Energy Sector of the Republic of Korea: Ideas for Studying

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Today the energy system of the Republic of Belarus is on the stage of reformation while the energy sector of the Republic of Korea experienced rapid industrial sector development during the later decades of the 20th century, also is beginning to make a transition to a service-oriented economy. But the energy systems of both republics have things in common and therefore should be studied in order to analyze the potential for using the Korean experience in the sector reformation.

Energy sector has the vertical structure in both republics. Same as SPA "Belenergo", the state-owned Korea Electric Power Corporation (KEPCO) dominates all aspects of electricity generation, retail, transmission, and distribution. In 2001, KEPCO's generation assets were divided into six separate subsidiary power generation companies. Although the initial restructuring included plans for their privatization, KEPCO continues to wholly own each of the subsidiaries. Furthermore, KEPCO owns majority shares of KEPCO Engineering and Construction, Korea Nuclear Fuel, Korea Plant Service and Engineering, and Korea Electric Power Data Network.

KEPCO's total generation capacity was 67,005 MW as of the end of 2011, accounting for 88.4% of the country's total capacity. SPA "Belenergo" total generation capacity today is 8,488 MW.

The Korea Electric Power Exchange (KPX), also established in 2001 as part of the electricity sector reform efforts, serves as the system operator and coordinates the wholesale electric power market. KEPCO continues to act as the electricity retailer, and controls transmission and distribution.

The energy sector in both countries is influenced much by the state regulation. The Electricity Business Act of Korea makes the Ministry of Commerce, Industry and Energy (MOCIE) primarily responsible for the economic regulation of the electricity sector. An electricity tariff pricing system is designed to protect low-income residents and industrial consumers. That is why the system of subsidization, same as in Belarus, also exists in Korean energy sector. Electricity tariffs vary on the basis by the voltage. The basic tariff structure is a two-part.

With its lack of domestic reserves South Korea is a major energy importer, importing nearly all of its oil needs and being the second-largest importer of liquefied natural gas in the world behind Japan, the third largest importer of coal, and the fifth largest importer of crude oil.

Total primary energy consumption, which stood at 43.9 million tons of oil equivalent (toe) in 1980, increased more than six-fold to 275.7 million toe in 2011, ranking Korea as the 10th largest energy consuming nation in the world.

Although oil accounted for the largest portion (42 percent) of South Korea's primary energy consumption in 2011, its share has been declining since the mid-1990s, when it reached a peak of 66 percent. This is attributed to the steady increase in natural gas and nuclear energy consumption. The government plans to dramatically increase the nuclear share of total energy consumption in the near future as planned reactors are built.

Oil represents 34% of energy sources for final consumers, followed by heat (28%). Gas accounts for 19% of consumption, electricity for 12%, biomass for 5% and coal for 2%.

Gas represents the largest share of primary consumptions (65%), followed by oil (25%). The gas is primarily used to supply the power plants.

The figures for Belarusian electricity generation in both republics have the tendency to grow.

South Korea has the sixth-highest nuclear generation capacity in the world. Korea Hydro & Nuclear Power Co. currently operates South Korea's four nuclear power stations, with 20 individual reactors. Fourteen additional reactors are scheduled to be completed by 2024, with the goal of

generating nearly half of the power supply from nuclear sources. Emerging as an international leader in nuclear technology, Korea is pursuing opportunities to export its technologies.

Nowadays the nuclear power plant is also being built on the territory of Belarus. Russian company is the contractor to build the nuclear power plant. The first reactor is expected to be operational by 2016-2017, and the second one by 2018-2020. The first two reactors will have the combined capacity of around 2400 MW. It is possible that two additional reactors will be built by 2025.

A renewable portfolio standard for South Korea became effective in 2012 with a beginning renewable electricity quota of 2 percent of total generation. Renewable sources remain a small share of South Korea's electricity generation, with hydropower being limited to small dams on the Han River, and a 1 billion kW pumped-storage facility at Yangyang. In response to global trends, the Korean government came up with the 3rd Basic Plan for New and Renewable Energy Technology Development at the end of 2008 with the goal of replacing 11% of primary energy with renewables by 2030.

The share of renewable energy sources in Belarus is also relatively small but the National program of local and renewable energy sources for 2011-2015 requires further development of the sphere. In 2012the share of renewable energy sources in the gross consumption of fuel and energy resources in Belarus amounted to 5%.

To summarize the mentioned above it should be said that in order to proceed the sustainable development of the Belarusian energy sector the experience of Korea in the fields of sector reformation and nuclear plants building and further operation is to be studied or partially implemented.