

ENERGY SECTOR OF UKRAINE IN 2014-2016: REVIEW AND SWOT ANALYSIS¹

1. Ukraine's energy sector at a glance

Structurally, Ukraine's energy sector consists of two large subsectors: fuel and electric power industry (Figure 1). The fuel subsector is comprised of seven main components: natural gas, oil, coal, biomass fuel, natural gas transportation and storage, crude oil transportation and storage, refinery. The electric power industry subsector consists of five main components: nuclear, thermal (including cogeneration facilities and block power stations), hydro, other RES, power electricity networks. The main components of the subsectors were classified depending on the type of the energy sources and/or type of business activity.

Natural gas in Ukraine is provided by imports and domestic production. The annual volume of gas production has been ranging from 18 to 21 bcm/year in the past 15 years and almost has not changed in the past decade. Approximately 85% of production is performed by enterprises of governmental sector of economy. The total gas consumption in Ukraine has declined from 57,6 bcm in 2010 to 33,8 bcm in 2015 or by 23,8 bcm (-41,3%). The largest reduction in gas consumption occurred for recent 5 years by industrial consumers from 23,0 bcm in 2010 to 11,8 bcm in 2015 or by 11,2 bcm (-48,7%).

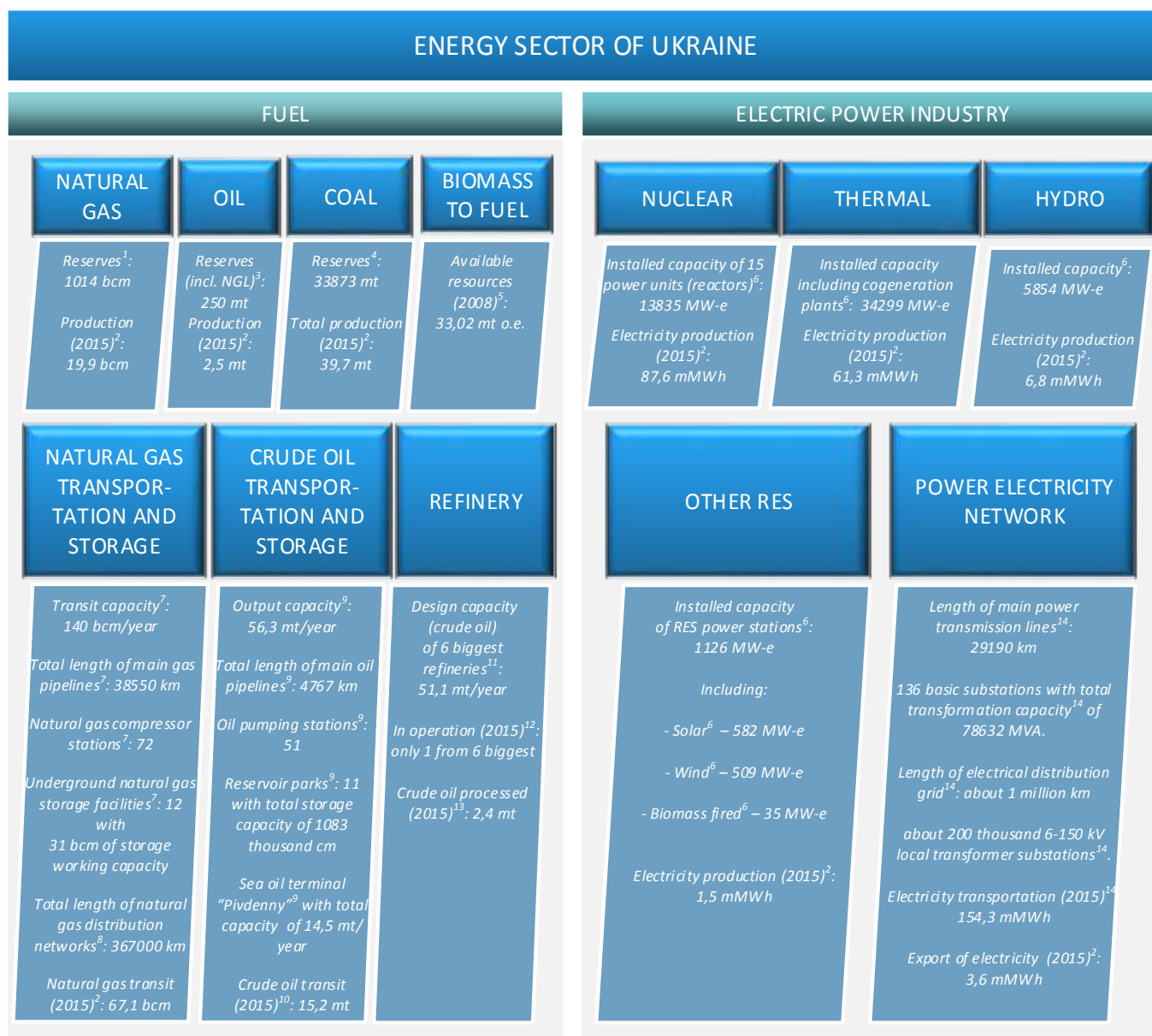
Gas usage for the operating needs of gas producers and system operators has declined by 6% from 3.6 to 3.3 bcm. Operating needs of Ukraine's gas transmission system operator Uktransgas are related to the volume of gas transported from the Russian Federation to the EU, Moldova and Turkey. In 2015, the transmitted volumes increased by 4,9 bcm (8%) from 62,2 bcm in 2014 to 67,1 bcm in 2015.²

Crude oil production and refining industry of Ukraine have not been refocused in order to implement new technologies, minimize raw material losses, attain European quality standards and increase the export of petroleum products. It was also planned that investors would provide reconstruction of existing refineries with the necessary volumes of raw materials, but it did not happen due to weak incentives for investments.

¹ Co-financing within the project of The International Visegrad Fund "Institutional Reform of Ukraine's Energy Sector in the Context of Its Integration into the EU Market"

² <http://www.naftogaz-europe.com/subcategory/en/GasConsumption>

The structure of mine assets of state coal mining companies indicates the aging of main assets. About 40% of all mines have been in operation for over 70 years.



Sites references to Figure 1:

- ¹ Victor Logatskiy and others. - *Natural Gas Recovery in Ukraine: Tax Incentives Initiatives for Discussion*. Razumkov Centre edition, 2015. – Kyiv, 44 pp.
- ² Kateryna Markevych and others. - *Energy Sector of Ukraine: Summary for 2015*. Razumkov Centre edition, 2016. – Kyiv, 72 pp.
- ³ Olexandr Alymov and others. - *Economic Development of Ukraine: Institutional and Resources Provision*. United Institute of Economy National Academy of Sciences of Ukraine, 2005. – Kyiv, 540 pp.
- ⁴ *Black Gold of Ukraine: Infographics*. Ukrinform Information Agency. http://www.ukrinform.ua/rubric-other_news/1536886-vidobutok_vugillya_v_ukraini_nini_vedetsya_v_160_shahtah_infografika_1857135.
- ⁵ Georgiy Geletukha and others. – *Energetic Potential of Biomass in Ukraine*. <http://elibrary.nubip.edu.ua/8102/1/10ggg.pdf>.
- ⁶ *United Energy System of Ukraine: Capacity at the end of 2014*. http://2014.ukrenergo.energy.gov.ua/ukrenergo/control/uk/publish/article?art_id=182509&cat_id=171201
- ⁷ *Data of PJSC Ukrtransgas*. <http://utg.ua/en/utg/gas-transportation-system/characteristic.html>
- ⁸ *Data of NJSC Naftogaz of Ukraine*.
- ⁹ *Data of PJSC Ukrtransnafta*. http://www.ukrtransnafta.com/en/about_company/shema/.
- ¹⁰ *Interfax-Ukraine Information Agency*. <http://ua.interfax.com.ua/news/general/323378.html>.
- ¹¹ *Refinery Industry of Ukraine: Condition, Problems and Development Ways*. National Security and Defence Journal, No 3. Razumkov Centre edition, 2006. - Kyiv, 48pp.
- ¹² *OilNews*. http://oilnews.com.ua/a/columns/Patsient_skoree_mertvu_u_ukrainskih_NPZ_perspektiv_net/221279.
- ¹³ Razumkov Centre's estimation.
- ¹⁴ *New Energy Strategy of Ukraine Until 2020: Security, Energy Efficiency, Competition*. National Security and Defence Journal, No 1. Razumkov Centre edition, 2015. - Kyiv, 56 pp.

Figure 1. Energy sector of Ukraine in key figures.

The coal industry remains a subsidized industry. The situation was severely complicated due to military events in the East of Ukraine and destruction of coal industry infrastructure. This leads to imminent closing down of mines, first of all those that were destroyed or damaged.

Under the conditions of military uncertainty of the future of coal mining in Eastern Ukraine, priority is shifted to the development of Lviv-Volyn coal basin, development of brown coal deposits and combustible shale deposits in Central Ukraine, as well as conducting an independent audit of mine assets and creating an open registry of coal reserves. In 2014-2015 the critical coal imports from the world market to the country were arranged.

The installed capacity of Ukraine's power stations (including CHP and block stations) is 55114 MW-e at the end of 2014³. Installed capacity distribution among the type of generation is following: thermal power generation – 34299 MW-e (62,2%), nuclear power generation – 13835 MW-e (25,1%), hydro power generation - 5854 MW-e (10,6%), other RES power generation – 1126 MW-e (2,1%). The electricity production of Ukraine is estimated to be about 157,2 mMWh in 2015 and was produced by the categories of power generation: 61,3 mMWh (39,0%), nuclear power generation – 87,6 mMWh (55,7%), hydro power generation – 6,8 mMWh (4,3%), other RES power generation – 1,5 mMWh (1,0%).

The total power losses in transmission and distribution networks are 35,4 mMWh or 22,5% in 2015. The high level of power losses in Ukraine's UPS networks is caused by their long period of exploitation, limited finances for reconstruction, modernization and new construction of transmission and distribution electricity grids.

Wholesale electricity market is only institutionally organized electricity market in Ukraine. In May of 2016, the current market model existence of a direct bilateral agreements with customers sector, segments of a balancing market and a market of ancillary services.

³ United Energy System of Ukraine: Capacity at the end of 2014.
http://2014.ukrenergo.energy.gov.ua/ukrenergo/control/uk/publish/article?art_id=182509&cat_id=171201

2. SWOT analysis

SWOT analysis of Ukraine's energy sector represents the most general strengths, weaknesses, opportunities and threats related to Ukrainian energy sector in the middle of 2016.

Strengths:

- Ukraine is richly endowed with primary energy resources;
- Ukraine has an advantageous geographic location between main suppliers of energy resources and European energy markets;
- Ukraine's energy sector has sufficient bi-directional transporting potential and relevant infrastructure in order to transit and export or import natural gas, crude oil, coal, power electricity, biomass;
- Ukrainian natural gas transporting system has the significant storage capacities which can be used for gas supply in peak demand season in Ukraine and Central European countries;
- Ukraine has a reserve of capacities for electric power generation in order to meet additional internal or external electricity demands;
- Energy sector has quite qualified domestic plants personal and engineering specialists;
- Ukraine's energy sector relies mainly on domestic machinery, equipment and materials.

Weaknesses:

- Ongoing dependence on several energy resources: nuclear fuel, crude oil and oil products, natural gas;
- Depletion of hydrocarbons reservoirs;
- Lack of geological survey of energy resources and deposits;
- low value-added stages of nuclear fuel production;
- High level of obsolescence of energy assets and deep degradation of domestic refinery industry;
- Insufficient legislation, over-regulation and weak governmental institutions which do not provide market competition;

- Temporary losses of several energy infrastructure objects and access to several hydrocarbons deposits.

Opportunities:

- Growth of production of convenient and inconvenient energy resources, including hydrocarbons based on new discovered reservoirs and/or more intensive use of current deposits and resources;
- Confirmation of country's "energy bridge" position between main suppliers and European markets;
- Development of technologies and works with high value-added stages of energy resources manufactory including the elements of nuclear cycle;
- More possibilities and gains based on modernization and reconstruction of energy infrastructure;
- Establishment of natural gas hub based on Ukrainian gas underground storages for Eastern and Central European countries;
- Growth of export potential, especially electricity;
- Utilization of low- or not-used renewable energy sources based on biomass, recycling, solar and wind resources;
- Access to Ukraine's energy market as the one of largest in Europe which has above 42,5 mln. country's residents, metallurgic, chemical and other industries as actual or potential energy consumers.

Threats:

- Sporadic war activities in several eastern districts of the country;
- Threatening and un-predictive Russian military policy in relation to Ukraine;
- Losses of the rates of energy sector development caused by temporary loss of control by Ukrainian governmental over the Crimea and several districts of Donbass;
- Accidents on energetic objects due to probability of diversions or high obsolescence of energy infrastructure;
- Creation of alternative transportation routes of energy resources bypassing Ukraine.

Analyzing the list of specified threats inherent to the energy sector, it becomes obvious that, to some extent, the main source of their origin and support is the negative RF factor. It should be noted that economic decline of Ukraine was reached mostly by the large shrinkage of the national economy due to the annexation of essential part of territory (Crimea), military activities in Donbas and huge losses of the industrial, natural and human resources of the country in 2014.

Nevertheless, Ukraine's energy sector demonstrates most competitive in the sense of self-sufficient primary energy supply country is Ukraine which occupies the leading position in the Central and Eastern Europe. Despite the temporal huge losses of territories, citizens, industrial and energy facilities, the energy sector of Ukraine confirms its survivability and readiness to rehabilitation and reforms.

