

FTI Consulting



# Romania and Moldova Market Report

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## Contents

1	Disclaimer .....	4
2	Abbreviations .....	5
3	Romania and Moldova Energy Market Report–Executive Summary .....	6
3.1	Key macro-economic, political and energy sector drivers in Romania.....	6
3.2	Key macro-economic, political and energy sector drivers in Moldova .....	12
4	Romania brief country intro: socioeconomic context and energy transition .....	18
4.1	Macro-economic and demographic overview and outlook .....	18
4.2	Romania’s political situation .....	20
4.3	Energy Transition in Romania and EU funds to support it .....	21
5	Moldova brief country intro: socio-economic context and energy transition .....	25
5.1	Macro-economic and demographic overview .....	25
5.2	Moldova’s political situation .....	27
5.3	Energy Transition in Moldova and EU funds to support it .....	28
6	Gas sector in Romania .....	31
6.1	Overview of the gas sector .....	31
6.2	Natural gas demand .....	33
6.3	Production, imports and export of natural gas: key players .....	35
6.4	Gas distribution.....	39
6.5	Gas retail: key players .....	40
6.6	Gas prices and retail tariffs.....	41
7	Electricity sector in Romania .....	46
7.1	Overview of the electricity sector.....	46
7.2	Electricity demand .....	47
7.3	Electricity installed capacity and production.....	52
7.4	Electricity imports.....	54
7.5	Electricity distribution .....	55
7.6	Electricity retail: key players .....	57
7.7	Electricity prices and retail tariffs .....	57
8	Electricity sector in Moldova .....	61
8.1	Overview of the electricity sector.....	61
8.2	Electricity demand .....	62
8.3	Electricity installed capacity and production.....	65
8.4	Electricity imports.....	69
8.5	Electricity distribution .....	70

8.6	Electricity retail.....	71
8.7	Electricity prices and retail tariffs .....	72
9	Gas sector in Moldova .....	74
9.1	Overview of the gas sector .....	74
9.2	Natural gas demand .....	76
9.3	Imports of natural gas: key players.....	79
9.4	Gas distribution.....	81
9.5	Gas retail: key players .....	81
9.6	Gas prices and retail tariffs.....	82
10	Regulatory framework in Romania: gas distribution and renewable energy generation..	85
10.1	Energy regulatory bodies in Romania .....	85
10.2	Regulatory instruments.....	87
10.3	Gas distribution regulatory framework in Romania .....	88
10.4	Incentive schemes for renewables .....	93
11	Regulatory frameworks for electricity sector in Moldova .....	96
11.1	Energy Regulatory Framework.....	96
11.2	Electricity Distribution Regulatory Scheme .....	98
11.3	Regulatory framework for Electricity Retail .....	102
11.4	Incentive schemes for renewables .....	104
12	Sources.....	107

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## 2 Abbreviations

ACER	European Union Agency For the Cooperation of Energy Regulators	INS	Institutul Național de Statistică of Romania
ANRE	Autoritatea Națională de Reglementare în domeniul Energiei	IRENA	International Renewable Energy Agency
ANRGN	Autoritatea Națională de Reglementare în Domeniul Gazelor Naturale	ITC	Internal Technological Consumption
AR	Allowed revenue	JTF	Just Transition Fund
AUR	Alliance for the Union of Romanians	LNG	Liquefied Natural Gas
bcm	Billion Cubic Meter	LTRS	Long term renovation strategy
BRUA	Bulgaria Romania Hungary Austria (pipeline)	L&A	Licences and Authorizations
BSOG	Black Sea Oil and Gas	MAR	Maximum allowed revenue
c.	circa	MD	Moldova
CAGR	Compound annual growth rate	MDL	Moldovan Leu
CAPEX	Capital expenditures	MS	Member States
CEGH	Central European Gas Hub	NBR	National Bank of Romania
CES	Central electricity supplier	NBS	National Bureau of Statistics of the Republic of Moldova
CESEC	Central and South-Eastern Europe Connection Initiative	NDC	Nationally Determined Contribution
CPI	Consumer Price Index	NECP	National Energy and Climate Plan
CFD	Contract for difference	NGO	Non-governmental organisation
CHP	Combined Heat and Power	NREAP	National Renewable Energy Action Plan
DAM	Day Ahead Market	O&G	Oil and Gas
DCFTA	Deep and comprehensive free trade area	OEC	Oltenia Energy Complex
DSO	Distribution System Operator	OH	Overhead (power line)
EBRD	European Bank for Reconstruction and Development	OPEX	Operational expenditures
EC	European Commission	PC-OTC	Centralised Market with continuous double trading of bilateral electricity contracts (Romania)
EIA	Energy Information Administration	PNL	National Liberal Party
EIB	European Investment Bank	PPA	Power purchase agreement
ENTSO-E	European Network of Transmission System operators for Electricity	PSD	Social Democrat Party
ERDF	European Regional Development Fund	PSLF	Public Sector Loan Facility
ERRM	European Recovery and Resilience Mechanism	PSO	Public Service Obligation
ESF	European Social Fund	PV	Photovoltaic
EUCER	European Center for Energy Resource Security	RAB	Regulatory asset base
EUR	Euro	RES	Renewable Energy Source
EU	European Union	RO	Romania
EU ETS	EU Emissions Trading Scheme	ROHU	Romania-Hungary gas transmission capacity
EV	Electric Vehicle	RON	Romanian Leu
FiT	Feed-in-tariffs	RRF	Recovery and Resilience Facility
FUI	Last resort supplier	SDC	Swiss Development Cooperation
GEO	Government Energy Ordinance	SNTGN	National Gas Transmission Company (Romania)
GDP	Gross domestic product	SSO	Storage System Operator
GHG	Greenhouse gas	TCF	Trillion Cubic Feet
GNI	Gross National Income	TSO	Transport System Operator
GOs	Guarantees of Origin	TTF	Title Transfer Facility
GTCC	Natural gas-fired combined cycle units	TYNDP	Ten-year network development plan
HEC	Hunedoara Energy Complex	UDMR	Democratic Alliance of Hungarians in Romania
IEA	International Energy Agency	UNDP	United Nations Development Plan
IMF	International Monetary Fund	USD	US Dollar
		VAT	Value Added Tax
		VIU	Vertically Integrated Undertaking
		VMTG	VestmoldTransgaz
		WACC	Weighted Average Cost of Capital
		WB	World Bank
		WGI	World governance indicators
		WSS	Water Supply and Sanitation

## **3 Romania and Moldova Energy Market Report—Executive Summary**

### **3.1 Key macro-economic, political and energy sector drivers in Romania**

Romania is a full Member State of the European Union since 2007, exhibiting a strong economic performance—average annual real GDP growth of 3.5% (2013-2022), above EU-27 countries, which stood at 1.7%—, and facing well the economic shocks from the COVID-19 pandemic, Russia’s invasion of Ukraine, and the resulting surge in energy prices, compared to its European peers (IMF, 2023a; IMF, 2023b).

In the short-term, IMF expects that Romania’s economic growth will remain robust—2.8% in 2024 after growing 2.0% in 2023 according to INS—, as consumption and exports recover further, and investment (supported by RRF funds), remains strong (IMF, 2023a; IMF, 2023b; INS, 2024, IMF, 2024). A lower GDP per capita than that of the average of Central and Eastern Europe (CEE) countries—c.EUR 15,000 vs. c.EUR 20,500—suggests that the country has potential to grow (IMF, 2023a; IMF, 2023b).

Risks for this growth to materialize include the regional conflict, with the war in Ukraine and potential reemergence of tensions in Moldova; a weakening of economic activity across Europe; a slowdown in global growth, which could reduce capital flows to emerging markets; or a poor implementation of measures to reduce the fiscal deficit or low utilisation of RRF funds, in the context of coming domestic and European elections (IMF, 2023b).

Ion-Marcel Ciolacu, the current Prime Minister supported by the centre-right National Liberal Party (PNL) and centre-left Social Democrat Party (PSD) coalition, has the main task to lead a Government which needs to ensure utilisation of available RRF funds and REPowerEU grants allocation approved by European Commission, which foresees both grants (EUR 13.6bn) and loans (EUR 14.9bn) totalling EUR 28.5bn (European Commission, 2023a).

#### **Gas and electricity demand and supply in Romania—Historical Overview**

Final gas consumption in Romania, excluding gas consumption for the energy sector, grew from 76 TWh in 2017 to 89 TWh in 2021 (CAGR of 4.1%). Gas prices in the EU started to rise substantially during 2021, as a result of the economic recovery from the COVID-19 pandemic, which caused an increase in demand for liquefied natural gas (LNG) and greater consumption of gas in Asia (European Council, 2024). In 2022, prices continued to raise following the war in Ukraine and, consequently, natural gas consumption declined. In 2022, final gas consumption in Romania stood at 69 TWh and total inland consumption, which includes energy sector consumption and network losses, at 105 TWh, below 2021 levels.

Natural gas final consumption is driven mainly by residential customers (49% in 2021), thanks to increased number of consumers (c.1 million added between 2017-2021) and coal/wood-to-gas switching, followed by the industrial sector (37%), chemical and fertilizer being the largest consumers, and commercial sector (12%).

Gas production has been decreasing since 2017 levels, which stood at 110 TWh, down to 95 TWh in 2021 (CAGR -3.6% between 2017 and 2021). In 2022, the production remained stable, at 96 TWh. Romania has been a net gas importer since 2017 having increased its net imports from 12 TWh in 2017 up to 29 TWh in 2021, which represents an increase of 1.5x in the period. Romania could become a net exporter of gas in the coming years as the Neptun Deep Black Sea gas project comes online, which is expected to start its production by 2027 (OMV Petrom, 2023a).

## Romanian Gas Sector Indicators—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022	2017-21 CAGR, %
Gas production	TWh	110	110	106	95	95	96	-3.6%
Net import/export balance	TWh	12	15	27	21	29	19	24.6%
Inland consumption	TWh	122	125	116	120	127	105	1.0%
Final gas consumption	TWh	76	78	77	81	89	69	4.1%
Final gas consumption per capita	kWh per capita	3,857	4,013	3,963	4,173	4,631	3,634	4.7%
Gas reserves	TWh	1,092	1,092	1,092	1,092	1,092	n/a	0.0%
Storage capacity – working gas volume	TWh	34	33	33	33	33	33	-0.7%
Withdrawal capacity	GWh per day	347	331	324	329	330	322	-1.2%
Stock levels	TWh	16.7	14.3	29.1	20.4	17.1	26.0	0.7%
Change in stock	TWh	-2.0	-2.4	14.8	-8.7	-3.3	8.8	12.6%
Total gas transmission grid length	km	11,562	11,586	13,430	13,925	14,209	13,978	5.3%
Total gas distribution grid length	km	49,444	51,015	56,694	54,209	56,097	58,594	3.2%

Source: FTI analysis based on Eurostat data (European Commission, 2024a), EIA data (EIA, 2022), ANRE annual report on the achievement of performance indicators for the transmission system service and the Gas distribution service data from 2017 to 2022 (ANRE RO, 2018; ANRE RO, 2019; ANRE RO, 2020; ANRE RO, 2021a; ANRE RO, 2023d), and Aggregated Gas Storage Inventory data (Gas Infrastructure Europe, 2022)

Note: Final gas consumption excludes gas consumption from the energy sector. Net import/export balance is defined as the difference between imports and exports. If positive, it corresponds to a situation of net import. If negative, it corresponds to a situation of net exports. Gas reserves are net of reserves in the black sea in 2021, not available statistic for 2022. EIA reported the reserves in Trillion cubic feet (tcf). The units were converted to TWh with a conversion factor of 1 tcf equivalent to 293.07 TWh (NRG Energy, 2024).

Final electricity consumption in Romania has been stable over the last years (CAGR 0.4%) between 2017 and 2021. In 2022, electricity consumption contracted as a consequence of high electricity prices that followed the post pandemic and energy crisis. The electricity final consumption stood at 45 TWh and total inland demand, which includes energy sector consumption and network losses, stood at 51 TWh, 9% lower than 2021 levels.

Electricity final consumption is driven mainly by industrial demand (50% in 2021), followed by the residential sector (29%)—which has seen a greater use of electricity for cooking, water heating and usage for household appliances—and commercial sector (18%).

Between 2017-2018 Romania has been a net electricity exporter, while in 2019, 2021 and 2022 the country imported between 2.2 TWh (net) (3.9% of inland demand) and 1.2 TWh (2.4%), respectively.

## Romanian Electricity Sector Indicators—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022	2017-21 CAGR, %
Electricity net generation	TWh	59	60	55	52	55	51	-2.1%
Net electricity import/export balance	TWh	-2.9	-2.5	1.5	2.8	2.2	1.2	
Inland demand	TWh	56	57	56	54	56	51	0.0%
Electricity final consumption	TWh	49	50	50	48	50	45	0.4%
Peak electricity consumption	MW	8,940	8,920	8,812	8,679	8,967	8,658	0.1%
Electricity consumption per capita	kWh per capita	2,487	2,548	2,556	2,487	2,584	2,385	1.0%
Total installed capacity	GW	24.7	24.6	20.7	20.6	19.6	18.7	-5.6%
thereof natural gas	GW	5.8	5.7	3.2	3.2	2.9	2.6	-16.1%
thereof coal	GW	6.2	6.2	4.8	4.8	4.1	3.4	-9.7%
thereof nuclear	GW	1.4	1.4	1.4	1.4	1.4	1.4	0.0%
thereof hydro	GW	6.8	6.8	6.7	6.6	6.6	6.6	-0.4%
thereof wind	GW	3.0	3.0	3.0	3.0	3.0	3.0	-0.1%
thereof solar	GW	1.4	1.4	1.4	1.4	1.4	1.4	0.3%
thereof biomass	GW	0.1	0.1	0.1	0.1	0.1	0.1	1.1%
Transmission grid length	Km	8,834	8,891	8,991	8,904	8,904	8,904	0.2%
Distribution grid length	Km	491,358	493,445	496,231	499,151	502,003	502,358	0.5%

Source: FTI analysis based on Eurostat data (European Commission, 2024a), Transelectrica annual reports from 2018 to 2022 data (Transelectrica, 2019; Transelectrica, 2021; Transelectrica, 2023) and ANRE Annual Report regarding the activity of the National Regulatory Authority in the field of energy from 2017 to 2022 (ANRE RO, 2018; ANRE RO, 2019; ANRE RO, 2020; ANRE RO, 2021a; ANRE RO, 2023d)

Note: Net import/export balance is defined as the difference between imports and exports. If positive, it corresponds to a situation of net imports. If negative, it corresponds to a situation of net exports. Inland demand doesn't consider statistical differences reported by Eurostat. 2021 distribution grid length was adjusted based on the shares provided by ANRE as the absolute values reported by the regulator exhibited inconsistencies.

## Gas and electricity demand—Outlook

Natural gas inland consumption in Romania is projected to remain stable between 2030 and 2040 (103 TWh in 2030 and 105 TWh in 2040) and to decline in the long run (c.90 TWh in 2050), as conventional fuels are replaced with renewables in manufacturing industries and electricity (Government of Romania, 2023a; European Commission, 2020; Transgaz, 2022). Drivers to sustain gas demand are the continued substitution of solid biofuels (wood/coal) with natural gas in households (European Commission, 2024a). These will be counterbalanced by the expected decline of natural gas consumption in the energy sector, since gas-powered plants will be ready to run on 100% green gases by 2036 (Government of Romania, 2023a), and by energy efficiency measures such as the renovation of the building sector, as the Long-Term Renovation Strategy (LTRS), which aims at reducing the energy consumption in buildings by 2050 (European Commission, 2021b).



## Romanian Natural Gas Domestic Consumption—Outlook

Indicators	Units	2022	2025	2030	2035	2040	2045	2050
Inland Consumption Actual	TWh	105.5						
Transgaz 2022 Demand outlook	TWh		123.3	103.4	105.3	105.2	98.7	89.4
European Commission – 2020 Reference Scenario	TWh		123.3	103.4	105.3	105.2	98.7	89.4

Source: FTI analysis based on Transgaz development plan 2021-2031 data (Transgaz, 2022), European Commission reference scenario 2020 data (European Commission, 2020), Eurostat data (European Commission, 2024a)

Electricity demand in Romania is projected to grow in the long run from 61 TWh in 2025 to 70 TWh-73 TWh in 2050 (ENTSOE-E, ENTSOE-G, 2023). This increase will be mostly due to the electrification of the transport sector, EV adoption is expected to increase demand from 1.3 TWh in 2021 to 18 TWh in 2050, and the industrial sector, yet partially offset by improvement in energy efficiency, while household consumption is expected to remain close to actual levels (European Commission, 2024a).

## Romanian Electricity Consumption—Outlook

Scenario	Units	2022	2023	2024	2025	2029	2030	2040	2050
Reference scenario	TWh	59.1	59.7	60.4	61.0	63.0			
Favourable scenario	TWh	59.1	59.7	60.4	61.3	65.0			
National Trends	TWh						60.5		
Distributed Energy	TWh							67.0	72.7
Global Ambition	TWh							60.3	70.0

Source: FTI analysis based on ANRE National Report 2020 (ANRE RO, 2021b; Transelectrica, 2022) and TYNDP 2024 Scenario report data (ENTSO-E, ENTSOE-G, 2023)

Notes: TSOE TYNDP 2024 only provides the National Trends Scenario for 2030, while the Distributed Energy and Global Ambitions Scenarios for 2040 and 2050.

## Energy Transition for Romania: targets and main policies

The EU adhered to the Paris Agreement and approved the core climate and energy transition targets in the European Green Deal. Since then, the fast-evolving geopolitical context and the energy crisis led the EU to accelerate the energy transition and set more ambitious energy and climate objectives for 2030 ('Fit for 55' package and REPowerEU Plan).

Romania set out the goal to reach climate neutrality and achieve 100% of renewable electricity production by 2050. Taking the aforementioned European context into account, Romania has updated its National Energy and Climate Plan (NECP), setting the following targets for 2030:

- GHG emissions should be reduced by 78% by 2030, compared to 1990 levels;
- The renewables share in final energy consumption should reach at least 34% by 2030;
- Primary energy consumption in 2030 should decrease by 46% (compared to PRIMES 2030 projections);
- Final energy consumption should decrease by 45% compared to PRIMES 2030 projections; and
- Romania aims an interconnection rate of at least 15% of the total installed capacity by 2030.

Romania aims at decarbonizing its economy while increasing the security of supply and achieving further integration with the European energy market. The country currently counts with a diversified energy mix with internal energy resources such as hydro-energy, uranium reserves, oil, natural gas and coal.

In general terms, the main decarbonization policies are: (i) the promotion of energy efficiency (i.e. 100% rehabilitation of street lighting by 2040, annual renovation rate of 3.8% of the existing public buildings); (ii) the development of renewable energy sources such as wind (additional +4.6 GW by 2030) and solar (additional

+6.8 GW by 2030) and storage (at least 240 MW by 2025); (iii) the substitution of more carbon intensive sources like coal with natural gas and renewable gases, gas-powered plants will be ready to run on 100% green gases by 2036; (iv) the reduction of municipal waste in 2030 (to 204 kg per capita) by 10% compared to 2017 levels (228 kg); (v) the promotion of high-efficiency cogeneration with installations on new capacities (additional +c.0.95 GW by 2040); and (vi) the adoption of carbon capture, storage and utilization (CCSU) technologies for the mining industry, by targeting at least 50% of its emissions to be captured by 2050.

In the power sector, Romania has established a timeline for the gradual decommissioning of coal and lignite power plants (4.9 GW of coal installed capacity to be decommissioned by 2032, of which 2.4 GW already decommissioned during 2021-2022). To ensure security of supply, the country plans to extend the life of nuclear power plants and build new capacity (462 MW), as well as diversify uranium sources, and increment the combined cycles capacity.

To achieve its targets regarding the electricity generated from renewables, Romania is transitioning from its previous scheme of Green Certificates (GCs) to a future use of Contracts for Difference (CfDs) to incentivise new renewable power generation projects. Green Certificates, valid for 15 years, were introduced in 2008 and were granted to renewable plants until 2016. The remainder of GCs in the market will be phased out by 2032. In 2024, Romania is expected to launch the first round of tenders for the allocation of CfDs for low carbon technologies (including nuclear power). The CfD support scheme will be complemented by bilateral PPAs, which were reintroduced in 2021, and trading in Guarantees of Origin (GOs) once a new trading platform is in place.

Romania's energy transition plans are also supported by grants from its National Recovery and Resilience Plan (PNRR), which was agreed upon with the EU. This plan allocates funds for investments in renewable projects and industrial initiatives in energy storage and recycling (EUR 458m in renewables and EUR 280m for industrial projects). Initial projects were awarded in 2022 and new rounds of grants are being made available to support new renewable power generation projects.

Consumers in Romania are also actively contributing to the renewable power generation targets. Starting in 2019, small consumers were allowed to install solar PV systems and to sell surplus production to the grid, becoming prosumers. This successful initiative led to an estimated 1.4 GW of installed capacity by more than 100,000 prosumers across the country as of the end of 2023 (in comparison to a target of 2.5 GW by 2030).

### **The gas sector in Romania**

The gas sector is a strategic driver of the development of Romania's national economy. The country has a rich and long history of exploiting hydrocarbons and is the second largest producer of natural gas in the European Union (US Department of Commerce, 2024).<sup>1</sup> Currently, natural gas production in Romania is carried out by 12 companies, but remains highly concentrated in Romgaz (state-owned), which is responsible for 51% of total country output, and OMV Petrom (privately-owned incumbent), accounting for 36% of output (ANRE RO, 2023a). Romania currently imports (net) gas from Bulgaria, Hungary and Russia, representing c.10% of its inland consumption in 2022, while in 2021, 23%. However, recent discoveries in the Neptun Deep perimeter, the Trident block, Media block and Ana platform could take Romania to a net exporter position.

Romania is focusing on reinforcing the natural gas transmission networks, including interconnections, which will allow the natural gas supplies to be diversified. Key projects to enable the supply of natural gas from the Black Sea to the country and Central and Eastern Europe are the expansion of the BRUA project (Bulgaria–Romania–Hungary–Austria), the second phase of ROHU (Romania-Hungary) to increase its capacity and the Eastring project to increase supply routes to Romania.

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<sup>1</sup> The comparison considers: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

An example of how Romania is benefiting from EU programs focused on energy transition is the investment in the expansion and upgrade of its national gas infrastructure. Transgaz has applied in August 2023 for EUR 554mn in EU grants out of a total budget of EUR 3.5bn to develop multiple projects as part of the upgrade of the National Gas Transmission System (NTS) (Transgaz, 2022) and has been successful in receiving part of the application as non-reimbursable financing from the EU's Modernisation Fund (Energy Industry Review, 2023a; Romania Insider, 2024a). This investment program is aligned with the objectives of the European Green Deal.

Romanian Distribution System Operators (DSOs) distribute natural gas to c.4.6m clients located in 250 cities and towns (2023) through a c.59,000 km network (INS, 2023). As of November 2023, Romania includes a total of 26 DSOs licenced by ANRE, the main players being Distrigaz Sud Retele, Delgaz Grid and Premier Energy (ANRE RO, 2023a), which jointly comprise c.90% of total grid length.

DSOs holding a concession agreement receive an allowed revenue approved by ANRE, which is calculated following a revenue cap methodology, based on their regulatory asset base (RAB) and their operational costs (ANRE Order No. 217/2018). The allowed revenue is established and then adjusted throughout the 5-year regulatory period. The latest regulatory period ran from 2019 to 2023, and 2024 was set as a transition year (ANRE Order No. 101/2023), before next regulatory period starts on January 1, 2025.

The allowed revenue considers: (i) the DSO regulatory asset base (RAB), which includes both tangible and intangible assets, which decreases with retirements and depreciation, and grows with additions and inflation. A regulated rate of return—calculated in real terms, which corresponds to a WACC, currently set at 6.39%—, is applied to RAB; (ii) the RAB depreciation (linear, asset dependent, useful life 5 to 40 years (i.e. polyethylene pipes); (iii) the operational costs, which are generally allowed to grow with inflation with an efficiency factor of 1%. This does not apply to certain costs such as non-controllable costs (i.e. taxes, royalties), which are a pass-through, technological consumption, which follows a specific ANRE methodology (ANRE Order 103/2023), or safety or labour costs, for example, which have specific caps for 2024 year set as 2023 costs plus inflation; and (iv) deviation factor that allows to eliminate discrepancies between projected variables and actuals.

The DSOs are to submit to ANRE proposals for a 5-year investment plan providing detail for each year of the regulatory period (ANRE Order No. 38/2019), the regulated revenue, the corrected regulated revenue and for distribution tariffs for the first year of the regulatory period. Based on the proposals submitted by the DSOs and an internal analysis, ANRE issues a report with proposals for distribution tariffs.

Annual efficiency gains achieved throughout a regulatory period, shall be accumulated and transferred to customers on a straight-line basis during the following regulatory period. The company can retain 40% of the efficiency gain.

In terms of gas supply, as of November 2023, Romania includes a total of 67 licenced suppliers (ANRE RO, 2023a). The retail market is fully liberalized since 2020, when household clients were allowed to freely negotiate their tariffs with suppliers. By the end of 2022, 56.11% of such customers had signed contracts under the competitive regime (ANRE RO, 2023d). However, ANRE designates suppliers of last resort (ANRE RO, 2024a).

Since 2021, increases in gas wholesale and retail prices have triggered several measures aimed at alleviating the burden on end consumers. Currently, price caps on retail natural gas supply are in place. For household customers, the final price is capped at RON 0.31/kWh (approx. EUR 0.06/kWh). For non-household customers (subject to exceptions), the final price for natural gas is capped at RON 0.37/kWh (approx. EUR 0.07/kWh). The price caps are in place until March 2025.

## 3.2 Key macro-economic, political and energy sector drivers in Moldova

The Republic of Moldova (subsequently Moldova), is an official candidate for EU membership since 2022. Already since 2010, Moldova is part of the Energy Community, therefore, committed to transpose and implement the EU energy *acquis* within the framework of the Energy Community Treaty into Moldovan law to develop competitive and open electricity and gas markets. Since 2016, an association agreement between Moldova and the European Union is in force, establishing a deep and comprehensive free trade area with the EU. Consequently, the EU accounted for 45% of Moldovan imports and 58.7% of exports in 2022 (European Commission, 2024c). Following Russia's invasion of Ukraine, Moldova has applied for full membership in the European Union in March 2022 and was granted the formal status of membership candidate later that year (European Parliament, 2023). Moldova has set itself the target to gain EU membership by 2030 (Government of Moldova, 2023a).

In 1990, the Transnistrian Region of Moldova (also referred to as the Left bank of the Dniester River or Transnistria) (Government of Moldova, 2022), declared independence. However, the region remains internationally recognized as part of Moldova. Transnistria is historically close to Russia and its separatists have aligned politically with Russia (The Conversation, 2022).

Over the past decade, Moldova has exhibited a strong economic performance with average annual real GDP growth of 3.1% (2013-2022), well above the EU-27 average of 1.7% (IMF, 2023a). Moldova, however, still remains among the poorest countries in Europe (The World Bank, 2023b) with a 2022 GDP per capita at EUR 5,438 compared to 20,500 of its Central and Eastern Europe (CEE) peer countries<sup>2</sup> (IMF, 2023a; The World Bank, 2024). Despite facing a series of severe economic shocks from the COVID-19 pandemic, Russia's invasion of neighbouring Ukraine, and the resulting surge in energy prices, the IMF again expects robust real economic growth in Moldova already in 2023 (2%) and 2024 (2.6%) – while the EU-27 remains at only 0.7% and 1.5%, respectively (IMF, 2023a; IMF, 2024).

Continued GDP growth is expected to be driven by emigrant remittances (making up c.14% of GDP in 2022), continued international economic support and further EU integration. Overall, more than EUR 2.5bn is currently committed across various international support programs for Moldova (which had a GDP of EUR 13.8bn in 2022).

Risks for this growth to materialize include the regional conflict, with the war in Ukraine and the potential of rising tensions in the separatist region of Transnistria, as well as a weakening of economic activity across Europe and globally that may lead to reduced Emigrant remittances.

Moldova's current political leadership is strongly pro-European with its President – Maia Sandu – actively promoting relations to neighbours and western partners and its Prime Minister Dorin Recean being backed by a strong pro-European majority in Parliament.

### Electricity and gas demand and supply in Moldova—Historical Overview and Outlook

Final electricity consumption in Moldova grew from 3.7 TWh in 2017 to 4.2 TWh in 2021 (CAGR of 2.8%). Electricity demand growth is driven mainly by the commercial sector (34% of 2022 end-consumption) and the residential sector (44%) which showed 2017 to 2021 annual growth rates of 4.7% and 2.8% respectively (European Commission, 2024a). The Government's Draft National Energy and Climate Plan expects electricity consumption to further increase by more than 75% until 2050, despite government policies advocating energy efficiency measures (Government of Moldova, 2023a).

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<sup>2</sup> Central and Eastern Europe (CEE) countries include Czechia, Hungary, Poland, Romania and Slovenia

Moldova's electricity supply is historically characterized by its strong dependence on one thermal power plant located in the Transnistria region. Since 2021 Moldova has been however improving its interconnection with Romania and is now synchronised with the ENTSO-E area, a key step towards integration with the EU electricity market (ANRE MD, 2022). Further expansion of cross-border interconnection capacities to both Romania and Ukraine are planned with two power lines (Government of Moldova, 2023a): Isaccea–Vulcanesti–Chisinau (Timeframe: 2023-2026) and Balti–Suceava (Timeframe: 2023-2026).

#### Moldovan Electricity Sector Indicators—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022	2017-2021 CAGR, %
Electricity Generation	TWh	0.8	0.8	0.8	0.8	1.0	0.9	7.3%
Net electricity import/export balance	TWh	3.4	3.5	3.5	3.4	3.6	n/a	1.4%
Inland demand	TWh	4.2	4.3	4.3	4.3	4.6	4.4	2.5%
Electricity final consumption	TWh	3.7	3.9	3.9	3.8	4.2	3.9	2.8%
Peak electricity consumption	TWh	n/a	966	999	1,127	n/a	n/a	n/a
Final electricity consumption per capita	kWh per Capita	1,347	1,422	1,439	1,461	1,615	1,550	4.7%
Total installed capacity	MW	357	383	386	392	426	n/a	4.5%
thereof fossil	MW	330	330	330	330	330	n/a	0.0%
thereof hydro	MW	16	16	16	16	16	n/a	0.5%
thereof wind	MW	9	34	35	41	67	n/a	65.4%
thereof solar	MW	2	3	5	4	12	n/a	56.5%
Transmission grid length	km	n/a	4,704	4,725	4,725	4,725	4,725	n/a
Total capacity of transmission grid transformers	MVA	n/a	4,688	4,750	4,775	4,775	4,651	n/a
Distribution grid length	km	n/a	n/a	57,184	57,571	57,101	56,993	n/a
Total capacity of distribution grid transformers	MVA	n/a	n/a	4,590	4,622	4,659	4,713	7.3%

Source: FTI analysis based on Eurostat data (European Commission, 2024a); Moldelectrica (Moldelectrica, 2024a); IMF World Economic Outlook data (IMF, 2022); Red Nord Annual Reports (Red Nord, 2019; Red Nord, 2020; Red Nord, 2021; Red Nord, 2022); Premier Energy Distribution Annual Report (Premier Energy, 2020; Premier Energy, 2022)

Note: The calculation is based on IMF estimates of 2020 Moldovan population. The Transnistrian region is not included in the scope of this analysis. Net import/export balance is defined as the difference between imports and exports. If positive, it corresponds to a situation of net import. If negative, it corresponds to a situation of net exports. Per capita consumption is based on final consumption.

Moldovan natural gas consumption has grown by 38% from 2017 to 2021 (a CAGR of 8.4%) reaching 6.9 TWh. Demand growth is driven mainly by the residential sector (65% of 2021 end-consumption), which exhibited annual growth rates between 2017 and 2021 of 11.2% (European Commission, 2024a). Moldova does not count with own gas production and historically supplied 100% of its gas through imports from Russia until April 2022. In 2023, Moldova managed to achieve full independence from Russian gas, develop

alternative supply routes via Romania to Europe, unbundle the energy market and disprove its debt to Gazprom (ECFR, 2023).

#### Moldovan Gas Sector Indicators—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022	2017-2021 CAGR, %
Gas production	TWh	0	0	0	0	0	0	0.0%
Net import/export balance	TWh	9.7	10.6	9.8	9.9	11.4	8.9	4.1%
Inland demand	TWh	9.7	10.6	9.8	10.0	11.4	8.1	4.0%
Final gas consumption	TWh	5.0	5.7	5.5	5.7	6.9	5.1	8.4%
Final gas consumption per capita	kWh per capita	1,794	2,072	2,037	2,157	2,662	2,019	10.4%
Gas reserves	TWh	0	0	0	0	0	0	0.0%
Storage capacity –working gas volume	TWh	0	0	0	0	0	0	0.0%
Total gas transmission grid length	km	1,570	1,570	1,570	1,682	1,682	1,683	1.7%
Total gas distribution grid length	km	23,290	23,738	24,175	24,659	25,317	25,800	2.1%

Source: FTI analysis based on Eurostat data (European Commission, 2024a), IEA data (EIA, 2024). and ANRE annual activity report 2022 data (ANRE MD, 2022)

Note: The calculation is based on IMF estimates of 2020 Moldovan population; Final gas consumption excludes gas consumption from the energy sector. The Transnistrian region is not included in the scope of this analysis, as the gas infrastructure and activities there are not controlled by the Moldovan authorities. Moreover, no natural gas storage facilities are available in Moldova. Net import/export balance is defined as the difference between imports and exports. If positive, it corresponds to a situation of net import. If negative, it corresponds to a situation of net exports.

#### Energy Transition for Moldova: targets and main policies

Moldova committed to the Paris Agreement and submitted its first Nationally Determined Contribution (NDC) in September 2015, which were updated in 2020 (Government of Moldova, 2023a). The 2020 NDCs include more ambitious commitments to reduce GHG emissions with respect to 1990 levels in 2030 by an unconditional target of 70%, and a conditional target of up to 88% by 2030 (Government of Moldova, 2020). The latter is conditional on a global agreement addressing important topics, including low-cost financial resources, technology transfer, and technical cooperation, at a scale commensurate to the challenge of global climate change.

In December 2023, the Government of Moldova drafted for the first time the Integrated National Energy and Climate Plan (NECP) for the period 2025-2030 with an outlook to 2050 (Government of Moldova, 2023a). Moldova set the following targets to achieve the goal of 68.6% reduction of GHG emissions compared to 1990 by 2030 for the Right bank of the Dniester River, committing to (Government of Moldova, 2023a):

- Increase renewable energy share in final energy consumption from 17% in 2020 to 27% in 2030;

- Energy Efficiency contribution in the final energy consumption must be such that total consumption stands at 2.8 Mtoe in 2030 (vs 2.55 Mtoe in 2020), to result in a total of 151.3 ktoe of energy savings.

Additionally, Moldova is introducing measures to increase energy efficiency and the production of renewable energy (Association Council of February 7, 2023). According to an estimate in the draft National Integrated Energy and Climate Plan (NECP), the share of electricity from renewable energy sources in the country will increase more than 40 times in 2050 compared to 2020, mostly from new wind (3 GW by 2050) and solar PV capacity (560 MW by 2050).

To accelerate the deployment of renewables, Moldova has a scheme of net billing applicable to prosumers, which sets feed-in-tariffs for small producers, and a program of tenders for larger energy projects (for so-called large eligible producers). The Government establishes capacity limits and quotas for each of these categories, and the country's National Agency for Energy Regulation (ANRE) determines the feed-in-tariffs and the tender ceiling prices, which are reviewed on a regular basis.

Small renewable energy facilities under 5 MW (small generators) are able to produce and trade in the open market without being obliged to obtain a licence for electricity production and also conclude short-term PPAs with regulated suppliers at a price not higher than the prevailing market price. It is also possible for renewable producers of up to 18 MW of capacity to sell their generated electricity to local regulated suppliers based on negotiated bilateral contracts (PPAs) at a price not higher than 90% of the lowest price awarded at the tenders.

To stimulate investment, the Ministry of Energy has approved a timetable to increase the frequency of tenders for larger generators and is opening up the market for bilateral PPAs. The success of prosumers in the country installing a large amount of new solar capacity has also prompted a change from net metering to net billing to enable a more sustainable growth of the sector.

Moldova has historically benefited from international support schemes from key donors such as the European Union, the World Bank, the EBRD, the Swedish International Development Cooperation Agency and the United States Agency for International Development (USAID). In total, more than EUR 2.5bn will be available to Moldova across multiple support schemes from these donors, with a strong focus on energy security and energy transition investments, and with more funding expected to become available over time as the membership ascension negotiations with the European Union progress.

Two of the key investments in the security of supply of electricity in the country financed by international sponsors (EIB and EBRD) are the Moldova Romania Power Interconnection project (Phases I and II), for a high-voltage transmission line between the two countries and the financing of Moldova's 4-year investment programme to modernise the country's electricity distribution network, including modernisation, digitalisation and expansion of the electricity grid.

### **The electricity sector in Moldova**

Up until recently, the wholesale electricity market consisted only of bilateral contracts, either at negotiated prices or regulated prices approved by the National Energy Regulatory Agency (ANRE). In addition, there are also prices established in the auctions for eligible electricity produced from renewable energy sources (RES). Only in February 2024 "Operatorul Pieței de Energie M" a subsidiary of OPCOM—the Romanian electricity market operator—was designated by Government to be the Nominated Electricity Market Operator (NEMO) for Moldova. Thus, it is expected that in the near future, an organized electricity market will start operating in Moldova. This step facilitates the transition away from a market purely based on bilateral contracts to one where there is an increasing importance of the organised market for day-ahead and intraday delivery.

Electricity supply activities are considered to be deregulated. The exception are supplier of last resort responsibilities and the activity of supply to households and small enterprises (termed "universal service"). ANRE may impose a public service obligation (PSO) on one or more suppliers to ensure the availability of a supplier of last resort. Universal services are to be provided under regulated conditions and at regulated prices approved by ANRE.

Suppliers providing universal services are obliged to conduct competitive procurement procedures (tenders) to buy the necessary electricity at the lowest costs. They generate a base profit from a revenue margin and have potential upsides from (i) OPEX outperformance; (ii) increasing the numbers of supplied end-users while not proportionally increasing OPEX; and (iii) for free market volumes (domestic production & imports) 50% of procurement price reductions compared to the previous year increase allowed revenues. Regulated retail electricity prices are generally changed annually. The supplier has, however, the right to request ANRE to update the regulated prices also during the year, if there are objective factors that cannot be controlled by the supplier that lead to a tariff deviation of more than 5% of the annual cost of electricity supply included in regulated prices. The methodology for the setting of regulated prices is updated every 5 years. The next update is overdue, and therefore the 2018 methodology is still applicable as of February 2024.

In February 2022, due to the emergency situation tendering procedures were suspended. The state supplier JSC Energocom was imposed with the obligation to procure electricity required for universal services and suppliers of last resort as well as system operators were obliged to conclude contracts for the purchase of electricity with Energocom. The period of application of this emergency regime was extended several times up until the end of 2024 (Government of Moldova, 2023c).

In recent years, several unregulated (competitive) suppliers have entered the wholesale electricity market. Given the absence of organized markets, these suppliers usually buy electricity on the bilateral contracts market in Ukraine or from the MGRES power plant in the Transnistria Region and resell electricity to local suppliers or final consumers at negotiated prices.

Energocom also acts as Central Electricity Supplier (CES) buying electricity from eligible renewable energy producers (based on 15 year PPAs), as well as from urban CHP plants (based on shorter term bilateral contracts) and resells it to retail suppliers (Energocom, 2017).

Electricity distribution activities are fully regulated. Tariffs for electricity distribution services are therefore approved by ANRE to be in line with a published tariff methodology. Access to electricity networks must be granted by all network operators to all system users, without discrimination.

ANRE utilises a revenue cap economic model for the regulation of electricity distribution companies (DSOs). Maximum allowed revenues are calculated based on a building-block methodology (ANRE, 2018) considering a quasi pass-through of allowed costs, and regulated return on investments. When calculating tariffs, the Allowed Revenue (AR) is adjusted for over/under-recovery in earlier years. During the year a DSO has the right to request ANRE to update the tariffs, if there are factors outside the control of the DSO which lead to a deviation of more than 5% of the annual distribution cost established in tariffs. The tariff methodology is approved for a period of 5 years and reviewed at the end of each regulatory period. The next update is overdue, so the 2018 methodology is still applicable.

### **The gas sector in Moldova**

Over the past few years, the Republic of Moldova has made notable progress in diversifying its natural gas supply routes and adopting EU legislation to liberalize – and restructure – its natural gas market. With new cross-border and domestic natural gas transmission and distribution infrastructure, increased access to energy markets of neighbouring countries, and shifting regional energy flows, the country now has access to a range of new options to mitigate high dependency on Russian natural gas supplies (Government of Moldova, 2023a). In 2022 Moldova's Right bank gas consumption and security stocks were entirely covered with non-Russian sources (ANRE MD, 2023c).

Moldova's gas market was entirely monopolized until 2022. The majority of activities (including import, wholesale and retail supply, cross-border & national transmission and a large share of distribution) were performed by JSC Moldovagaz (50% owned by Gazprom of Russia) and its subsidiaries which together account for more than 98% of the distribution network (IEA, 2021b). All quantities of natural gas necessary to cover local demand (including the Transnistria region) were imported exclusively from Russia, based on a



gas supply contract concluded by JSC Moldovagaz with Gazprom (Carnegie Moscow Center, 2021). Following Moldovagaz' failure to comply with unbundling requirements in line with Moldova's commitments under the Energy Community treaty, the gas grid of Modovagaz' transmission branch was leased by Moldova's sole certified gas TSO Vestmoldtransgaz in 2023. After years of back and forth the structure of Moldova's gas transmission sector thereby finally came in line with EU standards.

Following the 2022 decision of GAZPROM to reduce the volume of gas supplied to Moldova to a level sufficient only for the Left bank (Transnistrian region), the Moldovan government empowered Energocom (the state owned energy retailer) to buy gas in the wider region (Reuters, 2023). In 2022 the Energocom covered Moldova's current gas consumption and security stocks entirely with non-Russian imports (ANRE, 2023).

## 4 Romania brief country intro: socioeconomic context and energy transition

### 4.1 Macro-economic and demographic overview and outlook

Romania is a full Member State of the European Union since 2007. The country is located in South-Eastern Europe and its capital and largest city is Bucharest. It borders Bulgaria, Ukraine, Hungary, Serbia and Moldova. Romania counts with a population of approximately 19 million (IMF, 2023a).

Romania has been a strong performer among European Union countries. Average annual real GDP growth stood at 3.5% over the last decade (2013-2022), well above the respective average of the EU-27 countries, which stood at 1.7% (IMF, 2023a).

Romania faced the economic shocks from the COVID-19 pandemic, Russia's invasion of Ukraine, and the resulting surges in energy prices relatively well (IMF, 2023b). Romania's economy exhibited resilience during the pandemic, declining by only -3.7% in 2020, milder than the EU-27 average (-6.2%)(IMF, 2021), and rebounding to 5.9% growth in 2021 and 4.7% in 2022 (IMF, 2022; IMF, 2023a; IMF, 2023b).

Romania's annual inflation averaged 13.8% in 2022, following the surge in energy prices exacerbated by Russia's invasion of Ukraine. The actual average inflation decelerated down to 10.5% in 2023, close to the 10.7% projected by IMF, thanks to lower than expected increase in energy prices (NBR, 2024a; NBR, 2024b). Romania's most relevant historical macro-economic and demographic indicators are gathered in the table below.

#### Romanian Macro-Economic Indicators—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022
GDP, current prices	RON billion	852	959	1,640	1,067	1,187	1,410
GDP, current prices	EUR billion	186	206	224	220	241	286
Real GDP growth	% YoY	8.2%	6.0%	3.8%	-3.7%	5.9%	4.7%
GDP per capita	EUR	9,487	10,556	11,549	11,401	12,576	15,024
Inflation	% YoY	1.3%	4.6%	3.8%	2.6%	5.0%	13.8%
Population	Million	19.6	19.5	19.4	19.3	19.2	19.0
Population growth	% YoY	-0.6%	-0.6%	-0.6%	-0.4%	-0.7%	-0.8%
Number of households	Million	7.48	7.49	7.51	7.52	7.45	7.54
Unemployment rate	% of total labour force	6.1%	5.3%	4.9%	6.1%	5.6%	5.6%

Source: FTI analysis based on IMF World Economic Outlook database, October 2023 (IMF, 2023a), Eurostat database (European Commission, 2024a) and The World Bank (The World Bank, 2024)

In 2022, the GDP per capita in Romania stood at c.EUR15,000, below that of Central and Eastern Europe (CEE),<sup>3</sup> which averaged c.EUR 20,500. According to the IMF, in 2022, the GDP per capita in Romania was at 74% of the Euro average. This ratio increased from 40% when Romania joined the EU (IMF, 2023a; IMF, 2023b).

<sup>3</sup> Central and Eastern Europe (CEE) countries include Czechia, Hungary, Poland, Romania and Slovenia

## Romanian GDP per Capita in Europe, 2022

Country	Units	GDP per Capita, Current Prices, 2022
<b>CEE Average</b>	<i>EUR per capita</i>	20,531
Germany	<i>EUR per capita</i>	46,300
France	<i>EUR per capita</i>	40,216
Italy	<i>EUR per capita</i>	32,367
Spain	<i>EUR per capita</i>	28,299
Czechia	<i>EUR per capita</i>	25,481
Greece	<i>EUR per capita</i>	19,904
Poland	<i>EUR per capita</i>	17,419
<b>Romania</b>	<b><i>EUR per capita</i></b>	<b>15,024</b>

Sources: FTI analysis of IMF database (IMF, 2023a) and the World Bank (The World Bank, 2024)

Note: Czechia, Hungary, Poland, Romania and Slovenia were considered to estimate the Central Eastern Europe (CEE) Average. IMF reported GDP per capita in USD. Annual average exchange rate from the World Bank was used for GDP per capita conversion from USD to EUR.

Romania's efforts in the economic domain are focused on accelerating structural reforms and strengthening institutions to further convergence with the European Union. Maximal absorption of the EU Multiannual Financial Framework and Next Generation EU funds (structural funds and the Recovery and Resilience Facility (RRF)), will be crucial to sustain growth (The World Bank, 2023a; IMF, 2023b).

In the short-term, economic growth is expected to remain robust, according to IMF projections. In 2023, growth stood at 2.0% according to INS, close to the IMF forecast (2.2%) (INS, 2024). In 2024, the economy is expected to keep growing at 2.8% as consumption and exports recover further, and investment, supported by RRF funds, remains strong (IMF, 2023a; IMF, 2023b). Inflation is expected to remain above target levels (2.5%±1 pp.) until 2027.

IMF has identified three risks regarding Romania's macroeconomic long-term view: (1) the regional conflict, with the war in Ukraine and potential reemergence of tensions in Moldova; (2) a weakening of economic activity across Europe; and (3) a slowdown in global growth which could reduce capital flows to emerging markets. This would pose risks to the associated inflows of EU grants and to longer-term growth perspectives (IMF, 2023b). The European Commission also has expressed concerns regarding Romania's fiscal deficit expected to stand at 5.3% of GDP in 2024, above the budgeted level (4.9%) (European Commission, 2024b). Greater measures for fiscal consolidation are encouraged, as current efforts seem insufficient to tackle fiscal vulnerabilities. Romania's macro-economic and demographic indicators expected evolution are gathered in the table below.

## Romanian Macro-Economic Indicators—Outlook

Indicators	Units	2023	2024	2025	2026	2027	2028
GDP, current prices	RON billion	1,589	1,739	1,859	1,995	2,130	2,263
Real GDP growth	% YoY	2.2%	2.8%	3.6%	3.8%	3.8%	3.6%
GDP per capita	EUR	17,486	18,546	19,651	20,971	22,410	23,850
Inflation	% YoY	10.7%	6.0%	4.0%	3.3%	3.0%	3.0%
Population	Million	19.0	18.9	18.8	18.7	18.6	18.5
Population growth	% YoY	-0.1%	-0.5%	-0.6%	-0.6%	-0.7%	-0.7%
Unemployment rate	% of total labour force	5.6%	5.6%	5.4%	5.2%	5.1%	5.0%

Source: FTI analysis based on IMF World Economic Outlook database, October 2023 (IMF, 2023a), IMF World Economic Outlook database, April 2024 (IMF, 2024), Eurostat database (European Commission, 2024a), and the World Bank (The World Bank, 2024)

Note: Projections for 2023 were obtained from the IMF World Economic Outlook database issued in October 2023. Projections for 2024 onwards were obtained from the IMF World Economic Outlook database issued in April 2024. Estimations based on IMF GDP projections expressed in US dollars. The GDP per capita was converted to euros by assuming the same exchange rate as of 2022 from World Bank as 1 US dollar equivalent to 0.95 euros. GDP (current prices) corresponds to the reported by IMF on October 2023.

The Romanian currency (the Leu—currency code RON) showed relatively stable exchange rates against the Euro over the last years. Since it joined the European Union in 2007, Romania has committed to adopt the Euro once it fulfils the necessary conditions. As of 2023, the country does not use the Euro, and is not part of the European Exchange Rate Mechanism (European Commission, 2022a), which is a prerequisite for Euro adoption. Romania has set 2029 as its target year to adopt the Euro (Euractiv, 2023).

## Romanian Leu against the Euro Exchange Rates—Historical Values

Indicators	Units	2015	2016	2017	2018	2019	2020	2021	2022
Annual average exchange rate of the Romanian Leu against the Euro	RON per EUR	4.44	4.49	4.58	4.65	4.74	4.85	4.92	4.94

Source: FTI analysis based on the World Bank (The World Bank, 2024)

## 4.2 Romania's political situation

The latest national Parliament elections in Romania took place on December 6, 2020 amidst the second wave of COVID-19 pandemic. These elections allowed the centre-right National Liberal Party (PNL) (c.25% vote) to continue to govern by forming a new centre-right coalition together with the pro-European USR PLUS party (USR PLUS) (c.15% vote) and with the Democratic Alliance of Hungarians in Romania (UDMR) (c.6%). This Government was led by liberal Florin Citu (former Minister of Finance) as the new Prime Minister. Strong opposition came from the centre-left Social Democrat Party (PSD) (c.29%) and the new right-wing Alliance for the Union of Romanians (AUR) (c.9%) (CSIS, 2020).

While a much-needed stable political environment was expected, following various disputes within the incumbent coalition, a motion of no confidence against Citu's Government was passed in October 2021 (Euractiv, 2021). Several attempts to nominate and/or designate a new Prime Minister failed until the Liberals joined forces with the Social Democrats (Euronews, 2021). With support of UDMR, they managed to form a new governmental coalition to be led by two Prime Ministers from PNL and PSD, taking turns between 2021 and 2024. The first Prime Minister was liberal Nicolae Ciucă (with a mandate until May 2023), while the second

Prime Minister was Ion-Marcel Ciolacu (currently incumbent), proposed by PSD, whose mandate started in June 2023 and will last until the general Parliament elections, which are scheduled for the 2024 fall.

Ion-Marcel Ciolacu has the main task to lead a Government which needs to ensure utilisation of RRF funds available and REPowerEU grants allocation approved by European Commission, which foresees both grants (EUR 13.6bn) and loans (EUR 14.9bn) totalling EUR 28.5bn (European Commission, 2023a).

Sebastian Ioan Burduja is the incumbent Minister of Energy, after he previously served as Minister of Research, Innovation, and Digitalization (2022-2023) under former Prime Minister Nicolae Ciucă. He has pointed at four strategic topics to follow in the coming year: (1) Clean Energy expansion; (2) Grid modernization; (3) Cross-Border Energy Projects; and (4) Energy Efficiency Initiatives (Energy Industry Review, 2023b).

In 2024, Romania will hold local, national and European elections. Romania's ruling coalition will run together in the European Parliament election on June 9, but individually in local elections (Reuters, 2024). Romania's ruling coalition agreed to schedule the Presidential elections on 15 September, with an eventual second round to be held on 29 September (Romania Insider, 2024b).

The World Bank governance indicators for Romania on political stability and absence of violence/terrorism, rule of law and control of corruption show relevant improvements from 2010 to 2022, as depicted in the table below.

#### Romanian Governance Indicators—Historical Values

Indicators	Units	2010	2015	2020	2022
Political Stability and Absence of Violence/Terrorism	Percentile Rank	54	54	63	61
Rule of Law	Percentile Rank	58	61	63	62
Control of Corruption	Percentile Rank	45	52	51	56

Source: FTI analysis of the World Bank data (Kaufmann & Kraay, 2023, Kaufmann, et al., 2010)

Note: The Worldwide Governance Indicators (WGI) project constructs aggregate indicators of different broad dimensions of governance. These aggregate indicators are based on over 30 underlying data sources reporting the perceptions of governance of a large number of survey respondents and expert assessments worldwide. Details on the underlying data sources, the aggregation method, and the interpretation of the indicators, can be found in the WGI methodology papers (Kaufmann & Kraay, 2023; Kaufmann, et al., 2010). Percentile rank indicates the rank of the country among all countries in the world, 0 corresponding to the lowest rank and 100 corresponding to the highest rank.

### 4.3 Energy Transition in Romania and EU funds to support it

The European Green Deal, the fast-evolving geopolitical context and the energy crisis have led the EU and its Member States to accelerate the energy transition and set more ambitious energy and climate objectives. In this context, new legislative and policy framework was adopted by the EU under both the 'Fit for 55' package and the REPowerEU Plan (European Commission, 2021a; European Commission, 2021c; European Commission, 2022b).

The EU Member States have an obligation to submit a National Energy and Climate Plan (NECP) for the period 2021-2030. The NECP presents the Member State's ambitions and targets to achieve the EU energy and climate targets for 2030 in terms of greenhouse gases (GHG) emissions reduction, renewables share (RES), energy efficiency and electricity interconnection. Following such obligation, Romania's original NECP was published in April 2020 (Government of Romania, 2020).

Recently, Member States started updating their NECPs, with Romania having submitted a draft updated NECP on October 31, 2023 (European Commission, 2023b). The final updated NECP should be submitted by June 30, 2024, taking into account the Commission's recommendations and individual assessments. According to the latest draft NECP, the country plans to achieve the following targets (Government of Romania, 2023a):

- GHG emissions should be reduced by 78% by 2030, compared to 1990 levels;
- The renewables share in final energy consumption should reach at least 34% by 2030;
- Primary energy consumption in 2030 should decrease by 46% (compared to PRIMES 2030 projections);
- Final energy consumption should decrease by 45% compared to PRIMES 2030 projections; and
- Romania aims an interconnection rate of at least 15% of the total installed capacity by 2030.

Romania has a diversified energy mix with internal energy resources such as hydro-energy, uranium reserves, oil, natural gas and coal (Government of Romania, 2023a). The country aims to decarbonize its economy by promoting energy efficiency and the development of renewable energy sources such as wind and solar. Romania expects that natural gas will play a key role in the energy transition (Government of Romania, 2023a). The natural gas from the Netpun Deep, the largest natural gas project in the Romanian Black Sea, will turn the country into the largest gas producer in the EU and contribute to Romania's energy security and energy transition (OMV Petrom, 2023a). Furthermore, Romania is also focused on advancing the natural gas transmission network, including the interconnections, to diversify gas supplies and provide gas transportation from Black Sea deposits (Government of Romania, 2023a).

In terms of integration with the EU market, a number of reforms are central to the NECP, such as the operationalization of the support measures for vulnerable consumers, the regional integration of the internal energy market, the adoption of prosumer technologies (target of 2.5 GW by 2030), the introduction of battery storage capacity (target of 240 MW by 2025), the development of a support mechanism of the contracts for differences (CfD) for renewables, or further development of long-term power purchase agreements (PPA).

Regarding energy security, Romania has committed to taking measures to implement several projects on diversification of resources (Government of Romania, 2023a). Among those are:

- In the field of renewables, it aims to develop new capacity of renewable energy sources, promote the use of hydrogen and adapt infrastructure in this respect, develop storage capacity and increase interconnection levels to accommodate larger penetration of RES;
- Regarding coal-fired generation, it aims at ensuring sustainable transition towards low-carbon production of electricity through a gradual decommissioning of coal and lignite power plants;
- Regarding nuclear generation, it aims to diversify uranium sources, extend the life of nuclear power plants and build new capacity;
- In the natural gas sector it aims to implement the legal framework for the exploitation of natural gas resources in the Black Sea and increased regional interconnection.

There are a number of EU funding and support schemes available for Romania to support the energy transition. This support can take the form of grants, loans or equity investment into specific projects. The table below introduces the different EU schemes and budgets allocated at the EU level and specifically to Romania.

The funding and support schemes fall into three broad classes: (i) the EU's long standing general support schemes (i.e. the European Regional Development Fund and the Cohesion fund also (partly) usable for energy sector transition); (ii) traditional support schemes established for energy sector transition already prior to the EU Green Deal efforts (i.e. the EU ETS Modernisation Fund and the Innovation Fund); and (iii) support schemes introduced as part of the new Green Deal efforts, later expanded as part of the COVID-19 pandemic relieve package and the energy crisis (i.e. the LIFE Program, the Public sector loan facility under the Just transition Mechanism, the Just Transition Fund, the InvestEU programme, and the Recovery and Resilience Facility (RRF)).

Between EU funds and Romania's own national budget, support schemes aimed at EU projects could add up to EUR 80bn for the period 2021-2027 (Bloomberg, 2022), with a strong focus on energy transition investments. This is a relevant support, to be compared against Romania's 2023 GDP of c. EUR 286bn (2022). An example of how Romania benefits from EU programs focused on energy transition is the investment in the

expansion and upgrade of the national gas infrastructure. Transgaz has applied in August 2023 for EUR 554mn in EU grants from a total budget of EUR 3.5bn to develop multiple projects as part of the upgrade of the National Gas Transmission System (NTS) (Transgaz, 2022) and has been successful in receiving part of the application as non-reimbursable financing from the EU's Modernisation Fund (Energy Industry Review, 2023a; Romania Insider, 2024a). This investment program is aligned with the objectives of the European Green Deal.

### Overview of EU Funding and Support Schemes Available in Romania to Support the Energy Transition

EU Support Scheme	Budget Available to Romania	Description
European Regional Development Fund (Cohesion Policy)	EUR 25.7bn (budget for 2021-2027) (ERDF, ESF+ and ERDF-Interreg)	<ul style="list-style-type: none"> <li>Established by Regulation (EU) 2021/1058 aims to strengthen economic, social and territorial cohesion in the European Union by correcting imbalances between its regions and enabling investments in the green and digital transitions.</li> <li>The ERDF finances programmes in shared responsibility between the European Commission and national and regional authorities in Member States. The Member States' administrations choose which projects to finance and take responsibility for day-to-day management.</li> <li>The European Regional Development Fund is part of the Cohesion Policy (along with the Cohesion fund, the European Social Fund Plus and the Just Transition fund). At the EU level, the Cohesion Policy has a total budget for 2021-2027 of EUR 392bn.</li> </ul>
Recovery and Resilience Facility (RRF)	EUR 28.5bn (grants and loans)	<ul style="list-style-type: none"> <li>The Recovery and Resilience Facility (RRF) is a temporary instrument that provides grants and loans to mitigate the impact of the coronavirus pandemic and make countries more sustainable, resilient and prepared for the green and digital transitions.</li> <li>Member States have developed their own recovery and resilience plans to access the funds under the Recovery and Resilience Facility.</li> <li>At the EU level, EUR 723bn (EUR 385bn in loans, EUR 338bn in grants) are available.</li> <li>Romania's recovery and resilience plan will be financed by EUR 13.6bn in grants and EUR 14.9bn in loans (approximate figures).</li> </ul>
Cohesion Fund (Cohesion Policy)	EUR 3.5bn (budget for 2021-2027)	<ul style="list-style-type: none"> <li>The Cohesion Fund was set up with overall objective of strengthening economic, social and territorial cohesion of the Union by providing financial contributions in the fields of environment and trans-European networks and transport infrastructure (TEN-T), as set out in Regulation (EU) No 1315/2013 of the European Parliament and of the Council.</li> <li>The Cohesion Fund provides support to Member States with a gross national income (GNI) per capita below 90% EU-27 average to strengthen the economic, social and territorial cohesion of the EU.</li> <li>For the 2021-2027 period, the Cohesion Fund concerns Bulgaria, Czechia, Estonia, Greece, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.</li> <li>At the EU level the Cohesion Fund (part of the Cohesion Policy) has a total budget for 2021-2027 of EUR 392bn, with a third of the budget expected to contribute to climate objectives.</li> </ul>
Just Transition Fund (Cohesion Policy)	EUR 2.1bn (budget for 2021-2027)	<ul style="list-style-type: none"> <li>The Just Transition Fund (JTF) was established by Regulation (EU) 2021/1056 as an instrument of the Cohesion Policy 2021-2027. It is the first pillar of the Just Transition Mechanism in the context of the European Green Deal to achieve the EU climate-neutrality aim by 2050.</li> <li>The JTF supports the territories most affected by the transition towards climate neutrality to avoid regional inequalities growing.</li> <li>In order to unlock and implement JTF resources, Member States need to prepare strategic Territorial Just Transition Plans.</li> <li>At the EU level, the Just Transition Fund will invest EUR 17.5bn in the 2021-2027 period providing support to territories which face serious socio-economic challenges from the transition.</li> </ul>

EU ETS Modernisation Fund	18.6m CO2 allowances between 2024-2030 (EUR 1.4bn with carbon prices at EUR 75/tonne)	<ul style="list-style-type: none"> <li>• The EU ETS Modernisation Fund was established by article 10d of the ETS Directive as a dedicated programme to support 13 lower-income EU Member States – including Romania – to achieve their climate targets and the objectives of the European Green Deal by helping to modernise their energy systems and improve energy efficiency.</li> <li>• The Modernisation Fund supports investments in: generation and use of energy from renewable sources, energy efficiency, energy storage, modernisation of energy networks and just transition.</li> </ul>
Other EU Funds InvestEU, LIFE Program, Innovation Fund, Public Sector Loan Facility	Budget to Romania subject to project proposals	<ul style="list-style-type: none"> <li>• The budgets for other EU programs are allocated at the EU level.</li> <li>• The InvestEU Fund, established by Regulation (EU) 2021/523, combines 13 centrally managed EU financial instruments and the European Fund for Strategic Investments into one instrument.</li> <li>• The InvestEU Fund is expected to mobilise at least EUR 372bn to finance projects through implementing partners in sustainable infrastructure (including renewable energy and energy efficiency), digital connectivity, transport, the circular economy, water, waste, other environment infrastructure. Sustainable infrastructure has EUR 9.9bn allocated.</li> <li>• The LIFE Program is the EU funding instrument for the environment and climate action with a budget of EUR 5.4bn. The program covers four areas: nature and biodiversity; circular economy and quality of life; climate change mitigation and adaptation; and clean energy transition.</li> <li>• The Innovation Fund was established by Article 10a(8) of Directive 2003/87/EC to support across all Member States innovation in low-carbon technologies and processes. The fund supports innovation in energy intensive industries, renewables, energy storage and carbon capture and storage.</li> <li>• The innovation Fund revenue is provided by the auctioning of EU ETS allowances from 2020 to 2030 with around EUR 40bn (at EUR 75/tCO2) of support over 2020-2030. It finances the commercial demonstration of innovative low-carbon technologies, including renewables and energy storage, aiming to bring to the market industrial solutions to decarbonise Europe and support its transition to climate neutrality.</li> <li>• The Public Sector Loan Facility is established for 2021-2027, by the Regulation (EU) 2021/1229. With the objective to increase investments to address development needs of just transition plans and will only support public investment combining grant support provided by the Commission (up to EUR 1.5bn) and EIB loans (up to EUR 10bn).</li> </ul>

Source: FTI analysis based on Romania's Modified Recovery and Resilience Plan (European Commission, 2023a), The Recovery and Resilience Facility (European Commission, 2023d) and the EU ETS Modernisation Fund (European Commission, 2023h)



## 5 Moldova brief country intro: socio-economic context and energy transition

### 5.1 Macro-economic and demographic overview

The Republic of Moldova (subsequently Moldova) is a land-locked country located in Eastern Europe and an official candidate for EU membership since 2022 (European Parliament, 2023). Moldova has a population of more than 2.5 million (IMF, 2023a). It borders Romania and Ukraine and its capital and largest city is Chişinău.

In 1990, the Transnistrian Region of Moldova, with about 347,000 inhabitants (Government of Moldova, 2022),<sup>4</sup> declared independence. However, it remains internationally recognized as part of Moldova. Since then, Transnistria has close ties with Russia and has aligned politically with pro-Russian separatists (The Conversation, 2022).

Following Russia's invasion of Ukraine, Moldova has applied for full membership in the European Union in March 2022 and was granted the formal status of membership candidate later that year (European Parliament, 2023). Moldova has set itself the target to gain EU membership by 2030 (Government of Moldova, 2023b).

Moldova had stronger growth than its European peer countries. Average annual real GDP increased by 3.1% over the last decade (2013-2022), well above the respective average of the EU-27 countries, which stood at 1.7% (IMF, 2023a).

The COVID-19 pandemic and recent geopolitical conflicts have shown the Moldovan economy inherent vulnerabilities against external negative shocks. As stated by the World Bank: *"the pandemic, the energy crisis, and the refugee flows caused by Russia's invasion of Ukraine starkly exposed the vulnerabilities of Moldova's growth model to shocks. Moldova is one of the countries most affected by the war in Ukraine, not only because of its physical proximity but also because of its inherent vulnerabilities as a small, energy import dependent, landlocked economy with close linkages to both Ukraine and Russia"* (The World Bank, 2023b). Moldova exhibited a decline in GDP of 8.3% in 2020, and of 5.0% in 2022.

Since 2016, an association agreement between Moldova and the European Union is in force, establishing a deep and comprehensive free trade area with the EU. The EU accounted for 45% of Moldovan imports and 58.7% of exports in 2022 (European Commission, 2024c). Moldova's most relevant historical macro-economic and demographic indicators and their expected evolution are shown below.

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<sup>4</sup> Also referred to as the Left bank of the Dniester River or Transnistria (Government of Moldova, 2023a). The rest of Moldova's territory controlled by constitutional authorities is sometimes referred to as the Right bank of the Dniester River in this document (Government of Moldova, 2023a)

## Moldovan Macro-Economic Indicators—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022
GDP, current prices	<i>MDL billion</i>	176	189	206	200	242	276
GDP, current prices	<i>EUR billion</i>	8.4	9.5	10.5	10.1	11.6	13.8
Real GDP growth	<i>% YoY</i>	4.2%	4.1%	3.6%	-8.3%	13.9%	-5.0%
GDP per capita	<i>EUR</i>	3,030	3,490	3,910	3,833	4,475	5,438
Inflation	<i>% YoY</i>	6.5%	3.6%	4.8%	3.8%	5.1%	28.6%
Population	<i>Million</i>	2.8	2.7	2.7	2.6	2.6	2.5
Population growth	<i>% YoY</i>	-1.6%	-1.8%	-1.8%	-1.8%	-1.8%	-1.8%
Unemployment rate	<i>% of total labour force</i>	4.1%	3.1%	5.1%	3.8%	3.3%	4.6%

Source: FTI analysis based on IMF World Economic Outlook database (IMF, 2023a).

Note: The calculation is based on IMF estimates of 2020 Moldovan population. The data excludes the Transnistrian Region, IMF makes estimate of number of population after 2019.

Moldova has exhibited a solid economic performance over the past two decades, but still remains among the poorest countries in Europe (The World Bank, 2023b). In 2022, the GDP per capita in Moldova stood at c.EUR 5,400, compared to a Central and Eastern Europe (CEE)<sup>5</sup> average of c.EUR 20,500 per capita.

### GDP per Capita in Europe, 2022

Country	Units	GDP per capita, current prices, 2022
<b>CEE Average</b>	<i>EUR per capita</i>	<b>20,531</b>
Germany	<i>EUR per capita</i>	46,300
France	<i>EUR per capita</i>	40,216
Italy	<i>EUR per capita</i>	32,367
Spain	<i>EUR per capita</i>	28,299
Czechia	<i>EUR per capita</i>	25,491
Greece	<i>EUR per capita</i>	19,904
Poland	<i>EUR per capita</i>	17,419
<b>Moldova</b>	<i>EUR per capita</i>	<b>5,438</b>

Sources: FTI analysis of IMF database (IMF, 2023a) and the World Bank (The World Bank, 2024)

Note: The calculation is based on IMF estimates of 2020 Moldovan population; for CEE analysis Czechia, Hungary, Poland, Romania and Slovenia were considered. Annual average exchange rate from World Bank was used for GDP per capita conversion from USD to EUR.

In the short-term, the IMF expects a positive economic growth in 2024 (2.6%), after growing 0.7% according to NBS, lower than IMF projection (2%) (NBS, 2024, IMF, 2024). Growth is expected to be driven by strong

<sup>5</sup> Central and Eastern Europe (CEE) countries include Czechia, Hungary, Poland, Romania and Slovenia

remittances, fiscal stimulus, and better monetary conditions supporting consumption and investments (The World Bank, 2023c). The medium-term outlook will be influenced by the government's ability to counter the erosion of households' purchasing power while maintaining their reform programs regarding their education, climate and financial reform projects initiative (The World Bank, 2023c).

#### Moldovan Macro-Economic Indicators—Outlook

Indicators	Units	2023	2024	2025	2026	2027	2028
GDP, current prices	MDL billion	312	343	380	421	467	517
Real GDP growth	% YoY	2.0%	2.6%	4.8%	5.0%	5.0%	5.0%
GDP per capita	EUR	6,088	7,111	7,964	8,934	10,024	11,249
Inflation	% YoY	13.3%	5.0%	5.0%	5.0%	5.0%	5.0%
Population	Million	2.5	2.5	2.4	2.4	2.3	2.3
Population growth	% YoY	-1.8%	-1.8%	-1.8%	-1.8%	-1.8%	-1.8%
Unemployment rate	% of total labour force	4.9%	3.5%	3.5%	3.5%	3.5%	3.5%

Source: FTI analysis based on IMF World Economic Outlook database, October 2023 (IMF, 2023a), IMF World Economic Outlook database, April 2024 (IMF, 2024), and the World Bank (The World Bank, 2024)

Note: Projections for 2023 were obtained from the IMF World Economic Outlook database issued in October 2023. Projections for 2024 onwards were obtained from the IMF World Economic Outlook database issued in April 2024. The data excludes Transnistrian Region. The GDP per capita was converted to euros by assuming the same exchange rate as of 2022 from World Bank as 1 US dollar equivalent to 0.95 euros. GDP (current prices) corresponds to the reported by IMF on October 2023.

The Moldovan currency (the Moldovan Leu – currency code MDL) showed relatively stable exchange rates against the Euro and the US Dollar over the last years, as shown in the table below.

#### Moldovan Exchange Rates—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022
Annual average exchange rate of the Moldovan Leu against the Euro	MDL per EUR	20.90	19.84	19.67	19.78	20.91	19.90
Annual average exchange rate of the Moldovan Leu against the US Dollar	MDL per USD	18.50	16.80	17.57	17.32	17.68	18.90

Source: FTI analysis based on the World Bank (The World Bank, 2024)

## 5.2 Moldova's political situation

The current President Maia Sandu was elected in November 2020 and is actively promoting a pro-EU agenda. She is active on the international level, promoting bilateral relations with neighbouring countries and strategic partners like the United States of America, and a strong cooperation with international financing institutions.

Prime Minister Dorin Recean took office in February 2023 after being elected by the Moldovan Parliament following Natalia Gavrilita sudden resignation (BalkanInsight, 2023). The majority in the Parliament is held by the pro-European Party of Action and Solidarity (63 out of 101 active deputies of the Parliament) (Parliament of Moldova, 2024). Parliament played a major role in the EU accession process, supporting the government's

reform efforts. The new government has remained focused on Moldova’s reform agenda and has improved the transparency decision making and democratic accountability mechanisms (European Commission, 2023f).

On February 1, 2023, the Commission published an analytical report assessing the alignment of Moldova's laws with the *acquis communautaire*. The *acquis* is organised in 33 chapters, grouped in six thematic clusters, in accordance with the new enlargement methodology. As per June 2022, Moldova's progress varied between 'early stage' and 'moderately prepared' (European Parliament, 2023).

In the context of sectorial cooperation with the EU, special emphasis is put on ensuring supply of energy, food and health services. This shall be achieved, in particular, by connecting to European energy infrastructure and regional transport networks, as well as through obtaining the necessary political, technical and financial support for the recovery of the economy and a modernization of the health system. A strong emphasis is also put on accelerating the process of harmonizing national legislation with the EU *acquis communautaire* in order to achieve the objectives of political association and economic integration with the EU. Already since 2010, Moldova is part of the Energy Community and therefore committed to transpose and implement the EU energy *acquis*, within the framework of the Energy Community Treaty into Moldovan law, to develop a competitive and open electricity and gas markets (Government of Moldova, 2023a). More recently Moldova has committed itself to align its legal framework with the overall EU energy and climate policy goals as defined by recent EU legislative packages (Green Deal, Fit for 55, REPowerEU), the Paris Agreement, and Energy Community commitments (Government of Moldova, 2023a).

The World Bank governance indicators for the Republic of Moldova regarding rule of law and control of corruption have improved between 2010 and 2022, as depicted in the table below. The political stability and absence of violence/terrorism indicator, however, exhibited a significant drop in 2022.

#### Moldovan Governance Indicator—Historical Values

Indicators	Units	2010	2015	2020	2021	2022
Political Stability and Absence of Violence/Terrorism	Percentile Rank	33	35	35	40	22
Rule of Law	Percentile Rank	43	43	33	40	42
Control of Corruption	Percentile Rank	29	18	32	35	43

Source: FTI analysis of the World Bank data (Kaufmann & Kraay, 2023, Kaufmann, et al., 2010)

Note: The Worldwide Governance Indicators (WGI) project constructs aggregate indicators of different broad dimensions of governance. These aggregate indicators are based on over 30 underlying data sources reporting the perceptions of governance of a large number of survey respondents and expert assessments worldwide. Details on the underlying data sources, the aggregation method, and the interpretation of the indicators, can be found in the WGI methodology paper (Kaufmann, et al., 2010; Kaufmann & Kraay, 2021). Percentile rank indicates the rank of the country among all countries in the world, 0 corresponding to the lowest rank and 100 corresponding to the highest rank.

### 5.3 Energy Transition in Moldova and EU funds to support it

The draft National Energy and Climate Plan (NECP), which was published in December 2023, depicts the expected development of renewables in the country. While the document is still in public consultation stage, it is currently the best reference to understand the measures and actions that Moldova plans to implement by 2030 to develop the renewable energy sector.

Moldova reached a 25.06% of penetration of renewable energy in its final energy consumption in 2020, exceeding its overall 2020 target of 17%. However, Moldova’s renewable sector is less developed than neighboring countries (Government of Moldova, 2023a). For the Right bank of the Dniester River, there is a commitment to increase the share in final energy consumption to 27% in 2030. However, only the sectoral target for heating and cooling was surpassed, while contributions of renewable energy towards electricity and transport are still very low (Government of Moldova, 2023a).

There are discussions at the Energy Community level about establishing new renewable energy targets up until 2030. However, until now, no decision has been taken. A study on 2030 overall targets for the Energy Community has been carried out with the Support of Energy Community Secretariat with a focus on renewable energy and energy efficiency targets and GHG emission reduction (Energy Community, 2019).

In recent years, Moldova has benefited from a multitude of EU and international development support schemes. Several of these are to address the Moldovan energy sector and its decarbonisation. Historically, the biggest donors for Moldova’s energy sector have been the EBRD, the European Union (via the EU Delegation in Moldova), the World Bank, the Swedish International Development Cooperation Agency and the United States Agency for International Development (USAID, 2023).

With the EU granting candidate status to Moldova in June 2022 and starting accession negotiations in December 2023 (European Commission, 2023e), additional EU financial support will be available in the future to support the new policies that will be adopted in the energy market. Those are expected to be mostly oriented to liberalize the market and to increase the energy security, including the expansion of interconnections. Moldova also plans to join the EU common energy market in 2028-29, before reaching full EU accession.

In total, more than EUR 2.5bn will be available to Moldova across multiple support schemes, with a strong focus on energy security and energy transition investments. One of the key investments in the security of supply of electricity in the country is the Moldova Romania Power Interconnection project, which will build a high-voltage transmission line between Moldova and Romania. Phase I was financed by the EBRD and Phase II will also be financed with loans of EUR 32m from EIB and EUR 16m from EU IIP (EBRDb, 2023). The EIB and EBRD are also financing Moldova’s 4-year investment programme to modernise the country’s electricity distribution network, including modernisation, digitalisation and expansion of the electricity grid, with a loan of EUR 58m (USD 60m), split equally among the banks (EIB, 2022). The table below lists various support schemes available to Moldova for its energy transition.

#### Overview of Select Funding and Support Projects in Moldova to Support the Energy Transition

Support Scheme	Budget Available to Moldova	Description
EU Economic and Investment Plan (EIP) for the Eastern Partnership	EUR 1.2bn (subject to project proposals)	<ul style="list-style-type: none"> <li>Aims to support Moldovan Small and Medium Enterprises, refurbish the district heating systems and to improve interconnection with the European gas and electricity networks.</li> <li>The EIP, launched in 2021, aims to mobilize up to EUR 17bn until 2027 and has already mobilized EUR 1.2bn in investments for Moldova, out of which EUR 365m in grants.</li> </ul>
EBRD and Norway	EUR 500m	<ul style="list-style-type: none"> <li>Finance available to diversify gas supply sources and finance natural gas purchases, moving away from supply from Gazprom, increasing Moldova’s security of supply.</li> <li>Initial financing of EUR 300m granted in 2022 for natural gas purchases, has been increased to EUR 500m in 2023. The package includes also EUR 34mn non-refundable grant from Norway.</li> </ul>

Support Scheme	Budget Available to Moldova	Description
EU Macro-Financial Assistance	EUR 295m	<ul style="list-style-type: none"> <li>• Aimed at supporting the economic stabilisation and the structural reform agenda of Moldova, including in energy security, supplementing resources available from the IMF.</li> <li>• In April 2022 the EU Commission had made EUR 150m available to Moldova as part of a Macro-Financial Assistance program to support the country to navigate the negative effects of Russia's war in Ukraine on the Moldovan economy. In May 2023 the total amount was increased to EUR 295m.</li> <li>• The financial support is composed of EUR 220m in loans and EUR 75m in grants and s aimed to support the economic stabilisation and structural reforms in Moldova, including in energy security.</li> </ul>
USAID	EUR 275m	<ul style="list-style-type: none"> <li>• US is to provide USD 300m (EUR 275m) to strengthen Moldova's energy security including high priority power generation projects to diversify the country's supply and enhance system resilience.</li> </ul>
EU Neighbourhood, Development and International Cooperation Instrument (NDICI)	EUR 260m (2021-2024)	<ul style="list-style-type: none"> <li>• The NDICI, also known as Global Europe, supports reform agenda and key investments, including areas of governance, democracy and human rights, climate change, and migration and mobility.</li> <li>• At the EU level the NDICI total budget for 2021-2027 is EUR 79.5bn.</li> </ul>
Energy Efficiency in the Republic of Moldova	EUR 75m	<ul style="list-style-type: none"> <li>• The first national energy efficiency program implemented in the country.</li> <li>• Improving insulation of buildings, installing energy efficient lighting, heating, cooling and ventilation systems, integrating renewable sources and introducing efficient energy management practices.</li> </ul>
UNDP	EUR 28m	<ul style="list-style-type: none"> <li>• Smart meter pilot to digitalise grid and increase energy efficiency. 35,000 smart meters to be installed over 12 months with a sample of customers and in public buildings countrywide.</li> </ul>
EU Addressing the impacts of energy crisis in the Republic of Moldova	EUR 13m	<ul style="list-style-type: none"> <li>• The EU Programme, implemented by UNDP, will make USD 14m (EUR 13m) available to Moldova to diversify energy sources, improve its energy policy and building additional capacity.</li> <li>• The programme also aims to operationalize nation-wide energy efficiency programmes and demonstrate solutions to increase energy affordability in residential and public buildings.</li> </ul>

Source: FTI analysis based on European Commission, 2023g; EBRD, 2023a; USAID, 2023; European Union, 2023; EIB, 2021; UNDP, 2023; UNDP, 2022

Note: The above table provides a view of select funding to support the energy transition and is not an exhaustive list.

## 6 Gas sector in Romania

### 6.1 Overview of the gas sector

The gas sector is a strategic driver of the development of Romania's national economy. In terms of natural gas resources, Romania has a rich and long history of exploiting hydrocarbons and is the second largest producer of natural gas in the European Union (US Department of Commerce, 2024). Before the discoveries in the North Sea, Romania was also one of the largest producers of oil in Europe (Kottari et al., 2013).

Onshore natural gas resources were first discovered in 1909 in Mures County (Bulearcă et al., 2014). The gradual depletion of the onshore oil and natural gas deposits prompted new explorations in the Black Sea around 1970s, in which the first commercial discovery was in 1979/80, and the first production started in 1987 (Energy Industry Review, 2018).

Currently, natural gas production in Romania is carried out by 12 companies, but is highly concentrated in 2. In 2023 (up to November), Romgaz (state-owned) was responsible for 51% of total country output, while OMV Petrom (privately-owned incumbent), 36% (ANRE RO, 2023a).

An important discovery was made in 2013, through the explorations conducted in the Neptune Deep block by the OMV Petrom and ExxonMobil joint venture. Neptun Deep is expected to hold recoverable volumes of around 100 bcm (1,111 TWh<sup>6</sup>) (Heather & Bowden, 2023). However, investments were deterred in the initial production phases as investors were reluctant to commit, voicing legislative uncertainty and a burdensome tax regime, but also by the major disruption caused by Exxon's announcement of its intention to exit the project (Energy Industry Review, 2020). The Offshore Law,<sup>7</sup> providing a specific regulatory regime for offshore projects entered into force in 2018. However, certain provisions were found too onerous by investors, such as a new windfall tax and, as a result, further progress in the Neptune block was brought to a stall. In March 2022, the Romgaz Board endorsed a purchase agreement to acquire the ExxonMobil stakes as the company announced its decision to exit the project in 2019. With the agreement, OMV Petrom became the operator of the project (Heather & Bowden, 2023). In 2023, OMV Petrom and Romgaz approved the development plan for the Domino and Pelican South commercial natural gas fields in the Neptun Deep perimeter. It is expected that the first production of natural gas will start by 2027. Production at the plateau is expected to be approximately 8 bcm annually (c.90 TWh), for almost 10 years (OMV Petrom, 2023b).

Other important discoveries were made by companies such as Lukoil, PanAtlantic and Romgaz in the Trident block (approx. 30 bcm/333 TWh) and by Black Sea Oil and Gas (BSOG) in the Media block, in shallow waters (about 10-20 bcm/111-222 TWh) (Investment Reports, 2019). In 2023, Romania started producing 1 bcm (11.11 TWh) from the Ana platform, a field developed by Black Sea Oil and Gas (Dupy, 2023).

Romania has the lowest reliance in the region on imported natural gas and minimal dependency on external gas sources (US Department of Commerce, 2024). Romania produced almost 90% of its inland consumption in 2022 (European Commission, 2024a). By 2030, Neptun Deep and Ana productions combined could cover or exceed Romania's annual consumption (c.9-10bcm/c.103 TWh), becoming a net exporter.

Russia has been a steady supplier of natural gas to Romania since 1979. Due to its own domestic production of natural gas and alternative suppliers, Romania is less dependent on Russian imports as a share of its consumption of natural gas. Between 2015 and 2022, imports from Russia represented around 10% of the inland demand, except for 2020, which represented 22% and dropped to 4% in 2022 (European Commission, 2024a).

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<sup>6</sup> Using a conversion factor of 1 bcm equivalent to 11.11 TWh, assuming calorific value of 40 MJ/cm at standard conditions

<sup>7</sup> Law No. 256, November 2018. Law on regarding certain measures necessary for the implementation of petroleum operations by titleholders of petroleum agreements regarding offshore petroleum perimeters

Approximately 10% of natural gas consumed in 2022 was imported through four interconnectors (ANRE RO, 2023d): Giurgiu – Ruse (Bulgaria); Csanadpalota (Hungary); T1 connector Ukraine (Ukraine); and T1 connector Bulgaria, Negru Voda (Bulgaria).

From a network perspective, Romania's vision focuses primarily on improving the natural gas transmission network, including the interconnections for relevant projects (Government of Romania, 2023a):

- Bulgaria–Romania–Hungary–Austria (BRUA) project. Initiated discussions in 2017, the project aims to develop the Romanian national gas transmission system along the corridor Bulgaria-Romania-Hungary-Austria and the development of the Southern Gas transport corridor, which is intended to enable the supply of natural gas from the Black Sea.
- Eastring project. Started discussions in 2018, it aims to secure natural gas supply to the Balkan countries demand and to provide supply routes for western gas providers/shippers, to supply the region and Turkey.
- Romania-Hungary gas transmission capacity increase (ROHU–Second phase project). Co-joined project with Austria, Hungary, Slovakia, Ukraine, and Slovenia and signed in 2020. The main objective is to increase the gas transmission capacity at the Romania-Hungary border, allowing natural gas flows from the Black Sea to Central-Eastern Europe. The targeted capacity is 4.4 bcm/yr (c.50 TWh/yr).
- Central and South-Eastern Europe Connection Initiative (CESEC). High level dialogue to increase the regional cooperation between the Member States to ensure achievement of the European strategic objectives, including energy security policies.

Together, these projects are expected to diversify Romania's natural gas supply. Romania's NECP published on October 31, 2023 states that "*all of these projects will aid Romania's efforts in diversifying natural gas supplies by providing connectivity with future gas infrastructure projects such as TAP, Central European gas hubs, and prospective gas transportation from Black Sea deposits*" (Government of Romania, 2023a).

Romania's storage facilities significantly contribute to ensuring the security of its gas supply in case of gas disruptions. As of 2022, Romania operates seven underground gas storage facilities<sup>8</sup> with a gas storage capacity of 3.36 bcm (c.37 TWh) (covering around one quarter of 2021 annual consumption, and almost the equivalent of its total gas imports in 2021). Romania fulfilled its gas storage obligations in 2022, reaching 96.8% by November (more than 16 percentage points above its legal obligation, set at 80%) (European Commission, 2023c).

With regard to distribution, at the end of 2022, there were 28 licenced natural gas distribution operators, which owned a collective network of natural gas distribution pipelines of 58,594 km. Out of the entire 58,594 km network, more than 30% were networks developed in the last decade, and with greater growth in the last years. Between 2021 and 2022, the national natural gas distribution grid grew by 4.45%, extending the distribution network by 2,496 km (Government of Romania, 2023a).

The liberalization of the Romanian gas retail market started gradually in 2007, as Romania became part of the European Union. Full liberalization was achieved only in July 2020, with the final step involving the liberalization of household customers. Before that, liberalization of the non-household customers occurred in 2015. For certain end-users, last resort suppliers ensure gas supplies in case their chosen supplier cannot fulfil their obligations.

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<sup>8</sup> Two storage operators manage the underground storage facilities: Depomures 0.3 bcm (UGS Târgu Mureş) and Depogaz Ploiesti 2.87 bcm (UGS Bălăceanca – 0.05 bcm, Bilciuresti – 1.31 bcm, Cetatea de Baltă, Ghercesti – 0.15 bcm, Sărmăşel – 0.9 bcm, Urziceni – 0.36 bcm)



## 6.2 Natural gas demand

### Historic natural gas demand

Final gas consumption in Romania—excluding gas consumption for the energy sector—grew with a CAGR of 4.1% between 2017 and 2021, increasing from 76 TWh to 89 TWh. Gas prices in the EU started to rise substantially during 2021, as a result of the economic recovery from the COVID-19 pandemic, which caused an increase in demand for liquefied natural gas (LNG) and greater consumption of gas in Asia (European Council, 2024). Residential and Industrial sectors accounted for 86% of final consumption, followed by commercial (12%) and agriculture (2%) (European Commission, 2024a).

In 2022, prices continued to rise following the war in Ukraine and, consequently, natural gas consumption declined. In 2022, final gas consumption in Romania stood at 69 TWh and total inland consumption, which includes energy sector consumption and network losses, at 105 TWh, below 2021 levels. The per capita gas consumption in 2022 stood at 3.6 MWh. While rising over the last years at a CAGR of 4.7% (2017-2021), it still remains well below major EU energy markets, such as Germany, France or Italy, whose final gas consumption per capita in 2022 stood between 4.9 and 8.2 MWh. Romania gas consumption is close to Poland (coal dependent).

### Gas Final Consumption—Country Comparison

Country	Units	2022
Romania	<i>kWh per capita</i>	<b>3,634</b>
Greece	<i>kWh per capita</i>	1,487
Poland	<i>kWh per capita</i>	3,905
France	<i>kWh per capita</i>	4,866
Czechia	<i>kWh per capita</i>	5,859
Italy	<i>kWh per capita</i>	7,099
Germany	<i>kWh per capita</i>	8,224
<b>EU-27 Average</b>	<b><i>kWh per capita</i></b>	<b>5,648</b>

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

The residential sector was the largest contributor to the final consumption growth between 2017 and 2021, its consumption increasing by 32% (from 31 TWh up to 41 TWh) in the same period. The number of residential customers increased by 1 million between 2017 and 2023, from 3.7 million to 4.6 million (ANRE RO, 2018; ANRE RO, 2023a).

In the same vein, the industrial sector also witnessed a CAGR increase of 2.6% between 2017 and 2021 (from 28 TWh up to 31 TWh). Industrial consumption is driven by fertilizer and chemicals producers. Romania's chemicals producers are major consumers of natural gas as an energy source and feedstock (Miu et al., 2023).

Gas consumption for use in the energy sector has grown a total of 17% with a CAGR 4.1% from 2017 to 2021 reaching 84 TWh in 2021.

In 2022, total gas final consumption (69 TWh) decreased over the whole economy by 22% compared to 2021 (89 TWh). The decline was driven by company closures and reduced economic activity, which is consistent with a reduction in the industrial production volume, measured by the industrial production index, which was 1.8 % lower in 2022 compared to 2021. The drops in the energy intensive industries were severe: 22.1% for chemicals and 15.1 % for metalworking (European Commission, 2023c). For residentials, a warmer weather also drove down natural gas consumption for heating purposes (IEA, 2023).

## Romanian Natural Gas Consumption—Historical Values

Sector	Units	2017	2018	2019	2020	2021	2022	2017-21 CAGR, %
Industrial	GWh	28,184	9,188	27,793	28,498	31,213	22,891	2.6%
Transport	GWh	3	3	1	4	88	89	135.3%
Commercial	GWh	10,493	10,511	10,471	9,861	9,687	10,169	-2.0%
Residential	GWh	31,288	32,484	32,368	35,129	41,429	34,660	7.3%
Agriculture	GWh	1,366	1,443	1,342	1,307	1,385	1,014	0.4%
Total final consumption for energetic use	GWh	71,334	73,629	71,975	74,799	83,803	68,823	4.1%
Final consumption for non-energetic use	GWh	4,427	4,763	4,955	5,856	5,112	370	3.7%
<b>Total final consumption</b>	<b>GWh</b>	<b>75,761</b>	<b>78,392</b>	<b>76,930</b>	<b>80,655</b>	<b>88,915</b>	<b>69,193</b>	<b>4.1%</b>
Use in the energy sector	GWh	45,292	45,565	38,405	38,466	37,241	35,166	-4.8%
Network losses	GWh	997	939	765	682	658	1,124	-9.9%
<b>Total inland demand</b>	<b>GWh</b>	<b>122,050</b>	<b>124,896</b>	<b>116,100</b>	<b>119,803</b>	<b>126,814</b>	<b>105,484</b>	<b>1.0%</b>

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

## Natural gas demand outlook and drivers

The European Commission and the Romanian gas TSO (Transgaz) prepared a natural gas domestic consumption outlook, which was incorporated into the EU Reference Scenario 2020 (European Commission, 2020). Transgaz's 2022 Outlook report adopts this scenario (Transgaz, 2022), which projects stable consumption within the next few years and a decline in the long run, as conventional fuels are replaced with renewables in manufacturing industries and electricity production (Government of Romania, 2023a).

## Romanian Natural Gas Domestic Consumption—Outlook

Indicators	Units	2022	2025	2030	2035	2040	2045	2050
Inland Consumption Actual	TWh	105.5						
Transgaz 2022 Demand outlook	TWh		123.3	103.4	105.3	105.2	98.7	89.4
European Commission – 2020 Reference Scenario	TWh		123.3	103.4	105.3	105.2	98.7	89.4

Source: FTI analysis based on Transgaz development plan 2021-2031 data (Transgaz, 2022), European Commission reference scenario 2020 data (European Commission, 2020), Eurostat data (European Commission, 2024a)

The following policy decisions and market trends will impact natural gas consumption in the country:

- **Substitution of wood/coal by natural gas:** Solid biofuels in households are expected to continue to be substituted by natural gas. Solid biofuels consumption in households amounted to 37.8 TWh in 2021, accounting 37% of household energy consumption, higher than the average in the European Union (17%). The natural gas use has increased from 26 TWh in 2015 to 37 TWh in 2021, to cover 37% of household energy consumption, similar to biofuels current consumption share. The use of

gas is popular for cooking: 70% of cooking was carried out with natural gas in 2021 against 62% in 2015, while only 6% of solid biofuels were used for this purpose during this period. In 2021, natural gas also accounted for 59% of water heating for households, up from 52% four years earlier (European Commission, 2024a).

- **Energy use driver:** Consumption decline foreseen to be driven by the energy sector, since gas-powered plants will be ready to run on 100% green gases by 2036 (Government of Romania, 2023a).
- **Policy induced energy efficiency:** In December 2020, Romania approved the Long-Term Renovation Strategy (LTRS) (European Commission, 2021b), which aims at improving energy efficiency by renovating the national stock of buildings. The LTRS estimates that the renovation of buildings could lead to a 65% reduction of energy consumption in buildings by 2050. Since the national stock of buildings amounts to 42% of the final energy consumption, this reduction would be relevant (European Commission, 2021b).

### 6.3 Production, imports and export of natural gas: key players

Romania is the second largest producer of oil and gas in the European Union and stands to become a regional gas provider should its total extracted gas exceed domestic needs (US Department of Commerce, 2024). While gas production decreased between 2017-2021, which was mainly due to limited investment in exploration and production, significant discoveries have been made in recent years, which may cause the replacement rate of Romania's natural gas reserves (i.e., the ratio between new reserves and consumption rate) to become positive, which provides the natural gas sector with a unique development perspective among European countries (Iuga & Dudău, 2018).

In 2021, local production made up 75% of total inland demand, with the remaining of demand was fulfilled by exports from Bulgaria, with a small contribution from Hungary and Russia. In 2022, the local production made up 90% of total inland demand, with the remaining was fulfilled by exports from Bulgaria in greater extent.

## Romanian Production, Imports and Export of Natural Gas

Indicators	Units	2017	2018	2019	2020	2021	2022
<b>Gas production</b>	<b>GWh</b>	<b>110,125</b>	<b>109,534</b>	<b>105,848</b>	<b>94,560</b>	<b>94,993</b>	<b>96,256</b>
<b>Net import/export balance</b>	<b>GWh</b>	<b>12,042</b>	<b>15,296</b>	<b>27,468</b>	<b>20,603</b>	<b>29,011</b>	<b>19,363</b>
Inland demand	GWh	122,051	124,896	116,100	119,803	126,814	105,484
Change in stock	GWh	2,025	2,362	-14,792	8,726	3,255	-8,795
Total final gas consumption	GWh	75,761	78,392	76,930	80,655	88,915	69,193
Thereof final energetic consumption	GWh	71,334	73,629	71,975	74,799	83,803	68,823
Thereof final non-energetic consumption	GWh	4,427	4,763	4,955	5,856	5,112	370
<b>Total imports</b>	<b>GWh</b>	<b>12,310</b>	<b>15,614</b>	<b>27,604</b>	<b>22,078</b>	<b>36,701</b>	<b>29,353</b>
thereof Bulgaria	GWh	130	251	1,248	544	6,784	20,839
thereof Hungary	GWh	0	1,843	16,167	11,651	1,392	4,301
thereof Russia	GWh	12,181	13,520	10,189	9,883	28,477	3,763
<b>Total exports</b>	<b>GWh</b>	<b>268</b>	<b>318</b>	<b>135</b>	<b>1,475</b>	<b>7,690</b>	<b>9,990</b>
thereof Bulgaria	GWh	0	12	135	583	233	7
thereof Hungary	GWh	268	306	0	884	7,374	8,559
thereof Moldova	GWh	0	0	0	8	83	436

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: Net import/export balance is defined as the difference between imports and exports. If positive, it corresponds to a situation of net import. If negative, it corresponds to a situation of net exports. Inland demand doesn't consider statistical differences reported by Eurostat.

The Romanian gas market consists of seven main activities, which can be articulated as:

- **Gas producers:** Romania has a total of twelve gas producers. They are Amromco Energy S.R.L., Foraj Sonde S.A., Mazarine Energy Romania S.R.L., OMV Petrom S.A., Raffles Energy S.R.L., S.N.G.N. Romgaz S.A., Serinus Energy Romania S.A., Stratum Energy Romania LLC, Black Sea Oil and Gas S.A., Dacian Petroleum S.R.L., Gas Plus Dacia S.R.L. and Petro Ventures Resources S.R.L. (ANRE RO, 2023a). Romgaz and OMV Petrom accounted for 87% of the 2023 total natural gas production (up to November).
- **Gas imports:** A total of 554 gas importers with transactions from 2022 up to November 2023 on the Romanian market with the largest importer being OMV Petrom and Axpo Bulgaria in 2023. Other large importers include Ozbor Enterprises and MET Austria.
- **Underground storage operators:** Two storage operators, DEPOGAZ (a subsidiary of Romgaz) and Depomures, manage the underground storage facilities. Depomures operates UGS Târgu Mureș (0.3 bcm) and Depogaz Ploiesti a total of 2.87 bcm (UGS Bălăceanca – 0.05 bcm, Bilciuresti – 1.31 bcm, Cetatea de Baltă, Ghercesti – 0.15 bcm, Sărmășel – 0.9 bcm, Urziceni – 0.36 bcm).

- **Gas transmission:** SNTGN<sup>9</sup> Transgaz, is the technical operator (and part-owner) of the national gas transmission system thereby acting as the Transport System Operator (TSO). Transgaz operates approximately 14,000 km of pipelines. Initially a fully state-owned company it was partially privatised in 2007 and 2013 (Transgaz, 2023a).
- **Gas distribution:** As of November 2023, Romania had a total of 26 natural gas Distribution System Operators (DSOs) licenced by ANRE, the main players being Distrigaz Sud Retele, Delgaz Grid and Premier Energy (ANRE RO, 2023a).
- **Market Operators:** Romania has two market operators. OPCOM organises wholesale natural gas markets and BRM organises both wholesale and retail markets (ANRE RO, 2023a).
- **Retail suppliers:** A total of 67 suppliers were active on the Romanian gas market as of November 2023 (ANRE RO, 2023a). The largest suppliers on the retail market are OMV Petrom (accounting for 34% of the natural gas supplied), E.On (17%), and Engie Romania (17%). By supply segment, E.On (50%), Engie (36%) and Premier Energy (4%) represented 90% of the gas volumes supplied for household customer, while OMV Petrom,(45%), Romgaz (17%), Engie (11%) and E.On (6%) close to 80% of the gas volumes supplied for non-household customers.

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<sup>9</sup> SNTGN stands for National Gas Transmission Company

## Romanian Gas Sector—Key Players

Key player	Segment of Activity					
	Production	Import	Transmission	Distribution	Supply	Storage
Amromco Energy	X				X	
Foraj Sonde	X				X	
Mazarine Energy Romania	X					
OMV Petrom	X	X			X	
Raffles Energy	X				X	
S.N.G.N. Romgaz	X			X	X	X
Serinus Energy Romania	X				X	
Stratum Energy Romania	X				X	
Black Sea Oil and Gas	X				X	
Dacian Petroleum	X				X	
Gas Plus Dacia	X				X	
Petro Ventures Resources	X				X	
OMV Petrom		X			X	
RWE Supply & Trading		X			X	
MET Austria		X			X	
Axpo Energy Romania		X			X	
Engie Romania		X			X	
Premier Energy		X		X	X	
E.On Energie Romania		X			X	
Transgaz			X			
Delgaz Grid				X		
Distrigaz Sud Retele				X		
CEZ Vanzare					X	
Depomures						X
And 47 other gas importers as of 2023		X				
And 22 other DSOs (as of 11/2023)				X		
And 48 other retail suppliers (as of 11/2023)					X	

Source: FTI analysis based on ANRE November 2023 monthly report data (ANRE RO, 2023a) and ANRE Annual Report 2022 (ANRE RO, 2023d)

Note: Gas importer statistics consider players that imported natural gas from January 2022 to November 2023. CEZ Vanzare is one of the companies that resulted from the reorganization of the former Electrica Oltenia, after the company entered in 2005 in the CEZ portfolio. It was acquired by Macquarie Infrastructure and Real Assets (“MIRA”) in October 2020. In December 2023, Premier Energy signed a deal to acquire MIRA. The deal was completed on April 15, 2024.

## 6.4 Gas distribution

Gas distribution in Romania is a regional monopoly activity performed under concession agreements concluded by public authorities (i.e. municipalities). As a pre-condition of the service concession agreements, all the gas distribution operators are licenced by ANRE.

In 2006, ANRE, through its Decision No. 1139/2006,<sup>10</sup> approved the regulation on accounting, legal, functional and organisational unbundling of natural gas regulated activities based on the Law No 351/2004,<sup>11</sup> in accordance with the provisions of the Directive 2003/55/EC.<sup>12</sup> These modifications were applicable to entities that carry out regulated distribution activities, which should unbundle from entities that carry out gas production or retail supply activities. Distributors with a number of customers below 100,000 are exempt from these provisions (Felsmann et al., 2021).

Romania's natural gas distribution network has increased five times in length over the last three decades, from 10,772 km in 1990 to 58,594 km in 2022. In 2022, natural gas was distributed in 250 cities and towns (INS, 2023). Also, the number of connected end-users has been steadily rising, from 4.0m in 2019 to 4.6m in 2023.

### Romanian Gas Distribution Network—Number of Connected Natural Gas End-Users

Connection Type	Units	2019	2020	2021	2022	2023
Household	#	3,790,288	3,927,842	4,116,269	4,249,274	4,376,395
Non-household	#	215,779	227,383	236,197	228,748	221,786
<b>Total</b>	<b>#</b>	<b>4,006,067</b>	<b>4,155,225</b>	<b>4,352,466</b>	<b>4,478,022</b>	<b>4,598,181</b>

Source: FTI analysis based on ANRE monthly gas monitoring reports data (ANRE RO, 2023a)

Note: The month of November was taken as the reference month for connections

The main Romanian distributor grid operators are Distrigaz Sud Retele, Delgaz Grid and Premier Energy, which jointly comprise c.90% of total grid length.

### Romanian Distribution Grid Operators as of 2021/2023

Company	Grid Length (km)	Number of end-users connected	Gas Distributed
	Km	#	TWh
Distrigaz Sud Retele	23,300	2,200,000	47.9 (2021)
Delgaz Grid	24,862	n/a	n/a
Premier Energy	3,663	153,000	2.3 (2023)

Source: FTI analysis based on Company annual reports and websites data (E.ON Group, 2023; Premier Energy, 2024; Distrigaz Sud Retele, 2021; Distrigaz Sud Retele, 2024). The latest statistic of gas supplied for Distrigaz Sud Retele is 2021

Note: Romania counts with 26 licenced gas distributors as per the ANRE 2023 November monthly report. The selected distributors (Distrigaz Sud Retele, Delgaz Grid and Premier Energy) make up c.90% of total grid length. No data about the number of users is available for Delgaz Grid (E.ON), as only the total number of customers is reported (3.0m), including both electricity and gas, nor the gas distributed.

<sup>10</sup> Decision No. 1139, October 2006. On approving the Regulation on accounting, legal, functional and organizational unbundling of natural gas regulated activities

<sup>11</sup> Law No. 351, July 2004. The Gas Law

<sup>12</sup> Directive No. 55, June 2003. Directive concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC

## 6.5 Gas retail: key players

Supply activities on the gas market can be performed by entities licenced by ANRE. On the retail market suppliers sell natural gas to end customers based on negotiated contracts or standard offers. During the authorization process the applicant has to provide the structure of the managing team, their organizational and functioning structure, available funds, estimated turnover, and quantity of gas to be supplied, among others.<sup>13</sup>

Currently, a large number of gas suppliers are active in Romania (67 in November 2023). All of them require a licence from ANRE to operate in this segment (ANRE RO, 2023a). Eleven gas producers are also licenced as suppliers, the remaining 56 suppliers are companies involved in gas supply only.

### Number of Active Suppliers November 2022—November 2023

	2022					2023							
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Number of Suppliers	71	68	64	64	63	63	62	65	65	64	64	67	67

Source: FTI analysis based on ANRE monthly gas market monitoring reports (ANRE RO, 2023a)

The gas retail market started its liberalization in January 2015 and achieved full liberalization in July 2020, when gas supply tariffs to households were allowed to be negotiated on a competitive basis. According to ANRE, at the end of 2022, 56.11% of total household customers had signed contracts under the competitive regime (ANRE RO, 2023d).

### Romanian Top Gas Suppliers by Market Share, September-November 2023

Company	Market share by number of customers %	Market share by gas supplied in the retail market %	Market share by gas supplied to household customers %	Market share by gas supplied to non-household customers %
Engie Romania	45.6	17.2	35.6	10.8
E.On Energie Romania	42.2	17.4	50.4	5.8
PPC Energie	2.5	1.2	2.5	0.7
Premier Energy	2.4	4.3	3.5	4.6
PPC Energie Muntenia	2.1		2.0	0.6
Gaz Est	0.8		0.8	
Engie Romania Fui	0.6	1.3	0.5	1.6
Nova Power & Gas	0.6	2.1	0.7	2.5
OMV Petrom		33.7		45.5
Romgaz		12.9		17.4

Source: FTI analysis based on ANRE monthly gas market monitoring report for November 2023 (ANRE RO, 2023a)

<sup>13</sup> ANRE Order No. 199, October 2020. Licences and Authorisations in the gas sector



*Note: Market share estimated for the period September-November 2023. Energy consumers without a natural gas contract can be taken over by suppliers of last resort. In order to ensure last resort supply to final customers who are not assured gas supply from any other source, ANRE designates at least five last resort suppliers (FUJ). All natural gas suppliers who meet the eligibility criteria set out in the regulation under ANRE Order No. 173/2020, have the possibility to carry out the activity of gas supply as a last resort (ANRE RO, 2023d).*

## **Last resort suppliers of natural gas**

There are currently seven designated suppliers of last resort for natural gas in Romania (ANRE RO, 2024a), which should supply consumers with gas that cannot be sourced in any other way. The general framework for last resort supply of natural gas and the price formula applicable by suppliers of last resort is gathered in ANRE Order No. 173/2020.<sup>14</sup> ANRE appoints at least 5 suppliers of last resort whose combined market share must be at least 70% and ranks them each month on the basis of lowest cost. Large consumers (with an annual consumption above 28,000 MWh) to be taken over by a supplier of last resort can choose their supplier on the nominated list, while small consumers are automatically moved to the current months' cheapest nominated suppliers (ANRE RO, 2024b). Supply of natural gas by the supplier of last resort is ensured temporarily. The minimum or maximum term for which the supply of natural gas can be ensured by the suppliers of last resort depends on the reasons which led to the customer not being supplied with gas from other sources and his annual consumption.

In February 2024, the seven suppliers of last resort for natural gas are (ANRE RO, 2024a):

1. Electrica Furnizare S.A.
2. OMV Petrom S.A.
3. E.ON Energie Romania S.A.
4. Engie Romania S.A.
5. Premier Energy S.R.L.
6. S.N.G.N. Romgaz S.A.
7. PPC Energie S.A.

## **6.6 Gas prices and retail tariffs**

### **Wholesale prices**

In Romania, the gas wholesale market includes transactions on centralized markets, bilaterally negotiated contracts, and other types of transactions and contracts.<sup>15</sup> Centralized markets where gas can be traded are organized by OPCOM and BRM. The most widely used markets are Double Competitive Gas-Forward Platform (BRM), Day Ahead gas market (BRM) and Intra Day gas market (BRM).

A large portion of monthly wholesale market transactions are concluded based on bilaterally negotiated contracts. However, according to ANRE Order No. 144/2020<sup>16</sup> all producers with an annual production (for the previous year) exceeding 3 TWh are under the obligation to offer on the centralized markets 40% of the annual production of the previous year (after excluding their own consumption and technological

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<sup>14</sup> ANRE Order No. 173, September 2020. Regulation on the last resort supply of natural gas, article 22

<sup>15</sup> Law No. 123, July 2012. Law on electricity and natural gas, article 177, par. 2

<sup>16</sup> ANRE Order No. 144, July 2020. Obligation of natural gas market participants to offer on centralized markets

consumption).<sup>17</sup> For the period until December 31, 2024 the quantities which have to be offered on centralized markets will be offered at the prices regulated by GEO no. 32/2024.<sup>18</sup>

While there is a gas exchange established in Romania, it still shows limited liquidity, particularly on forward markets (Opcom, 2024a). As a reference of wholesale gas prices, we use three other more liquid EU gas hubs: the Dutch TTF, the Austrian CEGH and the Hungarian MGP. The Dutch TTF spot prices for day-ahead delivery are considered to be the benchmark for European natural gas (ACER, 2023). All three analysed markets exhibited a price peak in 2022. On average between 2019 and 2022, the EU wholesale natural gas prices increased 8x times (EnergyMarketPrice, 2024), with 2022 recording an average price of EUR 131/MWh (TTF). The increase in price for 2021 was driven by a colder winter in Europe which led to increased power demand for heating, increase in the economic activity following COVID-19 pandemic and reduced supply of gas at the global level (IEA, 2022).

In 2022, gas prices were pushed by the Russia’s invasion of Ukraine in which Russia cut pipeline deliveries to Europe significantly, placing unprecedented pressure on supply and intense price competition among buyers to secure additional gas resources, triggering a global energy crisis (IEA, 2023). As stated by the European Union Agency for the Cooperation of Energy Regulators: “most of the extra gas supplies were procured through costly spot LNG deliveries in competition with global LNG buyers. Rising gas demand, related to both the buildup of storage inventories ahead of winter and constrained non-gas-based power capacity resulting in a growing use of gas-fired power plants also contributed to exerting upward pressure on prices” (ACER, 2023).

#### Wholesale Natural Gas Prices—Historic Average Annual M+1 prices

Hub	Units	2019	2020	2021	2022	2023
Netherlands (TTF)	EUR/MWh	14.6	9.6	47.7	131.3	41.0
Austria (CEGH)	EUR/MWh	15.8	10.1	47.5	133.1	42.1
Hungary (MGP)	EUR/MWh			48.4	137.3	42.6

Source: FTI analysis based on EnergyMarketPrice data (EnergyMarketPrice, 2024)

Note: Prices shown are annual averages of front month future prices

As of February 26, 2024, forward markets expect gas prices to remain lower compared to 2023 level prices.

#### Wholesale Natural Gas Prices—Forward Market Quarterly Prices (as of February 26, 2024)

Hub	2024			2025				2026				2027			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
TTF	27.3	27.9	28.4	32.2	34.3	30.6	30.2	32.0	32.5	27.7	27.3	29.0	29.7	26.2	25.1

Source: FTI analysis based on EnergyMarketPrice data (EnergyMarketPrice, 2024)

<sup>17</sup> Law No. 123, July 2012. Law on electricity and natural gas, article 177, par. 3

<sup>18</sup> Government Emergency Ordinance No. 32, March 2024. Amendment and completion of the Government Emergency Ordinance no. 27/2022 regarding the measures applicable to final customers in the electricity and natural gas market during the period April 1, 2022-March 31, 2023, as well as for the amendment and completion of some normative acts in the field of energy and the adoption of some measures in the field of energy

## Historic retail gas tariffs

Romanian gas retail prices trended upwards from 2017 to 2019 for both household and non-household consumers, exhibiting a sharp decline in 2020 for non-household consumers and a slight decline for household, which was in line with the global markets at the time.

Starting the second half of 2021, natural gas prices experience a significant increase both for household and non-household consumers. Prices peaked during the second half of 2022, when gas prices increased to EUR 165.7/MWh for non-household consumers and up to EUR 120.3/MWh for household consumers. In the first half of 2023, gas prices started to decrease, but still remained larger than 2021 levels (European Commission, 2024a).

### Romanian Non-Household Gas Prices—Historical Values

Consumption Band	2019	2019	2020	2020	2021	2021	2022	2022	2023
	S1	S2	S1	S2	S1	S2	S1	S2	S1
	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh
Less than 278 MWh	33.0	35.1	34.8	31.1	30.9	50.7	97.3	165.7	150.1
Between 278 and 2,778 MWh	32.4	33.9	32.9	27.4	26.4	50.4	90.8	162.8	131.5
Between 2,778 and 27,778 MWh	31.0	30.9	29.4	23.8	23.5	43.1	82.9	147.1	106.6
Between 27,778 and 277,778 MWh	28.1	26.0	23.9	18.4	19.6	46.0	75.3	126.3	81.7
Between 277,778 and 1,111,111 MWh	23.8	21.0	19.3	16.4	18.5	39.4	54.0	70.9	55.1
Greater than 1,111,111 MWh	21.6	22.3	18.9	13.5	16.0	43.3	96.1	138.7	63.0

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: S1 refers to the first half of the year i.e. January to June, S2 refers to the second half i.e. July to December. Prices exclusive of taxes and levies.

### Romanian Household Gas Prices—Historical Values

Consumption Band	2019	2019	2020	2020	2021	2021	2022	2022	2023
	S1	S2	S1	S2	S1	S2	S1	S2	S1
	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh
Less than 5.5 MWh	29.3	28.4	27.7	27.4	27.0	42.3	62.3	112.2	106.0
Between 5.5 and 55.5 MWh	29.2	27.9	27.2	26.9	26.6	39.9	51.3	106.3	120.3
Greater than 55.5 MWh	28.5	27.5	26.8	24.6	25.6	38.6	54.5	120.3	118.8

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: S1 refers to the first half of the year i.e. January to June, S2 refers to the second half i.e. July to December. Prices exclusive of taxes and levies.

Increases of gas wholesale and retail prices raised concerns with public authorities. The Government, and further the Parliament, established several measures aimed at alleviating the burden on end consumers. On

October 4, 2021 the Romanian Government approved Government Emergency Ordinance No.118/2021<sup>19</sup> establishing a compensation scheme for electricity and gas consumption during the 2021-2022 winter season.

The Romanian government introduced support schemes to alleviate the impact of rising gas prices. These support schemes covered households, small enterprises and public institutions.<sup>20</sup> There were three main schemes for natural gas, including a compensation scheme for household consumers that amounted to a maximum of 40% of the value of the gas commodity price from the supply contract for natural gas, an exemption from the payment of tariffs and taxes, and price caps.

These measures were valid until March 2022, with the exception of price caps, which have been extended until March 31, 2025, through Law 357/2022,<sup>21</sup> which approved the Government Emergency Ordinance No. 119/2022<sup>22</sup> by regulating additional capped prices for household and non-household customers, a compensation mechanism for suppliers (who initially cover the difference between the capped prices applicable to customers and the price for acquiring electricity/natural gas) and a contribution to the Energy Transition Fund (having in essence the nature of a wind fall tax) applicable to a broad spectrum of market participants (producers, aggregated electricity producing entities, traders, suppliers that also carry out trading activities, aggregators trading electricity/natural gas on the wholesale market and hedging partners of producers) which is ultimately used to compensate the suppliers. The differences between the supplier's average costs for the period between November 1, 2021 and March 31, 2025 and the capped prices will be reimbursed to the supplier, from the state budget through a separate budgetary expense. The price cap reimbursement should be made in maximum 30 working days after the necessary documentation has been submitted by the suppliers.

For household customers, the final price for natural gas for the period February 1, 2022 to March 31, 2022 was capped at RON 0.31/kWh (approx. EUR 0.06/kWh), and later extended until March 2025 through Law 357/2022,<sup>23</sup> which approved the Government Emergency Ordinance No. 119/2022<sup>24</sup> For non-household customers (subject to exceptions) the final price for natural gas for the period February 1, 2022-March 31, 2022 (now extended until March 2025) was capped at RON 0.37/kWh (approx. EUR 0.07/kWh).

The fluctuations of commodity prices on the national and international energy markets, as well as the capped prices introduced by the Government in late 2021 led to some suppliers expressing their intention to discontinue their natural gas supply activity, requesting the withdrawal / suspension of the natural gas supply licence by ANRE. Actually, during 2021 ANRE withdrew the supply licences of 11 natural gas suppliers, and in 2022, it withdrew 12 supply licences, in most cases following requests made by the suppliers themselves (ANRE RO, 2022; ANRE RO, 2023d).

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<sup>19</sup> Government Emergency Ordinance 118, October 2021. Compensation scheme for the electricity and gas consumption

<sup>20</sup> More precisely: a) households customers; b) small and medium sized enterprises, micro-enterprises, authorized natural persons and family enterprises, sole medical offices and other liberal professions and c) public and private hospitals, academic institutions and kindergartens, NGOs, religious institutions and public and private providers of social services

<sup>21</sup> Law No. 357, December 2022. Approval of the Government's Emergency Ordinance no. 119/2022 for the amendment and completion of the Government Emergency Ordinance No. 27/2022 regarding the measures applicable to final customers in the electricity and natural gas market in the period April 1, 2022-March 31, 2023, as well as for the amendment and completion of some normative acts in the field of energy

<sup>22</sup> Government Emergency Ordinance No. 119, September 2022. Amendment and completion of the Government Emergency Ordinance no. 27/2022 regarding the measures applicable to final customers in the electricity and natural gas market in the period April 1, 2022-March 31, 2023, as well as for the amendment and completion of some normative acts in the field of energy

<sup>23</sup> Law No. 357, December 2022. Approval of the Government's Emergency Ordinance no. 119/2022 for the amendment and completion of the Government Emergency Ordinance No. 27/2022 regarding the measures applicable to final customers in the electricity and natural gas market in the period April 1, 2022-March 31, 2023, as well as for the amendment and completion of some normative acts in the field of energy

<sup>24</sup> Government Emergency Ordinance No. 119, September 2022. Amendment and completion of the Government Emergency Ordinance no. 27/2022 regarding the measures applicable to final customers in the electricity and natural gas market in the period April 1, 2022-March 31, 2023, as well as for the amendment and completion of some normative acts in the field of energy

Following the increases in electricity and gas prices in the second half of 2021, some last resort suppliers such as Engie, requested a waiver to this role anticipating difficulties in the takeover of customers and consequently their gas demand (Energynomics, 2021a). As a result, ANRE changed the conditions under which a supplier may waive its supplier of last resort status: this is now possible only if there are at least five other remaining suppliers of last resort who, in total, have 70% of all final customers on the market, currently in place (ANRE RO, 2023d).

Per ANRE Regulatory program for the 2024 – 2025 period, ANRE intends to make additional changes to the legal framework applicable to supply of natural gas by amending, among others, the (i) Regulation for the issuance of setting-up authorizations and licence in the natural gas field approved by ANRE Order No. 199/2020, and the (ii) Regulation for the supply of natural gas to end customers approved by ANRE Order No. 29/2016.

## 7 Electricity sector in Romania

### 7.1 Overview of the electricity sector

Since 1998, the electricity sector has transitioned from a vertically integrated state-owned monopoly, managed by the Autonomous Administration for Electricity (RENEL), to a liberalized market, open to competition and to private investors. Between 1998 and 2001, RENEL was progressively broken up into several entities, each of them being active in specific segments of the electricity value chain: Hidroelectrica, Nuclearelectrica and Termoelectrica for electricity generation; Transelectrica for electricity transmission, and Electrica for electricity distribution and supply.

In 2001, Electrica was further broken up into eight regional monopolies. The electricity sector then progressively opened to private investors, such as CEZ, E.ON or ENEL, who became majority stakeholders of 5 of these regional entities in 2005. Following entry of Romania in the EU in 2007, the distribution and supply activities of these 8 regional branches were legally separated into distinct entities, and the generation and supply segments of the value chain became completely open to private investors (Maxim & Roman, 2019). In October 2023, PPC finalized the acquisition of Enel's Romanian distribution operations. Macquarie, which owns CEZ Vanzare, has signed a binding offer for CEZ Vanzare to be acquired by Premier Energy, completed on April 15, 2024 (Romania Insider, 2024c).<sup>25</sup>

On the supply side, suppliers of last resort were nominated by the authorities (namely the former branches of Electrica) to supply customers in case they were unable to establish or continue their contract with other suppliers on the market. The progressive liberalization of the household consumer retail segment has allowed electricity consumers to freely choose their supplier, which has led to an intense competition, and to an increased number of consumers leaving their last resort supplier for competitive suppliers (Maxim & Roman, 2019). The residential segment was fully liberalized in January 2021 (Government of Romania, 2023a). Since then, electricity supply prices for households are no longer set by ANRE; instead, they are determined in a competitive marketplace based on supply and demand.

Romania has promoted the development of renewable energy sources (wind, solar, hydro, biomass, biogas, geothermal) under a green certificates support scheme applicable since 2011, with a rapid entry of wind projects in the following years (Maxim & Roman, 2019). Despite the entry of private investors in the energy sector, all nuclear and large hydropower, 98% of coal and 55% of natural gas units remain state-owned via the Ministry of Economy, Energy and Business (Bankwatch Network, 2024; Transelectrica, 2024a).

Hidroelectrica, the largest Romanian energy company (which is 80% state-owned), successfully concluded the largest initial public offering (IPO) ever made on the Bucharest Stock Exchange (BVB) through which Fondul Proprietatea sold its entire 19.94% stake in Hidroelectrica in July 2023. At the end of December 2023, Hidroelectrica's shares have gained 23% since their IPO offer price (PwC, 2024).

In October 2021, the country committed to phase out coal by 2032 (Government of Romania, 2023a). Coal power plants and mines are mainly managed by 2 companies: the Oltenia Energy Complex (OEC) and Hunedoara Energy Complex (HEC) (the main hard coal processing company). A restructuring plan has been adopted for OEC in 2019, in which its plants are set to be decommissioned starting from 2025, replaced by gas units and solar PV (to a lesser extent) (Bankwatch Network, 2024; Transelectrica, 2024a).

Romania has interconnections with 5 countries: Bulgaria, Serbia, Hungary, Ukraine, and Moldova. The interconnection capacity of Romania is expected to further increase in the coming years between Bulgaria and Romania (Black Sea corridor) and between Romania and Serbia (Mid Continental East Corridor). For January 2022, Romania's cross-border monthly average trade capacity available stood around 2,500 MW for exports and 3,000 MW for imports. This means the level of interconnection for the country stands at 13.5%

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<sup>25</sup> The deal was signed in December 2023 and completed on April 2024.

when examining from the export capacity perspective, and about 16% for the import capacity as of 2022 (Government of Romania, 2023a).

## 7.2 Electricity demand

### Historic electricity demand

Final electricity consumption in Romania has been stable over the last years (CAGR, 0.4%) between 2017 and 2021. In 2022, electricity consumption contracted as a consequence of high electricity prices that followed the post pandemic and energy crisis. The electricity final consumption stood at 45 TWh and total inland demand, which includes energy sector consumption and network losses, at 51 TWh, 9% lower than 2021 levels.

Industrial consumption provided the largest share of consumption in 2021, representing c.50% of overall final consumption. The residential sector and the commercial sector respectively accounted for 29% and 18% of the total final consumption. Transport represented 3%, and the agriculture sector represented 1%.

### Romanian Electricity Consumption—Historical Values

Sector	Units	2017	2018	2019	2020	2021	2022	2017-21 CAGR
Industry	GWh	25,886	26,436	25,995	24,282	24,678	20,773	-1.2%
Transport	GWh	1,089	1,056	1,060	1,086	1,325	1,204	5.0%
Agriculture	GWh	741	752	752	536	539	533	-7.6%
Commercial	GWh	8,548	8,753	8,827	8,538	8,835	9,397	0.8%
Residential	GWh	12,597	12,780	12,984	13,620	14,244	13,497	3.1%
<b>Total final consumption</b>	<b>GWh</b>	<b>48,861</b>	<b>49,778</b>	<b>49,619</b>	<b>48,063</b>	<b>49,623</b>	<b>45,407</b>	<b>0.4%</b>
Distribution losses	GWh	6,994	7,056	6,501	6,202	6,198	5,462	-3.0%
<b>Inland demand</b>	<b>GWh</b>	<b>55,855</b>	<b>56,834</b>	<b>56,120</b>	<b>54,265</b>	<b>55,821</b>	<b>50,869</b>	<b>0.0%</b>

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: Industry consumption includes transformation (generation) own consumption within the industry sector. Electricity inland demand doesn't consider the statistical differences considered in the aggregated statistic published by Eurostat.

In 2022, the per capita final electricity consumption in Romania stood at 2.4 MWh. While slightly rising over the last years, it remains well below major EU energy markets, such as Germany, France, Italy, Spain or Poland, whose electricity consumption per capita in 2022 stood between 4.8 and 6.3 MWh. This suggests that Romania will still see an increase of consumption per capita in the near future, as the country develops and further electrifies its economy.

## Electricity Final Consumption—Country Comparison

Country	Units	2022
<b>Romania</b>	<b>kWh per capita</b>	<b>2,430</b>
Poland	kWh per capita	4,112
Greece	kWh per capita	4,695
Italy	kWh per capita	5,012
Spain	kWh per capita	4,894
Czechia	kWh per capita	5,699
Germany	kWh per capita	5,879
France	kWh per capita	6,287
<b>EU-27 Average</b>	<b>kWh per capita</b>	<b>5,577</b>

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

### Electricity demand outlook and drivers

The TSO Transelectrica's projects a CAGR of 0.9% demand growth for the period 2020-29 in its TYNDP 2022 reference scenario (Transelectrica, 2022). In the past, a relative decoupling between the evolution of electricity demand and economic growth has been observed in Romania. Main reasons are structural adjustments in the national economy and improvements in energy efficiency in the end-user sector (The World Bank, 2016). In the mid-term, IMF projects a growth in GDP at an annual rate of 3.5% up to 2028. Electricity consumption is expected to grow, however, at a lower pace to be more moderate.

In the long-term (2030-2050), TYNDP 2024 projects that electricity demand will be driven by the industry, transport and residential sectors. Electricity demand in Romania is projected to growth within the next few years from 61 TWh in 2025 to 70-73 TWh in 2050 (ENTSOE-E, ENTSOE-G, 2023). This increase will be mostly due to the electrification of the transport sector—EV adoption is expected to increase demand from 1.3 TWh in 2021 to 18 TWh in 2050. Industrial demand is expected to show a net growth thanks to growing electrification, yet partially offset by improvement in energy efficiency, increasing from 25 TWh to c.30 TWh in 2050. Finally, households consumption is expected to remain close to actual levels due to increasing gains from energy efficiency renovations, around 10-12 TWh in 2050 from 14.2 TWh in 2021 (ENTSOE-E, ENTSOE-G, 2023; European Commission, 2024a).



## Romanian Electricity Consumption—Outlook

Scenario	Units	2022	2023	2024	2025	2029	2030	2040	2050
Reference scenario	TWh	59.1	59.7	60.4	61.0	63.0			
Favourable scenario	TWh	59.1	59.7	60.4	61.3	65.0			
National Trends	<b>TWh</b>						<b>60.5</b>		
Distributed Energy	<b>TWh</b>							<b>67.0</b>	<b>72.7</b>
Households	TWh							13.1	12.3
Buildings	TWh							6.7	5.9
Industry	TWh							30.6	31.8
Transport	TWh							11.2	17.2
Agriculture	TWh							1.0	1.1
Other	TWh							0.0	0.0
Energy	TWh							4.4	4.4
Global Ambition	<b>TWh</b>							<b>60.3</b>	<b>70.0</b>
Households	TWh							10.9	10.5
Buildings	TWh							6.8	6.1
Industry	TWh							28.3	30.3
Transport	TWh							9.1	17.9
Agriculture	TWh							0.8	0.8
Other	TWh							0.0	0.0
Energy	TWh							4.4	4.4

Source: FTI analysis based on ANRE National Report 2020 (ANRE RO, 2021b; Transelectrica, 2022) and TYNDP 2024 Scenario report data (ENTSO-E, ENTSO-G, 2023)

Notes: TSOE TYNDP 2024 only provides the National Trends Scenario for 2030, while the Distributed Energy and Global Ambitions Scenarios for 2040 and 2050.

The following policy decisions and market trends will impact electricity consumption in the country:

- **Electrification** is a major driver of electricity demand in the next decade for Romania. Projections indicate a surge in transport electrification. 29.8% of the final energy consumption in the transport sector will come from renewable energy sources by 2030, while for heating and cooling sector, 36.3%, according to European targets (Government of Romania, 2023a). Approximately 700,000 private electric vehicles (EV) and 600,000 charging points are estimated to be put in circulation by 2030. Moreover, in the heating sector, energy consumption from heat pumps is expected to amount to 600 GWh in 2025 and is expected to more than double between 2025 and 2030 to reach 1.4 TWh (Government of Romania, 2020). Finally, all natural gas-powered plants will be 100% ready for renewable gases (green hydrogen) by 2036.
- **Increased use of household appliances:** In Romania electricity utilisation for space heating/cooling or for cooking and preparation of hot water is low compared with the values from other EU countries, with relatively low endowment of the population with household appliances. However, the energy regulator of Romania noted an increase in the level of population endowment with household appliances (refrigerator, washing machines, etc.) (ANRE RO, 2015). In Romania, the 2021 energy consumption by household consumers have the following distribution: space heating (62%), water heating (14%), lighting and electrical appliances (13%) and cooking (10%) (European Commission, 2024a). However, lighting and electrical appliances concentrates 95% of the electricity consumption

for the same period, while the other uses have a low level of electrification (European Commission, 2024a).

- **Improvements in energy efficiency** are expected to further progress, driven by national targets stated in the NECP: a 46% decrease in primary energy consumption by 2030, compared to the 2030 Primes model projections for Romania (Government of Romania, 2023a). This will impact the dynamic of electricity demand, but effects are likely to be more significant from 2025 onward, after the implementation of the planned policies and investments in the energy, industry, residential, transport and tertiary sectors (Government of Romania, 2020).

### Key players in the electricity sector in Romania

The Romanian electricity market consists of 6 main activities, which can be articulated as follows:

- **Electricity producers:** In 2023 (up to November), Romania counted with 131 producers of electricity that operate hydropower, nuclear, fossil fuels (gas and coal), wind, photovoltaic and biomass power plants (ANRE RO, 2023b). Hidroelectrica (41%) and Complexul Energetic Oltenia (11%) represent slightly over half of the installed capacity of the country.
- **Transmission System Operator (TSO):** Compania Națională de Transport al Energiei Electrice (Transelectrica), is the sole transmission system operator in Romania and it operates according to the Ownership Unbundling model. Transelectrica manages and operates the power transmission system, corresponding to approximately 8,900 km of overhead electrical lines. Transelectrica has been publicly listed on the Bucharest Stock Exchange since 2006, the Romanian state being the main stakeholder (59% of the shares) (Transelectrica, 2023, Transelectrica, 2024b).
- **Electricity import/export:** Romania counts with 17 interconnection lines linking the national electricity transmission system to neighbouring countries, with a total length of 489.04 km (Government of Romania, 2023a). These interconnections are managed and operated by the transmission and system operator Transelectrica. The Romanian power system is connected to Hungary and Bulgaria and Energy Community neighbouring countries such as Ukraine and Serbia, and recently, in 2022, with Moldova (Energy Industry Review, 2022).
- **Distribution System Operators (DSOs):** There are currently 6 regional distribution system operators active in Romania (ANRE RO, 2023b). These six operators, under four companies, were previously local monopolies operating within the distribution and supply segments and were entities of the former fully state-owned company Electrica. All four companies have legally unbundled their distribution and supply activities.
- **Electricity suppliers:** In energy trading and supply, 76 entities were active as of November 2023. Out of those 51 were suppliers in the retail market, the remaining 25 being only active on the wholesale market – e.g. for electricity trading or for foreign exchanges. Electrica, Hidroelectrica and PPC represented close to half of the total electricity supplied to final customers in 2023 (up to November). Five suppliers were designated by ANRE as suppliers of last resort (ANRE RO, 2024c). They were previously supplying part of their electricity under a regulated tariff, which was removed in January 2021 (ANRE RO, 2023d). These default suppliers correspond to the former geographical entities of Electrica (Maxim & Roman, 2019).
- **Market operator:** OPCOM S.A. is the electricity market operator which notably administers the following electricity markets: the day-ahead market, the intra-day market, the organised framework for trading bilateral electricity contracts, as well and the green certificates market. Romania's day-ahead and intraday power markets were integrated with Hungary and Bulgaria through Single Day

Ahead Coupling in 2014<sup>26</sup> (ENTSO-E, 2024), and Single Intra Day Coupling in 2019 (All NEMO Committee, 2024).

### Romanian Electricity Sector—Key Players

Key Player	Field of Activity				
	Generation	Generation (Renewable)	T	Distribution	Supply
Transelectrica			X		
Hidroelectrica S.A.		X			
Complexul Energetic Oltenia	X				
SN Nuclearelectrica S.A.	X				
OMV Petrom	X				
Elcen	X				
Electrica		X		Distributie Energie Electrica	Electrica Furnizare
PPC		X		Former Distributie (now Rețele Electrice Muntenia, Rețele Electrice Dobrogea and Rețele Electrice Banat)	Former (ENEL Energie Muntenia, ENEL Energie)
E.ON		X		Delgaz Grid	E.ON Energie Romania
Macquarie		<ul style="list-style-type: none"> <li>▪ Ovidiu Development</li> <li>▪ Tomis Team</li> <li>▪ MW Team Invest</li> <li>▪ TMK Hidropower</li> </ul>		Distributie Energie Oltenia	CEZ Vanzare
Verbund		X			
Premier Energy		X			
Energias de Portugal (EDP)		X			
And other 120 producers (as of 11/2023)					
And 86 other retail suppliers (as of 11/2023)					X

Source: FTI Analysis based on company reports

Note: T: Transmission. Distributie Energie Electrica corresponds the merger of the 3 following former companies: SDEE Muntenia, SDEE Transilvania Sud, SDEE Transilvania Nord. In October 2023, PPC finalized the acquisition of Enel's Romanian distribution operations (now Rețele Electrice Muntenia, Rețele Electrice Dobrogea and Rețele Electrice Banat). The CEZ subsidiaries Ovidiu Development, Tomis Team, MW Team Invest, TMK Hidropower, Distributie Energie Oltenia, CEZ Vanzare was acquired by Macquarie Infrastructure and Real Assets ("MIRA") in October 2020. In December 2023, Premier Energy signed the deal to acquire MIRA assets. The deal was completed on April 15, 2024.

<sup>26</sup> The Bulgaria-Romania border was added to SADC more recently in October 2021

## 7.3 Electricity installed capacity and production

### Electricity generation capacities and their evolution

The electricity mix in Romania is balanced, with participation of coal, hydro, natural gas, nuclear energy, wind and solar power (Government of Romania, 2023a). The thermal and hydro portfolio brings a total firm capacity of around 12.1 GW, which represents 66% of the 2023 total installed capacity (18.2 GW). Renewable capacity stands at 4.6 GW, most of it wind (3.0 GW) and solar (1.6 GW).

The targets for the evolution of the installed capacity mix take into account both the decarbonization objectives and the need for security of supply in terms of flexibility and adequacy. The expansion of the total installed capacity is expected to be mainly met by the deployment of new wind assets (additional +4.6 GW by 2030) and new solar PV installations (additional +6.8 GW by 2030) (Government of Romania, 2023a). Moreover, much of the thermal generation capacity (c.80%) have exceeded their operating lifetime (Ministry of Economy, Energy and Business Environment, 2020). By 2032, 2.5 GW of coal installed capacity is expected to be decommissioned, while 2.4 GW has already been decommissioned. The production of several coal-based units are expected to be replaced with natural gas-fired combined cycle units (GTCCs) starting from 2024 (0.9GW of new installed gas capacity expected for 2025 compared to 2023) in addition to the renewable capacity. Furthermore, the NECP includes plans to refurbish an existing nuclear plant, and to build at least one new nuclear unit by 2030 (Government of Romania, 2023a).

On October 4, 2021 the Romanian Government approved Government Emergency Ordinance No. 118/2021<sup>27</sup> establishing a compensation scheme for electricity and gas consumption during the 2021-2022 winter season (Volciuc Ionescu, 2021). For the period ranging from November 1, 2021 until March 31, 2022, the government of Romania introduced a new tax for electricity producers: the additional revenue obtained by electricity producers resulting from the difference between the average monthly selling price and RON 450/MWh (approx. EUR 90/MWh) is subject to an 80% tax. This price has been reduced to RON 400/MWh (approx. EUR 80/MWh) through government Emergency Ordinance No. 32/2024.<sup>28</sup> This increased tax on additional revenues does not apply to producers of electricity based on fossil fuels, including cogeneration.

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<sup>27</sup> Government Emergency Ordinance 118, October 2021. Compensation scheme for the electricity and gas consumption

<sup>28</sup> Government Emergency Ordinance No. 32, March 2024. Amendment and completion of the Government Emergency Ordinance no. 27/2022 regarding the measures applicable to final customers in the electricity and natural gas market during the period April 1, 2022-March 31, 2023, as well as for the amendment and completion of some normative acts in the field of energy and the adoption of some measures in the field of energy

## Installed Capacity per Technology—Outlook

Net installed capacity	Units	2023	2025	2030
Natural gas	GW	2.7	3.6	5.3
Coal	GW	2.8	2.6	0.2
Nuclear	GW	1.4	1.4	1.9
Hydro	GW	6.6	6.7	6.9
Wind	GW	3.0	5.0	7.6
Solar PV	GW	1.5	4.3	8.3
Biomass	GW	0.1	0.1	0.2
Others	GW	0.0	0.3	0.0
<b>Total</b>	<b>GW</b>	<b>18.2</b>	<b>24.0</b>	<b>30.4</b>

Source: FTI analysis based on the Romania NECP from 2021-2030 Draft published in October (Government of Romania, 2023a)

## Electricity generation and their evolvement

As shown on the table below, the total electricity generation is expected to increase between 2020 and 2030, according to the Energy Strategy, which reflects the evolvement of the installed capacity. While the rising price of ETS allowances is putting additional pressure on fossil fuel electricity generation (Ministry of Energy, 2022), electricity generation from wind and solar sources is expected to more than double between 2020 and 2030.

## Gross Electricity Net Generation—Historical Values and Projections

Gross electricity generation	Units	2017	2018	2019	2020	2021	2022	2030
Natural gas	GWh	4,513	5,022	4,011	5,315	5,652	6,170	11,208
Coal	GWh	15,102	14,002	12,119	8,329	9,622	9,191	11,893
Nuclear	GWh	10,561	10,442	10,347	10,558	10,377	10,200	16,526
Hydro	GWh	14,542	17,681	15,675	15,418	17,411	14,038	17,529
Wind	GWh	7,332	6,260	6,705	6,878	6,511	6,903	12,571
Solar PV	GWh	1,850	1,754	1,760	1,716	1,685	1,754	7,357
Biomass	GWh	395	308	394	439	543	514	900
Other fossil	GWh	5,528	5,236	5,001	4,368	4,385	3,950	n/a
<b>Total</b>	<b>GWh</b>	<b>59,823</b>	<b>60,705</b>	<b>56,012</b>	<b>53,022</b>	<b>56,186</b>	<b>52,721</b>	<b>77,984</b>

Source: FTI analysis based on Transelectrica website data (Transelectrica, 2024a) and Romania's Energy Strategy 2022-2030 with a view to 2050 data (Ministry of Energy, 2022)

Note: "other fossil" includes oil products. For 2030, only gross electricity generation statistic is available.

## Current key electricity producers

Most of the installed capacity is state-owned in Romania, with the Romanian state having a majority share in the 3 major producers: Hidroelectrica, Nuclearelectrica and CE Oltenia. Altogether, the top 5 electricity producers operate 58% of the total installed capacity in 2023.

### Top 5 Electricity Producers' Net Generation Capacities and Outputs, 2023

Indicators for 2023	Units	Hidro-electrica	CE Oltenia	Nuclear-electrica	OMV Petrom	PPC Renewables
<b>Total generation capacity</b>	<b>MW</b>	6,159	1,635	1,413	832	532
thereof natural gas	MW	164			832	
thereof coal	MW		1,635			-
thereof nuclear	MW			1,413		-
thereof hydro	MW	5,994				
thereof wind	MW					498
thereof solar PV	MW					34
<b>Total supplied electricity</b>	<b>GWh</b>	<b>16,331</b>	<b>5,518</b>	<b>9,358</b>	<b>4,486</b>	<b>n/a</b>

Source: FTI analysis based on Transelectrica installed capacity database (Transelectrica, 2024a) and ANRE Electricity market monitoring report for November 2023 data (ANRE RO, 2023b)

Note: the total installed capacity is based in the technical documentation from NRA licences.

## 7.4 Electricity imports

Romania turned from a net exporter to a net importer of electricity in 2019. This was due to a reduction of domestic electricity production caused by (i) adverse natural conditions resulting in lower output for hydropower plants (2.0 TWh lower compared to 2018), and (ii) reduced production from thermal power plants (INS, 2020) due to worsening economics of hard coal plants that faced CO<sub>2</sub> price increases in the EU ETS market (Agora Energiewende & Sandbag, 2020). In 2022, Romania imported (net) 1.2 TWh, mostly from Bulgaria (about two thirds) and Hungary. Small quantities were also imported from Ukraine, Serbia and Switzerland.

## Romanian Electricity Import and Export Volumes per Trading Partner—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022
Electricity net generation	GWh	59,355	60,176	55,177	51,924	54,636	51,005
<b>Net import/export balance</b>	<b>GWh</b>	<b>-2,894</b>	<b>-2,544</b>	<b>1,518</b>	<b>2,792</b>	<b>2,199</b>	<b>1,224</b>
Electricity inland demand +plus electricity for pumped storage	GWh	55,855	56,834	56,120	54,265	55,821	50,869
Electricity final consumption	GWh	48,861	49,778	49,619	48,063	49,623	45,407
<b>Total imports</b>	<b>GWh</b>	<b>4,842</b>	<b>3,697</b>	<b>5,493</b>	<b>8,252</b>	<b>8,697</b>	<b>8,653</b>
Thereof Bulgaria	GWh	1,514	1,729	1,433	2,048	4,569	5,583
Thereof Hungary	GWh	2,086	1,144	1,840	2,520	2,286	2,115
Thereof Switzerland	GWh	0	57	149	404	0	23
Thereof Serbia	GWh	769	693	1,569	2,696	1,647	608
Thereof Ukraine	GWh	473	73	501	584	194	325
<b>Total exports</b>	<b>GWh</b>	<b>7,735</b>	<b>6,241</b>	<b>3,975</b>	<b>5,459</b>	<b>6,499</b>	<b>7,429</b>
Thereof Bulgaria	GWh	1,137	850	1,216	2,947	1,665	737
Thereof Hungary	GWh	2,771	2,567	1,075	1,468	2,462	3,771
Thereof Switzerland	GWh	0	206	68	67	0	0
Thereof Serbia	GWh	3,818	2,585	1,599	907	2,218	2,303
Thereof Ukraine	GWh	10	33	17	70	153	102

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: Net import/export balance is defined as the difference between imports and exports. If positive, it corresponds to a situation of net imports. If negative, it corresponds to a situation of net exports. Electricity inland demand doesn't consider the statistical differences considered in the aggregated statistic published by Eurostat.

## 7.5 Electricity distribution

As of November 2023, Romania has 6 licenced distribution system operators: Distribuție Energie Electrică România, PPC (now Rețele Electrice Muntenia, Rețele Electrice Dobrogea and Rețele Electrice Banat), Delgaz Grid and Distribuție Energie Oltenia.

## Romanian Distribution Grid Operators, 2022

Company	Region of operation	Total grid length	Number of connected end-users	Distributed electricity
		km	Million users	GWh
Electrica (SDEE Muntenia Nord)	Northern Muntenia	59,641	1.3	
Electrica (SDEE Transilvania Sud)	Southern Transilvania	46,045	1.2	17.7
Electrica (SDEE Transilvania Nord)	Northern Transilvania	53,147	1.3	
PPC (Rețele Electrice Banat)	Banat	45,387		4.4
PPC (Rețele Electrice Dobrogea)	Dobrogea	38,473	2.9	3.7
PPC (Rețele Electrice Muntenia)	Southern Muntenia	49,404		7.4
Delgaz grid (E.ON)	North-East (Cluj, Maramures, Timis, Bihor, and Sibiu)	81,123	3.0	4.9
Distributie Energie Oltenia (Macquarie)	Oltenia	87,725	1.5	6.9

Source: FTI analysis based on ANRE Report on the achievement of performance indicators for electricity transmission, system and distribution services 2022 data (ANRE RO, 2023c), Electrica annual report 2022 data (Electrica, 2023), E-distributie sustainability report 2022 (e-distributie, 2023), E.ON Romania Sustainability report 2022 data (Delgaz grid, 2023), Distributie Energie Oltenia sustainability report 2022 data (Distributie Oltenia, 2023)

Note: Distributie Energie Oltenia corresponds the merger of the 3 following former companies: SDEE Muntenia, SDEE Transilvania Sud, SDEE Transilvania Nord. The latest report ANRE for 2022 still provides the breakdown by company. For Distributie Energie Oltenia, the latest statistic for supplied electricity is 2021. In October 2023, Public Power Corporation S.A. (PPC) acquired all the equity stakes held by the Enel Group in Romania, including the electricity distribution assets.

## Number of End-Users Connected to the Distribution Grid, and Distribution Grid Length of the Six Largest DSOs

Indicators	Units	2017	2018	2019	2020	2021	2022
Total number of end-users	Person	9,332,511	9,448,823	9,548,041	9,676,106	9,786,424	9,937,430
Total grid length	km	491,358	493,445	496,231	499,151	333,362	502,358

Source: FTI analysis based on ANRE Reports on the achievement of performance indicators for electricity transmission, system and distribution services and the technical status of electricity transmission and distribution networks - 2017 and 2022 data (ANRE RO, 2023c)

Note: These figures correspond to the 6 distribution operators with more than 100,000 connected end-users.



## 7.6 Electricity retail: key players

On the Romanian electricity market, 91 retailers were active as of November 2023 (ANRE RO, 2023b), with the five largest suppliers accounting for 56.8% of the total supplied electricity.

### Top Five Electricity Retailers of Final Customers in Romania, 2023

Company	Historic main region of activity	Number of supplied end-users <i>millions</i>	Total supplied electricity <i>GWh</i>	Total supplied electricity - Market shares <i>%</i>	Total generation capacity <i>MW</i>	Total generation <i>TWh</i>
Electrica Furnizare (Electrica)	Muntenia Nord, Transilvania Sud & Nord	3.5	8,004	16.6%	n/a	n/a
Hidroelectrica	National	0.5	6,332	13.1%	6,159	16.3
PPC Energy & PPC Energie Muntenia	North-East - Moldovan border / Muntenia	3.0	8,655	18.0%	597	1.2
E.ON Energie Romania	Banat, Dobrogea	n/a	4,390	9.1%	n/a	n/a
CEZ Vanzare (Macquarie)	National	1.4	2,491	5.2%	622	n/a

Source: FTI analysis based on ANRE Electricity market monitoring report for November 2023 data (ANRE RO, 2023b), , Electrica Group annual sustainability report 2022 data (Electrica, 2022), E.ON Sustainability report 2022 data (E.ON Group, 2023), Hidroelectrica Corporate Presentation (Hidroelectrica, 2023), PPC Corporate Presentation (PPC, 2024), Transelectrica installed capacity database (Transelectrica, 2024a), CEZ Vanzare Annual Report (CEZ, 2021a; CEZ, 2021b)

Note: The number of supplied-end users were obtained from the respective annual reports or corporate presentation of the companies. No data is available for E.ON, as only the total number of customers is reported – 3.2m, including both electricity and gas. Total supplied electricity, market shares and total generation were obtained from ANRE Electricity market monitoring report for November 2023 as of November 2023. PPC group installed capacity was obtained from the Company's Corporate Presentation. CEZ Group installed capacity comes from the 2020 Annual Report.

Romania has five suppliers of last resort for electricity in place (ANRE RO, 2023c):

1. CEZ Vanzare S.A.
2. PPC Energie S.A.
3. E.ON Energie Romania S.A.
4. PPC Energie Muntenia S.A.
5. Electrica Furnizare S.A.

## 7.7 Electricity prices and retail tariffs

### Wholesale prices

The trends in the EU wholesale gas price had a consequential impact on the EU wholesale electricity market, whose average base load price rose sharply from an average price EUR c.100/MWh in 2021 to EUR 180/MWh in May 2022 to peak at more than EUR 400/MWh in August 2022 (EIA, 2023). The electricity price in Romania witnessed similar trends to the EU trends, with 2021 recording its peak in November 2021 at EUR 213/MWh,

one of the highest in Europe's spot markets (Fitch Ratings, 2021). However, in 2022 prices rose even higher. In Romania, the 2022 average wholesale price (EUR 265/MWh) was 1.3x higher than 2021 average price (EUR 111.5/MWh).

#### Historic Wholesale Base Load Electricity Prices for Romania, Germany and Hungary

Country	Units	2018	2019	2020	2021	2022	2023
Romania	EUR/MWh	47.1	50.1	39.1	111.5	265.0	103.7
Germany	EUR/MWh	44.5	38.2	31.1	97.1	235.3	95.5
Hungary	EUR/MWh	51.3	50.2	38.6	114.0	271.5	106.8

Source: FTI analysis based on EnergyMarketPrice.com data (EnergyMarketPrice, 2024)

Note: Prices shown are annual averages of spot prices.

Forward markets as of February 16, 2024 expect the wholesale electricity price to decline, but remain at high levels relative to historical prices before 2020.

#### Forward Wholesale Base Load Electricity Prices for Romania, Germany and Hungary as of February 16, 2024

Country	Units	2024				2025				2026				2027
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Romania	EUR/MWh	108.6	98.3	107.9	109.3	72.3	72.7	72.7	72.7	79.9	79.9	79.9	79.9	n/a
Germany	EUR/MWh	68.5	60.8	70.2	81.8	89.7	67.6	73.4	85.0	85.5	63.3	66.9	76.3	67.4
Hungary	EUR/MWh	76.2	66.7	77.6	92.7	98.5	85.5	85.5	85.5	77.6	77.6	77.6	77.6	70.9

Source: FTI analysis based on EnergyMarketPrice.com data (EnergyMarketPrice, 2024) for Germany and Hungary and Opcom for Romania (Opcom, 2024b)

Note: Prices shown are annual averages of front month future prices.

#### Historic retail electricity tariffs

The electricity market became fully liberalized starting January 2021 as regulated tariffs that applied to households were eliminated, according to the Law No. 123/2012.<sup>29</sup> Since then, electricity supply prices for households are no longer set by ANRE; instead, they are determined in a competitive marketplace based on supply and demand (Government of Romania, 2023).

The share of consumers supplied with electricity on a competitive basis has progressively increased since the beginning of the liberalization of the electricity market in 2007 and reached 84% in 2023 (in consumption, average January to November) (ANRE RO, 2023b). ANRE implemented a comparison tool in 2015 for both the electricity and gas retail tariffs to allow household customers and small enterprises with an expected annual consumption of less than 100,000 kWh to have free access to at least one tool for comparing suppliers' offers (ANRE RO, 2021a).

Retail tariffs for both household and non-household consumers have exhibited a nearly steady increase from 2017 until 2023 across all consumption bands. For non-household customers, the peak prices took place in the second half of 2022, in which electricity prices stood up to EUR 374/MWh, while for household customer, it was in first half of 2023 in which prices stood up to EUR 377/MWh (European Commission, 2024a).

<sup>29</sup> Law No.123, July 2012. Law on electricity and natural gas

### Romanian Non-Household Electricity Prices—Historical Values

Consumption Band	2019	2019	2020	2020	2021	2021	2022	2022	2023
	S1	S2	S1	S2	S1	S2	S1	S2	S1
	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh
Less than 20 MWh/a	96.2	100.0	112.9	106.0	104.9	124.3	248.6	374.2	372.1
Between 20 and 500 MWh/a	92.0	96.6	102.0	99.3	97.4	121.3	220.2	372.0	365.2
Between 500 and 2,000 MWh/a	82.1	85.3	89.0	84.8	82.4	113.0	214.9	339.5	313.9
Between 2,000 and 20,000 MWh/a	75.6	78.9	82.8	78.6	75.5	113.5	227.5	298.5	238.6
Between 20,000 and 70,000 MWh/a	71.6	74.1	75.6	71.3	69.0	117.2	159.5	259.7	189.7
Between 70,000 and 150,000 MWh/a	69.4	73.6	75.7	69.0	71.6	109.6	170.1	269.9	164.6
More than 150,000 MWh/a	57.5	60.2	59.0	56.7	56.0	104.7	157.9	202.0	138.1

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: S1 refers to the first half of the year i.e. January to June, S2 refers to the second half i.e. July to December. Prices exclusive of taxes and levies.

### Romanian Household Electricity Prices—Historical Values

Consumption Band	2019	2019	2020	2020	2021	2021	2022	2022	2023
	S1	S2	S1	S2	S1	S2	S1	S2	S1
	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh
Less than 1 MWh/a	96.8	102.8	105.4	105.1	113.8	119.0	168.6	283.3	377.6
Between 1 and 2.5 MWh/a	98.4	102.6	104.6	104.6	113.0	118.9	175.9	271.5	361.7
Between 2.5 and 5 MWh/a	98.3	102.5	104.5	104.0	111.5	116.7	177.9	268.3	337.3
Between 5 and 15 MWh/a	98.4	103.8	104.6	103.2	109.3	114.3	174.9	263.3	286.6
More than 15 MWh/a	98.0	102.1	102.4	100.7	105.3	110.3	163.1	221.8	214.7

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: S1 refers to the first half of the year i.e. January to June, S2 refers to the second half i.e. July to December. Prices exclusive of taxes and levies.

The Romanian government introduced support schemes to alleviate the impact of rising electricity prices. These support schemes covered households, small enterprises and public institutions<sup>30</sup>. There were three main measures: the compensation scheme that was only applicable to household customers and amounts to a maximum of RON 291/MWh (approx. EUR 58/MWh), the exception from the payment of the green

<sup>30</sup> More precisely: (i) households customers; (ii) small and medium sized enterprises, micro-enterprises, authorized natural persons and family enterprises, sole medical offices and other liberal professions; and (iii) public and private hospitals, academic institutions and kindergartens, NGOs, religious institutions and public and private providers of social services.

certificates' price and tariffs and the price caps. (GEO 32/2024)<sup>31</sup>: These measures were valid until January 2022 except for the price caps.

For household customers the final price for electricity is capped until March 2025. Household customers who consume less than 100 kWh per month will pay EUR 14 cents per kilowatt, between 100 kWh and 255 kWh per month will pay EUR 16 cents per kilowatt, between 255 kWh and 300 kWh will pay EUR 26 cents for the portion corresponding to consumption between 255 kWh and 300 kWh, and if their consumption exceeds 300 kWh, then they will be charged a maximum of EUR 26 cents per kilowatt). For non-household customers (subject to exceptions) the final price for electricity for the period February 1 2022 – March 31 2022 (now, extended until March 2025) was capped at a maximum of RON 1/kWh (approx. EUR 0.2/kWh) (Volciuc Ionescu, 2021). The differences between the supplier's average costs for the period between November 1, 2021 and March 31, 2025 and the capped prices will be reimbursed to the supplier, taken from the state budget through a separate budgetary expense. The price cap reimbursement should be made in maximum 30 working days after the necessary documentation has been submitted by the suppliers.

The Romanian legislators have extended the applicability of transitory measures aimed at protection of end customers and stabilisation of Romanian energy market until March 31, 2025<sup>32</sup>, by regulating additional capped prices for household and non-household customers, a compensation mechanism for suppliers (who initially cover the difference between the capped prices applicable to customers and the price for acquiring electricity/natural gas) and a contribution to the Energy Transition Fund (having in essence the nature of a wind fall tax) applicable to a broad spectrum of market participants (producers, aggregated electricity producing entities, traders, suppliers that also carry out trading activities, aggregators trading electricity/natural gas on the wholesale market and hedging partners of producers) which is ultimately used to compensate the suppliers (GEO, 32/2024).

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<sup>31</sup> Government Emergency Ordinance No. 32, March 2024. Amendment and completion of the Government Emergency Ordinance no. 27/2022 regarding the measures applicable to final customers in the electricity and natural gas market during the period April 1, 2022-March 31, 2023, as well as for the amendment and completion of some normative acts in the field of energy and the adoption of some measures in the field of energy

<sup>32</sup> Law No. 357, December 2022. Approval of the Government's Emergency Ordinance no. 119/2022 for the amendment and completion of the Government Emergency Ordinance no. 27/2022 regarding the measures applicable to final customers in the electricity and natural gas market in the period April 1, 2022-March 31, 2023, as well as for the amendment and completion of some normative acts in the field of energy

## 8 Electricity sector in Moldova

### 8.1 Overview of the electricity sector

The electricity sector in Moldova started its restructuring in 1997, when the vertically integrated state-owned company Moldenergo, comprising electricity transmission, distribution, supply, and generation was reorganized into different separate companies, with distinct activities. Moldenergo was unbundled in 4 generation companies, one company operating the transmission network, and 5 distribution companies (DSO) who also provided supply services.

In 2000, the Government conducted a subsequent reorganization of the company operating the transmission network and created a distinct legal entity in charge exclusively of operating the transmission system and system dispatch – Moldelectrica (state-owned). After the adoption of the Law No. 107/2016<sup>33</sup> (Parliament of Moldova, 2016), the Government undertook several actions to enable Moldelectrica to be certified as a transmission system operator (TSO) under Energy Community requirements following the ownership unbundling model, prescribed by the Law. In June 2019, the National Energy Regulatory Agency (ANRE) issued a decision on the preliminary certification of Moldelectrica as a TSO in line with this model. However, in October 2019, the Energy Community Secretariat issued a negative opinion on the preliminary certification, which stated that Moldelectrica was not actually unbundled as required by Article 9 of the Electricity Directive due to a lack of ownership over the assets and separation of control (Energy Community, 2019). After discussions with the Ministry of Economy and Infrastructure, it was concluded that the most appropriate unbundling model for Moldelectrica's separation is the Independent System Operator (ISO) model. However, since the Law on Electricity does not provide for alternative unbundling models, it had to be amended to transpose requirements related to alternative models as provided by the EU Third Energy Package. In May 2021, the Energy Community Secretariat opened dispute settlement proceedings against Moldova for not unbundling its electricity TSO (Energy Community, 2021). On July 11, 2023 in Decision No. 447/2023,<sup>34</sup> the Moldovan energy regulator ANRE issued a final decision certifying the electricity transmission system operator (TSO) Moldelectrica as an Independent System Operator. Almost five years after the first certification request by Moldelectrica, the TSO is now compliant with the European standards for unbundling. Following the successful certification of Moldelectrica as an ISO, the Energy Community Secretariat closed Case ECS-18/21 related to this topic.

Regarding distribution, in 2000, 3 out of 5 DSOs—representing 70% of the market—were sold to Union Fenosa (OED, 2002), while the rest of DSOs—RED Nord JSC and RED Nord-Vest JSC—remained entirely owned by the Government. In the context of requirements of the Law on electricity No. 124/2009<sup>35</sup> (Parliament of Moldova, 2009), transposing the EU Second Energy Package, distribution companies had the obligation to ensure the separation of distribution activity from supply activity by January 1, 2015. The privately-owned distribution company RED Union Fenosa JSC was the first to finalize the unbundling process, by creating a distinct company (Gas Natural Fenosa Furnizare Energie LLC) providing supply services, while the mother company (RED Union Fenosa JSC) obtained an electricity distribution licence and operated solely as DSO. In 2019, Gas Natural Fenosa's companies were acquired by EMMA Capital Group and Duet Private Equity Limited and rebranded to Premier Energy group. EMMA Capital Group originally held a 69% stake in the joint venture (EMMA Capital, 2019), and in 2020 acquired an additional 24% (EMMA Capital, 2020).

The other two state-owned distribution companies, located in the northern part of Moldova, finalized the unbundling process in July 2015. A new joint stock company was created—Furnizarea Energiei Electrice Nord (FEE Nord JSC), which undertook the supply activity. In July 2017, to improve efficiency of the companies,

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<sup>33</sup> Law No. 107, May 2016. Regarding electricity

<sup>34</sup> ANRE Decision No. 447, July 2023. Regarding the certification of the electricity transmission system operator Î.S. "Moldelectrica", IDNO: 1002600004580, legal address: MD-2012, Chisinau municipality, 78 V. Alecsandri str

<sup>35</sup> Law No. 124, December 2009. On electricity

the government approved the merger through absorption of two state-owned DSOs: RED Nord JSC absorbed RED Nord-Vest JSC. Up until recently the wholesale electricity market consisted only of bilateral contracts, either at negotiated prices or regulated prices approved by ANRE. Only in February 2024 “Operatorul Pieței de Energie M” a subsidiary of OPCOM—the Romanian electricity market operator –was designated by Government Decision No. 125/2024<sup>36</sup> to be the Nominated Electricity Market Operator (NEMO) for Moldova. Thus, it is expected that the organized electricity market will soon start operating in Moldova. This step facilitates the transition away from a market based purely on bilateral contracts to an increasing importance of the organised market for day-ahead and intraday delivery. Besides there are prices established in auctions for eligible electricity produced from renewable energy sources (RES) in the context of the support scheme set by the Law No.10/2016<sup>37</sup> on renewable energy sources. In 2022, Moldova synchronized electricity power system with the ENTSOE Continental European system now allowing imports from Ukraine and Romania (Government of Moldova, 2023a).

## 8.2 Electricity demand

### Historic electricity demand

Electricity final consumption in Moldova has grown from 2017 to 2021 by 2.8% (CAGR), with total consumption equalling 4.6 TWh in 2021 (European Commission, 2024a). In 2022, electricity consumption contracted due to limitation in imported electricity in September 2022, power supply outages caused by military actions, and the undertaking of electricity saving measures by final consumers as electricity prices increased (ANRE MD, 2022). In 2022, the electricity final consumption stood at 3.9 TWh and total inland demand, which includes energy sector consumption and network losses, at 4.4 TWh, 4.6% lower than 2021 levels.

The residential sector had provided the largest share of consumption in 2021, representing c.44% of overall final consumption. The commercial and industrial sector accounted for c.34% and c.19%, respectively. Transport represented c.1%, and the agriculture sector represented c.2%.

### Moldovan Electricity Consumption—Historical Values

Sector	Units	2017	2018	2019	2020	2021	2022	2017-21 CAGR
Industry	GWh	804	811	787	747	802	n/a	-0.1%
Transport	GWh	82	72	45	42	46	n/a	-13.5%
Agriculture	GWh	49	65	72	77	96	n/a	18.3%
Commercial	GWh	1,173	1,291	1,285	1,253	1,410	n/a	4.7%
Residential	GWh	1,636	1,642	1,671	1,730	1,825	n/a	2.8%
<b>Total final consumption</b>	<b>GWh</b>	<b>3,744</b>	<b>3,881</b>	<b>3,860</b>	<b>3,849</b>	<b>4,179</b>	<b>3,939</b>	2.8%
Distribution losses	GWh	429	441	425	404	435	462	0.3%
<b>Inland demand</b>	<b>GWh</b>	<b>4,173</b>	<b>4,322</b>	<b>4,285</b>	<b>4,253</b>	<b>4,614</b>	<b>4,401</b>	2.5%

Source: FTI Analysis based on Eurostat data (European Commission, 2024a)

Note: Industry consumption includes transformation (generation) own consumption within the industry sector; Transnistrian Region is not included in the scope of this analysis.

<sup>36</sup> Government of Moldova Decision No. 125, February 2024. Regarding the designation of the electricity market operator

<sup>37</sup> Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources

In 2022, Moldova’s per capita electricity consumption stood at 1.6 MWh. While slightly rising over the last years, it remains low compared to the EU countries, such as Germany, France, Italy, or Spain, whose electricity consumption per capita in 2022 stood between 4.9 and 6.3 MWh.

#### Electricity Final Consumption—Country Comparison

Country	Units	2022
<b>Moldova</b>	<b>kWh per capita</b>	<b>1,550</b>
Poland	kWh per capita	4,112
Greece	kWh per capita	4,695
Spain	kWh per capita	4,894
Italy	kWh per capita	5,012
Czechia	kWh per capita	5,699
Germany	kWh per capita	5,879
France	kWh per capita	6,287
<b>EU-27 Average</b>	<b>kWh per capita</b>	<b>5,577</b>

Source: FTI analysis based on Eurostat data (European Commission, 2024a); IMF World Economic Outlook data, October 2023 (IMF, 2023a)

Note: The calculation is based on IMF estimates of 2020 Moldovan population; Final consumption figures were used to calculate consumption per capita. Transnistrian Region not included in the scope of this analysis.

#### Electricity demand outlook and drivers

Access to electricity is available to the entire territory of Moldova with no villages/cities without access to electricity (The World Bank, 2022). In 2023, the “Rabla for Household Appliances” programme was launched in Moldova to replace old appliances and reduce bills in households (United Nations, 2023). In December 2023, the Government of Moldova drafted the Integrated National Energy and Climate Plan (NECP) for the period 2025-2030, including an outlook to 2050. The NECP provides a demand outlook for the following scenarios: (1) With Existing Measures (WEM, unconditional); and (2) With Planned Measures (WPM, conditional). Both scenarios cover only the Right bank of the Dniester River.

Moldova’s draft NECP sets decarbonization targets in line with the 2015 Paris Agreement. More specifically, it aims at (i) achieving a reduction of 68.6% of GHG emissions in 2030 for the Right bank of the Dniester River, (ii) increasing renewable energy share in final energy consumption from 17% in 2020 to 27% in 2030 and (iii) promoting energy efficiency so that total consumption in 2023 stands at 2.8 Mtoe (vs 2.55 Mtoe in 2020), resulting in a total of 151.3 ktoe of energy savings (Government of Moldova, 2023a). The latter expects to be partially achieved through the electrification of road and rail transport, the promotion of energy efficiency in Small and Medium-sized Enterprises (SMEs) and the installation of renewable energy plants

In terms of energy security, Moldova is looking to reduce dependence on energy imports and diversification of energy resources and import routes. Moldova already carried out measures to achieve this aim: its synchronisation with the ENTSO-E electricity market and the significant increase of interconnectivity with



Romania, the expansion of the use of renewable energy to meet domestic needs and its integration with the wider European electricity market.

Finally, in terms of Internal energy market, Moldova is expecting to promote further integration into the European Union and its internal energy market by implementing legislations to support renewable energy projects and construction of power lines with Romania.

#### Moldovan Total Electricity Consumption—Outlook, WEM Scenario

Sector	Units	2025	2030	2035	2040	2045	2050
Demand	GWh	4,408	4,664	5,408	6,303	7,036	7,722

Source: Draft National Energy and Climate Plan (NECP) for the period 2025-2030 (Government of Moldova, 2023a)

Note: Transnistrian Region is not included in the scope of this analysis. Projections considered existing energy efficiencies policies, measures and programs.

#### Key players in the electricity sector in Moldova

The Moldova electricity market can be articulated around the following activities:

- **Electricity producers:** Moldova’s largest power plant is located in the Transnistrian Region (Moldovan CERS, 2,520 MW), owned by Moldavskaya, a 100% subsidiary of Russian owned RAO ES, followed by other thermal plants owned by Termoelectrica JSC, owned by the Moldovan Government. Renewable power plants production only accounted for 6.3% (2023) of total Moldovan generation (Moldelectrica, 2024a). A licence for electricity production is required for producers who own power plants with an installed capacity of 5 MW and above, if this capacity is used for public consumption and of 20 MW and above if this capacity is used for own consumption (Law of Electricity).<sup>38</sup>
- **Transmission System Operator (TSO):** Moldelectrica is the only licenced transmission operator in Moldova. Moldelectrica manages and operates the power transmission system, corresponding to approximately 4,725 km of overhead electrical lines in 2022 (Moldelectrica, 2024a).
- **Electricity import/export:** Moldova has historically exchanged electricity with Ukraine but after the integration of the electricity system and ETSOE, Moldova also imports and exports energy from Romania.
- **Distribution System Operators (DSOs):** There are currently 2 regional distribution system operators active in Moldova. Premier Energy covers 70% of the Moldovan territory (Premier Energy Distribution, 2022) and Red Nord covers the remainder of Moldova, excluding the Transnistrian Region. The two companies have legally unbundled their distribution and supply activities.
- **Electricity suppliers:** To supply electricity on the retail market, a supplier must obtain a licence for electricity supply (Law on electricity).<sup>39</sup> A total of 78 entities hold licences to supply energy in Moldova. As of 2024, the two supply companies created as a result of the unbundling process (Premier Energy LLC and FEE Nord JSC) operate as universal service suppliers and suppliers of last resort within the licenced areas of the two DSOs (Premier Energy Distribution and RED Nord).

<sup>38</sup> Law No. 107, May 2016. Regarding electricity, article 12

<sup>39</sup> Law No. 107, May 2016. Regarding electricity, article 19



## Moldovan Electricity Sector—Key Players

Key Player	Field of activity				
	Generation	Generation (Renewable)	Transmission	Distribution	Supply
Termoelectrica JSC	X				
CET Nord JSC	X				
Moldovan CERS	X				
Costesti HPP		X			
Fly Ren First Solar Park LLC		X			
Sudzuker Moldova JSC		X			
Irarom Grup LLC		X			
Printemps LLC		X			
Nordix-Prim LLC		X			
Importex Trans LLC		X			
Moldelectrica State Enterprise			X		
Premier Energy Distribution JSC				X	
RED Nord JSC				X	
Furnizarea Energiei Electrice Nord JSC (FEE Nord)					X
Premier Energy LLC					X
Navitas Energy LLC					X
ML Energy Group LLC					X
Energocom JSC					X
And 73 other retail suppliers (as of 12/2023)					X

Source: FTI analysis based on ANRE data (ANRE MD, 2024a), ANRE Trimester report III 2023 (ANRE MD, 2023a)

Note: There are 78 companies that hold licences to supply electricity as of January 26, 2024; In 2023 there were only four active suppliers (ANRE MD, 2023a); the Kuciurgan Power Plant (MGRES Power Plant) is located in the Transnistrian Region.

## 8.3 Electricity installed capacity and production

### Electricity generation capacities and evolution

To serve electricity demand, Moldovan power system consist of 3.2 GW of installed capacity as of February, 2024. Moldovan generation portfolio is predominantly firm, with thermal capacity representing more than 90% of the installed capacity. Renewable capacity stands at 215 MW (c.7% of the installed capacity), most of it wind (131 MW) and solar (84 MW).

### Total Installed Capacity for Electricity (Excluding Net Metering)

Sector	Units	2024
Thermal	MW	2,929
Wind	MW	131
Solar	MW	84
Hydropower	MW	64
Biogas	MW	7
<b>Total</b>	<b>MW</b>	<b>3,215</b>

Source: FTI Analysis based on Moldelectrica website data (Moldelectrica, 2024b)

Note: Installed capacity as of February 2024, excluding net metering.

### Moldovan Power Plants Currently Operating

Power plant name	Type	Units	Installed capacity, 2024
<b>Moldova Right bank of Dniester River</b>			
CET-1 Chisinau	Thermal	MW	66
CET-2 Chisinau	Thermal	MW	258
CET Balti	Thermal	MW	37
CHE Costesti	Hydro	MW	16
Other RE Power Plants		MW	222
PV		MW	84
Wind		MW	131
Biogas		MW	7
<b>Total</b>		<b>MW</b>	<b>599</b>
<b>Moldova Left bank of Dniester River</b>			
Moldovan CERS	Thermal	MW	2,520
CHE Dubasari	Hydro	MW	48
Sugar Factories	Thermal	MW	48
<b>Total</b>		<b>MW</b>	<b>2,616</b>

Source: FTI Analysis based on Moldelectrica website data (Moldelectrica, 2024b)

In December 2021, Government approved a new decision to promote the use of renewable sources (Decision No. 401/2021)<sup>40</sup>, establishing capacity limits, maximum quotas and categories of capacities for electricity production from renewable sources, to be applied until 2025 (Government of Moldova, 2021a). The expansion of the total installed capacity is expected to be mainly met by the deployment of new wind assets (3,074 MW by 2050) and new solar PV installations (561 MW by 2050) (Government of Moldova, 2023a).

<sup>40</sup> Government of Moldova Decision No. 401, December 2021. Regarding the approval of capacity limits, maximum quotas and capacity categories in the field of electricity from renewable sources. In relation to the implementation of the support scheme for electricity produced from renewable energy source, established by the Law No. 10/2016 Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources

## Moldova Renewable and Cogeneration Capacities Support Scheme Until 2025

No	Electricity production technology	Capacity bracket	Maximum capacity quotas per type up until 2025			Capacity limit for the application of fixed feed-in tariffs	Feed-in tariff
			Total	At fixed feed-in tariff	At fixed price		
		MW	MW	MW	MW	MW	MDL/kWh
<b>Intermittent Sources</b>							
1	Total wind installations:	—	120	15	105	4	
1.1	Large wind installations	0.501-4	—	12	—	4	1.69
1.2	Small wind installations	<0.5	—	3	—	—	1.97
2	PV (photovoltaic) installations, total; of which:	—	200	140	60	—	
		<0.05	—	—	—	—	2.00
2.1	PV installations mounted on buildings (rooftop)	0.051-0.2	—	20	—	1	1.93
		0.201-1.0	—	—	—	—	1.78
2.2	PV installations, other than those in point 2.1	<1.0	—	120	—	—	1.89
<b>Subtotal</b>		—	<b>320</b>	<b>155</b>	<b>165</b>	—	
<b>Non-intermittent Sources</b>							
3	Biogas-based cogeneration plants (CHP), total of which	—	65	65	—	—	—
3.1	Biogas-based CHP units (from manure, animal waste, agricultural waste)	—	—	35	—	—	2.40
3.2	CHP units based on biogas (recovery of municipal solid waste)	—	—	20	—	—	1.51
3.3	CHP units based on biogas produced by the recovery of municipal liquid waste / wastewater	—	—	10	—	—	1.72
4	Synthesis-based cogeneration plants (solid biofuels, agricultural waste, crops)	—	10	10	—	—	1.91
5	CHP units using direct combustion (solid biofuel, agricultural waste, incl. crops)	—	10	10	—	—	2.28
6	Hydro installations	—	5	5	—	1.0	1.45
<b>Subtotal</b>		—	<b>90</b>	<b>90</b>	—	—	—
<b>TOTAL</b>		—	<b>410</b>	<b>245</b>	<b>165</b>	—	—

Source: FTI analysis based on ANRE Decision No. 401/2021,<sup>41</sup> last recorded change in January 2024 (Government of Moldova, 2021a), and ANRE Decision No. 84/2023<sup>42</sup> (ANRE MD, 2023d)

Note: At fixed tariff: capacities allocated for feed in tariffs established by ANRE. The procedure for granting eligibility status (the access to the feed in tariffs) to these categories of renewable energy producers is implemented by ANRE on a “first come, first served” principle. The eligible producers sign 15-years PPAs with the Central Electricity Supplier, at the feed-in tariff established by ANRE. At fixed price: capacities allocated for large producers, with installed capacities above the capacity limit established in the same Gov. Decision. These producers have to participate in tenders organized by the Government to gain access to the support scheme (i.e. mandatory purchase of all generated electricity by the Central Electricity Supplier on the basis of a 15-years PPA, at the price established in tenders).

## Electricity generation and evolvement

The increase in renewable generation in 2022 compared to 2021 was mainly thanks to the incorporation of wind energy (almost doubled its generation capacity) and solar energy (increase 2.5x vs. 2021).

### Gross Electricity Generation—Historical Values

Sector	Units	2020	2021	2022
Natural Gas	GWh	723	801	613
Solar energy (PV)	GWh	5	12	42
Biogas (produced from biomass)	GWh	28	32	24
Wind Energy	GWh	50	76	142
Hydropower	GWh	47	68	41
Transnistrian Region	GWh	3,251	3,446	n/a

Source: FTI analysis based on ANRE activity report 2022 data (ANRE MD, 2022), and Eurostat database (Eurostat, 2024a)

Note: Data separates Transnistrian Region, Solar PV figures include generation from net-metered customers.

### Current key electricity producers

Moldavskaya GRES is the owner of Moldovan CERS, the largest power producer in Moldova, which represents 78% of the 2024 installed capacity. This is followed by Termoelectrica, who owns several thermal power plants (10%) (Moldelectrica, 2024b).

<sup>41</sup> Government of Moldova Decision No. 401, December 2021. Regarding the approval of capacity limits, maximum quotas and capacity categories in the field of electricity from renewable sources

<sup>42</sup> ANRE Decision No. 84, February 2023. Regarding fixed tariffs and ceiling prices for electricity produced from renewable energy sources by producers who will obtain the status of eligible producer in 2023

## Moldovan Top Five Electricity Producers—Historical Values

Producer	Power Plant	Fuel type	Installed capacity in 2024	Annual generation	
				2022	2023
			MW	MWh	MWh
Termoelectrica S.A.	CET -1 Chisinau	Thermal	66	528.0	524.3
	CET -2 Chisinau	Thermal	240		
CET-Nord S.A.	CET Balti	Thermal	37	83.5	78.8
Nodul Hidroenergetic Costesti	CHE Costesti	Hydro	16	41.2	68.8
Dubasari Hydro Power Plant	CHE Dubasari	Hydro	46	n/a	n/a
Moldavskaya GRES	Moldovan CERS	Thermal	2,520	2,708	3,294

Source: FTI Analysis based on Moldelectrica website Annual Data Report (Moldelectrica, 2024a & 2024b)

Note: Electricity generated and delivered into the grid (excludes own-consumption of the power plants). Generation data for Moldavskaya GRES Power Plant is based on electricity balances of Moldelectrica for 2022 and 2023. These figures reflect the amount of electricity delivered by Moldavskaya GRES to Moldovan regions on the Right bank of the Dniester River.

## 8.4 Electricity imports

Historically, Moldova relied heavily on electricity from the biggest plant of Moldova located in the Transnistria region (Moldavskaya GRES) and imports from Ukraine to meet its electricity demand. In 2022, the Moldovan electricity system was synchronized with the ETSOE Continental European system thereby allowing also for imports and exports from/to Romania (Government of Moldova, 2023a).

### Moldovan Electricity Import and Export Volumes per Trading Partner—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022	2023
Electricity net generation Right bank Dniester River	GWh	761	822	784	835	1,007	3,473	4,158
Electricity net generation Left bank Dniester River	GWh	2,278	2,544	2,857	3,251	3,446	n/a	n/a
Net import/export balance	GWh	1,134	956	644	167	161	955	138
Electricity inland demand plus electricity for pumped storage	GWh	4,173	4,322	4,285	4,253	4,614	4,428	4,297
Electricity final consumption	GWh	3,744	3,881	3,860	3,849	4,179	4,266	4,125
<b>Total procurements and imports</b>	<b>GWh</b>	<b>1,134</b>	<b>956</b>	<b>644</b>	<b>167</b>	<b>161</b>	<b>955</b>	<b>459</b>
thereof Ukraine	GWh	1,134	956	644	167	161	474	153
thereof Romania	GWh	0	0	0	0	0	481	306
Total net exports	<b>GWh</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>321</b>

Source: FTI analysis based on Eurostat data (European Commission, 2024a), Moldelectrica website Annual Data Report (Moldelectrica, 2024a)

Note: The figures reported as “Electricity net generation Left bank Dniester River” in the table above are reported as “Not specified” by Eurostat. Net import/export balance is defined as the difference between imports and exports. If positive, it corresponds to a situation of net imports. If negative, it corresponds to a situation of net exports. For 2017 and 2021, Total procurements are net import/export.

In 2022, Moldova exchanged electricity with Romania for the first time. In 2023, Ukraine net import/export balance stood at 68.8 GWh and for Romania, at 69.4 GWh (Moldelectrica, 2024a). In 2023, interconnection capacities stood at (Moldelectrica, 2024a):

- Romania: Import 200-800 MW | Export 200-625 MW (400kV and 110kV lines)
- Ukraine: Import 0 MW | Export 800 MW

The interconnection with Romania is planned to be further expanded via the construction of two new 400 kV power lines in accordance with the Energy Strategy 2030 and the Electricity transmission network development plan for 2018 and 2027. The projects are expected to have a significant impact on the Moldovan electricity market and will be an important step towards Moldova’s integration into the European single electricity market (Government of Moldova, 2023a):

- Isaccea – Vulcanesti – Chisinau (Timeframe: 2023-2026). The project includes (Moldelectrica, 2017):
  - 158 kilometres of high-voltage power line
  - A 400 kV substation at each end of the LEA in Vulcanesti and Chisinau
- Balti – Suceava (Timeframe: 2023-2026). The project includes (Moldelectrica, 2023):
  - 48 kilometres of high voltage power line
  - New Balti station connected to the existing Balti power station
  - Modifications to the existing Balti power station

## 8.5 Electricity distribution

Electricity distribution is conducted by two DSOs: Premier Energy Distribution JSC and Red Nord JSC as per ANRE Licence register. Premier Energy covers 70% of the Moldovan territory, the south side, and are present in 20 of the 37 districts as well as in Chisinau (Premier Energy Distribution, 2022). Red Nord JSC is the DSO for the remainder of Moldova (excl. the regions on the Left bank of the Dniester River).

### Moldovan Electricity DSOs—Historical Values

DSO	Network length		Number of connected consumers		Total electricity distributed	
	2021	2022	2021	2022	2021	2022
	km	km	#	#	GWh	GWh
Premier Energy Distribution JSC	35,643	35,677	931,224	939,411	2,983	2,938
Red Nord JSC	21,458	21,316	492,366	492,586	944	899

Source: FTI analysis based on Annual Distribution report Premier Energy (Premier Energy Distribution, 2022), Red Nord Management Report (Red Nord, 2021; Red Nord, 2022)

## 8.6 Electricity retail

### Retail supply and respective public services obligations

In recent years, several unregulated (competitive) suppliers have entered the wholesale electricity market. Given the absence of organized competitive markets, these suppliers usually buy electricity on the bilateral contracts market in Ukraine or from the MGRES power plant in the Transnistria Region and resell electricity to local suppliers or final consumers at negotiated prices. State-owned company Energocom also acts as Central Electricity Supplier (CES), buying electricity from eligible renewable energy producers (based on 15 year PPAs), as well as from urban CHP plants (based on shorter term bilateral contracts) and resells it to retail suppliers (Energocom, 2017).

System operators, regulated suppliers of last resort and universal service suppliers are obliged to conduct competitive procurement procedures (tenders) to buy the necessary electricity at lowest costs. Supply of last resort protects consumers whose suppliers exit the market, go bankrupt or lose their licence from being disconnected by switching them to supply of last resort which is a regulated service. Universal services, guarantees the availability of a regulated supply contract to all household consumers and small businesses as an alternative to negotiated supply contracts. Local universal service suppliers, suppliers of last resort, and system operators conduct yearly tenders for electricity procurement to cover local demand and electricity needed by the system operators to cover losses in their networks. The tenders were conducted in accordance with the new Electricity Market Rules approved by ANRE in August 2020. At the entry into force of the Law on electricity, no. 107/2016<sup>43</sup> (Parliament of Moldova, 2016), former electricity suppliers at regulated prices (Premier Energy and Furnizare Energie Electrica Nord) were designated to act as universal suppliers for end-consumers and suppliers of last resort for a period of ten years, 2016-25.

For the 2021 round of tenders, MGRES participated in the procurement procedure organized by regulated suppliers and system operators and was declared the winner in all procurement procedures, becoming the sole wholesale supplier of electricity required by suppliers and system operators for April 1, 2021 to March 31, 2022 on the basis of bilateral contracts with each supplier and system operator<sup>44</sup> (Premier Energy, 2021).

Other Moldovan electricity producers, including producers from renewable energy sources who do not benefit from the renewable energy support schemes, sell their generated electricity to local suppliers (including regulated suppliers) based on negotiated bilateral contracts. As regulated suppliers are obliged to buy electricity at the lowest cost as per article 68, para (8) of the Law on Electricity<sup>45</sup> (Parliament of Moldova, 2016), the price they agree on with independent producers does not usually exceed the prices established in yearly electricity procurement tenders. These prices effectively serve as price caps in contracts with these producers.

Universal service suppliers were also obligated to conclude, upon request, net-metering contracts with final consumers who installed renewable energy generation facilities for their own use, until the predefined cumulated capacity limit was reached (15 percent of the peak load of the DSO within the distribution area the respective suppliers supply electricity). The net-metering scheme was discontinued and a new net-billing scheme started on 01 January 2024.<sup>46</sup>

By the end of 2022, Premier Energy LLC had signed net-metering contracts with 1657 consumers, with a total installed capacity of 27.8 MW. At the same time, FEE Nord JSC had signed net-metering contracts with 424 consumers, with a total installed capacity of approximately 10 MW (ANRE MD, 2022).

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<sup>43</sup> Law No. 107, May 2016. Regarding electricity

<sup>44</sup> Except for Moldelectrica, which signed a contract with MGRES for six months until September 30, 2021. In September, Moldelectrica organized a tender to procure system losses, after which the contract with MGRES was extended an additional six months to March 31, 2022

<sup>45</sup> Law No. 107, May 2016. Regarding electricity

<sup>46</sup> Law no. 10/2016 regarding the promotion of the use of energy from renewable sources

## Key players

Currently, there are 78 electricity supply licencees (as of January 26, 2024) (ANRE MD, 2024a) in Moldova, but only a limited number of suppliers are active on the retail/wholesale market. In 2019, the share of competitive supply in total electricity supplied on the retail market was 7.2%, while in 2020 this share increased to 9.7% (ANR MD, 2020). At the end of 2020, six suppliers concluded transactions on the retail/wholesale market based on bilateral contracts. According to ANRE data from Q4/2023, there were 186 participants in the electricity market and four of them also active in the retail market: Premier Energy, Navitas Energy, FEE Nord and ML Energy Group.

### Moldovan Top Electricity Suppliers by Market Share, 2022

Supplier	PSO	Market Share based on numbers of end-users	Number of customers		Total electricity supplied	
			Household #	Non-household #	Household GWh	Non-Household GWh
Premier Energy LLC	<ul style="list-style-type: none"> <li>Universal service</li> <li>Supply of last resort</li> </ul>	64%	804,860	30,727	1,234	1,740
Furnizarea Energiei Electrice (FEE) Nord JSC	<ul style="list-style-type: none"> <li>Universal service</li> <li>Supply of last resort</li> </ul>	36%	460,444	17,203	494	573
Other non-regulated suppliers	No PSO	n/a	n/a	n/a	10	

Source: FTI analysis based on Premier Energy Technical and Economic indicators data (Premier Energy, 2022), Fee Nord Technical and Economic indicators data (Fee Nord, 2022), ANRE report data (ANRE MD, 2022)

Note: There is no customer database available for the non-regulated suppliers however based on local knowledge, the number of customers range from 10-12 customers hence they do not have a significant impact on the total market shares  
Abbreviations: PSO stands for public service obligation.

## 8.7 Electricity prices and retail tariffs

Regarding historical wholesale prices, up until February 2024 there was no organised electricity market (exchange) established in Moldova, therefore no wholesale electricity prices are available. Average “electricity purchase prices”<sup>47</sup> for the last 5 years as published by ANRE are reported below.

### Moldovan Wholesale Electricity Prices—Historical Values

Index	Units	2018	2019	2020	2021	2022
Average electricity purchase price	EUR/MWh	50.09	53.68	49.18	49.78	86.94

Source: FTI analysis based on ANRE reports data (ANRE MD, 2022).

Note: Prices reported by ANRE in Bani (100 Bani=1 MDL) were transformed using average annual exchange rate from World Bank.

Regarding retail electricity tariffs, in 2022, the regulated prices of electricity to end consumers was adjusted in accordance with the provisions of the tariff methodologies in order to ensure reliability of the continuous

<sup>47</sup> The methodology for calculating these prices is not public but we understand that they reflect volume weighted average prices of bilateral wholesale electricity contracts



and uninterrupted supply of electricity. Retail tariffs for both household and non-household consumers have exhibited a nearly steady increase from 2019 until 2023 across all consumption bands, except in the second half of 2020 and 2021. For non-household customers, prices peaked in the first half of 2023 (EUR 167/MWh), while for household customer they peaked during the second half of 2022 (EUR 198/MWh) (European Commission, 2024a).

#### Moldovan Non-Household Electricity Prices—Historical Values

Consumption Band	2019	2019	2020	2020	2021	2021	2022	2022	2023
	S1	S2	S1	S2	S1	S2	S1	S2	S1
	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh
Less than 20 MWh/a	88.5	90.6	94.6	84.2	72.3	72.5	85.7	164.1	167.2
Between 20 and 500 MWh/	84.1	86.7	86.8	76.6	67.2	67.7	81.2	158.2	155.9
Between 500 and 2,000 MWh/a	77.1	78.7	79.5	71.8	63.3	64.0	76.1	149.5	146.5
Between 2,000 and 20,000 MWh/a	70.9	75.9	76.8	70.1	60.5	60.8	75.4	137.9	140.5
Between 20,000 and 70,000 MWh/a		68.1	68.8	59.4	53.8	50.0	74.8	139.3	131.0
Between 70,000 and 150,000 MWh/a					58.7	59.8			

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: S1 refers to the first half of the year i.e. January to June, S2 refers to the second half i.e. July to December. Prices exclusive of taxes and levies.

#### Moldovan Household Electricity Prices—Historical Values

Consumption Band	2019	2019	2020	2020	2021	2021	2022	2022	2023
	S1	S2	S1	S2	S1	S2	S1	S2	S1
	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh
Less than 1 MWh/a	91.2	96.7	99.5	89.6	76.2	76.8	92.9	166.3	172.6
Between 1 and 2.5 MWh/a	92.4	100.1	103.1	93.8	80.5	81.7	98.5	182.7	176.1
Between 2.5 and 5 MWh/a	93.6	101.9	106.8	99.3	85.1	88.8	104.7	197.6	179.5
Between 5 and 15 MWh/a	92.6	100.3	104.6	95.2	82.2	84.9	99.9	186.2	177.9
More than 15 MWh/a	90.6	93.2	93.7	84.7	90.4	72.2	85.4	162.2	171.2

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: S1 refers to the first half of the year i.e. January to June, S2 refers to the second half i.e. July to December. Prices exclusive of taxes and levies.

With respect to future evolution of tariffs, there are no publicly available studies on the evolution of wholesale or retail electricity prices in Moldova. Such outlooks are particularly difficult to be done given the absence of organized electricity markets (day-ahead, balancing markets) and subsequently a wholesale market consisting only of bilateral contracts.

## 9 Gas sector in Moldova

### 9.1 Overview of the gas sector

In 1991, the Moldovan Government approved the first “national program for the gasification of the Republic of Moldova until 2000”<sup>48</sup> (Government of Moldova, 1991). Ten years later, the natural gas network didn’t develop as expected and natural gas access was still limited. In 2002, only 16% of the localities had access to the natural gas network (Government of Moldova, 2002). During 2001-2002, the Moldovan Government adopted two National gasification programs (Decision No. 1492/2001<sup>49</sup> and 1643/2002<sup>50</sup>), with the aim to develop the gas distribution networks and increase the total number of cities/villages with access to natural gas.

In 2008, the Government also adopted a decision to establish new gasification measures to accelerate the internal gasification process of Moldovan cities/villages (Decision No. 715/2008<sup>51</sup>). This decision established the responsibility for the extension of the natural gas distribution networks in the localities for the holders of licences for natural gas distribution. As a result, the natural gas networks, in particular the distribution networks, were significantly expanded. By the end of 2022, 61.7% of localities had access to the natural gas network in the Right Side of the Dniester River (ANRE MD, 2022).

Over the past few years, the Republic of Moldova has made notable progress in diversifying natural gas supply routes and adopting EU legislation to liberalize the natural gas market. With new cross-border and domestic natural gas transmission and distribution infrastructure, increased access to energy markets of neighbouring countries, and shifting regional energy flows, the country now has access to a range of new options to mitigate its high dependency on Russian natural gas supplies (Government of Moldova, 2023a).

Moldova’s gas market was entirely monopolized until 2022. JSC Moldovagaz and its subsidiaries controlled the entire chain of gas business, including imports, wholesale and retail supply, cross-border & national transmission and distribution— more than 98% of the distribution network belonged to JSC Moldovagaz (IEA, 2021b).

JSC Moldovagaz is the parent company of the following gas undertakings that are currently active on the Moldovan natural gas market:

- Natural gas transport – Moldovatrangaz and Tiraspoltrangaz (in the Transnistrian region)
- Natural gas distribution – 12 distribution companies on the Right bank of the Dniester River and 5 distribution and supply companies in the Transnistrian region

JSC Moldovagaz also participates in the supply segment through LLC Moldovatrangaz—a daughter company of Moldovagaz. Transautogaz LLC holds a licence for supply of natural gas, as well as a licence for supply of compressed natural gas for vehicles issued by ANRE (ANRE MD, 2024b).

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<sup>48</sup> Government of Moldova Decision No. 403, July 1991. Regarding the State Gasification Program of the Republic of Moldova until the year 2000

<sup>49</sup> Government of Moldova Decision No. 1492, December 2001. Regarding the approval of the Gasification Program of the Republic of Moldova until 2005

<sup>50</sup> Government of Moldova Decision No. 1643, December 2002. Regarding the approval of the National Gasification Program of the Republic of Moldova

<sup>51</sup> Government of Moldova Decision No. 715, June 2008. Regarding the measures to accelerate the internal gasification process of localities

## Shareholder Structure Of JSC Moldovagaz

Shareholder	Shares owned
Gazprom (Russian majority state-owned entity)	50.00%
Public Property Agency of the Republic of Moldova	35.33%
Transnistria Wealth Management Committee	13.44%
Natural and legal persons	1.23%

Source: FTI analysis based on Moldovagaz website (Moldovagaz, 2021)

Moldovatrangaz was the only licenced gas TSO operating in Moldova until January 2015<sup>52</sup> when also LLC VestMoldTrangaz obtained a transmission licence for the operation of the newly built Iasi – Ungheni-Chisinau gas interconnection. VestMoldTrangaz was created as a state-owned company. Following its privatization in 2018 (Government of Moldova, 2018), it was acquired by Eurotrangaz LLC, which is owned 100% by the Romanian natural gas transmission company Trangaz (VMTG, 2022).

The Law on natural gas, No. 108/2016<sup>53</sup>, transposes the Third EU Energy Package into Moldovan law. It requires gas transmission system operators to take all necessary actions and measures to ensure by January 1, 2020 separation of transmission activity from other activities in the gas sector in line with one of the three unbundling models prescribed by the Law. The same law also obliges DSOs which serve more than 100,000 consumers to separate accounts, as well as to functional and legal unbundling in relation to the supply activity they carry out within two months after entry into force of the Law.

As of February 2024, JSC Moldovagaz still has to implement one of the permissible unbundling models in relation to the TSO Moldovatrangaz. In February 2020, ANRE adopted the unbundling plan submitted by JSC Moldovagaz, according to which the ITO model was chosen as the unbundling option for Moldovatrangaz. While the request for certification was envisaged to be submitted by October 2020, this deadline was not met. In January 2021, ANRE extended the deadline for finalization of the certification procedure for Moldovatrangaz until September 30, 2021 (ANRE MD, 2021a), however the licensee did again not manage to undertake the required actions to ensure separation. In September 2021, ANRE announced its intention to initiate sanctioning procedures for Moldovatrangaz due to non-compliance with obligations prescribed by the Law on natural gas<sup>54</sup> (ANRE MD, 2021b). ANRE did not further advance this sanctioning procedure due to the unfolding gas crisis and the results of negotiations over the new gas supply contract with Gazprom in November 2021, as specified in the negotiation protocol. The negotiation Protocol signed by the Minister of Infrastructure and Regional Development and representatives of Gazprom provides in pt. 3 and pt. 6 the obligation of Moldovan authorities to refrain from “forcing the reorganization” of Moldovagaz until Moldova settles its debt with Gazprom and from applying any financial sanctions towards Moldovagaz in this regard (Government of Moldova, 2021b). Later in September 2023, ANRE withdrew the licence of Moldovatrangaz in Decision No. 572/2023<sup>55</sup> (ANRE MD, 2023b).

In case of Vestmoldtrangaz, ANRE approved the final certification decision and finalized the certification procedure on September 6, 2021. Following this decision, Vestmoldtrangaz became the first Moldovan transmission system operator (TSO) that has successfully completed the certification procedure (ANRE MD, 2021c) in line with one of the unbundling models provided by the EU Third Energy Package (ownership unbundling model). In September 2023, a lease contract for the natural gas transport network was signed

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<sup>52</sup> Tiraspoltrangaz LLC operating in the Transnistria region does not hold a valid transmission licence

<sup>53</sup> Law No. 108, May 2016. Regarding natural gas

<sup>54</sup> Law No. 108, May 2016. Regarding natural gas

<sup>55</sup> Administrative Council Decision No. 572, September 2023. Regarding the withdrawal of the SRL licence "Moldovatrangaz", c/f 1003607010109 legal address: r-nul Drochia, sat. Tarigrad

between Moldovatrangaz and Vestmoldtrangaz. Subsequently, Vestmoldtrangaz started operating the entire natural gas transmission system of Moldova (ANRE MD, 2023c).

All DSOs affiliated with Moldovagaz transferred their supply activities to JSC Moldovagaz and currently operate more than 98% of the gas distribution network (IEA, 2021b). Via Decision No. 487/2019<sup>56</sup>, ANRE also imposed on Moldovagaz the public service obligation to supply natural gas to all final consumers connected to the distribution networks of its 12 affiliated DSOs for a period of 7 years, until 2026 (ANRE MD, 2019). According to the restructuring plan announced previously by Moldovagaz, all 12 DSOs were planned to be merged into one single distribution system operator (Agora, 2021). Up until February 2024 this plan was not implemented.

None of the other DSOs (i.e. those not affiliated to Moldovagaz) performed legal or functional unbundling, given that none of them individually serves more than 100,000 final consumers and therefore are not obliged to comply with the unbundling requirements. By the same resolution no. 487/2019, ANRE assigned specific undertakings with public service obligations (PSO) to supply natural gas to consumers within the area of each of these non-affiliated DSO.

Energocom (the state owned energy retailer) obtained their licence to supply gas in 2014. Following the 2022 decision of GAZPROM to reduce the volume of gas supplied to Moldova to 5.7 mln m<sup>3</sup>/day –sufficient only for the Left bank (Transnistria)– the Moldovan Government empowered Energocom to buy gas in the wider region (Reuters, 2023). In 2022 the Energocom opened a branch in Romania, obtained trading licences for electricity and natural gas from ANRE Romania and covered current gas consumption and security stocks with non-Russian imports. As part of the state of emergency legislation the authorities have also required Moldovagaz to buy all gas for the supply of end-users on the Right bank from Energocom. As a result, over the first three quarters of 2023, Energocom supplied 94.1% of the entire Moldovan Right bank natural gas consumption (ANRE MD, 2023c).

The lack of sources for natural gas imports other than Russia historically was the result of lacking alternative gas transit infrastructure. To increase diversification of supply routes and improve the security of gas supply, a new gas interconnection pipeline with Romania was built, with the support of donors and international institutions (OSW, 2013). The first segment of this project–the Iasi-Ungheni pipeline–was commissioned in 2015 (Hydrocarbons Technology, n.d.). However, due to constraints of technical nature, delivery of natural gas over this pipeline was very limited and created a need for the development of additional infrastructure both on the territory of Romania, as well as in Moldova (IEA, 2021b). The second segment of this transmission pipeline, Ungheni – Chisinau pipeline was built and put into operation in October 2021. The Chisinau – Ungheni – Iasi pipeline is used as an alternative gas supply source to the natural gas supplied by Gazprom through the Eastern gas interconnection. The Chisinau – Ungheni – Iasi pipeline has a maximum capacity of 5 million m<sup>3</sup>/day in the direction from Romania to Moldova and 932,000 m<sup>3</sup>/day in the direction of Republic of Moldova to Romania (Transgaz, 2021). The gas supply contract with Gazprom–extended in 2021 for another 5 years up until 2026–however, fully covers the Moldovan gas demand (Interfaz, 2023). The ability of Gazprom to deliver the gas under this contract may, however, depend on Gazprom’s ability to transit gas through Ukraine, with the respective transit contract between Gazprom and Naftogaz of Ukraine ending by the end of 2024 (Naftogaz, 2023).

## **9.2 Natural gas demand**

### **Historical natural gas demand**

Gas consumption in Moldova has grown at a CAGR of 4% from 2017 to 2021, with total consumption equalling 6.8 TWh in 2021. According to ANRE, the decrease of natural gas consumption in 2022 in the energy sector

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<sup>56</sup> ANRE Decision No. 487, December 2019. Regarding the imposition of the public service obligation

was mainly explained because "Termoelectrica" used alternative fuel sources instead of gas to produce electricity. In 2022, the gas final consumption stood at 5.1 TWh and total inland demand, which includes energy sector consumption, at 8.1 TWh, 28.7% lower than 2021 levels.

The residential sector provided the largest share of consumption in 2021, representing c.65% of overall final consumption. The commercial and industrial sector respectively accounted for c.17% and c.13% of the total final consumption. Transport represented c.5%, and the agriculture sector represented c.1%.

#### Moldovan Natural Gas Consumption—Historical Values

Sector	Units	2017	2018	2019	2020	2021	2022	2017-21 CAGR %
Industrial	GWh	698	889	753	809	878	745	5.9%
Transport	GWh	292	288	227	128	350	166	4.6%
Commercial	GWh	1,064	1,111	1,097	983	1,152	966	2.0%
Residential	GWh	2,910	3,334	3,352	3,726	4,445	3,189	11.2%
Agriculture	GWh	24	34	35	36	62	64	26.2%
<b>Total final consumption for energy use</b>	<b>GWh</b>	<b>4,989</b>	<b>5,657</b>	<b>5,464</b>	<b>5,681</b>	<b>6,886</b>	<b>5,131</b>	<b>8.4%</b>
Final consumption for non-energy use	GWh	0	0	0	0	0	0	0.0%
<b>Total final consumption</b>	<b>GWh</b>	<b>4,989</b>	<b>5,657</b>	<b>5,464</b>	<b>5,681</b>	<b>6,886</b>	<b>5,131</b>	<b>8.4%</b>
Use in the energy sector*	GWh	4,751	4,943	4,329	4,299	4,524	2,999	-1.2%
<b>Total Inland demand</b>	<b>GWh</b>	<b>9,739</b>	<b>10,599</b>	<b>9,793</b>	<b>9,980</b>	<b>11,410</b>	<b>8,130</b>	<b>4.0%</b>

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: Use in the energy sector includes transformation input energy use, energy sector energy use and distribution losses; Transnistria is not included in the scope of this analysis

In 2022, Moldova's per capita gas consumption stood at 2.0 MWh. Moldova remained well below major EU energy markets, such as Germany, France or Italy, whose final gas consumption per capita in 2022 stood between 4.9 and 8.2 MWh. Romania gas consumption is close to Greece, mainly oil products consumer.

## Gas Final Consumption—Country Comparison

Country	Units	2022
<b>Moldova</b>	<b>kWh per capita</b>	<b>2,019</b>
Greece	kWh per capita	1,487
Spain	kWh per capita	3,570
Poland	kWh per capita	3,905
France	kWh per capita	4,866
Czechia	kWh per capita	5,859
Italy	kWh per capita	7,099
Germany	kWh per capita	8,224
<b>EU-27 Average</b>	<b>kWh per capita</b>	<b>5,648</b>

Source: FTI analysis based on Eurostat data (European Commission, 2024a), and IMF World Economic Outlook data, October 2023 (IMF, 2023a)

Note: The calculation is based on IMF estimates of 2020 Moldovan population. Final consumption figures were used to calculate consumption per capita. Transnistrian Region is not included in the scope of this analysis.

### Natural gas demand drivers

There are currently no studies on the evolution of Moldovan gas demand in the mid-term published.

**Gas prices:** Historically low or declining gas prices supported demand increases in both the residential and industrial sectors. Over the last years, however, there has been significant volatility in European and also Moldovan gas prices. From December 2021 to February 2024, there have been six decisions of ANRE for the price of gas.

**Replacement of wood/coal with gas:** The share of coal in gross final energy consumption is very low (c.3% in 2021, or 1.1 TWh) while the share of biofuels is relatively high (c.20% in 2021, or 7.2 TWh) opening-up opportunities for substitution with natural gas (2021 final consumption 8.4 TWh) (IEA, 2021c). There are, however, no published studies available assessing this substitution. Wood is still widely used for heating in households (National office of Statistics, 2021). Data related to biomass (especially wood) is still very inaccurate due to the widespread use of inefficient technologies and illegal cutting of firewood (IRENA, 2019) thus leading to inconsistency in reporting of actual consumption.

**Distribution Grid Expansion:** By the end of 2022, 62.7% of the 1533 localities in the Right Side of the Dniester River had access to a gas distribution networks (ANRE MD, 2022). In 2022, development plans of the distribution system operators were approved for 3 years (2023-2025) by ANRE. In 2022 there was an expansion of 1.9% (482.5 km) compared to previous year.

The Moldovan gas market consists of four main activities, which can be articulated as:

- **Gas imports:** Moldova doesn't have any gas production. The country completely depends on imports.
- **Gas transmission:** Vestmoldtransgaz LLC, 100% owned by the Romanian TSO Transgaz, is the only TSO active in Moldova.
- **Gas distribution:** 20 entities in Moldova hold licences to distribute gas in Moldova. There are 12 companies affiliated to Moldovagaz; the remaining (8) are independent, such as Rotalin Gaz Trading and Nord Gaz.
- **Retail suppliers:** There are 24 entities that hold licences to supply energy (ANRE MD, 2024b), but only 13 active in the market (ANRE MD, 2024c).

## Moldovan Gas Sector—Key Players

Key Player	Field of activity			
	Import	Transmission	Distribution	Supply
JSC Moldovagaz	X			X
Vestmoldtransgaz LLC		X		
Energocom S.A.	X			X
Rotalin Gaz Trading LLC	X		X	X
Natural Gaz DC	X			X
Transautogaz LLC				X
And 8 other active retail suppliers (as of 02/2023)				X
And 11 other retail suppliers (as of 01/2023)				X
12 Distribution Companies affiliated to Moldovagaz JSC			X	
7 other independent Distribution Companies affiliated			X	

Source: FTI analysis based on ANRE Licencing Register data (ANRE MD, 2024b) and ANRE Decision No. 45/2024<sup>57</sup> (ANRE MD, 2024c)

Note: There are 24 entities licenced to supply gas as of January 26, 2024; only 5 out the 13 active suppliers of gas are listed above.

### 9.3 Imports of natural gas: key players

Moldova, excluding the Left Side of the Dniester River, managed to decrease import levels in 2022 compared to 2017-2021. In 2023, Moldova, excluding the Transnistrian Region, has managed to achieve full independence from Russian gas but still receives electricity with generated from Russian gas. By 2023, Moldova managed to develop alternative supply routes, unbundle the energy market, and disprove its debt to Russian majority state-owned gas company, Gazprom (ECFR, 2023).

<sup>57</sup>ANRE Decision No. 45, February 2024. Regarding the imposition of the public service obligation

## Production, Imports and Export of Natural Gas—Historical Values

Indicators	Units	2017	2018	2019	2020	2021	2022
Gas Production	GWh	0	0	0	0	0	0
<b>Net import/export balance</b>	<b>GWh</b>	9,724	10,625	9,778	9,934	11,429	<b>8,914</b>
Inland demand	GWh	9,739	10,599	9,793	9,980	11,410	8,130
Change in stock	GWh	14	-27	15	45	-19	-785
Final gas consumption	GWh	4,989	5,657	5,464	5,681	6,886	5,131
<b>Total imports</b>	<b>GWh</b>	9,724	10,625	9,778	9,934	11,429	<b>8,914</b>
thereof Romania	GWh	0	0	0	0	0	0
thereof Russia	GWh	9,724	10,625	9,778	9,934	11,270	7,979
thereof Greece	GWh	0	0	0	0	0	888
thereof Austria	GWh	0	0	0	0	0	4
thereof Slovakia	GWh	0	0	0	0	0	43
<b>Total exports</b>	<b>GWh</b>	0	0	0	0	0	0

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: Final gas consumption excludes gas consumption from the energy sector. The Transnistrian region is not included in the scope of this analysis, as the gas infrastructure and activities there are not controlled by the Moldovan authorities. Moreover, no natural gas storage facilities are available in Moldova (IEA, 2021b). Net import/export balance is defined as the difference between imports and exports. If positive, it corresponds to a situation of net import. If negative, it corresponds to a situation of net exports.



## 9.4 Gas distribution

Public data regarding the natural gas supplied through their network, grid length and number of end users is available for 14 out of 20 licencees. In 2022, the 14 licencees represented 25,649 km of distribution pipelines to attend 829,000 customers.

### Moldovan Distribution Grid Operators

Company name	Network length		Number of connected customers		Total natural gas supplied	
	2021	2022	2021	2022	2021	2022
	km	km	#	#	M m <sup>3</sup>	M m <sup>3</sup>
S.R.L Chişinău-gaz	3,374	3,450	341,434	348,462	662	482
S.R.L Ialoveni-gaz	3,737	3,756	83,940	84,608	92	68
S.R.L Bălţi-gaz	1,968	2,010	65,025	66,093	94	53
S.R.L Edineţ-gaz	2,008	2,025	35,358	35,600	51	26
S.R.L Floreşti-gaz	1,705	1,749	35,001	35,712	44	28
S.R.L Orhei-gaz	2,321	2,387	40,862	43,656	43	32
S.R.L Ştefan Vodă-gaz	1,467	1,522	29,407	30,359	22	15
S.R.L Gagauz-gaz	1,943	1,953	46,828	46,949	47	33
S.R.L Cahul-gaz	1,538	1,561	31,909	32,580	30	22
S.R.L Taraclia-gaz	641	644	26,400	26,606	15	11
S.R.L Cimişlia-gaz	1,448	1,473	24,951	25,396	19	14
S.R.L Ungheni-gaz	1,654	1,695	31,629	31,978	28	20
Nord Gaz – Singerei LLC	89	92	3,147	n/a	2	n/a
ÎM "Rotalin Gaz Trading" SRL	1,298	1,332	20,304	21,109	19	14

Source: FTI analysis based on ANRE activity report data (ANRE MD, 2022), and company Technical and economic indicators data (Chisnau-Gaz, 2021 & 2022), (SRL Ialoveni Gaz, 2021 & 2022), (Balti Gaz, 2021 & 2022), (Edinet-Gaz, 2021 & 2022), (Floreşti-Gaz, 2021 & 2022), (Orhei-Gaz, 2021 & 2022), (Ştefan Voda Gaz, 2021 & 2022), (Gagauz-gaz, 2021 & 2022), (Cahul Gaz, 2021 & 2022), (Taraclia Gaz, 2021 & 2022), (Cimislia Gaz, 2021 & 2022), (Ungheni-Gaz, 2021 & 2022), (Nordgaz, 2021), (Rotalin Gaz Trading SRL, 2021 & 2022)

## 9.5 Gas retail: key players

Currently, 24 entities hold a licence for natural gas supply in Moldova, four of these are also active as distribution system operators (ANRE, 2024). Moldovagaz is the largest supplier in the retail market with a share of 92.85% of the total turnover in the natural gas market, followed by Rotalin Gaz Trading with a share of 1.0% and by Nord Gaz with a share of 0.28% (ANRE MD, 2024c).

## Moldovan Major Gas Suppliers

Company name	Public service obligation (PSO)	Number of connected customers		Total natural gas supplied, mln m3	
		2021	2022	2021	2022
		#	#	mln m3	mln m3
Moldovagaz JSC	<ul style="list-style-type: none"> <li>PSO to supply to certain categories of final consumers</li> <li>supply of last resort</li> </ul>	774,613	789,141	1,151	847
Rotalin Gaz Trading LLC	<ul style="list-style-type: none"> <li>PSO was revoked in Decision No.45 of 2024</li> </ul>	20,304	21,109	19	14
Nord Gaz – Singerei LLC	<ul style="list-style-type: none"> <li>PSO to supply to certain categories of final consumers</li> </ul>	3,147	n/a	2	n/a

Source: FTI analysis based on ANRE activity report data (ANRE, 2022), and company websites (Moldovagaz, 2024; Rotalin Gaz Trading SRL, 2021 & 2022; Nordgaz, 2021)

## 9.6 Gas prices and retail tariffs

### Wholesale prices

The gas prices on the wholesale and retail gas market in Moldova has fluctuated substantially over the past few years with 2020 recording the lowest purchase price and with 2022 recording the highest purchase price over the past 5 years. The decrease in price is attributed to the COVID-19 pandemic due to drop in natural gas demand (and other energy commodities). The increase in prices is attributed to Russia's invasion of Ukraine in 2022. Average "gas purchase prices" for the last 5 years as published by ANRE are reported below.

### Moldovan Wholesale Gas Prices—Historical Values

Index	Units	2018	2019	2020	2021	2022
Average gas purchase price	Eur/1000m <sup>3</sup>	184.96	206.59	131.64	261.55	795.52

Source: FTI analysis based on ANRE activity report data (ANRE MD, 2022)

Note: Annual average exchange rate from World Bank for EUR values.

### Historic retail gas tariffs

The average natural gas prices for final consumers (regulated by ANRE) has generally followed the import prices. They are set annually, therefore generally following market developments, but do not respond to all price changes immediately. Retail tariffs for both household and non-household consumers have exhibited fluctuation from 2019 to 2023 due to the COVID-19 pandemic in 2020 and Russia's invasion of Ukraine in 2022 across all consumption bands. For non-household customers, prices bottomed in first half of 2021 (EUR16/MWh) and prices peaked in the first half of 2023 (EUR 146/MWh), similarly, for household customer

they bottomed in first half of 2021 (EUR23/MWh) and peaked in the second half of 2022 (EUR 100/MWh) (European Commission, 2024a).

#### Moldovan Non-Household Gas Prices—Historical Values

Consumption Band	2019	2019	2020	2020	2021	2021	2022	2022	2023
	S1	S2	S1	S2	S1	S2	S1	S2	S1
	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh
Less than 278 MWh	27.8	28.3	28.2	25.2	16.6	46.2	78.1	144.0	146.0
Between 278 and 2,778 MWh	27.8	27.9	28.2	25.5	19.5	41.2	77.6	132.3	143.0
Between 2,778 and 27,778 MWh	26.5	26.7	26.6	25.2	18.6	33.5	75.8	114.5	139.0
Between 27,778 and 277,778 MWh	22.7	23.5	23.6	18.9	15.9	30.7	74.8	120.5	138.6
Between 277,778 and 1,111,111 MWh							68.6	114.5	

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: S1 refers to the first half of the year i.e. January to June, S2 refers to the second half i.e. July to December. Prices exclusive of taxes and levies.

#### Moldovan Household Gas Prices—Historical Values

Consumption Band	2019	2019	2020	2020	2021	2021	2022	2022	2023
	S1	S2	S1	S2	S1	S2	S1	S2	S1
	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh	EUR/ MWh
Less than 5.5 MWh	26.5	26.8	26.9	26.2	22.5	32.7	78.2	92.0	87.6
Between 5.5 and 55.5 MWh	27.5	27.9	28.0	24.2	22.5	43.5	77.9	100.2	100.2

Source: FTI analysis based on Eurostat data (European Commission, 2024a)

Note: S1 refers to the first half of the year i.e. January to June, S2 refers to the second half i.e. July to December. Prices exclusive of taxes and levies.

On February 21, 2024, ANRE approved tariffs for the gas distribution service as a matter of urgency as it is important for the regulated prices of supply. As a result, domestic consumers will pay 3.33 Moldovan lei (c.EUR 0.19) less for 1 m<sup>3</sup> of gas than previous price (ANRE, 2024).

ANRE specifies that regulated prices for the supply of natural gas are annual. They are approved on the basis of a forecast of a weighted average annual purchase price of natural gas by the supplier with a public service obligation. According to the regulations in force, whenever the conditions for adjustment are met, the supplier will submit a request for adjustment. The main reason for the need of adjustment is the change in the purchase price of gas from the sources (ANRE, 2024).

## Recent Evolvement Of Gas Supply Prices For Moldovagaz

Pressure level	Units	02.21.2024	06.07.2023	% Decrease
At the exit points from natural gas transmission networks	EUR/1000m <sup>3</sup>	504	758	-34%
At the exit points from high pressure natural gas distribution networks	EUR/1000m <sup>3</sup>	510	767	-33%
At the exit points from medium pressure natural gas distribution networks	EUR/1000m <sup>3</sup>	563	807	-30%
At the exit points from low pressure natural gas distribution networks	EUR/1000m <sup>3</sup>	749	939	-20%

Source: FTI analysis based on ANRE decision No. 312 of 06-07-2023 and ANRE Decision No. 92/2024<sup>58</sup> (ANRE MD, 2024e)

Note: Exchange rate from National Bank of Moldova for corresponding date.

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<sup>58</sup> Decision No. 92, February 2024. Regarding the approval of regulated prices for the supply of natural gas by SA "Moldovagaz" in the context of the public service obligation for certain categories of final consumers and for the supply of last option

## 10 Regulatory framework in Romania: gas distribution and renewable energy generation

### 10.1 Energy regulatory bodies in Romania

In Romania, the Ministry of Energy, in accordance with Law No.123/2012<sup>59</sup> on electricity and natural gas, sets the national energy strategy and the national policy with respect to energy with the engagement, when required, of representatives from the energy industry, non-governmental organizations, social partners and other representatives of the business environment. The Ministry is also responsible for ensuring the implementation of these policies, by promoting new legislation to regulate the sector, commissioning studies to establish priorities regarding strategic investments and acting as the contracting authority for the granting of concessions and other initiatives, with the exception of the transmission network operated by Transgaz S.A. (Tansgaz, 2023) and Transelectrica S.A. (Tanselectrica, 2023), which are under the authority of the General Secretariate of the Government.

In July 2012, the Romanian authorities adopted the new Law No. 123/2012 on electricity and natural gas in order to meet the EU requirements of the Third Energy Package. Further regulatory changes in the energy sector involved the implementation of the Directive (EU) 2019/944<sup>60</sup> on common rules for the internal market for electricity into the national legislation, which came into effect on December 31, 2021, through the Government Emergency Ordinance No. 143/2021<sup>61</sup>. Subsequently, in 2022 and 2023 some secondary regulation was enacted to amend and establish new procedures related to different aspects in the electricity and gas sector such as the connection to the gas distribution,<sup>62</sup> criteria for approving the investment plans of transmission and system operators,<sup>63</sup> natural gas storage,<sup>64</sup> or performance standard for natural gas distribution service<sup>65</sup>, among others.

The key authorities in the electricity market include the Ministry of Energy, The General Secretariat of the Government, the National Environment Protection Agency and the Romanian Energy Regulatory Authority.

**The Ministry of Energy** is responsible for:

- Managing the public assets in the energy sector, with the exception of those pertaining to the gas and electricity transmission network, which are under the subordination of the General Secretariat of the Government;
- Drafting the national energy strategy and policy, and the implementation of the Government policy in the energy sector;
- Identifying and defining the objectives of the energy sector and the best ways of achieving such objectives;
- Initiating legislative projects in the energy sector; and
- Monitoring compliance with EU obligations and requirements.

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<sup>59</sup> Law No.123, July 2012. Law on electricity and natural gas

<sup>60</sup> European Parliament and the European Council, Directive (EU) 2019/944, June 2019. Directive on common rules for the internal market for electricity and amending Directive 2012/27/EU

<sup>61</sup> Government Emergency Ordinance No. 143, December 2021. Amendment and supplement of the Law on electricity and natural gas No. 123/2012 and for amending certain regulatory acts

<sup>62</sup> ANRE Order No. 136, December 2022. Amendment and completion of the Regulation on the connection to the natural gas distribution system

<sup>63</sup> ANRE Order No. 11, 2022. Procedure on the grounds and criteria for approving the investment plans of transmission and system operators, distribution and storage of natural gas, as well as LNG/hydrogen terminals

<sup>64</sup> ANRE Order No. 119, 2022. Regulation on natural gas storage in the natural gas distribution system

<sup>65</sup> ANRE Order No. 131, 2022. Performance Standard for natural gas distribution service

The **National Environmental Protection Agency** is a public central administration authority, subordinated to the Ministry of Environment, with competences in the following areas:<sup>66</sup>

- Strategic environmental planning and environmental factors monitoring;
- Permitting of activities which have an impact on the environment;
- Implementation of the environmental legislation, strategies and policies;
- Reporting to the European Environment Agency;
- Co-ordinating the implementation of environmental strategies and policies;
- Permitting activities having an impact on the environment and providing the compliance with the legal provisions;
- Representation on environmental aspects, both at a national and international level;
- Coordination, monitorization and control of the activity of environmental protection agencies in its subordination.

The **Romanian Energy Regulatory Authority (ANRE)** is responsible for adopting regulations in the electricity and gas sectors. In 2007, the regulatory bodies for electricity (ANRE) and natural gas (ANRGN) were merged under the name of the Romanian Energy Regulatory Authority (ANRE) following Government Emergency Ordinance No. 33/2007,<sup>67</sup> and ANRE Decision No. 410/2007.<sup>68</sup> In 2009, ANRE took over the activities of the Romanian Agency for Energy Conservation (ARCE), assuming responsibility for monitoring and implementing energy efficiency measures and promoting the use of renewable energy sources by final consumers.<sup>69</sup>

ANRE is responsible for promoting a modern energy sector, which responds to the major principles and objectives of the European Union energy policy of electricity and natural gas and capable of meeting consumer demand. In accordance with the provisions of Law no. 160/2012<sup>70</sup> on its organization and functioning, ANRE complies with and implements all relevant and legally binding decisions of the Agency for the Cooperation of Energy Regulators (ACER) and the European Commission (ANRE RO, 2022).

ANRE has developed and issued in recent years several orders, decisions and opinions in accordance with the obligations deriving from the primary national law and European legislation. Such regulation is published in the Official Gazette.

### **Responsibilities**

ANRE regulates electricity, heat and the natural gas sectors. Responsibilities include licensing, issuing technical and commercial regulations including the regulation of access to the transmission and distribution networks, tariff setting, energy efficiency and protection of consumer and investor interests (ERRA, 2014).

ANRE develops the regulatory system in order to meet the requirements imposed by the liberalisation of the energy markets, the completion of the internal market, and the requirements of ensuring a predictable regulatory framework and a stable investment climate, in order to ensure continuity of energy supply, in secure conditions and at affordable prices. The main tasks conferred by Law 123/2012<sup>71</sup> are:

- Issuing, amending or withdrawing authorisations and licences;

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<sup>66</sup> Government Decision No. 1000, October 2012. Reorganization and functioning of the National Environmental Protection Agency and the public institutions subordinated to it

<sup>67</sup> Government Emergency Ordinance No. 33, May 2007. Organization and operation of the National Regulatory Authority in the Energy Sector (amended and supplemented the Electricity Law no. 13/2007 and the Gas Law no. 351/2004)

<sup>68</sup> Decision No. 410, May 2007. Regulation on the organisation and functioning of the National Energy Regulatory Authority

<sup>69</sup> Law No. 329, November 2009. Reorganization of some public authorities and institutions, the rationalization of public expenditures, the support of the business environment and the observance of the framework agreements with the European Commission and the International Monetary Fund

<sup>70</sup> Law No. 160, October 2012. Organization and functioning of ANRE

<sup>71</sup> Law No.123, July 2012. Law on electricity and natural gas, article 7

- Issuing technical and commercial regulations, ensuring access and connection to electricity and gas networks;
- Issuing and approving pricing and tariff methodologies, approving prices and tariffs;
- Monitoring the functioning of the electricity and gas markets;
- Promotion of electricity production from renewable energy sources and high efficiency cogeneration (CHP);
- Creating the legal framework for the development and implementation of national energy efficiency policy to achieve the national energy efficiency target.

In relation to competition, the Competition Council is the autonomous administrative body responsible for promoting competition and consumers' interests. It is responsible for monitoring behaviour of market players, approving mergers that result in significant market concentration and state aid issues.

### **Administration and Funding**

For issuing and approval of regulations, a Regulatory Committee is established by the Parliament in a joint sitting of both Houses. The Committee is empowered to approve regulations in the electricity, heat and natural gas sectors and is made up of 7 members including the President and the two Vice-Presidents according to Law 160/2012.<sup>72</sup>

ANRE is financed through its own funds which are obtained from fees charged for licensing, permits and certifications, from annual contributions paid by the regulated undertakings in the electricity, heat and natural gas sectors as well as from funds provided by international organisations.<sup>73</sup>

## **10.2 Regulatory instruments**

In the gas sector, ANRE issues authorisations for the establishment of new capacities, such as (i) upstream supply pipelines related to the production of natural gas; (ii) surface technological installations related to underground storage of natural gas, in case of new deposits; (iii) transmission systems; (iv) distribution systems; (v) gas mains; (vi) production installations for hydrogen, liquified natural gas or bigas/biomethane.

Licences are issued for specific activities in the gas sector, including:

- Supply of natural gas, liquified natural gas or biogas/biomethane;
- Operation of various facilities (e.g., upstream supply pipelines, underground storage system, transmission system, distribution system, liquified natural gas terminals);
- Management of centralized markets;
- Trading of natural gas; and
- Commercial exploitation of installations for the production of hydrogen.<sup>74</sup>

Through a decision of the President of ANRE, the Authority can issue, amend, suspend, or withdraw a licence or authorisation (L&A) or deny any such actions requested by an applicant.<sup>75</sup> ANRE establishes the validity term of each licence based on the data provided by the applicant.

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<sup>72</sup> Law No. 160, October 2012. Amendment and completion of the Electricity Law No. 13/2007 and Gas Law No. 351/2004, article 4

<sup>73</sup> Law No. 160, October 2012. Amendment and completion of the Electricity Law No. 13/2007 and Gas Law No. 351/2004, article 2

<sup>74</sup> ANRE Order No. 199, October 2020. Regulation on the issuance of authorisations and licences in the natural gas sector, and Law 123, July 2012. Law on Electricity and Natural Gas, Article 119

<sup>75</sup> ANRE Order No. 199, October 2020. Licences and Authorisations in the gas sector, article 31

For gas, ANRE issues framework validity conditions for each type of L&A, plus associated conditions which contain the rights and obligations of the holder, any conditions, limitations and restrictions regarding the continuity and the regime of operation of the L&A objectives, the technical data and system/objectives and the obligation to provide information and the format of the data transmission specified by ANRE and/or the regulations in force.<sup>76</sup>

An amendment of a L&A can be made at the request of the holder, in limited cases, or at ANRE's initiative. ANRE can initiate the amendment of an L&A in several situations, such as changes in circumstances or where events substantially affect the L&A activities.<sup>77</sup>

Applicants must prove they have the necessary financing available from various sources (such as shareholders loans, bank credit lines and so on). This is a requirement for companies applying for specific licences from ANRE. For example, the minimum requirement for an electricity trading licence or for an electricity supply licence is to ensure financing of 25% of the estimated turnover for the first 12 months of operation, but not less than EUR 100,000 (Practical Law, Thomson-Reuters, 2020).

According to the Regulation for the issuance of licences and authorizations in the natural gas sector, when requesting the issuance of the supply licence, the applicant needs to submit to ANRE documents (bank statements, financial statements, contracts and so on) proving that it has available an amount equal to at least 25% of the estimated turnover to be achieved in the first 12 months of activity as supplier, but not less than EUR 100,000.<sup>78</sup>

### **10.3 Gas distribution regulatory framework in Romania**

The gas distribution service is considered a public utility service of general interest, thus is subject to a concession under Romanian law.<sup>79</sup> This means that the concessionaire has the right but also the obligation to carry out the service, in return of a royalty for a determined period, according to the provisions of the law and of the concession agreement. The grantor of the concession can be either the state or the territorial administrative units, and they are entitled to inspect the activity of the concessionaire in accordance with the concession agreement.<sup>80</sup>

In November 2023, 16 operators held a concession for the distribution of natural gas. The main Romanian gas distributor operators are Distrigaz Sud Retele, Delgaz Grid and Premier Energy, which jointly gather c.90% of total grid length. The other 13 operators account for the remaining c.10%.

In Romania, distribution system operators (DSOs) are subject to an economic regulation framework, which differs depending on whether they hold a concession or not. In the case of concessions, the legal framework for setting the gas distribution regulated revenue is provided by ANRE Order No. 217/2018,<sup>81</sup> which approves the methodology that establishes the allowed revenues for each 5 year regulatory period. Each regulatory year starts on January 1 and ends on December 31 the same year.<sup>82</sup> Since the advent of the methodology in 2018, it has been modified several times.

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<sup>76</sup> ANRE Order No. 199, October 2020. Licences and Authorisations in the gas sector, article 15

<sup>77</sup> ANRE Order No. 199, October 2020. Licences and Authorisations in the gas sector, article 21

<sup>78</sup> ANRE Order 199, October 2020. Licences and Authorisations in the gas sector, article 12

<sup>79</sup> Law No. 123, July 2012. Law on electricity and natural gas, article 103 and article 135

<sup>80</sup> Law No. 287, July 2009. Romanian Civil Code, article 871

<sup>81</sup> ANRE Order No. 217, December 2018. Approval of the Methodology for establishing regulated tariffs for distribution services in the natural gas sector

<sup>82</sup> ANRE Order No. 217, December 2018. Approval of the Methodology for establishing regulated tariffs for distribution services in the natural gas sector, article 3 point 3 and 4



ANRE publishes the orders that approve tariffs for each DSOs (ANRE RO, 2024d). Distribution tariffs cover one tariff year, from July 1 till June 30 the following year, instead of regulatory year.

### Allowed Revenue

Distribution system operators (DSOs) are subject to an economic regulation framework established by ANRE which provides a maximum regulated revenue per year. The methodology for determining the Allowed Revenue is based on a revenue cap scheme based on the regulatory asset base (RAB) and the operational costs for each DSO. The Allowed Revenue is calculated as depicted below in a simplified manner:

$$\text{Allowed Revenue (AR) (Y}_n\text{)} = \text{RAB Depreciation} + \text{RAB} \times \text{RRR} \times \text{CPI} + \text{OPEX}_{(Y_n)} \times \text{CPI} - X \pm \text{Deviation factor (Y}_{n-1}\text{)}$$

The main components and considerations are:

- **Allowed Revenue.** This corresponds to the revenue for each year within the 5-year regulatory period. Allowed Revenue is set the first year and thereof adjusted in subsequent years;
- **Regulatory periods.** The fourth regulatory period ran from 2019 to 2023 and 2024 is defined as a transition year before the fifth regulatory period that will start in January 2025;
- **Regulatory Asset Base (RAB).** This asset base is built on the tangible and intangible assets recognized by ANRE for each DSO to carry out the distribution activity. RAB increases with the incorporation of new assets and decreases with retirements and depreciation, and is adjusted with CPI. At the beginning of the year, the RAB is estimated using the value of the RAB on December 31 the previous year, and adjusting it with the estimated inflation;
- **RAB Depreciation.** Corresponds to the linear depreciation of the RAB. The depreciation period depends on the asset type;
- **Regulated rate of return (RRR).** Corresponds to the weighted average cost of capital (WACC) value in real terms, before tax, which is approved by ANRE. WACC for the current period stands at 6.39%,<sup>83</sup> and has been extended for 2024 transitory regulatory period. WACC can be exceptionally be updated during the regulatory period, which was the case during the fourth regulatory period;
- **Operational costs.** Costs are divided between controllable and non-controllable costs. Non-controllable costs (i.e. taxes, royalties) are a pass-through, as well as technological consumption (TC). For 2024, TC is calculated using the ANRE methodology, valued at a price based on the formula: 25% at the market price and 75% at the regulated price (150 Lei/MWh). After March 2025, TC value will be assessed at market price. Controllable costs grow with CPI, with an efficiency factor (X) that currently stands at 1%, which was used in the previous regulatory period and will remain in 2024. Some costs like safety or labour costs are not subject to this efficiency factor. For 2024, labour costs are capped to inflated 2023 base. For 2024, there are some specific temporary provisions related to (i) controllable operational costs; (ii) staff costs, and; (iii) occupational safety costs, which cannot exceed the substantial value for 2023 adjusted by the estimated 2024 inflation of 2024, according to the ANRE Order No. 101/2023;<sup>84</sup>
- **Revenue corrections and corresponding tariff corrections (Deviation Factor).** ANRE reviews each year the level of the corrected regulated revenue in order to balance projected against actual. If the corrected revenue for year (n-1) leads to a significant change in the distribution tariffs, ANRE may decide, in consultation with a DSO, that part of this revenue shall be recovered in the following year(s), as appropriate, and the update shall be made at the inflation rate corresponding to the period in which the recovery is made. The adjusted regulated revenue for each year of the regulatory period shall form the basis for determining the distribution tariffs, which the DSO is entitled to charge in the contracts for the

<sup>83</sup> ANRE Order No. 101, November 2023. Methodology for setting regulated tariffs for distribution services in the natural gas sector, approved by Order of the President of the National Energy Regulatory Authority No 217/2018

<sup>84</sup> ANRE Order No. 101, November 2023. Methodology for setting regulated tariffs for distribution services in the natural gas sector, chapter XII

provision of distribution services. Mid-year revenue corrections are also possible where material changes to costs or distributed volumes are observed (more than 10%).<sup>85</sup>

### Income and Tariffs

DSOs are obliged to submit to ANRE proposals for the regulated revenue, the corrected regulated revenue and for distribution tariffs for the first year of the regulatory period, together with supporting documentation, 150 days before the first day of the tariff year. Based on the proposals submitted by the DSOs and an internal analysis, ANRE issues a report with proposals for distribution tariffs.

The tariff system for the distribution of natural gas comprises five differentiated tariffs per client category for each of the DSOs. Customers are differentiated primarily based on their gas consumption, as follows:

Gas consumer categories Customer categories	Units	Annual gas consumption	
		Minimum	Maximum
C.1	MWh		≤280
C.2	MWh	>280	≤2,800
C.3	MWh	>2,800	≤28,000
C.4	MWh	≥28,000	≤280,000
C.5	MWh	≥280,000	

Source: FTI analysis based on ANRE Order No. 217/2019 article 48 Apart from the tariffs based on consumption, two further types of tariffs are applied, for customers who: (i) benefit from the proximity distribution tariffs (C.6) and (ii) benefit from the transit distribution tariffs (C.7).

The annual tariff is calculated as the ratio of Allowed Revenue and the estimated distributed gas volumes for each customer category, calculated each year.

$$\text{Annual Tariff} = \frac{\text{Allowed Revenue (AR)}}{\text{Number of projected units of gas}}$$

### Incentive mechanisms including other income: ancillary services

The methodology on gas distribution tariffs provides that the revenues obtained by a DSO from ancillary activities are not considered regulated revenues of the distribution activity. Therefore the costs incurred with ancillary activities are not included in the costs recognized by ANRE for the distribution activity. However, if during a regulatory year the rate of return achieved from the ancillary activities exceeds a 5% allowed limit, the excess will be considered revenue related to the distribution activity.<sup>86</sup>

### CAPEX efficiency

According to ANRE Order No. 38/2019,<sup>87</sup> before each regulatory period, the DSO has to produce and submit a 5-year investment plan, providing financial detail per each year of the regulatory period. The investment plan for DSOs with more than 100,000 customers also contains granularity for each category of works and for every year. For DSOs covering more than 100,000 customers, the value of the investments intended for amenities cannot exceed 15% of the total value of the annual investment plan. The investment plans must be approved by ANRE.

<sup>85</sup> ANRE Order No. 101, November 2023. Methodology for setting regulated tariffs for distribution services in the natural gas sector, article 66

<sup>86</sup> ANRE Order No. 217, December 2018. Approval of the Methodology for establishing regulated tariffs for distribution services in the natural gas sector, article 70

<sup>87</sup> ANRE Order 38, March 2019. Procedure regarding the qualification and criteria to approve the investment plans of the TSO, DSO, Storage and LNG Terminals for natural gas, article 37 paragraph 2

The DSO can amend the investment plan for the current year until October 1 with the observance of ANREs requests. The DSO has the obligation to justify each change of the investment plan and send supporting documents in this sense to ANRE.

ANRE will approve ex-post the performed investments. However, if the total value of an investment exceeds more than 10% the value provided in the investment plan, ANRE will keep in the regulatory asset base only those justified investments.

#### **Efficiency drivers<sup>88</sup>**

ANRE sets the controllable and non-controllable (pass-through) costs for the first year of the regulatory period based on an analysis considering the costs submitted by each DSO.

An efficiency factor (X-factor) is applied on controllable OPEX (excluding costs regarding technological consumption, expenses with social security and personnel costs), during the regulatory period. For distribution (DSO), the X-factor is set to 1% for each year of the regulatory period 2020-2023, and this value has been extended for 2024.

In case of exceptional circumstances that might intervene in the development/performance of the distribution activity, ANRE may adjust the efficiency factor, at the request of the DSO.

#### **Efficiency gains<sup>89</sup>**

Annual efficiency gains achieved throughout a regulatory period, shall be accumulated and transferred to customers on a straight-line basis during the following regulatory period.

The annual efficiency bonus shall be discounted by the rate of inflation up to the year in which it is to be surrendered and 60% of the efficiency gain realised by the DSO from the fourth regulatory period onwards shall be passed on to gas customers and 40% shall be retained by the DSO.

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<sup>88</sup> ANRE Order No. 217, December 2018. Approval of the Methodology for establishing regulated tariffs for distribution services in the natural gas sector, article 2, article 24, article 38

<sup>89</sup> ANRE Order No. 217, December 2018. Approval of the Methodology for establishing regulated tariffs for distribution services in the natural gas sector, article 38

## Summary and Observations

Subject	Qualification
Regulatory Laws	Order 217/2018, Order No. 38/2019, Order 101/2023 and Order 103/2023
Type	Revenue Cap
Revenue drivers	Regulatory Asset Base (RAB) and Operational Costs
Regulatory period (Yr)	5 years. Extended 1 transitory year for 2024
X efficiency factor	Yes – reflects the potential operational cost savings (OPEX), excluding costs related to technological consumption, labour safety expenses and personnel costs. For the period X = 1%.
Incentives / Efficiency gains	60% over the period returned to customers, remainder may be retained by a company
Indexation	RO CPI
Profit calculation	Regulated WACC
Asset lives	Varying lives for other assets (Polyethylene pipes for example 40 years)
Change deviation trigger	±10%
Tariff structure	5 flat tariffs, one for each customer categories + 2 tariffs: proximity and transit

Source: FTI analysis based on ANRE

- Forward consumption estimates for each of the 5 consumption tariff groups is important as accuracy in Y<sub>n</sub> impacts Regulated Revenue income in Y<sub>n</sub>;
- Where financial deviations occur in Y<sub>n</sub> these are compensated for in Y<sub>n+1</sub>. This provides more certainty of income than the standard price-control period which sets a maximum Allowed Revenue across the period;
- Most of a DSO's costs are adjusted for inflation or direct pass-throughs;
- For revenue corrections in favour of a DSO,<sup>90</sup> the company is to submit to ANRE the request for the adjustment of the revenue and associated distribution tariffs at least 120 days before the date from which they are established. This time frame puts pressure on company cash-flows;
- Regulatory depreciation assumptions determine the speed that RAB additions are paid for by customers and it is unclear from the current ANRE methodology whether the majority of the asset lives will change in the future. We have found no evidence at the moment of writing this report whether the majority of the asset lives will change in the future.

### Regulatory outlook for gas distribution

As discussed, the fourth regulatory period regarding distribution and transport tariffs ended in 2023, with 2024 acting as a transition year between the fourth and the fifth regulatory period. For this purpose, a new tariff methodology will be presented for public consultation for natural gas distribution. We have found no evidence at the moment of writing this report that the methodology for the fifth regulatory period will materially differ from the currently in place.

According to the ANRE Regulatory program for the 2024–2025 period, other envisioned changes in the gas distribution sector refer to: (i) amending the regulation regarding connection to the natural gas distribution system; (ii) issuing new regulation on the connection of biomethane production plants to gas transmission or

<sup>90</sup> ANRE Order No. 217, December 2018. Approval of the Methodology for establishing regulated tariffs for distribution services in the natural gas sector, article 56

distribution networks; (iii) amending Order No. 75/2020<sup>91</sup> on setting the regulated rate of return on invested capital applied to the setting of tariffs for electricity and natural gas distribution, transmission and system services until the end of the fourth regulatory period and amending some regulatory acts issued by ANRE; (iv) amending ANRE Order No. 78/2020<sup>92</sup> regarding the framework agreement for distribution of natural gas and general contracting conditions for distribution of natural gas.

Lastly, the Government Program for 2023-2024 briefly mentions as an objective, the initiation of investments in the extension of the gas transmission and distribution network, with focus on the implementation of smart transmission and distribution networks for both natural gas and electricity, especially electricity produced from renewable sources (Government of Romania, 2023b).

## 10.4 Incentive schemes for renewables

Following the adoption of the 2001 EC Directive, all EU countries, including Romania, who acceded to the EU in 2007, adopted measures to promote electricity generation from renewable sources (European Commission, 2008). The Romania Integrated National Energy and Climate Plan (NECP) from 2021-2030, which was updated on 21.12.2023, sets out its target to meet 36.2% of its total energy consumption from renewable energy sources in 2030 (Government of Romania, 2023a). Projections indicate that by 2025, this percentage will reach 32.3%. As part of this plan the country aims to meet 55.8% of its electricity production from renewable energy sources by 2030. Romania expects to achieve this through the construction of new wind and solar capacities for electricity generation.

Romania enacted a support scheme for renewables in 2011, which relied on a system of annual purchase obligations from renewable energy sources (quota) by electricity suppliers, combined with the trading of green certificates (GCs) (Government of Romania, 2011). While this scheme is still in place, only renewable energy capacity in place prior to December 31, 2016 is eligible to benefit from the scheme<sup>93</sup> (Government of Romania, 2008; Government of Romania, 2020). Currently, renewable promoters can access incentives to develop small-scale self-producers (prosumers), or larger projects through EU-funded grants.

### Green Certificate scheme

In 2008, Law 220/2008 was issued for establishing a system to promote the production of energy from renewable energy sources which implemented a support for renewables based on green certificates (GCs) granted to renewable electricity producers. This support scheme became applicable in 2011. Romania later adopted in December 2014 Government Decision 495/2014 (GC Decision) excluding certain categories of consumers from Law 220/2008 to reduce burdens by granting certain pricing exemptions.

The Government aimed to balance the conflicting interests of producers and consumers, and consequently the GC scheme was changed, first through ANRE Order No. 5/2016 (which was later annulled) (ROLII, 2017; HG, 2018; Legal Marketing, 2020) and Government Ordinance no. 24/2017, which amended Law 220/2008. The later introduced a new mechanism for calculating the mandatory quota from renewable energy, while considering a fixed annual quantity of GCs. The GCs issued after March 31, 2017 and those which were postponed from July 1, 2013 are extended until 2031 and may be traded until March 2032. This provision was aimed at securing the validity of the GCs for the period necessary to be traded, since their previous validity was only 12 months. Currently renewable producers have three options to sell their GCs: they can sell them

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<sup>91</sup> ANRE Order No. 75, May 2020. Establishment of the regulated rate of return on invested capital applied to the establishment of tariffs for distribution, transport and system services of electricity and natural gas until the end of the fourth period of regulation and amendment of some normative acts issued by the National Regulatory Authority in Energy field

<sup>92</sup> ANRE Order No. 78, May 2020. Approval of the natural gas distribution framework contract and the general contracting conditions for the provision of the natural gas distribution service

<sup>93</sup> Law No.220, October 2008. Establishment of the system for the promotion of energy production from renewable energy sources (as amended by Law No. 139/2010)

at a regulated price on the market exchange, directly to suppliers or sell the GCs in an indirect way bundled with Power Purchase Agreements (PPAs).

### **Prosumers and EU grants**

Currently there are other schemes available to incentivise the development of new renewable power generation in Romania, ranging from incentives to small-scale self-producers (prosumers) to EU-funded grants to build large-scale new generation capacity.

**Prosumers** – In July 2018, Law 184/2018 took effect introducing the definition of prosumers in Romania. The Law foresees that final clients that own small-scale power-generating installations, including renewables and cogeneration, can consume, store and sell electricity produced in their own building. This includes blocks of flats, residential sites or businesses, provided these activities do not constitute their primary commercial or professional activity.

Starting from 2019, small consumers were allowed to install solar PV systems and to sell surplus production to the grid, becoming prosumers. In 2021 the maximum generation capacity for prosumers was increased to 400 kW (from 100 kW previously) and at the end of 2023 there was an estimated 1.4 GW of installed capacity by more than 100,000 prosumers in the country, according to the Association of Prosumers and Energy Communities of Romania (APCE, 2024).

**Grants** – Approved in October 2021, Romania's National Recovery and Resilience Plan (PNRR) allocates EUR 458m for new renewable capacities plus an additional EUR 280m for industry on production, assembly, recycling of batteries, cells and photovoltaic panels as well as new electricity storage capacity. In 2022 new renewable projects applied for grants as part of PNRR. The awarded projects received a grant (level dependent on technology) to cover part of their investment. The maximum amount of state aid for wind farms was EUR 1.3m/MW for facilities with a capacity between 0.2 MW and 1 MW, and EUR 650,000/MW for bigger power plants. As for solar parks, subsidies were as high as EUR 750,000/MW and EUR 425,000/MW for the same two respective categories. Projects with grants from the PNRR are to finish their construction by June 2024, but this deadline might be extended.

The implementation of the EU Modernisation Fund in Romania is also making available new grants through tenders for small generators (less than 1 MW) and for renewable energy utility scale producers. For larger power plants, the maximum support per MW is EUR 700k for wind projects, EUR 1.81m (hydro) and EUR 500k (solar PV). The public call for new projects to apply for these new grants is scheduled to be launched on March 2024, and will enable companies to get a total of EUR 815m in grants for renewable electricity projects (Todorović, 2024).

### **PPAs and Outlook for Contracts for Difference**

In 2021 Romania reintroduced bilateral Purchase Power Agreements (PPAs) to the market after this option being unavailable for nearly 8 years. Even though long-term bilateral PPA contracts with a duration of 15-20 years are allowed, most of the current negotiated PPA contracts are signed for a period up to 5-year terms. The long-term PPA market is starting to develop and might accelerate with the evolution of the renewables market in the country.

As regards future policies or incentives in place to encourage the use of renewable or low carbon energy, on August 7, 2023, the Ministry of Energy published a draft Government Decision for the approval of the Contracts for Difference (CfD) Scheme. The scheme was initially announced in spring 2019, and a memorandum was signed in mid-2020, however the progress in implementing this new support scheme is rather slow.

In addition, apart from the Government Decision approving the general legal framework for the implementation and functioning of the CfD support scheme, the following legislative acts need to be approved for the CfD Scheme to be fully in force:

- (i) Order of the Ministry of Energy regarding the approval of a CfD scheme for the production of electricity from renewable sources of onshore wind and solar photovoltaic energy.
- (ii) The Auction Initiation Order containing the auction rules.
- (iii) The CfD template is applicable to all awarded projects under the auction, which should be annexed to the Government Decision.
- (iv) Approval by the European Commission of the CfD Scheme.
- (v) Funding of the CfD Scheme through the Modernisation Fund and/or a CfD levy on the consumers.

According to an informative note to bidders published by the Ministry of Energy in relation to the CfD Scheme, the first CfDs should have been signed at the end of December 2023, however that deadline was not met. The CfD Scheme will include two rounds of auctions, each with separate tenders for onshore wind and solar production technologies, with a total capacity of 5,000 MW. The first auction round should take place at the beginning of 2024 for 2,000 MW of wind and solar energy (Ziarul Financiar, 2023).

The financing of the CfD scheme is expected to be ensured by funds secured by the Ministry of Energy from the Modernisation Fund. The mechanism of the CfD scheme involves (i) a strike price (which is determined through the auction), and (ii) a reference price, which will be calculated by the CfD counterparty according to a formula established in the CfD contract according to a methodology approved by ANRE, although this methodology is not yet available (Ministry of Energy, 2023).

In addition, a new trading platform seems to be in the process of being established at the level of BRM. Recently BRM has published on its website a draft Procedure for trading guarantees of origin (GOs) aiming to provide the terms and conditions of sale, acquisition and transfer of GOs. Both electricity producers and suppliers may participate in trading GOs, as sellers or buyers. GOs trading has become an increasingly important topic, both in Romania and at EU level. GOs show to a final customer that a given share or quantity of energy was produced from renewable sources and can facilitate consumers' contribution to the development of energy from renewable sources. The biggest obstacle in the trading of GOs is that Romania is not yet a member of Association of Issuing Bodies (AIB), which is in charge of the cooperation and harmonization of the procedures for trading GOs, including issuing common rules, methodology and standards for GOs. As Romania is not yet member of the AIB, while most European countries are, cross-border trade of GOs is still a practical barrier. Talks about Romania joining AIB have increased in the past years, with some unofficial sources envisaging a potential partnership starting with 2025.

## 11 Regulatory frameworks for electricity sector in Moldova

### 11.1 Energy Regulatory Framework

Key policy makers in the energy sector of Republic of Moldova are the following authorities:

- **Parliament of Moldova** issues primary legislation regulating energy sectors; establishes state policy in the energy sectors, approves policy documents, as well as normative acts related to energy security.
- **Ministry of Energy**, responsible for the development and promotion of policy documents.
- **National Agency for Energy Regulation (ANRE)**: regulates the activities in the energy sectors through licensing, tariff setting and approval of regulatory documents, within the competencies and duties established by law, as well as monitors the activity of energy undertakings with oversight of energy markets.
- **National Center for Sustainable Energy**: plays a key-role in ensuring implementation of state policy in the field of energy efficiency and renewable energy, including attracting the financing and promotion of projects in these areas.
- **State Commission for Emergency Situations (CSE)**: established in 2001 under Decision No. 1340 to insure the implementation of corresponding measures when Moldova declares a state of emergency.

The electricity and natural gas sectors are regulated by primary law relating to electricity, No. 107/2016 and natural gas, No. 108/2016, and a separate law on energy, No. 174/2017, which established the main principles for organizing activities, as well as competences of the regulatory authority. These laws were adopted to ensure transposition of the EU third Energy Package. Implementation through the issue of secondary acts was developed and approved by ANRE and by the Government (the relevant ministry being responsible for developing the drafts).

The Law on natural gas and the Law on electricity (Parliament of Moldova, 2016) address the following aspects:

- Administrative and regulatory competencies of Moldovan authorities and institutions
- Licensing of activities in the electricity and natural gas sectors
- Electricity and natural gas production, gas storage
- Electricity/natural gas transmission and distribution, unbundling of activities
- Cross-border exchanges in electricity and congestion management
- Access to electricity and natural gas networks and provision of transmission and distribution services
- Land use and rights over third party property
- Aspects related to final customers
- Electricity/natural gas supply
- Electricity/natural gas market
- Regulation of prices and tariffs
- Dispute settlement and liability for breaching the legislation in the electricity and natural gas sectors.

#### **Regulatory Body – ANRE (Moldova)**

ANRE is the national regulatory authority in the Republic of Moldova, which undertakes regulatory oversight and monitoring of activities in the energy sector, i.e. the sectors of electricity, natural gas, heating, petroleum products, water and sewerage and renewable energy.

In connection with electricity and natural gas distribution and supply activities, the Law on electricity and the Law on natural gas established guidance on licensing procedures and sets specific requirements for the separation and independence of DSOs – requirements that were undertaken from the transposed EU Third



Energy Package. The respective laws also define the rights and duties of DSOs and suppliers, including specific public service obligations (e.g., universal supply and supply of last resort, which are provided at prices regulated by ANRE).

## **Responsibilities**

The duties and responsibilities of ANRE are listed in Law of energy No 174/2017.<sup>94</sup> The major ones are listed below in summary form<sup>95</sup>.

- Issue and revocation of licences and permits for activities in the energy sector,
- Application of the law and the protection of consumer rights
- Promotion of the development of energy markets under conditions of competitiveness
- Promotes and facilitates access of new participants, including the producers of energy from renewable sources to the electricity and natural gas networks by eliminating barriers to access
- Promotes the development of competition in natural gas and electricity markets
- Oversight of the reliable and safe operation of the electricity networks and the natural gas networks
- Eliminates restrictions that impede the commercial exchange of electricity, natural gas on the regional market
- Monitors the activity of energy market participants and ensure compliance with energy legislation
- Monitors and ensure compliance by energy companies with transparency in their activities including price transparency on the wholesale markets.
- Promotes a fair and economically argued tariff policy, applying the regulated tariffs and prices
- Approves regulated tariffs and prices in accordance with approved methodologies
- Implements maximum efficiency at minimum cost and monitors compliance by energy companies to ensure no cross-subsidization

## **Administration and Funding**

ANRE is financed exclusively from regulatory fees paid by licence holders in the energy sectors: electricity, natural gas, heating and petroleum products. The organisation also regulates the water and sewage sectors and licencees from this sector also pay regulatory fees.

## **Regulatory Instruments**

Electricity and natural gas distribution activities, as well as supply activities in these sectors are carried out on the basis of licences, issued by ANRE including a licence for electricity distribution, licence for natural gas distribution, licence for electricity supply and a licence for natural gas supply. The licensing procedure, including the requirements to be fulfilled by applicants, the necessary documents to be filed and the deadlines are established in the Law on electricity<sup>96</sup> (Chapter III), Law on natural gas<sup>97</sup> (Chapter III) and the Law on regulating entrepreneurial activity through authorization No. 160/2011<sup>98</sup> which sets general principles and procedure to be followed in order to obtain a licence.

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<sup>94</sup> Law No. 174, September 2017. Establishes the legal framework for organizing, regulating and ensuring the efficient and safe operation of the energy sectors

<sup>95</sup> Taken from Law No 174/2017 but severely truncated for the purposes of inclusion in this Report

<sup>96</sup> Law No. 107, May 2016. Establishes a general legal framework for organizing, regulating, ensuring the efficient operation and monitoring of the electric energy sector intended to supply consumers with electricity under conditions of accessibility, availability, reliability, continuity, quality and transparency.

<sup>97</sup> Law No. 108, May 2016. Establishes a general legal framework for the organization, regulation, ensuring the efficient operation and monitoring of the natural gas sector intended to supply consumers with natural gas under conditions of accessibility, availability, reliability, continuity, quality and transparency

<sup>98</sup> Law No. 160, July 2011. establishes the legal regulatory framework by authorizing entrepreneurial activity

In addition, for the purposes of setting tariffs in these sectors ANRE proposes tariff setting methodologies which are issued under the respective electricity and gas laws (107/2016 and 108/2016) as Resolutions or secondary legislation documents.

These Resolutions in effect set the price control periods (currently 5 years) and ultimately each company's allowed revenue via a published mechanism.

## 11.2 Electricity Distribution Regulatory Scheme

Access to an electricity network must be offered by all network operators to all system users, without discrimination. According to the Law on electricity, the contract for electricity distribution is concluded by the DSOs with suppliers, which provide supply services to final consumers. Final consumers do not conclude contracts for the provision of distribution services directly with the DSOs.

Electricity distribution activities are fully regulated, meaning that the tariffs for electricity distribution services are approved by ANRE according to a published tariff methodology, developed and approved by ANRE. The Law 107/2016 defines in article 87 the main principles regarding the calculation and approval of regulated distribution tariffs.

ANRE utilises a revenue cap economic model for the regulation of electricity distribution companies. Maximum allowed revenues are calculated based on a building-block methodology (ANRE MD, 2018) considering a quasi pass-through of allowed costs, and regulated return on investments. When calculating tariffs, the Allowed Revenue (AR) is adjusted for over/under-recovery in earlier years.

The tariff methodology is approved for a period of 5 years and reviewed at the end of each regulatory period. The 2018 methodology, however, is still applicable, being prolonged by ANRE Decision No. 116/2023<sup>99</sup> approving the extension of the application deadlines until the approval of the new methodologies. ANRE may also modify approved tariff methodologies within a regulatory period in case of amendments to primary legislation which directly affect the tariff setting principles or in other cases when such interventions are properly justified.

### Allowed Revenue

Allowed revenues are calculated combining (i) a "RAB times WACC" remuneration with annual (partial) WACC update, (ii) cost of allowed energy losses, (iii) OPEX incentives over the regulatory period (usually 5 years) and (iv) an annual make-up of deviations between plan and actual cost. Deviations can result from differences between forecast vs. actual values for (i) exchange rate, (ii) CPI, (iii) loss volumes (iv) cost of electricity for losses and (v) grid usage and lead to a make-up in following years.

During the year a DSO has the right to request ANRE to update the tariffs, if there are factors outside the control of the DSO (fluctuation of the national currency exchange rate, adoption of legislative acts establishing additional obligations on DSO, leading to increased distribution costs, etc.), which justify such an update and which lead to a deviation of more than 5% of the annual distribution cost established in tariffs.

$$\text{Allowed Revenue (AR)} = \text{RAB}_{USD} \text{ Depreciation}_{(Yn)} + \text{RAB}_{USD} \times \text{WACC}_{(Yn)} + \text{OPEX}_{(Y0)} \times \frac{\text{CPI} - X}{(X=0.2 \times \text{CPI})} \times \frac{1 + \Delta \text{GC}}{\Delta \text{GC}} + \text{Losses} \pm \text{Difference make-up}_{(Yn-1)}$$

Where:

- **Allowed Revenue**
  - Are set separately for three voltage levels (≤0.4kV, 6-10 kV, 35-110 kV)

<sup>99</sup> Decision No. 116, March 2023. Approving the extension of the application deadlines for some regulatory acts approved by the Administrative Board of the National Agency for Energy Regulation

- Are to be translated into tariffs for kWh distributed electricity or kW contracted capacity
- **RAB** – For foreign-owned DSOs the regulated asset base (RAB) is denominated in USD
  - The RAB is denominated in USD; depreciation and return on capital are therefore determined in USD
  - For tariff determination, the USD values are converted to MDL using the annual average exchange rate
  - Capital cost-based revenues are therefore insulated from exchange rate fluctuations (USD vs. MDL)
- **WACC** – is determined annually
  - The risk-free rate is set annually at previous year's 10-year US treasury level
  - The country risk premium is updated annually but a cap of 7.5% is applied
  - The equity risk premium is set at 5.2%
  - The unlevered Beta is set at 0.19
  - The debt interest rate is updated annually to the average rate of USD de-nominated corporate debt issued in Moldova
  - The debt to equity ratio is set at 35:65
- **OPEX index and incentives**
  - Permissible OPEX for each year of the five year regulatory period are derived from “base-year” OPEX
  - “base-year” OPEX are therefore inflated using partly MDL, partly (e.g. for equipment cost) US inflation indices and USD exchange rate, and partly MDL minimum wage level
  - Only 80% of the actual inflation index changes are applied to account for expected efficiency gains
  - Permissible OPEX in each year scale compared to “base-year” OPEX with the number of grid connections ( $\Delta$  GC)
  - Working capital is considered up to a level of 10 days of distribution invoices (insofar as proven to have been acutely incurred)
- **Losses** – Technical losses reduction sharing
  - The economic benefit of loss reductions are to be split (50:50) between DSO and end-users
- **Difference make-up** (“deviation factor”)
  - Revenue differences from (i) forecast cost vs. actual cost; and (ii) forecast vs. actual grid usage are made up in the next year
  - Difference bear interest at WACC level

### **Revenue corrections and corresponding tariff corrections (Deviation Factor)**

ANRE each year determines—ex-post—the actual permissible regulated revenues—based on actual rather than projected values for the impacting factors—in order to determine differences between projected actually charged and actually allowed revenues. A “deviation factor” is then applied to allow to make-up these differences accrued in for the previous year (n-1) in the current year (n). Where the actual permissible revenues for Year (n-1) leads to a significant change in the distribution tariffs, ANRE may decide—in consultation with a DSO—that part of this revenue shall be recovered in the later year.

## Distribution Tariffs

As with the determination of Allowed Revenue (AR) for three different voltage levels, final user tariffs are calculated each year based on each AR value against a forward projection of units delivered or carried per voltage level:

High Voltage	110 – 35 kV
Medium Voltage	10 – 6 kV
Low Voltage	0.4 kV and lower.

The tariffs for the electricity distribution services are calculated annually by the DSO and approved by ANRE in accordance with the provisions of the published methodology. At the beginning of each year, each DSO submits to the agency their calculation of tariffs, carried out in accordance with this methodology. Subject to compliance, ANRE will then update, approve and publish the new tariffs no later than April 1, of that year. The tariffs will enter into force and will be applied after the publication of the decision of the Administrative Board of the agency in the Official Gazette of Moldova. The annual tariff is determined as the allowed revenues divided by projected units of electricity (capacity subscribed or electricity distributed).

$$\text{Annual Tariffs (per voltage level)} = \frac{\text{Allowed Revenue (AR)}}{\text{Forecast grid usage (i.e. consumption or contracted capacity)}}$$

The Annual Allowed Revenue herein is the corrected regulated revenue, determined as the sum of (i) the Regulated revenue and (ii) the adjustment/ correction elements provided by ANRE.

The adjusted regulated revenue for each year of the regulatory period forms the basis for determining the distribution tariffs, which the DSO is entitled to charge in the contracts for the provision of distribution services.

## Auxiliary Services

Auxiliary services are specific distribution services provided to system users, for example, connection to the grid (a potential consumer may request the DSO to carry out the design and construction works to connect an installation to a power network and these services are provided at specific tariffs set by ANRE), disconnection from the grid, reconnection (for example, a consumer who was disconnected initially from the network requesting the DSO to be reconnected so in this case the DSO has some costs to accommodate this request (fuel/transportation costs, labour costs, etc), uninstallation of an existing meter and other similar services. The list of auxiliary services that can be provided by the DSO is established by ANRE. The latest version was published in ANRE Decision No. 472/2023<sup>100</sup> for RED Nord and in Decision No. 109/2024<sup>101</sup> for Premier Energy.

## System losses incentive

The cost of system losses (technical losses and non-technical losses) of electricity in distribution networks for each year "n" is determined by the DSO in total for the distribution networks, and separately, for each voltage level (high, medium and low voltage). This cost is based on (i) the amount of electricity required to cover the system losses and (ii) the average price of purchasing electricity in Year "n" to cover these needs.

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<sup>100</sup> ANRE Decision No. 472, July 2023. On regulated tariffs for ancillary services provided by S.A. "Rețelele Electrice de Distribuție Nord"

<sup>101</sup> ANRE Decision No. 109, March 2024. Regarding the regulated tariffs for the auxiliary services provided by Î.C.S "Premier Energy Distribution" SA

According to the methodology, the DSOs shall calculate the level of losses per voltage level in accordance with a specific instruction, approved by ANRE<sup>102</sup> and submit the resulting calculations to ANRE. ANRE shall examine the calculated values of losses, provided by DSOs and approve these values as normative losses.

These losses are a pass-through cost and are deemed part of the Allowed Revenue. According to Article 26 of the ANRE Methodology when such losses are reduced by a DSO from one year to the next, then the resulting financial benefit for any given year are shared equally between the DSO and system users.

Nevertheless, despite the ANRE methodology providing this incentive, a provision in the Law on electricity No. 107/2016 precludes the DSO from obtaining an actual benefit as a result of reduction of system losses. According to the Law on electricity (art. 87, para. (3), 2<sup>nd</sup> bullet point) ANRE shall consider for tariff purposes the actual level of losses, registered in the previous year. Therefore, the losses incentive, provided by the ANRE methodology has a very limited application, as it results in a lower level of losses recognized in the tariff for the following year, which implies an additional effort for the company to maintain the level of losses obtained.

### **Quality of electricity distribution services (QoS)**

According to the Law 107/2016 (art. 54, para. (2)), for non-compliance with the minimal values of the quality indicators, the Agency has the right – but not the obligation – to reduce the tariffs for electricity distribution by up to 10% of the value of the tariff and/or to establish individual compensations to be paid by the system operator to the system users, in line with the Regulation on quality of electricity transmission and distribution services.

The last version of Regulation on quality was approved by the regulator in 2020 (ANRE Decision No. 537/2020<sup>103</sup>), and amended later in 2023. According to this regulation, DSOs are tasked to

- maintain general continuity service indicators (SAIDI, SAIFI, CAIDI and MAIFI), and
- to guarantee continuity of service indicators

The DSO should maintain the values of **general continuity service indicators** (SAIDI, SAIFI, CAIDI and MAIFI), at the last 3-years average level. There are, however, currently **no penalties** for non-compliance with the general continuity indicators. These indicators are, however, monitored carefully by the regulator that may intervene with changes in case of serious deviations from the 3-year average level.

The DSO has to **guarantee two continuity of service indicators**:

- the duration of one interruption (planned and unplanned), and
- the annual number of interruptions for one customer.

For noncompliance with minimal value of these indicators, DSOs have to pay compensations to the affected users. For interruptions, produced in medium voltage networks and for all types of planned interruptions, compensations are paid automatically. In case of interruptions in low voltage compensation is paid upon request. The value of compensation is calculated taking into account the monthly amount of energy, consumed by user and the tariff for distribution service.

Besides, voltage quality should remain within limits.<sup>104</sup> Any complaint about violation of voltage characteristics should be solved in not more than 30 days, otherwise the DSO have to pay compensations to the customer, which is calculated as 25% of the value of the electricity supplied to the end-user over the period of non-rectification of the voltage quality issues.

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<sup>102</sup> ANRE Decision No. 190, 2005. Instruction for the calculation of technological consumption in electricity networks, approved by ANRE Resolution no. 190/2005

<sup>103</sup> ANRE Decision No. 537, December 2020. Regulation on the quality of transport services and electricity distribution

<sup>104</sup> Standard SM EN 50160:2014 „Voltage characteristics in the public electricity distribution networks”

## Regulatory outlook for electricity

As listed in the relevant secondary legislation (Resolution No. 64/2018<sup>105</sup> and 65/2018<sup>106</sup>) the methodology for the determination of allowed costs and tariffs is valid for a period of 5 years. Consequently, the electricity distribution and supply methodology as approved by ANRE in 2018 expired in March 2023 and the period of applicability was extended until a new methodology is approved. To set and approve new methodologies, ANRE are required to develop drafts of the new documents and publish them for public consultation over a defined period. Up until the end of February 2024 ANRE has not published the new drafts, nor even signalled the intention to develop or amend the existing methodologies.

### 11.3 Regulatory framework for Electricity Retail

Electricity supply activities are considered to be deregulated, except for supplier of last resort responsibilities and the activity of supply to households and small enterprises (termed “universal service”). The procedure for the final consumer to change supplier is also established in the law of electricity by ANRE. Additionally, ANRE may impose a public service obligation (PSO) on one or more suppliers to ensure the availability of a supplier of last resort. A last resort supply shall supply electricity to final customers who have lost their supplier. These services are to be provided under regulated conditions and at regulated prices approved by ANRE for a period of up to 90 calendar days.

Suppliers with a PSO are obliged to conduct competitive procurement procedures (tenders) to buy the necessary electricity at the lowest costs. In February 2022, due to the emergency situation declared by the Parliament of the Republic of Moldova, the tendering procedures were suspended. According to the Decision no. 2 of the State Commission for Emergency Situations (CES), universal service providers, were obliged to apply a simplified tendering procedure, approved by ANRE. On May 1 2022, by Decision No. 19/2022 of CES the state supplier JSC Energocom was imposed the public service obligation to procure the electricity requested by the universal service suppliers, suppliers of last resort and system operators for the period May 1 to May 31, 2022. Suppliers and system operators were obliged to conclude contracts for the purchase of electricity with Energocom. Later, based on a series of decisions of CES, the period of application of the obligations imposed in relationship with Energocom and universal service providers was extended until the end of 2024.

Currently (i.e. as of January 2024), there are 78 electricity supply licencees in Moldova (ANRE MD, 2024a), but only a limited number of suppliers are active on the retail market (IEA, 2021a).

The methodology for the setting of regulated prices is specified in ANRE Resolution No 65/2018 issued on February 23, 2018 relating to Regulated Electricity Supply Prices.<sup>107</sup> The methodology is updated every 5 years; the next update is overdue, so the 2018 methodology is still applicable, being prolonged by ANRE decision No. 116/2023.

For regulated supply under a PSO, retailers generate a base profit from a revenue margin and have potential upsides from (i) OPEX outperformance, and (ii) increasing the numbers of supplied end-users while not proportionally increasing OPEX.

Differences in inter alia forecasts of (i) sales volume or (ii) procurement cost can lead to the need for make-up in following year.

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<sup>105</sup> ANRE Decision No. 64, February 2018. Regarding the approval of the Methodology for calculating, approving and applying tariffs for the electricity distribution service. Part 2: the electricity distribution methodology shall apply for a period of five years

<sup>106</sup> ANRE Decision No. 65, February 2018. Part 2 : the electricity supply methodology shall apply for a period of five years

<sup>107</sup> ANRE Decision No. 116, March 2023. Extension of the application deadlines for some regulatory acts approved by the Administrative Board of the National Agency for Energy Regulation

## Scheme for the calculation of allowed revenues

$$\text{Allowed Revenue (AR)} = \left( \text{Electricity procurement (Yn)} + \text{Transmission \& Distribution cost (Yn)} + \text{Retail OPEX(Y0)} \times \text{CPI} \times \text{1+}\Delta\text{EU} \right) \times \text{1.01} \rightarrow \text{1\% revenue margin} \pm \text{Difference make-up (Yn-1)}$$

Where:

- **Electricity Procurement cost**
  - Electricity bought from regulated domestic producers and balancing energy is considered “at cost”
  - Incentive component: For free market volumes (domestic production & imports), 50% of procurement price reductions compared to the previous year increases allowed revenues
- **OPEX indexation**
  - Over the five year regulatory period, permissible OPEX are determined annually from “base year” OPEX
  - All OPEX are inflated using partly Moldovan, partly US inflation indices and partly Moldovan minimum wage level
  - Base year OPEX are scaled with changes in the number of supplied end-users
  - Working capital requirements are considered to cover max. 25 days of retail invoice revenue (insofar as proven to have been acutely incurred) and remunerated at debt interest rates
- **Base Profit**
  - A 1% revenue margin is granted on top of all costs for a given year
- **Difference make-up**
  - Revenue differences from (i) forecast cost vs. actual cost and (ii) forecast sales volumes vs. actual retail volumes are made-up in the next year
  - Deviations bear interest at debt rate levels

## Calculation of retail energy prices

$$\text{Retail energy tariffs (per voltage level)} = \frac{\text{Allowed Revenue (AR)}}{\text{Forecast retail volumes}}$$

- **Retail energy sales prices** are determined based on allowed revenues and forecast retail volumes
  - Retail prices are set separately for five voltage levels
  - Prices comprise either (i) an energy component (MDL/kWh) or (ii) both an energy component (MDL/kWh) and a capacity component (MDL/kW)
  - Electricity prices are changed annually unless costs change by more than 5%

Regulated retail electricity prices are generally changed annually. The supplier has, however, the right to request ANRE to update the regulated prices also during the year, if there are objective factors that cannot be controlled by the supplier (e.g. change in electricity purchase prices, fluctuation of the national currency exchange rate, approval of legislative and normative acts leading to increased supply costs, etc.) that justify such an update and lead to a tariff deviation of more than 5% of the annual cost of electricity supply included in regulated prices.

Tariff deviations are generally calculated annually to reflect the financial impact of the deviations between the forecasted values (e.g. procurement price, sales volumes, exchange rate fluctuations) applied when setting the regulated price in year "n-1" and actually values ones recorded this year.

Tariff deviations from the previous year (n-1) can be included in the allowed revenues of the current year. I.e. tariff deviations created during the year "n-1" will be included in the regulated price for year "n", bearing interest at the average annual interest rate on bank loans in Moldovan lei, based on deviation values determined monthly. In the event of a change in regulated prices during the year, the tariff deviation generated

in this year will be fully considered in the calculation of the new regulated prices. In this case, tariff deviations shall be included in the regulated price so that they are recovered by the end of the year.

## 11.4 Incentive schemes for renewables

The national objectives for renewable energy in Moldova will be established in the National Integrated Energy and Climate Plan (NECP) draft, that was recently presented for public consultations. According to the drafted NECP, the national target for renewable energy is 27% of the total gross energy consumption by 2030. It is estimated that the share of electricity from renewables will increase more than 40 times in 2050 compared to 2020, mostly from new capacity from wind farms (estimated capacity of about 3,074 MW in 2050) and solar PV generators (estimated capacity of 561 MW in 2050).

The incentives for renewable energy sources (RES-E) generation differ depending on the size of an installation (IEA, 2021a):

- net billing for installations up to 200 kW (prosumers);
- administratively set feed-in-tariffs for small-scale projects (small eligible producers);
- auctioned fixed prices for larger projects (large eligible producers)

The net-metering scheme, provided by the Law No. 10/2016<sup>108</sup> (Law on renewables) is no longer granted since the beginning of 2024, although existing net-metering prosumers will continue enjoying this scheme till the end of 2027. The net-billing scheme is applied for the new prosumers from the beginning of 2024 and to all prosumers from 2028.

For projects outside of the net-billing scheme, the renewables Law No. 10/2016<sup>109</sup> imposes the obligation for a central electricity supplier (CES) to buy all renewable energy generated units from generators holding the status of 'Eligible Producer'. Contracts run for a period of 15 years starting from when the plant is put into service<sup>110</sup>. The price at which the CES acquires renewable electricity depends on the size of the RES-E power plant owned/planned to be built by an Eligible Producer:

- CES obligation to buy RES-E at fixed prices established in tenders, for large eligible generators with an installed capacity/total cumulated capacity exceeding the capacity limit established by the Government (Government Decision No. 401/2021, <sup>111</sup> modified by Government Decision No. 26/2024<sup>112</sup>).
- CES obligation to buy RES-E at fixed tariffs (or feed-in-tariffs) established by ANRE for small eligible generators with an installed capacity /total cumulated capacity not exceeding the capacity limit established by Government, but which shall not be less than 10 kW. Currently the limit differentiation in the scheme is for Wind 4 MW and for solar PV it is 1 MW.

To implement the support scheme, the Government has established the above-mentioned capacity limits, as well as capacity quotas,<sup>113</sup> which specify the total amount of MW which can be installed under the support

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<sup>108</sup> Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources

<sup>109</sup> Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources

<sup>110</sup> Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources, Art. 3, art. 37, para. (1), art. 30, para. (2) letter a)

<sup>111</sup> ANRE Decision No. 401, December 2021. Regarding the approval of capacity limits, maximum quotas and capacity categories in the field of electricity from renewable sources valid until December 31, 2025

<sup>112</sup> ANRE Decision No. 26, January 2024. Amendment of Government Decision no. 401/2021 regarding the approval of capacity limits, maximum quotas and capacity categories in the field of electricity from renewable sources valid until December 31, 2025

<sup>113</sup> Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources. Art. 10, letter e)



scheme by different technologies established by Government decision no. 401/2021<sup>114</sup>. The allocated quotas were 15 MW for small eligible wind generators, 140 MW for solar PV and 65 MW for biomass generators.

### **Renewable energy tenders**

Tenders are organized by the Government to support large-scale renewables, following a technology neutrality principle within RES-E. The tenders will apply to renewable generators with an installed capacity exceeding the capacity limits established by the Government for FiT eligibility.

Operators intending to build power plants with used/refurbished generation equipment, or equipment manufactured more than 48 months before these are expected to be put into operation are not allowed to participate in RES-E tenders. For biomass cogeneration, only technologies with an overall efficiency of at least 80% are qualified to participate in tenders.

RES-E producers who do not wish to participate in the support scheme, or those who did not obtain the status of eligible producer, have the right to participate on the electricity market and sell the RES-E under negotiated conditions with electricity market participants.

Tenders are subject to ceiling prices determined by ANRE<sup>115</sup> set by technology type, with a ceiling being the FiT prices. The status of Eligible Producer is granted to potential RES-E generators who offered the lowest prices in the tender, within boundaries set by the established ceiling prices. Fixed PPA prices are established in the tenders and capacity quotas are established for different technologies for the tenders with quotas for wind turbines (105 MW) and solar PV (60 MW).

### **Feed-in-tariffs (FiT)**

The first set of feed-in-tariffs, used in the context of the support scheme, were approved by ANRE in February 2020.<sup>116</sup> These fixed tariffs are applied by small-scale renewable energy producers, for whom ANRE confirmed the Eligible Producer status. The initial set of feed-in-tariffs has been updated and revised by ANRE resolutions in subsequent years.<sup>117</sup>

In 2018 ANRE established the FiT level by technology and allocated funding to a defined capacity quota on a 'first come, first served' basis. The tariffs are regularly adjusted to account for USD/MDL exchange rate and cost evolution, with a maximum allowed capacity per plant at 4 MW (for wind), and 1 MW (solar PV and hydro generation). Multiple renewable generation technologies, especially solar PV, had a strong growth with the FiT mechanism, and have now exhausted their corresponding quotas.

### **Net-metering / Net-billing scheme**

The net-metering scheme was available for final consumers that installed small-scale RES-E generation facilities in order to offset their own electricity consumption. being restricted a maximum of 200 kW installed power, but not more than the power contracted with the supplier.<sup>118</sup> According to the Law No 331/2023<sup>119</sup> on

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<sup>114</sup> The maximum quotas, available as of 01.02.2024, <https://anre.md/cotele-disponibile-3-426>

<sup>115</sup> ANRE Resolution No. 375, 2017. The Methodology on calculation of fixed tariffs and prices for electricity produced by eligible producers from renewable sources

<sup>116</sup> ANRE Decision No. 54, February 2020. Regarding the approval of fixed tariffs and ceiling prices for electricity produced from renewable energy sources by producers who will obtain the status of eligible producer in 2020

<sup>117</sup> ANRE Decision No. 76, February 2022. Decision on fixed tariffs and ceiling prices for electricity produced from renewable energy sources by producers who will obtain the status of eligible producer in 2022; ANRE Resolution No. 84, 2023. The Methodology on calculation of fixed tariffs and prices for electricity produced by eligible producers from renewable sources in 2023; ANRE Resolution No. 105, 2024. Regarding the approval of adjusted fixed tariffs to electricity produced from sources renewable energy by producers who have obtained the status of eligible producer; ANRE Resolution No. 106, 2024. The Methodology on calculation of fixed tariffs and prices for electricity produced by eligible producers from renewable sources in 2024.

<sup>118</sup> Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources. Article 39

<sup>119</sup> Law No. 331, November 2023. For the amendment of Law no. 10/2016 regarding the promotion of the use of energy from renewable sources

amending the Law No. 10/2016, the net-metering scheme will be applied till December 31, 2027. From January 1, 2028, all beneficiaries of the net metering mechanism become prosumers of electricity from renewable sources.

With the last amendment, in the Law 10/2016<sup>120</sup> was introduced the definition of prosumers – a final consumer who produces electricity from renewable energy sources for self-consumption and who can store and sell the produced electricity. For all prosumers the scheme of net-billing will be applied.

Prosumers shall be entitled to remuneration for the quantity of electricity delivered to the electricity distribution network, expressed in a monetary equivalent and cumulated in an account of the renewable electricity prosumer. The account reflects the value of the electricity delivered to the electricity distribution network and the value of the electricity consumed from the distribution grid in a billing period (according to the net billing mechanism). The value of the electricity delivered to the electricity distribution system and the value of the electricity consumed from the distribution grid shall be taken into account when the electricity bill is issued by the supplier and allow the monetary balance of the prosumer to be established.

Capacity limits for prosumers are provided by Government Decision No 401/2021,<sup>121</sup> and the average price for net-billing is calculated as average day-ahead market closure price in the billing period. Until a liquid day-ahead market is established, universal service providers and suppliers of last resort will apply the average electricity purchase price for the billing period from all sources, except for the quantities of electricity procured from the central electricity supplier.<sup>122</sup>

### **Small Generators and PPAs**

Another incentive scheme available in Moldova allows renewable energy facilities under 5 MW (small generators) to produce and trade in the open market without being obliged to obtain a licence for electricity production and also conclude short-term PPAs with regulated suppliers at a price not higher than the prevailing market price.

Renewable Producers of up to 18 MW of capacity can also sell their generated electricity to local regulated suppliers based on negotiated bilateral contracts (PPAs) at a price not higher than 90% of the lowest price awarded at the renewable energy Tenders. The Government sets the available maximum quotas for this mechanism, with the PPAs priced in dollar and with a 15-year length limit, with corporate PPAs limited to 18 MW.

### **Outlook**

The existing fixed tariffs/ceiling prices were approved on Decision No. 106/2024<sup>123</sup> (ANRE MD, 2024d). The Ministry of Energy has approved the indicative timetable for the planned frequency of tender procedures to offer eligible producer status for the years 2024 to 2025. According to this timetable, in February 2024 the Government Decision amending Government Decision No. 690/2018 approving the Regulation on the conduct of tenders for offering the status of large eligible producer should be approved. In March 2024 the tender documentation and notice of initiation of the tender procedure should be published. Consultation of tender documentation with stakeholders is planned for the period March-May 2024, and opening the stage of receipt of tenders between May and July 2024.

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<sup>120</sup> Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources

<sup>121</sup> ANRE Decision No. 401, December 2021. Regarding the approval of capacity limits, maximum quotas and capacity categories in the field of electricity from renewable sources valid until December 31, 2025

<sup>122</sup> Law No. 10, February 2016. Regarding the promotion of the use of energy from renewable sources. Article 39-2, paragraph (2)

<sup>123</sup> ANRE Decision No. 106, February 2024. Regarding fixed tariffs and ceiling prices for electricity produced from renewable energy sources

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