

Romania Energy Sector

Analysis with a Focus on Gas and Power



Contents

I.	Introduction and short regional context	5
II.	Regional electricity demand	7
III.	Demand and Generation Capacity in Romania	8
IV.	Natural gas	11
V.	The structure of energy consumption by sector	13
VI.	A short analysis of the market structure	16
VII.	Prosumers connected to the distribution networks	19
VIII.	Development of prices	20
IX.	Electricity production mix forecast	25
X.	Infrastructure, Distribution Network and Storage Aspects	29
XI.	Recommendations	31

Executive Summary

The Romanian energy market, particularly in natural gas and electricity, has experienced significant transformations in recent years due to both internal developments and broader European Union policies. Romania has managed to maintain a balanced energy mix, with substantial contributions from oil, natural gas, nuclear, and renewables. However, there has been a decline in thermoelectric and hydroelectric capacities, while renewables, especially wind and solar, have seen only modest growth.

Energy consumption is dominated by the residential, transport, and industrial sectors, but there has been a noticeable reduction in industrial energy use, particularly in chemicals and petrochemicals, iron and steel, and paper and pulp. Meanwhile, the transport sector's energy use has increased, highlighting areas for potential energy efficiency improvements.

Energy prices, especially for electricity, have surged dramatically, placing Romania among the EU's highest, largely due to supply constraints and geopolitical factors. The high level of taxation in the gas sector impedes investment. Significant investments are urgently needed to modernize Romania's aging energy infrastructure, improve interconnectivity, and expand electricity storage capacities to support the anticipated growth in renewables. Romania's energy transition is closely tied to EU regulations, which necessitates a focus on sustainable energy production and efficiency. Key challenges for Romania include its continued dependence on fossil fuels, ensuring energy security amidst geopolitical tensions, and overcoming regulatory barriers that hinder market competition and innovation.

In our views, there are important and strategic requirements for Romania's energy sector. In terms of the decision-making process, the Romanian authorities should ensure a transparent consultation process involving all interested parties and establish appropriate measures related to intervention on the energy markets. The unpredictability of policy interventions deters potential investments in the energy sector. Investors are typically cautious about entering markets where policy and regulatory frameworks are unstable and a dysfunctional policy-making process obstruct the country's ability to modernise its energy infrastructure and transition to renewable energy sources, in which significant investments are needed to meet EU climate targets.

The ageing infrastructure requires modernisation to support the energy transition, and rising energy prices present significant social and economic challenges, but also an opportunity to increase investment in energy efficiency. This involves promoting heat pumps, improving building energy performance, and creating a stable and favourable regulatory environment for the energy sector to encourage private initiatives. On the other hand, a proper and targeted protection scheme for vulnerable consumers will need to answer the social challenges in an innovative and proactive way. Other areas of investment are oriented to the integration of renewable energy sources into the national system to reduce the dependency on fossil fuels, including upgrading grids for better interconnectivity. Moreover, expansion of energy storage capacities for both electricity and natural gas are critical for the sector's sustainability, alongside contingency planning for future geopolitical crises that could affect the energy supply.

List of abbreviation

EU – European Union
EC – European Commission
ETS – EU Emissions Trading System (EU ETS)
ENTSO-E - the European Network of Transmission System Operators for Electricity
GEO – Government Eemergency Ordinance
EV – Electric Vehicles
GDP – Gross Domestic Product
GHG – Greenhouse Gases
TYNDP – Ten-Year Network Development Plans
TSO – Transmission System Operators
PV – Photovoltaic
TOE – Tonne of Oil Equivalent
NECP - National Energy and Climate Plans
RES - Renewable Energy Sources
DSO – Distribution System Operator
Kt CO₂ eq. – Kiloton of carbon dioxide equivalent
NZIA - the Net-Zero Industry Act



Objective:

The primary objective of this paper is to provide a comprehensive analysis of the Romanian energy market, with a focus on the gas and electricity sectors, and to evaluate the market's current state, challenges, and opportunities. The paper aims to identify the necessary actions for ensuring the long-term sustainability of the energy sector, in line with Romania's commitments to the European Union's climate and energy targets, as well as the investments needed to achieve the EU's climate targets in the context of the EC's recent proposals that address changes in the energy sector.

Introduction and short regional context

In general terms, it seems that, in the last two years, the European Union has developed a more resilient energy system after the huge shock caused by the Ukrainian war. According to EMBER (2024), for the first time, more than a quarter of EU electricity (27%) came from wind and solar in 2023¹. Moreover, in the last seven years the share of renewable electricity has increased overall by 14 percentage points, but the EU is far from the 72% of generation target proposed in the REPowerEU plan. In terms of renewable-generated electricity among the EU member states, in 2017-23 the wind and solar generation increased, while bioenergy was stagnant and hydro declined.

In 2023, wind generation grew by 55 TWh (+13%) and solar by 36 TWh (+17%) compared to 2022. Also, in 2023, wind electricity production alone surpassed EU gas power for the first time, reaching 18% of electricity generation (475 TWh compared to 452 TWh for gas). Moreover, 2023 was also the first year (other than Covid-19-impacted 2020) when wind electricity exceeded coal (333 TWh) (see EMBER, 2024). The EU's total installed wind capacity grew by 17 GW (+8%) in 2023 up to 219 GW.

Also, in 2022 and 2023 more and more national power systems ran with very high renewables shares with up to 100% renewable electricity shares, as is illustrated in Table 1 below.

TABLE 1.

Renewable energy events in selected EU countries

Country	Period	Number of hours
Greece	October 2022	100% renewables for 5 hours
	July 2023	87 consecutive hours without lignite and with renewables shares up to 84%.
Portugal	November 2023	entirely on renewables for 6 consecutive days
Poland	June 2023	renewables covered 67% of domestic power demand in peak moments (above the traditional threshold of 50%)
Netherlands	June 2023	approximately 140 hours in which electricity production from solar and wind exceeded the total electricity demand
Germany	December 2022	six days in when the entire demand was covered by renewables

Source: authors based on EMBER (2024) data²

Figures 1 and 2 present the wind and solar energy production dynamic in EU Member States in 2022-2023, based on the share of these renewable resources in their electricity production mix. Also, some countries are important based on their geographic positions. For wind energy, Denmark strengthened its leadership position in 2023 (as 58% of the country's electricity is produced from wind, up from 54% in 2022). Denmark was followed by Lithuania (46% share of wind in the electricity mix). The particularity for Lithuania is that the country covered only 44% of its power demand with domestic generation. Third place in the EU is occupied by Ireland (the wind share increased from 33% to 36% in 2023).

1 <https://ember-climate.org/insights/research/european-electricity-review-2024/#supporting-material>

2 EMBER, European Electricity Review, Europe's electricity transition takes crucial strides forward, 2024

Overall, 21 countries achieved their highest ever share of wind in the electricity mix in 2023, with the largest year-on-year percentage point increases seen in Lithuania, the Netherlands, Germany and Belgium. To produce electricity based on solar, Greece is emerging as the new leader (19% of electricity from solar), followed by Hungary (18%) and Spain (17%). In Greece, the capacity has accelerated since 2019 due to the feed-in premium for small ground-mounted PV installations (until the end of 2022), permitting procedures simplified in 2022 and strengthened Power Purchase Agreement (PPA) support. Another important event was in the Netherlands – the former solar champion – which dropped to fourth place with 16% due to several negative factors: grid congestion, a lack of available space for ground-mounted PV systems and the anticipated phase out of the net-metering scheme.

FIGURE 1

Wind (a.) and solar (b.) energy production in 2022-2023 in the EU (%)

● 2022 ● 2023



SOURCE
Annual electricity data. Ember

//.

Regional electricity demand

During the energy crisis, data shows that in the EU Member States, electricity demand fell by 6.4% from 2021 to 2023, especially due a fall in industrial electricity consumption (38% lower). Nevertheless, EU industrial production increased by 1% in 2023 compared with 2021. The reason is that energy-intensive industries declined during this period, and this had a significant impact on total industrial electricity consumption. Data shows that 80% of the contraction came from three main sectors: chemicals and petrochemicals, iron and steel, and paper and pulp³.

In the following sections we will analyse the most recent data in relation to the energy sector in Romania. The structure of this paper is organised to provide a comprehensive evaluation of the Romanian energy market with a focus on gas and power. The analysis is divided into several key sections to address the set objective of identifying challenges and opportunities within these markets, including demand and generation capacity, pricing trends, infrastructure investments and storage needs.

The first sections establish the broader context, focusing on the demand-supply dynamics, followed by an in-depth analysis of market structure and prosumers. Additionally, recommendations are provided to offer actionable insights based on the analysis. This structure ensures that the analysis is not only thorough but also aligned with the objective of providing a clear path forward for Romania's energy sector in alignment with EU targets.

3 These sectors are heavy gas consumers, so it is more likely that the falls in production were a consequence of higher gas prices rather than of higher electricity prices. The overall fall in EU gas demand was three times that of electricity demand. It fell by 21% from 2021 to 2023.



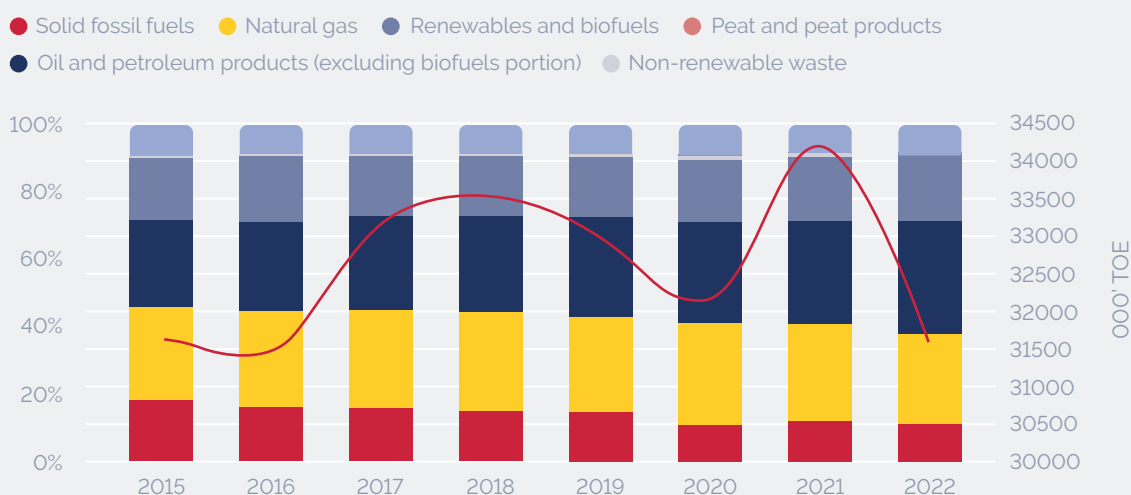
Demand and Generation Capacity in Romania

Romania has had a balanced energy capacity structure with a diversified source of energy supply in the last decade. At the end of 2022, in the total supply of energy, the most important contribution was from oil and petroleum products (33%) and natural gas (26.4%), while solid fossil fuels represented 11%. During 2015-2022 the share of fossil fuels decreased significantly, by more than 40%, resulting from the coal phase-out process.

For renewable resources, the most recent (definitive) data from Eurostat shows that 18-19% of the total energy supply was represented by renewables resources, close to the EU27 average, while the share of [renewables as a proportion of total electricity production](#) was more than 42% in 2022 (above the EU28 average of 38%) according to the Eurostat database (compared with 24-25% a decade ago). Nuclear energy represented 8.9% of the total energy supply (and almost 20% of electricity production in 2022).

FIGURE 3

Energy supply structure (2015-2022)



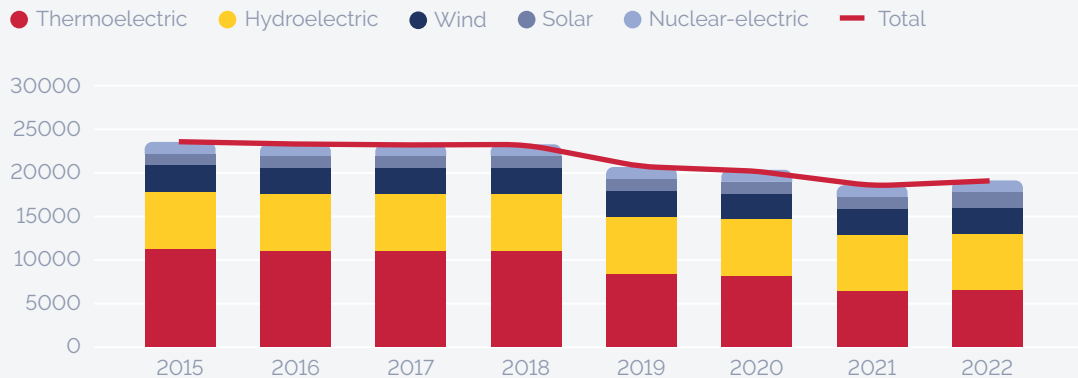
SOURCE:
[Eurostat](#)

Romania's electricity mix is one of the most balanced in the EU, with coal, hydropower, fossil gas, nuclear energy, and wind power all having comparable capacity and power generation shares. The total volume of installed capacity⁴ of power decreased in the 2015-2022 period by approximately 6 MWh, from 23,8 6Wh to 18,8 6Wh, especially due to thermoelectric capacity decline (-4,9 GWh), but also hydro energy. Additionally, wind (3 GWh), solar (1,3-1,14 GWh) and nuclear (1,4 GWh) energy installed capacities remained relatively constant in this period.

4 The installed power of an electric energy generating set represents the nominal power of the primary motor shaft (hydraulic turbine, eolian motor etc.) multiplied by the efficiency of the generator and of the mechanical transmission, if it exists. The average installed power at the end of the year is calculated as a ratio between the product of the installed powers of power plants, on the one hand, and the calendar time of the reference period, on the other hand.

FIGURE 4

Installed capacity for electricity by type (end of year 2022, Thousands of KW)

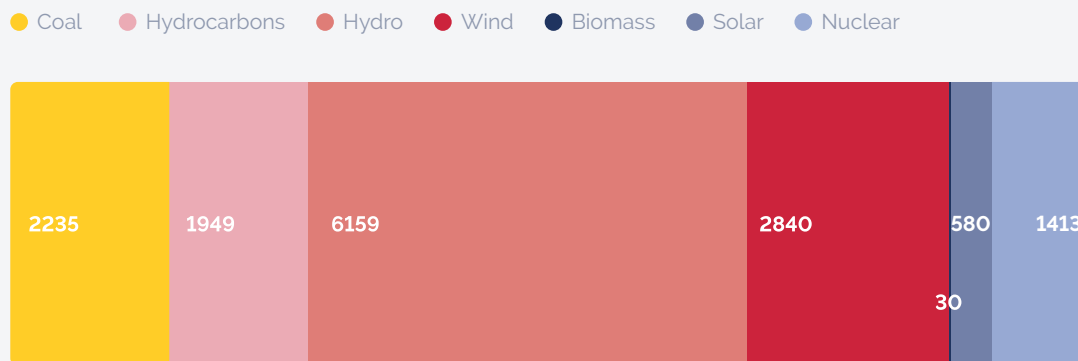


SOURCE
Romanian National Institute of Statistics

The most recent data from Transelectrica⁵ (April 2024) shows the following structure of the capacity installed by resources, with hydro (40,5%) and wind energy (18,7%) having the main shares in the electricity capacity mix. Coal (14,8%) was also an important resource. Total installed capacity for electricity is estimated at 15206 MW, with a net power of 14166 MW.

FIGURE 5

Electricity installed capacity (April 2024)



SOURCE:
[Transelectrica](#)

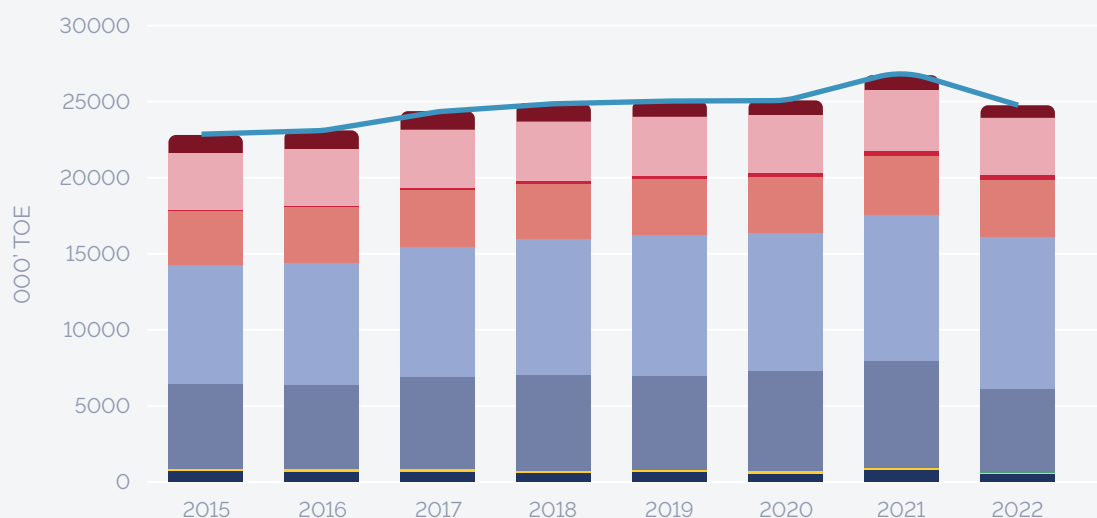
5 Values based on the total installed and available production capacity from the National Energy System for each dispatchable unit as at 1 April 2024

During 2015-2022 the energy available for final consumption (Figure 6) increased, even though that the structure of the sources remained mostly unchanged. Thus, for the entire analysed period, the energy available for final consumption increased from 22810 thousand TOE in 2015 to 24763 thousand TOE in 2022, with a peak registered in 2021, after the pandemic shock. Moreover, the decline in the amount of energy available for final consumption in 2022 is notable in a climate of rising prices.

FIGURE 6

The energy available for final consumption (2015-2022)

Heat Electricity Non-renewable waste Renewables and biofuels
Oil and petroleum products (excluding biofuel portion) Natural gas Peat and peat products
Manufactured gases Solid fossil fuels Total



SOURCE
Eurostat

IV. Natural gas

The figure below displays the trends related to the production, exports, and inland consumption of natural gas in Romania, quantified in million cubic metres, from 2015 to 2022. The data source is from [Eurostat](#). Up to 2015, Romania had no exports of natural gas. This changed slightly in 2017 and 2018, with minor export values of 26 and 30 million cubic metres, respectively. By 2019, exports had dropped again to a mere 12.8 million cubic metres.

However, there was a significant increase in 2020 with 139.8 million cubic metres exported, and a surge in 2021, when the total reached 730 million cubic metres. Exports continued to rise, albeit at a slower rate, reaching 947 million cubic metres in 2022.

Starting from 11262 million cubic metres in 2015, inland consumption increased to 12000 million cubic metres in 2017. Subsequently, there was a noticeable decline, with consumption reaching its lowest point (11217 million cubic metres) in 2019. In the pandemic years, 2020 and 2021, consumption began to rise again, but for 2022 a lower consumption volume of natural gas is estimated, at 10230 million cubic metres, in the context of a climate of high prices, at least partially resulting from geopolitical tensions with Russia.

The indigenous production of natural gas in Romania started at 11092 million cubic metres in 2015, with a constant yearly decrease until 2020, when the figure reached 8914 million cubic metres. However, in 2022 production expanded and estimates show an increase of 9051 million cubic metres according to Eurostat. In summary, Romania's natural gas trends from 2015 to 2022 indicate a period of decreasing indigenous production until 2017, followed by a subsequent minor rebound in 2021-2022. Inland consumption saw a drop between 2017 and 2019 but began increasing again in 2021, while dropping to an 8 year low in 2022.



Onshore natural gas production, it is expected to decrease, but a low degree of dependence on imports is expected to be maintained, contingent on the development of the reserves discovered in the Black Sea. According to the European Commission's reference scenario (REF 2020), the evolution of natural gas production in Romania in the period 2025-2050 is expected to be as follows:

FIGURE 8

Natural gas consumption and production forecast (2024-2050)

● Production
● Natural gas consumption
● Difference

SOURCE
Transgaz, European Commission's reference scenario (REF 2020)

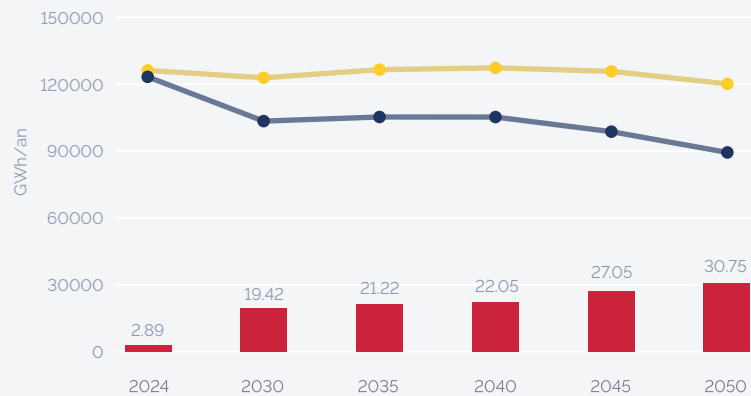
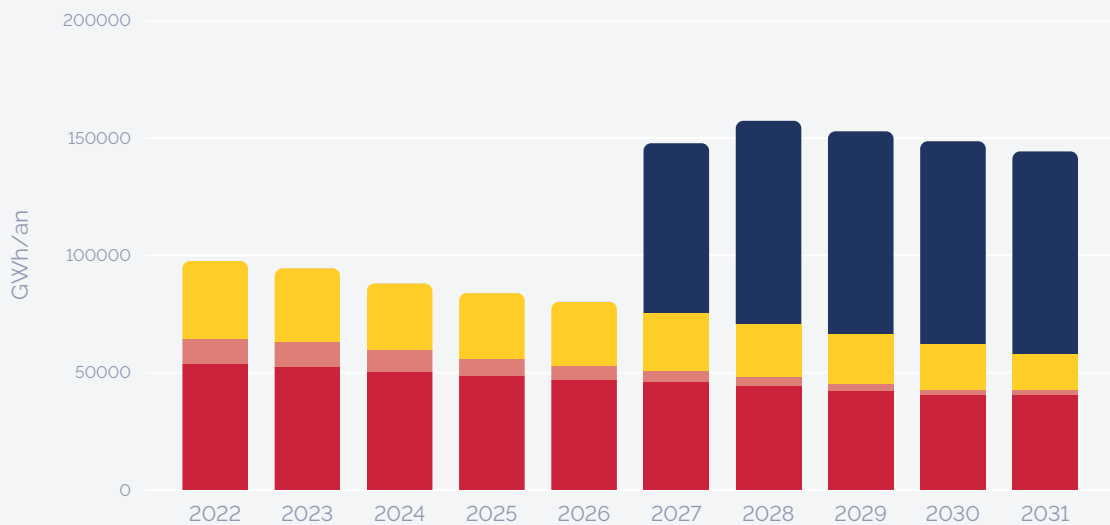


Figure 9 indicates a general forecast for natural gas production in Romania by the main producers: Romgaz, Black Sea Oil and Gas and OMV Petrom as well as production from the Neptun Deep project until 2050. The latter is anticipated to become the major source of energy starting in 2027, while production from the current gas production fields will decline⁶.

FIGURE 9

Main natural gas producers (2022-2031)

● Romgaz ● Black Sea Oil and gas ● OMV Petrom ● Neptun Deep



SOURCE
Transgaz

⁶ Even though it was initially expected to be operational in 2025, according to OMV Petrom's annual report 2023, the first gas is expected to be extracted in 2027.

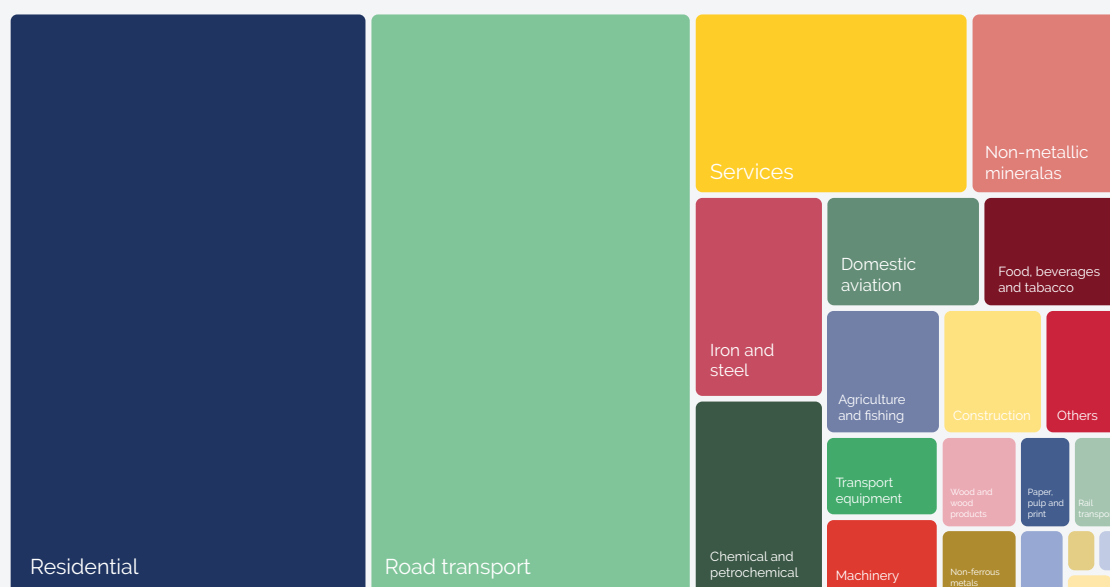
The structure of energy consumption by sector

The structure of energy consumption by sectors of activity shows that the highest consumption is in the residential sector, transport, and industry. Data from the Romanian National Institute of Statistics shows that road transport has a relative energy consumption equal to industry. Additionally, smaller shares are found in the service sector, as well as in agriculture and fisheries.

Compared to the pre-COVID19 period, the largest reductions in energy final consumption were registered in the chemicals and petrochemicals sector (a decrease of 33% in 2019-2022), non-ferrous metals (-52%), textiles and leather (-29%) as well as in the machinery sector (-20%). At the same time, transport equipment, mining and quarrying, construction and paper, as well as pulp and printing registered the most significant increases. During 2019-2022 the transport sector increased its energy use by 13%, especially due to the road transport sector.

FIGURE 10

The structure of energy consumption by sector (2022)



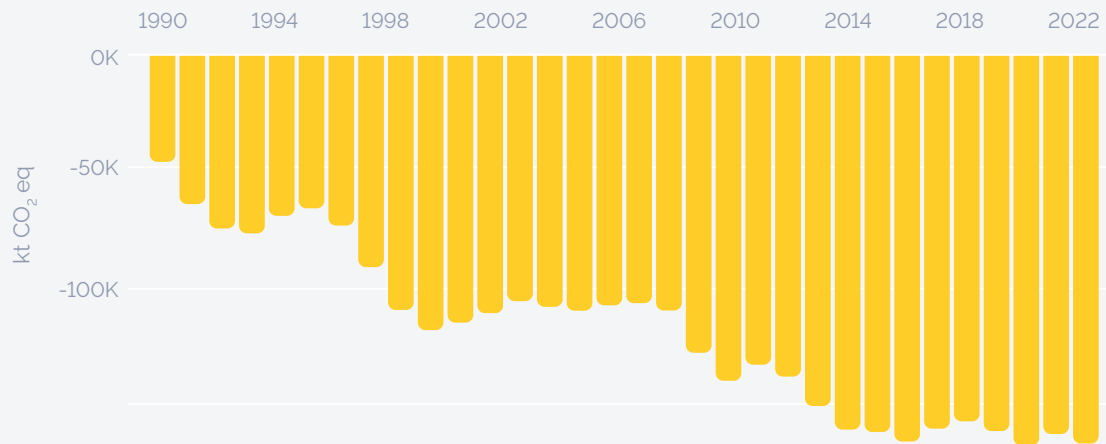
SOURCE:
European Commission, [Eurostat](https://ec.europa.eu/eurostat)

In relation to emissions⁷ (Figure 11), Romania has achieved a substantial reduction in CO₂ emissions across most sectors since 1990, with the most significant decreases observed in the Energy Supply and Industrial sectors.

7 Total greenhouse gas emissions and removals in the EU, based on data reported by EU Member States under the EU Governance Regulation <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>

FIGURE 11

Change since 1990 in emissions in Romania



SOURCE:
[European Environment Agency](#)

The sharp decline between 1990 and 2000 indicates major changes in emissions. Here we can mention the importance of industrial structural shifts toward lower energy intensity sectors, energy policy framework changes in the European Union (i.e. ETS introduction after 2005), as well as the adoption of cleaner technologies, usually amid large FDI-inflows in manufacturing. However, the stabilisation in emissions from other sectors, such as Domestic Transport and Residential and Commercial, suggests that further interventions may be needed in these areas to achieve further reductions (Figure 12 and Figure 13). Despite the large reduction in emissions, the energy and industry sectors continue to be the largest CO₂ emitters, alongside domestic transport.

FIGURE 12

The structure of greenhouse gas emissions by sector– kt CO₂ equivalent (2022)

SOURCE:
[European Environment Agency](#)

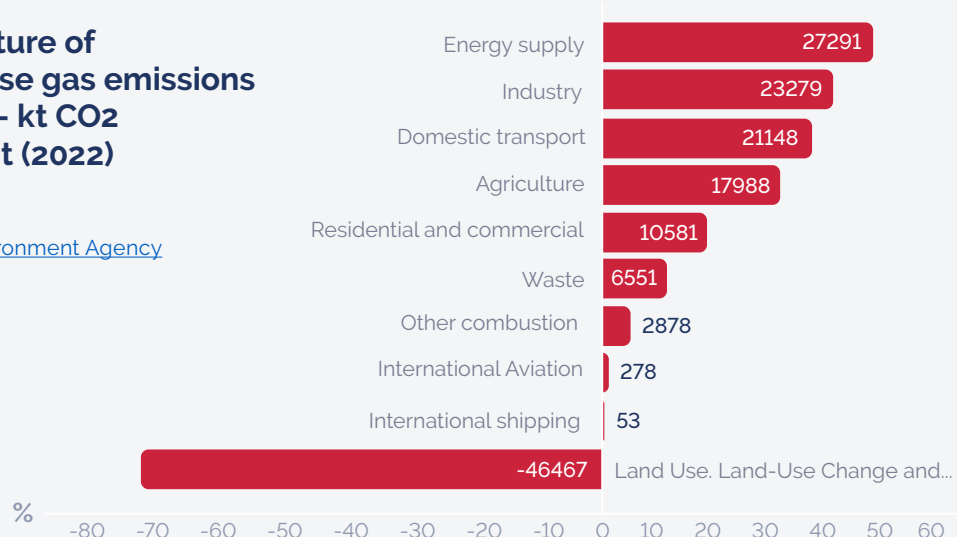
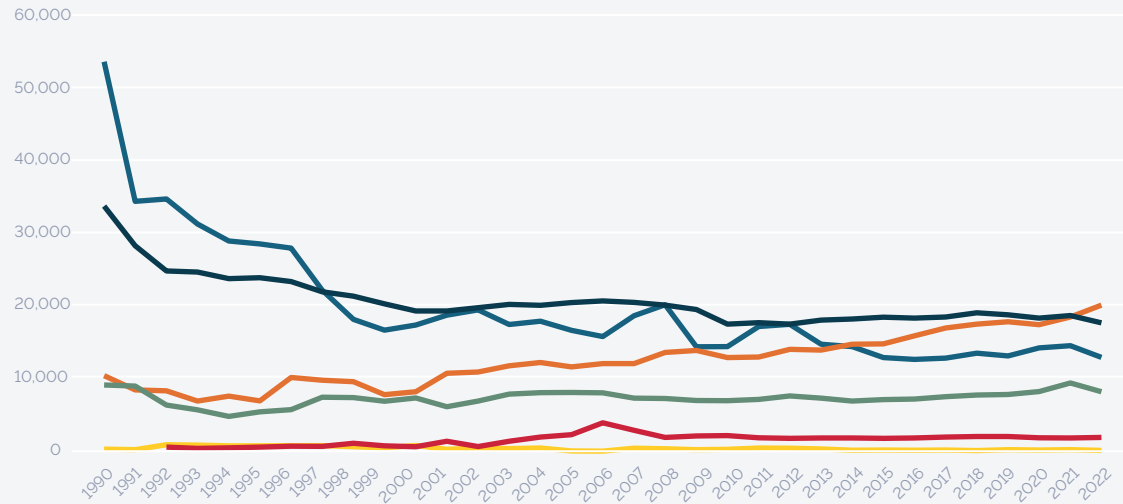


FIGURE 13

The evolution of greenhouse gas emissions in key sectors (1990-2022)

1.A.2 - Manufacturing Industries and Construction 3 - Agriculture 1.A.3.b - Road Transportation
1.A.4.b - Residential 1.A.4.a - Commercial/Institutional 1.A.3.c - Railways



SOURCE:
[European Environment Agency](https://www.eea.europa.eu/en/press/2023/04/04)

VI.

A short analysis of the market structure

Table 2 below provides insights into the market dynamics of the Natural Gas and Electricity sectors, showing the dominance of a few main entities in both sectors. Between 2015 and 2022 the energy markets (natural gas and electricity) registered some important developments. In the Natural Gas sector, from 2015 to 2022, the number of entities importing gas into the country saw an upward trend, reaching its peak in 2021 with 33 entities. Despite this growth in the number of importers, the main entities with deals of more than 5% of the total remained consistent, around 4 entities after 2019. This indicates that while more companies have entered the market, the major shares remained with a few dominant players. The market share of these main entities declined slightly from 93% in 2015 to 85% in 2021. Retailers selling to end consumers witnessed a modest fluctuation, with numbers peaking at 86 in 2017 and then slightly declining to 68 by 2022. Throughout this period, the largest retailer's market share hovered at around 25%, highlighting the competitive nature of the retail market.

In the Electricity sector, the period from 2015 to 2022 saw a diversification in major producers, with 26 entities by 2022, representing 95% of total production. However, the number of main producers (with over 5% of the total output) increased to 4 entities during the period 2015-22. The cumulative market share for the main entities generating electricity fluctuated, but showed a general trend of decline after 2018, suggesting a broader spread in market share among other entities. The market share of the largest producers in this period declined, dropping from 28% in 2018 to 25% in 2022, showcasing a reduced dominance of the leading player. There was a notable addition of capacity in 2015 and 2016 and a sharp decline in new capacities in subsequent years, with 2021-2022 witnessing an addition of 56 MW. Retailers selling to final consumers peaked at 105 in both 2016 and 2017 and then stabilised at 94 by 2022. The market share of main retailers hovered around 63% in 2022.

TABLE 2.

Market indicators in the energy sector (Natural Gas and Electricity)

	2015	2016	2017	2018	2019	2020	2021	2022
Natural Gas								
Entities bringing gas into the country [No.]	15	16	18	23	26	25	33	32
Main Entities bringing gas in the country, Deal >5% Total [No.]	2	3	2	2	4	4	4	4
Cumulative Market Share, Main Entities [%]	93	89	85	84	89	89	89	85
Market Share - Largest Production & Import Company [%]	47	46	44	43	41	40	39	42
Retailers to Final Consumers [No.]	74	84	86	80	73	76	75	68
Main Retailers, Sales >5% Total [No.]	4	4	5	6	6	5	4	4
Cumulative Market Share, Main Retailers [%]	82	82	83	86	84	80	78	84
Market Share, Largest Retailer [%]	27	27	26	25	25	24	24	25

Electricity								
Producers, Representing 95% Total [No.]	29	29	32	27	29	30	28	26
Main Producers, >5% Total [No.]	3	3	3	4	4	4	4	4
Cumulative Market Share Generation, Main Entities [%]	65	66	63	77	69	69	72	70
Cumulative Market Share Capacity, Main Entities [%]	58	57	57	51	59	59	35	61
Market Share Largest Producer [%]	26	28	23	28	27	28	30	25
New Capacity in the Year [MW]	387	203	14	20	9	3	41	15
Retailers to Final Consumers [No.]	95	105	105	96	91	88	92	94
Main Retailers, Sales >5% Total [No.]	5	5	5	4	5	6	6	6
Cumulative Market Share, Main Retailers [%]	61.2	60.7	63.0	55.0	67.8	67.8	67.0	63.0

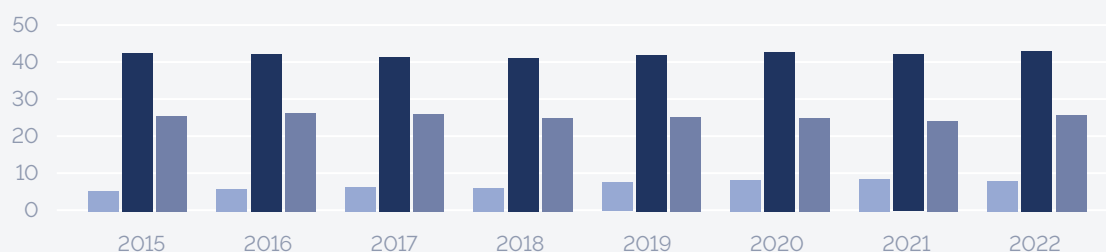
Source: European Commission; [Eurostat](#)

Renewable energy use in Romania remained constant during 2015-2022, although there were some increases in use in the transport sector as the number of electric vehicles increased. However, in electricity and also heating and cooling, the share of renewable energy sources was mainly constant in this period, as the EU targets were reached several years ago. This is mostly due to important government support via the renewable state aid scheme and the significant hydropower legacy of the former communist regime. In 2022 around 8% of renewable energy resources were in transport, 26% were used in heating and cooling, while 43.7% of electricity used renewable resources according to Eurostat.

FIGURE 14

Renewable energy use by sector

- Renewable energy sources in transport
- Renewable energy sources in electricity
- Renewable energy sources in heating and cooling

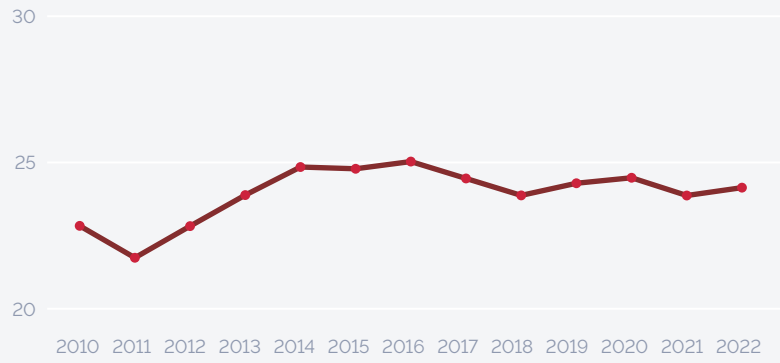


SOURCE:
European Commission, [Eurostat](#)

FIGURE 15

Renewable energy sources (% in total energy sources)

SOURCE
European Commission,
Eurostat



VII.

Prosumers connected to the distribution networks

Table 3 below illustrates the situation in relation to the number of prosumers (entities that both produce and consume energy) connected to various distribution networks managed by different operators. The data is presented in terms of the total number of prosumers and the total installed power capacity of these prosumers in megawatts (MW). At the national level, in May 2024, the total number of prosumers connected to the distribution networks was 129736, with a total installed power of 1707 MW. This number is almost double compared with July 2023. A key factor in this growth has been the governmental program "Casa Verde Fotovoltaice", especially for individuals.

The data underscores a wide diversity in scale and capacity across different distribution operators. While Distribuție Energie Oltenia has the most prosumers and the highest amount of installed power, other entities have a far lower portion in terms of number of prosumers and prosumer installed capacity. E-Distribuție Dobrogea has a lower MW capacity compared to the number of prosumers, indicating that individual prosumers under this network might have smaller-scale operations, while Delgaz Grid, E-Distribuție Banat, DEER MUNTENIA NORD and E-Distribuție Muntenia SA have a similar number of prosumers, but their installed capacities vary. By county, data from 2023 shows that most prosumers are in Ilfov, Timis, Arad, and Dolj counties.

TABLE 3.
Prosumers in Romania (May 2024)

Distribution Operator	Number of prosumers	Installed power (MW)
ALLIANSO PARK MANAGEMENT	2	1.61
DELGAZ GRID	17060	220.14
DISTRIBUTIE ENERGIE OLTENIA	21285	268.87
E - DISTRIBUTIE MUNTENIA SA	16231	235.21
E-DISTRIBUȚIE BANAT	15126	194.89
E-DISTRIBUTIE DOBROGEA	8844	118.36
OMV PETROM	21	0.59
DEER MUNTENIA NORD	14282	193.69
DEER TRANSILVANIA NORD SA	18284	249.89
DEER TRANSILVANIA SUD	18586	220.29
TETAROM	15	3.75
Total	129736	1707

Source: [Transelectrica](#)

VIII.

Development of prices

Figures 16 and 17 below reveal a comparative perspective on electricity prices for household consumers across different regions, specifically the European Union, Poland, and Romania, over a bi-annual period from the first half of 2018 to the first half of 2023. We added Poland in order to have a relatively similar development level country to compare Romania with.

Overall, the average electricity price across these countries and the EU has seen a gradual increase. In Poland, the initial recorded price was 0.1410 €/kWh in the first half of 2018, which increased to 0.1769 €/kWh by the first half of 2023. The trend indicates a consistent rise but at a pace that seems relatively stable compared to Romania. In Romania, the increase shows a more dramatic escalation. Starting at 0.1333 €/kWh in the first half of 2018, the price more than tripled after the start of 2021, reaching 0.4199 €/kWh by the first half of 2023. The increase is even higher for non-household consumers.

When comparing these regions, it is clear that while both the EU average and Poland have experienced increases in household electricity prices, Romania's prices have risen at a significantly higher rate. This is the result of a variety of economic, policy, and market conditions unique to Romania that have influenced the cost of electricity for consumers. Currently, the level of prices in Romania is one of the highest in the EU27 close to Belgium and Germany (Figure 18).

FIGURE 16

Electricity prices for non-household consumers

● Romania
● EU27
● Poland

SOURCE
Eurostat

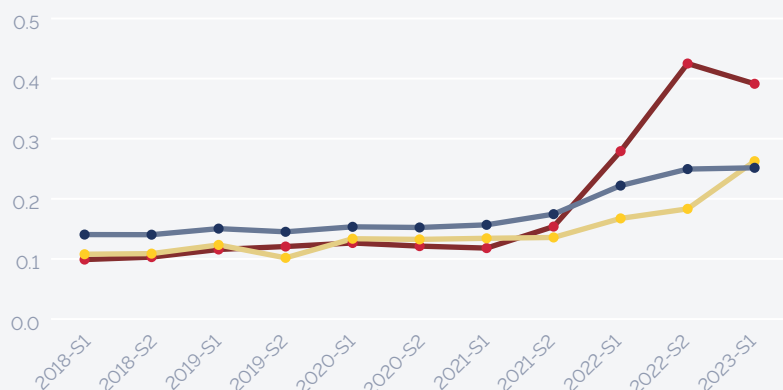
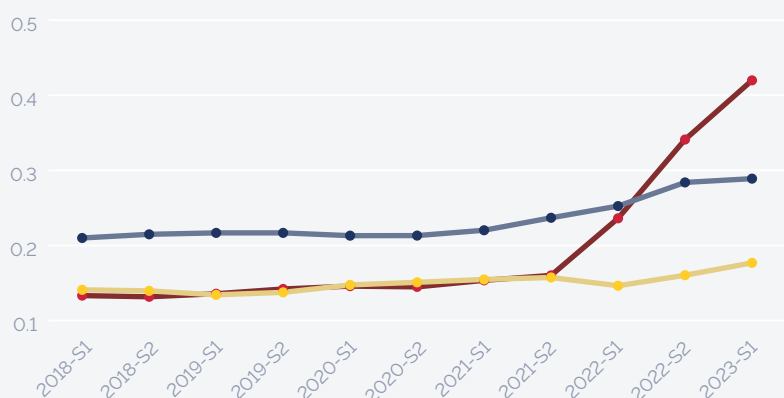


FIGURE 17

Electricity prices for household consumers

● Romania
● EU27
● Poland

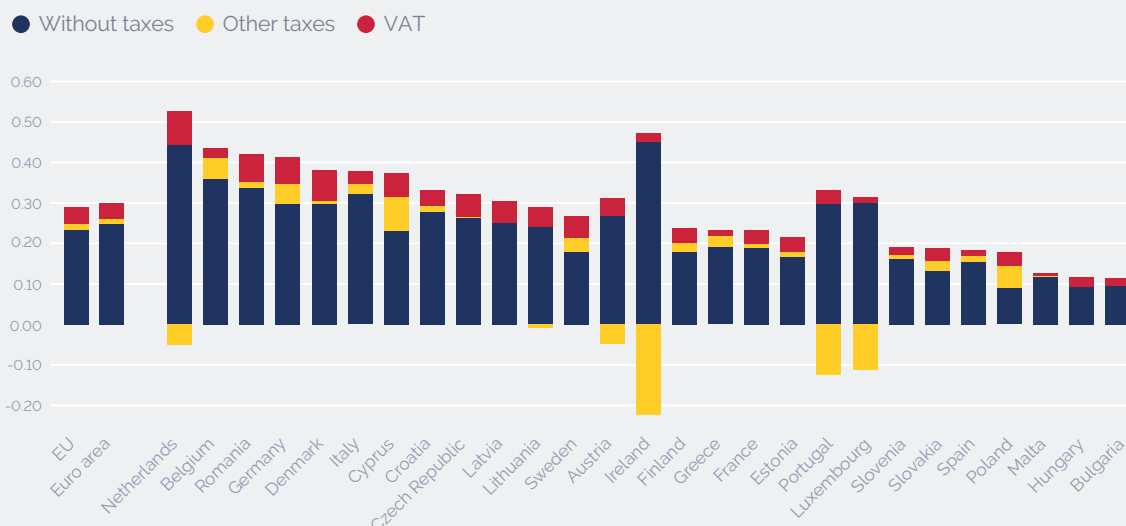
SOURCE
Eurostat



Note: The data relates to a specific annual consumption band (from 2500 kWh to 4999 kWh for households and 500 MWh to 1 999 MWh for non-household consumers). The prices are measured in euros per kilowatt-hours (kWh). All taxes and levies are included in the prices.

FIGURE 18

Electricity prices for household consumers in the EU, first half of 2023 (euro per kWh)



SOURCE
Eurostat

Figures 19 and 20 below provide information on gas prices for non-household and household consumers, indicating the average across all European Union Member States, as well as the figures for Poland, and Romania. The prices are measured in kilowatt-hours and include all taxes and levies, denominated in euros.

Romanian gas prices were the lowest at the start of the period, at 0.0321 €/kWh in the first half of 2018. As in the EU27 as a whole and Poland, there has been a general upward trend, albeit with less fluctuation, after 2021.

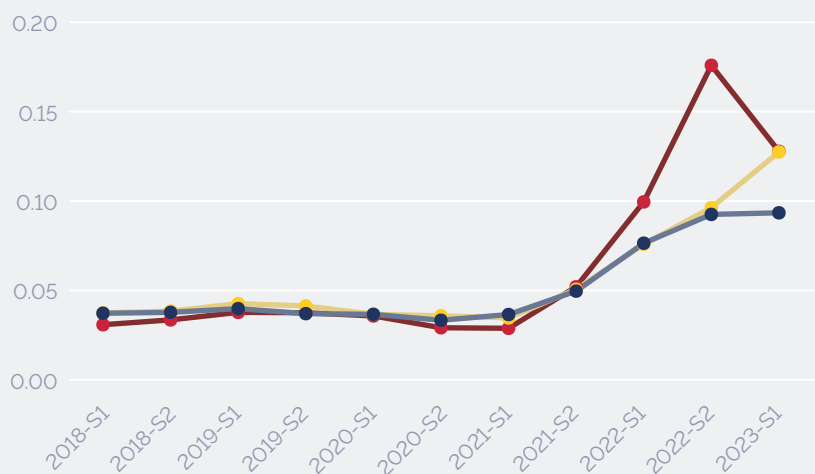
Prices rose significantly to 0.1431 €/kWh by the first half of 2023 for household consumers. The EU27 average shows variability in gas prices with a notable uptick in the last recorded year. Poland's prices were consistently below the EU27 average throughout the period, suggesting stable and lower gas pricing policies or market conditions. Romania started with the lowest prices but saw a substantial increase, surpassing both Poland and the EU27 average by the first half of 2023, which could indicate changes in domestic production, supply constraints, or fiscal policies affecting the gas market.

Overall, while the trend for all three is an increase over the five years, Romania's prices have escalated to the point of exceeding the EU27 average and Poland's prices, which could have significant implications for household consumers and energy policy in Romania.

FIGURE 19

Gas prices for non-household consumers

● Romania
● EU27
● Poland

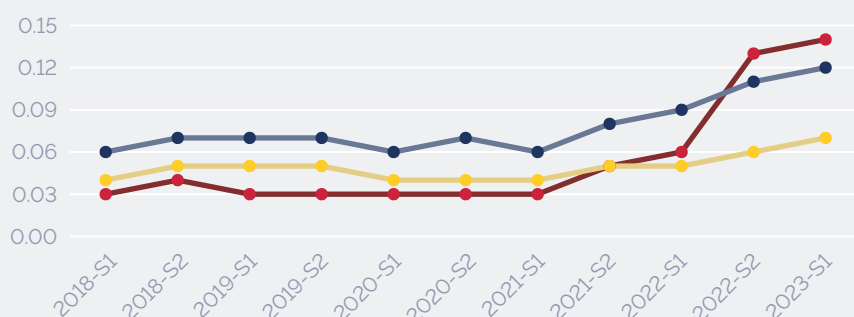


SOURCE
Eurostat

FIGURE 20

Gas prices for household consumers

● Romania
● EU27
● Poland

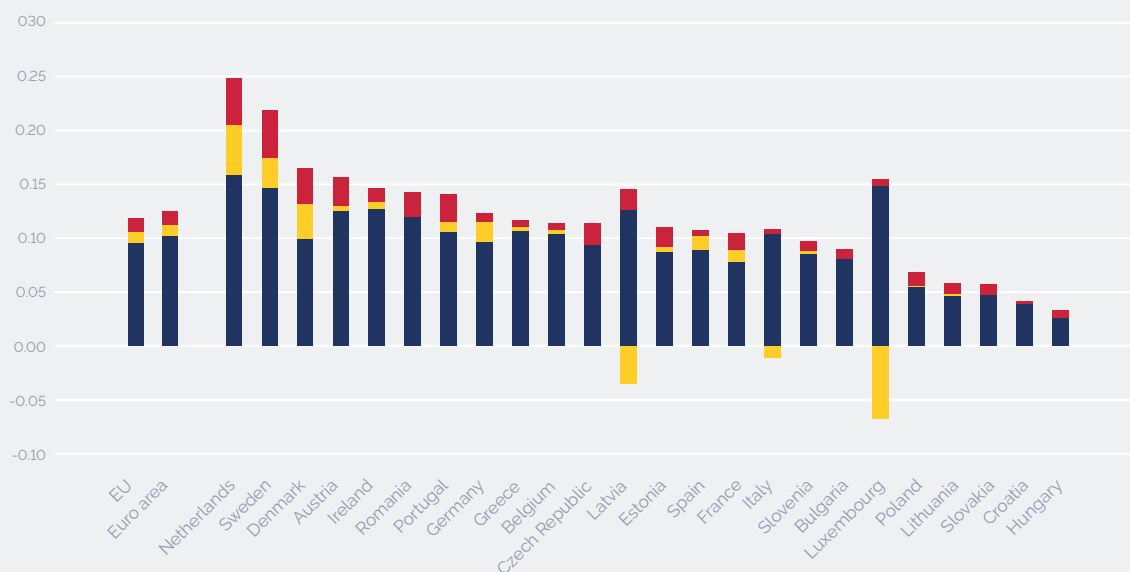


SOURCE
Eurostat

FIGURE 21

Electricity prices for household consumers in the EU, first half of 2023 (euro per kWh)

● Without taxes ● Other taxes ● VAT



SOURCE
Eurostat

Measures taken in Romania for natural gas and electricity

Romania has faced significant challenges due to market interventions aimed at controlling energy prices and protecting consumers from surging costs. While well-intentioned, these interventions have led to severe consequences for the sustainability of the sector. One of the most pressing issues was the delayed reimbursement to energy suppliers under the government's price cap and compensation schemes. This delay created liquidity problems for suppliers, many of which were forced to operate at a loss while waiting for government compensation. The unpredictability in receiving payments strained the cash flow of suppliers, with an impact on their ability to maintain operations and invest in future energy production and infrastructure.

Additionally, the lack of a robust and transparent consultation process during the design and implementation of these schemes further exacerbated the situation. Legislation was often drafted and implemented hastily, without sufficient input from industry stakeholders. This unpredictability in policymaking created an environment of uncertainty, where suppliers were unsure as to whether they would be able to recover the full costs incurred under the compensation scheme. As a result, many companies found themselves in financial distress. The inability to recover all costs in the disbursement process also meant that energy suppliers had to bear a disproportionate burden. The scheme did not fully account for the rising costs of energy, operational expenses, or other factors such as inflation and market volatility, undermining the stability and sustainability of the sector.

The unpredictability as to possible future policy interventions also deterred potential investments in the energy sector. Investors are typically cautious about entering markets where policy and regulatory frameworks are unstable and impede the country's ability to modernise its energy infrastructure and transition to renewable energy sources, as significant investments are needed to meet EU climate targets. The average prices presented in the Eurostat format are those from the supply contracts, as they were reported by suppliers operating on the electricity and natural gas retail market in the first six months of 2023. Compared to the contractual values presented, in the reporting period, according to the provisions of Government Emergency Ordinance no. 27/2022 (GEO 27/2022), with subsequent amendments and additions, the prices billed to electricity and natural gas household and non-household final clients have been capped, resulting in values that for certain categories are significantly lower than contractual values.

The data from Eurostat shows the capped values of the prices billed to electricity household clients, according to GEO 27/2022, and the final capped billed prices including network tariffs, taxes and VAT. For annual consumption between 0 – 1200 kWh the capped billed price (lei/kWh) is 0.68, for 1200 – 3060 kWh 1.3, for 3060 – 3600 0.8-1.3 and >3600 1.3. For non-household electricity clients, GEO no. 27/2022 provides for two capped values of the final price, 1 leu/kWh and 1.3 lei/kWh, which do not depend on the monthly or annual consumption but on the type of activity.

For natural gas clients the capped prices are a maximum of 0.31 lei/kWh, for household clients, and a maximum of 0.37 lei/kWh for non-household clients and thermal energy producers (in cogeneration plants and in thermal plants for consumption intended for consumers as direct clients of natural gas producers - PET). Only non-household consumption above a threshold of 50000 MWh per year is not capped.

Additionally, the over taxation of electricity producers under the conditions of elevated costs related to fuels, salaries and inflation, as well as the non-reimbursement of CO₂ certificates for the electricity they compulsorily sold through MACEE - according to the legal right established by GEO 27/2022, with subsequent amendments and additions - could jeopardise production capacity leading to a submaximal output level.

Romania assumed the objective of liberalizing the energy market even before joining the European Union. Liberalization, compliance with the principles of the free market, and the rules of fair competition are essential elements to attract investors and ensure the economic growth and competitiveness of the energy sector in Romania. The gas and electricity markets are to return to the free market and price deregulation starting April 1, 2024, but there is a need to set principles that underpin the free market so that the competitiveness of the energy sector and the industrial sector is ensured. It is important to ensure a competitive environment for both the energy sector and the industrial sector that respects the principle of market development as a whole so that recurrent shock-induced measures are not introduced.

Source: Eurostat

Electricity production mix forecast

The energy sector is a critical component of Romania's economy, underpinning the country's industrial growth, domestic needs, and overall economic stability. As Romania navigates its energy transition, understanding the investment needs in infrastructure, distribution networks, and storage capabilities has become increasingly important. These elements collectively determine the efficiency, reliability, and sustainability of energy supply across the country.

The new Energy Strategy of Romania for 2025-2035 with the perspective of 2050 mentions that, in order to achieve the SRE-E target of 58.5% by 2035, the new capacities of wind and solar are a key element. The installed capacity of wind and solar energy for 2035 is targeted at a level of 24 GW, representing a five-fold increase compared to the installed capacities of wind and solar energy at the level of 2021 (3 GW of wind energy and 1.4 GW of solar energy, respectively).

The energy transition path is directly correlated with economic activity – as it influences the domestic consumption of energy – but also with the evolution of energy intensity⁸, as well as the quantity of energy needed to create 1000 RON of GDP). Table 3 below presents the main coordinates of the reference scenario for Romania until 2031, with a decrease in the real GDP growth rate to close to 3%.

TABLE 3.

Electricity Consumption, Historical and Forecast, Transelectrica

		2019	2020	2021	2022	2026	2031	% change, 2031 vs 2022
GDP	Bn RON 2020	1100	1059	1121	1146	1363	1584	38.2
GDP growth	%	4.2	-3.7	5.9	2.2	4.4	3.1	n/a
Energy intensity (electricity)	KWh/1000 RON 2020	52.1	52.5	51.9	51	45.7	41.4	-18.8
Net domestic electricity consumption	TWh	57.3	55.6	58.2	58.5	62.3	65.5	12.0
Peak electricity consumption, net	MW	8813	8679	8967	9150	10100	10580	15.6

Source: [Transelectrica](#), Development Plan for the Grid Electricity Transmission, 2022, Reference Scenario. Data for year 2022 need to be revised – would change the whole forecast.

In this context, according to the Transelectrica scenarios, Romania's energy transition towards low-carbon technologies and energy production from renewable sources requires a considerable investment effort in the period 2022-2031, corresponding to the installation of new capacities in the NES exceeding 11 GW, according to the Reference Scenario (see Figure below).

8 Energy intensity is defined as the amount of energy (KWh) used to produce a given level of output or activity (1000 lei of GDP or 1% of GDP).

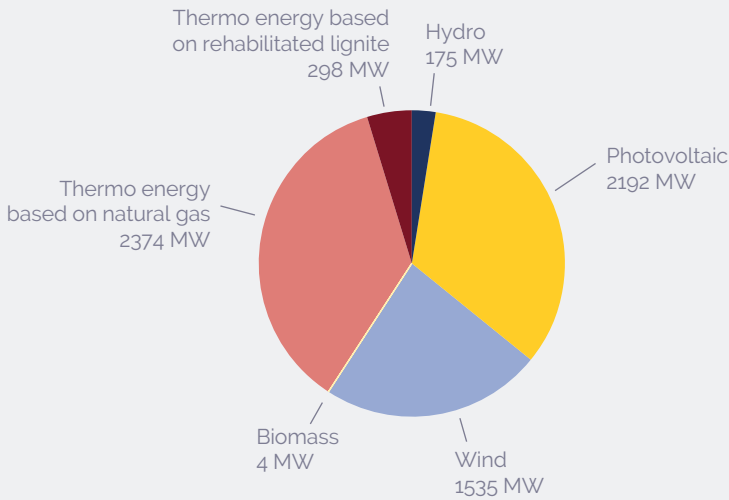
Along with natural gas, nuclear energy remains an essential component, which will play an important role in ensuring both the transition to decarbonization and energy security. SN Nuclearelectrica SA estimates that Units 3 and 4 of the Cernavoda Nuclear Power Plant will be ready at the end of 2030 and 2031, respectively. However, a discontinuity in nuclear production will take place between 2027 and 2029, when Unit 1 is scheduled to be upgraded to extend its lifespan by 30 years.

FIGURE 22

New and upgraded electricity generation capacity units for the period 2022-2031 – Reference Scenario

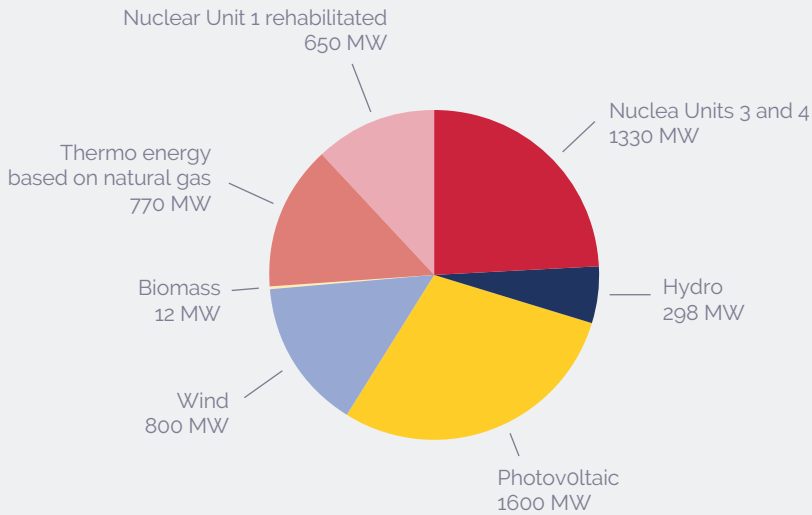
2022–2026

+6578 MW



2027–2031

+5460 MW



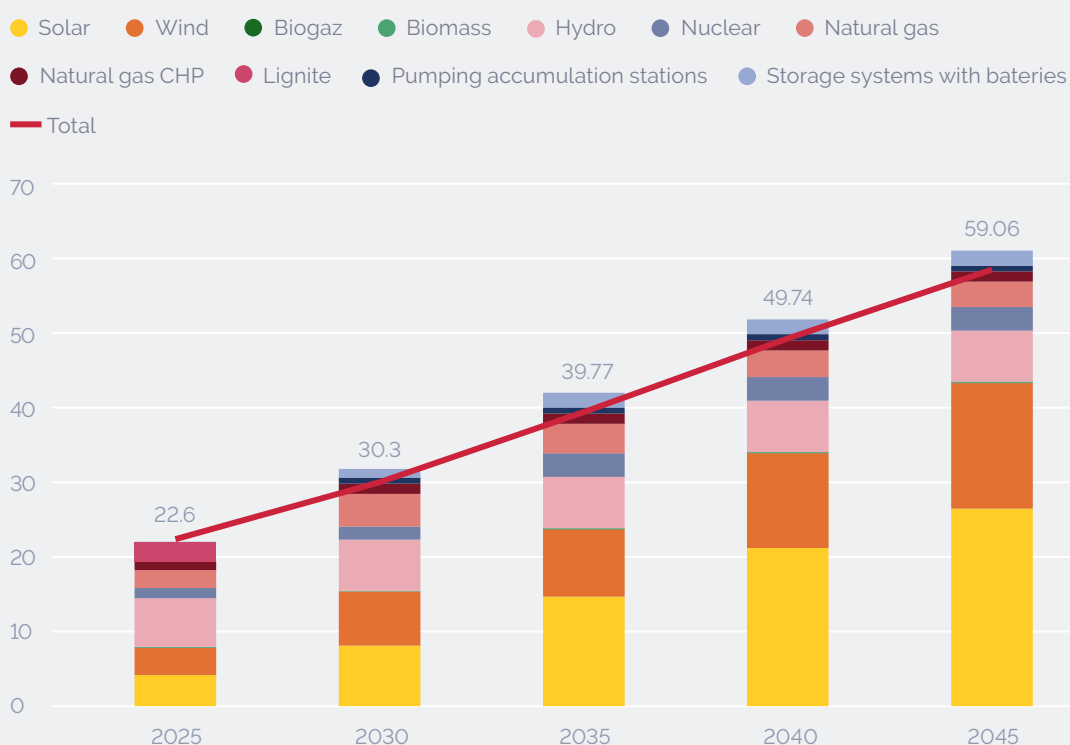
SOURCE
Transelectrica

In relation to electricity production, Romania aims to maintain its diversified energy mix, while reducing GHG emissions through the sustained increase of production capacities from low- or zero-emission sources. According to the latest version of the [Romanian Government Energy Strate-](#)

gy⁹, the target for 2035 is to reach an installed electricity generation capacity of 40 GW. The targets will be met mainly by increasing the installed capacity to produce energy from hydropower, wind and solar and geothermal sources, as well as by partially electrifying heating and cooling systems. Romania's target for the share of renewable energy resources in the gross final energy consumption is 44% in 2035 and 73% in 2050.

FIGURE 23

Estimated trajectory for installed electricity generation capacity



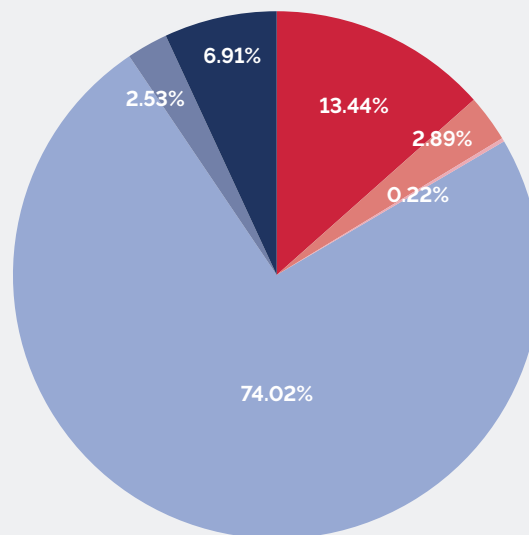
SOURCE
Romania Energy Strategy 2025-2035 with the perspective of the year 2050, 23 August 2024

Based on the Romania Energy Strategy 2025-2035 the Romanian installed capacities to produce electricity will almost double by 2035, especially due to greater use of solar and nuclear, but also to the development of significant storage systems using batteries. Current estimates show that the need for investment in production and batteries will be close to 9 billion euros, bearing in mind the current cost of different types of electricity sources and the new capacities forecast. Increasing the capacity of nuclear energy will require an investment of more than 6 billion euros (Units 3 and 4 of the Cernavoda power plant), while the cost of the projected solar and wind capacity increase is estimated at more than 1,4 billion euros. The cost of storage systems using batteries will be close to 600 million euros.

FIGURE 24

The structure of investment in new electricity production capacities (estimates for 2025-2035)

● Solar ● Wind ● Hydro ● Nuclear ● Natural Gas ● Storage systems with batteries



SOURCE

FIC estimates¹⁰, Romania Energy Strategy 2025-2035 with the perspective of the year 2050, 23 August 2024

¹⁰ Based on LCOE from Christoph Kost, Shivenes Shammugam, Verena Fluri, Dominik Peper, Aschkan Davoodi Memar, Thomas Schlegl, Fraunhofer ISE: Studie Stromgestehungskosten Erneuerbare Energien. Juni 2021. Retrieved 2 January 2022.



Infrastructure, Distribution Network and Storage Aspects

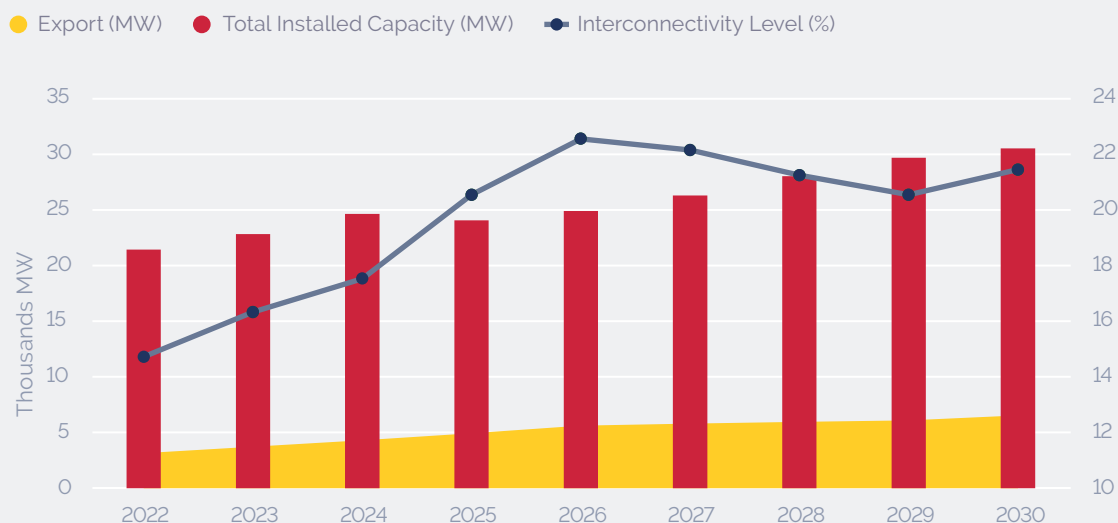
This section of the report will provide a macro-overview of Romania's energy infrastructure, and analyse the current needs for capital investments in infrastructure and, interconnectivity. It will consider the challenges faced by the distribution network, as well as exploring the emerging role of energy storage.

For electricity, according to the Romanian new Energy Strategy 2025-2035, the installed capacity will rise steadily until 2030, reaching 30409 MW – with a perspective of 63000 MW in 2050. The overall increase from 20690 MW in 2019 to 30409 MW in 2030 represents a rise of approximately 42% in installed capacity over the period.

Export capacity is also expected to increase significantly to 6500 MW by 2030. Consequently, there will be a consistent enhancement in Romania's ability to export electricity. Lastly, the interconnectivity level is expected to increase steadily from 14.7% in 2020 to a peak of 22.5% in 2026, before slightly declining and stabilising at around 21% in subsequent years.

FIGURE 25

Electricity exports, installed capacity and interconnectivity level (2022-2030)



SOURCE
Romanian Energy Strategy 2025-2035

The projected steady growth in both export capacity and total installed capacity for electricity production will require significant investment in and development of Romania's energy infrastructure. Moreover, the increasing interconnectivity levels reflect efforts to integrate with regional energy markets, which is crucial for energy security and market stability. In the overall EU network, Romania, Bulgaria and Greece are not adequately connected to the markets of Central Europe because of a lack of transport infrastructure to Hungary and Austria. Increasing the interconnectivity level between Romania and other regional markets will improve conditions in the electricity market, reduce interconnection congestions and contribute to lower prices for consumers.

Investment needs

Different studies and recommendations consider that, bearing in mind the projects in the latest approved TYNDP¹¹ (2022-2031) and those under consideration, there is a need for €6.8bn of investment in the transmission electricity grid by 2030, representing an amount five times greater than the value assumed in the current TYNDP, of 1.43 bn (EPG, 2024), based on certain important requirements for the development of the Romanian energy system, such as: modernisation of aging infrastructure (60% of Romania's grid infrastructure is more than 40 years old (NECP, 2022; EPG, 2024); extending grid capacity in order to integrate additional RES (such as solar and wind); digital transformation (smart grid technologies) to improve energy efficiency, reduce losses, and provide better service to consumers; support for electrification needed because of the increased demand for electric vehicles, heating and other electrification initiatives (EPG, 2024).

For distribution, currently, the DSOs' investment plans until 2030 involve a rise in investment from 360 million euros in 2022 to 637 million euros by 2027, with the largest share going into grid modernisation and expansion, resulting in a total amount of 6.7 billion euros by 2030. According to other studies (EPG, 2024), the investment needs in the Romanian distribution system are much higher, and are estimated to range between 9.2 and 11.5bn euros for the 2020–2030 period. However, these estimates present a major gap of 2.5 - 4.8bn euros compared to the planned investments by DSOs from tariff-based revenue and EU funding of 6.7 bn euros.

The Foreign Investors Council has estimated in its "Va Urma" project¹² from 2022 the average annual investment needed until 2040 to accelerate the energy transition in Romania in different scenarios. The overall value of required investment (production, infrastructure, distribution) has been estimated at approximately RON 36 billion in the Green Moderate scenario and at RON 47 billion in the Accelerated Green scenario.

Moreover, a partial fulfilment of the objectives from the perspective of the energy transition could mean a lower investment effort of approximately RON 25 billion per year on average, according to an alternative scenario. However, bearing in mind the European Environment Agency's most recent update on greenhouse gas emissions from 2023, in which the targets are more ambitious compared with the 2020-2021 versions, it is expected that additional investment will be needed to fulfil the net zero trajectory for Romania by 2050.

11 The Ten-Year Network Development Plan (TYNDP) 2024 has been prepared by ENTSO-E, the European Network of Transmission System Operators for Electricity. It is the association for the cooperation of the European transmission system operators (TSOs). The 40 member TSOs, representing 36 countries, are responsible for the secure and coordinated operation of Europe's electricity system, the largest interconnected electrical grid in the world.

12 <https://vaurma.ro/wp-content/uploads/2022/08/Va-Urma-Report-2022-English.pdf>

Recommendations



1| Security of Supply - Natural Gas and Electricity

- **Principles to ensure the security of supply and stable grid operation without undue distortions of the internal market**, by an adequate level of generation capacity, an adequate balance between supply and demand and an appropriate level of inter-connection between Member States.
- **An investment-friendly and stable legislative framework, including elimination or reduction of onshore supplementary gas taxation is required in order to uphold and extend current natural gas production capacities through the application of technologies to increase the degree of recovery from existing deposits, deep drilling in onshore deposits, as well as in offshore, while increasing production capacities from other sources of energy that reduce natural gas dependence, particularly in renewables**, which benefit from a favourable investment climate owing to recent EU regulatory initiatives and financial commitments. Additionally, investment-friendly legislative frameworks should be fostered in order to uphold and extend current production capacities through the application of technologies to increase the degree of recovery from existing deposits, as well as deep drilling of over 3,000 m in onshore deposits, and over 1,000 m offshore.
- On gas **demand reduction, especially for heating, one approach could involve substitutes**, such as promoting a **quick roll-out of heat pumps, where economically feasible. This could mean either stand-alone heat pumps, or thermo-hybrid configurations, in which the gas boiler would only be used as back-up during cold spells, to avoid power consumption surges.**
- **Another approach, applicable for both gas and electricity, and essential for heat pump adoption, would be energy efficiency, by improving the energy performance of buildings and creating an effective regulatory environment for Energy Service Companies (ESCOs).**
- As gas will continue to ensure 1/3 of the national electricity generation mix, in the medium run, Romania due to its reserves, could reduce its energy dependence on imports through new production capacities and reduction of demand. **Efforts should continue and be speeded up in order to extend the total gas and also electricity storage capacities.**

- **Contingency planning in advances is recommended for winters 2024/2025**, in view of the current geopolitical circumstances.
- **Creation of a favourable investment climate is recommended for modernisation and expansion of the grids.** In the context of an estimated investment requirement of 18 billion euros in Romania's distribution and transport networks by 2030 (EPG estimates), we consider it necessary to create a regulatory framework that will lead to the attraction of investments in this sector. Moreover, in the absence of sufficient allocations from EU funds, private capital will be essential.
- There is a need to initiate firm action (starting from a joint Romania-Bulgaria-Greece partnership/effort) to solidify regional interconnection capacity to enable electricity flows from Central Europe to Romania's region and vice versa. Current capacities are insufficient as exemplified by the summer of 2024 when network bottlenecks generated prices 2-3 times higher on the spot markets of Romania, Bulgaria and Greece compared to Central Europe. The ideal platform for improving interconnection is CESEC, of which Romania is already a member.



2| Sustainable Energy Production and Consumption

- NECP actualisation:
 - **Romania should make an upwards reassessment of the level of ambition for RES production, energy efficiency and other support measures for modernisation of the energy sector** (distribution and transmission networks, energy storage capacities, prosumers, demand response mechanisms, interconnections, energy produced and consumed in industrial processes, etc.).
 - In addition to the decarbonization efforts already deployed in the power sector, a specific target for green gases in final energy consumption for 2030-2050 should be included in the NECP, accompanied by intermediate targets and associated development measures.
- **The adoption of innovative technological solutions**, such as green hydrogen obtained through electrolysis powered by renewable energy should be taken into consideration, starting with areas like refining, chemicals, steel and chemical fertiliser production, as well as additive industrial processes (see also the [Romania National Hydrogen Strategy and Action Plan 2023-2030 project](#), 2023).

- To facilitate compliance with relevant EU Regulations, and make them economically viable for industrial uses, **carbon capture, utilisation and storage solutions should receive political, legislative and financial support throughout the whole value chain.**
- In order to support the high potential for the production of sustainable biomass and usage in various energy producing processes (co-generation, electricity, as well as industrial heating and cooling), **the development of secondary legislative (biomass sustainability and GHG saving recognition national scheme) and co-financing support in order to be deployed is needed.** These developments will support both RES deployment, as well as innovation and circular economy implementation.
- **The implementation of the Contract-for-Difference scheme:** the authorities should assess this through a comprehensive study on the impact of such instruments on the costs for final consumers in order to balance the interests of renewable energy investors with those of final consumers. The government should set out a clear policy on investments to be financed through the Modernisation Fund. Urgent attention should be given to the disparities between the NECP as a strategic document and the proposed 10-year development plan of the power TSOs, whose base case anticipates a significantly lower capacity of renewable assets to be built in the coming decade. Given that the European Union provides the Member States with significant funding, and requires only a concrete commitment, positive signals should be given by the Romanian authorities to investors in renewable energy, to encourage them to make new investments.
- **The increase of renewable energy sources in heating and cooling** is also important from the point of view of implementing the EU's RES II Directive and, later, the RES III Directive. Currently, the most significant share of renewable energy consumption in this sector comes from unsustainably burning wood biomass in deprived socio-economic areas. In particular, there are approximately 3.5 million households that use biomass for heating and will need in time to move to more energy efficient and more sustainable heating practices. Consequently, Romania must undertake steps forward in the direction of **supporting modern heating and cooling solutions**, such as those based on renewable powered heat pumps and green gases, as well as sustainable biomass use in industrial heating and cooling processes. Clear and implementable national rules on achieving biomass sustainability and GHG saving criteria and a national scheme for biomass neutrality recognition should be developed urgently in order to also accommodate the heating and cooling processes (including EU-ETS installations) and ensure recognition for all types of biomasses containing materials currently used for industrial heat production in Romania. Action plans for a nation-wide heat pump roll-out, electrification of public transport vehicle fleets, increasing the adoption of rooftop PV installation's (residential and non-residential), development of biomethane, green hydrogen and other green gases (e-gas), in addition to the decarbonization efforts already deployed in the power area, should be included in the updated National Energy Climate Plan.



3| Social-Economic Dimension of the Energy Transition

- The Romanian authorities should ensure a **transparent consultation and decision-making process involving all interested parties to establish appropriate measures and public policies related to intervention on the energy markets.**
- In particular, with regard to the price crisis, **better-targeted support measures based on the socio-economic profile of the consumer will make for a more efficient and effective use of public financial resources.** The current voucher is a step in the right direction, although its adequacy level potentially needs more scrutiny.
- **The Romanian authorities should implement the actions assumed through the Territorial Just Transition Plans, while particularly focusing on the issues of managing job losses** (i.e.: financial support for people made redundant), increasing job opportunities and addressing the issue of re-skilling and up-skilling, infrastructure and economic structural transformation.
- There is a need for **a review of the Vulnerable Consumer Law:** the instruments provided by the current version have proved insufficient in the context of a severe disruption of the energy market. An update would need to consider both an increase in the level of support given to the consumer and also the overall flexibility of the mechanism depending on the situation the potential beneficiary is facing.
- In order to promote a fair redistribution of costs associated with the energy transition, there should be a **revision of cost items within electricity bills and a removal of improper taxes and levies from electricity bills.** Those on low income, in particular, should be **supported via innovative, simplified and well-targeted social assistance measures** such as (non-financial) benefits, social tariffs and other solutions with low administrative costs.



4| Towards a Decentralized Energy Paradigm: Prosumers

- **Romania must invest in innovation to develop projects and initiatives that will ultimately result in a flexible and efficient distribution network** that is able to accommodate new type of services such as *micro-generation, demand reduction, load shifting or energy storage*.
- Through their consumer choices, individuals and households can help speed up the energy transition, making a difference and setting an example for others, while also sending a signal to governments to foster a proper investment climate especially in physical production equipment and distribution infrastructure and to businesses to focus on offering prosumer-oriented energy services.
- It would be particularly beneficial for the Government to understand the **seeing potential in Renewable Energy Communities**, whose members can participate in the installation and use of systems for the production and self-consumption of energy from renewable sources.
- **Romania's strategic plans must take into consideration the potential of prosumers and national policies should be adjusted to provide adequate financial and especially regulatory support to help the country move forward on this positively transforming trend.**



5| Principles to underpin Romania's strategy for returning to the free market

- The intervention of the authorities by eliminating the existing fiscal measures that lead to the discouragement of investments in production capacities and the implementation of **a fiscal framework that stimulates investments in new electricity and natural gas production capacities and renewable energy storage.**
- **Ensuring a regulatory framework that stimulates the investment processes** necessary in the development of electricity and natural gas distribution and transmission networks (fifth regulatory period).
- **Ensuring access to products in a transparent, non-discriminatory, and competitive manner.**
- **Return to the competitive market** (prices to be formed based on supply and demand) from April 1, but with a framework for the protection of the vulnerable consumer so that the state intervention is limited to targeted support for categories of consumers (vulnerable) and takes place exclusively through direct transfers from the state budget.
- **Clear division of the powers of each institution involved** (Ministry of Energy, Ministry of Economy, Ministry of Labor and Social Solidarity, ANRE, etc.).
- **Adapting the legislative framework towards a balanced and fair relationship between producers, consumers, suppliers, and network operators in the context of the increase of intermittent production sources and the development of decentralized generation (prosumers):**
 - **Optimizing the integration of renewable sources into the national energy mix** in order to increase the offer and present more options to consumers.
 - Adapting the regulations in order to **facilitate the suppliers' access to the consumption made**, in order to reduce forecasting errors and, implicitly, to reduce the balancing need in the profile market.
 - **The introduction of contracts with hourly and quarter-hour prices**, to the extent of the level of real-time monitoring, so that consumers and prosumers are aware of the value of energy according to availability, prices are as close as possible to supply and demand, and risks at the network level are minimized.
 - **Consumers should be able to contract energy from several suppliers**, depending on the flexibility of their offers.
 - **Encourage/stimulate consumers in industries to get involved in the system** by adopting renewable resources (prosumers, energy storage, etc.).

- **Integration of prosumers into the national energy system**, taking into account the need to take over energy under commercial conditions close to the market price.
- **Romania must continue its efforts with the other states to ensure interconnectivity in the region and to supplement cross-border connections** so that price formation is no longer affected.
- **The introduction of clearing houses within trading platforms for financial safety and guarantee of the parties involved in trading.**
- **Introduction of more guarantees and mechanisms for verifying players on the wholesale market in order to avoid speculative behaviors (e.g., unilateral terminations that currently attract convenient penalties for those who exit the contract relative to subsequent earnings).especially regulatory support to help the country move forward on this positively transforming trend.**

Sources:

1. EU regulation:
 - a. <https://www.consilium.europa.eu/media/59749/2022-10-2021-euco-conclusions-ro.pdf>
 - b. https://ec.europa.eu/commission/presscorner/detail/ro/IP_22_6225
 - c. <https://www.consilium.europa.eu/en/infographics/eu-measures-to-cut-down-energy-bills/>
2. Eurostat: https://ec.europa.eu/eurostat/cache/infographs/energy/img/pdf/shedding-light-in-the-EU-2022_en.pdf?lang=en
 - a. [Energy flow diagrams \(europa.eu\)](#)
 - b. [Action and measures on energy prices \(europa.eu\)](#)
3. Energy Policy Group (EPG), Bolstering the electricity grid: A priority to achieve Romania's 2030 decarbonisation objectives, June 2024
4. IMF: [Beating the European Energy Crisis \(imf.org\)](#)
5. Best practices from other countries <https://www.bruegel.org/dataset/national-policies-shield-consumers-rising-energy-prices>
6. [Electricity markets in transition: A proposal for reforming European electricity markets | CEPR](#)
7. Euractiv, Non-Paper, [Policy Options to Mitigate the Impact of Natural Gas Prices on Electricity Bills \(euractiv.com\)](#)
8. Nuclear Energy Agency, Levelised Cost of Electricity Calculator, [OECD](#)
9. Lazard, Levelized Cost of Energy Version 17.0, 2024 ([.pdf](#))
10. Concordia study: The future of transport, July 2022
11. [Concordia paper on solutions for energy crisis, 2022](#)
12. [Emerton, Benchmark of European measures to protect gas & power consumers and recommendations for Romania, Romanian International Gas Conference – 5th Edition](#)
13. Ministry of Energy, [National Integrated Energy and Climate Change Plan 2021-2030](#), Updated Version– 21 December 2023
14. National Hydrogen Strategy and Action Plan 2023-2030
15. Transgaz, Development Plan for the National Transportation System of Natural Gas 2021-2023, [PDSNT 2021-2030.pdf \(transgaz.ro\)](#)
16. Transgaz, Planul de Dezvoltare a Sistemului Național de Transport Gaze Naturale 2022 – 2031, revised 2023
17. Transelectrica, Planul de Dezvoltare a RET perioada 2022 – 2031 ([source](#))

Romania Energy Sector

Analysis with a Focus on Gas and Power