

Promotion of energy efficiency policy in transition economies: a view from inside (Belarus)

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1. SYNOPSIS

The purpose of the paper is to analyse changes in energy situation, to resume the results of energy policy in Belarus in 1991 – 2000 and to present strategy and programs in the sphere of energy efficiency for 2001-2010. The paper has three main points in its structure: brief assessment of the energy sector and ecological consequences of the energy activities in current political and economic conditions; summary of evolution of the concept of energy efficiency in Belarus to present state policy and programs; recommendations to overcome the barriers for more effective use of domestic resources and attracting foreign investments and assistance.

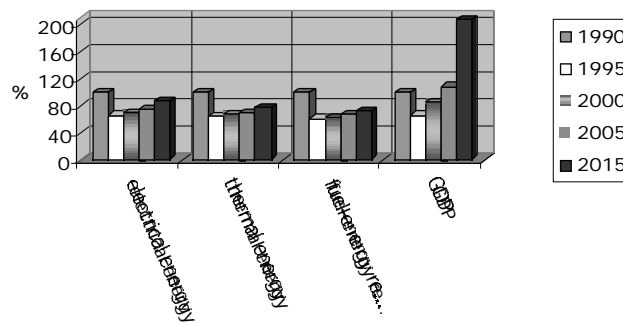
2. ASSESSMENT OF THE ENERGY SECTOR AND ECOLOGICAL CONSEQUENCES OF THE ENERGY ACTIVITIES

In 1991, the Republic of Belarus acquired its independence. The political independence was not supported with the economic one. During the last 70 years, the economic system of Belarus was developing as a part of the system of the Soviet Union. That is why there was a desperate need to reorganize urgently the structure, domestic and foreign relations of the Belarusian economy. The last ten years of the XX century have become a turning-point. That non-stable period in political, social and economic spheres led to growth of tension and crisis in the energy sector of the country. To overcome the crisis promotion of energy saving programs was adopted as a general direction of the state energy policy in Belarus for last six years. The final results of reforms during the past ten years to 2000 are the following:

- In political sphere the main changes consist in acquisition of the State independence, in gradual decline of the authoritarian regime, in appearance of democratic elements and openness, in lack of influential political parties and movements.
- New elements in economics are appearance of private property share and insignificant development of small and medium size enterprises. Economic growth decreased that years. Only in 1996 it was stabilised. Annual increase of GDP in 1996 was 2.8%, 1997 – 11.4%, 1998 – 8.3%, 1999 – 3.0%. Total increase of GDP equalled 28.2%, from 1995 it was provided without increasing the total demand for fuel and energy resources and with the decrease 24.7% of the GDP energy intensity.
- In energy sector there was a success in ensuring reliability and stability of the national energy system. A broad program for energy saving and renewable energy sources was launched. Complicated problems expecting their prompt decisions are accumulated: lack of own primary energy resources (volumes of fuels: oil, associated gas, peat, wood mining at the territory of the country satisfies only 15% of the total demand); moral and physical obsolescence of energy equipment and lack of investments for its modernisation and substitution; non-payments of consumers for electrical and thermal energy; discrepancy of the present tariffs to real costs for generation, transportation and distribution of energy. The debates on nuclear plant building took place at the governmental level and also this topic was discussed in the mass media. Nuclear industry development was admitted impossible at present because of economic and ecological reasons. The basic directions of the energy sector development are the interstate projects on transit of gas and electrical energy through the territory of Belarus, on energy saving and renewable energy sources.
- From 1995 to 1998, the total harmful emissions from the objects of the Belarusian energy sector were reduced by 20.5% and continue to decrease thanks to the substitution of fuel-oil by natural gas, decreasing energy consumption due to production fall in the country and utilisation of energy efficient technologies. Sulphur and nitrogen oxides are imported on the territory of Belarus due to transboundary pollution; the share of Belarusian sources consists only of 10.4%, energy objects making for a share of 2.5%.

Compared to 1990, the following indexes of GDP growth are forecasted by the State Program “Main Directions of Energy Policy of the Republic of Belarus for 2001-2005 and for period to 2015”: 104.5-113.9% in 2005, 146.6-167.3% in 2010, 203.1-214.4% in 2015; energy intensity is expected to decrease from $8.29 \cdot 10^{-3}$ toe/\$US in 1999 to $4.56-4.98 \cdot 10^{-3}$ in 2015, that is 40-45%. The main kind of fuels will be natural gas; its demand will increase from 13.75Mill toe in 2000 to 17.57Mill toe in 2015. The share of natural gas in the balance of boiler fuels will be 73.9% in 2015, the share of local fuels, renewable and secondary energy resources will increase from 7.6% in 2000 to 8.8% in 2015. According to mentioned State Program, electrical energy demand will grow from 34.2 (27.5 – generation at the power plants of Belarus) billion kWh in 2000 to 41.0-45.0 (41.0 – planning generation in Belarus) billion kWh in 2015. The forecast of thermal energy demand: from 310.1 million GJ in 2000 to 347.8-372.9 million GJ in 2015. The gross demand for fuel and energy resources will increase from 25 million toe in 2000 to 29.0-27.16 million toe in 2015. In addition to given data the diagrams of fig.1 can illustrate existing in Belarus tendencies of energy demand increasing.

Figure 1. Dynamics of energy resources demand and GDP from 1990 to 2015



3. SUMMARY OF EVOLUTION OF THE CONCEPT OF ENERGY EFFICIENCY

Energy saving activities have always been applied in Belarus. However, these activities had limited impact on efficiency because energy prices in the conditions of the Soviet planning system had been determined by the state and kept artificially low. Producers and consumers were not interested in energy saving. From the 1990s, the approaches to energy resources use have changed. The State Policy and Program on Energy Saving were elaborated. It was created the State system of energy saving management. A number of programs on energy saving were launched for regions, economics sectors, cities and enterprises. International collaboration and assistance in the framework of the programs THERMIE, TACIS, SYNERGY, WB, EBRD have emerged in the area of energy restructuring and energy saving. The dissemination of energy saving methods and tools among the population by means of mass media began.

A number of interesting projects on energy savings have been realised. For example, UNDP-EEC Project “Rational Use of Wood Waste and Reduction of Harmful Emissions in the Environment by Using Them with the Purpose of Production of a Thermal Energy”. The use of wood fuel in the fuel and energy balance of Belarus is now 1100.0 thousand tons of fuel equivalent. The implementation of the Project permits to attract additional 641.670 thousand tons of fuel equivalent in the balance of the country. Other project is municipal program for the capital of Belarus (Minsk) “Modernising of Heat Power Objects of Minsk for Energy Saving and Decreasing Contamination of Atmosphere”. At the first stage of the municipal program three thermal substations were connected to the boiler-house with the control system remote management of thermal network elements. As a result the saving of fuel and energy resources amounted to 11%. The payback time was 2 years.

Training seminars, courses and conferences were held jointly with the foreign partners from Western countries. The creation of the permanent educational system in the sphere of energy savings started beginning from pre-school age and finishing with higher education and retraining of engineers. The educational course “The fundamentals of energy saving” is introduced in the curriculums of the educational technical and economic establishments of Belarus. Also the new speciality “Energy efficient technologies and energy management” is launched in leading higher educational technical establishments.

The priorities of the State Program on Energy Saving in Belarus were the following: supervision and monitoring of energy consumption; promotion of small and micro-cogeneration power plants; use of secondary energy resources; increase of energy efficiency of boilers-sets and thermal networks; promotion of steam-gas-turbines; regulated electrical drives; increase of energy efficiency of lighting systems, refrigerator and compressors installations, building constructions; use of heating pumps; renewable and local energy sources use.

As a result of 10-years of efforts Belarus has got some successes in the spheres of stable energy sector functioning and energy saving. Energy efficiency is becoming a great state priority as seen by the following trends. The government is working actively to build the state system of energy saving management, the system of financing, stimulating energy saving programs, supervision and monitoring of energy use, realisation of a number of energy efficient technical projects (in Minsk, in Orsha, etc.).

In December 2000 new State Program “Main Directions of Energy Policy of the Republic of Belarus for 2001-2005 and for period to 2015” and new “State Program on Energy Saving for 2001-2005” were adopted. These Programs formulate new important tasks on energy efficiency for the conditions of energy market creation. The main accents at present are put on restructuring of energy industry of Belarus, on development of energy sector and energy saving to minimise harmful influence of energy industry on the economics and promotion of the methods of modern management.

4. BARRIERS AND RECOMMENDATIONS TO OVERCOME THEM

In table 1 for the poster specifically the authors systemise barriers to the promotion energy efficiency and recommendations how to remove them to make more effective national activities and reinvigorate international collaboration.

Table 1.

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1	Energy industry in Belarus is a complete state monopoly; lack of energy products market and competition in the spheres of generation and supply of electrical and thermal energy.	Energy sector restructuring in accordance with the social-economical structure and peculiarities of Belarus on the basis of a political will, adoption of the laws of energy industry restructuring.
2	Lack of well grounded progressive system of tariffs for electrical and thermal energy.	Adoption of the system of multiple tariffs for energy resources corresponding to restructured energy sector.
3	Lack of market and competition in the sphere of energy service of the final users including the municipal ones.	Improvement of energy service of the consumers, introduction the measures on energy efficiency stimulation of consumers.
4	Scarcity of own investments to re-orient various economic sectors of Belarus (machine-building, energy industry, device-building, refinery industry and other), to modern energy efficient, ecological clean technologies.	Creation of juridical and economic mechanisms to attract domestic and foreign investments to decisive branches and enterprises; creation of ESCOs.
5	Lack of structures of independent specialists and experts in the sphere of energy ecology.	Creation of private consulting firms with highly qualified experts licensed by the State.
6	Prevalence of “the method of a whip” (“stick”) in energy efficiency at the enterprises; insufficient interest in rational energy use.	Use of the methods of economic stimulation (“carrot”) and modern management.
7	Cross-subsidisation – payment of municipal consumers energy costs by industrial users.	Decrease of the electrical and thermal energy tariffs for industrial users to put ones in accordance with real expenditures; subsidisation for poor municipal consumers.

In 1999 the Project “Restructuring and Corporatisation of the Power Industry in Belarus” was implemented in the framework of the TACIS Program. Its main result: the governmental decisions and public opinion are prepared for gradual (step by step) restructuring. In the State Program “Main Directions of Energy Policy of the

Republic of Belarus for 2001-2005 and for period to 2015” restructuring is called the first priority. Concrete forms of restructuring are not yet determined.

The quantitative estimation of the social and ecological effects of energy saving and use of renewable and local energy sources in the national energy sector planning determines the economy in 1.43-3.12 billion \$US that could be used to renovate energy equipment or to build new energy industry objects.

Potential of using energy management at the industrial enterprises and in the cities of Belarus is not realised in fact at present because of insufficiency of qualifications of the leading staff in this sphere and lack of psychological readiness of population.

5. CONCLUSION

From 1990 to 2000 in the Republic of Belarus it was made large work to ensure stability functioning of power industry of the country in transition economies. New progressive approaches to energy efficiency promotion into Belarusian economic system were elaborated and realised. For 2001-2005 and for period to 2015 energy security and energy efficiency are called as the main priorities of the State energy policy in Belarus. The strategic tasks are to ensure to 2005 planning increase of GDP without increase of demand of fuel and energy resources and to decrease energy intensity of GDP by 15.1-18.6% in 2005 with reference to 2000.