Sustainable Energy for All:

the gender dimensions

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

UN WOMEN
United Nations Entity for Gender Equality
and the Empowerment of Women

Guidance Note

This Guidance Note provides a brief overview of issues related to gender equality, women's empowerment and sustainable energy.

Prepared specifically for the regional and country offices of UN Women and UNIDO, the Note aims to provide guidance for UN programming and work with policy makers around sustainable energy that integrates the gender dimensions.

The Note can help strengthen collaboration with national and regional partners, as well as members of UN Country Teams, and promote South-South exchange of experiences in generating and supplying sustainable energy for all women and men, girls and boys.

It seeks to create a momentum for targeting gender equality as one of the critical pathways for a successful transition to sustainable energy for all by 2030 and for reaching the objectives of the Future We Want.

As such, it will serve as a starting point in working with policy makers and other stakeholders in developing programmatic and policy activities that seek to redefine the gender-energy-development paradigm and expand the role of women in developing and implementing clean sustainable energy solutions.
The Note first presents the international energy situation and the enabling power of energy for economic and social development, as well as the importance of providing communities with access to sustainable energy solutions.

Next, the nexus between women's empowerment, sustainable energy and sustainable development is elaborated. Finally, policy recommendations for UN Women and UNIDO staff are outlined.

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List of Acronyms

AfDB	African Development Bank
BCI	Barefoot College of India
CDM	Clean Development Mechanism
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
C3E	U.S. Clean Energy Education & Empowerment Program
DfID	United Kingdom Department for International Development
ECREEE	ECOWAS Centre for Renewable Energy and Energy Efficiency
ECOWAS	Economic Community of West African States
ESMAP	Energy Sector Management Assistance Program
FAO	Food and Agriculture Organization of the United Nations
FUNAE	National Energy Fund (Mozambique)
GRB	Gender Responsive Budgeting
IEA	International Energy Agency
IISD	International Institute for Sustainable Development
LPG	Liquefied Petroleum Gas
MRU	Mano River Union
MDGs	Millennium Development Goals
PV	Photovoltaic systems
OECD	Organization for Economic Co-operation and Development
SDGs	Sustainable Development Goals
SELF	The Solar Electric Light Fund
SE4ALL	UN Secretary General's Sustainable Energy for All Initiative
STEM	Science, Technology, Engineering, and Mathematics
UN DESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UN-HABITAT	United Nations Human Settlements Programme
UNIDO	United Nations Industrial Development Organization
WFP	United Nations World Food Programme
WHO	World Health Organization

a global energy divide

Without energy, small and medium enterprises cannot function at maximum capacity. Without energy, industry cannot survive. Without energy, women and girls will continue to spend long hours looking for fuel sources, and will not have jobs.

Kandeh K. Yumkella,
UNIDO Director General, April 2013

The world today faces a significant energy divide: between rich and poor countries, with more than 95% of the world's population without access to electricity and clean cooking facilities living in sub-Saharan Africa and developing Asia; within countries, with the wealthiest benefiting from the majority of energy resources; and between urban and rural areas, with 84% of the estimated 1.3 billion people that do not have electricity in their homes living in rural areas (IEA, 2011).

For those who have access to electricity in rural areas, lighting and television use account for at least 80% of electricity consumption, with only 2% of the rural population using electricity for cooking (WHO & UNDP, 2009). Thus, 2.7 billion people still rely on open fires and traditional use of biomass for cooking and almost half of the world's population depends on solid fuels such as wood, dung, crop waste, coal and charcoal (IEA, 2011).

a *gendered* energy divide

The energy divide is also gendered with women in most developing countries experiencing energy poverty differently and more severely than men. Women are often associated with household activities and are to a large extent responsible for household and community energy provision in many developing countries.

Thus without access to modern energy services, women and girls spend most of their day performing basic subsistence tasks, including time-consuming and physically draining tasks of collecting biomass fuels, which constrains them from accessing decent wage employment, educational opportunities and livelihood enhancing options, as well as limits their options for social and political interaction outside the household (Danielsen, 2012).

At the same time, cooking from biomass is particularly detrimental to the health of women and children. Of the estimated two million annual deaths attributed to indoor air pollution generated by fuels such as coal, wood, charcoal and dung, 85% are women and children who die from cancer, acute respiratory infections and lung disease (WHO & UNDP, 2009).

In fact, illnesses from indoor pollution result in more deaths of women and children annually than HIV/AIDS, malaria, tuberculosis and malnutrition combined (IISD, 2013). Other important direct health impacts from dirty energy use and indoor air pollution include life-long or chronic diseases, such as asthma; burns to children; injuries to women from carrying wood; and increased violence against women and girls because of lack of street lighting at night (ESMAP, 2007).

Violence against women can also occur during daylight hours in situations where resources are scarce and women are obliged to collect fuel from remote and isolated areas (ENERGIA/DfID, 2006).

The UN Secretary-General's SE4ALL initiative has identified the nexus of energy and health services as they pertain to women's health as a high-impact opportunity for concerted action to provide sustainable, life saving energy solutions. UN Women will be working with the World Health Organization and the United Nations Foundation to increase the access to and availability of modern energy sources for women's health facilities and services in low- and middle-income countries (unwomen.org)

the enabling power of energy

Without significant political commitment and investment, energy poverty is set to deteriorate even further over the next 20 years (Danielsen, 2012).

It is, therefore, one of the most critical challenges facing the international community today. At the same time, access to energy is a critical enabler for economic and social development. Once communities have access to modern energy services, the impact on human development is significant: from cleaner indoor air and improved health to more income generating opportunities and more time for other pursuits.

Moreover, promotion of renewable energy technologies has the potential of increasing access to modern energy services in rural areas that currently have no access to grid electricity and pay higher prices for energy service delivery because of the transportation costs and inefficiency of traditional energy forms (UNIDO, 2009).

Moving directly to smaller-scale, renewable energy systems such as stand-alone systems of wind and solar energy can provide communities with affordable energy, promote productivity and help in creating employment by empowering enterprises for both the rural and urban poor.

At the same time, large-scale, renewable energy systems based on hydropower, modern clean biomass, geothermal, wind or solar energy can diversify energy supply, reduce energy imports and provide significant local and global environmental gains (UNIDO, 2009).

In April 2012, a coalition of nine countries launched the Clean Energy Education and Empowerment Initiative to attract more young women to careers and leadership positions in the energy field. The member countries of this coalition are Australia, Denmark, Mexico, Norway, South Africa, Sweden, the United Arab Emirates, the United States of America and the United Kingdom of Great Britain and Northern Ireland (UN Women, 2012).

Because of the gendered nature of energy poverty, access to modern, sustainable energy can also significantly enhance the empowerment of women by reducing their time and labour burdens, improving their health, and providing them with opportunities for enterprise and capacity building.

Access to clean, affordable, sustainable energy is thus an enabling factor for economic development and poverty reduction as well as for achievement of internationally agreed development goals, including ensuring environmental sustainability and promoting gender equality. At the same time, access to energy services can be argued to be a human right in itself.

The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), for example, explicitly refers to women's electricity rights and obligates state parties to the convention to "take all appropriate measures to eliminate discrimination against women in rural areas [...] [and to] ensure to such women the right [...] to enjoy adequate living conditions, particularly in relation to housing, sanitation, electricity and water supply, transport and communications" (quoted in Danielsen, 2012).

In May 2013, the Government of Sierra Leone, the MRU, AfDB, ECREEE and UNIDO jointly organized a three-day conference on Women's Economic Empowerment through Energy Access. The conference aimed to foster multi-stakeholder dialogue on mainstreaming gender in energy access at the institutional, policy and project/programme levels in the sub-region. The conference resulted in the development of an Action Plan on Women's Economic Empowerment through Energy Access for the MRU sub-region, and the adoption of this Action Plan by the Energy and Gender Ministers of the MRU sub-region. In addition, a Mano River Union Working Group on Women and Sustainable Energy was established at the conference to implement the Action Plan (ecreee.org).

sustainable energy and the post-2015 development agenda

Recognizing that access to sustainable energy services is central to addressing many of today's global development challenges and for achieving the Millennium Development Goals (MDGs), a growing focus on energy as a key development issue has emerged within the international community. The outcome document of the 2012 UN Conference on Sustainable Development (Rio+20), "The Future We Want", called for commitments to specific actions to achieve sustainable development, including universal energy access, and the launch of a process to develop Sustainable Development Goals (SDGs) to be integrated into the successive framework of the MDGs.

In the context of the post-2015 development agenda, considerable attention is being drawn to issues of energy within the UN-system with, among others, the designation by the United Nations General Assembly of 2012 as "International Year for Sustainable Energy for All", and the Secretary-General's "Sustainable Energy for All Initiative" (SE4ALL).

The SE4ALL initiative aims to ensure universal access to modern energy services, double the global rate of improvement in energy efficiency, and double the share of renewable energy in the global energy mix by 2030 (Secretary-General of the UN, 2011). In collaboration with UN Energy, the SE4ALL initiative coordinates the "Global Thematic Consultation on Energy" that seeks to inform the design of the post-2015 agenda by means of a global online discussion (The World We Want 2015), regional consultations, and a high-level meeting held in Oslo in April 2013.

The consultation process has led to, among others, a focus on the importance of gender considerations when working towards energy for all, and a proposal to extend the SE4ALL objectives with two additional targets: reducing by half the number of premature deaths due to indoor and outdoor air pollution; and providing modern energy services to 400,000 primary healthcare service providers in developing countries (IISD, 2013).

the gender-energy nexus

The following section elaborates further on the nexus between women's empowerment, sustainable energy and sustainable development.

It highlights that women can be powerful actors for change in the transition to sustainable energy and that their involvement in the design, distribution, management and consumption of sustainable energy solutions is a critical pathway for reaching the MDGs as well as the objectives of the SE4ALL initiative and The Future We Want.

Women-led sustainable energy initiatives and projects are successful in the new energy space and women are often in the driver's seat as entrepreneurs and providers of sustainable energy solutions at the community level.

At the same time, it emphasizes that the transition to sustainable energy creates benefits and opportunities for both women and men, such as job creation, market opportunities, and better health conditions.

Gender sensitive policies, leadership and participation

- Taking women's needs into account in energy interventions and strengthening women's leadership and participation in sustainable energy solutions are critical in the transition to sustainable energy for all and to reaching internationally agreed development goals.

- Women are underrepresented in the energy industry work force, in ministerial positions in the field of energy and are rarely considered as key stakeholders for energy initiatives.

- Policymakers need to recognize the importance of women in the energy sector and to engage them directly in policy making and project design.

Energy policies and programmes that recognize women's work and roles in the energy sector, and build on their expertise and influence within households and communities, can be effective in promoting access to sustainable energy solutions for all (ENERGIA, 2007).

Some governments have acted decisively to address inequities in energy policies. By 2007, for instance, the Government of Uganda had established strategies in its Renewable Energy Policy to ensure that women played an important role, and Zambia's revised National Energy Policy promised to provide more gender-balanced development in the energy sector. And since a gender audit of government policies and programmes in Botswana revealed that the National Energy Policy was formulated without involvement of women as a major stakeholder group, the government has moved to address gender equity, at least in its household energy supply policies (ENERGIA, 2007).

For one thing, women have been shown to respond differently from men to incentives and options for sustainable energy consumption patterns. In Europe, for example, recent studies have shown that single men directly or indirectly use up to 22% more energy than single women, and women have been found to be more receptive than men to energy conservation efforts and more willing to change their everyday behaviour to save energy (equalclimate.org).

At the same time, since in many low- and middle-income countries women are the primary energy managers in households and communities, involving women in the various steps of the energy value chain can expand both the scale and the quality of sustainable energy initiatives.

Women's involvement in the design of sustainable energy solutions, for instance, can help to ensure that solutions are tailored to women's needs, and women's engagement in distribution and marketing can help to encourage the use of sustainable energy services by providing other women with comfortable spaces within which to learn about technologies and discuss their particular concerns (Gill et al, 2012).

Furthermore, it has been shown that taking women's needs into account as a key variable in energy interventions makes it more likely that energy will have a significant impact on household and community poverty and on gender equality. Thus where energy interventions address women's equal participation, the potential for benefits is much higher for all (ENERGIA/DfID, 2006).

Despite these facts, women remain marginalized from decision-making processes in relation to energy, and gender-sensitive energy projects and research, such as those mentioned in the examples throughout this Note, are still the exception rather than the rule (ENERGIA/DfID, 2006). In developed countries, the share of female employees in the energy industry is estimated at only 20%, most working in non-technical fields such as administration and public relations, and worldwide women account for only 9% of the construction workforce and make up only 12% of engineers (ILO, 2007).

Worldwide, women occupy around 19% of all ministerial posts, but only 7% of these are in environment, natural resources and energy, and a mere 3% are in science and technology (International Parliamentary Union, 2011; UN Women, 2010). At the same time, fewer women than men pursue training in science, technology, engineering or mathematics (STEM) - fields that provide the necessary skills for accessing many green jobs and contributing to innovation and technology development.

For instance, while women account for more than half of university graduates in several OECD countries, they receive only 30% of tertiary degrees granted in science and engineering fields, and women account for only 25% of researchers in most OECD countries.

Women in the United States of America currently earn 41% of PhD's in STEM fields, but make up only 28% of tenure-track faculty in those fields.

Meanwhile 74% of teen girls are interested in the STEM subjects, but are not necessarily choosing STEM careers as their first choice. One possible reason for this is the need for greater exposure, education, and experience in these fields (OECD, 2006; whitehouse.gov, 2011; Modi et al, 2012).

As a consequence, the fora in which energy issues are identified, and potential solutions proposed, tend to have an inadvertent male bias. There is, therefore, a significant need for policy makers, donors and international development organizations to engage women directly in policy making, project design and implementation of energy strategies, policies and programmes, as well as to develop gender-responsive policy frameworks that take women's needs into account.

That said, efforts to mainstream gender in energy policies, programmes and projects have made headway in raising awareness among the international development community, including the UN. Not only the mandate and imperative of achieving gender equality and women's empowerment but also the economic rationale and benefits of gender mainstreaming have been understood to a certain extent. Gender aspects are more frequently incorporated in the development and implementation of projects and programmes.

However, challenges remain as has been discussed, particularly in translating the progress that has been made into global, national, and local sustainable energy policies and activities on the ground that incorporate the gender dimensions.

Green employment opportunities

- Energy access and consequent access to technologies can free up women's time, improve the productivity of their work and allow them to engage in income-generating activities.
- Barriers, such as lack of access to credit and training, limit the possibilities for women to develop and use energy-based technologies.
- Policymakers need to recognize the potential of women in the energy sector, as well as the value of their work, in order to design gender-equitable energy policies and legal frameworks that support green employment creation.

Access to sustainable energy can provide women with green employment opportunities by freeing up their time, enhancing their productivity and unleashing new economic potential (UNIDO, 2011).

Provision of lighting, for example, extends the working day and thereby the time available for engaging in income-generating activities for women who often face substantial time constraints due to domestic work obligations.

The Multifunctional Platform, initially set up in Mali but replicated in a number of countries, is an example of how energy supply can succeed in significantly reducing the time burdens of women and allowing them to earn higher incomes. With a simple diesel engine, the platform can power a variety of tools such as cereal mills, battery chargers, pumps, welding and carpentry equipment, and generate electricity for lighting, refrigeration, and water distribution.

Access to these services substantially reduces the time women spend daily on chores, allows them to work more productively and, at the same time, offers women who own or operate the platform income-generating opportunities and management experience. Results from initial impact reports in Mali show that the Multifunctional Platform has contributed to increasing skill development, economic empowerment, employment opportunities, food security, educational enrolment, and literacy rates for women and their children (un.org/womenwatch).

The successes of The Multifunctional Platform may be replicated with sustainable energy solutions that will bring about even more benefits due to lower fuel costs (from application of energy efficiency and renewable energy), as well as enhanced overall social, economic and environmental sustainability. An example is the Solar Electric Light Fund's (SELF) Solar Market Gardens in Benin that use solar-powered drip irrigation systems to help women farmers in remote, arid regions grow crops during the dry season. With drip irrigation – a proven efficient and labour-saving technology that delivers water directly to plant roots and facilitates simple and uniform fertilizer application – farmers can achieve higher yields over larger areas with less water and labour. The initiative reduces greenhouse gas emissions while allowing women farmers to increase their income and improve food security for their families. The higher income levels have been shown to help pay for school fees and medical treatment, among other expenditures (self.org).

Evaluations from South Africa and Guatemala show that electrification has resulted in a 9% increase in female employment, with no comparable increase in male employment, and in Nicaragua electricity has increased the propensity of rural women to work outside the home by about 23% while having no effects on male labour force participation (Dinkelman, Forthcoming; Grogan & Sadanand, 2009; Grogan & Sadanand, 2011).

At the same time, access to energy-based technologies – such as low-cost domestic appliances, power water wells, drip irrigation systems and labour saving technologies for agricultural production and post-production like grinding and milling – enhances labour productivity and increases the time available for engaging in productive activities outside the household.

With access to such technologies women can increase their incomes and young girls, previously burdened with labour-intensive chores, can attend primary school (SELF, 2003).

However, due to social and legal restrictions on women's rights, including rights to own land, borrow money and make their own economic decisions, women are often ineligible for financing for new equipment that can improve the productivity of their labour (ETC/ENERGIA, 2011).

Further, women's economic contribution to the energy sector, such as fuel collection, is unpaid, unrecognized and undervalued; and women's patterns of energy service use are often not reflected in national statistics. As a result, energy planners are unaware of women's energy demands, and less attention is paid to technology development and investments aimed at improving women's work in comparison to men's (ENERGIA, 2007).

It is, therefore, critical that policy makers address legal and regulatory frameworks that prevent women from accessing credit and other financial services, and that recognize the role of women in the energy sector – in part by collecting and using gender-disaggregated data to establish the specific energy use patterns of women and men – and their potential for creating and benefiting from green employment.

In Mozambique, UNIDO has implemented the UN Joint Programme on Environmental Mainstreaming and Adaption to Climate Change together with the Food and Agriculture Organization of the United Nations (FAO), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), United Nations Human Settlements Programme (UN-HABITAT) and World Food Programme (WFP). Through the programme, renewable energy systems were installed for water supply, irrigation and electricity supply in seven different communities. Additionally, the capacity of community members was built through training on various issues, including the maintenance of the installed renewable energy systems. By providing marginalized communities with renewable energies and clean, accessible drinking water, women's lives were transformed by lessening the burden of fetching unsafe water and increasing opportunities for income generation and other pursuits. Due to the project's very positive impact, the Government of Mozambique and the National Energy Fund (FUNAE) have replicated its best practices and have rolled out the initiative in other rural communities (mdgfund.org).

Sustainable entrepreneurship

- Energy access provides opportunities for women entrepreneurs to make an income and enhance their social status by creating and disseminating sustainable energy solutions.

- Barriers, such as lack of training and education, and social norms that view modern energy technology businesses as "men's work", limit women's opportunities to engage in sustainable energy entrepreneurship.

- Tasks ahead include enhancing women's leadership and participation in the energy sector, developing targeted training programmes for women, and improving women's access to credit.

Energy access provides opportunities for women's entrepreneurship. As mentioned, women play a critical role in energy provision and consumption within households and communities in many countries, and therefore possess valuable knowledge relevant to sustainable energy solutions.

Moreover, women can draw on their natural circles of family, friends and community for customers, which has been shown to be an effective way of distributing solar technology to rural households (solarsister.org). Thus women can become key actors in creating and disseminating sustainable energy solutions, allowing them to make an income and giving them the opportunity to take part in and drive sustainable development of their local communities, thereby enhancing their economic autonomy and social status.

This is confirmed by a recent UNDP report, which concluded that the greatest potential for poverty alleviation comes from combining energy service delivery with efforts to support income generation through information services, training in business development skills and access to capital and markets, including support for the active engagement of women in the energy sector through new enterprises, entrepreneurial activities and sustainable resource management (UNDP, 2012).

Women entrepreneurs do, however, face barriers such as lack of education and training on business management and technical aspects of sustainable energy technology, as well as lack of access to credit and other financial services necessary to start up sustainable energy businesses. Moreover, in some countries modern energy technology businesses are viewed as "men's work", while women are expected to operate more traditional, and less profitable, biomass-based micro-enterprises (Danielsen, 2012).There is, therefore, a need to develop targeted training programmes for women in the energy sector, as well as to improve women's access to microcredit and loans.

The perceptions of women's work should be changed, which can be facilitated, for example, by strengthening women's leadership and participation in the energy sector. More women in formal energy institutions can act as role models and result in a positive change of attitude towards women in other social institutions such as households and communities (Danielsen, 2012).

Improving health through modern sustainable energy

- Provision of modern sustainable energy services to health facilities, especially in rural areas, can improve women's health.

- Clean cook stoves that reduce indoor air pollution (from cooking with inefficient and dirty fuel sources, such as traditional biomass) also contribute to the health and safety of women and their families.

- Awareness-raising and resource mobilization are necessary to finance sustainable electrification of health facilities and to inform women and communities about clean and efficient cooking technologies.

Access to modern energy can significantly support the functioning of health clinics in rural areas, which is crucial for improving women's health, in particular sexual and reproductive health, as well as the diagnosis and treatment of certain infectious and non-communicable diseases, such as tuberculosis and breast cancer, which are often undetected in women. A recent World Health Organization (WHO) survey of available data in 11 Sub-Saharan countries indicated that about a quarter of clinics had no electricity, and less than one-third had what could be called "reliable" electricity (Rohani et al., in press). Anecdotally, health workers in clinics that have been electrified – even with very small PV systems – have reported results such as fewer infections, fewer delays in providing life-saving care, more timely blood-transfusions, and more successful child deliveries (Mills, 2012). Resources must be mobilized to achieve the target proposed in the Global Thematic Consultation on Energy of providing modern energy services to 400,000 primary healthcare service providers in developing countries. An essential

The SEED Awards for Entrepreneurship in Sustainable Development is an annual scheme designed to find the most promising and innovative social and environmental entrepreneurs in countries with developing and emerging economies. For 2013, UN WOMEN and UNIDO have partnered to sponsor the SEED Gender Equality Awards.

This year, two enterprises run or owned by women, and which prioritize gender equality and/or women's empowerment as core objectives, will be selected. They will not only receive a monetary prize, but also expert advice from the international law firm Hogan Lovells, which has an established pro bono practice advising women entrepreneurs across the world. Through such sponsorships, UN WOMEN and UNIDO offer another modality to promote gender equality and women's empowerment in sustainable development – and potentially sustainable energy – initiatives (unwomen.org; seedinit.org).

In a similar vein, the U.S. Clean Energy Education & Empowerment (C3E) Program is managing the U.S. C3E Awards, which intends to recognize rising women in clean energy who have demonstrated leadership and high achievement, and have the potential to contribute a great deal more over the course of their careers (cleanenergyministerial.org).

A pilot project in West Bengal has helped women to become solar entrepreneurs by providing them with training to manage and operate solar lantern charging stations. Women can charge lanterns, for example, and then rent them out to customers such as fishermen needing light on their boats at night. The project began in response to surveys about the impact of solar photovoltaic systems (PV) in West Bengal that showed a huge demand for service facilities, but a gap in their provision because the technically skilled male youth often migrated to the cities.

At the same time, the survey revealed that women were interested in understanding the technical aspects of PV systems. Thus the project trained women on technical aspects of PVs and troubleshooting; entrepreneurial issues such as need assessment, market research, and managing micro-enterprises; and institutional issues like networking, among others. As a result of the training, women have reported feeling empowered to become skilled solar entrepreneurs who can contribute to household income and wellbeing. In the project's aftermath many of the women have engaged in self-driven initiatives involving further training and formation of self-help groups. This has brought them in contact with other potential women entrepreneurs and helped them to tap a wider range of resources, including government schemes for women entrepreneurship development (teriin.org).

step in this regard is to raise awareness of the health benefits from increased access to modern energy services, and to establish public-private partnerships that combine support from national and international health and energy budgets with private sector investment.

Access to modern energy can also have a positive impact on women's health by supplying clean cooking solutions that can reduce indoor air pollution from burning wood, animal dung and other biofuel. The adoption of clean cook stoves using clean and renewable fuel is expected to prevent the majority of deaths attributable to indoor air pollution, which mainly affect women and children (IEA, 2011).

At the same time, dissemination of clean cook stoves can reduce environmental damage caused by depletion of forests and land degradation due to use of biomass fuels and charcoal production, as well as their negative consequences for agrobiodiversity and agricultural productivity (cleancookstoves.org).

Because of their responsibilities as cooks and managers of households in many countries, women's involvement in the design, marketing, and sales of clean cooking solutions is critical for achieving the goal of reducing by half the number of premature deaths due to indoor and outdoor air pollution proposed in the Global Thematic Consultation on Energy.

However, women in many rural communities lack information and capacity about clean, efficient, cooking technologies that could facilitate changing cooking habits (IISD, 2013).

Moreover, power relations within households can be a barrier to the dissemination of clean cooking facilities because investment in cooking technologies – that first and foremost benefit women – might not necessarily be first priority for male decision makers (Danielsen, 2012).

In order to produce health benefits from modern sustainable energy services, it is therefore critical to build the awareness and capacities of women and men – the entire community – about clean energy technologies.

The Solar Sisters project in Sub-Saharan Africa promotes women's entrepreneurship by providing women with a start-up kit to equip them to operate, maintain and sell solar technology, such as solar lamps, in their communities. Evaluations reveal multiple benefits of the initiative: The solar business allows the entrepreneurs to double their household income; the income generated by the entrepreneurs is reinvested 90% back into their families, thus providing benefits for the next generation; and the women who buy the solar lamps can reduce household expenses by 30% when the solar energy replaces expensive kerosene (solarsister.org).

policy recommendations and way forward

Women can and must play an active role in the planning, producing, supplying and managing of energy. There can be no energy for all that is sustainable unless we tap into the energy, engagement and expertise of women.

Lakshmi Puri
Acting Head of UN Women, April 2013

The preceding sections have emphasized how women are an important part of bringing about sustainable solutions for achieving energy access for all and increasing energy efficiency and renewables.

It has been highlighted that in order to achieve internationally agreed development goals, as well as the targets of the Future We Want and the SE4ALL initiative, gender-responsive policy frameworks should be developed that take women's needs into account; leverage women's participation and leadership in the design of energy strategies, policies and programmes; expand training and education of women on sustainable energy and entrepreneurship; and raise awareness in order to mobilize resources to finance sustainable energy technologies, among others.

Suggested below are specific action points for UN Women and UNIDO staff, both at headquarters and in regional and country offices, to engage with government policymaking and planning on sustainable energy; support civil society organizations working on sustainable energy and gender; and design and implement sustainable energy programmes and projects.

In Burkina Faso, a UNIDO project currently working with the traditional beer-brewing sector predominantly led by women, is installing over 1000 energy-efficient cook stoves. Additionally, the programme will establish a credit line to enable women to purchase the energy-efficient cook stoves. The financing will be provided by a regional African bank and implemented by a local financial institution.

UNIDO's intervention in Burkina Faso also focuses on developing four clusters of women beer brewers to generate collective gains and facilitate their integration into the local value chain. In addition to increased productivity and energy efficiency, the project is expected to improve the health and environmental conditions for over 1,600 women (thegef.org).

Energy governance and policy making

- Ensure that gender issues are mainstreamed in governance and decision-making processes related to policy development, implementation and monitoring, service delivery and financing of sustainable energy.
- Promote increasing women's participation and leadership in energy governance and energy institutions at the local and national levels.
- Facilitate inter-sectoral dialogues and consultations among key actors from government, civil society, the private sector and community leaders to discuss gender equality and women's needs and priorities as related to sustainable energy.
- Promote gender equity in planning, designing, producing, supplying, and managing sustainable energy solutions.

- Ensure that policies, programmes, and projects equitably valorize women's and men's time and labour burdens and expenditures.
- Recognize women as independent users of energy solutions and enable them to benefit from energy access, taking into consideration the challenges of land ownership/rights, access to credit, and social constraints.
- Support gender-responsive budgeting (GRB) in government planning and programming. GRB ensures that general budgets are planned, approved, executive, monitored, and audited in a gender-sensitive manner. Mainstreaming gender into national budgeting processes is a long-term process that requires a committed effort from the government and senior managers.

Capacity development

- Build capacity of women to work in the clean energy sector as policy makers, designers, managers, and suppliers of sustainable energy solutions.
- Build capacity of both women and men to engage with gender issues in energy solutions. This involves training of female and male energy practitioners, researchers and policymakers who need tools to engage effectively with gender.
- Create a "critical mass" of qualified women to have an impact on the gender balance in energy institutions. This can be done by supporting women's career development through training courses and mentorship programmes. Also important will be encouraging commitment from energy institutions to commit to gender objectives in their management.

- Support linkages and networks among women researchers, policymakers, and grassroots organizations as a means for generating self-confidence and increasing visibility at every level.

- Increase women's educational opportunities and professional development in science, technology, engineering and mathematics (STEM) fields. This may be achieved through scholarships for university and technical education. Introducing technical job opportunities to female primary and secondary school students can also encourage women to enter the energy field.

- Build capacity for local women to learn about, install, operate, and maintain sustainable energy solutions in their communities.

- Support women's role as energy managers and ensure that they are empowered to become energy entrepreneurs. This involves training women on technical aspects of sustainable energy technologies as well as building their entrepreneurial skills and access to capital and markets in the energy sector. Clearly communicating the benefits of sustainable energy for productive uses, and the potential implications for income generation, will also be important to encourage entrepreneurship.

- Sensitize project counterparts to ensure that all project partners are aware of the associated gender implications and opportunities. This will facilitate gender mainstreaming within a project at all levels.

- Create clear and functional technical guidelines and assistance for staff with energy expertise to facilitate gender-aware projects, taking care that gender-related considerations and requirements do not overpower the core objectives of the projects and programmes.

- Develop capacity of civil society to work on gender issues in energy. This will raise awareness among the local population, as well as ensure ownership. A strong awareness of gender-energy issues at the grassroots level can hold local enterprises, donors, and governments accountable.

In Ghana, UN Women supports projects carried out by ABANTU for Development and the Coalition for Gender Action on Climate Change for Equality and Sustainability that seek to improve women's health and cooking conditions, and to limit the use of trees for fuel. Women are provided with modern cook stoves fuelled by sustainable liquefied petroleum gas (LPG) and trained in cleaner cooking. Even though women's groups in some of the participating villages initially expressed scepticism, they report that their involvement in all stages of design and implementation has facilitated ownership and widespread use of the gas stoves as well as enhanced their incomes (unwomen.org).

The UN Secretary-General's SE4ALL initiative has identified the nexus of energy and health services as they pertain to women's health as a high-impact opportunity for concerted action to provide sustainable, life-saving energy solutions. UN Women will be working with the World Health Organization and the United Nations Foundation to increase the access to and availability of modern energy sources for women's health facilities and services in low- and middle-income countries (unwomen.org)

Evaluation and data

- Establish and implement accountability measures and indicators to ensure gender equity and women's agency in the energy sector.

- Support generation, collection and use of gender-disaggregated data on energy use, energy sector employment and impacts of energy development. This will serve as a baseline for evaluation purposes, and be instrumental in defining gender-sensitive targets and indicators. It will also facilitate understanding of gender-energy linkages. Both quantitative and qualitative data will be needed to capture all social, economic, and environmental aspects.

- Support data gathering to understand women's practical needs and to help energy projects identify how women can be instrumental in making energy projects more effective, for example, by marketing energy solutions or being involved in technology design. This involves gathering data about the gender division of labour and women's access to and control over resources and benefits related to energy.

Financing

- Ensure adequate financing for sustainable energy projects and programmes, as well as for training of women energy practitioners, researchers, policymakers and entrepreneurs.

- This involves ensuring that national governments allocate sufficient funds to achieve sustainable energy targets, as well as mobilizing additional investment, drawing from all sources and forms of investment finance.

Below are mentioned examples of such sources:

- Funds can be provided from government budgets and state-owned utilities and national electrification programmes for urban and rural areas.

- Multilateral and bilateral development sources such as the World Bank and the regional development banks support energy access projects through instruments such as grants, concessional loans and investment guarantees. Such financing is usually accompanied by technical assistance, such as policy and development advice to ensure efficient use of the provided funds. This would be an opportunity to mainstream gender concerns into these multilateral and bilateral funding mechanisms and their technical support priorities.

- Private sector sources including equity and debt financing, among others. To realize the potential for stepping up the proportional involvement of the private sector, it is critical to support national governments to adopt strong governance and regulatory frameworks and to investment in internal capacity building. Gains for the private sector include access to new markets, a broader competent workforce, and improved basis for developing sustainable solutions. Emphasizing corporate social responsibility and developing public-

Recognizing the importance of engaging women in spreading clean cooking solutions, the Global Alliance for Clean Cookstoves has included the empowerment of women as an explicit goal in its mission to ensure the universal adoption of clean cook stoves and fuels by 2020. As members of the Alliance, UNIDO and UN Women are incorporating clean cook stove initiatives into their country programmes and raising global awareness about women's time and energy use and the health impacts for women and their families (cleancookstoves.org).

With support from UN Women and the Government of India, the Barefoot College of India (BCI) has helped elderly women from 28 countries to become leaders in creating alternative energy solutions for their remote, rural villages by providing training in installing, repairing and maintaining solar lighting. The training enables women to electrify households in their villages with solar lighting units and to play a key role in maintaining and replicating solar technology in their communities. As a result of the BCI training, women have built around 10,000 household solar lighting systems in remote villages globally and saved several thousands of litres of diesel and kerosene from polluting the atmosphere. The project shows how women can be catalysts for adaptive technology in rural areas and key players in developing self-sufficient, solar-electrified villages (barefootcollege.org).

private partnerships might be effective in promoting sustainable energy projects with gender dimensions. Here the UN Women / Global COMPACT Women Empowerment Principles, such as establishing high-level corporate leadership for gender equality (1), promoting education, training and professional development for women (4) and implementing enterprise development, supply chain and marketing practices that empower women (5), would be key (weprinciples.org).

- The SE4LL Multi-partner Trust Fund provides funding for country-level catalytic activities related to technical assistance and capacity building to accelerate country action on activities to achieve the three objectives of the SE4ALL initiative. This provides a crucial opportunity for UNIDO and UN Women to promote gender approaches and energy programming.

- Norway's International Energy and Climate Partnership – Energy+ supports developing countries' efforts to transform the energy sector to achieve universal access to sustainable energy and decrease greenhouse gas emissions by scaling-up access to renewable energy sources and increased energy efficiency.

- Carbon finance from the Clean Development Mechanism (CDM) and voluntary carbon programmes offer a possible source of income for energy access projects that also help reduce greenhouse-gas emissions.

- End-user finance – possibly operated through local banks and microfinance arrangements – can help overcome barriers of initial costs of gaining access to sustainable energy services. UNDP and UNEP have been particularly active in helping developing schemes for end-user finance.

key messages

The aim of this Note has been to provide guidance for UN programming and work with policy makers around sustainable energy that integrates gender dimensions. In seeking to create a momentum for strengthening gender equality as one of the critical pathways for a successful transition to sustainable energy for all by 2030 and for reaching the objectives of the Future We Want, a number of key messages have been highlighted:

- The transition to sustainable energy creates benefits and opportunities for both women and men, such as green job generation, market opportunities, and better health conditions. Women play an important role in the transition to sustainable energy and in ensuring universal energy access. Women-led initiatives and projects are clearly successful in the new energy space and women are often in the driver's seat of sustainable energy solutions at the community level.

- It is essential to address the range of barriers that women face in benefiting from and participating in sustainable energy solutions. This involves ensuring equal representation in decision-making processes in relation to energy; ensuring equal rights to own land, borrow money and make economic decisions; promoting education and training of women on business management and sustainable energy technology; and promoting equal power relations within households and communities, among others.

- It is critical to develop gender-responsive policy frameworks that take women's needs and capabilities into account in relation to sustainable energy. Efforts to mainstream gender in energy policies, programmes and projects have been effective in raising awareness among the international development community, including the UN.

UN Women and UNIDO have a key role to play in ensuring the full engagement, participation and representation of women and men, girls and boys, in sustainable energy for all. It is critical that staff support the integration of gender elements by engaging with government policymaking and planning on sustainable energy; supporting civil society organizations working on sustainable energy and gender; and designing and implementing sustainable energy programmes and projects.

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