Strategic Directions of Romania in the Field of Energy Policy

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Abstract: Beyond energy and climate policy, the energy union aims at a structural modernization of the European economy. It promotes the structural reform of the use of energy and resources in all key sectors: energy, with its central role, construction, transport, industry, agriculture and, more generally, land exploitation. Also, the energy union is an investment strategy, which has positive effects on the economy and employment and takes into account its impact on regions and vulnerable people. By focusing on energy efficiency and internal energy resources, it will strengthen the EU's position on world markets. The 2018 evaluation of the progress made by Member States towards meeting the national energy efficiency targets for 2020 and towards the implementation of the Energy Efficiency Directive shows that after a gradual decrease between 2007 and 2014, energy consumption has started to increase in the last years and, at present, it is a little over the linear path for the objectives set for 2020. This is due to the climatic changes, especially the colder years 2015 and 2016, but also the growth of the economic activity. and low oil prices. The energy intensity in the industry continued to improve by up to 22% between 2005 and 2017, and the energy savings indeed contributed to partially offset the impact of these increases. However, energy savings were not sufficient to maintain a downward trend in total consumption. Although the energy efficiency target set for 2020 is still achievable, the continued increase in energy consumption could jeopardize it. This is why the European Commission has set up a Task Force with Member States to mobilize efforts and fully exploit the potential for energy efficiency.

Keywords: *energy policy; energy security; renewable energy sources; sustainable development.*

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1. About energy, technology and geopolitics markets

Numerous technological developments, supported by relatively high energy prices since 2000 and significant public subsidies, are the first of the key factors that have led in the recent years to increased energy production and reduced demand and energy efficiency measures.

In European energy markets which is likely to increase in the long run - at the same time as diversification of energy supply. The overall effect was to reduce the price and place the energy consumer in an advantageous position.

"Shale" hydrocarbon extraction technology has led to a reversal of the world hierarchy of oil and natural gas producers. The spectacular decrease in Renewable Energy Sources (RES) costs, the promise of commercially available in all value chain segments are challenging to the conventional paradigm of energy production, transport and consumption [1].

As a result, energy policy planners and decision-makers in the sector operate in an environment of new possibilities but also uncertainty.

The increasing share of wind and photovoltaic production, with intermittent generation and stochastic profile, raises the issue of permanent adaptation of the National Power System - NPS and of the functioning of the electricity markets [2].

In the 2030 horizon, the electric car will make significant changes in the energy markets. Petroleum products (gasoline, diesel, kerosene, LPG) will continue to provide the overwhelming majority of transport energy over the next two decades, but their use will also be limited by GHG reduction targets at the global level, consumption of fossil fuels.

2. The European context. Energy Union - Energy Security and Energy Diplomacy within the European Union

As early as 2000, the European Commission (EC) has associated EU energy security with ensuring the uninterrupted physical availability of energy products at affordable prices and pursuing sustainable development.

External action in European energy policy is underlined in the EC Communication on the Energy Strategy Framework Strategy.

The first of the five dimensions of the Energy Union is "energy security, solidarity and trust" between Member States. Nevertheless, diplomatic practice rather shows the preference of the most developed EU member countries for bilateral agreements with external suppliers, to the

detriment of the European solidarity of external action, so cluttered in the EU strategy [3].

Another dimension is "environmental diplomacy in the context of the formation of an international climate regime based on the Paris Agreement. The EU has taken on some of the most ambitious targets for reducing GHG emissions, increasing RES share and energy efficiency. The EU Intended Nationally Determined Contributions (INDCs) under the Paris Agreement coincides with targets 40/27/27 set by the European Framework for Climate and Energy Policy 2020-2030 [4].

The EU is an important financier of energy projects, especially those aimed at generating green energy and interconnecting energy markets. For example, major funding packages are allocated to projects of common interest in the energy field, developed by at least two Member States. Through the European Energy Program for Economic Recovery introduced in 2009, € 4 billion was dedicated to co-financing energy projects that simultaneously aim at economic recovery and GHG emissions reduction [5].

3. Regional context: Southeast Europe and the Black Sea Basin

South East Europe's interconnections contribute to the development of energy markets and regional energy security mechanisms, in line with EU common rules. In South East Europe, Western Europe, interconnections, modern gas storage capacities, institutions, market functional rules and infrastructure quality, needed for good regional cooperation, are under development [6].

Romania needs to develop capacity depends on the state of transport networks in the neighboring countries. Transelectrica SA, the transmission and system operator (TSO) for electricity in Romania, is involved in two projects included on the PCI list.

In the regional context, East-West and North-South interconnections have priority. In addition, mechanisms will be developed to coordinate the planning and financing of regional energy infrastructure projects [7].

Romania needs to develop an active and competent presence in intra-community energy diplomacy, in coordination with the Eastern European countries, with the structure of similar energy systems. As long as the Western Balkans and Ukraine do not participate in the ETS, the fossil fuel production there has the competitive advantage of not reflecting the cost of GHG emissions in the cost of production [8].

4. Regional Geopolitics

The Black Sea Basin has become, in recent years, an increased political risk environment. The risk of using gas transit through Ukraine as a weapon in a political-military conflict raises questions about the long-term stability of the Ukrainian gas supply route, impacting the stability of the neighboring country and regional influences. Turkey's summer 2016 events have effects on the investment environment in this country, with a potential impact on European energy security [9].

In the medium term, it is necessary to clarify the issue of the transit of Russian gas through Ukraine from 2019 onwards, as well as the timely implementation of infrastructure adjustments and contractual arrangements to ensure Romania's security of supply of imported natural gas. Exploration, development and subsequent exploitation activities in the Black Sea require an adequate security and predictability climate.

As an EU border country, Romania is directly exposed to the rise in geopolitical tensions in the Black Sea Basin. At the same time, Romania can be seen as a regional energy security provider. The natural gas flow from Romania would help countries such as the Republic of Moldova and Bulgaria to reduce their excessive dependence on a single source and the Romanian producers would receive an impetus to invest in prolonging the life of existing deposits and developing new deposits. By upgrading natural gas storage capacities and by balancing and back-up systems for electricity, Romania can make an important contribution to the regional system of system technology services (STS) [10].

5. Romania's primary energy resources

Oil

With an industrial tradition of over 150 years in oil and gas exploitation, Romania is the only significant producer of hydrocarbons in Southeastern Europe. Against the backdrop of the natural decline of deposits, annual production declined steadily in the last decade, reaching 20 million in 3.8 million tonnes of crude oil and 10.8 billion m³ of natural gas in 2015; the proven oil resources were 38.4 million tonnes in 2015 and 101.4 billion m³ of gas.

The decline in annual average production was 2% over the past five years, being limited by investments in drilling new wells, production gains, secondary recovery, etc. The sharp decline in the price of crude oil in 2014 significantly reduced such investments [11].

Natural gases

Natural gas has a share of about 30% of domestic primary energy consumption. The gas market is advantaged by Romania's favorable position towards the gas transport capacities in the Southeast European region and the possibility of interconnecting the National Transport System (NTS) with the European Central System and the gas resources in the Caspian Basin, eastern Mediterranean and the Middle East via the Southern Corridor [12].

In 2015, domestic oil production covered nearly 40% of the demand, and natural gas exceeded 95% of domestic consumption.

6. Renewable energy sources

However, the hydropower potential is already being used to a large extent, although there is the possibility to continue the hydropower development of the main water courses, respecting good practices for the protection of biodiversity and ecosystems. New capacities will be built in wind and photovoltaic power stations, even if the growth rate will slow down in the coming period [13].

7. Electricity energy

Total electricity consumption declined substantially from 60 TWh in 1990 to 40 TWh in 1999, mainly as a result of contracting industrial activity, after which it increased to 48 TWh in 2008. The 2008-2009 economic crisis has caused a in the last 10 months of 2016, the final per capita electricity consumption in Romania was 2430 kWh / year, very close to that of the similar period of 2015 [14].

According to Eurostat data, published in July 2016, Romania had in the year 2015 a sixth lowest EU average price for electricity for household consumers. However, given the relatively low purchasing power, price supportability is a first-order issue that leads to a high level of energy depletion. In fact, almost 100,000 Romanian homes are not connected to the electricity grid; the most suitable for them are autonomously distributed power generation systems [15].

8. Electricity production

About 42% of the electricity mix is composed of renewable energy, 60% is GHG-free and 75% low-CO₂. The intensity of CO₂ emissions per unit of electricity produced is close to the European average of about 300g CO₂ / kWh [16, 17].

Much of the generating capabilities are older than 30 years, with a relatively small number of remaining operating hours until the end of their service life. Older groups are often stopped for repair and maintenance, some being in conservation.

Unfortunately, there is a difference of almost 3400 MW between the gross installed power and the available gross power, of which about 3000 MW are coal and natural gas capacities. The coal and natural gas thermoelectric capacities represented approximately 40% of the gross available power in 2015 and achieved 40% of the annual electricity output [18].

Romania is among the 14 EU Member States that maintain their option of using nuclear energy. At present, Nuclearelectrica covers almost 20% of the country's electricity production through the two Cernavoda units; the percentage may exceed 30% if the investment is made in two new reactors at Cernavoda, which would exert a competitive pressure on the producers of coal and natural gas [19, 20].

9. Energy efficiency, heat and cogeneration

Energy efficiency is one of the least expensive ways to reduce GHG emissions, reduce energy poverty and increase energy security. For Romania, the target is 19%, corresponding to a primary energy demand of 500 TWh in 2020. For 2030, the EU proposes a cumulative reduction of at least 27% of energy consumption [21].

According to Eurostat, the energy intensity of Romania's economy in 2014 was 95% of the EU average, based on purchasing power parity (0.235 toe / 1000 €, equivalent to 2730 kWh / 1000 €), while the energy intensity per capita was 1, 6 toe (18.6 MWh), the smallest in the EU28 [22].

If Romania assumes the European target of reducing energy demand by 27%, the primary energy demand target for 2030 would be 431-454 TWh. According to preliminary NIS data, primary energy demand in 2015 was 383 TWh, with 117 TWh below the target for 2020 and 47-71 TWh below 2030. Of course, the 2030 target should be seen from a sustained growth perspective that its achievement will entail significant measures to increase efficiency across the entire energy sector. Energy efficiency in Romania has steadily increased in recent years. Between 1990 and 2013, Romania recorded the highest average energy decrease rate in the EU of 7.4%, amid the restructuring of industrial activity. In 2007-2014, the fall in energy intensity relative to GDP was 27%, including the closure of some energy-intensive industrial units. Increasing energy efficiency by investing in

technology is essential for high-energy enterprises to cope with international competition [23, 24].

10. Thermal energy and cogeneration

Only 15% of the total heat demand in Romania is distributed through CHPSS, the trend being down to only 10% in 2020. The difference is almost equally divided between heating on the base natural gas (38%) and biomass (44%, especially in rural areas). However, in central urban centers, district heating at municipal level is still an important proportion. According to NRACS data, thermal energy in cities is provided in about 60 localities through district heating plants (DHP) and CHPSS systems. Bucharest represents 44%, the next nine large localities being 36% cumulative. Currently, 1.25 million apartments are also connected to CHPSS [25].

In 2016, 20 localities with CHPSS operate with less than 1,000 apartments each connected. Since 1990, not less than 250 localities have abandoned centralized heating systems. The average heat loss in the transport and distribution networks of heat in Romania is very high, about 30%. Only secondary and distribution have been upgraded, the national target for 2020 being 30% and 40% respectively. Based on modeling results, the Strategy proposes indicative values for decarbonisation targets [26]. Romania does not exclude the 80% reduction of GHG emissions in 2050, but this is only possible by maturing new technologies, with the result of cost reduction. But a high quality and competitive cost, on the basis of a productive and well. Romania will be a partner in achieving the decarbonisation objectives [27, 28].

11. Conclusions

In the field of energy policy, the strategic directions of Romania focus on energy security, on the one hand, and on the other hand, on the sustainable development of the sector.

In terms of energy security, the main strategic directions focus on:

- maintaining national sovereignty over primary energy resources and respecting national energy options;
- increasing the security of energy supply and maintaining an acceptable degree of dependence on imports by diversifying import sources, own energy resources, national and regional routes and transport networks;
- regional cooperation for the protection of critical infrastructure in the energy field. [29]

The sustainability of the Romanian energy sector implies:

- improving the energy efficiency of the entire final production-transport-distribution-consumption chain by optimizing the production and distribution processes and reducing the total primary energy consumption in relation to the value of the products or services;
- increasing the share of energy produced on the basis of renewable resources in total consumption and electricity production;
- the rational and efficient use of non-renewable primary resources and the gradual reduction of their share of final consumption;
- promoting the production of electricity and heat in high efficiency cogeneration plants; capitalization of secondary energy resources; supporting research-development-innovation activities in the energy sector, focusing on increasing energy efficiency and the environment;
- to reduce the negative impact of the energy sector on the environment and to comply with the obligations undertaken to reduce greenhouse gas emissions and atmospheric pollutant emissions. [30]

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