modernization; Efficient use of energy resources

Other Activities, connected with the sector due to corporative, structural or functional reasons.

ADDITIONAL AGREEMENT

TO

COLLECTIVE LABOUR CONTRACT No. 19 / 12. 06. 2006.

Signed on 24. 03. 2008.

Registered in the General Labour Inspectorate on 02. 04. 2008, attached to CLC June 12th 2006 - № 19.

Parties:

National Electric Company (*Национална електрическа компания*) – employer.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

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The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Federation of Atomic Energy Workers – Podkrepa (*Федерация „Атомна енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Union of Energy Workers (*Съюз на енергетиците в България*) – not affiliated.

The National Professional Federation of Energy Workers (*Национална федерация на енергетиците*) – member of National Trade Union “Promyana”.

Association of Democratic Syndicates (*Асоциация на демократичните синдикати*) – the section of the Association, which operates in the power engineering sector.

Covers the following economic activities:

The National Electricity Company

COLLECTIVE LABOUR CONTRACT No. 22 / 10. 07. 2008.

Signed on July 03rd 2008 .

Registered in the General Labour Inspectorate on July 10th 2008 - № 22.

Parties:

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National Electric Company (*Национална електрическа компания*) – employer.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

The Federation of Atomic Energy Workers – Podkrepa (*Федерация „Атомна енергетика” – Подкрепа*) - member of the Confederation of Labour PODKREPA.

Covers the following economic activities:

The National Electricity Company

BRANCH COLLECTIVE LABOUR CONTRACT No. 21 / 19. 10. 2009.

Signed on October 06th 2009 .

Registered in the General Labour Inspectorate on October 19th 2009 - № 21.

Parties:

The Bulgarian Branch Chamber of Energy (*Българска браншова камара на енергетиците*) - sectoral employer's organization.

The National Federation of Energy Workers (*Национална федерация на енергетиците*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Independent Trade Union Federation of Workers in the Energy Industry in Bulgaria (*Независима синдикална федерация на енергетиците в България*) - member of the Confederation of Independent Trade Unions in Bulgaria, CITUB.

The Federation of Energy Workers – Podkrepa (*Федерация „Енергетика” – Подкрепа*) – member of the Confederation of Labour PODKREPA.

The Federation of Atomic Energy Workers – Podkrepa (*Федерация „Атомна енергетика” – Подкрепа*) – member of the Confederation of Labour PODKREPA.

Covers the following economic activities:

Nuclear Power Engineering

Producing of Electricity

The National Electricity Company

Distribution of Electricity

Heat

Developing of Electricity Infrastructure

Repair, Maintenance and Modernization; Efficient Use of Energy Resources

APPENDIX No 8.

**Some information on the socio-economic context of the Renewable Energy
Subsector in Bulgaria**

APP. 8.1. Number of employees in the organized enterprises in the Renewable Energy (Sub)sector in Bulgaria 2009-2010.

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Table 37.
MATRIX OERES in BG - 106.

	Total	MEN	%	WOMEN	%
01. 2009	5471	4048	74%	1423	26%
07. 2009	5233	3842	73,42%	1391	26,58%
01. 2010	5040	3715	73,71%	1325	26,29%

MATRIX OERES in BG – 120

	Total	MEN	%	WOMEN	%
01. 2009	6023	4473	74,27%	1550	25,73%
07. 2009	5727	4217	73,63%	1510	26,37%
01. 2010	5550	4107	74%	1443	26%

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

APP. 8.2. Distribution of the enterprises, following the number of the ensured persons.

Table 38
MATRIX OERES in BG – 106

	01. 2009	07. 2009	01. 2010
0 persons	39	30	28
1 – 10 persons	36	44	49
11 – 50 persons	21	23	20
51 – 100 persons	3	3	3
More than 100 persons	7	6	6

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

	01. 2009	07. 2009	01. 2010
0 persons	36,79%	28,30%	26,42%
1 – 10 persons	33,96%	41,51%	46,23%
11 – 50 persons	19,81%	21,70%	18,87%
51 – 100 persons	2,83%	2,83%	2,83%
More than 100 persons	6,60%	5,66%	5,66%

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Table 39.
MATRIX OERES in BG – 120

	01. 2009	07. 2009	01. 2010
0 persons	40	32	30
1 – 10 persons	40	48	52
11 – 50 persons	28	29	27
51 – 100 persons	3	4	4
More than 100 persons	9	7	7

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

	01. 2009	07. 2009	01. 2010
0 persons	33,33%	26,66%	25,00%
1 – 10 persons	33,33%	40,00%	43,33%
11 – 50 persons	23,33%	24,17%	22,50%
51 – 100 persons	2,50%	3,33%	3,33%
More than 100 persons	7,50%	5,83%	5,83%

APP. 8.3. Distribution of the ensured persons, following their age.

Table 40.
MATRIX OERES in BG – 106

	01. 2009	07. 2009	01. 2010
Number of enterprises with insured persons	67	76	78
Total number of insured persons	5471	5233	5040
Age up to 18 years	0	3	0
Age 19 – 30 years	889	888	745
Age 31 – 40 years	1436	1427	1310
Age 41 – 50 years	1817	1724	1728
Age 51 – 60 years	1164	1057	1104
Age more than 60 years	165	134	153

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

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	01. 2009	07. 2009	01. 2010
Number of enterprises with insured persons	67	76	78
Total number of insured persons	5471	5233	5040
Age up to 18 years	0,00%	0,06%	0,00%
Age 19 – 30 years	16,25%	16,97%	14,78%
Age 31 – 40 years	26,25%	27,27%	25,99%
Age 41 – 50 years	33,21%	32,94%	34,29%
Age 51 – 60 years	21,28%	20,20%	21,90%
Age more than 60 years	3,02%	2,56%	3,04%

Table 41.
MATRIX OERES in BG – 120

	01. 2009	07. 2009	01. 2010
Number of enterprises with insured persons	80	88	90
Total number of insured persons	6023	5727	5550
Age up to 18 years	0	3	0
Age 19 – 30 years	1003	989	838
Age 31 – 40 years	1576	1552	1449
Age 41 – 50 years	1943	1843	1851
Age 51 – 60 years	1303	1180	1223
Age more than 60 years	198	160	189

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

	01. 2009	07. 2009	01. 2010
Number of enterprises with insured persons	80	88	90
Total number of insured persons	6023	5727	5550
Age up to 18 years	0,00%	0,05%	0,00%
Age 19 – 30 years	16,65%	17,27%	15,10%
Age 31 – 40 years	26,17%	27,10%	26,11%
Age 41 – 50 years	32,25%	32,18%	33,35%
Age 51 – 60 years	21,63%	20,60%	22,04%
Age more than 60 years	3,29%	2,79%	3,41%

APP. 8.4. Distribution of the insurance income (without taking into account the cases of zero income).

Table 42.
MATRIX OERES in BG – 106

	01. 2009 Number of persons	01. 2009 Average insurance income	07. 2009 Number of persons	07. 2009 Average insurance income	01. 2010 Number of persons	01. 2010 Average insurance income
Self Employed	24	260,00	29	320,00	28	480,00
Management contract	38	1373,67	43	1369,86	45	1392,22
Contract following a civil relationship (not employment relationship)	82	409,92	111	544,14	81	504,33
Employee with a labour contract or civil servant	5198	950,68	4922	1047,94	4746	1084,44

Remark: The insurance income is given in Bulgarian Levs (Bulgarian Levs denominated in 1999 - BGN).

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

Table 43.
MATRIX OERES in BG – 120

	01. 2009 Number of persons	01. 2009 Average insurance income	07. 2009 Number of persons	07. 2009 Average insurance income	01. 2010 Number of persons	01. 2010 Average insurance income
Self Employed	31	379,35	35	440	34	511,76
Management contract	45	1347,63	50	1347,69	52	1337,63
Contract following a civil relationship (not employment relationship)	90	456,63	116	556,22	84	536,44
Employee with a labour contract or civil servant	5601	940,82	5395	1023,4	5119	1072,73

Remark: The insurance income is given in Bulgarian Levs (Bulgarian Levs denominated in 1999 - BGN).

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

APP. 8.5. Distribution by income of the employees (with labour contracts or civil servants).

Table 44.

MATRIX OERES in BG – 106

Range of incomes	Number of employees 01. 2009	Number of employees 07. 2009	Number of employees 01. 2010
Up to 240 levs	161	234	194
From 240,01 to 500 levs	688	810	663
From 500,01 to 1000 levs	2501	1687	1661
From 1000,01 to 1500 levs	1019	789	849
From 1500,01 to 2000 levs	829	1402	1379

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

Range of incomes	Number of employees 01. 2009	Number of employees 07. 2009	Number of employees 01. 2010
Up to 240 levs	3,10%	4,75%	4,09
From 240,01 to 500 levs	13,24%	16,46%	13,97
From 500,01 to 1000 levs	48,11%	34,27%	35,00
From 1000,01 to 1500 levs	19,60%	16,03%	17,89
From 1500,01 to 2000 levs	15,95%	28,48%	29,06

Table 45.

MATRIX OERES in BG – 120

Range of incomes	Number of employees 01. 2009	Number of employees 07. 2009	Number of employees 01. 2010
Up to 240 levs	197	309	257
From 240,01 to 500 levs	846	981	779
From 500,01 to 1000 levs	2569	1756	1685
From 1000,01 to 1500 levs	1092	879	917
From 1500,01 to 2000 levs	897	1470	1481

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

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Range of incomes	Number of employees 01. 2009	Number of employees 07. 2009	Number of employees 01. 2010
Up to 240 levs	3,52%	5,72%	5,02%
From 240,01 to 500 levs	15,10%	18,18%	15,22%
From 500,01 to 1000 levs	45,87%	32,55%	32,92%
From 1000,01 to 1500 levs	19,50%	16,29%	17,91%
From 1500,01 to 2000 levs	16,01%	27,25%	28,93%

APPENDIX No 9.

Some information on the socio-economic context and human resources in the enterprises involved in biomass utilization in Bulgaria

The results derived from “MATRIX BIOMASS” are really representative, because the list of the enterprises and companies included in it includes almost all the companies working in the field of the utilization of biomass in Bulgaria, familiar to the staff that carried out this survey.

APP. 9.1. Number of employees in the list of identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

Table 46.
MATRIX BIOMASS

	Total	MEN	%	WOMEN	%
01. 2009	1930	1328	68,81%	602	31,19%
07. 2009	1392	1008	72,41%	384	27,59%
01. 2010	1247	888	71,21%	359	28,79%

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

APP. 9.2. Distribution of the enterprises, following the number of the ensured persons.

Table 47.
MATRIX BIOMASS

	01. 2009	07. 2009	01. 2010
0 persons	48	45	43
1 – 10 persons	16	20	23
11 – 50 persons	14	12	13
51 – 100 persons	5	7	7
More than 100 persons	5	4	2

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

	01. 2009	07. 2009	01. 2010
0 persons	54,55%	51,14%	48,86%
1 – 10 persons	18,18%	22,73%	26,14%
11 – 50 persons	15,91%	13,64%	14,77%
51 – 100 persons	5,68%	7,95%	7,95%
More than 100 persons	5,68%	4,55%	2,27%

APP. 9.3. Distribution of the ensured persons, following their age.

Table 48.
MATRIX BIOMASS

	01. 2009	07. 2009	01. 2010
Number of enterprises with insured persons	40	43	45
Total number of insured persons	1930	1392	1247
Age up to 18 years	0	0	0
Age 19 – 30 years	246	201	157
Age 31 – 40 years	442	322	291
Age 41 – 50 years	538	386	360
Age 51 – 60 years	594	405	358
Age more than 60 years	110	78	81

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

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	01. 2009	07. 2009	01. 2010
Number of enterprises with insured persons	40	43	45
Total number of insured persons	1930	1392	1247
Age up to 18 years	0,00%	0,00%	0,00%
Age 19 – 30 years	12,75%	14,44%	12,59%
Age 31 – 40 years	22,90%	23,13%	23,34%
Age 41 – 50 years	27,88%	27,73%	28,87%
Age 51 – 60 years	30,78%	29,09%	28,71%
Age more than 60 years	5,70%	5,60%	6,50%

APP. 9.4. Distribution of the insurance income (without taking into account the cases of zero income).

MATRIX BIOMASS
Table 49.

	01. 2009 Number of persons	01. 2009 Average insurance income	07. 2009 Number of persons	07. 2009 Average insurance income	01. 2010 Number of persons	01. 2010 Average insurance income
Self Employed	8	477,5	7	508,57	6	420
Management contract	20	1293,49	21	1351,56	24	1410
Contract following a civil relationship (not employment relationship)	21	571,07	14	371,64	18	319,28
Employee with a labour contract or civil servant	1833	670,94	1297	646,1	1144	695,19

Remark: The insurance income is given in Bulgarian Levs (Bulgarian Levs denominated in 1999 - BGN).
Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

APP. 9.5. Distribution of employees (with labour contracts or civil servants), following their income.

Table 50.
MATRIX BIOMASS

Range of income	Number of employees 01. 2009	Number of employees 07. 2009	Number of employees 01. 2010
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Up to 240 levs	88	99	51
From 240,01 to 500 levs	609	443	340
From 500,01 to 1000 levs	838	582	571
From 1000,01 to 1500 levs	216	127	123
From 1500,01 to 2000 levs	82	46	59

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

Range of income	Number of employees 01. 2009	Number of employees 07. 2009	Number of employees 01. 2010
Up to 240 levs	4,80%	7,63%	4,46%
From 240,01 to 500 levs	33,22%	34,16%	29,72%
From 500,01 to 1000 levs	45,72%	44,87%	49,91%
From 1000,01 to 1500 levs	11,78%	9,79%	10,75%
From 1500,01 to 2000 levs	4,47%	3,55%	5,16%

APPENDIX No 10.

Comparisons of the socio-economic contexts in the Renewable Energy (Sub)sector and of the group of enterprises involved in biomass utilization in Bulgaria

APP. 10.1. Comparison between the number of employees in the organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and the number of employees in the list of identified enterprises, which are involved in the utilization of biomass in Bulgaria 2009-2010.

Table 51.

	MEN RES	MEN BIOMASS	WOMEN RES	WOMEN BIOMASS
01. 2009	74,27%	68,81%	25,73%	31,19%
07. 2009	73,63%	72,41%	26,37%	27,59%
01. 2010	74%	71,21%	26%	28,79%

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

APP. 10.2. Comparison between the distribution of enterprises according to the number of ensured persons in organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and in the identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

Table 52.

	RES 01. 2009	BIOMASS 01. 2009	RES 07. 2009	BIOMASS 07. 2009	RES 01. 2010	BIOMASS 01. 2010
0 persons	33,33%	54,55%	26,66%	51,14%	25,00%	48,86%
1 – 10 persons	33,33%	18,18%	40,00%	22,73%	43,33%	26,14%
11 – 50 persons	23,33%	15,91%	24,17%	13,64%	22,50%	14,77%
51 – 100 persons	2,50%	5,68%	3,33%	7,95%	3,33%	7,95%
More than 100	7,50%	5,68%	5,83%	4,55%	5,83%	2,27%

APP. 10.3. Comparison between the distribution of ensured persons, according to their age in organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and in identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

Table 53.

	RES 01. 2009	BIOMASS 01. 2009	RES 07. 2009	BIOMASS 07. 2009	RES 01. 2010	BIOMASS 01. 2010
Number of enterprises with insured persons	80	40	88	43	90	45
Total number of insured persons	6023	1930	5727	1392	5550	1247
Age up to 18 years	0,00%	0,00%	0,05%	0,00%	0,00%	0,00%
Age 19 – 30 years	16,65%	12,75%	17,27%	14,44%	15,10%	12,59%
Age 31 – 40 years	26,17%	22,90%	27,10%	23,13%	26,11%	23,34%
Age 41 – 50 years	32,25%	27,88%	32,18%	27,73%	33,35%	28,87%

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Age 51 – 60 years	21,63%	30,78%	20,60%	29,09%	22,04%	28,71%
Age more than 60 years	3,29%	5,70%	2,79%	5,60%	3,41%	6,50%

APP. 10.4. Comparison between the distribution of the insurance income in organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and in identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

Table 54.

	RES 01. 2009 Average insurance income	BIOMASS 01. 2009 Average insurance income	RES 07. 2009 Average insurance income	BIOMASS 07. 2009 Average insurance income	RES 01. 2010 Average insurance income	BIOMASS 01. 2010 Average insurance income
Self Employed	379,35	477,5	440	508,57	511,76	420
Management Contract	1347,63	1293,49	1347,69	1351,56	1337,63	1410
Contract following a civil relationship (not employment relationship)	456,63	571,07	556,22	371,64	536,44	319,28
Employee with a labour contract or civil servant	940,82	670,94	1023,4	646,1	1072,73	695,19

Table 55.

	DIFFERENC E 01. 2009 Average insurance income	%	DIFFERENC E 07. 2009 Average insurance income	%	DIFFERENC E 01. 2010 Average insurance income	%
Self Employed	-98,15	-25,87%	-68,57%	-15,58%	91,76	17,93 %
Management Contract	54,14	4,02%	-3,87	-0,29%	-72,37	- 5,41%
Contract following a civil relationship (not employment relationship)	-114,44	-25,06%	184,58	33,18%	217,16	40,48 %

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Employee with a labour contract or civil servant	269,88	28,68%	377,3	36,87%	377,54	35,19%
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APP. 10.5. Comparison between the distribution by income of employees (with labour contracts or civil servants) in organized enterprises of the Renewable Energy (Sub)sector in Bulgaria and identified enterprises, which are involved in the utilization of biomass in Bulgaria 2009-2010.

Table 56.

	RES 01. 2009 Number of employees	BIOMASS 01. 2009 Number of employees	RES 07. 2009 Number of employees	BIOMASS 07. 2009 Number of employees	RES 01. 2010 Number of employees	BIOMASS 01. 2010 Number of employees
Up to 240 levs	3,52%	4,80%	5,72%	7,63%	5,02%	4,46%
From 240,01 to 500 levs	15,10%	33,22%	18,18%	34,16%	15,22%	29,72%
From 500,01 to 1000 levs	45,87%	45,72%	32,55%	44,87%	32,92%	49,91%
From 1000,01 to 1500 levs	19,50%	11,78%	16,29%	9,79%	17,91%	10,75%
From 1500,01 to 2000 levs	16,01%	4,47%	27,25%	3,55%	28,93%	5,16%

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

APP. 10.6. Comparison of the distribution of ensured persons by basic economic activities in enterprises from the Renewable Energy (Sub)sector and in identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

APP. 10.6.1. Distribution of ensured persons by basic economic activities in the enterprises from the Renewable Energy (Sub)sector.

Table 57.

No.	Code of basic economic activity	Number of persons 01. 2009	Number of persons 07. 2009	Number of persons 01. 2010
1.	Agriculture, livestockbreeding, hunting, forestry and fishing	15	7	10
2.	Mining of metal ores	3136	2858	2865
3.	Production of timber and timber products, except furniture	146	132	112
4.	Manufacture of chemical products	9	4	5

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5.	Manufacture of products from other non-metallic mineral non-processed materials	154	168	170
6.	Production of metal articles, except machinery and equipment	166	181	141
7.	Manufacture of computer and communication equipment, electronic and optical products; Manufacture of electrical equipment	4	6	50
8.	Manufacture of engines and turbines, except aircraft, vehicle and motorcycle	44	55	28
9.	Generation, transmission and distribution of electricity	191	205	204
10.	Production and distribution of gaseous fuels through mains	0	4	0
11.	Production and distribution of heat	4	4	4
12.	Construction	824	408	286
13.	Construction of electric transmission and distribution and telecommunication networks	0	457	419
14.	Wholesale and retail trade with motor vehicles and motorcycles, maintenance and repair	640	628	647
15.	Hotels, restaurants, travel agents and tourist operators activity	29	32	23
16.	Air transport	0	30	0
17.	Financial and insurance activities	5	7	9
18.	Activities in the field of information technologies. Information services	155	125	85
19.	Research and development activities	4	3	2
20.	Activities financed by the state budget	102	96	97

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

APP. 10.6.2. Distribution of ensured persons by basic economic activities in identified enterprises involved in the utilization of biomass in Bulgaria 2009-2010.

Table 58.

No.	Code of basic economic activity	Number of persons 01. 2009	Number of persons 07. 2009	Number of persons 01. 2010
1.	Agriculture, livestockbreeding, hunting, forestry and fishing	77	109	68
2.	Production of timber and timber products, except furniture	23	20	7

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3.	Manufacture of paper and paper board and articles thereof	578	106	103
4.	Manufacture of chemical products	70	70	69
5.	Production of metal articles, except machinery and equipment	319	220	175
6.	Manufacture of machinery and equipment with general and particular purpose	202	246	235
7.	Manufacture of furniture	39	25	22
8.	Generation, transmission and distribution of electricity	0	0	2
9.	Production and distribution of heat	264	268	261
10.	Construction	21	17	18
11.	Wholesale and retail trade with motor vehicles and motorcycles, maintenance and repair	60	50	46
12.	Hotels, restaurants, travel agents and tourist operators activity	7	1	5
13.	Wholesale of pharmaceutical goods, medical equipment and apparatuses	0	1	1
14.	Financial and insurance activities	66	64	59
15.	Activities in the field of information technologies. Information services	113	112	79
16.	Research and development activities	44	45	41

Source: The National Social Security Institute (NSSI), on the basis of a special assignment by the Union for Private Economic Enterprise (UPEE).

2.

HUNGARIAN CASE STUDY: FOCUS ON THE RENEWABLE ENERGY CENTER OF HÁRSKÚT

1. Background

1.1. Presentation of the Region's Current Situation

According to the Hungarian Academy of Sciences, Hungary possesses approximately 1800 PJ of Solar –, 530 PJ of Wind –, 14 PJ of Hydro –, 63 PJ of Geothermal energy and 200 PJ of Biomass, that could be “harvested” with the technologies known at the moment. This amount adds up to 2600 PJ, exceeding the double of the total energy-demand of Hungary. In comparison, the total amount of renewables used by Hungary today is no more than a mere 60 PJ. The most favourable opportunities would come from solar and geothermal energy due to Hungary's geographical and natural features, but also wind energy use could be increased. However, data show that in practice, the source of renewables most used in Hungary, is none of the three mentioned above, but Biomass.¹

According to the 2008 Energy Club progress report (“Renewable Energy in Hungary”), Hungary still relies heavily (95 percent) upon the use of fossil and nuclear energy to cover its energy demand, despite the fact that, according to the existing potential appraisals, there would be more environmentally friendly sources of energy that could replace most of the ones that are currently being used. The report states that, although the opportunities and the above-mentioned

¹ Greenpeace handout 2010 edited by: Barbara Stoll, Márton Vay titled: “We’ve got energy!” page 12.

potential are huge, weak investments, a hard-to-follow support scheme and the Hungarian power characteristics significantly hinder the change. Further difficulties are to be found in the low support for research and development, lack of professionals on the field and in the fact that the Hungarian population – although there is no shortage of information – at the moment is not interested enough in renewable energy sources.

The situation is hindered even further by political and legal risks. According to the Energy Club, the proper engagement towards alternative production methods is missing, the legislation on renewables is changing rapidly and with the many changes it is easy to attain the opposite effect instead of the expected.

In the case of energy from biomass, it is worth mentioning that in most cases, it practically means burning wood. As a result of the recent Russian-Ukrainian gas-conflict, many Hungarian households changed over to this method, which was renamed “alternative fuel for heating” by the press. László Balogh, the President of the Hungarian Association for Renewable Energy, in his presentation prepared for Greenpeace, stated that the largest amount of domestic biomass is made up by the so called “dendromass” (which is nothing else but timber, often mixed with coal), which is mainly the result of the controversial support schemes. In general, every year the available biomass quantity adds up for a total of about 200-300 PJ, about 50-60 PJ of which is ligneous biomass and the rest is made up by herbaceous plants and other agricultural debris. The wood produced directly for this reason or even the debris in forests are good sources of energy, but only to a limited extent ².

Apart from the difficulties mentioned above, there are further difficulties to be faced, some of which were highlighted by acknowledged international experts; Professor Dennis L. Meadows, for instance, argued that, if the mentioned method will spread, risks in nature conservancy may arise due to the rising price of wood. He mentioned the rise in the numbers of wood thefts ever since the appearance of biomass-fired power plants in Hungary as an example. According to the

² http://hvg.hu/Tudomany/20090304_alternativ_megujulo_energia_magyarorszag.

Professor, it is not recommended to invest in bioethanol and biodiesel, as they not only have an unpleasant energy-scale, but are also not advisable from an ethical point of view. In some cases the production of biofuels requires more energy than the amount contained in the fuel itself. The “greenfuel” and biogas can also not be ethically acceptable, as the ingredients needed to produce them could be used for food production too - the Professor argued ³.

1.2. Outlook on Social Dialogue Trends in the Region

The electrical power industry in Hungary is considered as multipartite, as it consists of: producers, suppliers, service providers, and traders. Almost all of the companies have active and functioning Trade Unions, all of which have legal capacity, being Court-registered organisations.

A 3-level (3-stage) agreement system operates in Hungary:

- National Agreement (mostly wage recommendations)
- Sectoral Collective Agreements (can be extended)
- Local Collective Agreements

It is important that they do not conflict with each other, and lower-level agreements are only allowed to differ from the higher level ones if they provide a more favourable situation for the workers.

Professional groupings and participation of trade unions in the conclusion of agreements in Hungary are as follows:

- The local trade unions reach Collective Agreements with local employers, these local Collective Agreements may be very diverse from one another. Local trade unions are most commonly members of a Trade Union Alliance.
- There are three Trade Union Alliances in the electrical power industry, namely the LIGA (Democratic League of Independent Trade Unions), the BDSZ

³ http://hvg.hu/Tudomany/20070227_dennis_meadows_energiacsapda.

(Trade Union for Miners and Workers in the Power Industry) and the VDSZSZ (Trade Union for Railroad Workers). These trade union associations make up the employees' side of the Sectoral Dialogue Committee, and conclude sectoral agreements with the Association of Management Consultants in Hungary (VTMSZ). Trade union alliances are mostly members of a larger trade union grouping or confederacy.

- The trade union association in the electrical power industry is a member of the Autonomous Trade Unions. Trade union confederacies represent workers at the National Works Council where national agreements are concluded.

In practical terms, it is difficult to describe what the electrical power industry is. The classification is made according to the TEÁOR (a similar system to SIC, used in Hungary). The electricity industry falls under 40.1 including producers (power stations), transmitting, distributing and servicing companies and traders. This is very important, because if a company reaches an agreement with the trade unions, this could be extended by the Minister of Social Affairs and Employment to the whole sector (i.e. a clause of an agreement may be valid for a firm, even if it is not explicitly specified in the company agreement).

At present time, the number of activities of the VTMSZ is reducing. It does not provide any professional representation, it only represents its member-firms regarding work-related matters.

1.3. Employment Related Problems and Gender Issues

In general, Hungary has also to fight against a non-negligible unemployment rate, which has not developed recently but could not be overlooked any longer. The NUTS 1 (Nomenclature of Territorial Units for Statistics) divides Hungary up into three regions: Trans-Danubia, Central Hungary and The Plain and Northern region. The Central Hungarian region has the highest employment rate, but it did not exceed 63 percent in the last ten years. There also seems to be a difference in the employment rates of males and females as the highest number in the table of

women of age between 16 and 64 (who are considered economically active) employed is 56.5 percent in the Central Hungarian region (the lowest rate is 45.4 percent in the Plain and Northern region) whereas for men 69.5 percent (and 57.3 percent). The gender-based differentiation or in some cases discrimination should be tackled immediately, especially on the labour market, but firstly unemployment itself has to be dealt with.

2. Female employment in renewables

2.1. Description of the case study

This study would have originally focused on the experiences and practices of a smaller biomass-fired plant, from the Plain and Northern region of Hungary, but this year it had to be closed down due to financial difficulties. The problem is that this kind of situation seems to be the general “trend” in the long run for institutions with such profiles. It seems that, due to the above-mentioned rapid changes in various directions of legislation, setting up and even operating an energy farm using new green technologies requires countless permissions from different authorities, each of which is highly expensive, and support schemes provided by the government do not nearly match the costs required. As a result, most institutions in the field of renewables start with a deficit, which in most cases is not made up by other supports, making it difficult for them to switch to green technologies.

The situation does not seem to be different in the Renewable Energy Center of Hárskút, but, this institutions’ basic ideas of operation and achievements are unique and exemplary in Hungary, this study will further focus on their practices and experiences.

2.1.1. The Renewable Energy Center of Hárskút

The Company Itself and the Hardships it has to Face. The Renewable Energy Center of Hárskút began its operations in January 2003 with the purpose of establishing a renewable energy park and a research institute whose operations are fully sustainable and based on both environmental and economic factors. What makes this institution unique is that it makes it possible for people to see the different environmentally friendly technologies and processes, for the sole purpose of hopefully inspiring them to use these methods and technologies to reform their own lifestyles.

The Energy Center has a central office in Budapest, the capital of Hungary, and has a Demo Park in Hárskút, which, according to the NUTS 1 division, is situated in the Trans-Danubian region of Hungary. The Demo Park's most distinctive feature is the "Ecohouse of Hárskút", where different renewable energy systems can be viewed in operation on the scale of single-family residences. The energy systems include solar collectors, solar cells, windmills and biomass furnaces. Some experts are there to explain the function of each piece of equipment and share real-life experiences to raise awareness about the possibility of installing such systems in their own houses, or planning an energy-conscious lifestyle.

In the Demo Park there is also a bio-goat farm, where various goat cheese and other bio dairy products are produced; here, the whole energy need is supplied by the combination of the above-mentioned methods.

Biomass itself (that is later burned in biomass furnaces) is produced on the spot as well ⁴.

The services, provided by the Energy Center, include *Energy Consulting*, where the company provides energy consulting services to help those who have decided to develop and achieve optimal energy consuming systems. Some help is also guaranteed in the operation of those systems, as well as in keeping the operation rates as low as possible by the consultation of many energy providers.

⁴ www.megujulo.info/page/megalakulasunk/.

The company has also engaged in the *Installation of solar collector systems*. Solar collectors are devices capable of producing domestic hot water or heating (in houses or swimming pools for example). The company offers help from the planning to the installation and operation and also provides tailor-made solar collector systems.

Another service of the Energy Center is *Clearing of pastures and forests* which includes the service of maintaining the property in which all are interested, possibly creating paths within wood properties to allow the proper disposal of debris and also helping those who plan to engage in creating and or using biomass themselves.

The company also offers *Carbon neutralization*, that can be achieved through investments in renewable energy sources. Currently, the company is engaged in a project to install solar panels on the roofs of countryside schools and kindergartens with the aim of reducing CO₂ output and also to make it possible for children and parents to see their work.

The Renewable Energy Center of Hárskút also takes *Initial steps for a windmill park*. In Hungary, before finding the areas where windmills can be installed, the Investor must obtain many permits from various authorities, as previously mentioned. These permissions include environmental, building, electrical and grid connections. Actually, it is hard to obtain environmental permits as countless obstacles may arise during the process. It sounds interesting that, most of the time, the hardest opposing forces are no other than NGO-s and associations protecting the flora and fauna. To obtain a permission, it is necessary to call upon countless experts, each of whom must present some evidence that the technologies that are about to be installed are not going to damage the natural habitat of the different animals. The company helps investors obtain all the required permits, by preparing the required evidence which mostly is in the form of studies and obtaining the approvals from the government agencies. If necessary, company's experts provide additional support in form of advices and documents (if required by the authorities) and follow the process all the way to the end. Due to the inflexibility of Hungarian energy legislation, the so called "complex permit" is

required to operate a windmill park where the total power exceeds 50 MW. Such permission is even more complicated to get. There is also another even stricter rule about these installations, and that is the “quota”. It means that there is a given amount of energy that should be provided as a regular standard in given periods of time (most commonly each month) to allow them to produce energy for the electric power supply, which is not harmonized with the possible performance of the wind turbines at all. These rigid precepts make it more difficult to advance at the pace of the given potential.

The company also helps in developing different *Tenders* to anyone interested in investing in renewables. During the past 5-7 years the company’s experts gained significant experience in the field of project writing. Their expertise includes *Fund sources organisation*, *Project management* in general or in any specific phase and *Monitoring*.

In addition to all the above-mentioned services, the Energy Center prepares or helps to prepare *Architectural plans for environmentally friendly and energy efficient homes* for the individuals who show interest or willingness to live an energy efficient life or just aim at cutting down heat costs and electricity bills on the long-run ⁵.

The Renewable Energy Center of Hárskút uses a unique combination of instruments to operate and succeeds in providing a wide variety of services. It uses a 300 Ha area for bio-farming, and operates in a sample park that has almost all of the most wide-spread green technologies. In Hungary the most common form of green energy production is through a biomass furnace, or biomass-fired power plants which are sometimes combined with a land cultivated using bio-farming or bio-gardening techniques. Most green energy companies expert in a single technology and rely solely on one source. It is even uncommon to use wind turbines and solar panels together, except in low-emission houses.

However, the combination of different technologies is not the only feature that makes the Energy Center unique. It has both an agricultural and a research profile

⁵ www.megujulo.info/page/szolgalatasok/.

and it is also engaged in education. To some extent it can be considered as a non-profit organization, but some of its sub-institutions are for-profit, and this “diversity” makes it difficult for it to apply for tenders.

2.2. Social parts involved

2.2.1. Employment related difficulties

As it has been mentioned above, unemployment in Hungary is a serious issue, especially among people with low qualifications. The situation is even worse in rural areas, where low qualification and long-term unemployment typically couple with alcohol problems. According to data, women are in an even less favourable situation: unfortunately, when it comes to unemployment, gender discrimination is not unknown in Hungary. Changes towards the use of renewables are expected to solve the problem at least in part. Due to their nature, bio farms and green technology institutions are commonly set up in rural areas giving to the local workforce a chance to be reintegrated into the labour market, although this is often not enough. When introducing new policies, the gender issue should not be ignored.

Fortunately, there are some positive examples as well. The Renewable Energy Center of Hárskút is a good example also as for gender equality. Currently, the company employs more women than men (the ratio is around 65:35). There are no women in the physical labour section, but this is the only department without women. In Hungary architectural engineering is a mostly male dominated profession, but at the Energy Center there are two female engineers working for the same wage as the previous male engineer in the same position. The reason why this situation deserves attention is that the so-called “glass ceiling” is present in many places in Hungary, but not in the Energy Center.

2.2.2. Recruitment for non-traditional jobs

The Company deserves to be mentioned again when it comes to non-traditional work. In most parts of Hungary, traditional work is the only kind of work that is considered real work, whereas many women, especially those on maternity leave, could arrange, for example, home working. It is very common in Hungary that while women are on maternity leave, their employers have to find someone else as to replace them, but have no means to employ two people once the original employee returns from her maternity leave. At the Renewable Energy Center of Hárskút, both home working and part time work are possible, provided that the nature of work allows it. For example, the position of the assistant manager had to be filled when the person holding this position was on maternity leave, but when she came back, both she and the new employee kept their jobs. Teleworking, which is not very common in Hungary, is a necessity for the Energy Center, due to the nature of the work.

An outstandingly interesting feature of the Renewable Energy Center of Hárskút is that they do not have actual gender equality or even renewable energy policies, but they rather follow the vision and mission strategy created by the director, Károly Radzik. They also lack best practices, but it seems to be the case in general for Hungarian renewable energy companies.

2.2.3. Trends in social dialogue and the issue of representation

In Hungary, most companies engaged in renewables are small and employ only 10-30 people. In general, these companies do not use the instruments of social dialogue as, due to their small size, they consider it as an “unnecessary burden”. In such kind of companies, it is common for employees to represent themselves in front of the employer and also to launch negotiations about their situations and expectations in the future. Generally speaking the employees share this vision but some others would never approach their managers with their complaints about working standards for fear of possible “retaliation”. In the example of the Renewable Energy Center of Hárskút, the situation is similar, but still positive. The employees have no representative bodies, as they are all welcome to discuss

about their concerns with the employer and that is exactly what anyone working there would tell. This seems to be a good solution on a small scale, where it is easier to present the issues personally, but there are also some weaknesses due to its small scale: if there is a problem that requires actions at sectorial or national level, possibilities would be limited, as the exchange of information would be difficult due to the lack of connection. Of course it is possible to be connected to representative bodies at these levels directly, but it is not common. The Energy Center for example was the member of the *Renewable Energy Industry Association Hungary* and the *Hungarian Association of Renewable Energy Sources* but on the long run they resigned their membership. The reason was that these unions are too professional and as such, in most cases too scientific and theoretical. The problems these bodies deal with are not the ones that companies have to face in general at present time. There are some associations of course which meet the requirements of companies of smaller size dealing with renewable energies, like the KÖVET Association for Sustainable Economies which the Energy Center of Hárskút for example works closely together with.

3. Summary

The EU specified that Hungary should derive 13 percent of its total energy supply from renewable sources by 2020, but more could be easily accomplished if only the appropriate conditions for the spreading of renewables would be made available. Today those who are investing in renewables, must undergo a very complex and lengthy process of approvals that adds up to other issues such as network connection and production that still remain unsolved.

In order to be able to highly increase the proportion of the use of these energy sources and provide predictable, “investor-friendly” circumstances, a self-supporting renewable energy policy is needed in Hungary, which has to:

- simplify approving procedures and establish a single administration;
- manage network connection problems;

- use social dialogue actively, and coordinate the current and future/potential problems;
- put the question of renewables forward in the field of support schemes;
- redistribute the currently available financial resources to the appropriate targets and allocate new resources ⁶.

⁶ Greenpeace handout 2010 edited by: Barbara Stoll, Márton Vay titled: “We’ve got energy!” page 13.

3.

ITALIAN CASE STUDY: ENEL GREEN POWER

1. Background

1.1. Background presentation of the case study's company

Like many other European countries Italy engaged both institutionally and economically in the shift to low-carbon economy, in order to meet the targets set by the European Union's Climate and Energy Package. One of the major levers in this global, but also national and local challenge is going to be the energy sector, as it is one of the largest CO₂ producers. The development of the energy sector towards renewable sources is expected to have a considerable impact on the labour market. As reported by the UNEP ¹, the so called "job churn" effect is likely to be experienced, both across sectors and within the same industry. Firstly, new markets and job opportunities are stemming from the eco-crisis, like renewables in the energy sector. Secondly, the existing jobs will change their contents, in terms of required skills and working methods; for examples, electricians will have to update, upgrade and adapt their skills to new technologies, processes and working methodologies. Thirdly, other jobs will simply become obsolete and tend to disappear without any replacement, such as those depending on materials that are recognized as to be eco-unfriendly. Scholars and experts should not disregard that this kind of effect is likely to have a

¹ UNEP, UNEP, ILO, IOE, ITUC, *Green jobs: Towards decent work in a sustainable, low carbon world*, Worldwatch Institute, Washington DC, 2008.

considerable impact also on indirect jobs from supplier industries, which do very often entail massive job and human resources bulks.

The contribution of the renewable energy sector to the increase of employment rates in Europe could have a sizeable impact in Italy, since the country has recently been experiencing high unemployment levels. Moreover, taking into account the gender variable, female employment rates have traditionally been low comparatively to other European countries. According to data provided by Istat – the National Institute of Statistics – in the first quarter of 2009 the unemployment rate for the Italian male workforce was 6.8%, while in 2008 it was 5.5%. While a relevant number of European countries reached or were very close to reach the Lisbon’s target, namely 60% of female employment rate by 2010, Italy was still far away from it in 2008, with its 47.2% of female employment rate, much lower than France (60.7%), Germany (65.4%) or United Kingdom (65.8%). The female unemployment rate was instead much higher: 9.5% in the first quarter of 2009, comparing to 8.5% in 2008. The lower increase in female unemployment rates compared with male’s one, is directly correlated to the crisis that hit mainly male-dominated sectors, leaving therefore women workers relatively protected from job losses. The female unemployment rates in Italy are higher than the European Union’s average, and their geographical distribution vary a lot: in certain regions they reached 12.2% (Sardinia), 12.6% (Campania) or even 13.8% (Sicily) in 2008. In Italy, if EU 20-20-20 Package targets are achieved, renewable energy sector could fully contribute to jobs creation and employment boosting. Among the recent studies investigating the occupational impact of renewable energies, the UNEP’s report argues that the renewable energy sector has created 2.3 million jobs around the world and could reach 20 million jobs by 2030. Another study, carried on by Greenpeace and the European Renewable Energy Council (EREC), analysed two potential scenarios: one reporting the growth potential of renewable energy sources and one of the traditional sector, the so called “business as usual”. Results show the development of renewable technology could contribute to create

2.7 million more jobs by 2030 worldwide, compared to traditional sectors ². According to studies conducted by IRES CGIL and Filctem CGIL, there will be about 60,500 new “green workers” in Italy by 2020, in addition to 100,000 workers currently employed in the renewable energy sector ³. According to Enel Green Power’s study on renewable energies and the company’s business case ⁴ the potential employment will be related mainly to the wind (78,000 units) and solar (50,000 units) sector. What is interesting to notice is that the regions with the highest wind potential in Italy are those with the highest unemployment rates too, namely Puglia, Campania, Sicily and Sardinia, covering over 50% of the employment potential. The solar sector is also offering high potential in terms of employment: 23,000 employees per year by 2020.

These optimistic forecasts are supported by the growth of the renewable energy sector over the past years and by its dynamic development, which promises positive impacts on employment. It is worth noting that gender-disaggregated data on these impacts are still not available. Detailed insights into a case study at the company level could provide for the necessary data and help to understand the main concerns of the gender-related issues in this sector.

Enel Green Power is involved in developing and managing energy generation from renewable sources at international level, with a presence in Europe and in the American continent. Since 2008 when it was founded, the company became the world leader in the sector having installed over 5700 MW of capacity from wind, solar, geothermal, hydroelectric water flow and biomass energy sources. Furthermore, it has over 600 plants in operation or under construction worldwide. Having as one of its main objectives the maintenance of its leadership position in the Italian solar, hydroelectric and geothermal markets, and to become leader in the wind power segment, Enel Green Power is continuing to develop projects for

² Energy sector jobs to 2030: A global analysis.

³ IRES CGIL, Filctem CGIL, *Lotta ai cambiamenti climatici e fonti rinnovabili: Gli investimenti, le ricadute occupazionali, le nuove professionalità*, 2010, in www.adapt.it.

⁴ F. Starace, *Energie Rinnovabili: il quadro di riferimento e l'esperienza di Enel Green Power*, attachment to Dossier Adapt no. 4, 25 February 2010.

the coming years both nationally and internationally. One of them is the collaboration agreement with Sharp and ST to invest 320 million euro in the photovoltaic factory in Catania, Sicily in 2011. It is estimated that the factory will have 160 MW/year of installed capacity in 2011 and future expansion of capacity up to 480 MW/year by 2014, employing 250 people in 2011, additional 450 employees by 2014 and in average 4-500 employees during the construction. Another important agreement is the one signed with Sharp, aiming at installing 500 MW of solar plants within 2016 in the so called EMEA (Europe, Middle East and Africa), with a particular focus on Italy, Spain, Greece, France and Portugal. The Overview on Enel Green Power, provided by the company, gives detailed information on the main characteristics of a typical renewable energy industry, its value chain, workforce composition and requested competences.

Working on a total of 2,5 GW installed capacity in hydro, 0,7 GW in geothermal, 1,5 GW in wind segment, and having a strong position in the fast growing Italian solar market, Enel green power has developed numerous long lasting competencies across all geographies. These range from development to operation and maintenance, including exploration, engineering and construction, development of new projects, flexibility and many others.

Its divisions count for 2,685 units worldwide, mainly concentrated in Italy (1,756), Latin America (509) and North America (280). Enel Green Power is present also in Spain (56), Greece (38), France (32), Romania (10) and Bulgaria (4 divisions).

When it comes to the composition of its workforce, Enel Green Power provides for gender-disaggregated data: female workforce accounts for 50% of staff members, but for only 6% among line employees. The later percentage is higher if the blue collars are excluded, reaching 10%. Coming to women education and training, 28% women working in EGP in Italy hold a degree in Economics, 18% in Engineering, 15% holds a scientific degree, 12% Geology, 10% Law and 16% are distributed among politics, psychology and other degrees.

When it comes to the distribution of competences for the line members, percentages of female workers on the total are irrelevant or very low, ranging

from 4% in operation-generation to a maximum of 22% in sales. Higher percentages of female on the total of the unit are present among staff members, reaching 71% among employed in services and 76% among employed in general management and assistance.

While Enel Green Power managed to assure a balanced and equal representation of male and female workforce among staff members, the critical issue remains the line segment, which is strongly male-dominated.

1.2. Outlook on social dialogue in the Enel Group

The issues regarding social dialogue are conducted at a group-level, that means that all the policies promoted by Enel Group are applied to all of its branches, including Enel Green Power.

Social dialogue plays an important role in Enel Group as 70% of its employees are unionized and in some companies of the group there are even higher levels in the number of unionized employees ⁵. The company maintains that unions' exponents are truly representative of the workforce, as usually they are normal people working in the company and with a relevant knowledge of its business. Enel Green Power is proud of its tradition of high quality relations with the unions. As they run a public interest service in a strategic sector, trustful and widespread social dialogue is considered a useful investment.

Recently, the main issues that unions are concerned with, include change management and business restructuring processes, more than bargaining matters, such as provisions and salaries. Unions are seen as assets, able to achieve workers' people consensus, to gather and report ideas and proposals.

⁵ All information is derived from F. Starace, *Energie Rinnovabili: il quadro di riferimento e l'esperienza di Enel Green Power*, attachment to Dossier Adapt no. 4, 25 February 2010

Social dialogue played a particular role in the period of the transition from a State-owned monopoly to a private multinational company and finally to a worldwide utility. During the years of national power “market”, characterized by the absence of competitors and high influence from politics, unions were mainly involved in the sector of Human Resources, dealing with organization and recruiting through open competition.

After almost 30 years of public monopoly, company switched to the private sector, operating in 23 countries with liberalized power and gas markets worldwide and having 1.4 million of shareholders. The privatization led to a clear distinction of roles and responsibilities, and unions were excluded from the managerial choices.

The new European regulation brought about new subjects to deal with and new causes for concern. According to the EU law (directive 94/45) Enel, as a group with an European dimension, had to establish a new trade-union organism, the EWC (European Work Council), with the aim of improving employees’ right to information and consultation. After a previous request from the European Trade Unions (EPSU and EMCEF), and a long period of negotiations, in December 2008 the agreement that defines the Establishment and the regulation of the EWC in Enel was signed. This agreement is a faithful representation of Enel philosophy about industrial relations as it extends the existing process of informing and consulting (not bargaining) to all Group companies operating within the European Community.

A two-ways communication model in the company refers to individual concerns on one side, including compensation, performance, training, development, career planning, differences and worthiness, and the collective issues on the other side, which include general agreements, protection, organization, work environment, CSR, prevention and conflicts management. Unions provide for information, consultation and negotiation between these two sides.

The company’s expansion led to the new scenarios and new challenges for social dialogue. These include the presence of people from all over the world, trans-national integration, change management and its impact on employees, new ways

and subjects representing the workforce. Anyway, the set of values remains the same and is protected by the Code of Ethics, Corporate Social Responsibility and Agreement 27.04.09. The last mentioned agreement refers to the Enel Corporate Social Responsibility Protocol and the Observatory on the Industrial, Environmental and Occupational Policies, which represents a completion of a co-division process upon common “sustainable development” principles.

The first part of the agreement, Enel Corporate Social Responsibility Protocol, focuses on:

- Sustaining the promotion of actions taken to promote company’s CSR policies, working towards a constant emphasis on the person’s centrality (responsible competition);
- Sharing the principles relating to the fundamental rights of workers, and the commitment to respect, promote and implement them in all the States in which Enel operates;
- Enhancing, in line with the provisions of the Enel’s Code of Ethics on the promotion and training of the Human Resources, the role and operations of the “Joint body on training and employability”, as a way to enhance the “bilateral approach” to training activities.

The other part of the agreement, Observatory on the Industrial, Environmental and Occupational Policies, focuses on:

- A joint body formed by Enel and trade unions’ representatives;
- Ideal place for labour relations upon Enel’s Industrial, Environmental and Occupational policies;
- Issues relating to the safety of procurements, liberalization of the electricity sector, environmental conservation and Enel’s industrial policy development.

1.3. A gender mainstreaming perspective of the company (female employment, gender pay gap, family-friendly services, public policies for gender equality, etc.)

As already mentioned in the first chapter, Enel Group offers gender-disaggregated data on its employment composition. In 1990, statistics were much more pessimistic for female workforce that they are now. Actually, in those years, women working at Enel were only 7% of staff members, totally absent from the category of blue collars, and on average without high education. Female executives were only 3% of the total, and executives were 3.5%. Today, the situation is much “rosier”: women make up about 13% of total workforce, in the Enel Group, and in Italy this percentage reaches 17%. Female executives nowadays count for 10.9%, supervisors for 20.7% and white collars for 23.8%. The percentage of female blue collars is still very low: only 0.2%. In the Italian divisions, women make up for 12% of line workforce and 43% of staff members. Still, Enel was the first Italian company to transpose and implement the European guidelines about “Equal Opportunities” within a productive enterprise. The idea of the Commission was strongly supported by Enel Top Management, which, in agreement with the Unions, focused on organizational issues of gender, taking some concrete actions. One of these was the collective agreement of 1989, which established and regulated the activities’ operation of a National Joint Commission for Equal Opportunities (6 members by Company/6 members by Unions), as a first example of bilateralism in the landscape of Industrial Relations, in Italy and in the electricity sector.

Since then many steps forward have been taken, such as Corporate Social Responsibility, Welfare Systems and People Care, Equal Opportunity Committee and Code of Ethics, all of which dealing with equality and diversity inside the Company.

Referring to the Equal Opportunity Committee, it is worth noting that it has always been an active part in enhancing diversity and promoting practical implementation of the non-discrimination principle. It focuses on monitoring

(through its survey and studies, Biennial report 125/91), information (e.g. Booklet on Parental Leave) and search (through mentoring for female leadership, Equal opportunities and diversity Toolkit, International project).

Furthermore, Enel provides for a detailed overview of its human resources composition, in terms of educational rank and type of university. Women reach the highest levels of equality when it comes to tertiary education, accounting for 31% of workers holding a university degree. Among workers with secondary education, women account for 15%, and among others, they account for 12%. When it comes to female employees holding a university degree, 36% of them are graduated in economics, 20% in engineering, 20% in politics and laws, 6% in scientific fields and geology, 2% psychology, and 16% in other fields of study.

As already said, women employed in the line account for only 6%. They are mainly represented among profiles dealing with market (48% of total), energy management (43%), upstream gas (42%). The percentages decline when it comes to business development (20%), engineering (14%), network (7%), renewables (7%) and operation and generation (5%).

Women are better represented among staff members in Enel Group. They account for 66% of total employees in P&O, 61% in legal competencies, 59% in external relations, 47% in services, 47% in general management, 43% in CFA, 40% in procurement, 40% in regulatory. The percentages are lower for security, environment and quality competences, where women represent 16% of total work force, and for ITC, with 15% of female presence.

Enel Group is well aware of the dynamicity of its markets and the new frontiers that must be explored. These require a well-programmed management of equality and diversity. Through talent management, Enel is searching for new tools and new approaches to promote female employment.

When it comes to work-life balance, there is a different way of thinking about the needed flexibility, and a different feedback to the changing needs. Moreover, concerning the globalization and Enel's activity internationally, diversity does not only mean to have a gender approach.

Among the most recent activities on the subject, particular attention must be paid to by the visit of Avivah Wittenberg-Cox, CEO of 21, one of the biggest consultancy societies on gender-issues worldwide, on 7th June this year in Rome, during the Enel's initiative dedicated to training. Wittenberg-Cox explained the importance of female presence in the companies of the 21st century, and the necessity of a virtuous management of diversities inside the company, including the gender one.

1.4. Public policies for renewable energy in Italy

Development of renewable energies and promotion of energy efficiency have been among the main priorities for the Italian energy policy. With the European Union's Directive 2009/28/CE, published on June the 11th 2010, Italy got its National Action Plan for Renewable Energies. The aims of Italian energetic strategy are: safety of the energetic supply, reduction of energy costs for companies and for citizens, promotion of innovative solutions and technological chains, environmental protection and sustainable growth. One of the aims is also to balance the energy mix, which today is far too dependent on imports. The recent law L. 99/2009 called for the implementation of an Extraordinary Plan for Efficiency and Energy Conservation. Its operative tools are the promotion of cogeneration, self-production of energy by small and medium-sized enterprises, enforcement of the mechanisms of energy efficiency, promotion of new constructions and energy-efficient refurbishing of existing constructions, promotion of new, highly-efficient products.

The National Energy Strategy set up a National Conference on energy and environment, which could also serve as an occasion to compare different regional situations.

When it comes to renewable energies, the law 13/09 specifies that the targets of the European Union should be distributed among the different Italian regions. The recent community norm provides that Parliament implements the Directive

2009/08/CE along specific criteria. The main aim of this Directive for Italy is to achieve a 17% of the total energetic consumption through the renewable energies. It is very important for the future development of renewable energies in Italy to streamline legislative procedures, using the available instruments, such as the Interregional Operative Program on Renewable Energies and Energy Conservation 2007 – 2013 supported by the EU and the so called “Rotation Fund of Kyoto.

2. Social dialogue for female employment in renewables

2.1. Description of the case study

This case study, implemented in cooperation with Enel Green Power from Italy, aims at providing an insight into the characteristics of a company operating in the sector of renewable energy, with a specific accent on female employment inside the company, and the development policies promoted by social partners. The analysis was carried out with a gender perspective, focusing on few subjects regarding human resources in the company. In particular, these subjects are:

- employment and the way in which social partners promote equal opportunities, for example through anti-discrimination laws and family-friendly policies;
- recruitment policies, and especially those for non-traditional jobs;
- training for green jobs through specialized apprenticeship and other training initiatives provided by the company;
- equitable treatment, in terms of gender-based job segmentation and wage gaps;
- representation of women in union memberships.

2.2. Social partners involvement (effective or potential) in promoting equal opportunities and in promoting gender equality

As mentioned above, the current situation within the Company is analyzed by disaggregating some macro-areas of interest. The Enel Group's Sustainability Report for 2009 offers significant amount of useful information for the analysis, at the level of the Enel Group. In order to obtain information regarding Enel Green Power, some direct interviews with its representatives have been conducted.

Employment

The employment situation in Enel changed very quickly: in a little more than five years it has become a multinational company operating in 23 countries worldwide, and over 50% of its employees are citizens of a country other than Italy. The Company is aware of the emerging need for adaptation to the new situation, and stated that the Personnel and Organization Department will perform the crucial role of *aligning* values and cultures of Enel people. In practical terms, it means that the Department must establish and implement policies aimed at the construction of a work environment attentive to results, but also to the involvement of people in the company and the quality of the relationship that individuals and different professional groups have with the Company. For the Department, this implies the development of a new way of doing and thinking to help people to feel less and less "employees" and more and more "citizens" of Enel, able to combine their opportunities and expectations with the growth of the Company, within a framework of overall sustainability, as highlighted in Enel's Sustainability Report 2009.

Some concrete actions and initiatives have been identified in order to reach these objectives.

For example, there has been repeated concern for safety issues. For Enel, this means reaching the goal of "zero injuries" – not only for employees, but also for all the people who come in contact with the Company, both suppliers as well as others. In order to pursue this goal, the Enel Leadership Model was revised in

2009 to make the safety issue explicit and codified in a specific behavior. The Sustainability Report 2009 predicts that the next step will be the extension of the concept of workplace health from an idea of absence of injuries, disease, or discomfort to the concept of physical and mental well-being.

Two years ago, a research was conducted on an international level (concentrating mainly on the European divisions those of Latin America for example were excluded because of too wide cultural differences), that aimed at acquiring major knowledge, and understanding of similarities and differences among various policies on the subject of employment and human resources, but also perception of gender issues and sensibility of a country for this subject.

As part of initiatives started by Enel to increase the well-being of individuals and of the business community, a specific unit called People Care was created within the Human Resource Department. Its task was to provide new tools and services to improve the work-life balance and to increase the quality of the environment and work systems, in order to promote employees' well-being.

In Italy, the main areas of interest related to employees were identified through a dedicated preliminary survey. The most important areas were:

- health and well-being;
- taking care of family;
- commuting to work.

Considering that some of the needs connected with the aforesaid areas are well covered by the wide range of assistance and recreational services offered by social Institutions like FISDE, ARCA, ANSE, and FOPEN, the People Care unit concentrated on some additional solutions which could support the concrete everyday needs of Enel workers, and, at the same time, focusing on developing a corporate culture founded on the values of sharing and mutual support among people.

In Italy, the first area is already well covered by FISDE (Supplementary Health Fund for Enel Group Employees), so many initiatives aimed at improving the well-being of employees with either temporary or permanent difficulties were identified.

For example, the “C’è posto per te” (“There’s room for you”) service was implemented, guaranteeing all Enel mothers-to-be a reserved parking space in the Company garage or in another affiliated facility.

The second area, the family, is very well-covered by the multiple services offered by ARCA (Recreational, Cultural, and Assistance Association for Enel Group Employees). Enel addressed this area by using technology and offering employees the possibility of purchasing IT equipment scheduled to be replaced every four years and take it home for personal use. In this way, the use of a tool that is by now a resource for increasing knowledge, communication, and social integration was promoted. Considering that most schools use Internet as a teaching instrument, this initiative is proposed especially to employees’ families, and in particular to school-age children, who can find it useful to interact with a tool that is fully functioning for home use, although it may need to be replaced in the professional sphere. Moreover, the entire process is managed through an ad hoc system accessible through the company Intranet, which allows the employee to view the characteristics of the IT equipment, to find out scheduled replacement times, and to compare the purchase price (which amounts only to the cost of removing Company information and programs) to the market price and then, if interested, to request that the purchase is deducted from his or her salary.

With regard to the third area, Enel started a Company car-pooling service, which includes particular advantages for employees who, on the way to and from work, make their own car available to co-workers, in groups of at least three people. The service is currently a pilot project for the branches in Rome and will be extended to other cities soon. Since employees’ houses are not necessarily located close to each other, another project had much more success, providing incentives for using public transport. Coordinating the activities of six Enel Mobility Managers located in Italy, appointed in compliance with Decree 27.3.1998, “Sustainable mobility in urban areas” – which objective is to identify and propose sustainable mobility actions for employees’ daily commutes – agreements were made with local public transport companies for Enel employees to purchase discounted annual passes. Currently active in Rome (ATAC-Metrebuss), Milan (ATM-

Ferrovie Nord), Piedmont (GTT), Ancona (ATMA), and Genoa (AMT-Trenitalia), they consist of discounts offered by transportation companies, sometimes in cooperation with local governments (Municipal, Provincial, Regional), to which Enel adds a further discount ranging from 10% to 20% and spreads the final cost over twelve interest-free monthly installments deducted from salaries. Finally, everything takes place through a dedicated web platform, which manages the entire process from the subscription request to delivery, including insertion of the digital format photo, without any paper forms. The pass is then delivered to the employee directly at his or her workplace. Since April 2009, when the service began, 1,335 employees out of 38,121 have participated by subscribing to an annual pass.

The same problem of car-pooling (long distances from one employee's home to another) was faced when Company considered the issue of child-care services. A unique kindergarten was excluded as an eventual solution, because of the problem in providing parents – employees living in different areas of the city or region – with such service. Therefore, a different kind of help was introduced, that is a financial contribution to the employees with children in the age of 0-3 years. A similar problem was faced when Enel considered the promotion of a summer-camp for the children of employees. In certain periods of the year, employers face with a specific problem of child-care, as school-vacation lasts much longer than the parents' one. But once again, it was difficult to organise summer camps or similar initiatives in specific child care centres to take care of employees' children, as for some children it would take too much time to reach them.

Recruitment

In order to obtain detailed information on recruiting processes conducted in EGP and in Enel Group, an interview with the responsible for the Recruitment Team in Enel Group was conducted. From the interview it emerged that a centralized structure plays an important role in the selection procedures. That means that the first interview is conducted strictly at the Group level, at least when it comes to the Italian level, and with no difference between the various divisions. In other

countries, there are similar teams, and in this case, the Group one is invited to act only for some particular job profiles or when it comes to international projects. This centralized organizational structure contributes to avoid involuntary stereotypes, for some technical positions. After the first step, candidates pass to the second one, directly to interested Division, in this case to Enel Green Power. From the very first moment of the recruiting process, there are guaranteed standards or processes, such as the Code of Ethics or the Plan of Tolerance to Zero Corruption, which operate as a protection from favoritism, nepotism, discrimination or any other sort of illegal behavior.

What is interesting to notice is that the recruitment team is entirely composed of women. This composition was partly inherited, and partly maintained on purpose, although the company has always been trying to identify heterogeneous candidates. It is the case that most candidates for these positions have always been women. It is worth noticing that the team-structure does not influence in any way the selection procedures and the decision-making process. As it was many times highlighted by the HR Manager, these processes are absolutely gender-neutral.

During the research process, two main criteria are taken into account: the educational background for the junior positions, and the working experience for some senior positions. Gender is not one of the criteria. The selection process starts online: potential candidates can apply on the website, filling in an application form, which contains different information: age, gender, nationality, profession and other. During the following interviews, some objective data are taken into account: education, regressive experience, sometimes residence (it can be a decisive factor for some activities).

It is important to highlight that Enel is a very active employer: it employs approximately 700-800 new people each year. In the last year, this number reached almost 1000. Two thirds of these new employees are young people – with diploma for operative units or newly graduates for some other positions. The remaining third refers to the positions that require some working experience. This means that Enel represents not only a valid stepping stone for young people, but also a guarantee for a fair generational adaptation and change.

People employed by Enel have typically technical educational background, such as mechanical, electrical, sometimes chemical technicians and engineers. This is understandable if we take into account Enel's core business. However, the second most common degree in Enel is the one in Economics. For these reasons, the prevalence of Enel's employees are male, as a direct consequence of the prevalence of male students obtaining a diploma or a degree in technical professions. No particular regional differences were identified when it comes to finding the right person for a job vacancy, although it has always been harder to find adequate candidates (with high degrees and satisfying other criteria) in the North, as young people there have more opportunities offered. In general, the criteria for selecting young people are very strict: they should have the highest degree, speak more languages, be still young, flexible, and available to travel and change their place of residence. The unique system of Welfare present in Enel provides all necessary conditions to facilitate these changes, especially for employed moms and dads. The gender factor does not play a particular role here, as these employees are often young, open-minded people, desiring to enter and meet the labour market. The only important criteria are their capacities.

There are some professional profiles, especially when it comes to a relatively new sector such as the renewables, for which it is particularly hard to find adequate candidates. This is especially true for the professions that require experience. Anyway, the labour market for these professions is becoming more active and innovative. One example can be the profile of Business Developer. The company had to make a big effort to find adequate candidates for this vacancy, both in Italy and abroad. Difficulties concern in particular the construction of new machines, wind farms, the use of new technologies etc. It is crucial for this profile to have cross-disciplinary competencies, as this is a typical "double-side" profile: it can be an economist with technical knowledge, or an engineer with analytical competencies. The Business developer should have specific legal knowledge, the knowledge of the area and its features, communication and negotiation skills, especially when it comes to permitting procedures. Another example is the "driller", an extremely relevant figure, but very rare to find on the labour market.

Sometimes, the solution is to find already existing drillers for the gas constructions, and adapt them to the geothermic sector. There have also been a lot of candidates from abroad, especially from countries where these technologies are already consolidated. A quite similar figure is the one of wind power expert for wind farms. For the managing and maintenance of sites solutions can generally be found, but there are more difficulties when it comes to the construction of something different and new.

The biggest “supplier of the most important resource” for Enel have been schools, technical institutes and universities. Enel has a wide network of contacts with more than 40 universities in Italy and is enlarging it to other countries. It provides scholarships for some particular courses, makes presentations in schools, creates some specific projects. All of this contributes to reduce the gap between the professions needed in the company, and those offered on the labour market. This gap would be even smaller if there were a better and more efficient career counseling system at the national level.

Enel is trying to give its contribution to the environment also through “green recruitment”: Internet is the most efficient and at the same time the “cleanest” selection system. A big effort was made to develop the system of online communication among employees through blogs, social networks and forums. When a direct interview is not possible, it is made by telephone or online. Enel uses recycled paper, and print only the most necessary material.

Training

Enel Group puts a specific accent on knowledge management. Enel University offers a number of technical and functional courses, with both internal and external instructors, aimed at defining key knowledge and developing and disseminating it widely.

In 2009 the Company launched the second Enel-Endesa Performance Improvement Program, part of which is dedicated specifically to Best-Practice Sharing. The four areas of initial concern were conventional thermal production,

distribution, sales, and nuclear production, and will be developed by mixed work groups.

With regard to support systems for knowledge exchange, two important platforms were planned and launched: the “Global Intranet”, which – in addition to being conceived to reach all the Group’s countries – was, also enhanced by a number of web 2.0 collaboration functions, and the Enel Learning System, in which online courses and study materials are available. Online courses seem to be an excellent example providing for more flexibility and conditions for a better work-life balance planning.

In addition to these specific recent programs, the Company has developed a training model with the purpose of guaranteeing all employees the opportunity to extend their knowledge and develop the key abilities to be able to perform their roles effectively.

The Company’s training model, developed both at the level of Enel University and of single Divisions, is conceptually based on two important principles: allowing everyone equal access to the “sources” of professionalization and providing life-long learning opportunities.

In practice, the training model consists of three large families:

- 1) *In-house Training* is mainly technical and specialized training, which the Divisions or countries manage directly. Normally, it aims at consolidating or developing the necessary knowledge to do the typical required work. A key example of this is the recurrent training.
- 2) *Enel University Training*, the training managed by Enel University together with the Divisions, has the purpose of providing employees with the knowledge they need to understand change, help people “inhabit” the organization, and develop the specialized capabilities that qualify them for certain kinds of jobs.
- 3) *The Leadership Curriculum* refers to training with the general purpose of accompanying and supporting people in their professional development at significant times for them within Enel: when they start working at the Company, their career growth, membership on the talent team, membership on the executive team, and their performance review.

Below you can find a brief description of several of the programs included in the leadership curriculum. These programs are perfectly integrated with the training that the Divisions manage independently.

Furthermore, Enel provides training and information courses that include worker health and safety issues in the various specific initiatives dedicated to its employees. According to Enel Green Power, the Division adopts the Safety Management System, as a part of the Renewable Energy Division.

The research on best employers, CRF, has identified training and development as the area of excellence in Enel: in terms of investments, not only economic, in terms of know-how, training courses, training-on-the-job etc.

While there are available data on training hours per employee provided by Enel Group, there are no such gender-disaggregated data.

Equal opportunities

In 2009, there were 15,579 women employed in Enel Group, that is 19.2% of the total workforce. There were 3,610 supervisors and executives (35.5%); 10,102 white-collar and 1,867 blue-collar female workers. There has been an enormous progress, as 20 years ago there were only 9.1% of the female workforce in the Company, of which only 3% were supervisors and executives.

The following tables offer a detailed insight into the employment composition in Enel Green Power, according to gender. Considering the nature of its core business, the gender differences within the Company are understandable. There is a net prevalence of male employees, especially when it comes to the Line division, where there is only 7% of female workforce. For the Staff division, the situation is much different: there is 59% of male employees, and 41% of female employees.

ITALY

DIVISION	STAFF		LINE		Total
TIPO DIP.	M	F	M	F	
D	11	3	29	1	44
Q	45	18	123	16	202
I	41	47	603	80	771
O			648	7	655
Totale	97	68	1.403	104	1.672

STAFF		LINE		TOTAL	
M	F	M	F	M	F
79%	21%	97%	3%	91%	9%
71%	29%	88%	12%	83%	17%
47%	53%	88%	12%	84%	16%
0%	0%	99%	1%	99%	1%
59%	41%	93%	7%	90%	10%

The Company's concern over the issues of *diversity management* found concrete expression during 2009 in a specific initiative: together with ten other large multinational companies, an association was founded with the purpose to support female corporate leadership.

"W Value" stems from the awareness, confirmed by a McKinsey study, that companies with a significant number of women in their top management have better results, from the point of view both of organizational health and economic performance. Among the associations' objectives there are the programs of activities enabling companies to enjoy the benefits of a greater participation by talented women in corporate dynamics and women to express their professional capabilities and have them acknowledged.

Enel is a member of "W Value" in order to be part of a network of companies that intends to try out new tools for diversity and equality management.

“W Value” was founded one year ago. Enel has contributed – though the active participation of its representatives – to guiding the “launch” phase of the association, as well as to planning and implementing its activities. The main initiatives have involved, and will involve, Enel women (developing managers and professionals) as participants, and focus on the following areas:

- skill building, with the goal of strengthening the credibility of women in high-level managerial roles through training aimed at increasing their business capabilities and reinforcing the elements that define leadership;
- mentorship, supporting women throughout their career with a senior figure to guide personal and professional growth;
- role modeling, through the identification of the key characteristics, both professional and other, of successful managers;
- flexibility, which aims to develop proposals to innovate the world of work, creating instruments and equal opportunity for growth or women, and facilitate a lifestyle that combines private and professional life.

As far as gender wage equity is concerned, the current collective bargaining agreement establishes that the basic salary must be the same for men and women in the same employee category. Data show that in 2009, women’s pay was 80.5% of the men’s one, 6.6% lower than the year before.

Representation

When it comes to the representation in the trade unions, the following tables offer a detailed insight into the composition of their membership by gender. Data show that in the line area, there are more men in the trade unions than women, but this is a direct consequence of the male prevalence in this company’s division. In fact, female representation in trade unions is much higher and almost equal among staff members, as there are also more female employees in the staff division.

ITALY

ISCRIZIONE SINDACALE	STAFF		LINE		Totale complessivo
ISCRIZIONE SINDACALE	M	F	M	F	
ISCRITTI	29	24	954	37	1.044
NON ISCRITTI	68	44	449	67	628
TOTALE	97	68	1.403	104	1.672

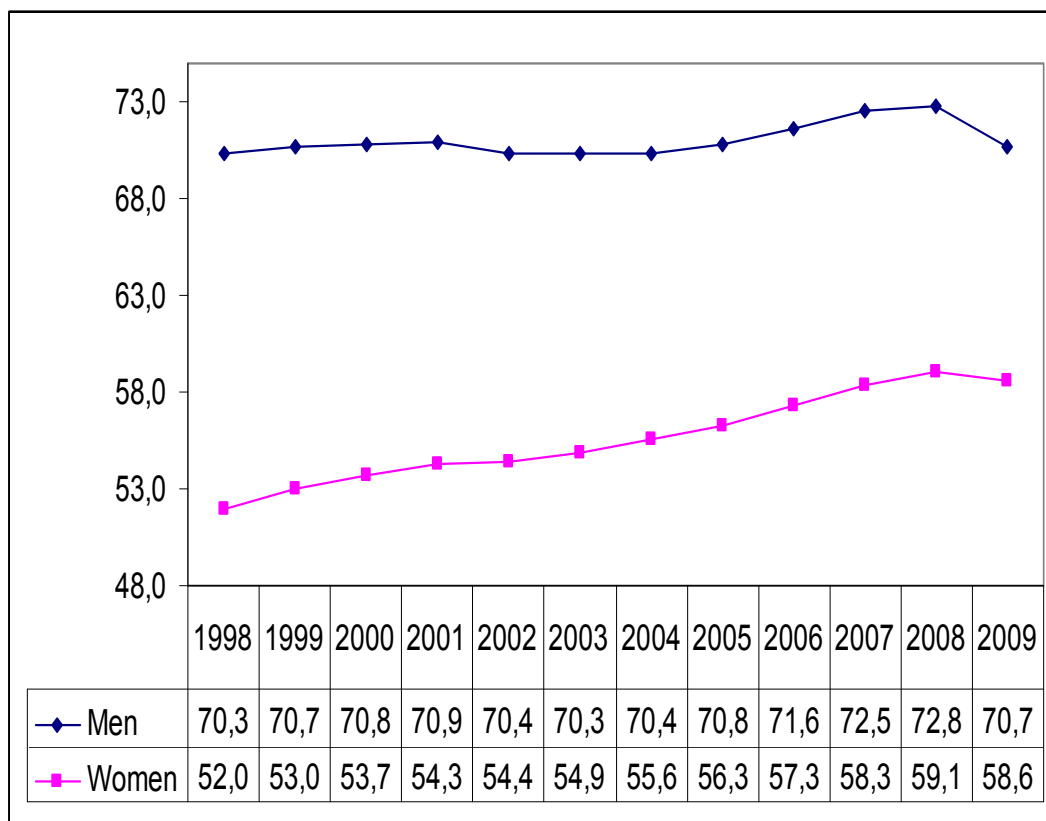
STAFF		LINE		TOTALE	
M	F	M	F	M	F
55%	45%	96%	4%	94%	6%
61%	39%	87%	13%	82%	18%
59%	41%	93%	7%	90%	10%

Part IV
ANNEXES

1. STATISTICAL ANNEX: A SET OF INDICATORS FOR WiRES

1. Employment, unemployment and activity rates in Europe

Figure 1. Employment rates of both men and women 1998-2009, EU 27



Source: Labour Force Survey, Eurostat

ANNEXES

Table 1 – Employment, unemployment and activity rates for both men and women, 2009

	ACTIVITY RATE*		EMPLOYMENT RATE**		UNEMPLOYMENT RATE***	
	Men	Women	Men	Women	Men	Women
European Union (27 countries)	77,8	64,3	70,7	58,6	7,5	7,7
Belgium	72,8	60,9	67,2	56,0	6,4	6,7
Bulgaria	72,0	62,5	66,9	58,3	5,9	6,1
Czech Republic	78,5	61,5	73,8	56,7	4,9	7,0
Denmark	84,0	77,3	78,3	73,1	5,4	4,5
Germany (including ex-GDR from 1991)	82,3	71,4	75,6	66,2	7,5	6,6
Estonia	77,6	70,6	64,1	63,0	14,7	9,4
Ireland	78,1	62,4	66,3	57,4	12,7	6,5
Greece	79,0	56,5	73,5	48,9	6,0	11,5
Spain	81,0	64,8	66,6	52,8	15,5	16,4
France	75,2	66,3	68,5	60,1	7,4	8,4
Italy	73,7	51,1	68,6	46,4	5,5	7,8
Cyprus	82,0	66,2	77,6	62,5	4,4	4,5
Latvia	77,0	71,0	61,0	60,9	17,6	12,2
Lithuania	72,0	67,8	59,5	60,7	14,8	9,4
Luxembourg (Grand-Duché)	76,6	60,7	73,2	57,0	3,7	4,9
Hungary	68,2	55,3	61,1	49,9	8,8	8,7
Malta	76,6	40,8	71,5	37,7	5,1	6,1
Netherlands	85,3	74,1	82,4	71,5	2,7	2,9
Austria	81,0	69,6	76,9	66,4	4,1	3,7
Poland	71,8	57,8	66,1	52,8	6,3	7,3
Portugal	78,5	69,0	71,1	61,6	8,1	9,3
Romania	70,9	55,4	65,2	52,0	6,1	4,5
Slovenia	75,6	67,9	71,0	63,8	5,0	5,1
Slovakia	76,3	60,6	67,6	52,8	9,5	11,6
Finland	76,4	73,5	69,5	67,9	6,9	5,9
Sweden	81,4	76,4	74,2	70,2	6,1	5,6
United Kingdom	82,0	69,5	74,8	65,0	6,3	4,7
Norway	81,3	76,4	78,3	74,4	2,6	1,8

*between 15 and 64 years old

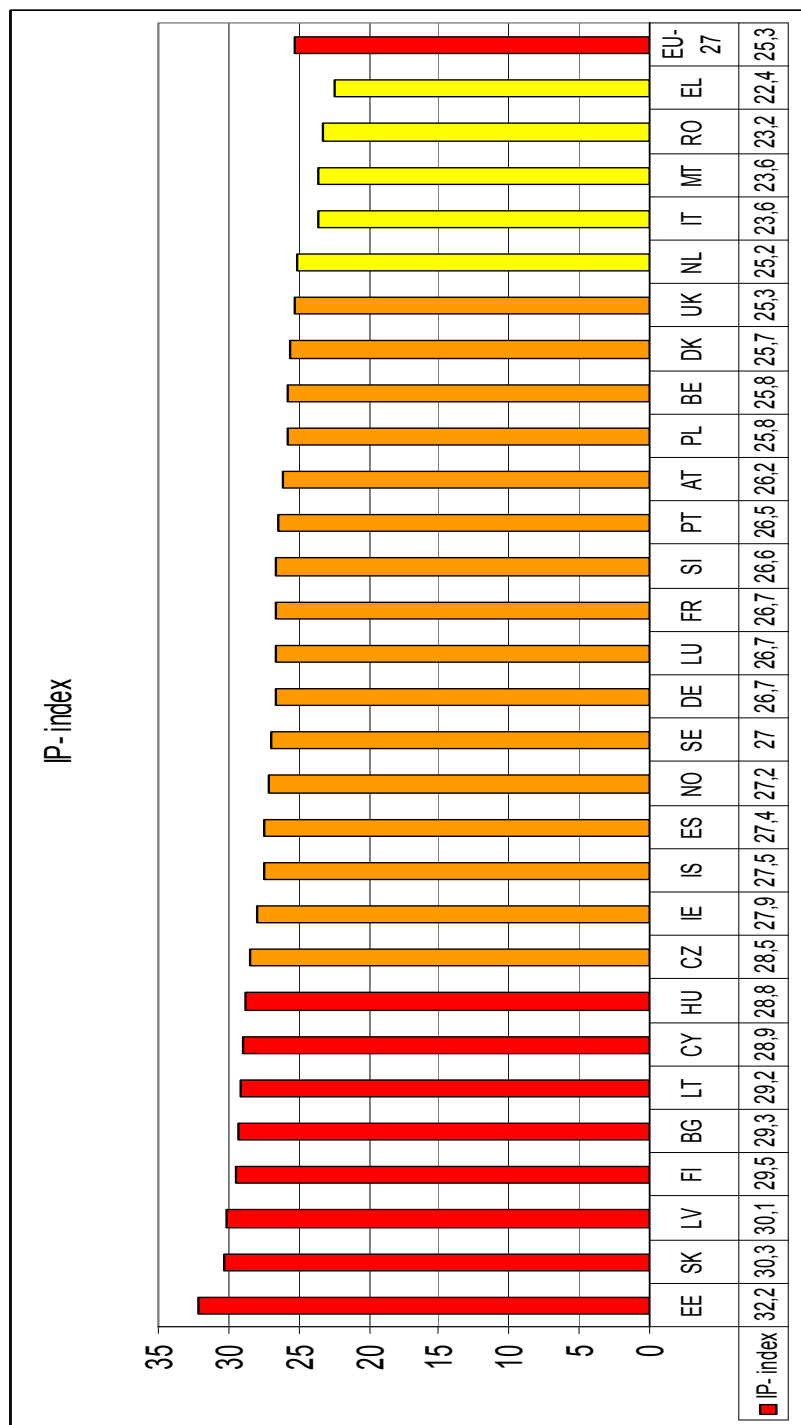
** between 15 and 64 years old

***between 25 and 74 years old

Source: Eurostat, Labour Force Survey

2. Gender segregation

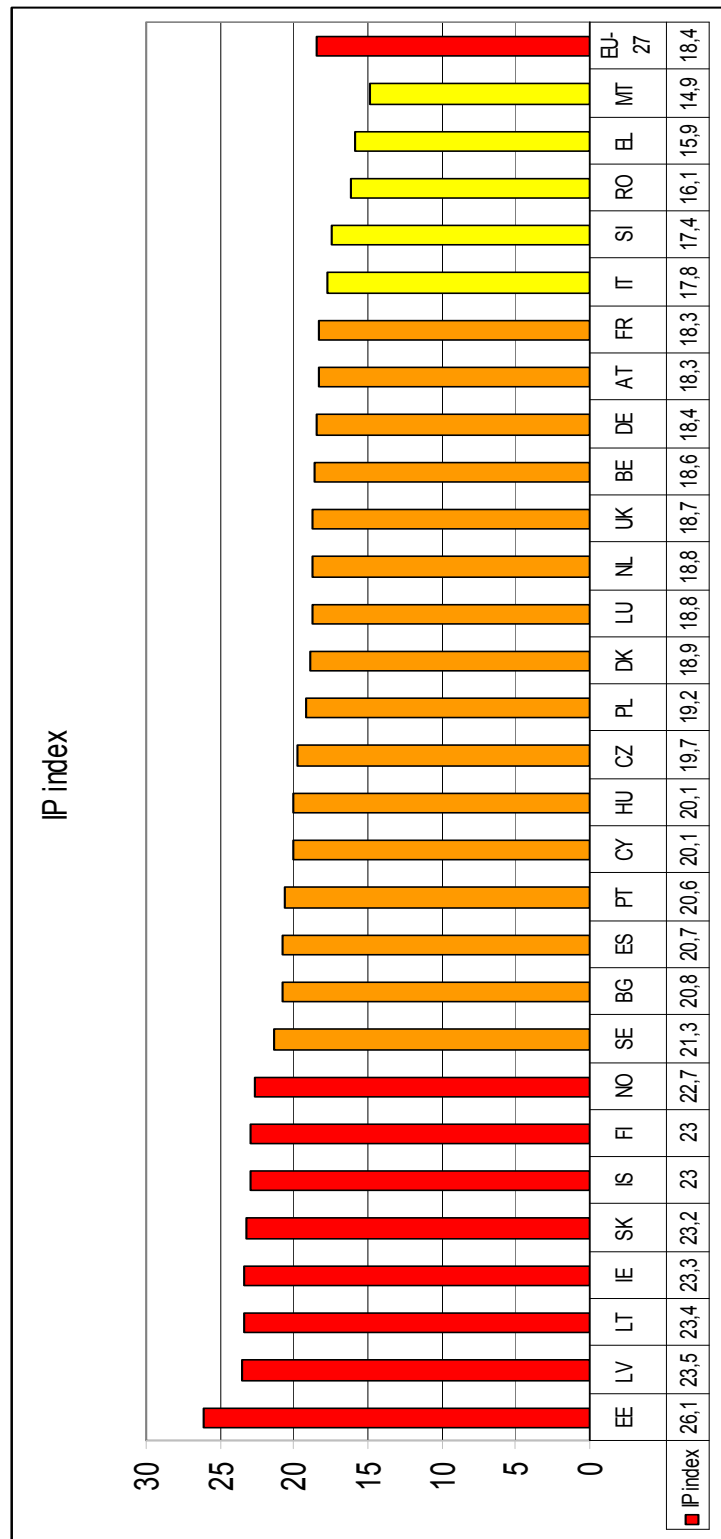
Figure 2: Gender occupational segregation in Europe, 2007



NB: countries are grouped by level of the IP index into high, medium and low. High – (low-) segregation countries score above (below) the EU average + (-) the mean absolute deviation

Source: European Commission, Gender Segregation in labour market, March 2009

Figure 3: Gender sectoral segregation in Europe, 2007

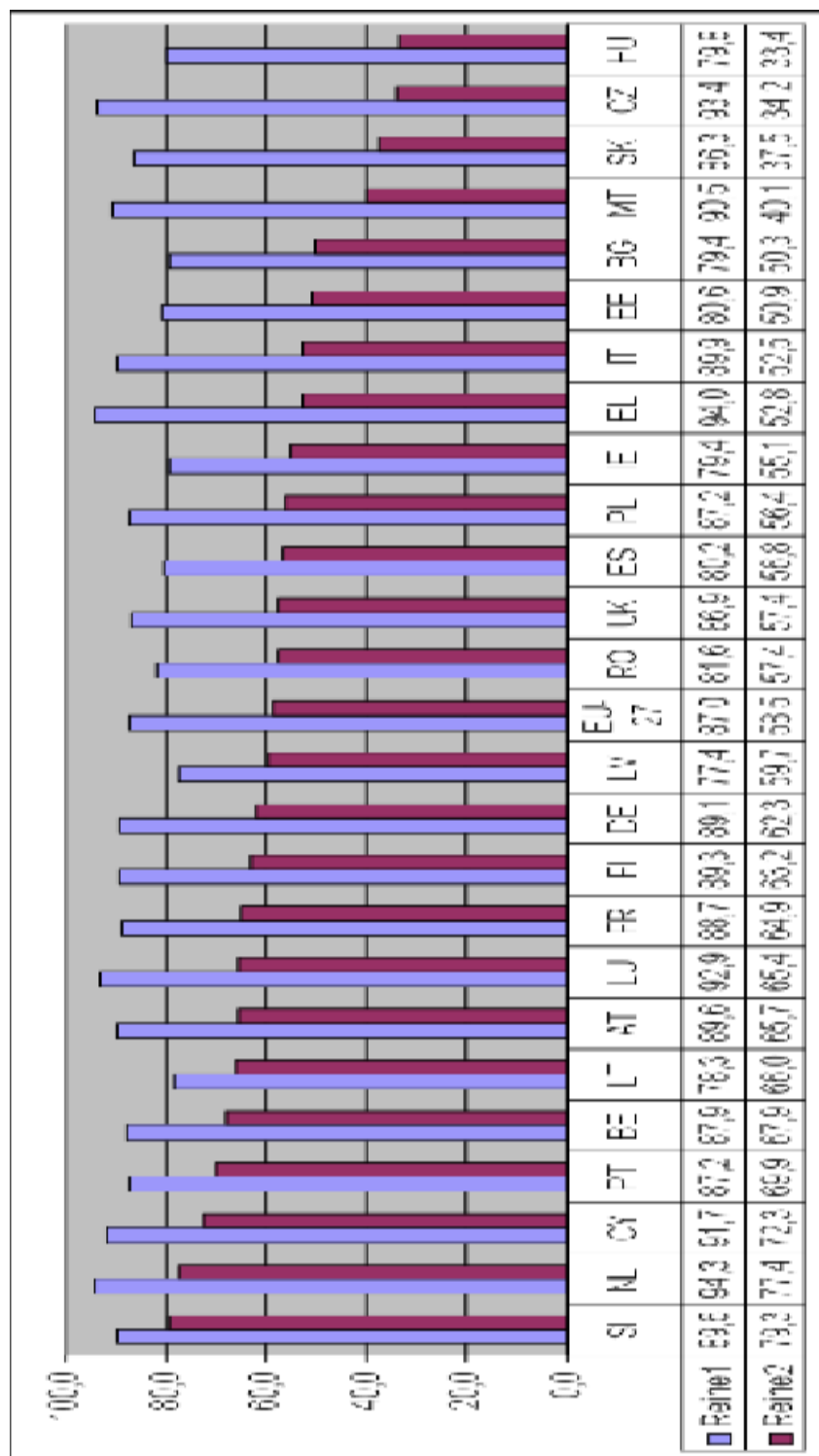


NB: Countries are grouped, according to the level of the IP index, into high/low-segregated

Source: EGGE (2009)

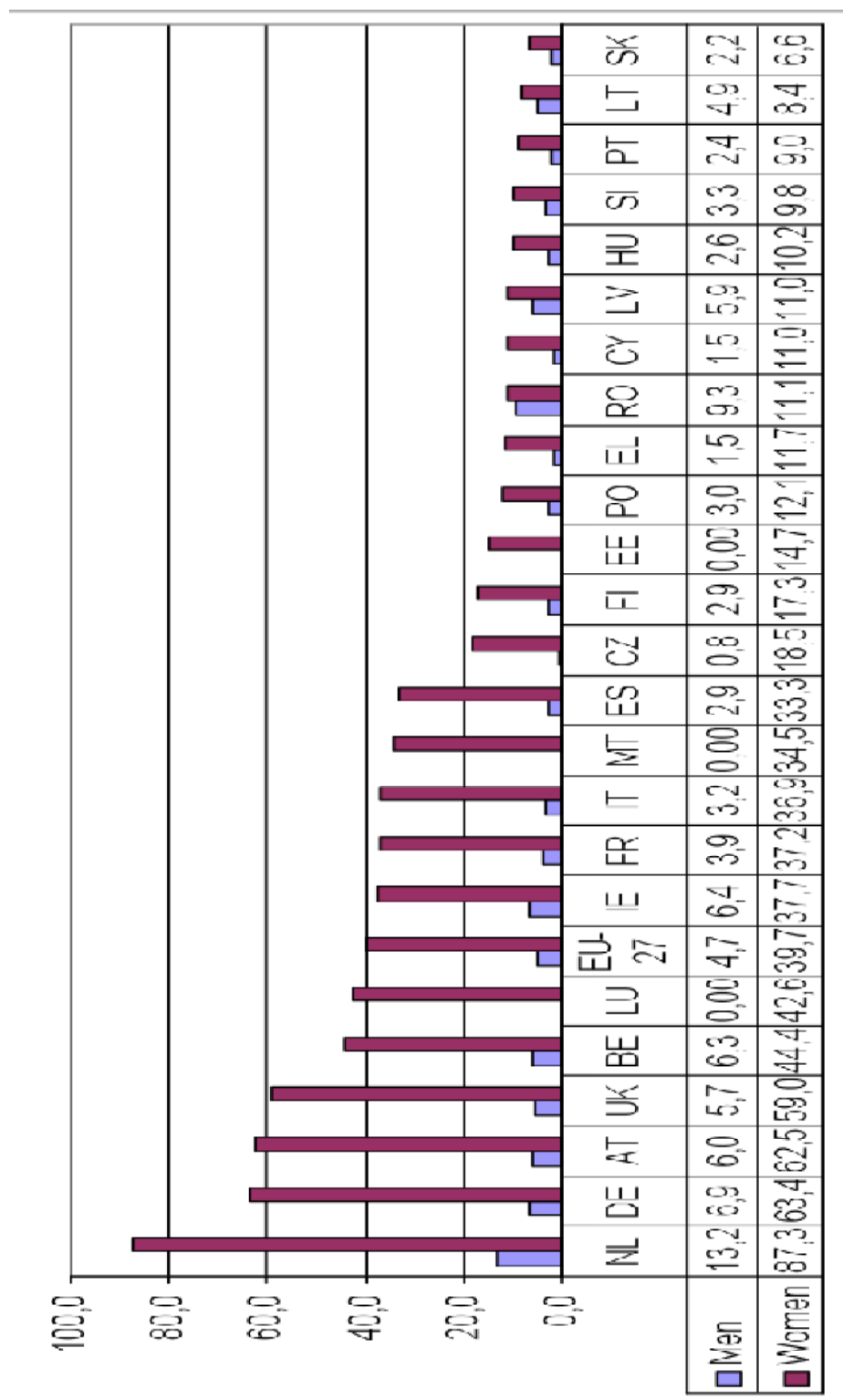
3. Work-life balance

Figure 4: Employment rate of men and women with a child less than 6 years old



Source: Labour Force Survey, Eurostat

Figure 5: Percentage of part-time employment of men and women between 15 and 64 with a child less than 6 years old



Source: Labour Force Survey, Eurostat

STATISTICAL ANNEX: A SET OF INDICATORS FOR WIRES

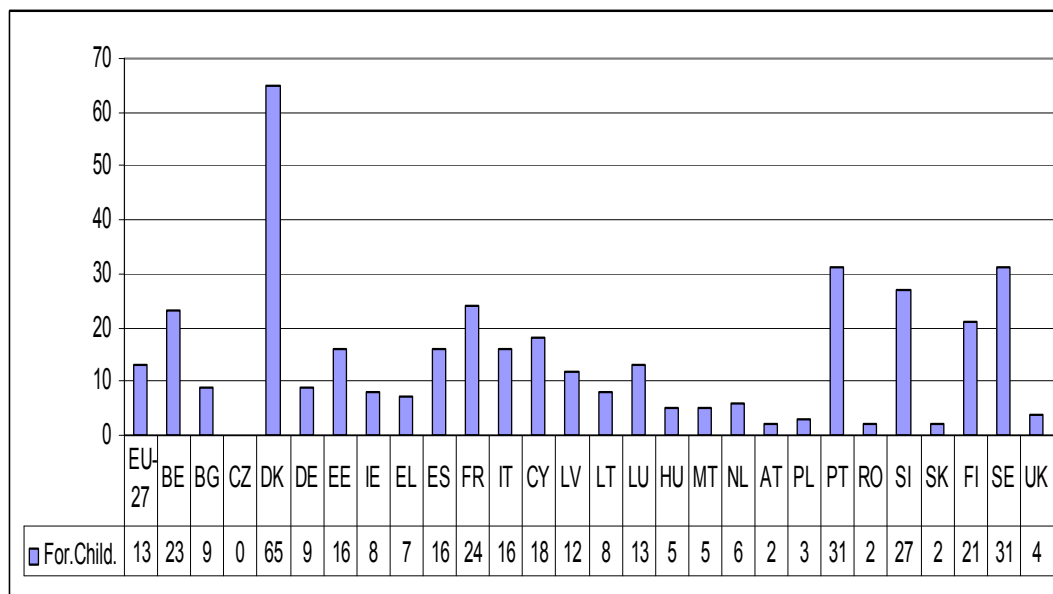
Table 2: Population in employment working from home as a percentage of the total employment, for a given sex, age group and professional status (Between 15 and 64 years), 2009

	Men	Women	Total
European Union (27 countries)	4,2	5,0	4,6
Belgium	9,4	9,3	9,4
Bulgaria	0,3	0,7	0,5
Czech Republic	2,2	3,3	2,7
Denmark	10,9	8,7	9,8
Germany (including ex-GDR from 1991)	3,1	3,7	3,4
Estonia	3,8	3,4	3,6
Ireland	8,3	4,0	6,3
Greece	1,5	2,6	1,9
Spain	3,1	3,5	3,3
France	8,7	11,9	10,2
Italy	3,3	2,9	3,2
Cyprus	0,4	1,1	0,7
Latvia	2,3	2,2	2,2
Lithuania	4,0	3,4	3,7
Luxembourg (Grand-Duché)	9,9	11,8	10,7
Hungary	2,1	2,3	2,2
Malta	3,9	6,9	4,9
Netherlands	12,2	8,5	10,5
Austria	9,1	10,8	9,9
Poland	3,7	4,7	4,2
Portugal	0,7	1,3	1,0
Romania	0,2	0,5	0,3
Slovenia	4,5	7,5	5,9
Slovakia	3,1	4,3	3,6
Finland	8,9	9,0	8,9
Sweden	4,1	3,7	3,9
United Kingdom	2,3	3,7	3,0

Source: Eurostat

ANNEXES

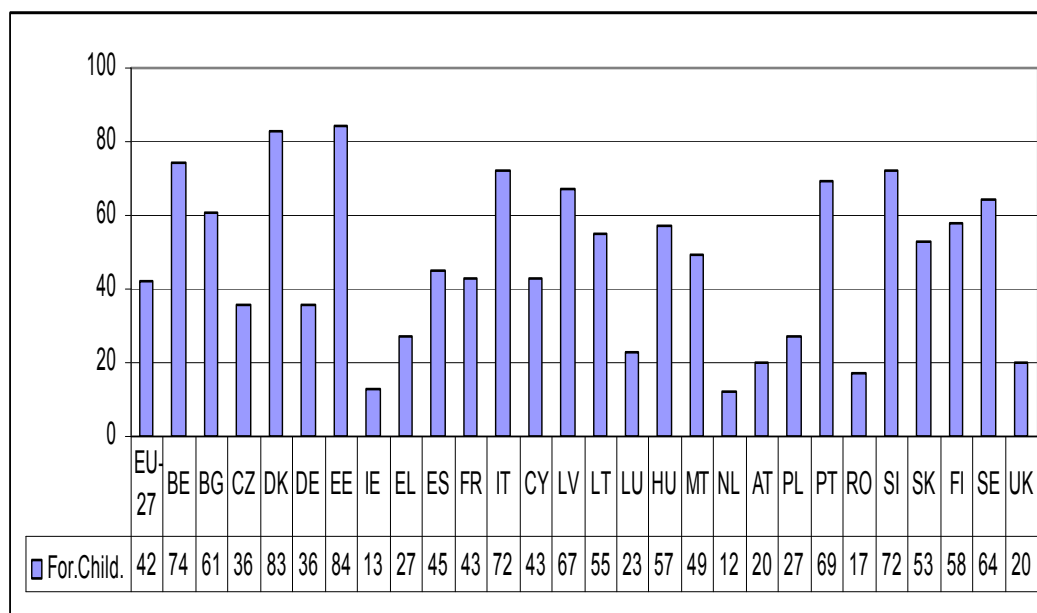
Figure 6: Formal childcare by age group and duration (less than 3 years); Duration: 30 hours or more, 2008



NB: Data for Norway not available

Source: Eurostat, SILC

Figure 7: Formal childcare by age group and duration (Between 3 years and minimum compulsory school age); Duration 30 hours or more, 2008



NB: Data for Norway not available

Source: Eurostat, SILC

4. Renewable energy sources

Table 3: Mandatory national targets set out in the Renewable Directive (2005 and 2020)

	Share of energy from renewable sources in final consumption of energy, 2005	Share of energy from renewable sources in final consumption of energy, 2020
Belgium	2.2%	13%
Bulgaria	9,40%	16%
Czech Republic	6,10%	13%
Denmark	17%	30%
Germany	5,80%	18%
Estonia	18,00%	25%
Ireland	3,10%	16%
Greece	6,90%	18%
Spain	8,70%	20%
France	10,30%	20%
Italy	5,2%	17%
Cyprus	2,90%	13%
Latvia	34,9%	42%
Lithuania	15%	23%
Luxembourg	0,9%	11%
Hungary	4,3%	13%
Malta	0%	10%
The Netherlands	2,4%	14%
Austria	23,3%	34%
Poland	7,2%	15%
Portugal	20,5%	31%
Romania	17,8%	24%
Slovenia	16%	25%
Slovakia	6,7%	14%
Finland	28,5%	38%
Sweden	39,8%	49%
United Kingdom	1,30%	15%

Source: Energy technology roadmap 2020

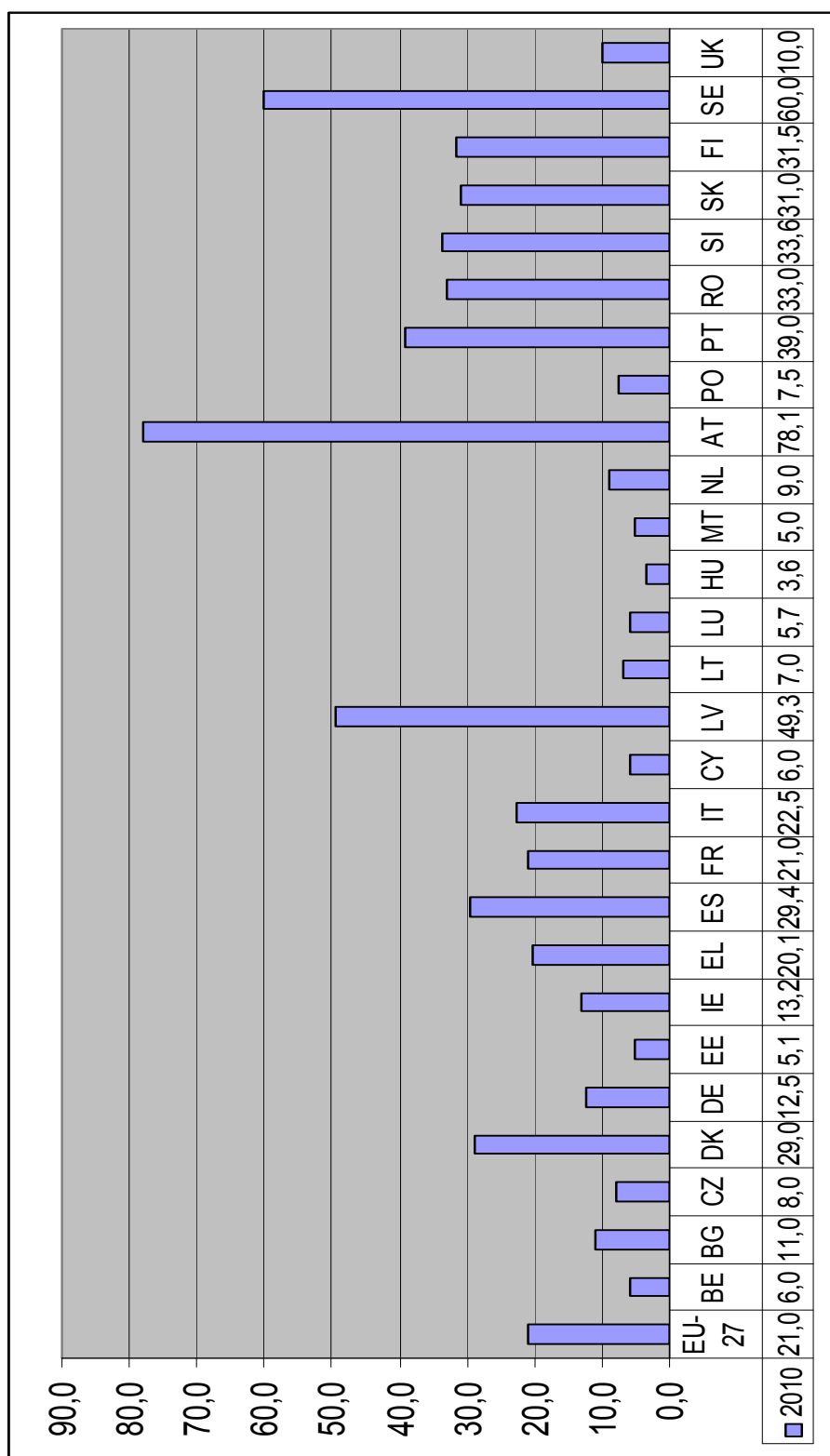
5. Energy structural indicators

Table 4: Energy intensity of the economy

	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU - 27	187,34	187,80	185,10	187,18	184,78	181,28	175,73	169,09	167,11
Belgium	243,68	237,38	226,80	237,11	229,30	224,07	215,48	198,65	199,82
Bulgaria	1362,36	1361,08	1276,39	1250,33	1139,26	1129,32	1090,96	1011,74	944,16
Czech Republic	659,13	658,88	654,50	685,77	660,22	601,15	587,62	552,37	525,30
Denmark	112,47	115,36	112,65	117,92	111,86	106,48	110,13	105,65	103,13
Germany	165,99	169,18	165,51	167,18	166,12	163,37	159,19	151,96	151,12
Estonia	812,71	773,42	696,26	708,87	687,52	616,96	548,36	571,15	570,51
Ireland	137,00	135,22	129,65	121,95	122,97	110,55	107,68	103,86	106,52
Greece	204,57	202,21	200,83	192,43	186,75	186,09	178,96	171,44	169,95
Spain	196,16	193,61	194,97	195,62	198,07	195,36	187,13	183,91	176,44
France	179,10	181,36	179,71	180,75	179,36	176,46	170,66	165,02	166,74
Italy	146,62	144,65	144,38	151,22	150,53	151,41	147,29	143,79	142,59
Cyprus	237,06	230,64	227,68	243,00	215,47	208,90	212,05	210,70	213,39
Latvia	441,00	445,74	411,45	409,36	387,02	356,70	327,28	306,50	308,74
Lithuania	571,22	615,79	611,91	577,19	547,40	478,30	433,95	428,10	417,54
Luxembourg	165,32	167,83	169,94	176,49	185,63	179,64	170,12	157,80	154,61
Hungary	487,54	477,06	464,69	465,02	435,32	443,92	423,95	407,54	401,35
Malta	191,27	218,64	194,55	214,42	217,38	212,07	194,76	197,78	194,88
Netherlands	184,82	186,64	186,91	191,48	191,56	184,83	174,62	178,92	171,58
Austria	140,32	147,61	146,80	152,96	151,71	153,99	147,64	140,82	138,06
Poland	488,67	483,51	469,48	463,75	442,13	432,06	427,01	398,80	383,54
Portugal	197,45	194,81	201,38	198,63	201,25	204,50	188,89	189,15	181,53
Romania	913,36	858,93	852,87	846,95	768,30	730,94	703,38	657,32	614,57
Slovenia	299,15	305,38	297,98	293,00	289,60	283,50	269,62	252,36	257,54
Slovakia	796,44	844,89	810,48	769,88	729,08	680,69	620,12	538,22	519,68
Finland	246,34	245,93	256,46	266,01	257,39	231,39	241,32	228,12	217,79
Sweden	177,44	186,29	185,72	177,82	177,45	168,67	157,68	152,05	152,08
United Kingdom	144,54	141,76	135,33	134,16	130,96	128,40	122,94	115,20	113,66
Norway	143,07	142,11	127,74	142,88	142,34	130,94	130,30	127,31	136,88

NB: Gross inland consumption of energy divided by GDP (at constant prices, 1995=100) – kgoe (kilogram of oil equivalent per 1000 Euro – PRODUCT: Infrastructure. Source: Eurostat

Figure 8: Share of renewable energy - Contribution of electricity from renewable to total electricity consumption (%), 2010

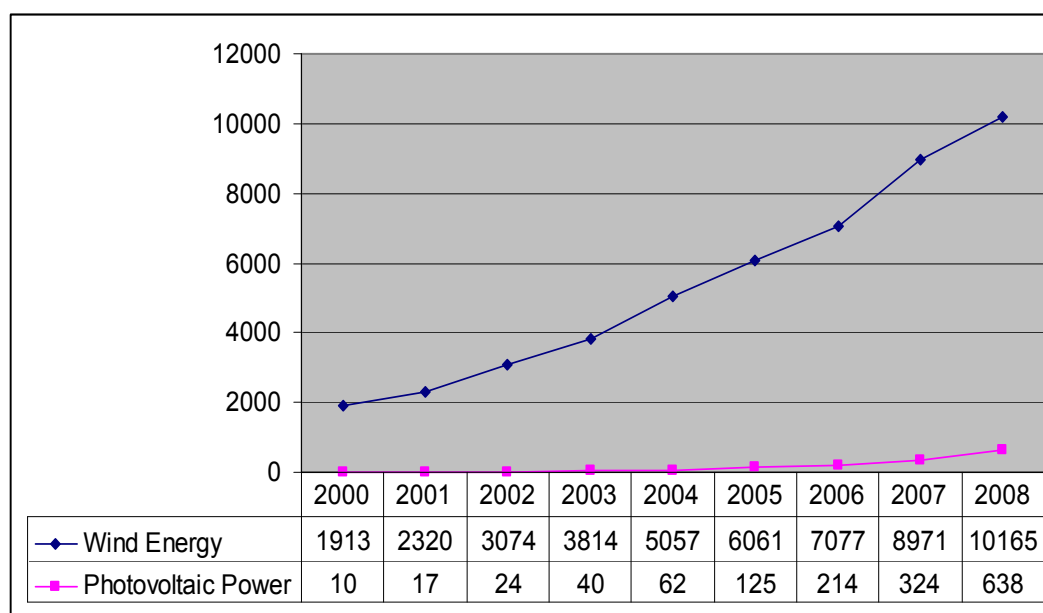


NB: Data for Norway not available

Source: Eurostat

6. Energy statistics, supply, transformation and consumption

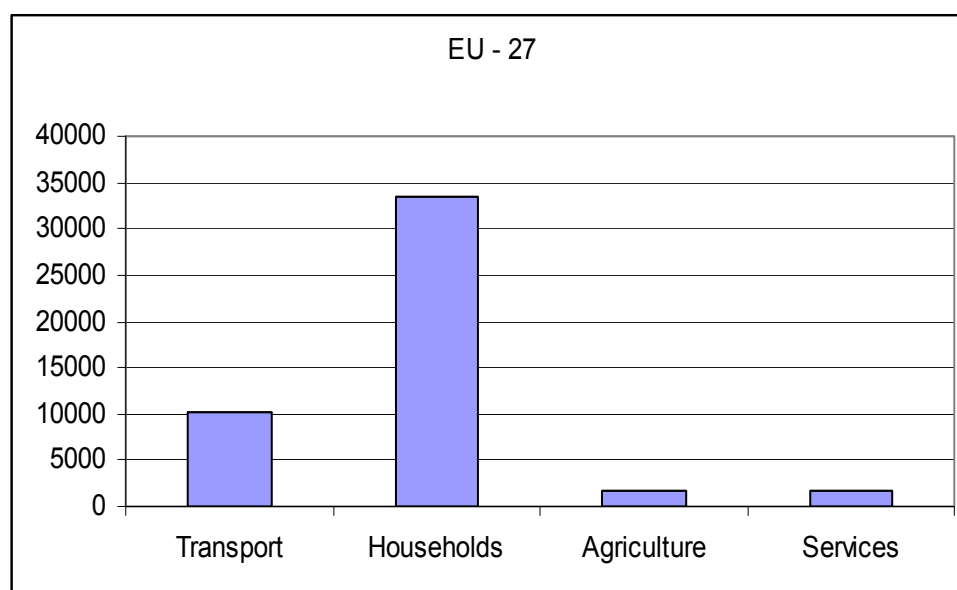
Figure 9: Wind and Photovoltaic Power - Primary production in Europe (27 countries), between 2000 and 2008 (in TOE)



Source: Eurostat

Figure 10: Final energy consumption of renewable and wastes in transport, households, agriculture, services (TOE), 2008 (annual data)

a) whole EU – 27 countries



Source: Eurostat

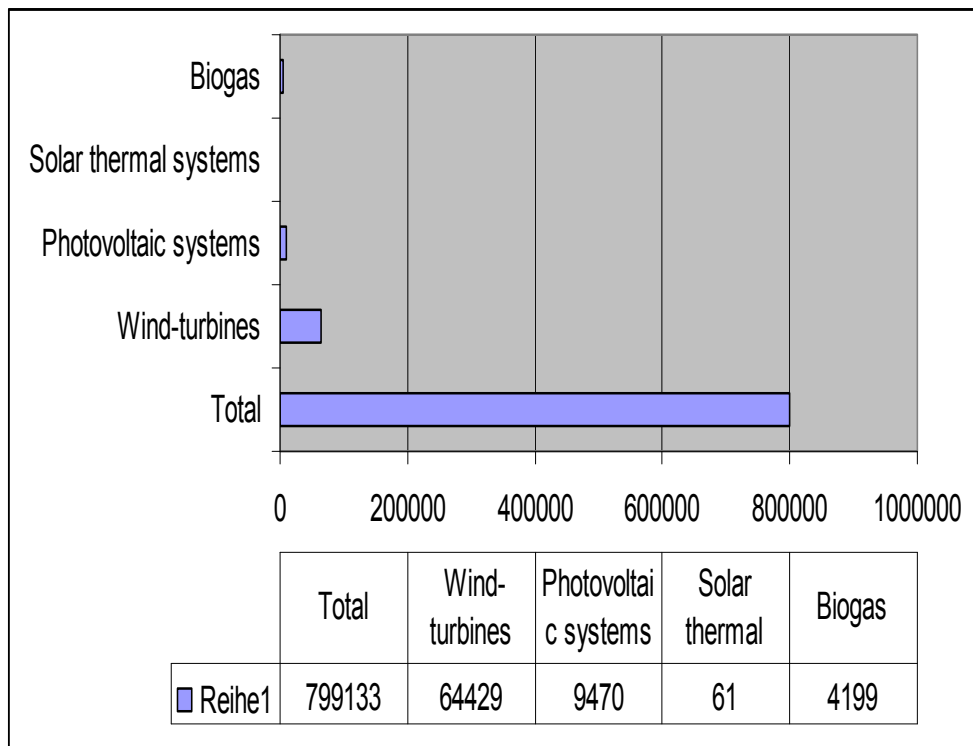
STATISTICAL ANNEX: A SET OF INDICATORS FOR WIRES

b) per country

	Transport	Households	Agriculture	Services
Belgium	101	224	5	7
Bulgaria	4	639	2	49
Czech Republic	110	1058	18	51
Denmark	5	935	65	56
Germany	3083	5908	0	13
Estonia	:	388	4	22
Ireland	53	29	1	14
Greece	69	777	19	4
Spain	610	2154	44	115
France	2291	6789	48	630
Italy	723	1488	162	:
Cyprus	14	56	0	9
Latvia	2	732	7	77
Lithuania	61	403	10	29
Luxembourg	37	16	:	:
Hungary	165	469	24	153
Netherlands	287	247	29	53
Austria	419	1706	200	87
Poland	441	2458	454	182
Portugal	128	1179	0	22
Romania	107	3432	13	15
Slovenia	22	324	:	2
Slovakia	126	35	3	16
Finland	75	1126	117	64
Sweden	371	686	317	45
United Kingdom	790	312	62	89
Norway	76	591	1	23

Source: Eurostat

Figure 11. Electrical energy - Net installed capacity in Europe, 2008 (in Megawatt)



Source: Eurostat

2. LITERATURE REVIEW

1. European social dialogue committees in the field of energy

Brief introduction of the European social dialogue's devices

The latest Commission staff working document on the functioning and potential of European sectoral social dialogue (SEC(2010) 964 final) reaffirms Social Dialogue as *one of the pillars of the European social model, and as a tool of social cohesion and resilience*.

- *Definition:* According to the European Commission definition (<http://ec.europa.eu/social/main.jsp?catId=329&langId=en>), *European social dialogue refers to discussions, consultations, negotiations and joint actions involving European organizations representing the two sides of industry (employers and workers). It takes two main forms - a tripartite dialogue involving the public authorities, and a bipartite dialogue between the European employers and trade union organizations.*
- *Functioning:* *the bipartite dialogue takes place at cross-industry level and within sectoral social dialogue committees. As a result of their representativeness, European social partners have the right to be consulted by the Commission, and may decide to negotiate agreements: the social partners may, in accordance with Article 155(2) of the TFEU, request jointly that agreements concluded by them at Union level in matters covered by Article 153 of the Treaty on the Functioning of the Union (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2008:115:0047:0199:EN:PDF>) be implemented by a Council decision on a proposal from the Commission.*

The sectoral dimension of the European Social Dialogue

- *Legal framework:* based on the provisions enacted in the Amsterdam Treaty, in 1998, the Commission set out the framework of European sectoral social dialogue (COM 98/500/EC). Subsequently, the Commission has created 40 European social dialogue committees (ESSDC), which now cover 145 million workers in Europe, in sectors of crucial importance (e.g. transport, energy, agriculture, construction, commerce, fisheries, public services, metal, shipyards, education, etc.).

- *Role of the ESSDC*: The European Commission defines European sectoral social dialogue committees as *fora for consultations on European policies*. They are also tools for autonomous social dialogue among the European social partners who may develop joint actions and conduct negotiations on issues of common interest, thereby contributing directly to shaping EU labour legislation and policies (<http://ec.europa.eu/social/main.jsp?catId=329&langId=en>).
- *Topics*: the committees work on issues such as occupational health and safety, vocational training, skills, equal opportunities (gender equality, elimination of gender pay gap), mobility, corporate social responsibility, working conditions, sustainable development, etc.

European Social Partners in the field of Energy

The Energy sector is currently covered by four *European Sectoral Social Dialogue Committees* (namely Chemical Industry, Electricity, Extractive Industry, Gas). With reference to the *WiRES*’ research field, the *WiRES* research does not take into account social dialogue within the Extractive Industry, which is not representative of the renewable energy context.

List of European Sectoral Social Dialogue Committees (ESSDC) established within the field of Energy

EUROPEAN SECTORAL SOCIAL PARTNERS (Energy Sector)		
ESSDC	MANAGEMENT	LABOUR
ELECTRICITY		 
GAS		 
CHEMICAL		

On the worker’s side, EPSU and EMCEF are the most representative European trade unions federations in the Energy sector:

- EPSU, the European Federation of Public Service Unions, is the largest federation of the ETUC (European Trade Unions Confederation) and comprises 8 million public service workers from over 250 trade unions. It organizes workers in the energy, water and waste sectors, health and social services and local and national administration, in all European countries including in the EU's Eastern Neighbourhood. The last EPSU Congress was held from 8 to 11 June 2009 in Brussels. It adopted a series of resolutions concerned with public services, collective bargaining, pensions and gender equality (see the hereto attached Literature Review). EPSU has established a Gender Equality Committee which has the same constitutional standing as the Executive Committee (further information available at www.epsu.org).
- The European Mine, Chemical and Energy Workers' Federation (EMCEF) comprises 2.5 Million blue and white collar workers in 35 countries and 129 national trade unions in a broad range of industries. These include the chemical industry, but also mining, energy and several process industries. It is one of the 12 European Industry Federations that are members of the ETUC. EMCEF was founded in 1996, resulting from the merger of the European Mineworkers Federation and the European Federation of Chemical and General Workers and works closely with ICEM, the global Chemical and Mineworkers Federation. According to its statute, among other things, the EMCEF promotes equal opportunities regardless of gender, race or creed and safeguards economic, social, environmental and cultural interests (further information available at www.emcef.org).

Unlike the Union's sectoral organizations, the European sectoral employers' federations are not formally linked to any cross-industry European social partner (e.g. BUSINESSEUROPE):

- The Union of the Electricity Industry, EURELECTRIC, is the sector association which represents the common interests of the electricity industry at pan-European level, plus its affiliates and associates in several other continents. The association was formed as a result of a merger in December 1999 of the sister sector bodies UNIPED and EURELECTRIC. Since 2006 EURELECTRIC has been a Campaign Associate of the Sustainable Energy Europe Campaign (www.sustenergy.org), a European Commission initiative set up in order to: raise the awareness of decision-makers at local, regional, national and European level; spread best-practice; ensure a high level of public awareness, understanding and support; and stimulate trends towards increasing private investment in sustainable energy technologies (further information available at www.eurelectric.org).
- EUROGAS, the European Union of the Natural Gas Industry, is composed by 50 members from 28 countries amongst which 36 natural gas companies, 12 federations of natural gas companies, and 2 international organizations. EUROGAS has established an Environment Committee to discuss environmental issues together with its partner Marcogaz, a technical association of the European Natural Gas Industry (further information available at www.eurogas.org).

- The European Chemical Employers Group (ECEG) is an independent federation within the CEFIC (European Chemical Industry Council) family of organizations representing the European Chemical Industry in many areas. The ECEG, which deals with social affairs and social dialogue on behalf of the industry, was founded in 2002 and has at present 23 national Chemical Industry employers federations from as many European countries as there are members.

European social dialogue committees in the field of Energy



Brief introduction of the sector

During the last decades, the electricity sector has been characterized by an important process of restructuring, as a consequence of the EU liberalisation of network industries since the second half of the 1990s. Several Directives aimed at the full opening up of the market by 2007 contains a number of obligations for national regulators which are called to monitor the development of competition, levels of investment and, where appropriate, the level of prices. According to the EU Institutions view, this should lead to more transparency and give operators more ability to predict change. On the other hand the process of privatisation/liberalisation has had the effect of significantly reducing employment in the Electricity Sector. The ECOTEC's study on the impact of the opening of electricity and gas markets on employments in the EU-27 reports that electricity utilities in the EU-15 have lost nearly a quarter of a million jobs over the past decade, from 854,000 in 1995 down to 608,000 in 2004. This represented over a quarter of the total workforce in the sector. For the 12 new Member States around 50,000 jobs were lost in the sector during the same period, representing around a sixth of the workforce.

The electricity sector is playing a leading role in the fields of sustainable development and Renewable Energies: the EURELECTRIC's Fourth Environment and Sustainable Development Report shows positive trends in environmental performance as well as in the social and economic areas.

Remarkably, in March 2009, 61 CEOs from European power companies – representing well over 70% of total European power generation – signed a Declaration (Declaration by European Electricity Sector Chief Executive Officers on Climate Change, Electricity Markets and Supply Security, EURELECTRIC, 2009) by which they commit themselves and their companies to the following:

- achieve a carbon-neutral power supply by 2050;
- work for an integrated European electricity market that will deliver power cost efficiently and reliably;
- promote energy-efficient electricity exploitation as a key part of the solution to the great energy-climate challenge.

In this framework, since 2008 EURELECTRIC has been awarding the so called EURELECTRIC Award in order to honour companies or persons that have made a pioneering contribution towards revolutionizing the operations, processes, technologies or products of the electricity industry. So far, the prize has been awarded to persons and companies which have contributed to develop carbon-neutral and climate friendly activities or devices (further information available at www.eurelectric.org).

Activities of the ESSDC Electricity

EURELECTRIC, EPSU and EMCEF, have set up a sector Social Dialogue Committee which operates within the framework of the EU Social Dialogue process.

Social partners in the electricity industry are notably committed to equality and diversity and have worked together continuously on these topics, also in the framework of the Social Forum. This led to the publication in December 2006 of a practical guide entitled Equal Opportunities & Diversity - Toolkit/Best Practices Guide, which aims at promoting understanding and awareness of the management of equality and diversity in the workplace. It provides practical advice and tools for employers, managers and unions to accommodate and implement equality and diversity programmes and initiatives in the workplace.

The handbook is the result of a series of activities that have been undertaken by the European social partners in the Electricity sector, which include the following:

- Joint Declaration on Equal Opportunities and Diversity (2003), in which the partners stated their commitment to the construction of a "democratic, pluralist and open Europe that respects the dignity and integrity of all human beings";
- Research study on Equal Opportunities and Diversity- Changing Employment Patterns in the European Electricity Industry published in January 2005, comprising a mapping of the European electricity industry workforce and an account of equal opportunities policies at supra-national, national and company levels, thus providing the basis for policy making and learning strategies.

Along with the above mentioned initiatives on equal opportunities, the sectoral social dialogue committee has been working on lifelong learning at sectoral and national level and on the crucial role of identifying future skill needs in the European Electricity sector: a joint statement the European social partners issued in 2003 underlines the importance of those matters and a new statement on the future skills needed in the European electricity sector and South East European Energy Community has been adopted in 2004.

Social partners decided in 2007 to launch a project in order to consider the ongoing implications of demographic changes in the Electricity Industry. This project focused on the employment life-cycle, from recruitment through employment to retirement. The result of this project was the publication in November 2008 of a toolkit for promoting age diversity and age management strategies (EURELECTRIC, EPSU, EMCEF, 2008). This toolkit presents the best practices from company case studies, which can be used by employees, trade unions and workers' and employer's representatives in the Electricity Industry to address issues arising from demographic change. Some of the main challenges identified in this toolkit are:

- Manage an ageing workforce to ensure competitiveness and sustainability;
- Value and retain the skills and experience of older workers;
- Create age diversity in the workforce and tackle age barriers and age discrimination in the workplace;
- Develop a corporate culture that promotes a strategic and comprehensive approach to age management;
- Ensure that line managers are effectively trained to implement company policies and promote age diversity;
- Integrate age management policies and strategies into the social dialogue between unions and employers.

A 2007 Joint declaration on work-related stress provides some kind of monitoring exercise in order to assess how their respective member organizations have been able to respond to the call of their European sectoral colleagues.



Brief introduction of the sector

Like the Electricity Sector, the Gas Sector has undergone large changes in the past few years, which are a consequence of the EU liberalization of network industries since the second half of the 1990s. The gas sector is facing significant changes in its production, distribution and retail functions, resulting from changes in product markets, the potential of increased demand for energy in the future, and from the need to respond to climate change and reduce the emission of greenhouse gasses. These all have implications for energy infrastructure, training and the forecasting of skills and competencies of the workforce and have a profound impact on employment.

The gas sector employs around 246,716 (based on 1,300 gas companies in the EU 27) (Eurogas survey, 2008). However, there has been a progressive reduction in employment in the sector, which is a general trend since the liberalization of the European energy sector, and there is a trend towards higher skilled technical and engineering employment: statistics in the gas sector point to a decline of 12-13% of jobs between 2001 and 2005. According to the Toolkit on demographic change, age management and competencies in the gas sector, the majority of employment in the sector is male employment, with women representing between 8 and 15 per cent of the overall energy sector. Women are clustered into administrative, customer service and clerical positions, and few hold managerial and executive positions.

Activities of the ESSDC Gas

EUROGAS, EPSU and EMCEF, have set up a sector Social Dialogue Committee which operates within the framework of the EU Social Dialogue process.

In 2008 in the framework of the committee they signed their first common declaration on ECOTEC study on the impact on employment in EU-25 of the opening of electricity and gas markets, and of key EU directives in the field of energy.

In 2009 EUROGAS, EMCEF and EPSU decided to consider the implications of demographic change on skills and competencies in the gas industry, and launched a project in the framework of the social dialogue committee. The project's outcomes show that:

the ageing of the population in the European Union means that the number of people aged 20-59 years will decrease from 208.7 million in 2000 to 151.2 million in 2050;

during this time, the numbers of people over the age of 60 will increase significantly so that retired people will outnumber active workers by 2030;

this has implications for the gas sector where many companies report that between 10 and 40 per cent of the gas sector workforce are over the age of 50 years.

A separate study was carried out by the Working Life Research Institute of the Metropolitan University of London, to provide an analysis of trends in demographic ageing, skills and competencies. The study presents the results of a joint survey which show the following:

- Demographic ageing and changes taking place in the industry will require new investments and skills and competencies.
- Employers and trade unions need to set aside time and resources to properly study the effects of the sector's ageing workforce and adequately address them jointly.
- There is a lack of discussion and bargaining on demographic change and competencies.
- The study highlights the specific jobs that will be affected, such as, meter readers, engineers, plant operators, and workers in customer services, distribution and exploration.

During a conference held in 2009, social partners presented a toolkit on demographic change, age management and competencies in the gas sector in Europe in order to raise awareness and point to ways in which social partners can address the implications of demographic change in relation to the skills and competencies that are necessary to ensure competitiveness. Amongst other things, the Toolkit:

- identifies the challenges gas companies face and the way they can be resolved-dealt with;
- demonstrates how companies can benefit from the skills and motivations of different age groups in the workforce and provide guidelines, information and good practice approaches. There are several case studies which exemplify joint company/ trade union approaches, that include the sectors main companies;
- underlines the case for the role – the importance of the social dialogue in the management of demographic change, and illustrates how it will be useful for human resource and line managers and trade union officials working in the gas sector, who have a responsibility for drawing up policies and procedures and monitoring progress in this area. The European social partners want to see the toolkit used as a basis for addressing the consequences that demographic change has on skills and competencies.



Brief introduction of the sector

According to EC's sources, the EU is the leading chemical producing area of the world, representing 28% of world production. The European Chemical Industry is the second largest industrial sector in Europe and employs 2 million people directly in Europe and an even larger number of employees are dependent on the chemical industry indirectly. It is composed of large multinational companies as well as of many successful small and medium sized entities. It has a positive trade balance, playing a key role for the export position of the European economy as a whole. The chemical industry is a high-tech industry underpinning numerous innovations and closely linked to new developments such as bio- and nanotechnology.

The challenges facing the industry include slow demand growth in Europe, high demand growth in Asia, relocation, higher production costs and a highly regulated environment. A 2007 study carried out by the European Social Partners in the sector acknowledges that:

- production growth in the EU has been lower than on global level and the overall employment in the European Chemical Industry is lower today than several years ago;

- the average age of the employees in the Chemical Industry has risen and the percentage of low and non-skilled labour employed in the industry is lower than it was in the past;
- the majority of restructuring cases in the Chemical Industry created more jobs than were lost.

The main regulatory challenge for the sector is the implementation of a workable and cost-effective REACH system (Registration, Evaluation and Authorisation of Chemical substances). The REACH system aims at reconciling competitiveness with reduction of chemical pollution: if adopted, REACH would represent a unified regulatory regime that should invigorate the international competitiveness and innovative capacity of the sector (notably of its SMEs), and improve the sector's performance as regards the environment and health and safety.

Activities of the ESSDC Chemical Industry

EPSU and ECEG, have set up a sector Social Dialogue Committee which operates within the framework of the EU Social Dialogue process.

In February 2003, EMCEF and ECEG (together with CEFIC) adopted a memorandum of understanding on responsible care, aimed at improving and promoting the safety, health and environmental performance of the industry. Chemical social partners decided to set up a joint monitoring group to review improvements in safety, health and environmental performance, share best practice and develop education and training.

In 2005, ECEG and EMCEF adopted a joint declaration that underlined the lack of skills in the chemical industry and stated the mutual interest of employers and employees in investing in them. A working group was set up to develop an in-depth analysis of the situation relating to skills, qualifications, vocational training and lifelong learning and to exchange good practice.

From July 2007 to May 2008 the Social Partners of the Chemical Industry worked together on the project "Restructuring, Managing Change, Competitiveness and Employment in the European Chemical Industry".

2. Occupational outlook for women in green jobs: an institutional perspective

Updating the Beijing Platform for Action (tentative numeration)

The fourth and last World Conference on Women, which took place in Beijing in September 1995, set up an agenda for women's empowerment and a platform for action

to promote women's rights: see UNITED NATIONS, DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, DIVISION FOR THE ADVANCEMENT OF WOMEN, *Beijing Declaration*, Adopted at the 16th plenary meeting of the General Assembly of the United Nations, New York, 132 pages, 15 September 1995 (available at www.un.org/womenwatch/daw/beijing/pdf/BDPfA_E.pdf). The previous declarations discussed climate change in relation to women's livelihood and living conditions, these factors being jeopardised by adverse environmental conditions. The Beijing Declaration introduces in its terminology a direct reference to women as active professionals, effectively promoting self-determination in training and education. *Strategic objective K.2.(i) of Chapter IV*, reads that "governments should develop programmes to involve female professionals and scientists, as well as technical, administrative and clerical workers, in environmental management, develop training programmes for girls and women in these fields, expand opportunities for the hiring and promotion of women in these fields and implement special measures to advance women's expertise and participation in these activities". Strategic objective K.2.(e), of the same chapter, highlights the importance of integrating gender-sensitive research and data into mainstream policies.

In the 15-year review of the implementation of the Beijing Declaration and Platform for Action seen in UNITED NATIONS ECONOMIC AND SOCIAL COUNCIL, COMMISSION ON THE STATUS OF WOMEN, *Report on the fifty-fourth session* (13 March and 14 October 2009 and 1-12 March 2010), New York, 97 pages, 2010 (available at www.un.org/womenwatch/daw/beijing15/index.html), good practices and new challenges are emphasized, ranging from the implementation of the Millennium Development Goals to the new conditions created by the economic downturn. Point 11 of Decision 54/101 actually makes a direct reference to green jobs for women, highlighting the importance of accessing to newly created jobs in the labour market.

The United Nations has further stressed the importance of education and training for women in order to achieve empowerment in the Millennium Development Goals, ratified after the Millennium Summit in September 2000 in New York. In the UNITED NATIONS, GENERAL ASSEMBLY, *Resolution 55/2 United Nations Millennium Declaration*, 8th plenary session, New York, 8 September 2000 (available at www.un.org/millennium/declaration/ares552e.htm), specifically in *point 20 of Chapter III. Development and poverty eradication*, there is a focus on the promotion of gender equality and the empowerment of women, advocating for the levelling of gender differences in primary and secondary education and gender mainstreaming in the workforce, even at the political level.

The Millennium Development Goals are periodically assessed by the major UN agencies. The last report, UNITED NATIONS, *The Millennium Development Goals Report 2010*, Published by the United Nations Department of Economic and Social Affairs, 76 pages, June 2010 (available at http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2010/MDG_Report_2010_En.pdf) states that women's employment in paid jobs

outside the agricultural sector has increased between 1990 and 2008, even though there is a strong vertical segregation, where only one in four senior officials or managers are women. Furthermore, in all 10 regions analyzed, women are underrepresented among high-level workers, accounting for 30% or more of such positions in only three of the regions.

The European Union adheres to internationally recognized principles such as the Beijing Platform for Action and the Millennium Development Declaration. The Beijing Platform of Action is considered as one of the main foundations of the European Union's gender policies. In fact, the twelve critical areas of concern of the Beijing Declaration and Platform for Action are closely linked to the priorities outlined in Annex I of the European Commission's Roadmap for Equality between Women and Men, as seen in EUROPEAN COMMISSION, *Roadmap for Equality between Women and Men (2006–2010)*, Luxembourg: Office for Official Publications of the European Communities, 43 pages, April 2006 (available at <http://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=12&furtherPubs=yes>). The Roadmap outlines six priority areas for EU action on gender equality: equal economic independence for women and men; reconciliation of private and professional life; equal representation in decision-making; eradication of all forms of gender-based violence; elimination of gender stereotypes; and promotion of gender equality in external and development policies. The High Level Group on Gender Mainstreaming, an informal group created in 2001, looks to promote gender mainstreaming at national level and plans the strategic follow-up of the Beijing Platform for action, including the development of indicators.

The Swedish Presidency of the Council of the European Union in 2009 has presented the third review of development at the EU-level of the areas of concern on the Beijing Platform for Action in MINISTRY FOR INTEGRATION AND GENDER EQUALITY IN SWEDEN, *Beijing + 15: The Platform for Action and the European Union. Report from the Swedish Presidency of the Council of the European Union*, 179 pages, 11 November 2009 (available at <http://ec.europa.eu/social/BlobServlet?docId=4336&langId=en>). The report acknowledges the gender gap in occupational sectors related to environmental issues, such as energy, transport and technological development, signalling that managerial and policy making positions in these sectors are still male-dominated.

The European Union: Europe 2020

The Europe 2020 strategy enters the field after a crippling global economic crisis, which has created further employment and social gaps between Member States and within them. The downturn of the last years was also one of the reasons why the previous strategy, known as the Lisbon Agenda, was unable to fulfil the envisioned targets. The Lisbon Strategy has been widely criticized for its lack of envisioning realistic objectives, which

essentially have not been fulfilled also due to its non-binding nature. Overturning the current situation, the European Council looks to becoming the leading body in decision making process of the new strategy, ensuring the integration of policies and managing the interdependence between Member States and the EU. The European Commission will monitor more closely national governments, which will submit tailor-made plans in terms of research, infrastructure and spending, to be used for setting custom-made targets. A public form of peer-review will probably be implemented by the end of 2010.

The European Union has underlined the importance of combating gender inequality and discrimination in labour markets in its new strategy for jobs and growth, presented in the EUROPEAN COMMISSION, Communication from the Commission, *Europe 2020. A European strategy for smart, sustainable and inclusive growth*, Brussels, 32 pages, 3 March 2010 (available at <http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf>), a plan where new targets regarding education, environmental sustainability and employment for the next decade are set, updating those defined on the Lisbon Agenda. The new strategy proposes 5 headline targets: raising the employment rate of population aged 20-64 to 75%, raising the investment in R&D to 3% of the EU's GDP, cutting greenhouse gases by 20% (and drawing 20% of its energy from renewable sources), reducing early school leavers to under 10%, ensuring 40% of the younger generation has a tertiary degree, and relieving 20 million people out of poverty. The Europe 2020 strategy will be implemented through 7 flagship initiatives, which require a joint effort on behalf of the European Commission and member states. The initiatives 'Resource efficient Europe' and 'An Agenda for new skills and jobs' are both pivotal for the creation of green jobs for women, although the strategy itself does not pinpoint the relationship between women's employment and sustainable development.

The Europe 2020 economic and employment strategies are detailed, under the form of 10 overarching guidelines, in the EUROPEAN COMMISSION, Recommendation for a Council Recommendation, *Europe 2020. Integrated guidelines for the economic and employment policies of the Member States*, 23 pages, 27 April 2010 (available at <http://ec.europa.eu/eu2020/pdf/Brochure%20Integrated%20Guidelines.pdf>), where a direct reference to the need of retaining women in highly qualified jobs is made: "Work-life balance policies [...] should be geared to raising employment rates, particularly among youth, older workers and women, in particular to retain highly-skilled women in scientific and technical fields.". The creation of employment is closely linked to Guideline 6, which recommends modernising the industrial base, with a particular focus on small and medium-sized enterprises (SMEs), these representing the major employer of workers in the renewable energy field within the European Union. Research & Development (R&D) is also underlined as a major factor in overcoming societal challenges, especially in the field of energy, resource efficiency and climate change.

Gender policies in the European labour market

Comparing and measuring gender equality within the European Union is a difficult challenge due to the disparities in social structures, economies and welfare systems of the member states. What emerges from the analysis seen in EUROPEAN FOUNDATION FOR THE IMPROVEMENT OF LIVING AND WORKING CONDITIONS, *Patterns of recent employment growth in the EU: implications for gender equality, Background paper*, 12 pages, Dublin, 15 May 2009 (available at www.eurofound.europa.eu/publications/htmlfiles/ef0935.htm) is that countries with the lowest gender pay gaps present very different employment rates and population sizes, which signifies that an array of factors influence the measurement, from a small proportion of low-skilled or unskilled women in the paid workforce to different institutional mechanisms and wage settings. A high pay gap is typical of labour markets which are highly segregated or with a strong component of women working part-time. The EU average, at 17.8% (2008) could be seen an indicator for high segregation, but could also signify more women are entering the paid workforce at all levels. Women are also penalized in management and supervisory roles: there is more than a 20% gap between the country with the highest value of workers with an immediate female supervisor and the lowest EU15 value. Although women's employment rates fell short of the Lisbon target of 60% female employment rate by 2010, the majority of employment growth from 1995 to 2006 within the EU has involved women. Pushing for balanced gender proportions in technical professions and in the highest income quintiles will most likely result in a better occupational outlook in green jobs.

Gender segregation does not occur solely by sectors, or horizontally, but throughout the workforce hierarchy, or vertically. The report EUROPEAN COMMISSION DG EMPLOYMENT, SOCIAL AFFAIRS AND EQUAL OPPORTUNITIES, *Gender segregation in the labour market. Root causes, implications and policy responses in the EU*, Luxembourg: Publications Office of the European Union, 111 pages, Belgium, March 2009 (available at: <http://ec.europa.eu/social/BlobServlet?docId=4028&langId=en>) looks into horizontal and vertical segregation and how factors such as the undervaluation of women's work, confinement to low quality jobs, and skill shortages are the main causes of segregation. In order to combat segregation, the best tools are education and vocational training. Currently women receive on average 10% less hours of training than men. The report comments that labour or skill shortages are primarily in male-dominated occupations, meaning that training and orientation need to start from the early stages of development, in order to avoid sectoral occupations being dominated by one gender or the other, a setting which in the long run can also shape a type of mindset, limiting the evolution of disciplines.

The European parliament has called for addressing the gender dimension within the European recovery plans in response to the economic and social crisis in EUROPEAN PARLIAMENT, *European Parliament resolution of 17 June 2010 on gender aspects of*

the economic downturn and financial crisis (2009/2204(INI), Strasbourg, 17 June 2010 (provisional edition available at www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P7-TA-2010-0231+0+DOC+XML+V0//EN&language=EN). The resolution directly mentions the potential of green jobs for women, considered a sector where occupation can double by 2020. Despite these positive projections, women are strongly under-represented in the RES. The Parliament asks the Council and the Commission to ensure that more female workers are included in training projects and programmes on ecological transformation, and encouraging policy to promote women in entrepreneurial initiatives. Furthermore, the report suggests using European Structural Funds to promote training workshops and upskilling initiatives.

The European Commission has formulated a proposal on the priorities to prevent gender discrimination within the European Union after 2010, pushing for the presence of women in training and employment programmes in green jobs: see EUROPEAN COMMISSION, *Opinion on The Future of Gender Equality Policy after 2010 and on the priorities for a possible future framework for equality between women and men*, Advisory Committee on Equal Opportunities for Women and Men, 24 pages, January 2010 (available at <http://ec.europa.eu/social/BlobServlet?docId=5362&langId=en>). Building on the Lisbon's strategy social model generally known as the 'knowledge society', the opinion paper also discusses the need for women to find employment at the appropriate level of qualification, since women have difficulty in entering (and remaining in) the labour market at the same conditions as men. The balancing of genders in the workforce, reads the paper, must also pass through a lower feminization of certain sectors, such as teaching and health care work, and a greater representation in areas such as engineering and the physical sciences, which are currently male-dominated. Other than levelling gender balances in employment sectors, the Commission suggests women must also be put in the condition to reconcile work, private and family life, meaning greater social protection and health services to working mothers. Finally, all forms of discrimination which perpetuate stereotypes, hindering women and ultimately economic growth, must be addressed and eliminated.

The European Commission has marked the objective of mainstreaming gender in scientific research in EUROPEAN COMMISSION, *European Research Area. Benchmarking policy measures for gender equality in science*, Luxembourg: Office for Official Publications of the European Communities, 162 pages, Belgium, 2008 (available at http://ec.europa.eu/research/science-society/document_library/pdf_06/benchmarking-policy-measures_en.pdf). The situation of women in science still varies depending on their position on the career ladder, another form of vertical segregation, with density withering at higher levels. Women professionals in this sector present the highest density in countries with a large business enterprise R&D sector, while countries with lower-paying government and higher-education positions fall behind. Countries with funding and mentoring schemes, together with those which have a specific unit dedicated to women in ministries, are often the ones with the highest presence of women in scientific fields. Studies have proven that women's chronic under-representation in scientific disciplines depends on the lack of demand rather than supply, so what ultimately needs to

be modified in order to balance gender roles are employer policies and strategies, rather than government policies. It is important to underline that many green jobs are strongly dependent on the high specialization of individuals in the scientific and technological fields (sectors such as renewable energy plant engineering, hybrid cars and green transport systems, waste disposal, etc.), an idea which has been further underlined by Cedefop and ILO in the report *Skills for Green Jobs* (2010), discussed in a later section: “Skills development responses need to focus on adding to existing competences, emphasising core skills, including those in mathematics, engineering, technology and science”.

The literature points out that women are more educated than ever, but despite the positive trend towards balanced gender levels in higher education, they are still underrepresented in many job sectors due to a series of factors ranging from institutional ones, such as the lack of public childcare and social protection, to cultural, such as fixed ideas on gender roles. Most European countries nevertheless present a disproportion between the qualification level of women and the job position they occupy, meaning there is poor job matching. Some studies have shown that this can depend on private employers rather than national policies, but matching skills to the appropriate job level ultimately depends on the stakeholders which provide education and training and their ability to direct human capital into the most productive and demanded occupations.

Women quotas in Europe

Quotas and positive action are methods for mainstreaming gender and avoiding segregation in area where the market creates unfavourable balances. In the year 2000, following a the EU Council Recommendation 96/694/EC, the Greek government passed a law requiring a 30% minimum representation of women in governing councils, administrative boards and collective bodies in the public sector. Between 2004 and 2006, Norway implemented a mandatory 40% quota in favour of women on the boards of state-owned companies and privately-owned public limited companies, resulting in a current ratio of 42% women and 58% men on the boards of the largest listed companies. The Spanish government in 2007 passed a law requiring public companies and listed firms with more than 250 employees to apply a 40% quota for women on their boards. The law is expected to become compulsory from 2015, but in the past 4 years women’s representation on boards has already doubled.

New skills for new jobs: education and training

Europe’s competitive edge depends on the release of the full potential of its human capital. The European Union has pressed stakeholders to promote lifelong learning programmes in order for EU citizens to update skills and acquire new ones. EUROPEAN COMMISSION, *New Skills for New Jobs. Anticipating and matching labour market and skills needs*, 34 pages, Luxembourg: Office for Official Publications of the European Communities, Belgium, April 2009 (available at <http://ec.europa.eu/social/main.jsp?catId=568&langId=en&furtherPubs=yes>) encourages the match between the skills acquired and the needs of the job market, while at the same time improving the ability of Member States and their institutions to anticipate which skills their citizens and businesses will require. According to the report,

17.7 million jobs will be created in the EU25 by 2020 in the high-skilled non-manual occupations, and jobs requiring high levels of education attainment should rise from 25.1% of 2006 to 31.3% by 2020. Despite these positive figures, shifts in labour market demand could continue to cause wage differentiations between jobs, bringing a high polarization, a trend which has been constant since the 1980s. This trend mainly affects women with low and medium skills, since they disproportionately hold service sector jobs. In order to combat mismatches in the supply and demand of labour, the Commission established in 2009 the programmes 'European Labour Market Monitor', which analyses and disseminates short term data on the job supply, and 'Match and Map', part of the EURES platform and linked to PROTEUS and EURAXESS portals, describing job and training opportunities in the EU. The Commission will also collect information available in Member states and provide the necessary guidance drawn from stakeholders and education and training systems. Updated projections on job supply will be published every 2 years, starting in 2010.

The Commission established a small group of experts in support of the 'New Skills for New Jobs' initiative, which has provided advice on analysis, common methodologies and policy responses: see EUROPEAN COMMISSION, *New Skills for New Jobs: Action Now. A report by the Expert Group on New Skills for New Jobs prepared for the European Commission*, Luxembourg: Office for official publications of the European Communities, 33 pages, February 2010 (available at <http://ec.europa.eu/social/main.jsp?catId=568&langId=en>). The group of experts has highlighted four key recommendations: provide the right incentives to upgrade and better use skills for individuals and employers; bring the worlds of education, training and work closer together; develop the right mix of skills; and better anticipate future skill needs. The report marks the importance of lifelong learning and vocational training, especially considering the increasing old-age dependency ratio: in order for Europe to stay competitive, it will require those already on the labour market to update their skills. Since most of the 2020 workforce is already at work today, raising skill levels must involve individuals at all levels. The most important actors in matching demand and supply are the stakeholders which provide education and training: these need to adapt their behaviour and provide quality information on the nature of the competences in demand on the labour market, and how these demands can be translated in relevant education choices. The stakeholders need to ultimately influence the relevant decision-makers. European learning outcomes tools such as EQF, ECTS, ECVET and Europass are considered extremely sound instruments for the case, validating learning and working experience and making these transferrable between Member States. These tools, underutilised for now, will acquire importance as the workforce becomes more flexible and mobile, and for the placement of individuals in new jobs, such as those in the green economy.

Green jobs will shape the upcoming job market, much in the same way national economies will be affected by the transformation towards a more energy efficient society. In CEDEFOP & ILO, *Skills for Green Jobs. European Synthesis Report*, Luxembourg:

Publications Office of the European Union, 102 pages, 2010 (available at www.cedefop.europa.eu/EN/publications/16439.aspx) a number of case studies from six EU Member States are delivered (Denmark, Germany, Estonia, Spain, France and the UK), showing how these Member states are approaching the transition towards the new job market requirements and combining them with decent employment practices and proper job matching. According to the report, the sectors which have reacted most to green restructuring have been the automotive and shipbuilding sectors (building for example, hybrid vehicles and offshore wind and tidal energy facilities). Many current occupations also need to be ‘greened’, meaning a revision and upgrading of the current skills. An example of this are construction workers who need to learn how to insulate and renovate buildings to improve energy efficiency. The energy sector is the prime market for green jobs, but this has been offset by the lack of supply of human capital with technical skills (specifically, skills pertaining to science, technology, engineering and mathematics [STEM]). Reports such as *Benchmarking policy measures for gender equality in science*, commissioned by the European Commission (2008), discussed previously, have mentioned how women who are qualified in STEM fields are often over-qualified for their jobs, meaning that the market is not responsive to these individuals. The report mentions social partners as fundamental for establishing the necessary analysis and subsequent qualification and training reform, such as the promotion of changes in the vocational and education training systems. Further reading on social partners and their role can be found in the section ‘Social dialogue for green jobs’.

The French national plan for a mobilization of the industries and the territories toward a development of jobs and skills in a green economy

Following a presentation of the Secretary of State Valérie Letard in September 2009, and on request of the President, the French government commissioned the creation of a platform for green jobs (*Plan de mobilisation des filières et des territoires pour le développement des métiers de la croissance verte*). The plan is implemented by the Ministry of Ecology (MEEDM) and focuses on the 11 sectors which are most affected by green job creation or transformation. The national strategies and recommendations deriving from the committees have been discussed in the National Conference on Green Jobs held on January 28 2010. The outputs of the conference, under the form of a dossier, are available at www.developpement-durable.gouv.fr/IMG/pdf/Dossier_de_presse-2.pdf. The Ministry has announced measures such as the creation of an inventory of green skills and green occupations, an observatory and a revision of the names of the occupations.

For further information, see: www.developpement-durable.gouv.fr/Les-metiers-de-la-croissance-verte.html

Cedefop has analyzed which qualifications Europeans need in order to be competitive in the future in CEDEFOP, *Future Skill Needs in Europe. Medium-term forecast synthesis report*, Luxembourg: Office for Official Publications of the European Communities, 121 pages, 2008 (available at www.cedefop.europa.eu/EN/publications/12968.aspx). The report states that the 25 EU Member States, together with Norway and Switzerland, are expected to see 13 million additional jobs by 2015 (2006 base levels), despite a loss of two million jobs in the primary sector and half a million in the manufacturing industries. The best prospects will be in business and miscellaneous services, where 9 million jobs

are expected to open, mostly in management, professional work or technical support to these activities. New technologies are polarizing the workforce, creating jobs at higher levels and blocking lower level workers from upgrading to higher positions. The data predicts a decline of over 8.5 million jobs for those with no or few formal qualifications. The projections of occupational employment subdivided by industry presented in the report are based on the macroeconomic scenarios produced by the Cambridge Econometrics E3ME Model (www.e3me.com). Again, the report suggests that the best solutions to avoid job supply shortfalls is for individuals to work on improving and upgrading current skills rather than develop new training programmes designed specifically for green jobs. This combined effort needs to be carried mainly out by the providers of education and training, and social partners.

Employment in renewable energy sectors

In 2007, the European Union proposed a new energy policy, to be supported by market based tools (taxes, subsidies, and CO₂ emissions trading schemes), energy technologies and Community financial investment. An integral part of the policy, inserted in the Strategic European Energy Review, is the Renewable Energy Road Map presented in EUROPEAN COMMISSION, Communication from the Commission to the Council and the European Parliament, *Renewable Energy Road Map. Renewable energies in the 21st century: building a more sustainable future*, 20 pages, 10 January 2007 (available at: http://ec.europa.eu/energy/energy_policy/doc/03_renewable_energy_roadmap_en.pdf).

The road map launches the feasibility of an electric energy mix, where renewables could make up to 34% of the total energy production by 2020. The communication suggests a strong investment in wind energy, photovoltaic, and biomass, this last one pertaining in particular to the heating and cooling sector. The Commission believes that an overall legally binding EU target of 20% of renewable energy sources in gross consumption by 2020 is feasible and desirable, despite the missed target set in 1997 to reach 12% by 2010. The electricity sector is the only one which has met its targets for 2010, but the heating and cooling sector still needs to adjust to renewable energy, especially considering that buildings account for nearly 40% of all energy used in the EU. The communication states that 300,000 people were employed in the renewable energy sector as of 2007, and many of these in agricultural areas and peripheral regions.

The European Renewable Energy Road Map has been legislatively supported by the adoption of the Renewable Energy Directive, see EUROPEAN COUNCIL, OFFICIAL JOURNAL OF THE EUROPEAN UNION, *Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC*, 47 pages, 5 June 2009 (available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF>). The directive sets the target of 20% renewable energy in the EU by 2020 with binding national targets and an electricity target of 34% by 2020. Governments have been given a

National Renewable Energy Action Plan template, a binding framework through which national targets can be obtained, with a deadline set to the 30 June 2010. The template required governments to detail how they will develop their power grids and streamline administrative procedures. The directive also states that by 2018 the Commission will present a Renewable Energy Roadmap for the post-2020 period.

A description of the economic effects deriving from the policies promoting stronger growth in RES deployment can be read in the report commissioned by the European Commission's Directorate-General Energy and Transport, FRAUNHOFER ISI, ECOFYS, ENERGY ECONOMICS GROUP, RÜTTER + PARTNER SOCIOECONOMIC RESEARCH + CONSULTING, LITHUANIAN ENERGY INSTITUTE, SEURECO, *The impact of renewable energy policy on economic growth and employment in the European Union*, Karlsruhe, 208 pages, April 2009 (available at http://ec.europa.eu/energy/renewables/studies/renewables_en.htm). The study discusses in detail, the impact of two scenarios, 'Business as Usual' and 'Accelerated Deployment Policies' (ADP). The two scenarios consider the important variable of trade relations, focusing on the net exports of global cost components of RES technologies with rest of the world. The report describes RES-related gross economic and employment impacts, even on the sectoral level, where biomass, wind and hydro are regarded as the most important for current employment. As of 2009, RES industries contribute about 0.6% to total GDP and employment in Europe. Two thirds of the jobs created in the RES sector are based on small and medium-sized enterprises. The ADP scenario, with moderate export expectations, leads to a slightly higher increase of averaged employment by 396,000 – 417,000 employees by 2020 and by 59,000 - 545,000 employees in the last years before 2030.

A focus on job creation in the renewable energy sector is presented in detail in EREC & GREENPEACE, *Working for the climate. Renewable energy & the green job [r]evolution*, Published by Greenpeace International, Amsterdam, 71 pages, August 2009 (available at <http://www.greenpeace.org/international/en/publications/reports/working-for-the-climate>). The report analyses job creation by scenarios subdivided into hypothesis for the years 2015, 2020 and 2030, and using job type and energy sector as the main variables. Two alternatives are presented: a 'Reference' scenario and the so-called 'Energy [R]evolution' scenario: this last one sets a target reduction of 50% below 1990 level of greenhouse emissions by 2050. According to the Energy [R]evolution scenario, by 2050, 77% of total world electricity will come from renewable energy sources and more than 8 million jobs in renewable energy and energy efficiency will be created by 2030, triple the amount of the 'business as usual' approach seen in the 'Reference scenario'. In the 'business as usual' scenario, there will be about 500,000 jobs lost in the power sector because the 2 million reduction in coal power will not be compensated by green jobs. The energy sectors which currently employ the most people (person year per megawatt) both in construction and maintenance are the solar photovoltaic sector, the wind sector (onshore and offshore) and hydroelectric sector. The biomass sector is considered to have a very high potential according to the calculations made in the Energy

[R]evolution scenario, where more than one million additional jobs worldwide could be created.

Wind energy sector

Renewable energy technologies made up 61% of total new power generating capacity in 2009 in Europe, and wind power has taken the lead in the sector, accounting for 39% of the total new generation capacity. In its latest report, the Global Wind Energy Council describes that the global annual market for wind technologies grew 41.5% from 2008, as seen in GWEC, *Global Wind 2009 Energy Report*, 63 pages, Brussels, March 2010 (available at <http://www.gwec.net/index.php?id=167>). The global installed wind power capacity in EU27 passed from 64,719 MW of late 2008 to 74,767 MW in late 2009, a figure which places Europe as the leader in the sector, not only installation and construction, but also in export. By comparison, North America has installed a wind power capacity of 38,383 MW in late 2009 and Asia has installed a total of 39,610 MW.

Employment opportunities arising from the wind energy sector are detailed in the European Wind Energy Association report, EWEA, *Wind at work. Wind energy and job creation in the EU*, 50 pages, Brussels, January 2009 (available at: www.ewea.org/fileadmin/ewea_documents/documents/publications/Wind_at_work_FINAL.pdf). According to the study, employment in the EU wind sector will pass from 154,000 of 2007 to 325,000 by 2020 (with predictions of 377,244 jobs by 2030), the bulk of which will derive from wind turbines and component manufacturers. The breakdown of employment by type of company is useful in identifying which jobs and skills will be required in this field in the future. Manufacturers make up almost 60% of the employment, while installation/repair/operations/maintenance operators and developers trail behind. EWEA's surveys have calculated that men make up 78% of the industry's workforce, due to their concentration in the production, building and engineering sectors. The report has also indicated that information is missing on certain key factors that affect the wind energy labour market, such as profiling candidates and the gender issue.

With the legislative support and binding targets set in the new Renewable Energy Directive deriving from the Europe 2020 framework, the European Wind Energy Association has shaped its strategy around 6 areas: the renewable energy directive and post-2020 legislation, electricity infrastructure and power markets, offshore wind, research, climate change and communicating wind, as seen in EWEA, *A breath of fresh air. Annual Report 2009*, 37 pages, Brussels, April 2009 (available at: www.ewea.org/index.php?id=178). EWEA has also set up five working groups to working the topics of grid code, large-scale integration, offshore, communication and national associations.

Solar photovoltaic and solar thermal energy sector

The European Photovoltaic Industry Association in its latest annual report, EPIA, 2009 *Annual Report*, 54 pages, Brussels, 2009 (www.epia.org/publications/epia-publications.html), states that photovoltaic have first appeared in the Global Climate Change debate in the 15th Conference of the Parties held in Copenhagen in December 2009. The 'SET For 2020' initiative promoted by the EPIA has set the target of supplying through PV 12% of the EU electricity market by 2020 on the basis of proper policy-driven support and an evolved distribution system, such as smart grids. The global photovoltaic market has more than doubled in 2008 compared to 2007, passing from an energy release capacity of 2.4 GW to 5.8 GW. PV prices are also expected to drop substantially, up to 8% each year. The association aims to foster implementation of the EU Directive 2009/28/EC on the promotion of the use of energy from renewable sources and ensure that the National Renewable Energy Action Plans (NREAPs) include measures to boost PV development.

The EPIA has estimated that the European PV industry employed in 2008 close to 200,000 people between direct and indirect employment, as described in PV SOLAR EMPLOYMENT & EPIA & WIP & UNIVERSITY OF FLENSBURG & NATIONAL TECHNICAL UNIVERSITY OF ATHENS, *Solar photovoltaic employment in Europe. The role of public policy for tomorrow's solar jobs*, 16 pages, 2008 (available at www.pvemployment.org/index.php?eID=tx_nawsecuredl&u=0&file=uploads/media/09-0163_PVemployment_final.pdf&t=1284767977&hash=4b5d12c98ffc1156e9954b21510b60ad). The report states that the sector could create 1.4 million sustainable jobs by 2020 and 2.2 million by 2030, also including overseas investment, an important factor for European PV companies. In 2008, Europe represented over 80% of the Global PV market, although this market is concentrated in a very limited number of member states. The report also discusses the skill needed to work in the PV sector, these being mainly technical highly skilled academics (physicists, chemists and engineers, architects) and skilled labourers (technicians and electricians). The study states that production of PV systems, the current major source of employment, is likely to decrease, giving way to a larger proportion of employment in operation & maintenance activities and the service sector. There is a lack of qualified personnel in the field, not so much due to the academic title which the candidates possess, but because their skills are not adjusted to the qualifications that are required.

Biomass sector

In 2005, organic plant and animal products used to produce energy or in agriculture accounted for about half (44 – 66%) of all renewable energy in the EU, meeting 4% of total EU energy needs. Although five years outdated, and part of the previous EU energy policy strategy launched within the Lisbon Strategy, the EUROPEAN COMMISSION, Communication from the Commission. Biomass action plan, 47 pages, 7 December 2005,

Brussels (available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52005DC0628:EN:NOT>) marks a roadmap in this sector. The Action Plan outlines that by 2010, 250,000 – 300,000 could be created, mostly in rural areas, assuming that 70 – 90% of the necessary biomass is produced inside the EU. Bioenergy is typically extremely employment intensive; in fact, biofuels are 50 to 100 times as intensive as fossil fuel alternatives, while biomass electricity is 10 to 20 times as intensive, and biomass heating twice as much. There is debate as to whether bioenergy will actually create employment or simply replace other jobs, meaning a zero employment effect. Central and eastern Europe are pointed as having a comparative advantage in the field, owing to low labour costs and high resource availability.

Biomass in the knowledge economy

What type of jobs the bioenergy industry offers to the public? Jobs in the bioenergy industry and in biomass utilization today cut across a wide spectrum of specialties and skills.

The big chance of women with high education are the expanding activities of universities, scientific laboratories and R&D departments of industrial enterprises in the fields of production of biomass and its utilization, particularly its use for producing of electrical energy and heat. According to the point of view of EREC (Energy Efficiency and Renewable Energy Clearinghouse) and the National Renewable Energy Laboratory, “these R&D efforts require chemists, agricultural specialists, microbiologists, biochemists and engineers, just to name a few”**

Biomass utilization and bioenergy are already integrated in the “knowledge based” economy. “Some enterprises may even require individuals cross trained in areas, such as engineering and biology, or chemistry and agriculture. And if R&D and industrial efforts succeed in making bioenergy more commercially profitable, we may see a dramatic increase in the number of bioenergy – related jobs”**.

Of course, these bioenergy related jobs won’t need only high sophisticated knowledge and skills. With the development and commercialization of R&D in the biomass utilization industry, there will be a strong need for more farmers and more foresters to produce and harvest the necessary biomass resources. The industry will need more truckers to transport the raw materials to the bioenergy power plants and to the biomass fuel plants. The industry will need more operators to run facilities.

* EUROPEAN COMMISSION, *Communication from the Commission. Biomass action plan*, 47 pages, 7 December 2005, Brussels (available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52005DC0628:EN:NOT>).

** ENERGY EFFICIENCY AND RENEWABLE ENERGY CLEARINGHOUSE, *Careers in Renewable Energy*, DOE/GO-102001-1130, FS123, January 2001, p. 5., (available at www.nrel.gov/docs/fy01osti/28369.pdf).

The United Nations Agencies. A Global Green New Deal

The landmark Agenda 21 set the basis for a common ground in climate change policies at the international, national, regional and local level. The international community adopted Agenda 21 in 1992 after the United Nations Conference on Environment and Development in Rio de Janeiro, further strengthening these goals in the Johannesburg

Plan of Implementation of 2002. Agenda 21 highlights the importance of active involvement of women in the economic and political decision making, as laid out in Chapter 24 of Section III ‘Strengthening the Role of Major Groups’ of UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, *Agenda 21: Earth Summit - The United Nations Programme of Action from Rio*, 294 pages, April 1993 (available at www.un.org/esa/dsd/agenda21/res_agenda21_00.shtml). Preparations are underway for the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012 (Rio +20), as seen in GENERAL ASSEMBLY OF THE UNITED NATIONS, *Resolution A/RES/64/236 Implementation of Agenda 21, the Programme for the Further Implementation of Agenda 21 and the outcomes of the World Summit on Sustainable Development* (available at www.un.org/en/ga/64/resolutions.shtml). The Conference will review the progress of previous commitments, adapting the format to the multiples crises the world is experiencing today and securing the participation of important global actors, a factor which has caused lagging in the past, such as the absence of the United States delegation in Johannesburg in 2002. The Green Economy has been identified as one of the two main themes to be addressed at the Conference, together with the idea of creating an Institutional Framework for Sustainable Development, as seen in GENERAL ASSEMBLY OF THE UNITED NATIONS, *Preparatory Committee for UN Conference on Sustainable Development, General Assembly ENV/DEV/1139*, May 17 2009 (available at www.un.org/News/Press/docs/2010/envdev1139.doc.htm). Numerous delegates have reminded the Assembly on the need for States to converge on a common and shared understanding of what constitutes the ‘green economy’.

In response to the financial and economic crisis, the United Nations Environmental Programme has called for a ‘Global Green New Deal’ (GGND), outlined in the UNEP, *Global Green New Deal. Policy Brief*, 34 pages, Geneva March 2009 (available at: www.unep.org/greenconomy/GlobalGreenNewDeal/tabid/1371/Default.aspx), a paper based on the report written by Edward Barbier of the University of Wyoming, commissioned by UNEP to act as the backbone to the upcoming ‘Green Economy Report.’ The policy brief was shared with the G20 members at the London Summit in April 2009 (see UNEP press release “Realizing a ‘Green New Deal’”, Nairobi, 16 February 2009, available at www.unep.org/Documents.Multilingual/Default.asp?DocumentID=562&ArticleID=6079&l=en&t=long) and updated by a report in the Pittsburgh Summit in September 2009 (see UNEP, *Global Green New Deal. An Update for the G20 Pittsburgh Summit*, 14 pages, September 2009, available at www.unep.org/greenconomy/GlobalGreenNewDeal/tabid/1371/Default.aspx). The aim of the initiative is to revive the global economy and boost employment, while simultaneously accelerating the fight against climate change, environmental degradation and poverty. UNEP at the start of 2009 has suggested that the G20 invest US \$750 billion as a ‘green’ stimulus in five critical areas: raising the energy efficiency of facilities, transition to renewable energies, improve sustainable transportation, and bolster ecological resources and sustainable agricultural practices. The report suggests that countries should dedicate at least 1% of their GDPs to greening their economies, a

percentage that amounts to only a fourth of the size of the proposed stimulus packages. In order to promote the use of international statistical standards based on economic growth, green jobs and environmental impact, UNEP proposes that the GGND should utilize international statistical standards and the System of Environmental Economic Accounting (SSEA). The brief suggests that major G20 economies take the lead, using the UN as the main coordinator, relying on its capacity for monitoring and reporting the activities which will derive from the GGND.

Green jobs outlook

Green jobs are one of the pillars on which the United Nations pushes for recovery from the economic crisis, as seen in ILO, *Recovering from the crisis: A Global Jobs Pact. Adopted by the International Labour Conference at its Ninety-eighth Session, Geneva, 19 June 2009*, 15 pages, Geneva, 19 June 2009 (available at www.ilo.org/wcmsp5/groups/public/@ed_norm/@relconf/documents/meetingdocument/wcms_115076.pdf). The policy paper works around the framework of the ILO Decent Work Agenda and has been defined by the leaders of the G8 July 2009 Summit as “relevant to respond to the crisis at worldwide level and advance the social dimension of globalization”. At the G20 summit in Pittsburgh in November 2009, world leaders welcomed it as an “an employment-oriented framework for future economic growth”. According to the Pact, 300 million new jobs will need to be created from now to 2015, in order to keep in line with the growing workforce. In June 2010, in the High-level Segment session of the United Nations Economic and Social Council (ECOSOC), the Annual Ministerial Review focused on “implementing the internationally agreed goals and commitments in regard to gender equality and the empowerment of women”, meaning there is reinforced international effort in promoting these issues. As mentioned in point 24 of the Pact, member states need to take into account gender concerns in their recovery packages, levelling the voice of both women and men.

Occupational outlook in green jobs is closely related to skills, but also to defining a broader paradigm of gender equality in relation to employment, ensuring that women earn the same gains as men, a concept which is described in ILO, *Women in labour markets : measuring progress and identifying challenges*, 92 pages, International Labour Office, Geneva, March 2010 (available at: www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/--trends/documents/publication/wcms_123835.pdf). The report offers the analysis of 12 indicators derived from the ILO Key Indicators of the Labour Market (KILM) database in order to measure the progress from the Beijing Platform of Action. There has been a trend towards wage and salaried work from more vulnerable employment, an important step for economic freedom and self-determination for women. Unfortunately, women bear a larger burden of time-related underemployment, overrepresented in almost all countries which present data on this underemployment statistic. The indicators have shown that women who do attain work are generally segregated in poorly-paid, insecure, home-based or informal employment, due to

discrimination among employers and also due to need to combine family responsibilities with their job. Earning potential compared to men continues to be quite low, meaning a persistent pay-gap.

In the paper taken from the 'World of Work Report 2009: The Global Jobs Crisis and Beyond' by International Institute for Labour Studies, ILO & INTERNATIONAL INSTITUTE FOR LABOUR STUDIES, *Green policies and jobs: a double dividend?*, 17 pages, International Labour Office, Geneva, 2009 (available at www.ilo.org/wcmsp5/groups/public/---.../wcms_119186.pdf), the question is raised as to whether green policies, and the consequent ones that will render carbon gas emissions costly, will have adverse effects on world output and employment. A series of studies analyzed in the report indicate that green policies, if combined with subsidies and job support (e.g. lower labour taxes) could raise employment by 14.3 million globally. The paper describes the risk, not analyzed in detail for now, of creating green policies which translate into higher prices and lower competitiveness, meaning jobs could be reallocated to countries with less stringent environmental standards. However, green policies such as carbon taxes or cap-and-trade can generate government revenues, which, if used wisely, can reduce labour taxes, stimulating demand. Again, the safest way of adapting occupation to the new green economy is the development of skills and the matching between these and new job requirements.

While the United Nations delegates are working towards a common definition of what constitutes the 'green economy' to be agreed on during the Rio+20 Summit in 2012, the United Nations Environmental Programme has come to define 'green jobs' in UNEP, ILO, IOE, ITUC AND WORLDWATCH INSTITUTE AND CORNELL UNIVERSITY GLOBAL LABOR INSTITUTE, *Green Jobs: Towards decent work in a sustainable, low-carbon world*, 352 pages, Washington DC, September 2008 (available at www.unep.org/labour_environment/features/greenjobs.asp) as "positions in agriculture, manufacturing, construction, installation, and maintenance, as well as scientific and technical, administrative, and service-related activities, that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect and restore ecosystems and biodiversity; reduce energy, materials, and water consumption through high-efficiency and avoidance strategies; decarbonise the economy; and minimize or altogether avoid generation of all forms of waste and pollution". The report details how employment will be affected by the transition to a greener economy, employing the term 'shades of green' to indicate that some policies will yield greater environmental benefits than others. The UNEP identifies 5 key challenges in a just transition: employment, rights, social protection, social dialogue, and equity. This last challenge, in particular, needs to be met in order to overcome "glass-ceiling" barriers and be on the same level as men when in the condition of negotiating traditional career ladders. Green jobs do not imply a zero-sum game, since employment will be added, substituted and essentially transformed. Public policies, ranging from funding schemes to infrastructure development, need to minimize disparities between winners and losers that arise in this transitional phase.

The U.S. Department of Labor initiative “Green Jobs for Women”

The United States Department of Labor has launched the initiative “Green Jobs for Women” within the Women’s Bureau, counting on the collaboration of women’s organizations and workforce practitioners in 10 U.S. regions. Since September 1 2009, 30 workshops and nine green jobs training projects have been started have been held cross-country. The outputs of the activities will serve for the future publication “A Woman’s Guide to Green Jobs”.

For further information, see www.dol.gov/wb/programs/initiatives2010.htm

3. Contractual arrangements, wages and working time arrangements***Introduction***

The European Union has committed itself to increase the share of renewable energy up to 20% of the final consumption by 2020, from 9.2% in 2006. The same political wave is mounting in several other countries, most notably the United States.

The proposal that renewable energy sources (RES) should cover a higher share of energy production is based on two major arguments: (a) it is assumed that reliance on fossil fuels should be reduced, both for the sake of energy security and for climate-related reasons; and (b) investing in RES will spur economic growth and, in the post-recession world, will enhance economic recovery (Istituto Bruno Leoni, *Are green jobs real jobs ? The case of Italy*, Milan, 2010).

Environmental policies can contribute to employment objectives and vice versa, in line with the concept of sustainable development. These potential win-win solutions need to be sought and promoted whenever possible (EU Commission, *Commission Staff Working Document on the links between employment policies and environment policies*, SEC(2005) 1530, Brussels, 2005).

Total employment generated by the demand for environmental goods and services is at least 2.6 million jobs taking into account the (first round) indirect effects on the rest of the economy. These jobs include, for example, jobs in supply of electricity to the eco-industry, as well as jobs in a range of other industries that supply (non-environmental) goods and services to ensure that environmental infrastructure remains fully operational (e.g. maintenance firms) (ECOTEC – Research and Consulting Limited, *Analysis of the EU Eco-Industries, their Employment and Export Potential*, Birmingham, 2008).

Most green jobs will derive from the transition to low-carbon economies, including the development of renewable energy sources, production of fuel efficient vehicles, investments in public transport infrastructure, and retrofitting buildings. It is estimated that over 40% of green employment will be linked to investments in renewable energy – wind power, solar, biomass, small-scale hydropower, and geothermal (EmployRES, *The*

impact of renewable energy policy on economic growth and employment in the European Union, Karlsruhe, 2009).

The renewable energy sector is already very important in terms of employment and added value. New industries with strong market potential have been created, contributing for about 0.6% to total GDP and to employment in Europe. This development is likely to accelerate if current policies are improved in order to reach the agreed target of 20% renewable energies in Europe by 2020 (EmployRES, *The impact of renewable energy policy on economic growth and employment in the European Union*, Karlsruhe, 2009).

Most green jobs are expected to be created in the secondary sectors of construction, manufacturing and energy production, where women are significantly underrepresented. The construction and renovation of buildings have high technical and economic potential for reducing emissions. This conclusion is supported by the Intergovernmental Panel on Climate Change, and also by the McKinsey Global Research Institute. Using current technology, high-performance buildings have the potential to cut energy costs by at least 80 per cent compared with traditional building construction. Jobs in this sector are likely to be performed by people who already work in the building sector, but will be redefined in terms of new skills, training and certification requirements. (UNEP, *Green jobs. Towards decent works in a sustainable, low carbon world*, UNEP, Nairobi, 2008).

Women may fare better in the tertiary sector where most are now employed. However, men dominate the better paid jobs in engineering, financial and business services, where the bulk of green service positions are likely to be created.

It does not yet exist any catalogue of good practices concerning gender mainstreaming in the segments of the labour market supported by extensive investments in the renewable energy industry.

However, bearing in mind the difficulty in establishing a direct causal link between climate policy and employment, the ETUC report *Climate Change and employment. Impact on employment in the European Union-25 of climate change and CO2 emission reduction measures by 2030*, Brussels, 2007 tries to analyse the causal links between climate-related policies and climate-related measures and economic, technological and strategic variables, which in turn are linked to employment. These variables include: the level of activity, infrastructure, technology, consumer behaviour and the competitiveness of the sector at the global level.

Contractual arrangements

- Environmental employment has been (and in the next future will be more) a source of job creation at the Member State level, although it is impossible to identify accurately the impact on aggregate employment (ECOTEC Research and Consulting Limited, *Analysis of the EU Eco-Industries, their Employment and Export Potential*, Birmingham, 2008).
- As a lot of environmental jobs are in manufacturing, construction, maintenance etc., wages are related to positions held by traditional workers. As for the energy sector, the share of female employees is estimated at 20%, the majority of them working in non-technical fields such as administration and public relations. The share of female technical

staff is at most 6%, in decision making positions it is about 4% and in the top-management is less than 1% (ECORYS *Environment and labour force skills. Overview of the links between the skills profile of the labour force and environmental factors*, Rotterdam, 2008).

- Parts of the environmental sector (e.g. environmental consultancy and research) include highly educated and skilled workforces. There is a continual need for improvements in skills and training across many sectors. For example, rapid technological changes in the waste treatment and recovery/recycling sectors created a growing demand for new skills, with obvious implications for training providers. A Cedefop's study argues that many of the skills needed for low-carbon jobs can be found in existing occupations. A balance of generic skills (for example autonomy and communication), generic green skills (such as reducing waste and improving energy and resource efficiency) and 'topping up' existing job related skills is much more important to developing a low-carbon economy than more specialised green skills (CEDEFOP, *Skills for green jobs*, Thessaloniki, 2010)

- Climate policies should contribute to increasing the demand for more and more educated and skilled workers, and reduce the number of jobs available for the least qualified workers (ECORYS *Environment and labour force skills. Overview of the links between the skills profile of the labour force and environmental factors*, Rotterdam, 2008). These are general changes in the green economy, affecting also energy efficiency measures and renewable energy productions, stemming from the implementation of the EU Climate change package and, certainly, from new technological developments. In this sense, a German study (Neuhoff, K., Schleich, J., *Implications of announced phase II national allocation plans for the EU ETS*, Climate Policy, Karlsruhe 2006) focusing on energy-intensive industries confirms the shift towards jobs corresponding to the highest levels of education (master's equivalent) and medium levels (bachelor's degree and foremen/technicians), but finds that climate policies will not have a significant effect for jobs requiring lower qualifications (in ETUC *Climate Change and employment. Impact on employment in the European Union-25 of climate change and CO2 emission reduction measures by 2030*, Brussels, 2007).

- The trend is clear: the development towards a "greener" economy is not necessarily only likely to create *new* jobs (although this is certainly not excluded either); but a lot of the "green" employment will result in adapting *current* jobs to match new green technological enhancements as well as in adding new "green skills" to existing occupations. Thus, we suppose that it does not exist (until now) a specific frame of contractual arrangement for the green sector and, in particular, for the renewable energy one.

- In this sense, in order to face the increasing demand of green jobs it will become necessary both to expand education and training options for workers and for the currently unemployed, and to formulate new forms of contractual arrangements. In terms of gender, this represents a great opportunity to deal with some of the questions that affected non-standard and 'very atypical' female green workers – for instance, less job security, the lack of a fixed career plan, fewer training and career development opportunities, and

greater difficulties in reconciling working and non-working life due to the characteristics of atypical work.

– In terms of income, non-standard forms of employment are usually associated with low incomes; however, this is not always the case in the green sector – for example, in relation to self-employed freelancers whose wages are comparable to or even higher than those of their employed counterparts. In general, however, non-standard employment tends to be associated with lower rates of pay, since many workers in this sector work in relatively low-skilled jobs. Of course, such forms of work may also impact negatively on receipt of bonuses or on workers' social security coverage and entitlements.

Wages

Environmental sector employment accounts for on average 1,3% of total paid employment in the EU-15, although it is higher in some countries (e.g. Austria, Denmark, France) (ECOTEC Research and Consulting Limited *Analysis of the EU Eco-Industries, their Employment and Export Potential*, Birmingham, 2008).

As the Report by the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions (*Report Equality between women and men*, Brussels, 2010) describes, women are more likely to have a disadvantaged position on the labour market e.g. due to higher incidence of precarious contracts, involuntary part-time and a persistent unfavourable pay gap (17.6 % on average in the EU in 2007), with repercussions on their lifetime earnings, social security protection and pensions, resulting in higher at-risk-of-poverty rates, especially once in retirement.

A research conducted by the European Foundation for the Improvement of Living and Working Conditions (*Addressing the gender pay gap: Government and social partner actions*, Brussels, 2010) shows that the actions of the social partners– through centralised collective bargaining or the establishment and increase of minimum wages, for example – could narrow the gap substantially.

Government initiatives do not specifically address the gender pay gap but rather gender equality in general. Nevertheless, a few interesting actions directly targeting the reduction of the gender pay gap have been undertaken in a number of countries – namely, Austria, Belgium, Cyprus, Denmark, Finland, France, Italy, Lithuania, Luxembourg, the Netherlands, Norway, Romania, Slovenia, Sweden and the UK. (EUROFOUND *Addressing the gender pay gap: Government and social partner actions*, Brussels, 2010). These measures have been implemented through different types of tools such as: national action plans, direct or indirect legislation, dedicated bodies and specific wage policies.

Regarding wage discrimination in particular, a specially targeted programme introduced in Italy in 2008 establishes that positive actions should meet the following objectives:

1. modify the organisation of work, performance evaluation and bonus systems;
2. reduce the pay differential between women and men;
3. advance female careers to also allow for an equitable distribution of tasks;

4. adopt the European Commission strategy on female employability including ‘flexicurity’ criteria, combining flexibility and security (EUROFOUND *Addressing the gender pay gap: Government and social partner actions*, Brussels, 2010).

Working in non-standard jobs – both temporary employment and part-time work – is associated with the gender pay gap in two ways. Some countries, for example Malta and Spain, report that the pay gap is higher among people in such employment compared with standard employment. Secondly, the higher presence of women in part-time work has been singled out as a determinant affecting the overall gender pay gap. In the Netherlands, fixed-term employment contracts and, to a lesser extent, part-time work are foremost in the ranking of the gender pay gap determinants. In Italy, one of the main factors of a widening pay gap is found to be the high presence of women in non-standard jobs, although a qualitative study mentions that Italian women are likely to prefer more stable and secure jobs even if they have lower wage growth profiles. In France, working time patterns have been singled out as the principal factor explaining the gender pay gap. By contrast, a German study finds that statistical discrimination against women is not apparent if the duration of the employment contract is defined in advance. In Spain, in some cases women tend to choose temporary and more flexible jobs that require less engagement and leave them more time and energy to devote to family care (EUROFOUND *Addressing the gender pay gap: Government and social partner actions*, Brussels, 2010).

Increasing the share of women in the renewable sector and, at the same time, reducing the pay gap will certainly require a combination of innovative and traditional strategies, overcoming discriminatory and organizational barriers. A way to reduce the pay gap has been suggested by Colm McLaughlin and Simon Deakin, in their study *Equal Pay and Reflexive Regulation* (presented at IIRA European Congress, University of Copenhagen, 2010). Looking the issue of equal pay in the context of wider debates about the effectiveness of regulation, they affirm that the mandatory pay audits can be understood as reflexive regulation rather than hard law, and that reflexive regulation is an approach that has the potential to avoid the dichotomy between hard and soft forms of regulation. Mandatory pay audits would provide transparency in relation to pay systems, thus enabling employees and unions to engage in deliberative learning processes with employers over narrowing the pay gap.

Working time arrangements

As stated in the Commission’s current policy framework for gender equality (*A Roadmap for Equality between Women and Men 2006-2010*, Brussels, 2006) : “Flexible working arrangements boost productivity, enhance employee satisfaction and employers reputation. However, the fact that far more women than men make use of such arrangements creates a gender imbalance which has a negative impact on women’s position in the workplace and their economic independence” .

Moreover, due to the lack of consistent data, it is difficult to determine the exact incidence of working time arrangements in the renewable energy sector.

- An important target of the European Employment Strategy is to increase the labour participation rate of men and women. Flexible working time arrangements are considered as an important instrument to attain this goal.
- Some forms of flexible working schedules such as part-time work, compressed work weeks, annualized hours, and flexitime have a long history and have traditionally been introduced largely to meet employer needs for flexibility or to keep costs down, though they may also have met employee needs and demands. These and other flexible arrangements are also introduced ostensibly to meet employee needs for flexibility to integrate work and family demands under the banner of so-called family-friendly employment policies
- The existence and development of non-standard forms of work have been repeatedly acknowledged by European institutions. For instance, in its 2006 *Green Paper, Modernising labour law to meet the challenges of the 21st century (COM (2006) 708 final)*, the European Commission notes how non-standard work forms such as fixed-term contracts, part-time work, on-call and zero hours contracts, temporary agency work and freelance contracts have become an established feature of the European labour market, accounting for 25% of the workforce.
- Of course, large organizations are more likely to provide these flexible working time arrangements than smaller ones; however, evidence shows that in the renewable energy sector most of the companies are SMEs. Considering that one third of green jobs will be created in the secondary sector (SUSTAINLABOUR, *Desarrollando las renovables Renovando el desarrollo*, Madrid, 2010) we should expect that it is less likely that green jobs, for example in eco-building or even in renewable, will allow women to access flexible working time arrangements. Nevertheless, the tertiary sector is the one comparatively employing more women, in which, as a consequence, flexible working time arrangements are more common in the service and financial sector compared with construction and manufacturing.
- It is usually believed (Suzan Lewis, *Flexible working arrangements: implementation, outcomes, and management*, International Review of Industrial and Organizational Psychology, Manchester Metropolitan University, Manchester, 2003) that having more women in the workforce creates internal pressures that are associated with the development of work–family policies. However, findings on the influence of the proportion of women in the workforce are mixed. On the one hand, some studies find this factor is associated with the likelihood of adopting flexible working time arrangements and work–family policies such as childcare. This may depend on the position of women as there is evidence that organizations with a relatively large share of women managers seem to provide work–family arrangements more often than organizations where women’s employment consists mainly of lower skilled jobs (Suzan Lewis, *Flexible working arrangements: implementation, outcomes, and management*, International Review of Industrial and Organizational Psychology, Manchester Metropolitan University, Manchester, 2003). On the other hand, the choice of part-time jobs in order to better reconcile work and family responsibilities, makes it almost impossible to reach top managerial positions. Moreover, being the principal care givers, women are often unavailable to offer the kind of flexibility that companies would require. They are

unavailable for long travelling and unplanned overtime. (EUROFOUND *Addressing the gender pay gap: Government and social partner actions*, Dublin, 2010).

- Considering that environmental-based jobs tend to be *local* jobs as they usually involve transforming or upgrading the natural and built environment (e.g. installing solar panels, constructing electricity distribution networks, landscaping, etc.) (ECORYS *Environment and labour force skills. Overview of the links between the skills profile of the labour force and environmental factors*, Rotterdam, 2008), we presume that also the tertiary related sector could tend to be local: this factor can contribute to overcome (almost partially) the obstacles regarding the ways to reconcile work and family responsibilities.

4. Family-friendly policies and work-life balance instruments

Introduction

The instrument is based on the detailed study of the data collection about specific cases. Case studies are necessary to assess complex processes, programs' implementation and the representation/description of their impact. In general, case studies are applied to situations requiring an exploratory study when available information are lacking.

The identified case studies can be used in order to give an added value to the assessment provided in a descriptive way. These cases have been chosen as they aim at showing a specific point or action. These cases describe work-life balance actions in the field of green jobs, which still show a series of shortcomings that need to be overcome in the future.

Case studies

Sustainability can be achieved by striking a balance between economy, environment, social factors and their integration through sustainable development strategies.

Green economy initiatives that are not aiming at the creation of an environmental-friendly economy run the risk of not responding to fundamental social needs, such as equity, quality of working life and gender equality. If these factors are not taken into due consideration, it will not be possible to buck the negative social and distribution trends of the traditional economy reducing inequalities. At worst, they could even reinforce these trends. Thus, as it has been highlighted by Candice Stevens in *Green jobs and women workers. Employment, Equity, Equality, Draft Report* (2009) and in the recent *Are Women the Key to Sustainable Development?* (Boston University, 2010) the sustainability of green jobs depends not only on the environmental benefits they bring, but also on the social contents, in particular, on those that contribute to the growth of social equity. Notably, the raise in women presence in the field of green jobs, and the guarantee of the

quality of the work, are part of a process that, among the different steps, envisages the overcoming of those obstacles hindering a wider female participation in the workforce. This is possible through the implementation of family-friendly policies in the firms, since the main problem for working women is the lack of infancy services. Helping women better balance work and family life is one of the possible solutions, also in economic terms. Indeed, we speak about gender economy as the first pillar and as the missing link for a sustainable economy. The report *Reconciliation between work, private and family life in the European Union* (Eurostat Statistical Book, 2009) gives an overview of the labour market of workers between 25-49, the family workload sharing, the remunerated and not-remunerated family work, care services, maternity, paternity and parental leaves, and of the flexible work, by emphasizing how the European Council recognized the necessity of improving both public and private infancy services, in order to raise female participation rates. For the same reason, the *Report on Equality between women and men 2010* (European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities, December 2009) highlights the lack of access to, first of all, care services for not self-sufficient people (children, disabled and elderly people); secondly, to a proper and flexible leave systems; and thirdly, to more suitable working conditions for both parents in order to allow especially women to participate into the labour market or to have a full-time job. In this connection, it is also interesting to mention here the *Parental leave in European companies, Establishment Survey on Working Time 2004-2005* (European Foundation for the Improvement of Living and Working Conditions, 2007), a report that investigates the use of parental leaves in firms all over Europe, on the basis of the large-scale analysis carried out in firms with 10 or more employees in 21 European countries in 2004-2005. National regulations can strongly influence the use of parental leave by employees in enterprises, demonstrating how the financial support on the one hand, and the social and cultural conventions and on the other, play together a relevant role in the definition of the family workload sharing. It is largely predictable that the measures aimed at balancing work and family commitments are mainly used by women rather than by men.

Electricity is one of the fundamental elements in the everyday life of all European citizens and firms. Together with EDF, E.ON is one of the biggest electric energy providers in Europe. This firm has a big responsibility in guaranteeing the energy production at affordable prices. The company manages this responsibility with great effort.

As reported in *European Monitoring Centre on Change case studies – Energy sector E.ON, Germany* (European Foundation for the Improvement of Living and Working Conditions, 2007), the firm employs more than 80.000 employees trying to promote better working conditions. The firm supports and carries out several initiatives to improve the work-life balance and health of its employees and their career's progress. Since the firm has an European scope, it has defined a set of values and behaviours – valid for all firm branches - among which the idea that the employee is the key for success of all kind of activities and the importance of high-quality jobs. Compared to other companies in the energy sector, E.ON has a rather high female population (27% up to 2006). In the view to

improve the integration of the female workforce, several initiatives to better combine family life and working hours have been implemented.

On the assumption that “balancing work and private life is not always an easy task”, several measures have been adopted. In 2006 two projects have been launched: *Balance.ON* and *Familie und Beruf*. The aim of these two projects is not only to satisfy the needs employees that strive to combine family life and work, but also to guarantee an active and continuous participation of the young mothers into the labour market. Some measures have been promoted, such as part-time jobs, teleworking, and flexible timetables. Moreover, it has been formulated a mentoring system for parents who are on parental leave.

In Spain, one of the main private firms producing energy is Iberdrola S.A., which core business is the production, transmission, distribution and sales of electric energy. Not only is Iberdrola one main firms in the electric sector in Europe, but it also shows high involvement with the local community (Basque Country, Bilbao) also implementing an economic policy to promote sustainable development. Furthermore, it has been the first firm in the Spanish electric sector to set renewable energy as a strategic priority.

Development can be fostered through the enterprise’s social responsibility, financial results, respect of the environment, trust and the sense of belonging.

The Group employs 16.000 people in the world, and in the Basque Country it is well-known for its commitment in the field of local development. In the view to continue having highly motivated workers, it has implemented a series of policies addressed to the youngest workers. *European Monitoring Centre on Change case studies – Energy sector Iberdrola, Spain* (European Foundation for the Improvement of Living and Working Conditions, 2008) highlights that one of the objectives to undertake is to make the firm more attractive for women. The working women represent 14% of the workforce and the number grows by 40% per year. In Spain, women find it difficult to enter the labour market due to the lack of infancy care services. Therefore, to allow women and men to balance and combine work and family, some initiatives have been launched, included maternity leave, that is remunerated 15 days before the date established by the law; the binding maternity leave where women are paid their full salary, voluntary flexibility of working hours (less then five hours a day till the end of the child’s first year, with no salary reductions); the voluntary flexibility of working hours for those employees having children under 10 years old (instead of 6 years old as established by the law) or with disabled children with a proportionate wage cut, not exceeding 50% of the total wage; with the guarantee to keep the job from one up to three years in case of extended maternity leave.

In Sweden the production of electric and geothermic energy is provided by Vattenfall, a state-controlled firm that focuses its attention on renewable energies. As it has been pointed out in the case study carried out by the European Foundation for the Improvement of Living and Working Conditions - *European Monitoring Centre on Change case studies – Energy sector Vattenfall, Sweden* (2008) – the firm does not only pay attention to renewable energies, but it also tries to maximize its efforts to make the

workplace an ideal environment, in which employees can express the best of their abilities and acquire new and better competences.

25% of employees are women. In 2006 the firm introduced a set of policies aiming at satisfying the needs of its employees.

Family-friendly policies and equal opportunities – in Sweden the law requires all firms to present an annual plan for equal opportunities – that are a central part of the firm culture, as it is clearly pointed out in the *Vattenfall CSR Report* (2007). The *Group Collective Agreement* and the *Group Works Council* of 26th March 2007 laid the foundations for a culture aimed at the work-life balance. The Company offers back-up measures, such as parental leave, regional back-up services, the possibility of enjoying flexible working hours (on the basis of the employees' requests), and non-remunerated leaves in case of specific family situations. Furthermore, it is possible to provide support measures for the reintegration of employees in maternity or parental leave.

In *Motivation by finding the right balance between work and home life* (2008), Siemens AG argues that “the ability to strike a balance between work and family life is more important for those who work.” The majority of people have no doubts concerning the choice between children and career. They choose both of them. Siemens, which main aim is to provide facilities and services for children and relatives needing care, decided to follow this direction.

Regarding infancy services, in Germany Siemens provides its employees with around 400 places in structures that are located close to the workplace. Daytime centres and Kindergarten are easily reachable by parents at any moment and their timetables are compatible with working hours. This represents a model of infancy service, which is the result of a public-private partnership. It demonstrates how the local government and the enterprise can cooperate in order to satisfy the needs of a whole community. Out of 72 children attending this centre, 36 are children of Siemens' employees and the other 36 are recipients of the places placed at their disposal by the city of Monaco. Siemens gave its contribution in building the infrastructure and the city of Munich provides support for the daily needs.

For those employees who prefer to have a babysitting service at home, there are conventions with specialized agencies. The firm has also introduced a series of services to help parents during summer and winter holidays. Furthermore, there are also support programs addressed to the reintegration from maternity and parental leaves, together with flexible working hours, part-time job and teleworking.

Teleworking is the most used measure by the majority of the employees with balance needs. It allows a certain level of flexibility and it creates new opportunities to find a balance between work and family life since it allows to work from home.

Regarding part-time jobs, it is at least 10 hours per week, also at managerial level. Another possibility is the hour flexibility through the so called “hours bank”.

In the view to an ageing society, like the German one, support services for those workers that have elderly relatives to look after are becoming increasingly important. Employees are helped by an information service and by specific care activities supported by specialized external structures.

5. Professional development and female entrepreneurship

The European and international framework

The second of the four pillars of the European Employment Strategy is 'entrepreneurship'. In general, it aims at promoting the development of new businesses; focusing in particular on the growth of small and medium-sized enterprises (SMEs). This has to be achieved through the creation of a 'new culture of entrepreneurship' in Europe. The European Commission considers entrepreneurship as a decisive element to achieve the political objectives set at the *European Council Meeting in Lisbon in 2000*, where the European Union committed itself to become, within a decade, 'the most competitive and dynamic knowledge-based economy in the world'. Entrepreneurship is regarded as a driver for economic growth, competitiveness and job creation, as well as a vehicle for personal development and for solving social issues.

At the Barcelona Council in 2002, the Council took note of the Commission's intention to present a *Green Paper on Entrepreneurship* (Brussels, 21 March 2003, COM (2003) 27 final) as a contribution to reaching these ambitious goals [com2003_0027en01.pdf].

The *Green Paper on Entrepreneurship*, [007_green_paper_entrepreneurship_final_en1.pdf] launched in 2003, aimed to stimulate the debate among policy-makers, businesses and representative organisations on how to promote entrepreneurship and shape policy for the future (*The green paper on entrepreneurship. The entrepreneurship action plan*, SONIA HERRERO-RADA, *Local Economy*, 1470-9325, Volume 20, Issue 1, 2005, 98-103) The Action Plan aims to encourage more people to start businesses and to increase the number of entrepreneurs. The Commission has emphasised that a joint effort from Member States, professional organisations and local authorities is needed to achieve this target, promoting a 'co-ordinated approach'. To improve the state of entrepreneurship in the EU, the Commission proposes five key actions:

1. *Entrepreneurial mindsets*: The Commission seeks to promote awareness of the entrepreneurial spirit by presenting best practise models and fostering entrepreneurial attitudes and skills among young people.
2. *Better incentives for entrepreneurs*: This does not only concern the possibility to register a business quickly and cheaply, but also the need for a fairer balance between risk and reward. The Commission plans to tackle the negative effects of business failures facilitating the transfer of companies and amending social security systems for entrepreneurs.
3. *Growth and competitiveness*: The Commission sets out to promote access to support and management training for entrepreneurs from all backgrounds, especially women and ethnic minorities. Moreover, the Commission will encourage cross-border trading and support networks and strategic partnerships between entrepreneurs.
4. *Access to finance*: The Commission's aim is to create more equity and stronger balance sheets through improving the availability of venture capital, business angel finance and investments by private individuals. Existing financial instruments will be used and there will be an effort to lower capital taxes.

5. *Regulatory and administrative framework*: Administrative barriers and regulatory burdens need to be reduced and simplified in areas such as taxation, employment and environment. The Commission will concentrate on implementing the measures of its European Governance programme (2002) through better law-making, impact assessments and stakeholder consultation.

In 2007, with the *Proposal for a Community Lisbon Programme 2008 - 2010* (Brussels, 11 December 2007, COM(2007) 804 final), the European Commission re-launched the significance of exploiting the enterprises' potential, in particular that of SMEs, aiming at unblocking the growth potential and the employment of enterprises – which represent 99% of enterprises and employ 67% of the EU workforce – before 2010, especially stressing on education and skills development in a perspective of a more occupability and social cohesion.[COM(2007)804.pdf]

Female entrepreneurship: an active and growing area of the labour market

On the basis of the ILO's report *Women in labour markets: Measuring progress and identifying challenges* [ILO_Women in labour markets_2010] the female participation rate in the workforce has raised from 50, 2% to 51, 7% between 1980-2008 (+1, 5%), while the male rate has slightly declined from 82% to 77, 7%. Again in 2009, with *Gender Equality at the Heart of Decent Work* [ILO_Report VI - Gender equality at the heart of decent work_2009] the ILO shows which measures are the most suitable to support women and gender equality. This document represents a kind of guide towards the creation of a labour market in which women and men can freely and actively participate, by promoting , for instance, the adoption of measures that, first of all, facilitate the women's economic empowerment through the entrepreneurial development; secondly, face the challenge of the remuneration's disparity between women and men; thirdly, reinforce the social protection for everybody; and finally increase the women's participation in social dialogue.

In some Regions, associative organisations, such as cooperatives and enterprises associations, can become important drivers in a perspective of social inclusion and women empowerment. Despite the above mentioned constraints, women are becoming more and more organized and present in sectors in which they were traditionally more discriminated, achieving more successes even in male-dominated sectors. These improvements show the benefits they have brought not only to women, but also to their families, communities and to society as a whole.

Indeed, it is well-known that the presence of women in the economy goes together with more well-being.

Nowadays, women's presence is considered an important driver for the growth and economic development, and no longer as a mere question of equal opportunities (*Rivoluzione Womenomics*, AVIVAH WITTENBERG-COX, ALISON MAITLAND, Gruppo24Ore, March 2010). Today, female entrepreneurship appears to be a minor component of the labour market. However, it is active and growing (*Quanto vale la differenza. L'imprenditoria femminile come fattore di sviluppo locale*, ILARIO

FAVARETTO, Franco Angeli, 2007) and shows the tendency to adopt new forms of enterprises, getting into high competitive fields, despite the difficult conditions of the economic situation. Although it is demanding and complex to manage, the entrepreneurial activity represents an essential answer to some still widespread phenomena of underutilisation of the female component of the human capital. The new rules about the legal forms of the small enterprise have offered the possibility to have a certain flexibility by improving in the meanwhile opportunities for female entrepreneurship's development. Also in the economists' opinion, women work will represent the successful element for the market in the future.

Stereotypes and budget restraints: stumbling blocks for female entrepreneurship, also in renewable energy sector

The data obtained by the European Commission in *Evaluation on policy: promotion of women innovators and entrepreneurship* (European Commission, 2008[promotion_women_innovators_entrepreneurship_2008]) highlight the high potential – but still the insufficient tendency – of women to start an entrepreneurial activity (Tab. 1 – 2).

Tab. 1 - Summary table with data and information on female innovative entrepreneurship

Data on women inventors/innovators' entrepreneurs	
European level	
Only 8.3% of patents awarded by the European Patent Office are awarded to women	
Only 20.3% of businesses started with venture capital belong to female entrepreneurs	
Women score less than men when assessing the level of innovation of their own business (innovation of product: 13.9% women compared to 14.5% of men; innovation of process: 4.1% women compared to 7.8% of men; innovation in the organisation 5.2% of women compared to 6.5% of men; marketing innovation 9.1% women compared to 10.45% of men).	
Member States	
Finland	Only 6% of patents registered are granted to women Only 5% of applications for financial support for developing an innovation are made by women
Sweden	Only 4% of patents registered are granted to women
Austria (regional)	Only 10% of beneficiaries of spin-off initiatives at regional level are women
Italy (regional)	33% of beneficiaries of spin-off initiatives at regional level are women

Source: *Evaluation on policy: promotion of women innovators and entrepreneurship*, European Commission, 2008

Tab. 2 - Summary table with data on women entrepreneurs in science and technology

Data on women entrepreneurs in science and technology	
European level	
Only 5%-15% of high-tech business is owned by women	
Member States	
UK	Only 5% of female early stage activity is in the technology sector compared to 12% of men. Only 5% of female established business is in the technology sector compared to 11% of men.
Sweden	Only 1% of the overall rate of female entrepreneurship is in information and technology
Italy	Only 2.5% of the overall rate of female entrepreneurship is in technology Only 1.4% of the overall rate of female entrepreneurship is in R&D
Germany	Only 10%-15% of women start a business in science and technology (estimate)
Latvia	24% of high-tech enterprises (core and moderate) are run by women

Source: *Evaluation on policy: promotion of women innovators and entrepreneurship*, European Commission, 2008

Indeed, in the renewable energy sector, several opportunities are offered in the technical, managerial and organizational profiles, running the risk of excluding women just for the above mentioned reasons.

However, there are some other factors - that are common to different sectors – able to exclude women more than men in the start up of an entrepreneurial activity.

The same research of the European Commission identifies three types of hurdles:

1. Of conceptual nature
2. Of economic nature
3. The so called ‘soft’ hurdles

1. Hurdles of conceptual nature

Among the hurdles of conceptual nature we find the educational choices; the horizontal and vertical women segregation in the employment; the number of women that are potentially prepared in business and sciences but that are not able to convert their skills in entrepreneurial activities; the still rooted cultural concept of associating science, technology, innovation and invention to men; the persistence of a high number of men in some sectors in a way that women are discouraged; the stereotype that tends to under evaluate the ideas of “business that are coming from women”; and in general, the tendency to consider women as subjects of a less credible and professional market. All of this implies a general scepticism in considering women as potential customers, suppliers

and commercial partners, forcing them to a stronger tenacity in order to show their own knowledge, skills and abilities.

Another quite persistent hurdle of conceptual nature is linked to the traditional idea of women's role in society and in the labour market as a *critical* presence, since, as compared to the men's one, it is mostly connected to the management of the family obligations and responsibilities. This is true above all for those sectors that are evolving quickly and that are highly competitive, which also require long and flexible working hours, and a constant training in order to be updated with the new technological development and market's opportunities.

2. The economic hurdles

In general, comparing to men, women entrepreneurs face more difficulties in the access to funding. This phenomenon becomes more evident in the field of science and technology, where first of all a huge investment is often required, (for instance for the products' development, product marketing ect.) and secondly, a credibility that, as it has been mentioned before, women operating in these sectors do not always have from backers and investors. This effectively represents a discriminatory element.

3. The so called 'soft' hurdles.

For women there is an initial difficulty in, first of all, developing business ideas; secondly, to meet potential customers, suppliers and commercial partners; thirdly, to understand the market with its developments, opportunities and weak points, and finally, to obtain strategic information, cooperation and support. The lack of entrepreneurial training is significant too. Also the lack of self-esteem, assertiveness, and capacity of taking risks – elements that represent a problem for starting an enterprise more for women rather than for men - often plays a regrettable role.

In the renewable energy sector, where the demand of these character's typologies is high, this potentially represents a relevant hurdle. Science and technology are sectors where, as it is well known, there is a male predominance and the levels of risk and uncertainty are high.

The lack of consolidated models in the role of "women entrepreneur" does not help the development of the image – that is still relatively new – of a successful larger female presence in these sectors and activity's fields.

Implications connected to the female proneness to start an entrepreneurial activity

The literature does not offer in-depth examinations concerning the specific motivations that are inducing women to start an activity, despite some recent studies are offering interesting hypothesis that remand limited samples. The paper *What's the Difference?! Gender, Personality, and the Propensity to Start a Business*, MARINA FURDAS KARSTEN KOHN, IZA DP n. 4778, February 2010, [IZA_What's the Difference. Gender, Personality, and the Propensity to Start a Business.pdf] shows how, among the industrialized countries, to a self-employment workman corresponds – in average – just 0,

64% of women. This observation is also true for Germany – one of the most industrialized countries and specific object of the study – where in 2007 the self-employment rates between men and women were respectively 13, 4% and 8, 6%. The analysis is mostly about the possible implication of the features linked to the personality in starting a new autonomous activity, where in the personality's notion are included both 'hard' factors - as the social and demographic features like education, training, age, composition of the family unit, and 'soft' factors - like personality's traits, abilities, behaviours, and personal perceptions. However, the current studies are not sufficient to explain the existing gender differences in starting an autonomous activity. The differences of human capital seem to be largely negligible to explain the gender gap. In a more focused perspective, by analyzing the relation between gender differences and personality's traits, it comes out that personality's traits are less favoured for women in starting an activity, whereas the human capital gift seems to be more favourable for women rather than for men (CRAMERER, C. F., AND D. LOVALLO *Overconfidence and Excess Entry: An Experimental Approach*, American Economic Review 89, 1999, 306–318; [Overconfidence and Excess Entry. An Experimental Approach_AER_1999.pdf] *I think I can, I think I can: Overconfidence and entrepreneurial behavior*, KÖLLINGER, P., M. MINNITI, AND C. SCHADE, *Journal of Economic Psychology* 28, 2007, Issue 4, 502–527).

This aspect seems to make women more cautious and planning in the long term rather than daring in the short term, as men – on the contrary - seem to be.

The private life-work life balance constraint

The work-family balance is one of the major challenges for an entrepreneur, even more for a woman. Without any doubts, a decisive factor is the investment of the female time in the care work (care of children, elder parents or ill relatives). As lot of studies report (*Time-Use Patterns and Women Entrepreneurs*, TAMI GURLEY-CALVEZ, AMELIA BIEHL, KATHERINE HARPER, American Economic Review. Apr 2009, Vol. 99, n. 2: 139-144) [*Time Use Patterns and Women Entrepreneurs_2009*], the maternity and subsequent necessity of a work-life balance are decisive factors in the paths of female career and thus, also in the good outcome of an autonomous entrepreneurial activity. In *Exploring the Career/Achievement and Personal Life Orientation Difference between Entrepreneurs and Nonentrepreneurs: The Impact of Sex and Dependents*, (DEMARTINO, RICHARD, ROBERT BARBATO, PAUL H. JACQUES, *Journal of Small Business Management*, 2006 350-368) there is a depth-examination about how career and private life of entrepreneurs could be independent from variables of gender and children's presence. Actually, there are no specific studies on this subject and, in this case, the comparison is carried out among women entrepreneurs and non-entrepreneurs women with similar levels of education, training, age, and working experience. The analysis does not statistically show significant differences in career/realisation/orientation of the personal life between women entrepreneurs and women non-entrepreneurs. On the contrary, it seems that programs supporting the work-life balance and infancy services, could stimulate the

chronic low rates of the female self-employment. Secondly, the research points out the necessity of deepening the valuation about whether the self-employed women are numerous just because this opportunity does not represent a concrete valid option for advancing in the career of reaching important aims, or whether all of this is more determined by factors like the difficulties in having access to credit or aversion to the enterprise's risk (*Traditional and Non-Traditional Female Entrepreneurs: An exploration into what influences their selection of industry sector*, ELAINE AYLWARD, Centre for Entrepreneurship, School of Business, Waterford Institute of Technology, 2007). [2007_Traditional_and_non-traditional_what_influences_their_selection_of_industry_sector.pdf]

Women – compared to men – are more prone to use part-time contracts and parental leaves, thus having consequences on the low entrepreneurship's rates. This causes periods of partial absence or of career's interruption that stop the linearity, which is by contrast one of the features of the male career.

In this sense it is worth mentioning here *Parental leave in European companies, Establishment Survey on Working Time 2004-2005*, EUROPEAN FOUNDATION FOR THE IMPROVEMENT OF LIVING AND WORKING CONDITIONS, 2007 [*Parental leave in European companies 2004-2005*] a report that examines the use of the parental leaves in firms of all Europe, on the basis of a large-scale analysis carried out in firm structures with 10 or more employees in 21 European countries in the period 2004-2005.

The large-scale research examines, on the one hand, the financial support and, on the other, the role of social and cultural conventions in the family obligations' definition and sharing, because the measures to improve the balance between family and work are generally addressed to women rather than men.

The raise in female participation in the labour market implied huge changes in the women's life (*Sociologia della famiglia*, SARACENO C., NALDINI M., IL MULINO, 2007). Unlike the above mentioned studies, which report that the flexibility offered by an autonomous activity is always regarded as a good instrument to improve work-life balance - as *Flexible Working Hours, Family Responsibilities, and Female Self-Employment. Gender Differences in Self-Employment Selection* (RICHARD J. BODEN, JR., American Journal of Economics and Sociology, Volume 58, Issue 1, 71 – 83) highlights – comparing to men, women seem to be more inclined to consider working hours' flexibility in relation to the family management as a reason for becoming autonomous. This is particularly true for women with young children.

New policies at European level supporting the female entrepreneurship

It is significant considering “*Think Small First*”. A “*Small Business Act*” for Europe (Brussels, 25 June 2008, COM(2008) 394 final) [COM(2008) 394 final.pdf], an ambitious new policy initiative that reflects the Commission's political recognition of the central role of SMEs in the EU economy and for the first time puts into place a comprehensive SME policy framework for the EU and its Member States. On 15th December 2009, the Commission adopted a report which highlights the progress made in

implementing the SBA (Small Business Act) at EU and national level: in *Report on the implementation of the SBA* (Brussels 15 December 2008, COM (2009) 680) [COM (2009) 680_en.pdf], is argued that «the well-being of SMEs is key to the future employment and prosperity in the EU». In this document the Commission highlights the role of the new *General Block Exemption Regulation* (GBER) adopted as part of the SBA including in one text all the rules previously set out in five separate regulations, and enlarging the categories of state aid covered by the exemption. The GBER introduced new rules on aid intensity for SMEs (i.e. 20% higher aid proportion allowed for small enterprises and 10% higher for medium-sized enterprises) as well as on incentives for the creation of start-ups and support for women entrepreneurs. Although the Commission highlights that the *Conference on the SBA/European Charter for small enterprises* have contributed to promoting entrepreneurship among the general public, giving voice to entrepreneurs to present their career paths and providing opportunities for networking: «The exchange of good practices, and the process of learning from each other, is working well beyond the borders of the EU. For example, Norway established an Action Plan to promote women's entrepreneurship with the objective of having women represent 40% of all entrepreneurs by 2013. Overall, more than 600 good practices have been proposed by the participating countries over the past ten years» (*Report on the implementation of the SBA*, Brussels 15 December 2008, COM (2009) 680).

A *European Network of Female Entrepreneurship Ambassadors* was launched in collaboration with the Swedish Presidency in Stockholm in October 2009 with the aim of 'bridging the gender gap' and increasing the number of women starting businesses in Europe. The *Female Entrepreneurship Ambassadors* will serve as role models and highlight the role that women can play in creating jobs and promoting competitiveness. The network consists of 100 ambassadors, currently covering ten countries (http://ec.europa.eu/enterprise/policies/sme/promotingentrepreneurship/women/ambassadors/index_en.htm).

One of their main tasks also consists in developing an entrepreneurial mentality in schools, universities, in the communities and through the media, in order to raise among women – in particular among the young women – the idea of creating their own enterprise. Indeed, women usually choose to start and manage enterprises in sectors like retail trade and care services, which are often regarded as less important for the economic and knowledge development. The ambassadors, through their own experience, are willing to show that women can be successful in all sectors.

Italy: some data on female entrepreneurship

An interesting study on the female entrepreneurship in Italy (*L'imprenditoria femminile in Italia. Le imprese italiane secondo una prospettiva di genere: aspirazioni e problematiche delle aspiranti e delle neo-imprenditrici*, Unioncamere Toscana, Ufficio Studi, January 2010) [*imprenditoria_femminile_Italia_EC_2010.pdf*] offers a first framework about the female presence in this market's sector. In Italy, in mid 2009, enterprises led by women were 1.446.543 units and represented 23, 8% of the global total

(equal to 6 millions). Thus, almost one enterprise out of four is led by women or has a strong female presence. From 30th June 2004 to 30th June 2009, the number of female enterprises increased by 7, 4% (in absolute terms+99.609 units). Over the five years considered by the research, the number of female enterprises reached the highest peak in mid 2005 (+2, 9%) and the lowest one in mid 2008 (+0, 1%), while in the last period it registered a good level (+1, 5% in the I semester 2009). Up to 30th June 2009, the majority of female businesses were located in the South and in the Islands (36%) and one quarter in the North-West. The Centre of Italy follows with 21 % and the North-East with 18%. The latter turns out to be the area with the lowest concentration of female enterprises. In particular, the Region with the highest number of female enterprises turned out to be Lombardy (more than 200 thousand units equal to 13,9% of the national total), followed by Campania (with more than 150 thousand equal to 10,4%) and Lazio (more than 144 thousand equal to 10,0%); on the contrary, the regions where the pink enterprises are less concentrated turn out to be The Aosta Valley, Molise and Basilicata (*Impresa in genere 2007-2003, Primi dati dell'imprenditoria femminile*, Unioncamere, 18 June 2009). [*impresa_genere_2007-2003_dati_if_2008.pdf*]

At the end of June 2009, the majority of female enterprises turned out to be in the trade sector, which gather almost 422 thousand enterprises (29,2%). 18,0% of “pink” enterprises, i.e. more than 260 thousand businesses, work in the field of agricultural activities, 8,5% (more than 123 thousand businesses) carry out accommodation and catering's activities, in other words activities connected to tourism. 4,5% of the Italian female entrepreneurship work in the constructions field (almost 66 thousand businesses) and about 68 thousand units in the field of the real estate's activities (*L'imprenditoria femminile in Italia. Le imprese italiane secondo una prospettiva di genere: aspirazioni e problematiche delle aspiranti e delle neo-imprenditrici*, Unioncamere Toscana, Ufficio Studi, gennaio 2010, 9).

The sector of ‘services industry’ and ‘health and social work’ turned out to be the one with the biggest number of female enterprises. However, also the sectors of ‘accommodation and catering’, ‘rent and travel agencies’, and ‘education’ register a considerable female presence. These sectors are followed by others with quite high female rates: ‘agriculture and fishery’, ‘trade’, ‘art and sport activities’, ‘real estate activities’, and ‘information services’ (*Le donne al comando delle imprese: il fattore D, I rapporti Cerved sulle imprese italiane*, March 2009). [*donne_comando_imprese_CERVED_2009.pdf*]

At the end Of 2007, enterprises led by women -registered in the Register of Enterprises before 1940 – were 901 (*Impresa in genere 2007-2003, Primi dati dell'imprenditoria femminile*, Unioncamere, 18 giugno 2009).

Among them, the “oldest” companies belong to the trade sector. In the period between 1940-1949 there were 1.288 entrepreneurial activities, among which the most numerous worked in the real estate. In the following decade there were 4.598 enterprises, among which 1.853 operate in the trade sector, which turned out to be the most long-lasting female entrepreneurial sector.

The presence of non-Italian women was particularly relevant in the development of individual firms led by women between 2003-2007. The prevailing ethnic group is the

Chinese (more than 11 thousand, growing by 111% compared to the previous five years), followed by the Moroccan (3.438 units, even 169% compared to 2003), the Romanian (3.429 units, even +167%). Albanian women entrepreneurs are among the emerging communities, and they register a strong increase (+176%).

The Law 215 of 1992 “Positive actions for female entrepreneurship” promoted the development of existing or to be started ‘pink’ enterprises.

6. The role of social dialogue for education and training opportunities in renewable energy sector in Europe

Introduction

Renewable energy sector (RES) took a lion’s share in the first phase of development of “green jobs”. Among other industries mostly included in the shift to low-carbon production, the renewable energy sector is seen as one of the new solutions for the current economic crisis. Discussions took place about its potential to become the key player in saving European economy, and to significantly contribute to reach the European climate and economic objectives. Its employment potential is strongly emphasized by many researchers, but also by key players within the European and global energy supply market. UNEP/ILO/IOE/ITUC, *Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World*, September 2009 specify that renewable energy, compared to fossil-fuel plants, generates more jobs per unit of installed capacity, per unit of power generated and per dollar invested. In practice, numerous wind, solar and biomass companies have registered high rates of growth, in terms of production, but also in terms of employment potential.

Along with this rapid growth, some critical issues have emerged, and in particular the one regarding difficulties in the labour market. The practice shows that labour supply in RES has not met the labour demand instantly and automatically. In the last years, numerous companies have reported an acute shortage of skilled workers. Examples have been found in all sectors of renewable energy, which is understandable, considering the pressure on human resources caused by strong growth and extraordinary performance of these sectors in past years. The difficulties to find adequate and prepared workforce have been faced particularly for sector specific profiles, those that require some “new” skills or “new” combinations of skills. Anyway, shortages have been registered also among traditional, but redefined profiles, which require cross-disciplinary competences. In both cases, skills and competences, or better shortages of the same, occupied a central role in the analysis of the issue. Consequently, great importance was given to the emerging needs in education and formation of current and future workforce, training and re-training opportunities, life-long learning activities and other similar programs that could

significantly contribute to prepare the European workforce for the challenges of the “green revolution” and to enable it to take the most of it.

Social dialogue is involved in actions aimed at solving current and future problems faced on the RES market, as those regard different actors: companies, current and future workers, educational institutions. To provide for adequate educational and formational programs in renewable energy sector, it is essential to identify the actual needs of the labour market, the characteristics and shortages in the labour offer, and the way these two sides could find to meet properly. An important role is played by initiatives promoted by social partners, very often by companies and trade unions themselves.

Social partners’ initiatives for education in RES

Different countries showed different levels and intensity of commitment, as far as “green” initiatives developed by social partners are concerned. In order to provide an insight into the activities promoted by different Member States, it is necessary to analyze the general level of awareness and interest for the issue in these countries, as this “generic” interest often influences the intensity of concrete actions promoted by States, including those aimed at promotion of “green education”.

Significant differences among European countries in the interest and level of knowledge of union players on policies to counteract climate change, have been identified within European Trade Union Confederation (ETUC), Instituto Sindical de Trabajo, Ambiente y Salud (ISTAS), Social Development Agency (SDA), Syndex, Wuppertal Institute, *Climate Change and Employment: Impact in Employment in the European Union–25 of climate change and CO2 emission reduction measures by 2030*, February 2007. The report is highlighting this statement at a very general level, not taking into account specific actions aimed at educational or training needs. Still this information is important, as the interest in raising awareness and improving education programs is reflected also in interest that countries have for climate issues. On the one hand, in the new Member States presented in the Report, except for Slovenia, players within the unions have a lower level of knowledge of issues relating to climate policies. The involvement in the consultation process accompanying the development of national allocation plans is also lower. By contrast, the unions in Slovenia have been more active and had discussions with the government and employers’ organisations about the social and employment consequences of policies regarding climate change. On the other hand, in the EU-15 countries, union organisations have a generally better-developed level of knowledge and expertise. In some countries, they are directly involved in tripartite dialogues, with governments and employer organisations, on the implementation of policies tackling climate change, or in national and regional debates on long-term emission-reduction scenarios. It should be taken into account that the Report was published in 2007, and since then the level of awareness and the intensity and number of initiatives changed, and is still changing, with different results among countries.

As for green jobs education, the subjects interviewed in the research maintain that climate policies should contribute to increasing the demand for more educated and skilled workers.

The same report offers recommendations for social policies in different sectors. For example, it acknowledges the necessity for development of training paths appropriate to renewable energy sources, in particular in the maintenance area.

Going from generic level of awareness to a more specific one, for example the awareness of the need for specific and concrete actions, the literature provides some policies and measures and highlight the importance of better cooperation between different social partners. The importance of social dialogue for the transition to low-carbon economies, through education, formation and improvement of competencies, is emphasized in the Report of Ana Belén Sanchez and Peter Poschen, *The social and decent work dimensions of a new Agreement on Climate Change: A Technical Brief*, June 2009. The authors highlight the importance of vocational training, and the need of taking into account the vulnerable groups of women and youth. Policies and measures aimed at facing rapid changes on the global markets, and other challenges brought about by climate change, should be designed and implemented by governments in consultation with social partners. The Report sustains that organizations of industry/employers and workers have an in-depth understanding of the technical options, human resource requirements as well as of the economic and social implications of mitigation measures. These stakeholders should actively participate in the design, implementation and monitoring of policies to reduce the cost, enhance the effectiveness, improve health and safety and maximize benefits in terms of employment. Sectoral organizations have an important role in facilitating just transitions for enterprises, workers and communities negatively affected by mitigation policies. Skills development is seen as fundamental for an effective response to the climate change, as available technology and resources can be both used efficiently and deliver the expected environmental benefits and economic returns only if there are qualified entrepreneurs and skilled workers.

The need for a close collaboration among all stakeholders relevant for the adaptation and modernizing of vocational and general educational systems for renewable energies is emphasized also by TNO Netherlands Organization for Applied Scientific Research, SEOR Erasmus University Rotterdam, ZSI Centre for Social Innovation in *Investing in the Future of Jobs and Skills: Scenarios, implication and options in anticipation of future skills and knowledge needs. Sector Report: Electricity, Gas, Water and Waste*, May 2009. Companies, education and training organizations, social partner organizations, research institutions and public authorities, should minimize information deficits on current and emergent skills needs.

The concrete actions that could be promoted by social partners in order to ensure improvements in education and training opportunities in renewable energy sector in Europe are suggested by the same Report. These actions refer mainly to strengthening co-operation in sector-specific training measures, facilitating training co-operations between SMEs, building joint training facilities, enhancing flexibility through modularization of

education and training, supplying special courses dedicated to sector characteristics, supplying special courses for older workers, enhancing transparency of the quality of training as well as improving the trans-national recognition of vocational qualifications.

After designing theoretical basics for social partners' initiatives, such as recommendations and suggestions, it is necessary to analyse measures that have already been implemented or that are being implemented. There is no literature specifically regarding renewable energy initiatives. Some reports handle the subject in a much wider context, the one of the environmental education. An overview of initiatives aimed at supporting the transition to low-carbon economy in Europe is provided by the European Foundation for the Improvement of Living and Working Conditions (EUROFOUND), *Greening the European economy: Responses and Initiatives by Member States and Social Partners*. The report presents not only national initiatives, but also those at a regional and local level. When it comes to initiatives in providing training opportunities to help workforce in transition to a low-carbon economy, there are some important examples of commitment from employers' organizations and trade unions from different countries.

In Austria, for instance, the government is looking at reforming the country's vocational training scheme in order to meet increasing business demand for skilled workers in the environmental technology sector. On the employers' side, courses have been run by the Austrian Federal Economic Chamber to help members reduce energy consumption.

Likewise, in Estonia, efforts are being focused on creating the skills needed for the sustainable energy industry.

An innovative scheme exists in Belgium, whereby long-term jobseekers are trained to carry out energy assessments and help advise on energy-saving measures. These people are called 'energy trimmers' (*Energiesnoeiers/tuteurs d'énergie*) and help to implement energy-saving measures in buildings through 'energy trimming companies', which are not-for-profit organisations.

In Italy, the trade fair SolarExpo and the employment agency Adecco have developed training and retraining courses for technicians in the solar panel and wind farm industry. Under this scheme, skills that are particularly relevant to these industries are taught.

In Sweden, trade unions offer career coaching to prepare members for the shift to the green economy.

Important initiatives are promoted in United Kingdom, where the employers' organization the Confederation of British Industry (CBI) makes a range of recommendations on how to increase the number of workers with the skills that are emerging during the shift to the low-carbon economies. These include encouraging a greater focus on such skills in schools and proposing ways to encourage education providers to work with businesses to meet the demand for these types of skills. TUC operates a range of courses for trade union representatives, helping them to address the following issues: identify environmental changes that affect the workplace; research and identify appropriate environmental legislation, policies and information; and identify environmental problems and opportunities for trade union action. In Ireland, the employers' confederation IBEC provides environmental training for members.

In Germany, the trade union confederation DGB, in cooperation with the educational institution DGB Bildungswerk and the German Ministry for the Environment, Nature Conservation and Nuclear Safety, runs a project 'Resource efficiency in firms'. The aim of the project is to train workers in detecting and implementing ways to improve energy efficiency. Training is part of a programme that leads to a certified degree as an 'efficiency expert'. The metalworking trade union IG Metall cooperates with the employer association of the aluminium industry in implementing this project at workplace level.

Another overview of the initiatives in different Member States focusing on Education and Training is provided by Employment Committee (EMCO) in *The Employment Dimension in Tackling Climate Change: Overview of the state-of-play in Member States*, October 2009.

Further initiatives in greening jobs and skills - linked to the organisation of training and education courses in Belgium, France, Germany, Spain, and UK in different sectors correlated with green economy, but also in a specific field of renewable energy in Denmark - are briefly presented in OECD, C. Martinez Fernandez, C. Hinojosa, G. Miranda, *Greening jobs and skills: The local labour market implications of addressing climate change*, 8th February 2010.

ECORYS, *Environment and labour force skills. Overview of the links between the skills profile of the labour force and environmental factors*, 2008

Case studies

One of the examples of an intensive cooperation between different social partners is the British case. The 'Sector skill councils' in UK are funded by the Department for Innovation, Universities and Skills and are part of the government's skills strategy for the 21st century. The councils ensure that individuals gain the skills required by the labour market. Sector skills strategies are defined for each sector based on the analysis of present and future skills needs. The case is presented on www.sscalliance.org.

A similar program is implemented in Germany, where a research network FreQueNz is funded by public. The network involves scientific institutes, education and training organisations, social partner organisations, companies and public authorities and contributes to early identification of qualification needs. This network has conducted a number of evaluative research projects on human and ICT resources, staff qualifications, tests, career guidance for adults, computerized career guidance programmes, and beneficiaries of guidance services. This project is presented on www.frequenz.net.

In Denmark, closer cooperation has been established between the environment and education sectors with the aim to use both sectors' competences in the best possible way. This ensures synergy between the Government's over-arching strategic planning framework for sustainable development and the substrategies that are developed within

other sectors, including the education and environment sectors. The Danish Ministry of Education therefore launched its strategy for education for sustainable development as part of United Nations Decade of Education for Sustainable Development 2005-2014. The strategy shall ensure that children, young people and adults become aware of the concept of sustainable development and learn how to act competently through knowledge and skills. In this way, the education sector contributes to enhancing the green profile of the national Government and makes it possible for the education sector to fulfill the goals and ambitions for the UN DESD. The aim is to introduce sustainable development in all relevant curricula in basic Education, youth education and teacher training in order to establish a link between natural and social sciences and humanities. Different aspects of climate related problems can for instance be introduced in multidisciplinary educational programmes. The UN's Strategy for Education for Sustainable Development is supported by a number of Danish initiatives, such as: The report "Et Fælles Løft" (A General Boost), which focuses on strengthening science, technology and health education; Climate Education 2009; Virtual Galathea. More details about these programs can be found in Danish Ministry of Education, *Education for Sustainable Development – a strategy for the United Nations Decade 2005-2014*, 2009.

Finally, great importance should be given to disseminating measures aimed at promoting the exchange of good practices between countries. Therefore, "The Electronic Meeting Place for the Educational Sector" www.emu.dk, has been designed in order to disseminate good examples of education programmes and teaching methods.

7. Social dialogue and bargaining experiences in the fields of energy and environmental safeguard. National case studies

Introduction

The acceleration of climate change and the economic and employment crisis brought the issue of sustainability of the current development model to the attention of economic and social actors.

Workers are directly influenced by this problem, also as regards changes processes in terms of development of new competences or updating of the old ones, in terms of mobility towards new productive sectors or adaptability to new productive processes.

In some sectors, such as energy, refinery, steel industry and cement, these problems appear to be particularly urgent, also due to the Directive 2003/87/CE on the *Emissions Trading Scheme*.

Trade unions and businesses organizations are called to take up these challenges, first of all through social dialogue and participation, in order to define negotiation paths with concrete fallouts on the collective bargaining and on working conditions.

Particularly, the activation of participatory instruments proved to be able to anticipate and keep up to changes. Social dialogue is a praxis in the definition of socio-economic policies and constitutes one of the pillars of the EU social model and of economic growth.

1. The Italian case

The sector of renewable energies is one the most important areas of the *green economy* at an international level. Therefore it is important to analyse the Italian situation, characterised by the import of technological systems from abroad to build plants for renewables. This dependency (the umpteenth one, if we think for example to the dependency on fossil sources) from abroad implies that a great deal of the – high – incentives granted by Italy for the development of renewable energies (in Italian: FER) ends up in the hands of countries able to produce these systems; paradoxically, Italy transfers the incentives abroad, overcharging the bill on its citizens. Therefore, it would be appropriate to develop these technologies within the country, in order to pour part of the economic help into the country itself. This would contribute to the growth of a more mature market, able to further develop even when incentives will be reduced or phase out, as it happened in other countries (e.g. Germany). Furthermore, as shown by the IRES (Economic and Social Researches Institute) Report “Towards the Green Economy” (Rome, 2010), it would produce positive effects in terms of occupation and local industrial production.

Specific and cross-disciplinary professional competences, connected to the development of green technologies, play an important role to raise awareness concerning the changes involving our society, in order to indentify new models of growth, which incorporate criteria of competitiveness, security and environment, constituting the three pillars of the FER development.

It is difficult to indentify the professional skills required in the field of renewable energies especially in the view of the recent expansion of the sector. In fact, as regards solar energy, windpower and biomass, their development has only recently started to take place.

Consequently, not all the professions operating in these sectors have a clear position within the standard systems of national professional classification.

Furthermore, the intrinsic dynamism of the sector, open to new transformations, constantly requires new skills necessary to manage technological innovations, producing significant effects from a wider socio-economic viewpoint.

Hence, the importance to plan strategic training measures, to develop new competences matching the current and potential requirements of the green sector, to better adapt to the present situation.

The CESPA

In Italy the Ministry of the Environment and of the Safeguard of the Territory, with a Decree published in the Official Journal of the 6th September 2004, established the Economic and Social Council for Environmental Policies (CESPA), confirmed through a new Ministerial Decree issued in 2006.

The CESPA is chaired by the Minister of the Environment and the main economic and social national organizations (i.e. trade unions and entrepreneurial associations) take part in it. Three plenary meetings are programmed, taking into account the most important political deadlines in the field of economic planning of the State budget and of the annual European summit held in Spring.

The CESPA aims at:

- promoting the active participation of economic and social players, called to contribute to outline and implement political strategies related to environment;
- increasing efficacy of the strategies and of the provisions on environment, from an economic, social, productive and occupational viewpoint;
- increasing the competitiveness of our businesses, also through a new policy of supports to enterprises, based on incentives to eco-efficiency;
- providing shared tools for the assessment of direct and indirect effects of the implemented policies;
- contributing to a better integration and synergy between the planning of the national government and the planning of the decentralized institutions;
- favoring the harmonization among the different institutional competences;
- better coordinating national policies with the European and international legal framework;
- contributing to the diffusion of the culture of “sustainable development”;
- promoting and monitoring common and integrated actions and projects concerning environmental, social and economic aspects.

The contract for chemistry and energy workers

The contract for chemistry workers, signed in May 2006, establishes the common goal of a continuous improvement of the security and health level in the workplace while protecting the environment through a preventive and systemic management of the risk factors. Sustainable development, meant as the balanced and dynamic integration of the principles of economic growth, environmental protection and social equity, is the point of reference for the construction of a consistent environmental strategy. This strategy derives from the idea of a participative method involving the whole sector and promoting better cooperation at all levels, particularly on environmental issues. The firm has the task to offer workers and their representatives all the necessary elements for a correct understanding and participation in improvement programs and initiatives, such as the implementation of management systems, the drainage of sites, energy conservation, training activities.

On this purpose, the RLSSA was established, to foster participation, sharing of the goals and cooperation. Its priority is to extend and improve the participation of the RLSSA particularly in the fields of health, security and environment. As far as environment is concerned, the sectorial experience has shown the possibility to achieve significant results as regards the capacity of the parties involved to define common goals, joint strategies and concrete actions at an entrepreneurial and local level.

In order to develop an active collaboration, specific meetings are organized to inform the RLSSA on: improvement goals; level and nature of the investments; initiatives in the field of drainage of sites, energy conservation and improvement of environmental performances; monitoring and certification systems of the management; initiatives on the field of assessment and management of health, security and environment, along all the life-cycle of the product.

It is important for the parties to increase workers' participation to achieve the established goals in the field of health, security and environment.

Protocol of agreement with ISPRA (ex-APAT)

Together with the National Agency for Environment Protection (ex-APAT, now ISPRA, which stands for: Superior Institute for Environmental Research) and the technical services, two protocols have been signed, respectively in 2001 and 2007. The goal of the agreement is to cooperate and to analyse the national and European legislations, as well as to provide specific training courses for corporate management.

The agreement with Electrolux Italia on the conversion of the Scandicci (Fi) plant

In the above mentioned document issued by the Dublin Foundation, there is a close analysis of the agreement between Electrolux Italia and the trade unions, signed the last 20th September 2008, which led to the sale of the company Energia Futura and to the consequent transformation of the Scandicci plant, in the Province of Florence (450 redundant workers), where the production of refrigerators would be stopped and replaced by solar panels and wind blades.

The agreement can be downloaded at this website: <http://www.uilm.it/archivio/SettoriAziendeUffici/elettrodomestici/20080920%20verbale%20electrolux%281%29.pdf>

To complete the information given by Eurofound, it should be noted that over 2010 the plant conversion faced some difficulties. On the one hand, training activities proceeded as agreed, but on the other, the guidelines for the productive conversion came late. In September 2010, coming back from summer holidays, the company had run out the raw materials necessary for the production of solar panels, while in the previous months production had stopped and delays in the payment of the salaries were experienced.

The agreement is very innovative and the conversion process is still ongoing, but practical and financial difficulties run the risk of reducing, at least in part, the positive effects of this initiative in terms of employment and social responsibility.

Bosch (Bari) Agreement

The agreement was signed in December 2009 between Bosch and the trade unions, in order to safeguard the productive settlements of the Bari plant.

The corporation, together with the trade unions (Fiom Cgil, Fim Cisl, Uilm Uil) and with the support of the local institutions, chose the Bari plant for the experimentation of productive models connected with renewable energies in Italy.

The agreement provides for the obligation by the corporation not to reduce the number of workers in the next two years and to invest in the production of solar plants. The agreement covers approximately 2000 workers.

The expected investment consists of 2.5 million Euros, while the land area where the renewable solar energy is to be produced, measures 12,000 square meters.

The agreement has raised the attention of other productive settlements of the group, outside our country, and particularly after significant reductions in the number of workers operated by the corporation in Czech Republic, France, Spain and Brazil.

Sharp-Enel (Catania) Agreement

After a long negotiation an agreement with the Japanese corporation Sharp was reached, to identify in Catania a site for the production of solar panels and an electricity generation field which will reach the power of 1 Giga Watt, at top speed.

The project, financed by Sharp for 1.4 million Euros, is similar to a project carried out in Japan, that will lead to construction of the Sakai plant, near Osaka. The Japanese corporation will make the investment in partnership with Enel, which on its side will invest 220 million Euros for the construction of buildings and other 300 million euros for the solar fields.

The technology to be used will be the so-called “thin film”, allowing the production of solar cells with a very low environmental impact.

The project has the direct support of the CIPE, with a bunch of incentives amounting to 200 million Euros (49 million Euros have already been delivered), and the direct involvement of the Ministry for the Economic Development and of the Sicily Region.

Porto Marghera Agreements

The agreement, signed in 1999 between the trade union organizations, the Minister for the Environment, Transport, Infrastructure and Industry, the local authorities and industrial local associations, aims to achieve the following objectives:

- To reduce the emission of greenhouse gases into the atmosphere.
- To reduce the traffic of oil tankers in the lagoon area by 50%
- To facilitate diffusion of Emas and Iso 14001 environmental certification
- To draft an environmental report of the area.

Programme agreement for the maritime transport of dangerous substances

The agreement, signed in 2001 by the Ministry for the Environment, the Ministry for Transport, Confindustria (Federchimica, Confindustria and Assoporti), trade union organisations and environmental associations (Wwf, Friends of the Earth, Mare Vivo, Legambiente and Greenpeace), aims to move shipping routes away from areas of particular environmental importance, provide training personnel for maritime navigation about industrial waste disposal and to ensure transport of dangerous substances is limited to double-hulled ships.

National contract for cement workers

The agreement, drawn up in 2008, regulates workers information and participation in initiatives relating to the social corporate responsibility and introduces the so called RLSSA (Workers' Representative for Health, Safety and the Environment). Recognition of the latter professional figure aims to assess and implement programmes for the continuous environmental improvement of the company as part of the corporate investment programmes and an annual check on the commitments undertaken and environmental performance.

Company agreement Almagia

The agreement signed in July 2009 between the industrial computer group Almagia from Rome, with 17,000 workers in 39 settlements in Italy and 630 million Euros of sales, and the Rsu (trade unions) of Fiom, Fim and Uilm. The agreement introduces a connection between a performance bonus and a complex project for energy saving. In December 2008 the negotiation for the renewal of the company contract that had already been lasting one year, came to a standstill because of the performance bonus. At that point the Rsu proposed to promote a project for the company energy saving, making resources available for performance bonuses. With the consensus of the Direction, which was already working on a study on this matter, in May 2009 a mixed Green Team

(company-Rsu) was summoned in order to develop a comprehensive plan and to start with the first concrete interventions, first of all in the Casalboccone settlement to be later on extended to other plants.

The joint Green Team still has the an orientation and coordination task of the initiatives on this field, obviously following a distinct procedure in respect with the normal trade union relations. But this project has also paved the way for negotiation regarding the renewal of the company contract, reached on 3rd July 2009, providing for a performance bonus with depends (25%) on efficiency and energy savings, and on the improvement of company processes.

2. Greece

According to the Greek law, the synergy between the environment in general and the work environment was recognised and mentioned for the first time in the Presidential Decree no. 17 dated 1996 that harmonized Greek law with the Framework Directive 89/391 regarding Health and Safety at Work. Article 10, paragraph 2, regarding worker consultations and participation, states that: «...Workers or their representatives shall take part in a balanced way and in accordance with existing legislation and/or practices, or shall be consulted in advance and in good time by the employer with regards to *the solution of problems linked to interaction between the workplace environment and the environment in general*». As far as employers are concerned, by adopting an environmental policy at a company level they can reduce production costs by *saving natural resources*, increase incentives to workers and at the same time *promote the experience of workers on environmental issues*.

They can also improve the image of the company among clients, consumers and society in general.

With regards to workers, their representatives can obtain improvements in the workplace environment such as, for example, safety at work, to ensure that dangerous substances are not used, etc. In Greece, trade unions were fairly quick to define issues regarding environment, in terms of information and consultation. Some indicative elements that concern the actions of the Greek trade unions relating to the organisation of environmental policies in their activity include:

- Collective consultation: *environmental issues are considered matters for collective consultation*. Issues such as, for example, dangerous substances and waste management, should be dealt with in collective consultation. In Greece, the institutional demands of the National General Collective Labour Agreement (EGSSE), signed by the trade unions and employers, have existed since 1994 and *include an article relating to the environment, which provides for collaboration between employers and workers' trade unions designed at highlighting and dealing with environmental issues together*.
- Environmental action programmes: having made the necessary elaborations, Greek trade unions include the environmental dimension in their action programmes. These programmes concern the GSEE, workers' centres, and sectoral confederations, such as

the Cement Confederations, GENOP-DEH (electrical energy), EYDAP (water), POE-OTA (solid waste) and other leading associations.

- Environmental management of companies: trade union members, workers' representatives who have the role of dealing with hygiene and safety in the workplace and workers' councils that promote initiatives for improving the environmental management of the companies through training, consultation and the pressure exercised in this direction in terms of work environment.
- Legislation for the quality of work and participation: trade unions promote institutions that deal with hygiene and safety in the workplace and include and examine environmental issues in their activities.
- Initiatives linked to exercising pressure on state policies: trade unions have carried out initiatives linked to environmental fiscal reform, the eco-labelling of products and the creation of «green» jobs, the emission of greenhouse gases, waste management, layout of the area, the awarding of eco-labels, etc.
- Participation in social action for the environment: trade unions take part in social dialogue for the environment. Some of the issues dealt with include chemical substances (pesticides, toxic substances, etc.), agriculture, infrastructure, transport, climate change, energy saving, renewable energy sources, water management, waste management, GMOs, etc.
- European initiatives: along with the sector federations, GSEE takes part in consultation on a European level on issues such as climate change, «green» employment, Reach Regulations, EMAS, dialogue for sustainable development and the role of trade unions.
- Environmental training: trade unions provide environmental education-training that focuses on production activities and services, their repercussions on the environment and the measures that need to be taken.

Thanks to the National Plan, the aim is to reduce greenhouse gas emissions in the 2008-12 period by 16.6% in 152 companies. In the new National Plan, the distribution of emission rights concerns some of the country's industries, including 33 electricity-producing plants, 24 combustion plants, 4 oil refineries, 1 mineral fusion plant, 5 iron and steel production plants, 8 plants that produce clinker, 18 limestone works, 1 glass company, 44 ceramic producing plants and finally, 14 plants that produce paper and cardboard.

3. Great Britain

Great Britain does not have a long tradition in tripartite bargaining; social partnership does not have a glorious past and voluntary agreements are far more popular. Great Britain also has excellent organisations on a national level, one of which is an organisation called the Trade Union Sustainable Development Advisory Committee (TUSDAC).

Through this committee, the trade union movement in the United Kingdom collaborates with the Department for Environment, Food and Rural Affairs, a top-level body under the joint Presidency of the Secretary of State for the Environment, who is currently Hilary

Benn, and a member of the TUC General Council. This organisation permits the TUC and its members to push for the promotion of trade union priorities in terms of training for the workforce, in order to support workers' representatives for the environment – those who negotiate agreements on environmental issues in the workplace – and the request from the base aimed at improving dialogue and obtaining joint policies on sustainable development.

The three main pillars of this legislative framework are a planning law that allows for the setting up of a new system, on the basis of which renewable technologies and nuclear power enjoy preferential treatment. There is also an energy law that establishes the measures required for development of the capture and storage of carbon, also creating the legislative framework necessary for the development of new nuclear power stations.

Lastly but probably far more significant is the law on climate change that establishes an objective to reduce emissions that is legally binding and that decrees the creation of a top-level committee on climate change that will deal with developing sector objectives that reduce emissions in the short term. It is possible to make use of this framework in order to develop a shared agenda with the government with regards to the expertise needed for each of these general policy laws. At the same time, it is possible to implement some of the mechanisms established by these laws.

At the moment, the main priority is the work currently being carried out with regards to commitments relating to the reduction of emissions. The law on climate change provides the Secretary of State with the necessary authority to implement mechanisms for exchanging emissions in various fields. The government committed to reduce emissions through a *cap and trade* system introduced in the services sector. This is a system that will concern large local authorities, the health sector and large sales *outlets* at airports or similar. Basically, it is similar to the *Emissions Trading Scheme* in the European Union, on an immediately lower level with regards to the emissions produced. Both the government and the trade union organisations are wholeheartedly committed to showing that participation of the world of labour in the attempt to reduce emissions in various sectors is essential if the aim is to make real progress.

A project called *Greening the Workplace* fits perfectly into this context. The TUC has received a small amount of funding from a public body, The Carbon Trust, whose role is to promote energy efficiency on a company level. From the point of view of the TUC, the objective of this project consists in putting policies into practice, as well as developing case studies on best practices focusing on the positive work that has already been carried out. The specific objective of the project consists in the implementation of eight pilot schemes, based on specific workplaces, aimed at increasing awareness on climate change and the issue of energy amongst trade union representatives. The aim was to lead to a tangible cut in carbon dioxide emissions in the workplace. The general objective of this initiative was to ensure that the issue of environment was taken into account in the bargaining framework.

Therefore, joint committees were set up in order to promote dialogue on energy saving in the workplace.

The committees dealt with the negotiation of collective agreements, which in some cases are still underway. The issues that most clearly emerged were the right to information on

the use of energy. In some cases, the reluctance of employers merely reflected a lack of understanding on the issues linked to energy use. Awareness was lacking among workers, even when employers had set up policies linked to environmental issues. In many cases, no more than a quarter of workers was aware of these policies and it was therefore impossible to put them into practice in the workplace and even more difficult to have the opportunity to adapt them.

4. Bulgaria

On a national level in particular, some social dialogue experiences are worthy of note and include a working group called «twenty», an operational programme on the environment, the «Phare» project, the possibility for workers to take part in the work of parliamentary commissions and finally, the drafting of some informal reports.

In terms of civil society, social dialogue regarding environmental problems is characterised by what, to all intents and purposes, is a conflict between environmental organisations that passionately defend their position and trade union organisations, clearly not yet considered capable of handling environmental policies. In the context of the civil society, this aspect means that social dialogue is somewhat chaotic and dominated by merely economic interests. In other words, in this context the experience of the Bulgarian trade union movement is still very marginal. Some attempts are being made to reach agreements, such as the trade union platform for employment implemented in the city of Tvarditsa and meetings held on a regional level with control bodies. However, it has not prevented Bulgaria from experiencing enormous difficulties and delays that have led to some labour unrest and protests.

For this very reason, Bulgarian trade union organisations have highlighted the need to implement a strategy aimed at improving awareness on the relevant issues, also thanks to the collaboration of trade unions in neighbouring countries. All this must be accompanied by the simultaneous remodulation of energy production, formulation of prices and protection of employment.

Annexes and documents

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