

TECHNICAL AND COMMERCIAL QUALITY OF ELECTRICITY DISTRIBUTION IN ROMANIA

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Abstract: *The discovery of electricity, the greatest discovery of humanity, has fundamentally changed its way of life. In an ever-changing and innovating society, electricity has become a vital component of daily life, fueling entire infrastructures and making our daily lives easier. The energy sector in Romania has, so far, underwent multiple, profound transformations. From a promising start and an explosive development, to moments when the energy system stagnated in evolution and entered a downward slope, in which financial interests prevailed to the detriment of the development and assurance of an increasingly high quality of services offered. However, one element remained and will remain extremely important: the consumer of electricity. In the conditions of a legislative dynamic that entails profound changes, Romania's Energy Strategy must set concrete and clear goals for Romania to consolidate its position as an energy producer and manager of stress situations at regional level, so that the main beneficiary of its implementation will be the consumer.*

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JEL Classification: *C46, L15.*

1. The energy sector in Romania after 1990

The fall of the communist regime in December 1989 led to a period of transition that generated profound changes in all fields. These changes have also affected the energy sector, a strategic sector of great interest.

In 1990, with the legal reorganization of socialist enterprises in mind, autonomous companies emerged in the energy sector, the most important of which were: Autonomous Coal Management in Romania, Autonomous Lignite Management in Romania, Autonomous Natural Gas Management “ROMGAZ” Mediaș, Autonomous Petroleum Management “PETROM” and Autonomous Electricity Management “RENEL”. Also, autonomous heat distribution companies have been set up in the main cities of the country.

But the transition period also led to a reduction in industrial production, a situation that inevitably affected the energy sector.

The volume of energy resources provided by the extractive industry decreased, this decrease being only partially covered by the increase in imports of natural gas and crude oil.

The severe reduction in production in the energy-intensive branches, which did not have an sale market, led to a significant decrease in national consumption, which allowed meeting the growing demand from household consumers. On the other hand, electricity and heat prices, including the price of natural gas, being controlled by the state, rose more slowly than the inflation index.

The downside was the accumulation of losses in the autonomous utilities in the energy sector, although under normal conditions they should have been extremely profitable.

In the mid-1990s, the authorities' attempt to revive the economy using the old procedures failed, with economic losses leading to severe imbalances. Following the 1996 elections, the government led by the Democratic Convention decided on a strong restructuring, which also affected the energy sector.

By starting to use the first unit of the Cernavoda nuclear power plant in 1996, coal mining exploitation was put to an end, which became unprofitable and generated massive financial losses after 1990.

In order to compensate for the serious deficits of the state budget, the government initiated a broad privatization policy. The government wanted to attract investors that would support the modernization of industry and services enterprises.

This step led to the transition to privatization of the energy sector.

The first privatization took place in 1997, when the majority stake of Astra Ploiești Refinery was taken over by Interagro.

Between 1998 and 2004, the refineries were the "stars" of privatizations in Romania. In 1998, the decision to reorganize the Autonomous Companies was taken, which were restructured and transformed into commercial companies. The restructuring of the integrated monopolies RENEL and ROMGAZ was done at the coercion of the International Monetary Fund and the World Bank.

The "ROMGAZ" Mediaș Autonomous Authority was restructured and transformed into the National Natural Gas Company S.N.G.N. ROMGAZ S.A., organized in 5 (five) subsidiaries and, subsequently, in 2001 S.N.G.N. ROMGAZ S.A. was reorganized again, being divided into 3 (three) companies: the National Natural Gas Transmission Company Transgaz S.A., Distrigaz Sud S.A. and Distrigaz Nord S.A.

Between 2004 - 2005 Distrigaz South S.A. and Distrigaz North S.A. were privatized by selling the majority stake in the E.ON Group in Germany and Gaz de France. In 2008, at the international level, the merging took place between the majority shareholder Gaz de France and Suez, the new name of the company being GDF SUEZ. In 2015, following a rebranding process, the company changed its name again, becoming ENGIE.

The Autonomous Petroleum Authority "PETROM" after 1989 took over all the activities of exploitation of crude oil resources.

In 1997, the autonomous directorate was transformed into the National Company PETROM S.A., which included several production areas, two refineries, chemical activity, transmission networks and local distribution entities (PECO).

In 2001, the privatization process began, initially by listing the shares on the Bucharest Stock Exchange and continued in 2002, by registering 11 (eleven) qualified investors in the privatization race. During all this time, the Romanian state was assisted by the international bodies: the International Monetary Fund and the World Bank.

After the completion of the privatization process, in 2004, the company underwent an extensive restructuring and reorganization process, OMV gradually giving up all unprofitable activities, among the most important being the DOLJCHIM plant and the ARPECHIM refinery.

The Autonomous Electricity Authority "RENEL" specialized in production, transport, distribution of electricity through conventional and nuclear power plants, the production and transport of thermal energy and the supply of electric and thermal energy.

It was restructured in 1998, leading to the creation of the National Electricity Company "CONEL", following the application of the Romanian Government Decision 365 / 03.07.1998.

In 2000, following successive restructurings, CONEL was divided into 5 (five) independent companies wholly owned by the state: S.C. Termoelectrica S.A., S.C. Hidroelectrica S.A., S.N. Nuclearelectrica S.A. for electricity production, S.C. Electrica S.A. for the distribution and supply of electricity and C.N. Transelectrica S.A. with the role of Transport and System Operator, having the subsidiary with legal personality S.C. OPCOM S.A. Following this division, the National Electricity Company "CONEL" was dissolved.

In 2001, based on the Romanian Government Decision no. 1342 / 27.12.2001, regarding the reorganization of S.C. Electrica S.A., 8 (eight) electricity distribution and supply companies were created.

Between 2005 and 2014, the Romanian state privatized a large part of these companies, selling shares to investors or listing shares on the Stock Exchange.

The companies S.C. Termoelectrica S.A., S.C. Hidroelectrică S.A., C.N. Transelectrica S.A. and S.N. Nuclearelectrică S.A. also went through a similar privatization process.

In the vision of the Romanian state, the privatizations in the Romanian energy field were made on the one hand to bring revenues to the state budget, on the other hand to attract companies in Romania that were able to improve management and invest in the Romanian energy industry.

Regarding renewable energy, European countries have been developing renewable energy programs since the 1990s..

As the exploitation potential of renewable energy resources was used below optimal capacity in the European Community, it was necessary to accelerate the achievement of the goals set in the Kyoto Protocol. In 2001 the first European Directive was issued to regulate electricity from renewable sources.

The first European Directive was amended in 2009 by another Directive, which required a sound legislative framework. Thus, all Member States of the European Union were required to contribute to the 20% target of energy produced from renewable sources in the final gross energy consumption.

Romania has adopted a National Action Plan in the Field of Renewable Energy (PNAER) through which it has assumed the target of 24%, composed of:

- the share of energy used for heating and cooling from renewable sources;
- the share of electricity from renewable sources;
- the share of energy from renewable sources in transport.

Thus, in 2013 in the Romanian energy sector the most electricity projects from renewable sources were registered, built and connected to the National Energy System wind and photovoltaic parks, respectively cogeneration plants based on biomass and biogas.

In order to stimulate investments in this sector, the Romanian state promoted a subsidy scheme, by granting green certificates to producers for each MWh delivered in the network.

The granting of these subsidies, however, led to increased costs in invoices, as suppliers of final customers were forced to buy a number of green checks, costs that were transferred to the invoices of consumers, domestic and industrial.

The privatization process has forced Romania to adapt to the policies and institutional mechanisms of the European Union. In this context, Romanian state institutions were created, meant to ensure the regulation in the energy sector. One of the most important, the National Energy Regulatory Authority (A.N.R.E.) is an autonomous public institution of national interest that has legal personality and is subordinated to the Romanian Parliament. This was created as a result of the Romanian Government Decision no. 767/11 August 1997. Between 1997 and 1998, the A.N.R.E. rules and the primary legislative framework for regulating the energy sectors were approved.

A.N.R.E. was created to enforce the system of mandatory regulations at the national level, necessary for the functioning of the electricity and heat sectors and market, in terms of efficiency, competition, transparency and consumer protection.

In 1998 the A.N.R.E. issued the first activity licenses on the electricity and natural gas markets and approved the first decisions on electricity, heat and gas tariffs.

In the three areas that fall within its sphere of competence - electricity, natural gas and the promotion of energy efficiency - A.N.R.E. monitors the issuance and application of legal and technical regulations, the establishment of prices and tariffs, as well as the concordance of the situation in Romania with the energy policy and regulations of the European Union.

2. Electricity Distribution in Romania

The Electricity Distribution Companies were founded in 2001 following the process of reorganization and restructuring of the former National Electricity Company “CONEL” and the reorganization of S.C. Electrica S.A.

Based on the Decision of the Romanian Government no. 1342 / 27.12.2001, regarding the reorganization of S.C. Electrica S.A., 8 (eight) Commercial Companies for the distribution and supply of electricity have been established:

- Electrica Transilvania Nord (based in Cluj-Napoca);
- Electrica Transilvania Sud (based in Braşov);
- Electrica Muntenia Nord (based in Ploieşti);
- Electrica Muntenia Sud based in Bucureşti);
- Electrica Banat (based in Timişoara);
- Electrica Moldova (based in Bacău);
- Electrica Oltenia based in Craiova);
- Electrica Dobrogea (based in Constanţa).

In 2005, the subsidiaries of Electrica Banat, Electrica Moldova, Electrica Oltenia and Electrica Dobrogea were 51% privatized, Electrica S.A. remaining a shareholder in them. Their buyers were CEZ (Czech Republic), E.ON (Germany) and ENEL (Italy).

On August 1, 2007, the European Directive no. 54 from June 26, 2003 was put into practice and it was regulated by GD no. 675 from June 28, 2007 on the separation of the activity of electricity supply from the activity of electricity distribution.

Consequently, the 3 (three) subsidiaries wholly owned by Electrica S.A. were divided on the basis of the supply and distribution activity, thus forming the following subsidiaries:

- Electrica Supply Muntenia Nord;
- Electrica Supply Transilvania Nord;
- Electrica Supply Transilvania Sud;
- Electrica Distribution Muntenia Nord;
- Electrica Distribution Transilvania Nord;
- Electrica Distribution Transilvania Sud.

Between 2008-2014, the Romanian state continued the privatization process of S.C. Electrica S.A., selling shares to investors or listing shares on the Stock Exchange.

Regardless of the organization, the Electricity Distribution Operators serve all areas of Romania, having as coverage area all the counties of the country.

Their mission is to distribute electricity at high quality standards in terms of safety, performance, accessibility and sustainability.

The activities carried out within the Electricity Distribution Operators in Romania are the following

- electricity distribution;
- electricity measurement;
- connection to the electrical distribution network

In relation to the customers, the Electricity Distribution Operators provide important and useful information for them regarding:

- planned power outages;
- compensation of household customers for damaged appliances due to the fault of the distribution operator
- granting compensations according to the provisions of the Performance Standard for the Electricity Distribution Service, approved by the A.N.R.E. no. 11 / 30.03.2016, published in the Official Gazette of Romania, part I, no. 291 / 18.04.2016;
- the procedure for changing the electricity supplier;
- tips for the safety of electricity consumers.

3. Performance Standard for the Electricity Distribution Service. Performance indicators

The activities of the Electricity Distribution Operators in Romania are regulated by Orders and Decisions of the National Regulatory Authority in the Field of Energy, respectively by Energy Technical Norms.

The main activity of the companies is electricity distribution, which is being regulated by the A.N.R.E. no. 11/2016 on the approval of the Performance Standard for the Electricity Distribution Service. This order took effect on 30.03.2016 and was published in the Official Gazette of Romania, part I, no. 291 / 18.04.2016.

With the entry into force of the Order of the A.N.R.E. no. 11/2016, the first Performance Standard for the Electricity Distribution Service approved by the A.N.R.E. Order was repealed. no. 28/2007.

The standard establishes the performance indicators for the distribution service, indicators that are grouped in 3 (three) categories:

1. indicators regarding the continuity of users' electricity supply;
2. indicators regarding the technical quality of the distributed electricity;
3. indicators on the commercial quality of the electricity distribution service

The provisions of the Standard, regarding the observance of performance indicators, do not apply in situations of major force or abnormal operation of the Electricity Distribution Network determined by the Transmission System Operator, provided that the Distribution Operator has taken all measures to limit the effects of the cause that causes the abnormal functioning.

3.1. Continuity indicators in users' power supply

In accordance with the provisions of the Performance Standard for the Electricity Distribution Service, the Romanian Electricity Distribution Operators have the obligation to ensure continuity in the electricity supply, in accordance with the levels established in the Standard, taking, in this regard, all measures to reduce the duration of outages and to plan them at dates and times that affect electricity consumers as little as possible.

Interruptions in the supply of electricity can take place planned (for the development or maintenance of networks) or unplanned (accidentally, due to damage to the electricity distribution networks).

Distributors have the obligation to record all long-term outages ($t > 3$ min), as well as short-term outages ($1s < t < 3$ min) of electricity at consumption / production sites connected to RED, regardless of their voltage.

In accordance with the provisions of the Performance Standard, starting with January 1, 2019, distributors have the obligation to refuel electricity consumers, after an unplanned outage, as follows:

- for the urban environment, except for the county seat municipalities, under normal weather conditions, in a maximum of 6 hours;

- for the county residence municipalities, in normal weather conditions, in maximum 4 hours;
- for the rural environment, in normal weather conditions, in maximum 12 hours;
- for the urban or rural environment, in special meteorological conditions, in maximum 48 hours;

At the same time, the number of long, unplanned outages in a calendar year, depending on the voltage level to which the places of consumption are connected, must not exceed:

- 3 interruptions, regardless of the area, for all consumption places connected to IT (high voltage) and MT (medium voltage);
- 8 interruptions, in the urban environment, for all consumption places connected to JT (low voltage);
- 16 outages, in rural areas, for all consumption places connected to JT (low voltage).

Regarding the planned interruptions, the Electricity Distribution Operators in Romania have the obligation to notify the users affected by this type of interruptions, mentioning their estimated duration. In a calendar year, for development and maintenance works, the company is not allowed to cause, to the consumers of electricity, interruptions more than:

- 4 planned interruptions with a maximum duration of 8 hours each, in the urban environment;
- 8 planned interruptions lasting a maximum of 8 hours each, in rural areas.

In case of non-compliance with the conditions imposed by the Standard, the Distribution Operators are obliged to pay compensations to the affected consumers.

3.2 Indicators regarding the technical quality of distributed electricity

These indicators refer to the quality of the voltage curve. The main quality parameters of the voltage curve are the following:

- limits for medium voltage (MT) and high voltage (IT) contract voltage;
- flicker;
- rapid voltage variations in normal regime;
- asymmetry (negative component);
- frequency

The technical quality of electricity is monitored using quality analyzers.

In the case of written complaints regarding the quality of the voltage curve, received from consumers, Distribution Operators have the obligation to perform checks, analyze and inform users about the results of the analysis and the measures taken. The standard time limit for responding to complaints about the quality of the voltage curve is 20 calendar days.

3.3 Indicators on the commercial quality of distributed electricity

13 (thirteen) indicators on the commercial quality of distributed electricity are nominated in the Performance Standard for the Electricity Distribution Service, namely:

- issuing technical approvals for connection
 - 10 calendar days in case the establishment of the connection solution to the electrical network of IT, MT or JT of a place of consumption / production is made

- on the basis a solution study
- 30 calendar days for the establishment of the network connection solution
IT, MT or JT of a place of consumption / production is made on the basis of a sheet of solution
 - issuing connection certificates
 - 10 calendar days
 - transmission of the connection contract offer
 - 10 calendar days
 - design, obtaining the building permit for the connection, execution and reception of the commissioning of the connection
 - 90 calendar days
 - transmission of the distribution contract offer
 - 20 calendar days
 - he term of energization of the use installation
 - 10 calendar days
 - response to written requests to explain the cause of the interruptions
 - 15 calendar days
 - response to written complaints about the quality of the voltage curve
 - 20 calendar days
 - response to requests / notifications / complaints or requests regarding causes other than those explicitly provided in the standard
 - 30 calendar days
 - response to the written complaint regarding the measured data / recalculated electricity consumption
 - 15 calendar days
 - reconnection to the network, from the moment of announcing the OD by the user / provider of making the payment
 - 2 working days
 - installation / replacement of the measuring group / elements of the measuring group missing, defective or suspected of erroneous records
 - 5 working days for a place of consumption / production with an approved power greater than 100 kW
 - 10 working days for a place of consumption / production with an approved power less than or equal to 100 kW or in the case of a household customer
 - replacement / reprogramming of the meter, at the request of the holder of the distribution contract to change the type of tariff or at the change of the holder of the supplycontract
 - 15 calendar days

4. Conclusions

If the Distribution Operators do not ensure the level of performance established by the standard, they are obliged to pay compensation to the affected electricity consumers.

Compensation is an amount of money that Distribution Operators pay to users connected to the affected network area, if the level of a performance indicator is not reached. The values of the compensations are established in the annexes of the Performance Standard for the Electricity Distribution Service. The compensations are granted automatically by the Distribution Operators, without the need for a request from the affected consumers.

Reforms in the energy sector, that began in the 1990s, started with the idea of providing quality services to consumers by improving security and offering low prices. The solution to these desiderates seemed to be the separation of the monopoly areas from the competition ones and the creation of the premises for the competitive market.

With Romania's joining to the European Union, it had to fully comply with the provisions on guidelines for trans-European energy infrastructure. The European Union has put on the agenda, among other things, the alignment of energy prices in Romania to current levels in international markets.

The price of energy is in a gradual liberalization process, under the pressure of withdrawing regulated prices and the need to reflect in the price of energy, investments for the development and modernization of energy infrastructure. which defines the vision and sets the fundamental objectives of the development process of the energy sector.

The energy sector represents the backbone of a state's economy, its interest being the realization of investments, the establishment of fundamental objectives and a vision regarding its growth in conditions of sustainability.

References:

1. ANRE, 2021. *Despre ANRE*. [online] Available at: <<https://www.anre.ro/ro/despre-anre/statutul-si-rolul-anre>>.
2. Elbielectric, 2021. *Depre noi*. [online] Available at: <<http://elbielectric.ro/despre-noi/blog/electricitatea-in-romania-o-istorie-de-138>>.
3. Electrica, 2021. *Grupul Electrica*. [online] Available at: <<https://www.electrica.ro/grupul/despre/istoric/>>.
4. Leca, A., Muşatescu, V., Ionescu, V., Tobescu, F. and Guşilov, E., 2014. *Liberalizarea treptată a pieţelor de energie electrică şi gaz şi impactul acestui proces asupra economiei româneşti*. Bucharest.
5. Legea nr. 123/10 iulie 2012 Energiei electrice şi a gazelor naturale.
6. Ministerul Energiei, 2021. *Surse regenerabile de energie in România*. [online] Available at: <<http://energie.gov.ro/home/informatii-de-interes-public/surse-regenerabile-de-energie-in-romania/scurta-istorie-a-regenerabilelor>>.
7. Murgescu, B., Cazan, M. and Maier, V., 2012. *Istoria energiei în România*. Bucharest: NOI Media Print.
8. Ordinul A.N.R.E. nr. 11/30.03.2016, Standardul de Performanţă pentru Serviciul de Distribuţie a Energiei Electrice.