ALTERNATIVE VARIANTS OF DEVELOPMENT OF ELECTRIC POWER INDUSTRY OF UKRAINE TAKING INTO ACCOUNT EUROPEAN EXPERIENCE

Mykhailo Krutsyak
National Technical University of Ukraine Igor Sikorsky Kyiv Polytechnic Institute
m.Krutsya@gmail.com

From the first day of independence, Ukraine occupied a leading position in the world in a number of important socio-economic indicators, including high scientific, nuclear, military, agricultural and industrial potential, a high place in the world in terms of GDP and GDP per capita, high employment rates, low level of public debt, high positive rates of population, high fertility rate, high quality of higher education, a large number of inventions and even achievements in sports (Vox-Ukraine, 2017). However, in the process of transition of the national socialist economy of the 90-ies of the last century into a market system, virtually all its branches were in a disastrous state - in the absence of financing.

First of all, it concerns those sectors of the national economy, which for many years did not undergo dramatic changes due to lack of funding, but despite this, they are still promising. Yes, one of these sectors of the economy is the Ukrainian fuel and energy complex, in particular. Of course, for more than 25 years of independence, certain changes occurred in the industry, but they were not significant and, in most cases, were unjustified in advance, because the industry was moving in wrong direction of development, which in the long-term period could not provide the necessary positive results.

Currently, there is a need to address the problems of the future development of Ukraine's electricity sector, taking into account the latter's accession to the ENTSO-E and the Paris Climate Agreements, in addition to which the rapid development of technologies also has a bearing on the resulting to significant changes in the volumes of final consumption of electricity (respectively, both in terms of generation) and in the consumption structure, which entails changes in the structure of generation, tariff policy, in market rules, etc.

After analyzing the overall structure of the electricity generation sector in Europe, it is easy to see that each of them has a different structure in the production and consumption of electricity as well as their volumes, which is primarily due to the availability of fossil primary energy resources, as well as financial opportunities that directly affect the development of technologies and, as a result, leads to the emergence of new, alternative ways of generating electricity. Against the backdrop of a number of EU member states that are part of the ENTSO-E, two of them are allocated - France and Germany.

Electricity in France and in Germany are interesting because both use principally different ways for generating electricity. The basis of the first is the technology of traditional energy for the conversion of heat from the half-reaction of nuclei of heavy elements, while the basis of another is modern advanced technologies that enable the generation of electricity from renewable energy resources (hereinafter RES). Of course, each technology has its advantages and disadvantages (Table 1).

Table 1: Comparison of the main characteristics of the power generation technology received from the nuclear power plant and the power plant using RES

Technology of receiving electricity using:	Advantages	Disadvantages
nuclear fuel	1) Relatively low electricity generation unit price; 2) Minimal damage to ecology under normal operating conditions; 3) Ability to work regardless of the pores of the years, days, climatic conditions.	1) Limited amount of energy resources; 2) Significant damage to the environment in the event of an accident; 3) The need for disposal of waste.
RES	1) Unlimited amount of energy resources; 2) There is little harm to the environment (but more than in the case of using nuclear fuel).	1) Relatively low installed capacity; 2) Significant costs of manufacturing and installation per unit of power; 3) High price per unit of electricity; 4) The need to establish a much larger number of this type of EU, compared with nuclear power plants, as well as the construction of more branched electric networks.

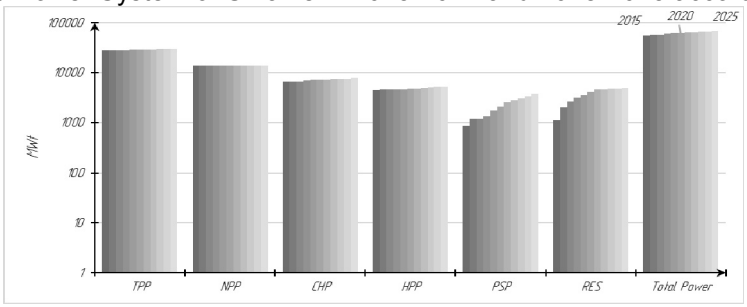
The structure of the French electricity sector has a certain monotony, with a clear pronounced enhanced electrification of the national economy at the expense of electricity generated by local nuclear power plants (over 75% of the energy supplied to the United Energy System), power units of which are characterized by the possibility of working on spent nuclear fuel, and also sufficiently large capacity for maneuvering power units, which allows regulating the volumes of generation in accordance with the needs of the consumption sector in a rather wide range (Deloitte, 2017)). For this reason, the share of all other types of power plants in the electricity generation structure is relatively small, and as a result, the price per unit of electricity in France de jure is one of the lowest in the world (Agora, 2017).

Germany is the world leader in installed power plants using RES. But for a number of reasons (lack of wind on land and in the sea, sunny weather, etc.) such stations can not provide the required amount of electricity for the needs of the consumption sector of Germany. Therefore, in the structure of electricity generation, the

share of traditional TPPs and CHP plants still remains significant, notwithstanding the low efficiency and environmental requirements. Taking into account the share of power stations using RES in the overall generation structure, as well as the considerable costs of their production and installation, their number and the development of the necessary infrastructure, respectively, and electricity prices in Germany, respectively, are the highest in the region (Agora, 2017).

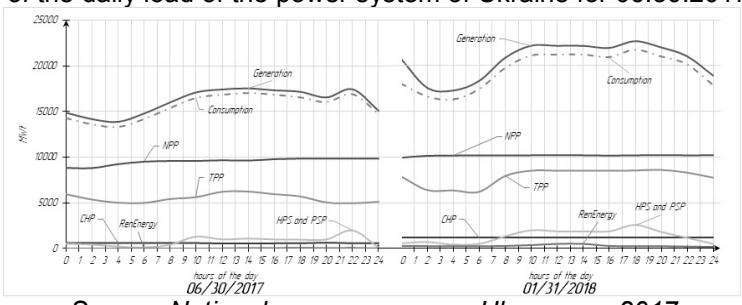
Instead, the characteristic feature of Ukraine's power industry is that it is well represented almost by all ways of generating electricity (Figure 1), and its structure is, to a certain extent, explained by the limited maneuverability of power units at NPP and the availability of energy resources (CHPP, TPP, hydroelectric power stations, hydropower plants and alternative energy resources). Actually, this structure and determines the schedule and mode of operation of power plants of different types, both during the day (Fig. 2) and during the year.

Figure 1: The actual and planned structure of the installed capacity in the electricity generation sector of the United Power System of Ukraine in 2015-2017 and 2018-2025 accordingly.



Source: National energy company Ukrenergo and Cabinet of Ministers of Ukraine, 2017

Figure 2: Graph of the daily load of the power system of Ukraine for 06.30.2017 and 01.31.2018



Source: National energy company Ukrenergo, 2017

Most of the electric load in Ukraine falls on NPPs and CHPs / TPPs, which are characterized by their outdated and complete non-compliance with environmental requirements and time requirements. Most of them have already exhausted their projected work life. However, the works on modernization and repairs made it possible to continue their operation, which for a relatively short period of time provided an opportunity to delay the process of structural adjustment of the power industry in Ukraine.

But this process can not be avoided constantly. Therefore, the necessary attention should be paid to studying the experience of advanced power generating countries of the EU, such as France and Germany, as well as adapting it for the possibility of implementation in Ukraine's electricity industry. Moreover, the experience of the above countries is quite acceptable for the domestic electricity industry, as Ukraine possesses, in the first case, significant in the world dimension of deposits of radioactive elements (Ukraine does not have an infrastructure for the manufacture of nuclear fuel, its enrichment and disposal), and in the second case, the corresponding landscape and climate for the installation of power stations using RES. The development of domestic electricity such as French or German, or a combination of them, fully complies with the requirements of the Paris Climate Agreement and the ENTSO-E.

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