

**NATIONAL REPORT
ON INTEGRATION
OF THE “GREEN GROWTH” TOOLS
IN THE REPUBLIC OF KAZAKHSTAN**

**НАЦИОНАЛЬНЫЙ ОТЧЕТ
ПО ИСПОЛЬЗОВАНИЮ
ИНСТРУМЕНТОВ “ЗЕЛЕННОГО РОСТА”
В РЕСПУБЛИКЕ КАЗАХСТАН**



BBC 65.9

B 64

“National report on integration of the “Green Growth” tools in the Republic of Kazakhstan” / under the ed. of Prof. Bakhyt Yessekina, Almaty, 2010 — 128 p.

ISBN 978-601-78-243-1

This report has been developed by the NESDCA “The Network of Experts for Sustainable Development of Central Asia» within the framework of ESCAP Pilot Project Application and integration of the “Green Growth” tools and policies into the strategic planning system of the Republic of Kazakhstan” with the support of the governmental bodies of the Republic of Kazakhstan and Korean International Cooperation Agency (KOICA).

The purpose of this publication is to inform the public about the “Green Growth” Concept, which was originally presented in 2005 in Seoul at the 5th Conference of Ministers of Environment of the Asia-Pacific region. The Report contains a methodology of the Concept, an assessment of eco-efficiency of national economy, an overview of the use of the “Green Growth” principal tools in Kazakhstan and recommendations on introduction of the “Green Growth” principles into the strategic planning system



УДК 338
ББК 65.9
В 64

«Национальный отчет по использованию инструментов “Зеленого роста” в Республике Казахстан» /Под ред. Б.К.Есекиной. - Алматы, 2010 - 128 с.

ISBN 978-601-278-243-1

Настоящий отчет подготовлен Общественным Объединением «Сеть экспертов устойчивого развития Центральной Азии» в рамках пилотного проекта ЭСКАТО на тему «Возможности использования и внедрения механизмов зеленого роста в систему стратегического планирования Республики Казахстан» при поддержке государственных органов Республики Казахстан и Корейского международного агентства по развитию (KOICA).

Целью данной публикации является информирование казахстанской общественности о концепции «Зеленый рост», впервые презентованной в 2005 г. в г. Сеуле на 5-ой Конференции Министров охраны окружающей среды Азиатско-Тихоокеанского региона. В отчёте представлены методология концепции «Зеленый рост», оценка эко-эффективности национальной экономики, анализ использования инструментов «зеленого роста» в Казахстане, предложены рекомендации по внедрению принципов «зеленого роста» в систему стратегического планирования.

При использовании материалов отчета ссылка на данную публикацию обязательна.

© NESDCA 2010

FOREWORD



“ Two years ago in the heart of Eurasia we have begun an important conversation on problems and prospects of the global and national economy.

Despite the difficult period of global recession we searched for decisions to overcome this crisis .

...The recent dramatic accident in the Gulf of Mexico was a kind of coming backward consequences that will appear constantly in case

of pursuing merely an economic growth and ignoring environmental and climate issues.

Today the world needs new, ecologically safe technologies, rapid exchange and wider usage of renewable energy sources.

Therefore, during the 66-th Session of the United Nations Economic and Social Commission of Asia and Pacific the Republic of Kazakhstan has initiated the idea of new economic approach named as the "Green Bridge" between the Europe and Asia. This should underpin the link between the processes in providing ecological safety and in forming the green economy”.

**Exert from the Speech of the President of the Republic of Kazakhstan
HE Nursultan Nazarbayev on the Third Astana Economic Forum,
1.07.2010, Astana, Republic of Kazakhstan**





FOREWORD

The opportunity is now for Asia Pacific to emerge as a leader: in the global economy, in the realm of social progress, and in safeguarding our global environment. Asia Pacific's development relies on our ability to achieve three balances on our shared development journey.

First, balance between our economic growth, our social needs and the limits of the earth: the three interconnected pillars of development;

Second, balance between the individual and the collective; how to transform the initiative of each into the common good for all;

Third, balance between the power of the market and the power of the state: the global financial crisis of the past two years underscores the limits of relying solely on the market to correct itself and the dangers of over-regulation by the state.

ESCAP has been a pioneer in developing the green growth agenda and other environmentally sustainable economic agendas and in promoting its use in the region. Cambodia has adopted a national Green Growth Roadmap, Kazakhstan has established an inter-ministry coordination mechanism to promote Green Growth and a growing number of Member Countries are exploring how to green their development efforts. ESCAP is bringing governments and businesses together for the first time in meetings such as the Asia Pacific Business Forum on low carbon economy held last month in Kunming China, to adopt forward thinking practices and policies – these are critical steps at the very forefront of Asia-Pacific's green future.

**Exerts from the speeches of Dr. Noeleen Heyzer,
UN Under-Secretary-General and Executive Secretary of ESCAP
at the 66 Commission Session,
17.05.2010, Incheon, Republic of Korea**





OPENING ADDRESS

Having signed the Rio-92 Declaration, Johannesburg Declaration (2002) and having ratified twenty five International Conventions in the field of environmental protection and Kyoto protocol the Republic of Kazakhstan has become an active participant of global processes of sustainable development both in Europe and in Asia.

Currently Kazakhstan has practically achieved the three of the Millennium Development Goals (MDGs)- poverty reduction, access to primary education and women's rights promotion. As far as achievement of the 7th MD Goal is concerned – ensuring ecological sustainability - a number of key documents have been adopted in Kazakhstan. These are the Strategy of Kazakhstan Development till 2030, Strategic Development Plan of the Republic of Kazakhstan till 2020, Environmental Code of the Republic of Kazakhstan, the Concept of Environmental Safety of the Republic of Kazakhstan till 2015 and the Concept of Transition of the Republic of Kazakhstan to Sustainable Development for 2007-2024. The Council on Sustainable Development was set under the Government of the Republic of Kazakhstan in 2005 and is successfully functioning now.

To ensure continuous progress of the country towards a sustainable development in 2009 a system of strategic planning was introduced into the sphere of public administration, which includes a hierarchy of long-term and mid-term plans with due regard to ecological-social and economic factors.

Therefore, in order to introduce principles of “Green Growth” that ensure economic growth without threatening environmental safety, rather a developed institutional foundation has been set up in Kazakhstan. However, integration of the aforementioned principles into the process of strategic planning and forecasting requires a consistent work to adopt a whole complex of system measures. Consequently the first National Report implemented by an Interagency Task Force with the expert support of national and international researchers within the framework of the ESCAP Pilot Project seems to be quite timely given the oncoming Global UN Summit dedicated to the MDG achievement. I would like to express my hope that the results and recommendations of the given Report will be successfully used by politicians, scientists and experts in their striving to promote the progress of Kazakhstan and other countries towards sustainable development.

**Advisor to the President of the Republic of Kazakhstan
Chairman of the Interagency Task Force within the
ESCAP Pilot Project**

B.Sultanov





INTERAGENCY TASK FORCE

Bakhyt Sultanov - Adviser to the President of the Republic of Kazakhstan, Chairman of the Interagency Task Force

Eldana Sadvakasova - Vice-minister of the Ministry of Environment Protection of the Republic of Kazakhstan

Bakhyt Yessekina - Project Coordinator, Director of the Higher Party School of the PDP “Nur Otan”, Professor of Economics

Kuralai Abisheva - Consultant of the Department of Social-economic Monitoring within the Administration of the President of the Republic of Kazakhstan

Alexander Bragin - Director of the Department of Legal Issues and International Cooperation within the Ministry of Environment of the Republic of Kazakhstan

Nailya Nurlanova - Deputy director of the Institute of Economy under the Science Committee of the Ministry of Education and Science of the Republic of Kazakhstan, Professor of Economics

Svetlana Gamarnik - Director of the Department of Strategic Planning within the Ministry of Economic Development and Trade of the Republic of Kazakhstan

Aliya Shalabekova - Director of the Department of Strategic Planning within the Agency of the Republic of Kazakhstan on Land Resources, PhD in Economics

Kairat Ustemirov - Director of the Administration on Forestry and Specially Protected Territories under the Committee of Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan

Maira Amirkhanova - Director of the Administration on Social Statistics under the Department of Social and Demographic Statistics of the Statistics Agency of the Republic of Kazakhstan, PhD in Economics

Saltanat Zhumabekova - Director of the “Network of Experts for Sustainable Development of Central Asia” (NESDCA), PhD in Economics





EXPERT GROUP

Dr. Renat Perelet - Academician of the Russian Ecological Academy, Member of the Higher Ecological Council of the State Duma of the Russian Federation, Senior expert at the Institute of System Analysis of the Russian Academy of Science

Dr. Rae Kwon Chung - Director of the Environment and Sustainable Development Division, UNESCAP.

Dr. Aneta Nikolova - Environmental Affairs Officer, EDPS/EDD, UNESCAP.

Dr. Gulmira Ismagulova - Manager of the Department of Ecological-economic Problems of Nature Exploitation under the Institute of Economy of the Science Committee at the Ministry of Education and Science of the Republic of Kazakhstan, PhD in Economics

Bekbergen Kerei - Chief of the Department of Strategic Planning under the Department of Environmental Policy and Sustainable Development of the Ministry of Environment Protection of the Republic of Kazakhstan

Dr. Sholpan Sapargali - Manager of the Department of Development of Public-Private Partnership of the JSC "Regional Center of PPP of Karaganda Oblast", PhD in Economics

Dr. Bakhytgul Yeleusizova - Senior Researcher of the Academy of Public Administration under the President of Kazakhstan, PhD in Economics

Ms. Gulzhamal Isayeva - Expert of the "Network of Experts for Sustainable Development of Central Asia" (NESDCA)





LIST OF ABBREVIATIONS

APR	Asia and the Pacific Region
EU	European Union
GDP	Gross Domestic Product
OSCE	Organisation on Security and Cooperation in Europe
PES	Payments for Ecosystem Service
SD	Sustainable Development
SP	Sustainable Production
SRES	State Regional Electrostations
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
US	United States
WB	World Bank
WTO	World Trade Organisation





CONTENT

Foreword	3
Opening address	5
Interagency task force	6
Expert group	7
List of abbreviations	8
Content	9
Introduction	11
1. Methodological basics of “Green Growth”	12
1.1 Major “Green Growth” principles and instruments	13
1.2 Eco-efficiency: criteria and evaluation methods	16
2. Introduction of the “Green Growth” tools in the economy of Kazakhstan	21
2.1 Assessment of eco-efficiency of the national economy	22
2.2 Analysis of the “Green Growth” policies in strategic planning	31
3. Recommendations on introduction of the “Green Growth” principles	37
3.1 Green Growth principles into the system of strategic planning and taxation	38
3.2 Green business and infrastructure development	44
3.3 Introduction of sustainable production and consumption	50
Conclusion	57
Reference list	59
Annex	
Annex 1 Indicators of eco-efficiency of the Republic of Kazakhstan	61
Annex 2 Measures for renewable energy development	62
List of authors	64



Table 1	Groups of eco-efficiency indicators	23
Figures		
Figure 1	Scheme of the flows of natural resources, involved into economic activity	22
Figure 2	Assessment of eco-efficiency.....	23
Figure 3	GDP and an average annual population of the Republic of Kazakhstan	25
Figure 4	Power consumption and GDP power intensity for 2000-2008	26
Figure 5	Power consumption, per capita 2000-2008	27
Figure 6	Emission of greenhouse gases and carbon intensity for 2000-2008	28
Figure 7	Water consumption and water intensity for 2000-2008	28
Figure 8	Volume of toxic waste and its specific generation rate in 2001-2008	29
Figure 9	Specific weight of toxic waste accumulated on the balance of companies for 2001-2008, per capita	29
Figure 10	Specific weight of emission of the most common pollutants per GDP unit in 2000-2008	30
Figure 11	Specific weight of sulfur and nitric oxides emissions per GDP RK unit in 2000-2008	31
Figure 12	State planning system of the Republic of Kazakhstan	32
Figure 13	Forecasts of greenhouse gases emission in CO ² equiv in industrial sector of Kazakhstan	43
Figure 14	Key indicators of toxic waste in the Republic of Kazakhstan	52
Figure 15	The share of energy generated from biomass products and combustible waste (including secondary waste), within the total energy consumption.....	54
Figure 16	Energy efficiency in industry for 2004-2008	55
Figure 17	Price competitiveness of some of renewable energy sources	62
Box		
Box 1	«Decoupling effect»	25
Box 2	Sources of ionizing radiation	42
Box 3	Metal losses due to metallurgical conversion	51
Box 4	History of waste reclamation	52





INTRODUCTION

Global financial, energy and climatic crises proved it necessary to look for new models of economic growth oriented not only on sustainable development but on adequate consumption and an increase in material benefits.

Following the crisis impact many international organizations and institutions under the UN auspices boosted their research on quality of economic growth and search of innovative models ensuring harmonious development of the nature and a human being. One of these models is the “Green Growth” Concept that entails a qualitative change of the models of production and consumption, integration of «green» principles into the system of strategic planning and budgeting, ensuring environmentally friendly business and infrastructure.

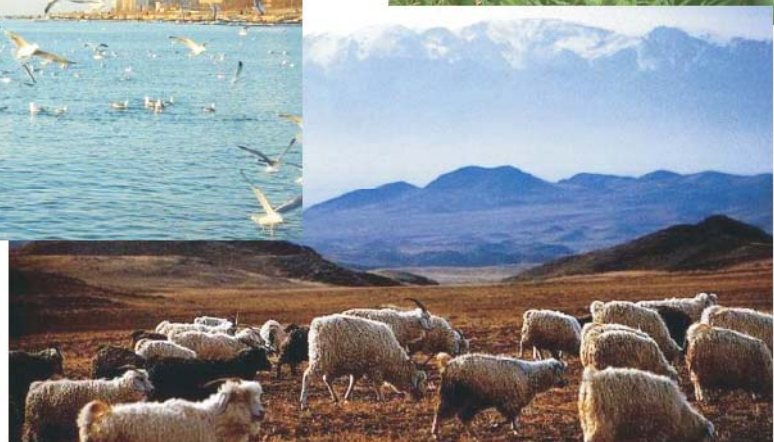
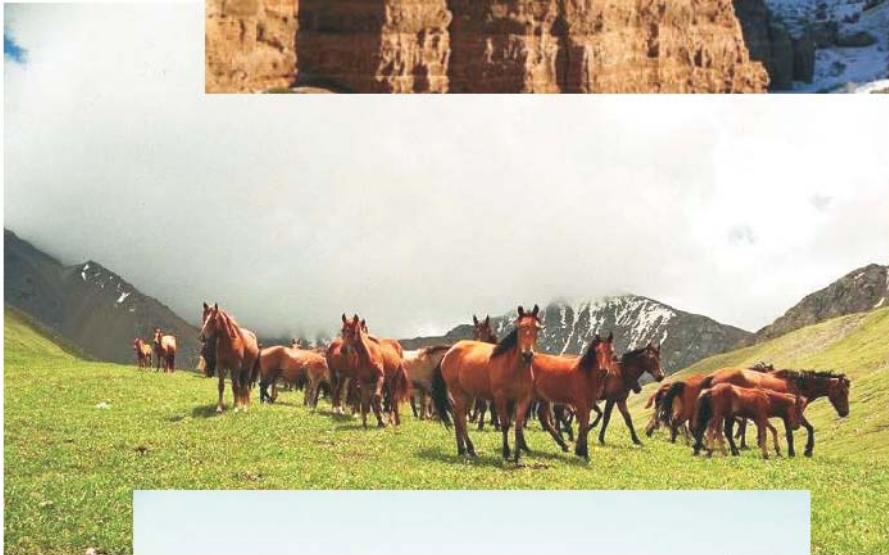
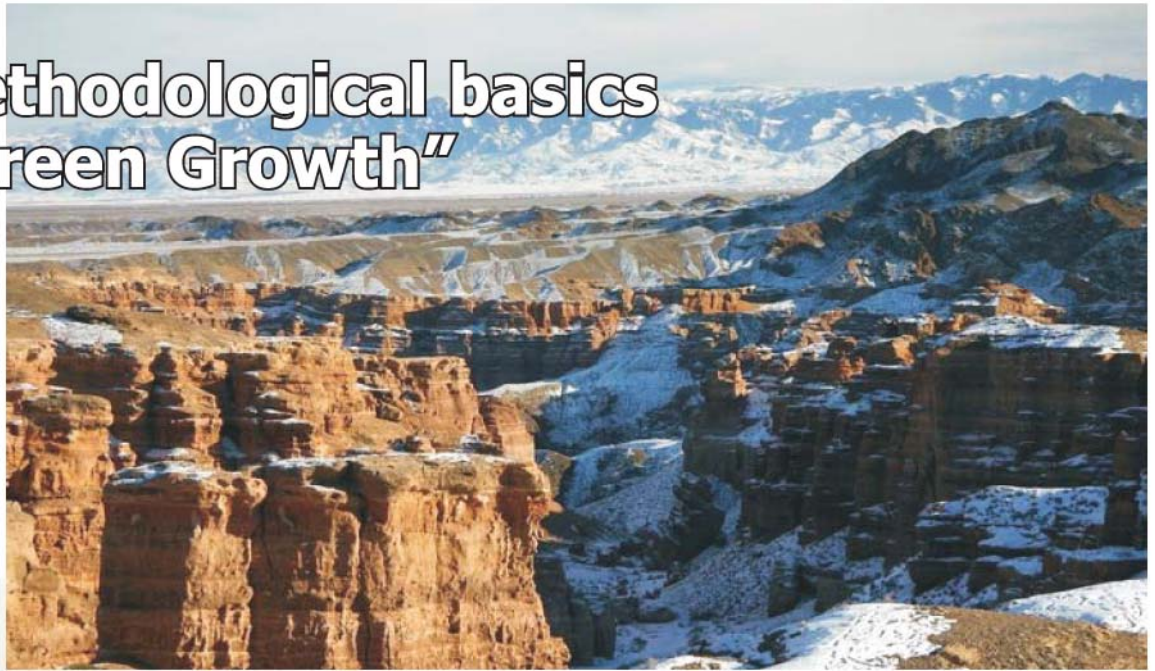
International experience proves that many developed countries use the “Green Growth” Concept as a transitional route to switching to sustainable development model. There are a number of preconditions for this concept in the Republic of Kazakhstan. Firstly, there is an up-to-date regulatory-legal basis that meets international standards in the field of sustainable development; secondly, strategic planning system has been implemented in the sphere of public administration, which is based on the use of sustainable development indicators; thirdly, National Program of Accelerated industrial-innovative development for 2010-2014 has been adopted, which is designed to perform economy restructuring and to reduce the share of mining sector.

Therefore, the National Report is of special topicality given the framework of contemporary search for effective approaches to achieve sustainability of economic system. It represents a review of basic approaches and principles of the “Green Growth” Concept, analysis of the use of its instruments in Kazakhstan, which also includes conclusions and recommendations to the Government of the Republic of Kazakhstan with regard to their integration into strategic planning processes.

The Project Expert Group expresses its gratitude to the Administration of the President of the Republic of Kazakhstan, ESCAP Environmental Department, Ministry of Economic Development and Trade, Ministry of Environmental Protection, Statistic Agency of the Republic of Kazakhstan, Ministry of Agriculture of the Republic of Kazakhstan for productive participation in the Project implementation and hopes that the information and conclusions of the Report will be used for the “Green Growth” promotion in the interests of the present and future generations of the country.



1. Methodological basics of "Green Growth"





1.1 Major “Green Growth” principles and instruments

The global financial crisis has clearly indicated instability of the current economic system and has signaled the global community the urgency of looking for an alternative model to achieve economic growth that reflects on the ecological safety factors. Therefore, the Concept of “Green Growth” put forward by the 5th Conference of the Ministers of Environmental Protection of Asian-Pacific regions is one of the approaches ensuring economic development balance.

The Concept is based on the following four principles:

- 🌱 eco-efficiency principle, promoting maximization of useful characteristics of goods and services and simultaneous minimization of impact on environment in the course of the entire product life cycle;
- 🌱 resource saving principle, stipulating managerial decision-making given the necessity of conservation of natural resources.
- 🌱 unity principle, stipulating coordinated actions of all the subjects of economic relations of the given process;
- 🌱 inter-sector principle involving of representatives of different community sectors into decision-making process.

Based on these principles one could conclude that the “Green Growth” Concept is the first stage of transition to sustainable development both at the country and global levels.

According to the Concept the aforementioned principles are integrated into the strategic planning process of development of the national economies with the help of the use of the following mechanisms:

1. budgeting system reform through introduction of ecological taxes;
2. introduction of models of sustainable production and consumption;
3. “green business” development;
4. formation of sustainable infrastructure.

Implementation of the first policy – budgeting system reforming through introduction of ecological taxes - makes it possible to shift tax burden from traditional activity types to environment polluting industries. This measure covering the interests of all the participants of economic relations from users to public institutions will allow minimizing environmental burden and at the same time will ensure economic growth within the norms set by the strategic plan.

The key purpose of eco-taxation is redistribution of the tax burden from socially-important activity (for example, population employment) to the hazardous for environment activity. Apart from that, budget redistribution, could increase investments into development of ecologically safe types of activity, for example, into improvement of transport infrastructure and development of the public transportation system, to reduce air pollution in big cities. The goal is not to increase tax





burden but to undertake effective measures to protect environment and to conserve natural capital for future generations.

Eco-taxes are the most effective instrument of putting together effective social and ecology-oriented fiscal system, the main principles of which include internalization of production and consumption costs and fair income distribution. Thus, introduction of eco-taxes will not increase a tax burden but will contribute to its redistribution within the society and at the same time will contribute to reduction of ecological damage to the nature.

The next tool of the “Green Growth” is development of sustainable production and consumption models. It is well known that production and consumption methods are major gears of any type of economy and consequently are major determinants of the economic growth quality. Development of regulatory frames and standards combined with increase of prices for raw materials may determine the interest of producers in cleaner, ecologically sustainable production process.

This Concept involves such instruments as ecologically clean governmental purchases; assessment of the life cycle of goods and demand-driven management that takes into account sustainable consumption trends; stimulation of sustainable use of resources and bringing up the interest to clean production by way of repeated use and recycling of wastes.

This tool of the “Green Growth” is closely linked with “green business” development, which is oriented at sustainable use of renewable natural resources, manufacturing clean product, use of low waste and resource saving technologies. As a rule, companies that implement the policy of “green business” enjoy positive image at global markets, their product is characterized by high innovative level and competitiveness.

Different forms of public-private partnership, including ecological partnership, also contribute to green business development. It is now rapidly developing and finds support on the part of private and public institutions such as banks, insurance companies and etc. The initiative of the government finds support of the population given that it contributes not only to poverty level reduction but also to environmental protection.

In Asian and Pacific countries sustainable business strategies develop basically due to the pressure on the part of the governments, given the necessity to match corporate interests and increasing population needs, including users, non-governmental organizations and in information on the activity of companies.

Thus, “green business” introduction is a successful market strategy that makes it possible to enhance competitiveness through obtaining tax benefits and elimination of administrative barriers, through introduction of ecologically clean technologies and industries and production of ecologically safe goods.

Practically speaking all commercial and non-commercial organizations, including state companies, encounter similar problems in practicing “green business” policy, which can be described as:





- distribution of capital between short-term profit gain and long-term investments for development;
- erroneous idea of businessmen including shareholders and managers that “green strategies” are decisive not only for the current but also for the future generations;
- development of sustainability strategies, including monitoring;
- development of the system of management, which allows profit growth faster than the growth of costs for green business development and audit services.

On the whole “green” business and sustainable consumption are basic elements in improving the population well-being and environmental protection.

Another important “Green Growth” instrument is sustainable production and social infrastructure development. It allows rational use of natural resources so that future generations do not experience shortage of those resources. Thus, urbanization processes are not always accompanied by adequate infrastructure development while investments into infrastructure may ensure environmental sustainability and as a consequence, economy sustainability.

Global experience proves that ecologically oriented construction of buildings may help to bring down the costs of energy and water resources by more than 30% during the entire period of this object functioning. Despite this fact potential advantages of the use of eco-efficiency principles are not taken into account during building, design and infrastructure development. At the same time costs for sustainable infrastructure development will make it possible to bring up competitiveness of the country on the whole while preserving environment, population health and natural- raw material resources.

Sustainable infrastructure development makes it possible to minimize the use of natural resources, including energy and ensure long-term economic growth; address environmental problems related to production and services provision of infrastructure economy sectors; preserve local ecosystems, mitigate man-made impact on climate change and ozone layer depletion; to contribute to production of economically useful goods and services.

In retrospect, the major objective of the “Green Growth” policy implementation is preparation for transition to sustainable development, which requires an urgent diversion from extensive use of natural resources and a search for progressive and innovative economic models.





1.2 Eco-efficiency: criteria and evaluation methods

Originally the concept of «Eco-efficiency» was developed back in 1992 by the World Business Community for Sustainable Development (WBCSD) specifically for the companies with the aim to channel business to sustainable development.

The concept has been accepted as guidance by many companies all over the world. It proved to be effective at the micro-level and became one of the driving forces governing business to sustainable development today. As a rule the concept is practiced in countries with high natural resources prices and developed environmental legislation.

According to this concept eco-efficiency is achieved through price -competitive goods and services with highly useful properties; those meet the needs of people and improve the quality of life at the same time minimizing environmental impact in the course of the entire product life cycle to the level matching an estimated Earth capacity.

Eco-efficiency in the area of business is achieved through:

- Reducing consumption of materials when producing goods and services;
- Reducing production energy intensity;
- Reduction of toxic wastes generation;
- Increase of wastes recycling;
- Maximizing sustainable use of renewable resources;
- Prolongation of life of the product;
- Increase of after-sales service of goods and services.

However, as global practice shows the use of the concept «Eco-efficiency» in businesses and enterprises does not ensure tangible switch-over of national to energy-saving economies. In developed countries it is explained by unsustainable consumption while in developing ones – low market prices for natural resources and immature environmental legislation.

To achieve high efficiency of natural resource consumption and minimize the environmental impact to theoretically possible level, ESCAP recommends the national governments to follow to the principles, indicators and instruments of eco-efficiency in strategic planning at the macro-level.

Eco-efficiency of economies is measured using the system of indicators. Initially eco-efficiency indicators have been devised to assess production sustainability, that is why in fact they represented the ratio of indicators of economic (financial) and environmental performance of a company or a sector.

Based on eco-efficiency methodology and depending upon the specific nature of environmental-economic problems we may build the most diverse indicators. There are three major groups of eco-efficiency indicators:





- The ratio of two environmental components that constitute the measurement of mass or volume in natural units. For example, the volume of waste (in tons)/ total use of resources for production (in tons).
- The ratio of environmental effectiveness in mass or volume units and financial effectiveness in monetary units. For example, the volume of CO² emission (in tons)/, the volume of sales (in monetary units), net profit/total water consumption of water (in tons).
- Ratio of environmental efficiency expressed in monetary units and financial effectiveness of the company. For example, profit/ payment for energy consumption.

From the examples above, it can be seen that when calculating eco-efficiency indicators apart from financial component some of the company/country eco-efficiency indicators are used likewise. Evaluation methodology of the eco-efficiency of an activity is absolutely applicable for any management level, including mesolevel (for sectors and country regions) and macrolevel (for the entire national economy).

The theory of sustainable development requires not only switch over to sustainable production but to sustainable consumption as well, which at the macro-level could be assessed based on indicators of resource consumption and per capita waste generation.

With the growth of the population well-being consumption in households becomes irrational, especially in rich countries. Consumption of energy and water resources increases alongside with the housing area increase, more material benefits, food and different commercial services are bought including different electric appliances, personal cars, use of taxi and air carrier services and etc.

At the same time industrial development of the countries is accompanied by the process of urbanization and rise of new megapolises. Global experience shows that it is possible to achieve better indicators with regard to the use of natural resources and per capita waste generation at the expense of the formation of sustainable urban infrastructure.

It is necessary to link environmental efficiency indicators used to define eco-efficiency to the most significant global, regional and national environmental problems so that they should reflect the degree of a party «contribution» to these problems. It is very important that direct contribution of the country to this problem should be measured at the national level based on reliable data provided by the statistics bodies.

To identify a set of priority indicators of environmental efficiency it is necessary to select the most essential environmental problems. For example, Kaspar Mueller and Dr. Andreas Sturm in their presentation «Standardized Eco-efficiency Indicators» recommend recognizing the following ones as the most significant environmental problems:

- Depletion of non-renewable energy resources;
- Depletion of fresh water resources;
- Global warming;
- Ozone layer depletion;
- Deployment of solid and liquid (including hazardous) waste.

In its turn WBCSD suggests that when assessing the contribution of parties into global problems they should be guided by the following priorities:





- Total energy consumption;
- Use of material resources;
- Use of water resources;
- Emission of greenhouse gases;
- Emission of ozone depletion gases into atmosphere.

In its turn ESCAP recommends to answer the following key questions to be able to select priority eco-efficiency indicators that will make it possible to control in future the quality of economic growth:

- How eco-efficiency of the national economic growth could be measured or what indicators could the countries use to measure eco-efficiency¹?
- Does infrastructure become more or less eco-efficient or does infrastructure provide more services per unit of wastes generated? (particularly energy, transport and construction services and etc.)
- Does the current fiscal system contribute to consumption quality improvement or do the ways (nature) of consumption become more eco-efficient with the increase of the population income?
- Are technological and food innovations leading to more eco-efficient production and consumption actively used in business-sector?

Important stages of the national “Green Growth” strategy development are:

- Selection of eco-efficiency indicators of national priority;
- Based on them – identification of the country eco-efficiency level; dynamics in the values of these indicators will make it possible to see the progress on the way to achieving the “green growth” goals;
- International comparison of eco-efficiency to establish targeted indicators;
- Defining national “green growth” goals (targeted values of priority indicators of eco-efficiency)².

It is expedient in our opinion to consider the following list of eco-efficiency indicators with regard to Kazakhstan:

Consumption of energy resources

- GDP energy efficiency
- Per capita energy consumption
- Per capita electricity consumption
- Yearly per capita petrol consumption

Consumption of water resources

- GDP water intensity, including water intensity of food and industry sectors.

¹ Data collection is an expensive activity for the companies, organizations, countries. However, the lack of data or adequate data – may lead to the wrong political decisions or to inadequately optimal options of their implementation that turn out to be more expensive in a longer perspective.

² National «green growth» goals are, as a rule, defined by the country governments in percent of the value of selected base year.





Emission of greenhouse gases

- 🌿 GDP carbon intensity
- 🌿 Per capita CO² emissions
- 🌿 CO² emission increase for a certain development period.

Acid emissions

- 🌿 Specific SO_x emission per GDP unit
- 🌿 Specific NO_x emission per GDP unit

Generation of solid waste including toxic and radioactive ones

- 🌿 Generation of solid waste per GDP unit
- 🌿 Generation of toxic industrial waste per unit of industrial product
- 🌿 Specific per capita toxic waste accumulated on the balance of the companies
- 🌿 Per capita solid wastes generation.

International organizations such as the World Bank, UNDP and UNEP publish some of the sustainable development indicators that are in compliance with the eco-efficiency indicators in terms of the aforementioned characteristics. The availability of such data makes it possible to perform a comparative analysis of indicators between the countries. This, to some extent, helps to be sure with regard to feasibility of the «green growth» national goals.

The «Green Growth» concept is considered by the countries that ratified Kyoto Protocol without any national quantitative commitments as an alternative approach to introduction of the national quotas without infringement of economic interests of developing countries.

International audit agency PricewaterhouseCoopers (PWC) assessed this approach efficiency in 2006 and came up with the Strategy «Green Growth Plus». Based on the construction of the global model that allows forecasting greenhouse gases given the use of these or those industrial technologies the given Report suggests possible reduction levels of GDP carbon intensity of the countries (in percentage relatively to the base level). Currently this approach is being implemented in the AP countries through the National Plans of «Green growth» achievement.

To illustrate this we may consider the example of China (CPR) that has identified goals of eco-efficient economy development as of 2020 compared to the level of 2000 in its 11th Five-year Plan (2005). Among numerous expected outcomes we may see ambitious goals of increasing economic growth eco-efficiency:

- 🌿 GDP energy intensity reduction by 50-60 %;
- 🌿 GDP water intensity reduction by 80%;
- 🌿 Reduction of specific sulfur dioxide (SO₂) emissions per GDP unit by 75%;
- 🌿 GDP carbon intensity reduction by 60%.

Energy strategy of Japan by 2030 (2006) is targeted at reduction of oil import by not less than by 40% until 2030 compared to the level of 2006. Hence the implementation of the Plan of energy saving «Toprunner» was launched, which is to ensure the GDP energy efficiency growth by 30% until 2030 compared to 2006.





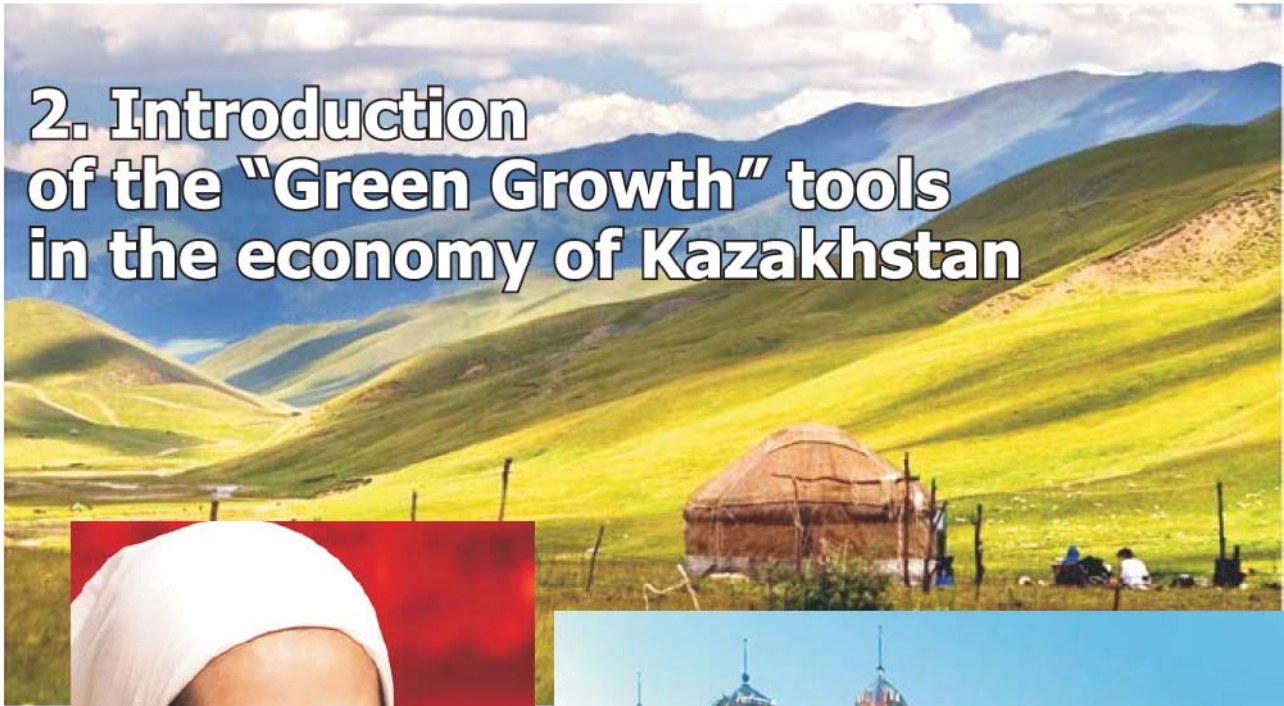
Energy strategy of Russia by 2020 (2002) stipulates reduction of GDP energy intensity by 25-27% until 2010, by 35-40% until 2015 and by 42-46% by 2020 compared to the level of 2000 under the basic scenario (values stipulated in the optimistic scenario are higher by 2-5%).

According to the goals of the National Program of Accelerated Industrial-innovative Development of the Republic of Kazakhstan as of 2010-2014 (2009) GDP energy intensity should reduce as of 2015 by not less than 10 % compared to 2010.

With regard to greenhouse emissions then in November 2009 the Government of the RK made a decision to reduce their emission by 15% till 2020 and by 25% till 2050 compared to the basic years 1992, which has been formally announced at the conference in Copenhagen that took place in December 2009. However it is necessary to stipulate the GDP carbon intensity reduction as well for a long-term perspective. Apart from that it is necessary to determine quantitative national target indicators of acid emissions, wastes generation, including toxic and radioactive ones as well as reduction of water consumption rates.



2. Introduction of the “Green Growth” tools in the economy of Kazakhstan





2.1 Assessment of eco-efficiency of the national economy

The national economy is a large system, which consists of economic entities that use natural resources for production of goods and services, inevitably forming and distributing different types of waste into the natural environment. Assessment of eco-efficiency of a national economy is similar to the assessment of eco-efficiency of businesses and is performed on the basis of developing mass-balances. That is why in Figure 1 major flows of natural resources are schematically reflected as an “input” into the national economy while the “output” is comprised by products and waste with their negative impact on natural eco-systems, specifically greenhouse gases, acid emissions, toxic waste, municipal solid waste and etc.



“Raw materials” represent physical resources of natural origin apart from energy, land and water resources (for example, metalliferous ores, construction materials, biomass and etc).

Figure 1 – Scheme of the flows of natural resources, involved into economic activity

Improvement of national well-being and the quality of life is accompanied by an intensive use of natural resources and industrial waste generation. Maximum efficiency in resource consumption and minimum environmental pollution in all the economic sectors is a criterion of sustainable development and «green» growth of economy.

Eco-efficiency indicators may be broken down into two groups, each of which is in its turn subdivided into subgroups:

1. Specific use of natural resources per a product unit or per capita;
2. Specific wastes generation per a product unit production or per capita.

Specific consumption of natural resources and waste generation per unit of product characterizes the degree of production sustainability while similar per capita indicators – the





degree of consumption sustainability (Table 1). Such indicators like energy and water consumption in housing and communal sector, per capita petrol use, per capita household rubbish generation and etc. are used to evaluate the sustainability of consumption.

Table 1 – Groups of eco-efficiency indicators

Specific consumption of natural resources		Specific generation of wastes	
Per unit of product	Per capita	Per unit of product	Per capita
GDP Power intensity, GDP water intensity, GDP land intensity, GDP material intensity and etc.	Per capita power consumption, Per capita water consumption, Per capita land consumption, Per capita material consumption and etc.	GDP carbon intensity, GDP wastes intensity, GDP specific emission of pollutants and etc.	Per capita specific emissions of greenhouse gases, per capita generation of solid wastes, per capita generation of toxic wastes and etc.

The eco-efficiency indicators are defined as a ratio of Environmental Cost (volumes of natural resources used or generated or production and consumption wastes generated or deployed in the environment) and Economic Output (GDP) or the average annual population. Reverse ratios are also possible (Figure 2).



Source: Eco-efficiency Indicators: Measuring Resource-use Efficiency and the Impact of Economic Activities on the Environment, UN ESCAP, 2009. – 24 pp.

Figure 2 – Assessment of eco-efficiency





For example GDP power intensity and GDP energy efficiency are considered to be eco-efficiency indicators, both resource intensity and resource efficiency.

Alongside with the national eco-efficiency indicators and indicators of individual companies indicators of eco-efficiency for mesolevel (regional and sector) can be identified. 4 sector categories are usually considered: industry and construction; agriculture, fishery and forestry; transport sector; sphere of public social objects and commercial services.

Comparable cost indicators. Assessing eco-efficiency of the national economy is, identification of trends of real economic growth given the use of natural resources and environmental pollution as well as identifying eco-efficiency indicators in dynamics.

Both natural and cost indicators can be used when calculating eco-efficiency indicators. Whereas natural indicators can be substituted by cost indicators.

When identifying GDP trends and other cost indicators their values should be expressed in values of the base rather than in current values. This has to be done in order to exclude the impact of the price factor on the result assessment. There are correspondent deflators that can be used for this purpose.

For international comparison of GDP cost indicators in US Dollars (based on the purchasing-power parity of the national currency) of the selected base year but not the official exchange rate of the National Bank should be used.

Eco-efficiency indicators characterize progress/regress on the way to sustainable production and sustainable consumption.

In case the dynamics of absolute volumes of natural resources consumption, generation, utilization and decontamination of production of waste characterize accumulation and solution of environmental problems then eco-efficiency indicators as aggregate indicators the general quality of economic growth or development. Meanwhile, structural and technological changes in production and consumption spheres are immediately reflected in it.

Eco-efficiency indicators taken in dynamics help to detect «decoupling effect» (insertion 1), the achievement and enhancement of which in fact is the goal of “Green Growth”.





Box 1 - «Decoupling effect»

The term “decoupling” is very often used both by scientists and politicians in different contexts. Sustainable expression «decoupling economic growth» implies a mismatch (different vector) of trends of macroeconomic growth and use of natural resources. In the documents developed by ESCAP with the aim to help governments of the regional countries in the sphere of strategic economy management the focus is made on achieving decoupling effect.

“Decoupling effect” as the consumption rate of energy resources leading to GDP growth rate is currently achieved by all developed countries.

Nowadays, however achieving “decoupling effect” by advanced GDP growth rate over the greenhouse gases emission rate, specifically of carbonic acid gas when burning fuel, is considered to be equally important.

The given two decoupling effects are expressed in reduction of GDP power intensity and GDP carbon intensity.

Kazakhstan GDP and average annual population. Procedure of the national economy eco-efficiency assessment should begin with an alignment of GDP and selected base year prices. Dynamics of real GDP in prices of 2000 and average annual population size in Kazakhstan is reflected in Picture 3. During 2000-2008 gross domestic product has increased twofold. Living standards in the Republic have improved, which positively influenced the population growth rate: since 2004 the number of the country population has been gradually growing to make up 5,3% during 9 years.

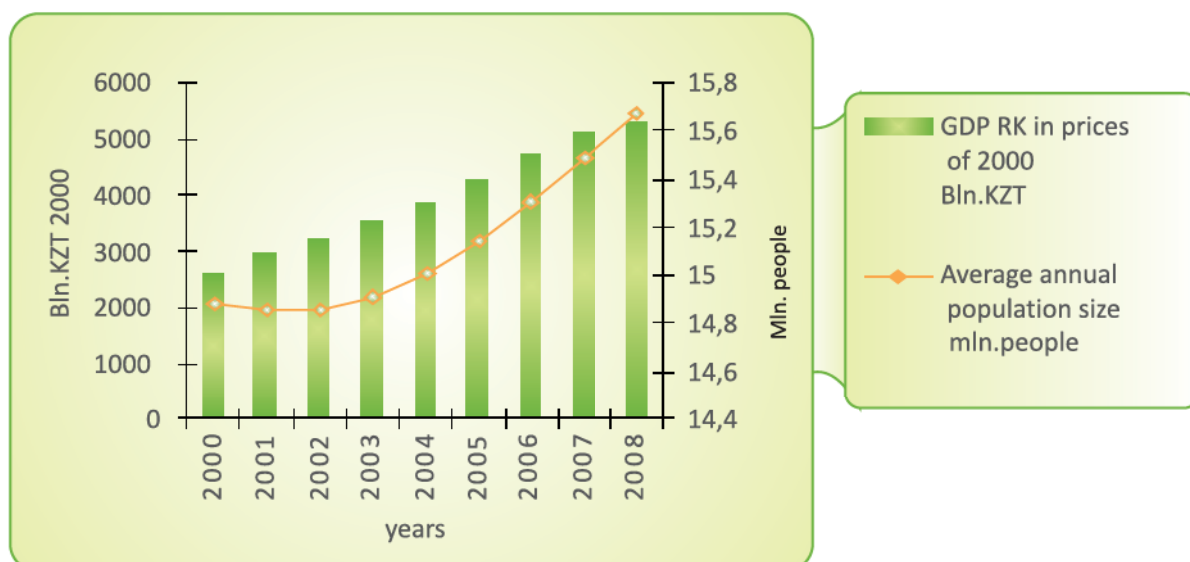


Figure 3 – GDP and an average annual population of the Republic of Kazakhstan





GDP power intensity. Regardless an increase in energy consumption in the Kazakhstan by 52,7% for 2000-2008 GDP power intensity reduced by 30,5% (see Figure 4). The conclusion can be made that decoupling effect is achieved in Kazakhstan with regard to the use of energy resources per GDP unit.

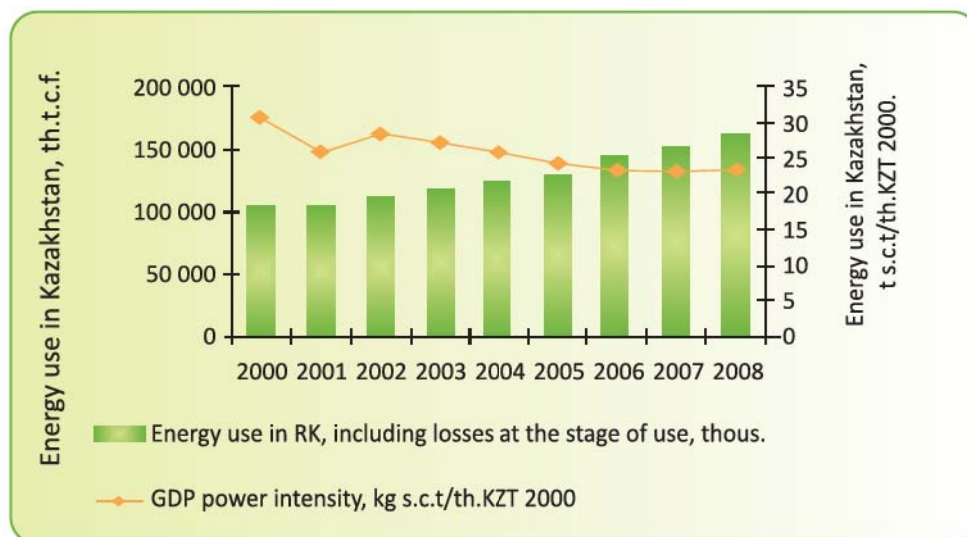


Figure 4 – Power consumption and GDP power intensity for 2000-2008

According to WB data for 2009 Kazakhstan takes the 10th place among the most power intensive economies next to Congo (0,9 USD/kg n.e.), Uzbekistan (1,2 USD /kg n.e.), Turkmenistan (1,4 USD /kg n.e.), Mozambique (1,7 USD /kg n.e.), Zambia (2,0 USD /kg n.e.), Trinidad (2,0 USD /kg n.e.), Togo (2,0 USD /kg n.e.), Tanzania (2,1 USD /kg n.e.), Ukraine (2,1 USD /kg n.e.) and Ethiopia (2,3 USD /kg n.e.). It should be noted that with regard to many countries (basically developing) power efficiency is not indicated. However, out of this list it is obvious that Kazakhstan is at the same level with countries of Sub-Saharan Africa in terms of power efficiency.

Statistics Agency published GDP power intensity in the Kazakhstan in t.o.e. per 1000 US Dollars in current prices at the formal National Bank exchange rate, but not in purchasing-power parity of Kazakh Tenge (KZT) to US Dollar (USD):

- 2005 – 1,77 t.o.e./th. USD.
- 2006 - 1,85 t.o.e./th. USD.
- 2007 – 1,71 t.o.e./th. USD.
- 2008 – 1,77 t.o.e./th. USD.

It is obvious that the trend does not match what we have got based on the aforementioned methodology. Thus, for the sake of reliability the data of the Statistics Agency should be considered to be incommensurable with the power intensity of other countries.





Per capita power consumption in Kazakhstan has increased during the same period by 45,0% to make up 0345,8 kg s.c.f. or 7242,1 kg o.e., which

- Is 5,8 times higher compared to the average in APC countries;
- Is 5,7 times higher than on the average in countries with the average per capita income;
- Is 2,5 times higher than on the average in the EECCA countries;
- Is 1,9 times higher than on the average in the EU countries;
- Is 1,4 times higher than on the average in the countries with high per capita income;
- Is in line with the per capita power consumption in such highly developed countries as the USA, Canada and Finland.

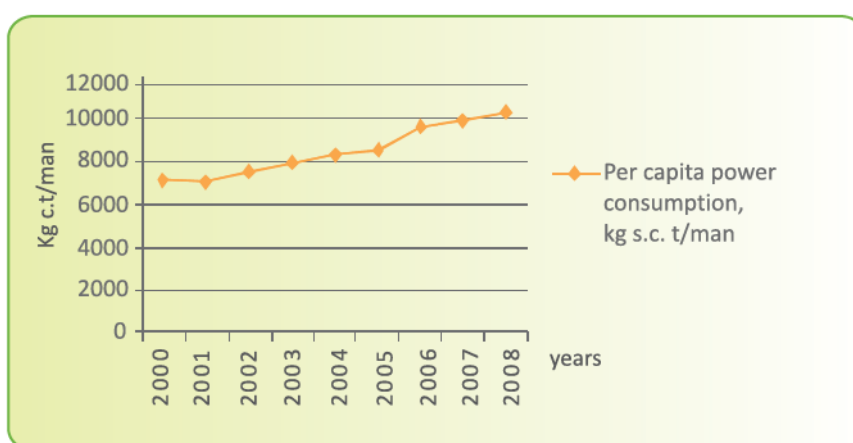


Figure 5 - Power consumption, per capita 2000-2008

GDP carbon intensity in Kazakhstan. “Decoupling effect” may also be observed with regard to GDP carbon intensity. Regardless the increase of GHG emissions by 52,4%, GDP carbon intensity reduced by 25,2%³. (Figure 6)

³ General emission of greenhouse gases in CO₂- equivalent without stocks (volumes of absorbed carbonic acid).



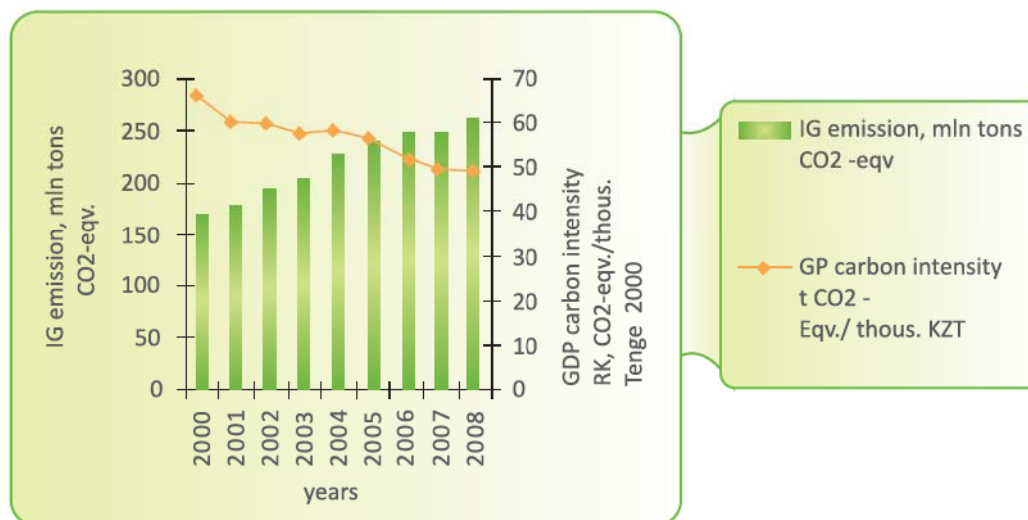


Figure 6 – Emission of greenhouse gases and carbon intensity for 2000-2008

GDP water intensity. Until the year 2004 water consumption in the Republic had an increasing trend; but by 2008 water consumption reduced compared to the level of 2004 by 22,6%. In general considerable decoupling effect with regard to GDP water intensity for 200-2008 has been achieved (Figure 7).

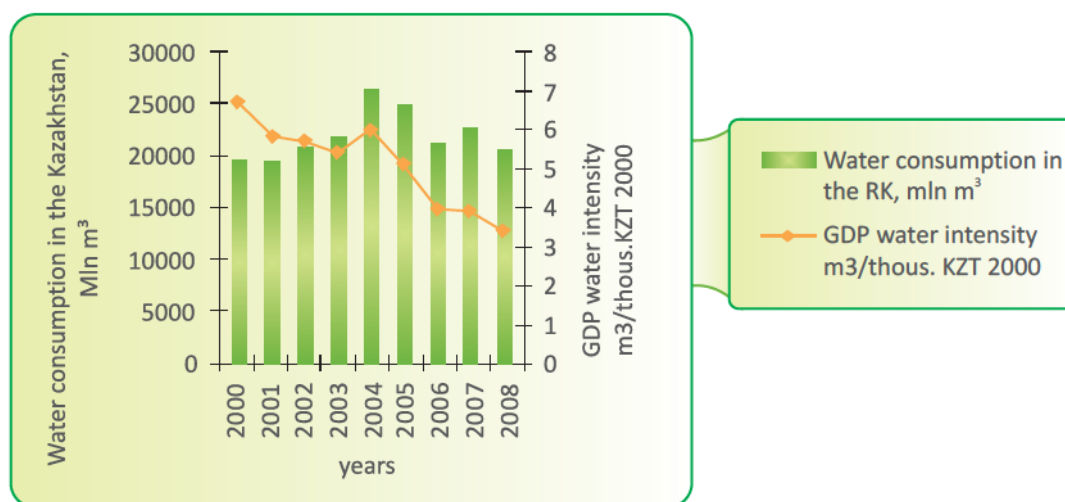


Figure 7 – Water consumption and water intensity for 2000-2008

Generation of toxic wastes per GDP unit. Annual volume of newly generated toxic wastes in the country (minus recycled and decontaminated ones) in 2001-2008 increased four times over. Specific weight of toxic wastes generation per a GDP unit increased by 2,15 times. (Figure 8).



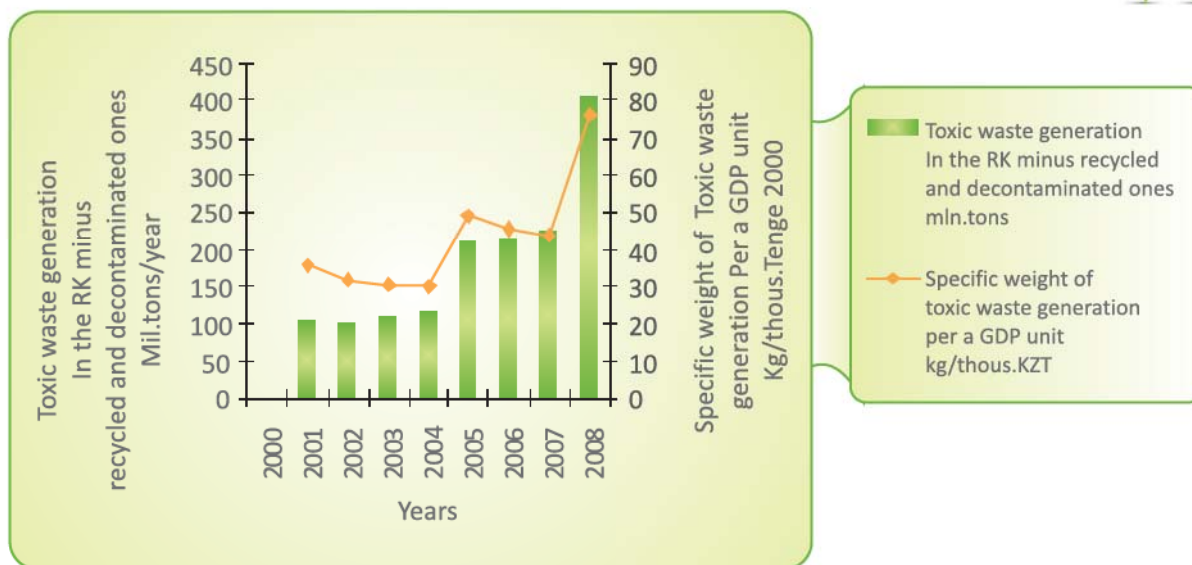


Figure 8 – Volume of toxic waste and its specific generation rate in 2001-2008

Dynamics of specific weight of toxic waste accumulated on the balance of companies, per capita. When estimating per capita toxic waste accumulated on the balance of the companies one could clearly see that this indicator increased in 2001-2008 by 60,6%. Currently the ratio of toxic waste per a Kazakhstan citizen is almost 400 tons (Figure 9).

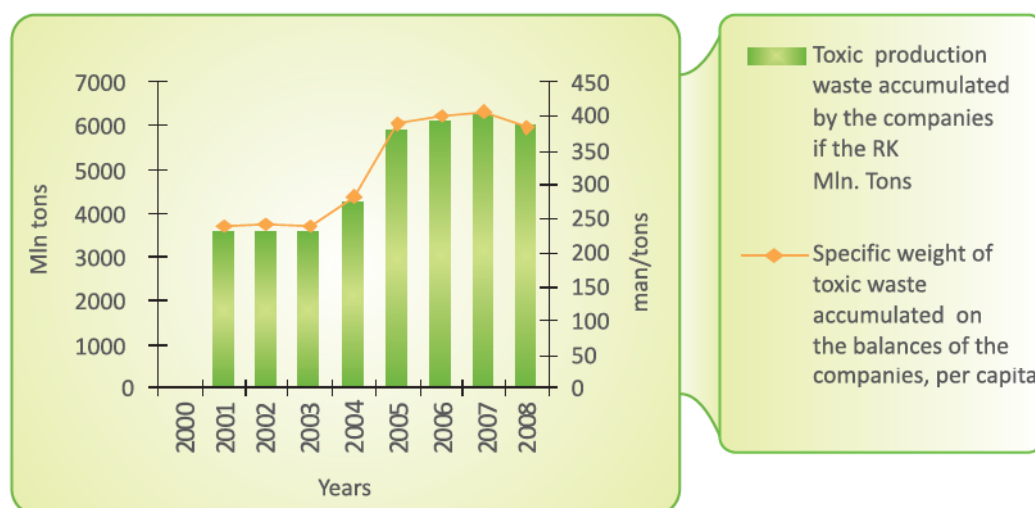


Figure 9 – Specific weight of toxic waste accumulated on the balance of companies for 2001-2008, per capita





Dynamics of specific weight of emissions of the most common pollutants per a GDP unit.

According to the Action Plan aimed at the implementation of the «Zhasyly Damu» Program it is expedient to track specific weight of emission of pollutants per GDP RK given that a number of measures are aimed to reduce emission of pollutants by metallurgy companies as well as by other issuers. Analysis of the given eco-efficiency indicator dynamics manifests positive trend: sustainable reduction as of 2009 made up 85% compared to the level of 2000 (Figure 10).

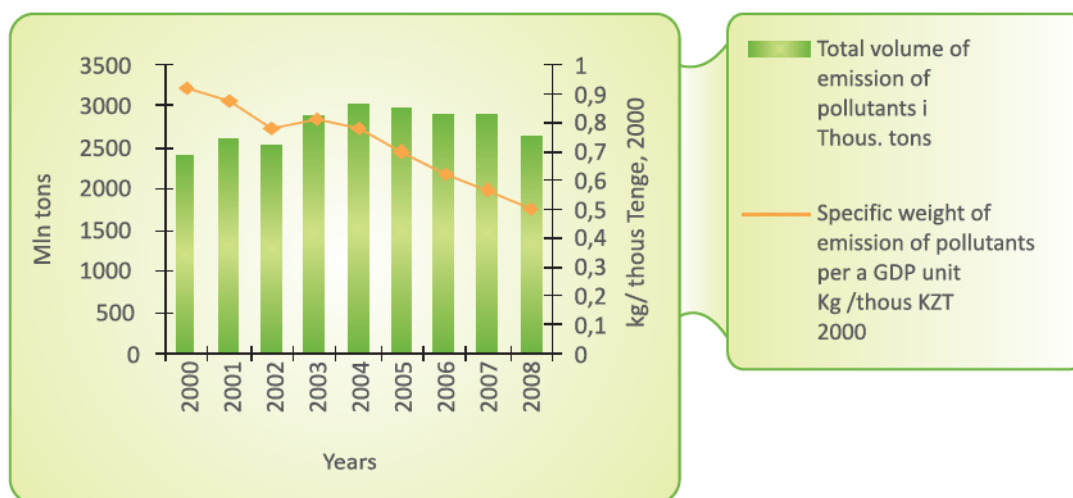


Figure 10 - Specific weight of emission of the most common pollutants per GDP unit in 2000-2008.

Specific weight of sulphur and nitric oxides per GDP unit in Kazakhstan. Specific weight of sulfur oxides per GDP unit for 2000-2008 reduced by twofold, that of nitric oxides – by 57,5% (see Figure 11).

Thus summarizing the dynamic analysis of eco-efficiency indicators (Annex 1) it should be mentioned that business sector development is characterized by decoupling effect. However if one to compare values of selected eco-efficiency indicators with those of the overseas countries it becomes obvious that on the whole economic growth in Kazakhstan is due to extensive use of natural resources. That is why when identifying the Kazakhstan transition strategy with regard to green growth the goals set should be less ambitious (in per cent of the selected base year rate) compared to those of China or Russia. The problem of handling hazardous wastes in Kazakhstan requires special attention.



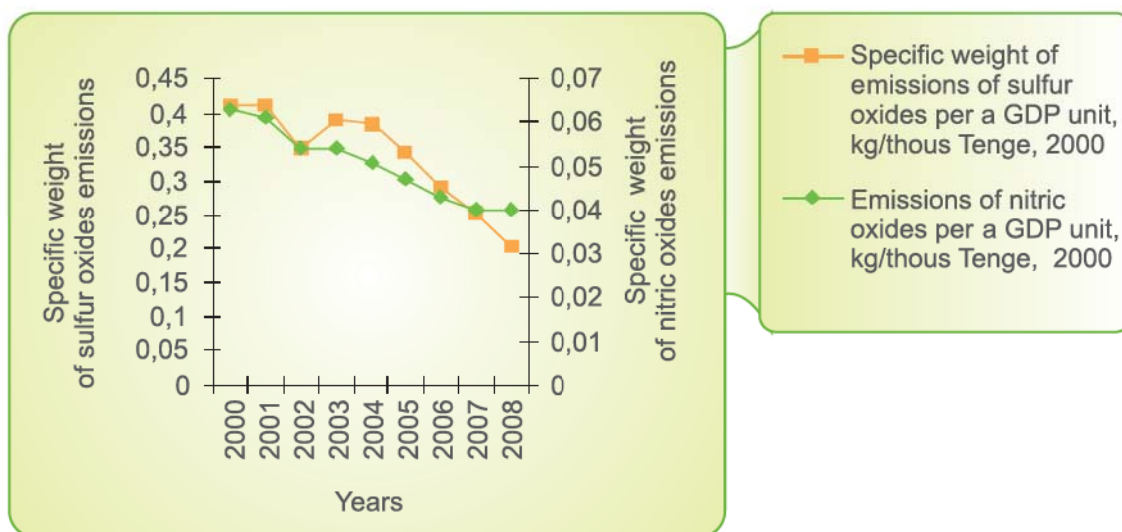


Figure 11 – Specific weight of sulfur and nitric oxides emissions per GDP RK unit in 2000-2008.



2.2 Analysis of the “Green Growth” policies in strategic planning

The system of strategic planning in Kazakhstan is an integral part of the System of State Planning in the Republic of Kazakhstan endorsed by the Decree of the President of the RK of June 18, 2009, №827. The Decree sets the following hierarchical structure of the System of State Planning (Figure 12).



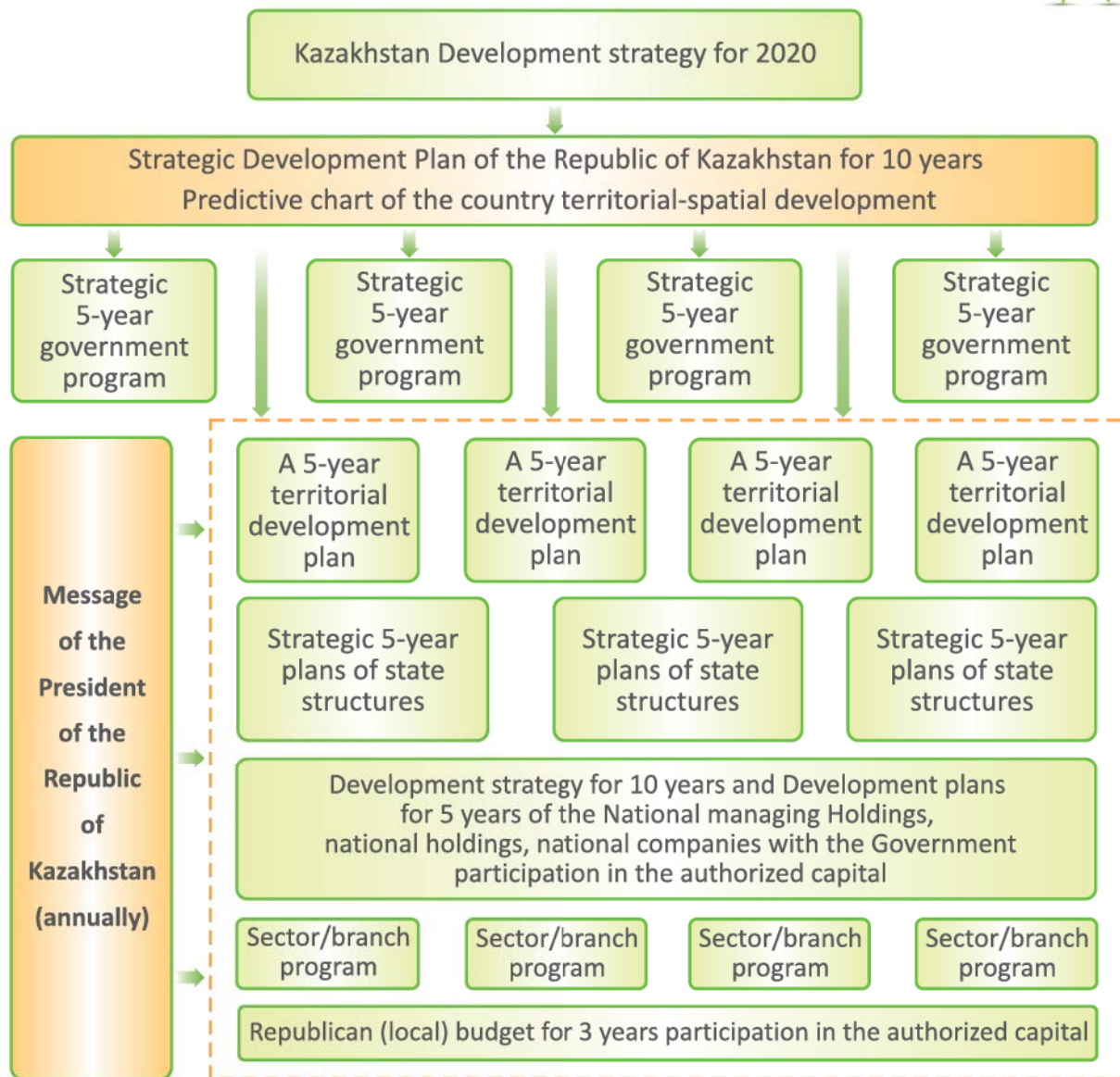


Figure 12 - State planning system of the Republic of Kazakhstan

Kazakhstan development strategy by 2030 sets basic long-term goals for the country's social-economic development and is a framework document for the following strategic documents. Issues of environmental protection in the Strategy-2030 are addressed in the fourth priority «Health, education and well-being of the people of Kazakhstan».

The Strategic Development Plan of the Republic of Kazakhstan till 2020 endorsed by the Decree of the President of the Republic of Kazakhstan of February 1, 2010 takes a special place in the hierarchy of strategic documents. This mid-term plan as well as Strategic Development Plan of the Republic of Kazakhstan by 2010 indicates the importance of environment and the necessity to reduce an anthropogenic impact on the national eco-system.





Thus, the Strategic Plan - 2020 highlights problems of climate change as a result of expected global warming and the necessity to control hazardous emissions into the air. Given that Kazakhstan ratified Kyoto Protocol there is a necessity to define clear targeted parameters regarding the greenhouse gases emissions in the long-term.

It is assumed that reduction of emissions of greenhouse gases will be achieved through «...accelerated technological energy sector modernization and energy saving development», specifically by:

- Introduction of state-of-the-art technologies based on renewable energy sources. Motivating environment will be created in Kazakhstan for development of wind-power engineering, solar and geothermal power engineering; effective use of water resources will be introduced in the country given the principles of integrated management of water resources along with undertaking further efforts to ensure drinking water for the population;
- Optimizing the system of state regulation of sustainable development processes, “green” policy implementation, transition to low carbon economy by investment attraction, addressing ecological problems, reduction of negative impact of man-made burden upon environment, enhancement of responsibility of nature users for emission reduction and complex reclamation. In addition, Strategic Plan - 2020 sets a goal to reduce power intensity of the national economy by 10% minimum by 2015 and by 25% minimum by 2020 compared to the level of 2010 and points out that «reforms in the power industry will be performed with regard to pricing and tariffing that will allow to ensure this sector development in market conditions. A new tariffing policy for electricity supply network companies will be implemented». Development and implementation of long-term tariff policy and pricing for electric energy, transmission and distribution is assumed to be implemented as of 2012.

Tariff reform in electric energy sector is vitally important because it is the basis for the introduction of economic instruments of enhancement competitiveness of renewable power engineering (Annex 2).

Strategic plan - 2020 has given some outlines of the policy for the implementation of “green” instruments:

- development of «sustainable» infrastructure in the form of renewable energy technologies, increasing energy and water preservation;
- perfection of tariff policy for paid services and increasing tariffs in general in power engineering may be considered as an alternative to eco-taxes and may contribute to reduction of externalities of traditional energy sector.

At the same time Strategic Plan does not stipulate necessary institutional grounds for the introduction of other «green» instruments that stimulate “green business” development and sustainable use. Given that they are designed to create regulatory basis for the complex resolution of the entire national economy issues but not its individual sectors it seems necessary to reflect





them in the program documents adopted within the framework of the Strategic Plan – 2020 implementation.

The next significant program document within the system of strategic planning is the National Program of Accelerated Industrial-Innovative Development of the Republic of Kazakhstan for 2010-2014 (NPAID) endorsed on March 19, 2010. The major objective of this Program is the national economy restructuring towards processing sector development and production diversification. The given document includes a number of institutional measures aimed at «green development», specifically: fortified technological norms with regard to emissions into the air; introduction of ecological Euro-3 standards for vehicles since 2011 and Euro-4 – since 2014; staged fortified requirements to environmental pollution by industrial and municipal sources beginning with 2011.

Separate section in NPAID is dedicated to the alternative power engineering development. In terms of economic measures to support producers in the area of alternative power engineering the following is stipulated: reservation and priority allocation of land plots for construction of objects of renewable energy sources; liabilities of power-transmission companies with regard to electric power purchase generated with the use of renewable sources of energy; exemption of renewable sources of energy from payment for electricity transportation along the networks; support in connecting objects-users of renewable energy sources to networks of power transmission companies.

Another Part is dedicated to energy conservation, with regard to which there have been set certain national energy saving policy goals and objectives. Assumed measures to implement this policy include measures of tariff and tax regulation, introduction of contracts for energy services and stimulation of business development in energy conservation. Thus this section specifies implementation of some of the “green growth” instruments.

Among strategic program documents currently in force that cover issues of ecology and environmental protection the Program of Territorial Development for 2011-2015 stipulates addressing issues on improvement of environmental condition of territories and improvement of ecological safety of the population through ensuring rational nature management and reduction of negative impact upon the environment. To address the problem of ecological sensitivity of production and transition to sustainable territorial development model the Program sets the following directions:

- methodology perfection with regard to pricing for environmental pollution;
- development of incentive measures for the use of energy effective and resource saving production technologies;
- stimulation of transition of national producers to international standards ISO-9000 and ISO-14000.

The first of the aforementioned measures can be considered within the category of eco-taxes – redistribution of tax burden from socially-important activity (for example, population employment) to environmentally hazardous activity. It is apparent that such methodology should





be linked with other measures in the subject of environmental protection, specifically with measures aimed to stimulate implementation of ecologically clean production industries to redistribute tax burden towards polluting production industries.

Implementation of the second and the third directions requires “green business” tools provided they are integrated with the current national fiscal system.

The Concept of transition of Kazakhstan to sustainable development for 2007-2024 endorsed by the Decree of the President of the RK of November 14, 2006, № 216 (hereinafter – Concept) sets the following measures towards environmental stability:

- introduction of state-of-the-art evidence-based approaches to nature management including methods of rational nature management in terms of all types of resources;
- stimulation of introduction of energy saving and wasteless technologies in all spheres of the national economy;
- support of the rational power generation, including the use of renewable sources and secondary raw materials;
- formation of a system of national energy planning based on the use of renewable sources of energy and clean energy strategy, which link available energy resources and development of technological programs with national security and sustainable development scenarios;
- development of decision-making instruments and new infrastructure development with the aim of introduction of sustainable technologies into economic activity practice: a long-term planning, mechanisms of financial regulation, measures of public support, developed innovative structures, conditions for infrastructure modernization and transformation and etc.

A separate sub-sector is dedicated to economic instruments of environmental protection where they are supposed to be used by way of:

- implementation of the principle «polluter pays», assuming that a user will bear responsibility for financing activities on environmental protection and compensation for the possible ecological damage or this user has to refuse from activity performed;
- increase of incentive payment for emission into the air and administrative forfeitures for the violation of environmental regulations with the refusal in future from payment for emission into the air and with simultaneous enhancement of administrative responsibility for the violation of environmental standards;
- inclusion of the overall cost of natural objects with due regard to their nature contributing function as well as the cost of nature-conservative (environmental) works (services) into economic indicators;
- introduction of the system of trading quotas between nature managers;
- introduction of market mechanisms of nature conservancy, including those that stimulate repeated use and secondary processing of industrial wastes.

The given measures assume the use of “Green Growth” instruments. At the same time it should be mentioned that for an effective introduction of these instruments it is necessary to stipulate mechanisms of their implementation in the “Action Plan” or in future programs on the Concept implementation as well as in the Concept itself in the process of its elaboration.





In conjunction with this, the given measures should also include the Program «Zhasyl Damu» for 2010-2014, specifically, in the Part «3.3.5. Economic Stimulation Mechanisms», in which it is expedient to stipulate directions of regulatory-legal basis development for the implementation of the aforementioned economic mechanisms of the Concept.

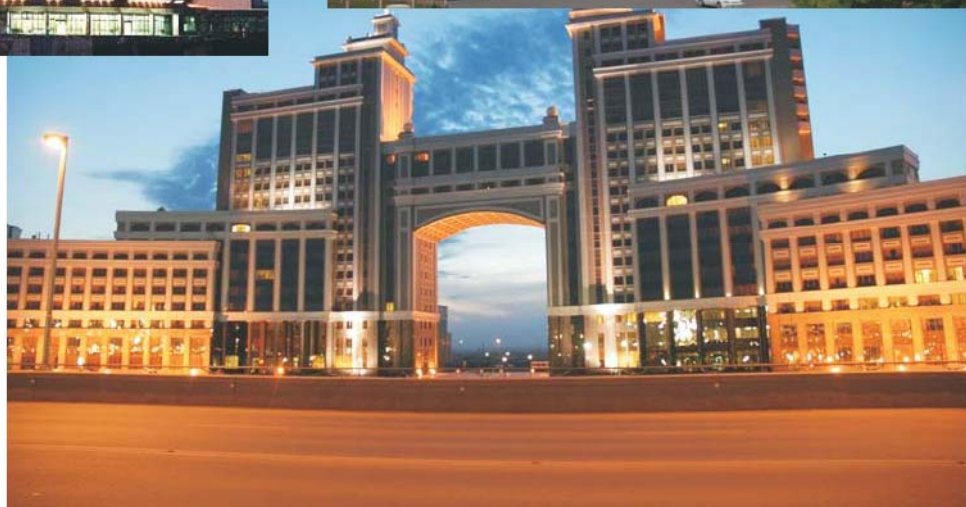
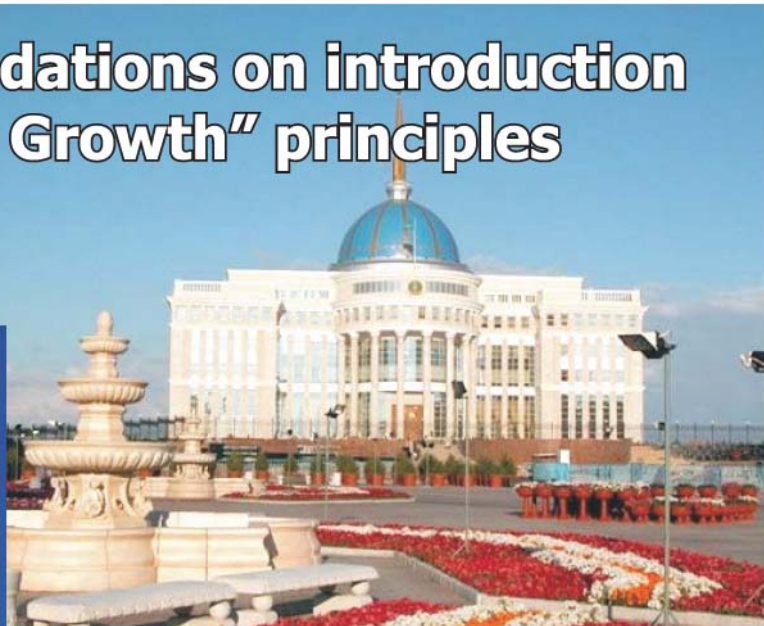
One example of such development is the Concept of introduction of such environmental taxation in the Republic of Kazakhstan developed by the Ministry of Environmental Protection. This document assumes radical measures and rationalizes mechanisms of economic incentives for environmentally friendly behavior. It seems that its adoption will enable radical improvement of environmental situation in the country and will contribute to introduction of “green growth” instruments.

As a result, the analysis of strategic documents performed proves that within the system of state planning there are preconditions for introduction of “Green Growth” tools. As it was noted earlier, economy modernization and diversification is the strategic priority of all the current country programs including Strategic Plan - 2020, NPAID as of 2014 and others. Of course their implementation will contribute to reduction of man-made pressure through development of higher recast industries and introduction of innovative technologies.

At the same time for a better progress of the country towards sustainable development it is necessary to expand a set of “Green Growth” tools currently in use within the system of strategic planning and enhancement of their stimulating role. measures aimed to stimulate implementation of ecologically clean production industries to redistribute tax burden towards polluting production industries.



3. Recommendations on introduction of the “Green Growth” principles





3.1 Green Growth principles into the system of strategic planning and taxation

Section 2.2 revealed the formation of the system of strategic planning in the Republic of Kazakhstan that entails the use of “sustainable development” and “green growth” principles in development plans of different scales. The President Decree endorsing the Rules of Development and Monitoring, Assessment and Control of Strategic Development Plan of the Republic of Kazakhstan, Predictive Scheme of Territorial-spatial Development of the Country, National Programs, Programs of Territorial Development and Strategic Plans of Public Bodies were issued to implement these plans.

Endorsement of these Rules ensured a unified methodology of state planning and coordination of objectives of all the strategic documents within a strict hierarchy. Thus, in line with the Rules developed strategic documents of the country have to work in accordance with the goals of the Strategic Plan of Kazakhstan Development and should be based on indicators, which will enable to monitor efficiency of the implementation of strategic plans. The later creates preconditions to use eco-efficiency indicators in the national economic strategic planning. Thus the regulatory basis is predetermined for the implementation of the “green growth” directions within the system of strategic planning in Kazakhstan.

When developing strategic documents not only the eco-efficiency indicators suggested in Part 2.1 should be used but the “green growth” principles as well.

The National Program of Accelerated Industrial-innovative Development of Kazakhstan by 2014 (hereinafter – NPAIID) is the core document in the current economic policy of the country. It covers the main features specific for an environmentally friendly production. Meanwhile, there are no time assessable indicators of the progress towards the “green growth”; its achievement would prove that the objectives set are achieved without a “power intensity” indicator. Therefore, in order to further develop the NPAIID Program it is necessary to complement the endorsed documents by eco-efficiency indicators that will make it possible to present information in a brief and structured form and to monitor the selected strategy implementation. Apart from that the NPAIID has to stipulate, in our opinion, measures on business development and support that is oriented on production and the use of ecologically clean technologies given the scarce natural resources. Favorable environment for ecologically oriented “green business” could be ensured by the state through fiscal mechanisms.

Tax privileges, account payable restructuring and soft credits as well as public-private partnership development with regard to natural monopoly objects will help to implement the most promising projects in terms of promotion of the “Green Growth”.

One of the most effective ways to introduce the green growth tools is through ecological taxation. Currently the Law on Ecological taxation is being drafted based on the international experience of their application. Principal provisions of the given Law are as follows:





- Switch from emission payments to taxation of emission of 5 to 10 substances with certain rates will be implementation of the principle «pollutant pays», collection of resources for the implementation of ecological programs, stimulation of the achievement of maximum possible emission level. Calculation of the billing rate is based on the sum of necessary nature-conservative measures and the total emission volume. All the duties are forwarded to the local budgets with the aim of covering budget expenditures for nature-conservative programs.
- Introduction of the tax on energy generation while exempting solar, wind and small hydropower stations from tax payment. This innovation is targeted at stimulation of energy efficiency, energy conservation and development of renewable sources of energy. The tax is sensitive to users; that is why the current tariff has got to be increased at least by 50 % on condition of proportional reduction of the social tax rate, increase of the pension sizes and minimum wages.
- Fuel saving, reduction of pollutant emission and greenhouse gases are to be ensured at the expense of excise introduction on the use of motor fuel depending upon sulfur and CO₂ content in emission. Moreover, tax is flexible for the users given that it may result in the price rise approximately by 20%.
- Development of disposal technologies for reclamation of packages, plastic bottles and etc. as well as hazardous wastes (accumulators and electrolytic batteries, fluorescent lamps and etc.) is possible on condition that producers organize collection of the given types of packages or waste from the users with simultaneous introduction of taxes for packages that are not subject to utilization.
- Introduction of differential road tax rate depending not only on engine displacement but also on the observation of environmental requirements through the implementation of Euro standards and etc.

Stimulation of water saving and development of water recycling through introduction of taxes for water collection from natural water sources. At the same time the tax will also be sensitive for the users given that the increase of the current tariff will be required approximately by 50% with proportional reduction of social tax rates and increase of the pension volume and minimum salary.

In general, analysis of the overseas practice of economic policies in environmental management shows that ecological taxes like any other source of the state budget or any financial instrument may be used by the governments to achieve the following goals:

- Resolving negative impact on environment from production of goods and services that is not compensated by contracts or market mechanisms (externalities) through stimulation and encouragement of the activity reducing environmental hazard.
- Achievement of goals in line with international agreements, for example, reduction of greenhouse gases according to Kyoto Protocol.
- Promotion of progress in environmental quality and effective use of resources.





- Budget replenishment at the national and/or regional levels to provide collective ecologically safe goods and services, i.e. such goods and services that are not produced spontaneously on the market or in required quantities given that they are not in private ownership (such as air quality) and this is why they can not be applied or excluded from the use by somebody.

Despite the fact that there are no generally accepted standards regarding ecological taxation, there are principles that have to be followed when developing effective system of ecological taxes regardless the tools selected (taxes, incentives, quotas and proprietorship revision), specifically:

- Minimizing impact on competition. Tax rates/prices applied in Kazakhstan should be adapted to international practice (to harmonize with international standards);
- Market neutrality, i.e. minimal changes in the market operation. It should be stressed that ecological taxation reforming should not be considered simply as a way to ensure more money for the state. The main idea behind their introduction is to maintain general taxation level by decreasing profit tax and at the same time increasing tax for raw materials sector. The balance on the market can be ensured by reducing other taxes such as labor taxes (for example, unified/lower social tax rates and social insurance, tax on capital and etc.) so that aggregate tax burden on business does not increase. Evidently for natural-raw companies introduction of eco-taxes will imply increase of costs, however aggregate effect for state revenue will be neutral;
- Avoiding double taxation of the same goods or services;
- Use of regressive taxes, i.e. classified taxes given population life standard (for example, taxes for specific products – milk, petrol for heating, heat and electric power and etc.);
- Introduction of more active use of market mechanisms compared to the use of administrative mechanisms and control mechanisms. Special policy has been devised in the USA with regard to ecological taxes, which offers business entities an option within the framework of their use, for example, «bubble policy» and «controlled sale of emissions/permits, which could be traded»;
- Gradual introduction of ecological taxes. “Green” taxes for consumption/use have been introduced in many countries and then its rates have been gradually increased in the course of three-four years. In this sense companies need time to try the given taxes: limited time (1-2) does not contribute to these changes. Prolongation of the terms (3-5 years) allows making this transition more sustainable.

Regarding the sector of processing natural resources it is necessary to point out that in the majority of countries oil and gas companies are not exposed to ecological taxes directly but are subject to taxation through indirect taxes (excise taxes). Apart from that in many countries there are special tax incentives for mining/ oil and gas companies, for example if the limit of power consumption is not exceeded then big/oil and gas companies may pay only 20 % of regular ecological taxes. In the future non-tax sources may be used to get budget revenues in order to reduce or maintain unchangeable tax burden of oil companies.





In fact, introduction of ecological taxes will make it possible to improve environment, will motivate nature managers in emission reduction and rational use of natural resources.

The next effective economic “green growth” tool is the introduction of payments for ecosystem services (PES), which is a transaction between a buyer and a seller of an eco-system service or it may be the practice of land tenure/ or the organization of the use of land that may ensure such a service.

Therefore, ecosystem services related to water use (quantity) such as protection from floods and water regulation (run-offs, infiltration, retention and accumulation) can be ensured with the help of afforestation, use of saving methods in agricultural activity and rehabilitation of food-lands. Services such as decrease of pollution of water resources, can be ensured by extensive land use (with agricultural purposes), comprehensive agricultural pest control; introduction of quotas for pollution and reorganization of transformation or restoration of natural growth. Other services, for example, services on water treatment can be ensured by restoration or creation of wetlands and rice cultivation on flooded fields. The possibility to “combine” service should also be considered given that forest services linked with water can be combined with services on carbon binding; services of wetlands and flooded fields may be integrated with services of these tenure forms in biodiversity sphere.

Economic analysis is a necessary form of effective decision-making in terms of development of PES scenarios. It serves as a logically complex basis that facilitates comparison of the costs related to change in ecosystem services and benefits from their use. It may also be used as the basis to assess the distribution nature of these costs and benefits between all the stakeholders and compensation that probably will be required in order to prevent environmental damage.

The process on PES definition should include several stages:

- identifying respective ecosystem services;
- identifying key stakeholders;
- assessment of net benefits determined by the change of ecosystem services that will be obtained as a result of the change of the type or management of these ecosystems;
- assessment of the nature of costs and benefits distribution among the key stakeholders and development of package of compensatory measures that may be required.

Interested stakeholders have to be involved into this process including national governments, local administration bodies, community groups individual land owners, commercial companies, non-governmental organizations and donors. Decision-making with regard to effective measures is necessary for achieving goals and it also assumes ensuring the balance of interests of all the stakeholders and, in this connection, the decision-making process should be open to all the stakeholders.

The governments should devise a clear policy and strategy for the development and implementation of PES scenarios in different forms and within the relevant sectors: water use, environmental protection/nature management activity, agriculture/forestry and (municipal) services.

Provisions regulating protection, rehabilitation and sustainable use of ecosystems related to water have to be included into the national legislation, into agreements of transboundary water resources and international nature management agreements.





Therefore, PES mechanisms may help to find resolution of a wide set of problems related to production and consumption of natural resources and as a result, to environmental impact. PES application may help to resolve problems of emission of greenhouse gases within the framework of the Kyoto Protocol implementation, water supply accessibility for small settlements in the country and other issues that require undertaking complex resolution measures.

Alongside the introduction of ecological taxes, perfection of the current legislation attention should be given to externalities that are common for energy intensive industries imposed onto the population of Kazakhstan. Ignoring problems of formation of radiation, chemical and biological pollution foci resulted in the fact that violated environmental objects including toxic waste jeopardize not only ecological systems but also the human's health. The given problem is especially pertinent in big cities and industrial centers of the Republic of Kazakhstan that are characterized by high population concentration; it is there that the high morbidity and mortality levels are registered; they are caused by the problems of respiratory organs, oncological diseases, cardio-vascular system, skin and subcutaneous tissue conditions as well as neurological diseases.

Box 2 - Sources of ionizing radiation

Natural sources of ionizing radiation may also be the principal cause of a number of diseases. Based on expert opinion people receive about 70% of the aggregated radiation dose from all the sources of radiation and about 20% of all the lung cancer cases are determined by the impact of radon and its by-products in the indoor environment.

On the territory of Kazakhstan, specifically in a number of areas in Akmola, North-Kazakhstan oblasts and in the mountainous regions of other territories of Kazakhstan the rate of radon and its decay products is ten times more than allowed by the current hygienic norms.

It seems that criteria of population health status should be prioritized among all the factors that are taken into account in the process of development and implementation of strategic plans and activities ensuring ecological safety of the country, including the study of the impact of hazardous environmental factors upon the health of population, as well as measures on the population rehabilitation in the regions that have been affected by the nuclear weapon tests or population residing on the territories of environmental hazard.

In order to resolve the aforementioned problems it is assumed that the work on assessment of the negative environmental impact on population will continue alongside with the measures aimed to reduce their impact on environment and population health. These include:

- Identification of risk criteria for population morbidity determined by the air quality on territories affected by big extraction and raw processing industries, objects of heat-and-power engineering, transport and other sources of negative impact;
- Development of medical-sanitary monitoring and especially regular control of hygienic indicators in relation to environmental pollution and diverse sanitary-epidemiological situation;





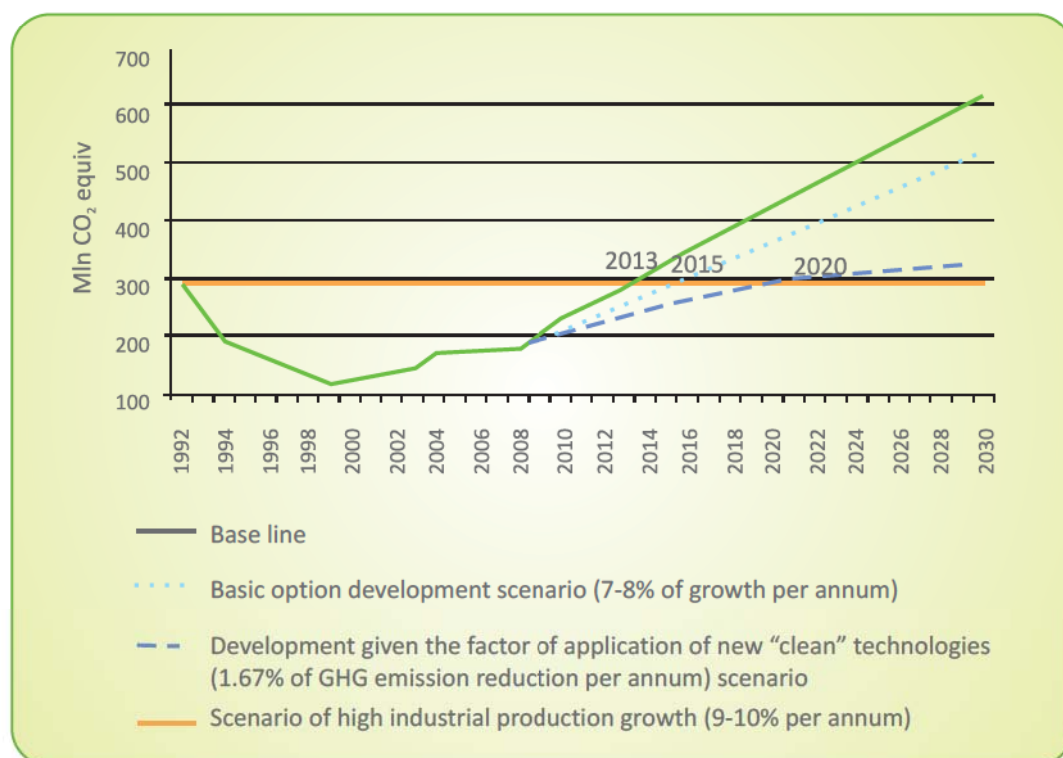
- Development and implementation of specific rehabilitation measures including population rehabilitation on the territories affected by the nuclear weapon tests based on the screening results of exposed people and their descendants.

Integration of the principles of “Green Growth” into strategic planning will contribute to successful implementation of Kazakhstan international obligations within the framework of the Kyoto Protocol ratification.

Estimated increase of the country GDP by 50% by the year 2014 compared to 2008 according to NPAIID highlights the significance of the of Kazakhstan participation in the international carbon trade given that the rate of industrial production stipulated in the current and perspective development plans imply dramatic increase of the emissions of greenhouse gases.

Under the most optimistic estimates the excess of emission quotas for greenhouse gases in Kazakhstan during the first Kyoto Protocol accounting period (2008-2012) could make up about 150 mln. tons CO² equiv. and more in case of NPAIID successful implementation.

The principle scenario of development following ratification of Kyoto Protocol is given in Figure 13, based on the current indicators of industrial production and emission of greenhouse gases. In case of the use of “green” technologies contributing to the reduction of greenhouse gases due to the power-efficiency increase the carbon potential of the country may considerably grow up.



Note – developed by Y.Karazhan, from Ph.D thesis

Figure 13 - Forecasts of greenhouse gases emission in CO² equiv in industrial sector of Kazakhstan





As it can be seen from Figure 13 the use of «green» technologies will let Kazakhstan to delay the quota excess in terms of emission by the year 2020 and in the longer term – to considerably reduce emissions.

To conclude, integration of the principles of “Green Growth” into the national strategic planning and taxation will allow effective consumption of natural resources, industrial potential of the country and on the whole to contribute to the improvement of quality of life.



3.2 Green business and infrastructure development

An important direction of transition to “Green Growth” as it has already been mentioned in Part 1.1 is the development of «green business» and infrastructure. Its major advantages include reduction of negative environmental impact with simultaneous increase of production volumes, reduction of specific volumes of raw and other materials and product quality improvement.

There is a number of preconditions for “green business” development in Kazakhstan: high rate of development of the national primary sector, which is the main pollutant of natural ecosystems. Despite a drop in production volumes due to the global financial crisis, housing construction is still booming, which implies an increased air pollution and environment degradation in general. For example, according to data of the Ministry of Environment Protection of the Republic of Kazakhstan, more than twenty billion tons of waste accumulated in the country, one third of which is toxic. The very reason of waste generation is the result of the activity of mining-processing sectors, ferrous and non-ferrous metallurgy, petrochemistry, production of construction materials. Perilous production (lead, zinc, phosphate and chrome) in East-Kazakhstan, Karaganda, Dzhambyl and Aktyubinsk oblasts resulted in considerable air pollution, which in its turn amplified health risks for population of aforementioned and neighboring regions.

Recently, there was a growing awareness of the fact that effective environmental management is an important factor for business development. This factor is now considered as an integral part of the entire system of business management. However, sustainable business strategies develop under the pressure of the need to comply with corporate interests and increasing demand on part of the consumers.

Currently, there is an active state level politics towards stimulation of environmentally friendly business management. This is supported by the “Zhasyl Damu” Program for 2010-2104, the Concept of Transition of the Republic of Kazakhstan to Sustainable Development for 2007-2024», the Concept of Environmental Safety of the Republic of Kazakhstan as of the 2015, the Council on Sustainable Development under the Government of the Republic of Kazakhstan.





The “Zhasyl Damu” Project suggests a number of innovative tools that would contribute to “green business” development. Specifically the project stipulates implementation of macroeconomic policy elements, such as radical structural changes in the economy and export policy, tax system reform, use of rent payments and other instruments. For example, stabilization and reduction of share of mining industries with simultaneous development of processing ones will allow saving up to 50 % of the natural resources while increasing the final product volume and considerably reducing wastes. The use of resources and accumulation of waste could also be considerably reduced at the expense of tax restructuring within their total sum and based on the examples of such countries as Norway, USA. Rental payments and their use for the purpose of reproduction of natural resources could also be important for the «green growth» and sustainable development of Kazakhstan.

Enforcement of the Environmental Code of the Republic of Kazakhstan in January 2007 played an important role in redirecting Kazakhstan industry into more environmentally friendly business. As the result of the Environmental Code numerous legal regulating tools for resource consumption and environmental protection have been amended while other individual regulatory tools have been introduced: norm-setting, licensing system, production environmental control and ecological audit.

The basis of nature-conservation measures of industrial institutions in Kazakhstan are special programs on environmental protection, which are developed by the institutions on an annual basis and are coordinated by the Ministry of Environment Protection and its territorial subdivisions. Upgrading the status of the given programs, exploitation of rigid criteria for their coordination, close monitoring of implementation will contribute to growth of institutional responsibility as regards to environmental protection issues.

Unfortunately, no system of incentive mechanism has been developed in our country to stimulate an expansion of activity scope of the institutions when controlling the environmental management. That is business bears responsibility for unexecuted planned nature-conservation measures, although no one rewarded for over-fulfillment of the plan. A number of foreign companies functioning on the territory of the Republic of Kazakhstan follow quite a rigid corporate liability in environmental issues and are not motivated either for additional investments into this activity.

Environmentally sensitive business largely contributes to introduction of ecological management standards. Such voluntary mechanisms as international standards of ecological management – ISO 14001, voluntary ecological ratings of the companies, public eco-control are widely used and replicated.

International standards ISO 14000 become an important tool to environmentally friendly economy and elucidation of global and local environmental problems. Issues of integration of the Republic of Kazakhstan into the global market, creation of free trade zones, growth of product export, accession to the World Trade Organization (WTO) are quite pertinent for our state. The most effective way to solve these issues is mastering and integration of eco-management tools in line with the requirements of the international standards 14000.

One of the most important elements of integration into the global market is an ecological compatibility of the manufactured product and eco-labeling. Low ecological image of the





companies very often becomes a barrier for the access of their production to the external market where alongside with the competitiveness documented ecological consistency of Kazakhstan companies is taken into account.

ST RK ISO 14001-2006 (ISO 14001:2004) establishes requirements to the system of eco-management – recognized mechanism of improving eco-efficiency of the activities in enterprises. The system of eco-management can be developed in a company of any level and specialization, any pattern of ownership and production or services sphere.

Introduction of the ISO 14001 standard within the framework of eco-management system formation stimulates a company transition from controlling of the negative impact upon environment to prevention or minimizing such an impact.

Key element of eco-management system in line with ST RK ISO 14001-2006 (ISO 14001:2004) is ensuring accommodation and control of all the existing ecological aspects and impacts.

Since 2007 Kazakhstan practices company rating development based on ecological indicators, which makes it possible for an authorized body to objectively compare and assess «ecological compatibility» of businesses by calculating a number of indicators mentioned in the questionnaires, developed specifically for rating purposes.

Participation of companies in ecological ratings implies disclosure of non-financial reporting, which will increase investment attractiveness and capitalization of the most transparent companies. Companies that have provided comprehensive information about the activity contribute to implementation of international liabilities by the country within the framework of Aarhus Convention on access to information, community participation in decision-making process and access to justice on issues related to environment.

According to published information business structures may perform internal audit and set goals that would contribute to an increase in competitiveness, attraction of investments and the most importantly – any company could set a goal to reduce its ecological costs compared to its competitors.

Measurable goals and objectives based on data of ecological ratings may become the basis for developing ecological policy of a company – a key document of eco-management system.

As it has been noted before, in past few years attention to cooperation and interaction of business with public organizations keeps increasing. Accounting for stakeholders opinion when planning business strategies and strategies on environmental protection will contribute to more complex approach and prevention of contradictions and potentially possible conflict situations. A complex solution could include consultations with all the stakeholders. Strategic planning based on systematic studies on stakeholders' opinion, including local population, public organizations, advisory and international organizations and etc., is a perspective approach for the companies aimed at the implementation of sustainable business strategies. Furthermore, an introduction of consultations with the stakeholders into the business practice will facilitate the development of more effective development strategies.

Sustainable infrastructure is the next important “green growth” policy measure.





Currently urban population of the Republic of Kazakhstan has reached 8.4 million people⁴. The biggest growth has taken place in the last few years. Such dynamics is determined by considerable migration of rural population to cities as well as by the flow of resettlers from other countries to their historical motherland. The rate of internal migration is several times higher than the housing construction rate. The volume of housing in Kazakhstan during the last ten years has not practically changed. Firstly, this is due to the fact that construction of new houses is done at the place of demolished buildings. Secondly, it is due to the growth of population size during this period. Regardless the negative impact of the global financial crisis some revival of construction market was registered in Kazakhstan in 2009. Thus, total area of residential constructions that were put into operation in August increased compared to July 2009 by 5.05% or by 9.13% as of January of the current year. However according to the forecasts of the Statistics Agency of the Republic of Kazakhstan a considerable part of new housing will become obsolete in the coming 30-40 years.

Construction sector on the one hand is a big user of natural resources, raw materials and energy and on the other hand it makes a considerable contribution into the emission volume of greenhouse gases. For example, construction sector makes up 10% total national CO₂ emission.

The idea of creation of sustainable infrastructure aimed to reduce negative impact of construction and other industrial sectors. Ecologically safe design and planning are rooted in understanding the basis of natural systems as well as behavior of ecosystems; thus contributing to conservation and establishing links between nature and buildings. They cover the entire process of planning, designing, construction, exploitation and technical maintenance during the entire building life cycle. The basis of this concept is the aspiration to ensure rational use of natural resources with the aim of building up a harmonious environment and a safe place for people to live and at the same time minimizing negative environmental impact.

Environmentally friendly construction has potential to reduce consumption of energy and water resources as well as costs by more than 50% compared to regular construction.

In Kazakhstan introduction and development of environmentally friendly building presses has a great potential due to high power intensity of buildings. Power consumption of buildings makes up 30% of the total energy use of the country.

The current principle regulatory act in power-efficiency subject is the Law of the Republic of Kazakhstan of December 25, 1997, № 210-І “On Energy Saving”. It covers energy saving processes related to mining operations, processing, transportation, production, storage and use of all types of fuel-energy resources, thermal and electric energy, including supply and distribution along centralized networks. This Law advocates the reduction of thermal energy in the process of delivery and use as well as ensuring accuracy, reliability and uniformity of measurements regarding stock-taking of energy resources released and used. National, regional and sector programs on energy saving have been identified as key implementation instruments of energy saving.

Currently there is no generally accepted methodology in the country, based on which energy audit of utilities could be performed as well as necessary regulatory-legal basis for the

⁴ Based on the formal data of the Statistics Agency of the Republic of Kazakhstan as of the beginning of 2009.





implementation of this kind of services. However, many Kazakhstani companies (especially in big cities) have already started work on improvement and upgrading thermal/heat units in the buildings with the aim of normalizing heat supply and minimizing user costs for heat consumption. Certain positive results have already been achieved and factual materials have been accumulated, which proves that demand for the services of these companies escalates from year to year.

So far, the work on improving power efficiency of buildings is limited to upgrading of thermal units. Other activity directions to reduce heat consumption of buildings are not yet adequately developed. It is known that heat-proof measures yield significant effect for energy-saving with regard to utility heating, specifically such as: heat insulation of walls, roofs, replacement of windows, doors and etc. Each building (or type of building) is unique and requires individual approach to measures on power efficiency improvement; to that end it is necessary to perform energy audit of these buildings. In the course of this energy audit each building is examined and assessed. Likewise, current energy consumption (heat and electric) is analyzed looking at the use of technical devices and development of possible measures to reduce energy use in the building and to appraise their efficiency.

Apart from the principles of power saving measures that have to be used when designing and operating different constructions, it is important to stipulate the use of renewable energy sources. Fossil fuel could be replaced by renewable energy sources, specifically by electricity and heat produced using natural terrestrial processes. Regardless the fact that renewable energy sources are environmentally clean, sustainable and do not increase greenhouse emissions, its efficiency of transformation of natural forms of energy into electricity and heat is still rather low. In the majority of countries renewable sources of energy are still responsible for a small share of national energy supply. One of the main barriers on the way of their implementation is their low economic efficiency compared to energy system working on fossil fuel through operational costs for their generation on the whole remain rather low.

In 2009 the Law on alternative sources of energy was adopted “On Support of the Use of Renewable Sources of Energy”, the enforcement of which will make it possible to increase the share of renewable sources of energy (RSE) used when building and designing houses, to reduce economy power intensity and environmental impact of electric energy generation, including emission reduction of greenhouse gases.

In order to ensure system approach to development of renewable sources of energy the Law stipulates endorsement of:

- the plan (program) on deployment of objects utilizing renewable sources of energy;
- the programs targeted at development and use of renewable sources of energy for medium and long term periods;
- approval of the procedure for coordination of design and building of objects utilizing renewable energy sources.

One of the key indicators of environmentally friendly construction is minimizing the use of water resources, its rational use.





In Kazakhstan coverage with water supply services is relatively high - 79,4% of urban population. The length of networks in the cities of the country is comprised by water supply – 23468 km and sewerage system – 11133 km. The majority of water pipelines have been put into operation and undergone capital repair more than 25-30 years ago. More than half of these networks are in need of replacement or capital repair. Apart from that there are abandoned (not on the balance of the local public utility companies) networks that earlier belonged to central departments and now are in need of complete replacement.

Overall losses in water pipelines due to the wear and tear of pipes make up 30-50% and more of water produced. The number of network breakdowns increases annually by 4-5%. The system of water supply and distribution becomes obsolete resulting in greater breakdown rates and consequently in increase of leakages. Obsolete services lose 250-300 thousand of m³ of water a day.

Thus, introduction of practice of water measuring at the building entrance and utilization of water saving principles as well as water recycling technologies for technical needs when designing buildings are expedient and justified from the economic point of view.

For building construction purposes an important aspect is the selection of materials. Utilization of ecologically safe materials may contribute to reduction of power consumption in the buildings, to enhancement of thermal protection of buildings and to minimizing negative impact on health of people. Unfortunately so far there are no formal methodologies in Kazakhstan to define ecological compatibility of construction materials though Ecological Code of the Republic of Kazakhstan (Article 32) defines the concept of «ecologically clean production».

As it was mentioned earlier many of the national and foreign companies when announcing the procurement of goods and services among other requirements to potential contractors set forward the requirement on the availability of eco-management systems. Availability of ISO 9001 and 14001 certificates proves that the company is adherent to certain principles, approaches and standards. However their availability does not guarantee ecological safety of the product manufactured by the company itself. Development and introduction of special ecological criteria for procurement of construction materials may considerably influence quality standards for building design and construction. To achieve high results on development of the so called «green purchases», evidence-based approach to defining procedures of their implementation has to be in place.

Thus, recommendations on “green” business and sustainable infrastructure introduction worth mentioning may include the following:

- Development and introduction of the incentive system to trigger nature-conservative measures beyond those set by the norms;
- Due regard to achievement of measurable goals and objectives in regulation of nature management based on eco-rating data;
- Introduction of practice of holding consultations with the stakeholders (Stakeholders consultations) for strategic planning of business companies in environmental protection;
- Development of methodology for energy audit of different buildings;
Improvement of regulatory-legal basis for energy audit of different buildings;
- Application of the principles of water saving and water recycling for technical needs when designing buildings;
- Introduction of the principle of «green purchases».





3.3 Introduction of sustainable production and consumption

Sustainable production and consumption as a “Green Growth” path includes the next tools: ecologically clean state procurements; assessment of life cycle of goods; stimulation of sustainable use of resources and clean production; reuse/recycling of waste and their processing.

Sustainable production and consumption, deemed as enhancement of qualitative characteristics of the given processes, become a requirement for stable economic growth and consequently contribute to improvement of ecosystems status with simultaneous increase in consumption.

Sustainable production and consumption within the context of the national economy sustainable development include:

- Introduction of the best practices of ecological management in institutions (cleaner production, resource and power saving, pollution prevention, minimization waste);
- Development and introduction of eco-management system;
- Improvement of system of management of wastes;
- Search and transfer of ecologically clean technologies.

Transition of Kazakhstan to sustainable production and consumption at the current development stage will make it possible to implement its main objective – conservation of the natural potential for future generations.

Major preconditions for transition to sustainable production and consumptions are:

- Obsolete production technologies;
- High consumption norms;
- Poorly managed impact environment;
- Inadequate attention to environmental and sustainable development issues on the business part;
- Imperfection of current norms of consumption and permit system

There are different methods and approaches to sustainable production and consumption: eco-efficiency, 3R model (reduce, reuse and recycle), environmental management standards and etc. Key principles of these methods and approaches are:

- ensuring unity of phases of products and services life cycle from production to consumption;
- taking into account all the three aspects – economic, social and environmental effects.

Implementation of these methods and approaches is done through tools like green tax, green market and green business, sustainable infrastructure and sustainable consumption, with the help of which it is possible to stipulate regulatory bases for sustainable development of individual sectors and national economy on the whole in strategic plans of public bodies.





Sustainable development without sustainable consumption, as the experience shows, does not yield desired effect. For example, increase in consumption of cheap goods and services because of increase of technological and economic production efficiency leads to «cancellation» of the given effect.

Intensive exploitation of mineral resources for the last ten years resulted in more than 21 bln. tons of industrial waste accumulating in Kazakhstan. Furthermore, 20 mln m³ of domestic and up to 1 bln tons of industrial waste is generated annually. One of the factors of this negative phenomenon is a greater utilisation of hard-cleaning, fine and emulsively ingrained ores, increasing number of oxidized and solvable mineral forms.

Production waste comprised by remains of raw materials, semi-products, chemical compounds that are formed in production process or during the work implementation and that have lost completely or partially original properties. Consumption waste are products and materials that have completely or partially lost their consumption properties as a result of physical or functional depreciation and vital activity of the people.

Box 3 – Metal losses due to metallurgical conversion

As a result of irrational use of resources more than one third of metals produced is lost. Most of the losses of metals are registered in production processes: during metal mining – 15-20% of non-ferrous metals and 8-12% of noble metals, during concentration – accordingly 43-48% and 74-75%, during metallurgical conversion – 35-42% and 14%. Precious co-metals are not extracted either while they constitute the basis of high, science intensive technologies in electronics, aerospace, motor-car construction and other industries and if to take into account the global demand for these metals in money terms then losses in terms of useful product are tremendous and unjustified.

Toxic waste as part of industrial waste is of special concern regarding their impact on environment and people's health given that their amount in 2008 was 6,00 bln tons, which accounts for 28,5% of the total accumulated waste in the country (Figure 14).

Annual increase of waste volume (453,3 mln tons got accumulated in 2008) is the main reason of violation of ecological balance in biosphere. Small volumes of its utilisation (less than 10%) and decontamination (1-2%) of waste prove unsustainable use of the country natural resources.

Subsequently, it seems necessary to meet increasing needs of social production in raw materials at the expense of secondary mineral resources. Economic industry growth of developed countries is characterized not only by the degree of the use of new materials, low-waste technologies but also by the share of secondary raw materials within the total balance of resources, indicators of their recycling. For example, reuse of metals in Japan makes up 98%, slags – 75%, ash – 45%. Ash-and-slag waste of thermal power stations in Germany are used by 80%, in France – by 65%, in Great Britain – by 53%.



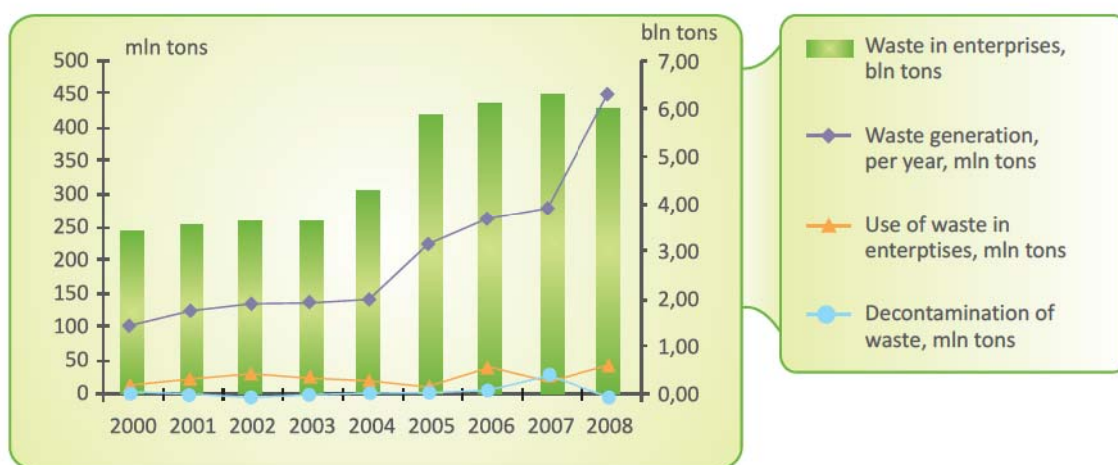


Figure 14 – Key indicators of toxic waste in the Republic of Kazakhstan

Box 4 - History of waste reclamation

Search of effective ways of waste processing has its history. It was back in 1596 that J. Harrington (Great Britain) addressed these issues and later waste reclamation became one of the priority issues in many countries and acquired national significance. Since the middle of the XXth century in many countries tailing dumps have been used as an additional source of metal, coal and etc. production. Aluminium, gallium, potash, soda and cement are produced out of nepheline tailings. 30-40% of solid mining slag-heaps are used as construction materials, 20-30% are used to fill-in worked-out areas in mines and quarries.

By the end of the second half of the XXth century, the process of waste processing started being addressed with the help of nanotechnologies and production of new types of raw materials. For example, Institute of Plastic Wastes set up in Japan at the initiative of the Ministry of International Trade and Industry, which develops innovative technologies of secondary use by plastic transformation into ammonia and use of plastic waste for cement production. Production waste is vitrified and the resulting glassy mass is used in construction in France and Germany. An industrial complex functions in Russia, in Nizhniy Novgorod oblast, which utilizes waste from shock-absorbing tire-covers processing; these are used to produce rubber mats, sport and road paving, artificial football fields, railroad sleepers, and roofing.

Today in Kazakhstan out of total scrap-iron volume (4,5 mln. tons) 60% is exported, 35% is consumed internally and 5% is left for carry-over stock. Export of ferrous metal scrap sold in thirteen countries. While exporting scrap of low conversion Kazakhstan imports half-finished products that could have been successfully produced inside the country. Annual growth of scrap-iron makes up 0,5 mln. tons and this fast aging and dynamically discarded metal stock with time may yield the annual growth of one million tons.





An important factor that determines the expediency of deep waste processing is the availability of energy component, which is present practically in all the types of waste, specifically – the presence of organic component up to 50%. I.e. waste can be used as a considerable power resource, which is renewed on a regular basis. Estimates prove that from 10 to 20% of the energy needs in developed countries could be covered at the expense of waste power component use.

Levels of secondary waste processing (recycling) and reclamation to generate power considerably vary among the different countries. A significant volume of waste accumulates around the dumps. Unused global potential of waste utilization for energy generation varies from 3 to 5 EJ a year. Increasing efficiency of the use of raw materials/product and waste management may result in reduction of approximately 0,3-0,8 bln tons of CO₂ emission a year.

Thus, incineration and burial is an unprofitable way of waste processing due to the loss of the aforementioned «energy margin» and still greater loss in terms of land resources, the area of which increases each year. Grading waste with the follow-up extraction of useful component is becoming a more and more effective way of waste processing/recycling.

The amount of energy obtained from biomass products and combustible waste, including liquid and solid, domestic and municipal (local) wastes shows to what extent waste is used in the country as a secondary raw material. As is obvious from Figure 15 Kazakhstan does not practically use secondary energy, which is the manifestation of huge reserves for introduction of sustainable production and consumption.

The current situation in power consumption shows that losses are responsible for more than 2/3 of the volume in a utilization process. In the first place – in industry, which share of power consumption is more than 60% of the entire energy consumption. Specifically in the national metallurgical industry specific weight of used power resources is 1,5 to 5,5 times compared to the US depending upon the product manufactured.

This has a negative impact on the general picture of power intensity of the entire economy, reducing the decoupling effect, described in Chapter 2. Thus, power efficiency in industry for 2004-2008, regardless the growth in nominal value from 92,13 KZT/kwt/h to 201,82 KZT /kwt/h, reduced to 0,3%. Reason for this being the growth of global prices for mineral resources that considerably exceed the increase of volume and rate of improvement of production technology.

Within industries the share of energy saving potential is as follows: electric power engineering – 32%, metallurgy – 29%, mining – 14% and other industries – 25%.

In mining industry product manufacturing per each energy kwt/h has increased in 2004-2008 from 245 KZT to 653 KZT; on the whole real growth rate made up 5%.

Quite the contrary situation is observed in the sector of crude oil and casing-head gas: real energy efficiency during this period has reduced by 5% (Figure 16).

Considerable reduction of energy efficiency is observed in the production process of mineral ores – about 9% while power consumption related to production of 1 Tenge of metal ores reduced almost by 2,6. While energy efficiency of their mining reduced by 6%. In ferrous metallurgy the given indicator is twice as high and makes up 1,12. (Figure 16).



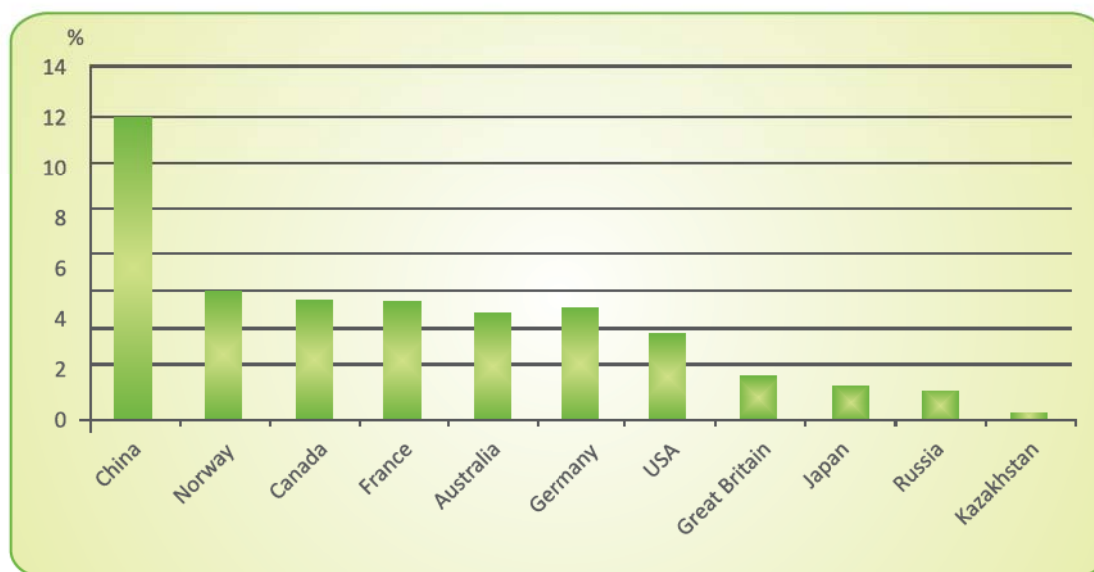


Figure 15 – The share of energy generated from biomass products and combustible waste (including secondary waste), within the total energy consumption.

It is worth mentioning that 99% of the processing industry and more than 90% of all the waste in mining industry are formed specifically in metallurgical industry and in production of finished metal goods. This fact characterizes the given sector as the most ecologically hazardous among other industries.

In production and distribution of power energy, gas and water power consumption has reduced by quarter, which makes it possible to mention considerable losses in production and as a result of obsolescence of transmission networks. Hence, in electrical systems losses make up 15-20%, in thermal systems 25-30%; the majority of TPS, HPS and other industrial companies use obsolete ineffective equipment; buildings and constructions, including new ones are characterized by increased consumption of thermal and power energy.

Major barriers to energy intensity reduction of product manufactured are: obsolete technological equipment, inadequate supply of recording, regulation and automation, low management level, lack of economic incentives and poor efficiency of the current regulatory- legal basis and etc.

Therefore in the Legislation of the Republic of Kazakhstan “On Energy Saving” the energy saving mechanism is of declarative nature. The side-law “The Rules of Differentiation of Tariffs for Power Energy by Energy Supplying Companies based on the Time Zones and (or) Depending upon the Quantities of its Use by Physical Entities” developed to implement the given norm regulates the size of the rates of payment for electricity for the companies based on the time zone, while for



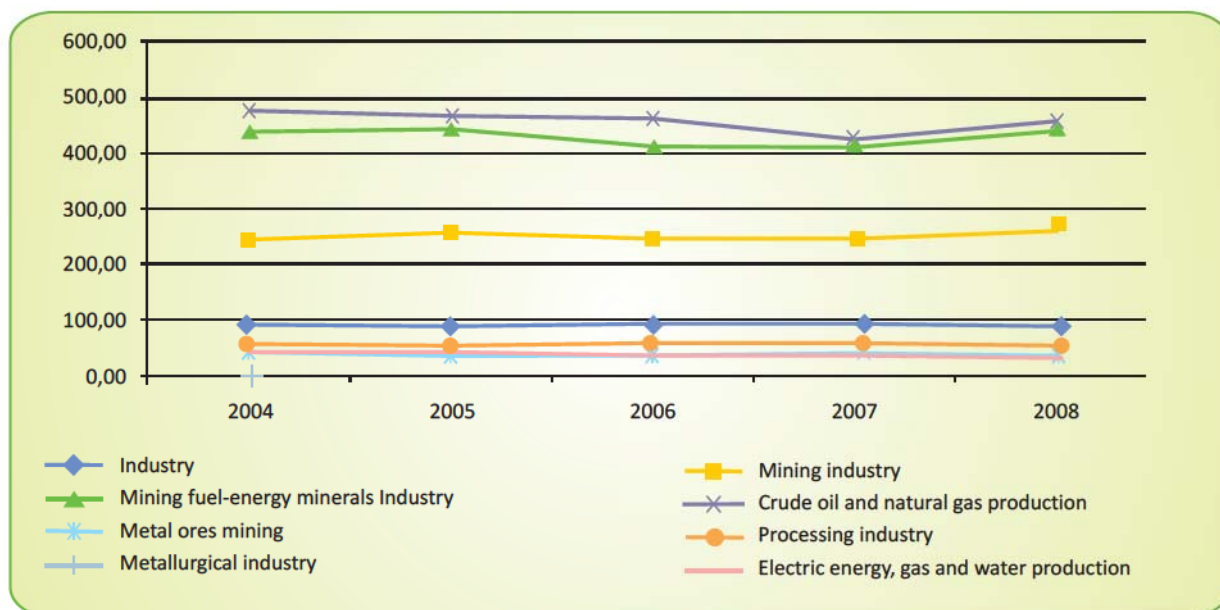


Figure 16 – Energy efficiency in industry for 2004-2008

physical entities – depending on the amount used. On our opinion, the influence of the given mechanism on the activity of legal entities is barely effective. The introduction of taxation norms for the companies that generate and use electric power stipulating some benefits for the energy saving measures will contribute to perfection of the energy saving regulation on the part of the state. According to the Comprehensive Plan of Energy Saving of the Republic of Kazakhstan (1st stage) endorsed by the Decree of the Government of the Republic of Kazakhstan № 221 of 26.02.2009 the given issue is to be resolved in 2010 by the Ministry of Energy and Mineral Resources of the RK. We consider it reasonable to involve local authorities into this Plan implementation as well, which will make it possible to take into account regional peculiarities.

Accordingly, in order to form the models of sustainable production and consumption it is necessary to undertake effective management mechanisms; implementation of which initially stipulates development of the policy tool for energy preservation and formation of effective energy-saving management system as well as development of effective system of waste management and regulation in the regions. It entails a setting up of special waste management and regulation bodies in the regions. To that end, it is necessary to analyze and evaluate accumulated production waste, to ensure control over their arrival and follow-up use, regulation and norm setting for enterprise waste, development of measures on elimination of waste generation, neutralization and decontamination of hazardous, toxic waste etc.

To facilitate regulation of utilisation of waste for raw material production that is proposed to produce innovative products the following is necessary:

- full or shared financing of innovative technologies on utilization and recycling of waste from different sources;
- control over the use of these funds;





- granting credits, loans, leasing with «soft» repayment terms;
- tax remissions;
- use of system of symplified issue of licenses and permits for innovative activity and etc.;
- contribution of scientific and private sector to the development and implementation of programs in this area.

These measures also confirm the necessity of wholistic regional-economic complex of wastes management.



CONCLUSION

The Concept of “Green Growth” endorsed by the Asian-Pacific countries at the 5th Ministerial Meeting (Seoul, 2005) suggests the economic growth model that ensures conservation of natural resources and harmonization of “man-nature” relations. Information of the given Report proves that all the necessary preconditions exist in the Republic of Kazakhstan for integration of the basic “green growth” principles into the strategic planning system, specifically, those are:

I. Institutional preconditions

- 🌿 The system of strategic planning and budgeting oriented at final result has been formed;
- 🌿 25 international ecological conventions and agreements have been ratified;
- 🌿 Environmental/ecological Code stipulating mandatory ecological expert examination of all the investment projects has been enforced;
- 🌿 The Concept of transition of the Republic of Kazakhstan to sustainable development for 2007-2024 has been endorsed by the Decree of the President of the Republic of Kazakhstan;
- 🌿 The Law «On Concessions» adopted in 2006 that has become the start of public-private partnership;
- 🌿 The Council on Sustainable Development under the Government of the Republic of Kazakhstan has been set up and is successfully functioning;
- 🌿 The National Program of accelerated industrial-innovative development for 2010-2014 endorsed by the Decree of the President of the Republic of Kazakhstan aimed at processing economy sector development has been enforced.

II. Preconditions in the sphere of economic development

- 🌿 High energy intensity of industrial production;
- 🌿 Structural economy reorganization and diversification;
- 🌿 Customs Union accession and preparation for WTO accession.

III. Preconditions and risks in the sphere of environment

- 🌿 Climate change and growth of industrial pollutions;
- 🌿 Destruction and degradation of ecosystems;
- 🌿 Water deficit and reduction of the area of arable lands;
- 🌿 Accumulation of industrial and domestic wastes.

To integrate “green growth” tools into the system of strategic planning of the Republic of Kazakhstan the Interagency Working Group/Task Force recommends:

1. In the national statistics perfection:

The List of indicators of sustainable development of the Republic of Kazakhstan reflected in the Draft Decree of the Republic of Kazakhstan, № 848, should incorporate the following:

Consumption of energy resources

GDP energy efficiency; Per capita power consumption; Per capita electricity consumption; Per capita annual petrol consumption.



Water resources consumption

GDP water intensity including water intensity of production and industrial sectors

Emission of greenhouse gases

GDP carbon intensity; Per capita CO² emissions; Increase of CO² emissions for a certain development period.

Acid emissions

Per capita specific emissions of SO_x; GDP per capita specific emissions of NO_x

Generation of solid waste, including toxic and radioactive ones

Generation of solid waste per GDP unit; Generation of toxic industrial waste per unit of industrial product; Specific toxic waste accumulated on the balance of companies, per capita; Generation of per capita solid domestic waste.

2. Taxation

- ✔ Ministry of Environment and Ministry of Finances of the Republic of Kazakhstan should consider the option of development and introduction of ecological taxes and methods of payment for ecosystem services into the Tax Code;
- ✔ Agency of the Republic of Kazakhstan on Construction and Housing and Communal Services should introduce amendments to construction standards and norms (SN&R) on accounting factors ensuring power efficiency and energy saving at the stage of designing, construction and capital repair.

3. Ensuring sustainable production and consumption

- ✔ In order to identify procedures of energy audit and energetic expert examination of buildings the Ministry of Industry and New Technologies should develop Rules of their implementation.
- ✔ The Law «On Government Purchases» should be complemented by ecological requirements to goods, works and services procured.
- ✔ The Ministry of Environment should introduce stock taking procedures with regard to potential of CO² absorption by natural ecosystems for regulation and emission assessment of greenhouse gases, based on the norms stipulated by the Environmental/Ecological Code.

4. “Green Business” development

- ✔ Forms of public-private partnership should be encouraged.
- ✔ Ministry of Education and Science, Ministry of Economic Development and Trade, Ministry of Environment Protection should contribute to enhancement of staffing potential in the subject of the “Green Growth” with the support of donor organizations.

Implementation of the given recommendations on the opinion of expert group of this Report will enable to update both the system of strategic planning and its monitoring arrangement and to develop more sustainable model of the country's economic growth.





REFERENCE LIST

1. Strategy of Kazakhstan Development till 2030
2. Decree of the President RK "On Endorsement of the System of the Governmental Planning in the Republic of Kazakhstan" of 18.06.2009 #827
3. Decree of the President RK of November 14, 2006 #216 "On Endorsement of the Concept of Transition of the RK to Sustainable Development for 2007-2024"
4. The Strategy of Territorial Development of the Republic of Kazakhstan as of 2015
5. Decree "On Endorsement of Strategic Plan of Development of the Republic of Kazakhstan as 2020" of 01.02.2010
6. State Program of Forced Industrial-innovative Development of the Republic of Kazakhstan for 2010-2014
7. S.Bobylev, P.Perelet and etc. Economy of Sustainable Development. A text-book for Higher School, Moscow, 2003
8. Indicators of Sustainable Development of the Republic of Kazakhstan. – Almaty: De Luxe, 2002.-64 p.
9. B.Yesekina. Sustainable Development of Economic Systems in Conditions of Globalization. – Almaty: De Luxe, 2006. -42 p.
10. Priorities of the Concept of Transition of the Republic of Kazakhstan to Sustainable Development. Almaty: De Luxe, 2006.- 42 p.
11. Indicators of eco-efficiency, www.ecobez.narod.ru/ecoefftypes.html
12. Eco-efficiency Indicators: Measuring Resource-use Efficiency and the Impact of Economic Activities on the Environment, UN ESCAP, 2009.-24 pp., www.greengrowth.org
13. Green Growth in Asia and Pacific, UN ESCAP, 2008.-73 pp., www.greengrowth.org
14. PWC submitted a Report "World in 2050", 13.10.2006
<http://www.cybersecurity.ru/news/14738.html>
15. Recommendations on issues of energy efficiency (translation from English) –OECD/IEA, 2009.-84p.
16. Report of the Vice-minister of Environment of the Republic of Kazakhstan Y.Sadvokasova, December 3, 2009, www.kazenergy.com
17. The Little Green Data Book 2009.-U.S.A.: The World Bank, 2009.-234p.
18. Gupta, Sh. Fiscal Implications of Environmental Taxes in India: An Exploratory Analysis, paper presented at the 9th Annual Global Conference on Environmental Taxation on November 6th-7th, 2008 organized by Asia-Pacific Center for Environmental Law (APCEL) and Singapore Academy of Law
19. N.Rogozhin. In Search of Answers to Ecological Challenge, 1999.
20. Draft Program "Zhasyl Damu" for 2010-2014.



21. Reference document to practical workshops “Possibilities of Improvement of Energy Efficiency in Central Asia, Including SPECA Countries”. Environmentally Safe Construction Design and Projection”, - Brahmanand Mohanti
22. “Enhancement of the Energy Efficiency in Heat Supply”. Reference materials. UNDP Project/GEF/AREM “Elimination of Barriers to Bring up Energy Efficiency of Communal of Heat Supply”.
23. Report “Access of Population of the Republic of Kazakhstan to Drinking Water and Sanitation”, UNDP, 2006.
24. A.Kobzhasov. Potential of non-ferrous metallurgy//Industry of Kazakhstan, №6 2006 –p.49-51.
25. K.Novikov. Dukes of Dirt, //Money, №15(571)2007 – p.119-125.
26. A.Korostelov, Y.Bakhovskaya. Pertinent Issues of Recycling, Wastes Reclamation and Clean Technologies//non-ferrous metals, Recycling, №2, 2007 – p.126.



Indicators of eco-efficiency of the Republic of Kazakhstan, Kazakh Tenge (KZT) in 2000

	2000	2001	2002	2003	2004	2005	2006	2007	2008
GDP energy intensity, kg s.c.t./thousands	30,35	25,96	28,41	27,13	25,79	24,14	23,17	23,12	23,26
Per capita energy consumption, kg s.c.t./people	7134,63	7079,8	7542,1	7915,8	8338,0	8562,0	9604,6	9870,6	10345,8
GDP carbon intensity* tCO ₂ Equiv/thousands KZT	66,16	60,32	60,19	57,79	58,74	57,06	52,83	50,03	49,46
GDP carbon intensity* kgCO ₂ Equiv/thousands KZT	52,81	43,55	44,02	42,47		43,75	41,01	40,57	
GDP water intensity, m ³ /thousands KZT	7,63	6,67	6,51	6,17	6,81	5,82	4,51	4,45	3,86
Specific generation of toxic waste per GDP unit RK, kg/thousands KZT		35,481	31,548	30,810	29,832	49,148	45,676	43,958	46,285
Specific volumes of toxic waste accumulated on the balance of companies, per capita, tons/people		238,37	241,18	239,86	283,01	390,55	399,706	405,63	382,83
Specific emission of pollutants per GDP unit, kg/thousands KZT	0,922	0,875	0,781	0,815	0,777	0,697	0,620	0,568	0,499
Specific emission of sulphur oxides (SOx) per GDP unit, kg/thousands KZT	0,411	0,410	0,349	0,391	0,384	0,341	0,290	0,253	0,203
Specific emission of nitric oxides (NOx) per GDP unit, kg/thousands KZT	0,063	0,061	0,054	0,054	0,051	0,047	0,043	0,040	0,040

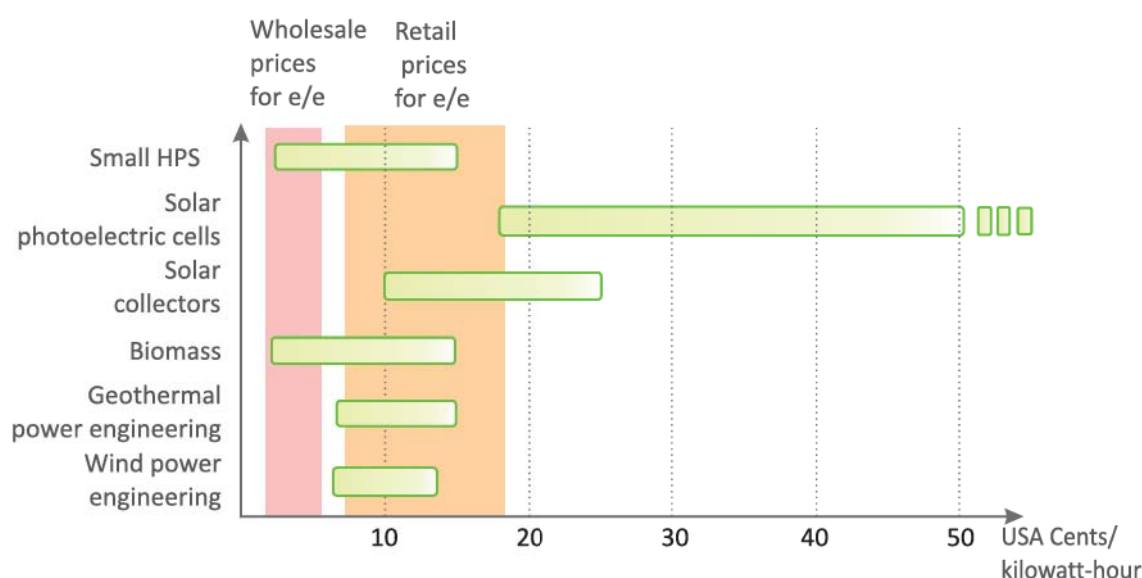
Note: developed and calculated based on the data of Statistic Agency and KazRIE

*to calculate of the given indicator general emissions of greenhouse gases in CO₂ equivalent have been used, without stocks (volumes of absorbed carbonic gas)



Measures for renewable energy development

It is known that under the current market prices for electric energy, renewable energy is noncompetitive compared to traditional one due to higher production/process costs.



Note: horizontal axis reflects production/process costs; vertical axis reflects different types of renewable sources of energy; pink bar – reflects wholesale prices for electric energy, cream-colored wide bar – retail consumer prices for electric energy.

Figure 17 – Price competitiveness of some of renewable energy sources

Source: International Energy Agency, Renewables in Global Energy Supply, January 2007.

Countries around the world allocate considerable subsidies to support renewable power engineering. However such measures are expensive for the state budget and inadequate to support “green power engineering” development.

There are two major ways to enhance competitiveness of renewable power engineering:

- 🌱 Development of technologies that facilitate reduction of production costs. It is a natural process; however, its operational speed may be inadequate to ensure fast alternative energy development.
- 🌱 To enhance a general level of wholesale and retail prices in power engineering market; to reach at least the lowest limit of production costs of alternative energy producers. This



could be achieved through charging traditional energy producers “green” taxes (the principle “pollutant pays”). The advantage of “green” taxes is that in case of adequate legal support they automatically ensure redistribution of financial resources from traditional power engineering sector to alternative one. Evidently, implementation mechanism of this strategy should be carefully developed taking into account the need to protect socially vulnerable population groups when increasing tariffs for prices on paid energy supply services.





LIST OF AUTHORS

Prof. B.Yessekina	- Introduction, Conclusion, Parts 1.1
Prof. N.Nurlanova	- Part 1.2
Dr. G.Ismagulova	- Parts 1.2, 2.1
Dr. S.Sapargali	- Part 2.2
Dr. A.Shalabekova	- Parts 1.1, 3.1
Dr. S.Zhumabekova	- Part 3.3
Dr. B.Yeleusizova	- Part 3.3
Ms. G.Isayeva	- Part 3.2
Bs. D.Galiyeva	- Part 1.1



United Nations Economic and Social Commission
for Asia and the Pacific (UN ESCAP), www.unescap.org

The Network of Experts for Sustainable Development
of Central Asia (NESDCA), www.nesdca.narod.ru

Korea International Cooperation Agency (KOICA), www.koica.go.kr