

The Energy Market in Romania between Constraints, Energy Independence and Sustainability

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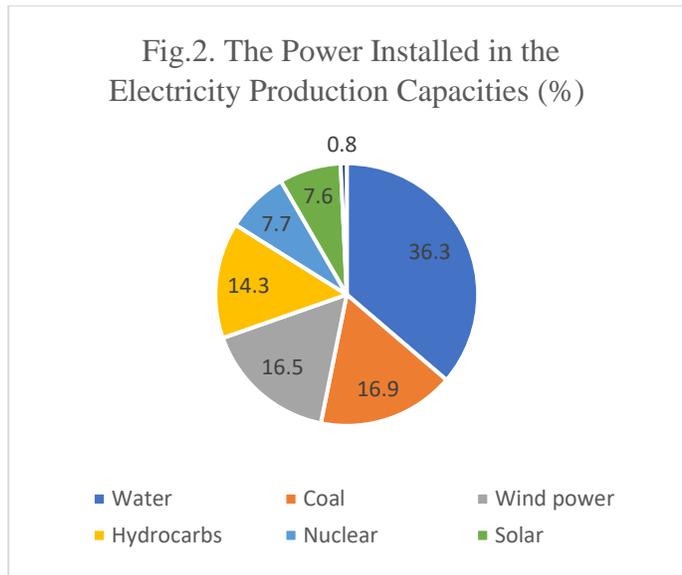
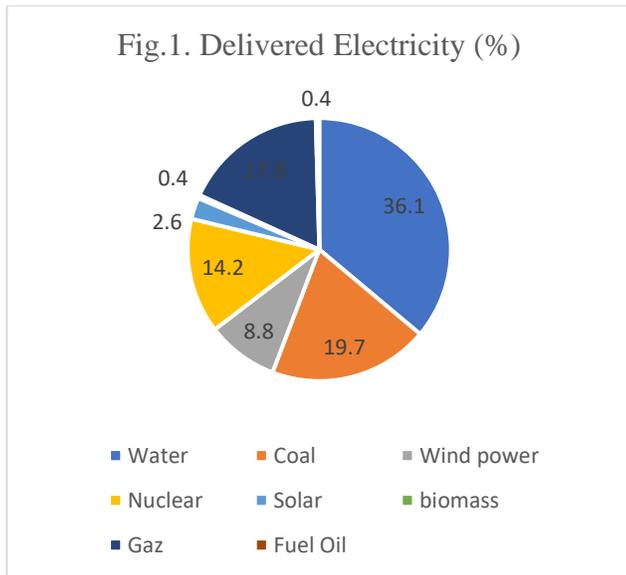
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Introduction

The energy market in Romania has seen profound transformations in the last 30 years, along with the transition to the market economy and the adherence to the European Union. The reform of the system in the direction of privatization, vertically disintegration and liberalization aimed at increasing its efficiency and competitiveness. The energy sector has three components: thermal energy, electrical energy and the natural gas sector. The responsibilities of thermal energy are shared between the local councils (communal, city and municipal), county councils, town halls and prefectures. The current paper will focus on electricity and natural gas traded at the national level.

The Electrical Energy Market Situation in Romania

The electricity sector during the communist period developed and functioned as a vertically integrated structure, and the price of energy was fixed by the state. After 1989, an extensive reform process took place which aimed at the privatization and separation of production, transport, distribution and supply activities. The reform also aimed at the gradual liberalization of the market, starting in 2007. Thus, by 2014, the gradual elimination of regulated tariffs for non-domestic customers was achieved, and by 2021, the tariff for domestic customers was liberalized. Currently, there are two electricity markets, the wholesale market and the retail market. The Romanian Electricity and Natural Gas Market Operator (OPCOM) is the main organizer and administrator of the electricity markets. Wholesale energy transactions take the following forms: centralized bilateral contract markets (PCCB), bilateral contract market (PCB), day-ahead market (PZU), intraday market (PI) and balancing market (PE). PCCB ensures the largest part of domestic consumption (generally over 80%) and takes several forms depending on the trading mechanism, the price being in all cases the result of meeting demand with supply. PCB includes transactions not administered by OPCOM and involving contracts negotiated and concluded bilaterally, possibly through other trading platforms. The Next Day Market (PZU) is where firm hourly electricity transactions are carried out with delivery on the day following the trading day. The Intraday electricity market (PI) is the one on which "firm hourly electricity transactions are carried out for each delivery day starting from the day before the delivery day, after the conclusion of transactions on PZU and up to one hour before the start of delivery /consumption" (OPCOM, 2022). PE is a mandatory one, administered by the Balancing Market Operator (a component of Transelectrica), which ensures the correction of deviations from the programmed values of electricity production and consumption. The retail electricity market includes the transactions concluded between suppliers and final customers. The electricity producers are grouped according to the energy source; the production structure of the national energy system by types of resources and the power installed in the electricity production capacities are represented below:



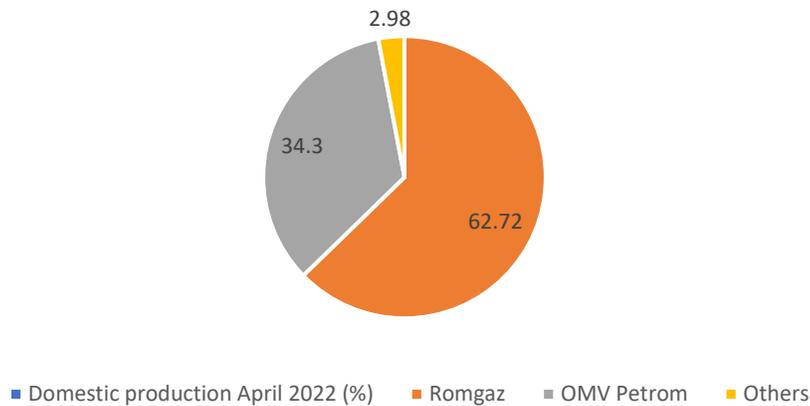
Source : ANRE, May 2022

On the Romanian market, there are 81 producers of electricity from classic and renewable sources, one supplier of hydroelectric energy (Hidroelectrica) and one supplier of nuclear energy (Nuclearelectrica). Electricity transport is a monopoly, called Transelectrica. The distribution is divided between six companies, being a strong oligopoly market. The suppliers are of two types: suppliers of last resort (5 in number, with market power) and suppliers that operate either exclusively on the wholesale market (30) or in both markets (51). The price of electricity has grown strongly in the last 12 months, the growth index varying between 150% for domestic consumers and over 340% for PI transactions.

The Overview of Natural Gas

Romania has the largest natural gas market in Central Europe, the sector being subjected to a reform similar to the one in the field of electricity and aimed at separating production, storage, transport and distribution activities after 1989. In 2000, the National Regulatory Authority for the Natural Gas (ANRGN) was founded and merged in 2007 with The National Authority of Regulation into the Field of Energy (ANRE, established in 1998). Between 2001 and 2007, the market was gradually liberalized. Now consumers are free to choose a supplier and negotiate a contract with them. From July 2020, the natural gas market is competitive and includes the trading of natural gas on the wholesale market (between suppliers, including producers of natural gas, between suppliers and distributors, as well as between suppliers and the transmission and system operator) and on the retail market (between suppliers, including producers and final customers). Similar to the electricity market, transactions on the gas market mainly take two forms: transactions on centralized markets (administered by OPCOM and The Romanian Commodity Exchange - BRM) and bilateral contracts, which are added transactions on the balancing market and other types of contracts. The main actors in the natural gas market are the operator of the National Transport System - SNTGN Transgaz S.A., ten producers, 78 suppliers, 28 distributors, one transporter - SNTGN Transgaz S.A., two storage operators, 2 centralized market operators and 8 traders. In the last five years, over 81% of consumption was covered by domestic production, and the rest by import. Production is concentrated in two producers, Romgaz and OMV Petrom, which together hold more than 97% of the market, as can be seen from the following graph:

Fig.3. Domestic Production, April 2022 (%)



Sursa : ANRE, 2022

The wholesale market of suppliers is a competitive one, with an HHI of 964 in April 2022. On the other hand, in the retail market, depending on the number of customers, the supply activity is highly concentrated, with two companies that together own over 88% of the market, Engie Romania (45.17%) and E.ON Energie Romania (42.89%). The price of natural gas on the wholesale market has increased in the last 12 months by more than 4 times, and on the retail market for domestic consumers by more than 3.4 times, on the basis of the escalation of the energy crisis in the EU.

Sustainability and Security in the Energy Sector

The main strategic documents in the field of energy in Romania are the Energy Strategy of Romania for the period 2020-2030 (SER), currently in the project phase, and the Integrated National Plan in the Field of Energy and Climate Change 2021-2030 (PNIESC), approved in 2021, both correlated with EU strategies and regulations, mainly with the European Climate Law (2021). SER is focused on competitiveness, clean energy, access to energy for all consumers and energy security. Competitiveness is approached on two levels: microeconomic and macroeconomic. At the national level, Romania aims to become a supplier of energy security and stability in the EU. At the firm level, the strategy foresees the improvement of corporate governance and the functioning of state companies. In order to achieve the strategic objectives, priority investments are foreseen in the following directions: decarbonization of the electricity and thermal energy production sector (primarily of the Oltenia Energy Complex), capitalization of the potential of wind, photovoltaic, geothermal and nuclear energy, capitalization of the potential of hydrocarbons and offshore of renewable sources from the Black Sea, of hydrogen and renewable gases, the modernization of energy networks through the introduction of digitalization and the smart grid, the development of cross-border interconnections, the increase of storage capacities. SER and PNIESC include common quantitative targets regarding the sustainability of the energy system, subordinated to the EU objective to reduce net greenhouse gas emissions by at least 55% compared to levels in 1990 and to reach climate neutrality by 2050:

Table 1. SER and PNIESC: Main Quantitative Targets until 2030

Indicators	Quantitative Target	2020
ETS* emissions (compared to 2005, %)	-43.9	-34.7
Non- ETS emissions (compared to 2005, %)	-2	-5.4
Global share of energy from renewable sources in the final gross consumption of energy (%)	30.7	24.4

Primary energy consumption (million tons of oil equivalent)	32.3	30.92
Final energy consumption (million tons of oil equivalent)	25.7	23.53
Dependence on Energy Imports	20.8	17.8

Source : SER (2020), PNIESC (2021) and Eurostat, September 2022

*Emission Trading System

The main energy consumer is the residential sector (30.9% of final consumption), followed by industry (27.4%) and transport (27.5%). Buildings account for 42% of the final energy consumption, most of them being residential buildings. That's why Romania adopted the Long-Term Renovation Strategy, whose goal is to achieve an energy class A for all types of buildings except for single-family homes, for which class B is accepted. At the same time, the strategies propose incentive schemes to transform individual consumers into prosumers (bonuses, remuneration for energy delivered to the network). The increase in energy efficiency in the industry requires new technologies for enterprises, possibly by accessing state aid. In the field of transport, the modernization and expansion of public transport, the encouragement of alternative mobility and the renewal of the national car fleet are foreseen. In conclusion, energy sustainability is based on two pillars: increasing the share of "green" energy in production and consumption and increasing energy efficiency.

Energy security has three pillars: diversification, flexibility and risk management. The first aims at the diversification of electricity supply sources, through the development of new capacities, especially in the nuclear field, and the development and diversification of storage capacities. Storage, together with the application of inter-temporal price discrimination, will contribute to the stability and flexibility of the energy system. The development of the energy market through the introduction of Power Purchase Agreements and through the future introduction of new risk management instruments will influence flexibility and diversification. The implementation of a capacity mechanism is being considered, which would ensure additional production capacities, in addition to the active capacities in the electricity market, to prevent crisis situations. Also to prevent crises, it is foreseen to maintain minimum reserves of crude oil, petroleum products, natural gas, fuel and water. At the same time, the national strategies provide for increasing the degree of cross-border interconnection of natural gas and electricity networks, as a measure to increase energy security at the national and European levels. Digitalization is necessary for energy security, as it ensures the system's proper functioning and allows its management based on empirical evidence. The total investments required in the period 2021-2030 are estimated at approximately 22.6 billion euros, part of which is included in the National Recovery and Resilience Plan (2021).

Future Expectation and Implications

The Romanian government aims to achieve energy security, under sustainability conditions, but there are several obstacles to achieving this goal. The first obstacle is represented by the availability of the resources necessary to implement the strategies: financial, human and technological. The volume of necessary investments, public and private, will be difficult to achieve in the current increasingly restrictive international financial context. Inflation and the war on the border of Romania determine both the increase in the cost of investment projects, as well as the increase in the cost of financing and the reduction of the exposure of potential investors. The human resource in the field of energy is aging and insufficient, due to the abolition of vocational schools. In addition, the sector is politicized, which makes it difficult to attract highly qualified personnel to the management teams and improve corporate governance. The technological challenges refer to the availability of the technologies necessary for a sustainable energy system and to the human resource capable of implementing and using the new technologies. According to the Deloitte report (2019), Romania has natural resources that allow it to exceed 3 times the target of 35% renewable energy in the final energy consumption. However, intermittent production raises the issue of balancing and storage technologies, wind and solar energy having a limited capacity to replace coal-based capacities. This is why Romanian specialists support the development of nuclear energy, and SER foresees the expansion of Nuclearelectrica's capacity and the introduction of IV generation nuclear reactors, small and modular.

Another important obstacle is represented by the geopolitical factor: the war in Ukraine and the tensions between the USA and China. The political instability in the Black Sea area makes it difficult to capitalize on the natural gas potential. In addition, Romania has a dependency of approx. 18% of natural gas imports from Russia, and the reduction of this dependence calls into question the abandonment of coal in the short term. US-China tensions require reducing dependence on imports from China, in the conditions in which wind and solar technologies use components produced in this country. Consequently, in the short and medium term, Romania will rather focus on reducing consumption and increasing energy efficiency, than on diversifying gas production and import sources (Energy Policy Group, 2022). Long term, Romania has natural resources and the means to increase the energy efficiency necessary to achieve energy independence and security, under sustainability conditions.

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