CONCEPTUAL APPROACHES TO IMPLEMENTATION OF TRANSITION OF KAZAKHSTAN TO "GREEN ECONOMY"

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Abstract— Currently exist the following technological preconditions for gradual development of green economy: rapid development of Internet-globalization and computer technologies, modernization of transport, rapid technological change, increased volume of scientific and technical information and growth of high-tech industries. All these factors provide a basis for global use and spread of new green technologies, development of modern tools of controlling and monitoring of environmental issues, rapid response to a particular complex environmental situation. The article provides brief analysis of economic situation in Kazakhstan. Particular emphasis is placed on the issues related to energy capacity and energy efficiency, their impact on environment and competitiveness of the country, as well as opportunities to improve these indicators. Also, it includes the author's approach to the implementation of "green" economy in the Republic of Kazakhstan based on synergy effect of energy-saving and parallel increased influence of human capital on process of transition to "green" growth.

Index Terms— Energy Efficiency, Energy Saving, Environmental Damage, Green Economy.

I. INTRODUCTION

Already during this century a new concept of so called "green economy" has been formulated, which is aimed to ensure harmonic coordination between economic, social and environmental components of development which would be acceptable to all countries. One of the reasons of its occurrence include anthropogenic changes of natural-economic complexes in the framework of natural- economic systems. This made it possible to determine the degree of sustainability of natural complexes within the natural- economic systems with extensive zones of ecological and economic tension, first of all, transformation of landscapes in the process of their assimilation, mainly during mining, processing and transportation of raw hydrocarbons (West Kazakhstan), development of mining and metallurgical industries (East Kazakhstan), chemical industry (Southern Kazakhstan), as well as agricultural production and tourism - recreational activities etc. The financial and economic crisis has further strengthened the processes of degradation of natural systems.

Current stage of civilization development is directly related to the constant technological development and change of production technological modes. The sphere of high technology is rapidly developing in post-industrial countries, that sets new requirements for scientific justification of their theoretical-methodological and applied aspects, and is expressed in growing interest of scientists to these issues. Economy of Kazakhstan is substantially lagging behind in technological aspect, which is based on production of the 3rd and 4th technological structure (see Table I).

Table I. Share of technological structures in the economy of certain countries (evaluation)

Country	III-d techno-structure	IV-th techno-structure	V-th techno-structure	VI-th techno-structure
USA	-	20 %	60 %	5 %
Russia	30%	50%	10%	-
Ukraine	57,9 %	38 %	4 %	0,1 %
Kazakhstan	65 %	34 %	1 %	1 %

The table shows the share of tech lifestyles in some economies [1], [2], [3].

Kazakhstani economy needs a qualitative jump in the development of production forces, establishing of new industries, which will have the improved management forms and methods for entering of the Republic into the world's innovation technological chain, which means, it is needed to transform technological structure. Weak innovative development of Kazakhstan is also associated with the lack of systematic legal and regulatory framework which regulates scientific sector. Comparative analysis of scientific and technological activities in Kazakhstan and industrialized countries has shown that development of the country's national system of support and introduction of innovations is at the beginning stage. Kazakhstan is only at the early stage of economic transition from raw materials to innovative type of development.

In this situation, only "green economy" which is resource-saving, energy-efficient, low-carbon, knowledge-based, innovative, ecologically and socially oriented, balanced and alternative, could determine the directions of changes in the structure of used resources and technologies.

The United Nations experts on Environment Conservation Program (UNEP) have proposed the

most extensive content of this concept, considering the "green economy" as an economic activity, "which increases the welfare of the people and ensures social equity while significantly reduces environmental risks and deterioration of nature [4].

According to the experts, the defining features of such economy are as follows:

- efficient use of natural resources;
- conservation and increase of natural capital;
- reduction of pollution;
- low carbon emissions;
- prevention of loss of ecosystem services and biodiversity;
- income growth and employment.

According to the estimates of the International Monetary Fund, Republic of Kazakhstan is among the ten fastest growing countries in the world. According to the Global Competitiveness Index of the World Economic Forum, at the end of 2013, Kazakhstan occupies 50th place among 148 countries of the world. This is a fairly high assessment of the country's economy at international level.

Foreign investments attracted to the country during the last two decades in the amount of 150 bln.USD, have significantly contributed to the economic growth. According to the data of the United Nations Conference on Trade and Development (UNCTAD), Kazakhstan took the 19th place among the Top 20 leading countries in terms of attracting direct foreign investments. However, according to the forecasts of international analysts, in 2015 and in the forthcoming years, due to the sharp slowdown in economic growth in most countries and the world community in whole, the outflow of capital from developing countries is expected (which fully applies to Kazakhstan).

II. MATERIALS AND METHODS

In the frame of the project it is supposed to conduct scientific research based on systematic structural analysis using methods of economic and statistical data processing, logical method, peer reviews, comparative analysis, economic and mathematical methods, synthesis etc.

III. RESULTS AND DISCUSSIONS

In view of the dynamics of economic structure of the Republic of Kazakhstan, the correlation between the share of different sectors and industries in the country's gross domestic product (GDP) and exports, we can conclude that during a long period of time and currently mining industry is the basis of economic growth, incomes of the country and well-being of the population.

Mineral resources basis, as already has been indicated, is represented by approximately 5,000 deposits. The energy sector of the country is almost entirely dependent on natural resources - oil, gas, coal and uranium, although the country has specific potential for development of hydro and wind energy, i.e. renewable energy sources.

At the same time, the level of energy capacity in GDP in Kazakhstan is several times higher than corresponding figure in such countries as Italy, Japan, Germany, United Kingdom and United States.

The energy capacity in GDP of Kazakhstan is 1.9, energy capacity in GDP of Belarus - 1.17, while energy capacity in GDP of Japan is only 0.1, that is 19 times lower than indicator of Kazakhstan. The average indicator of specific energy consumption of buildings in Kazakhstan is 270 kWh/m^2, whereas in Sweden the same figure is only 82.

To reduce energy capacity in GDP by 10% by 2015, and by 25% by 2020, Kazakhstan adopted a new law "On energy saving".

Energy capacity in GDP of Kazakhstan is 1.5 times higher than energy capacity in GDP of Russia and Belarus. However, the rate of decline of this indicator "evidences about the effectiveness of energy-saving policy of the State". Despite the high energy capacity in GDP, energy consumption in Kazakhstan (per capita) is comparable to the level of industrialized countries [5].

The key energy consuming sectors (more than 98% of total consumption) are: energy supply, housing and utilities (buildings), industry and transport.

The emphasis on exploitation of natural resources, in addition to increasing negative impact on the environment, makes the country's economy very vulnerable and dependent on the level of prices for raw materials and energy. Forecasts of analysts in this direction for the forthcoming years are not "optimistic" - as the decline in prices is expected [5].

At the highest level, Kazakhstan has declared the intention to refuse from raw material orientation of economy, to focus on final stages of processing and proceed to construction of a new model - model of "green economy". Over the last few years a number of strategic documents have been developed, which define strategic directions of economic development, guidelines for construction of its sustainable and efficient model in average and long term perspective.

One of the main documents - is the Concept of transition of the Republic of Kazakhstan to "green economy." In this document "green economy" is defined as economy with a high quality of life, careful and rational use of natural resources for the benefit of present and future generations and in accordance with international environmental obligations taken by the country.

In the next few years the Republic of Kazakhstan assumes to implement some projects very important for the international community, in particular, the exhibition EXPO 2017: "Energy of the Future" and Partnership Program "Green Bridge" to promote sustainable development in Central Asia and other regions of the world.

At this stage of work on the basis of available

information on the status and prospects of development of Kazakhstan's economy, the authors have formulated their own vision of transition from current model to "green economy."

The process (in enlarged form) can be viewed as follows:

1. Large volumes of minerals in the Republic of Kazakhstan, acting mining and processing enterprises of fuel and energy complex (FEC), which provide employment for a large number of workers, will remain for a long period of time and will exist in parallel with developing centers of crystallization of "green economy "(maybe during several decades). During this period, sectors and industries, which now refer to "brown" economy, can maintain their leading positions in the GDP and exports of the country. It means that emissions of pollutants and greenhouse gases will continue, which contribute to climate change and other negative consequences, if we don't undertake urgent measures on their prevention, or, more precisely, reduction.

2. The process of transition to a new model - a model of "green economy" - would be long enough, and the presence of large reserves of natural raw materials and carbon fuel in the country may be, to some extent, only a restraining and slowing down factor. In addition, process of shifting from raw material model is highly inert. Also, the presence of significant reserves of natural resources is the guarantee of stable economic development, but for a relatively short period of time.

A key feature of economic transition from one to another condition is that the approaches and the entire development process will not be uniform, and simultaneous, when, for example, "brown" economy will disappear and instead of it will arise a new "green economy" (gradually economic structure, correlation between industries, level of its environmental safety and other characteristics) will change. At least two approaches may be implemented.

The first approach:

The most technologically backward and energy-intensive businesses and industries of "brown" economy, as repeatedly mentioned in publications and experts' evaluations, should be substantially upgraded to the level of the best available technologies in order to further take major part in new "green economy".

In regard to technologically backward businesses, which also have greatest negative impact on the environment (these companies are revealed during regional audit), certain priorities are formed, i.e., a list of the most backward enterprises (priority ones) and schedules of their compulsory reconstruction and modernization.

Approach Two:

Sectors of low-carbon energy efficient "green economy" are established on a new basis. For example, old buildings with a high degree of physical deterioration are gradually replaced by new ones (Concept of the country's transition to "green economy" envisages that within the next 20 years, 55% of buildings and 40% of power stations of their total volume, will be built from zero and with account of all modern requirements, including energy efficiency) or partially reconstructed, modernized at modern technological level. Eco-construction is emerging and developing.

A similar situation occurs in transport (the Concept stipulates that 80% of the vehicle fleet in 2030 will be new vehicles) - eco-transport (electric cars etc.) appear. New industry sectors also appear which will use wastes of other industries [6].

Development of renewable energy sources (RES) is one of the most effective mechanisms of introduction of "green" low-carbon economy. It is planned that in 2014 the share of RES in total energy balance of the country will reach one per cent, and up to 2020 - three. In the long term perspective, renewable energy source technologies will be cheaper and will improve. This will facilitate massive use of alternative sources in energy generation and by 2030 will enhance the increase of the share of RES by 10 percent of total energy consumption volume [7].

As a result, a new infrastructure is established and a new more efficient economy- "green" economy is formed, which rationally uses natural resources and is environmentally friendly - (which meets the interests of a specific region, country and international community).

In practice, both of these approaches will be implemented simultaneously - as two parallel processes.

The following factors can have positive impact on acceleration of transition to "green" economy:

- understanding and awareness of the need and expediency of modernization of economy of their territories by regional leadership (with appropriate incentives and accountability);
- availability of initiatives, innovative ideas and projects on creation of "green" productions, technologies, modernization and greening of existing industries (by research organizations, businesses, individual entrepreneurs, credit institutions) in specific region and their concentration in the relevant data bank (objective- establishing of such Innovation banks in each region);
- availability of regional research and design institutions, universities, small innovative enterprises, university campuses, start-ups and business incubators, etc .;
- favorable investment climate and acceptable business conditions;
- support (including information, administrative and financial) at regional and national levels;
- highlighting of strategies, policies and best practices (implementation of new technologies, pilot

projects, etc.) in "green economy" and introduction of innovative projects;

• periodic exchange of views with experts and stakeholders on modernization of economy in different regions (conferences, round tables, etc.).

Experts, including foreign, note that there are uniform (or similar) principles, but there is no uniform way to transition to "green economy". Moreover, each country, each region must find their most rational way of transition to a new economic model. So, we are discussing several possible scenarios of transformation of current economic model. Selection of scenario, first of all, will be determined by specifics of the territory (geographical, climatic, economic, social and other) and presence of specific preconditions (favorable conditions) for modernization.

CONCLUSION

In the course of the research the following measures have been formulated and proposed:

- approaches to determining parameters and criteria for evaluation of innovative technologies in comparison with foreign analogues;
- establishing of expert bodies (based on sectoral feature), implementation of environmental-economic audit of regions aimed to determine preconditions and potential of the regions for implementation of "green technologies", formulation of modernization process management system etc.;
- the necessity of changing production structure and consumption of electric power on the basis of new technological solutions;
- proposals on reduction of regional imbalances and conservation of landscape - ecological sustainable system, as a basis for improving the viability of population;
- the results can have positive impact on the effectiveness of action plan on transition to "green economy"

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