

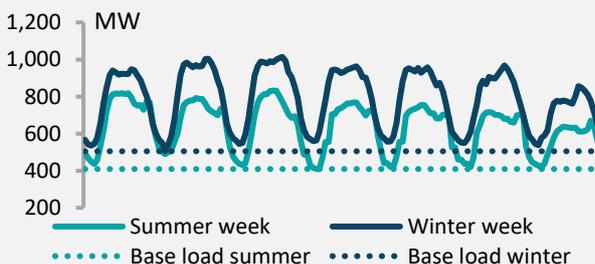
## Key challenges in Moldova's electricity sector

Electricity consumption in Moldova is characterised by a high share of residential use, which makes affordability a key issue. In addition, the country's electricity supply heavily relies on the Russian-owned MGRES, located in the Transnistrian region. MGRES supplies electricity at low prices compared to those in neighbouring countries. Nevertheless, the gas crisis in 2021 and the war in Ukraine have illustrated the importance of energy security and the need for diversification of electricity supply. In the short-term, diversification options are limited to imports from Ukraine and Romania, while in the long-term an expansion of domestic capacity through renewable generation will play a salient role. Furthermore, competition on the wholesale electricity market needs to be increased. The prospect of EU energy integration, including ENTSO-E market coupling, will contribute towards a more competitive market.

### Electricity demand

Electricity consumption in Moldova has been relatively stable for years despite steady economic growth. Moldova's largest industries are not very energy-intensive so that the residential sector consumes 40% of electricity, which is significantly above the European average of 30%. Therefore, affordability of electricity prices is a key factor in energy policy making. Furthermore, the bulk of electricity is consumed by households during the day while consumption halves during the night.

### Hourly load in summer and winter week



Source: ENTSO-E; data for 2021; load curve covers rb MDA and TN

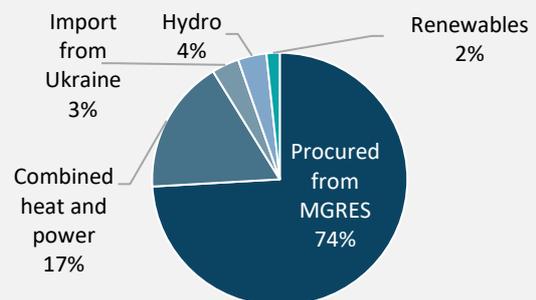
This difference between peak and off-peak periods constitutes a challenge for balancing demand and supply.

### Electricity supply

Moldova's electricity supply is heavily dominated by the Russian-owned Kuchurgan power plant (MGRES) located in the Transnistrian region. In 2021, MGRES generated 74% of right-bank Moldova's electricity supply. The remaining electricity came from production in right-bank Moldova (23%) and via imports from

Ukraine. As domestic electricity is mostly produced by combined heat and power plants, which are must-run capacity in winter due to heat production, the electricity generation mix varies a lot between seasons. In summer, MGRES covers up to 95% of electricity supply in contrast to only around 60% in winter.

### Structure of electricity supply



Source: Moldelectrica, data for 2021

Transnistria receives gas free of charge from Gazprom so that the cost for electricity production at MGRES and consequently prices for consumers in Moldova are very low. However, the dependence on only one source of electricity production not under control of Moldovan authorities poses risks in terms of energy security. Thus, a diversification of electricity supply is needed to reduce the dependence on MGRES.

### Diversification options for electricity supply

In the short-term, Moldova could increase electricity imports. The country has cross-border transmission capacity with Ukraine (600 MW) and Romania (310 MW). In previous years, Ukraine has been an important competitor for MGRES. On 16 March 2022, the Ukrainian-Moldovan electricity systems were technically synchronised with the European Network of Transmission System Operators (ENTSO-E) to provide grid stability. This process was initially scheduled for 2023 but was brought forward by the war. Although the technical synchronisation leads to high cross-border electricity flows from Romania to Moldova, those are mainly unwanted loop flows to the Odessa region in Ukraine. Therefore, Moldova considers building a B2B-station to better control electricity flows between Romania and Moldova. However, the synchronisation does not cover market aspects yet, so regular commercial imports from Romania are not possible at the moment.

## Renewable energy supply

In the long-term, Moldova can expand its domestic electricity generation capacity, particularly with renewable energies. Currently, renewable capacity (excl. hydro) is at 104 MW and covers 2% of total right-bank Moldovan electricity supply. To promote renewable energy development, Moldova offers three types of support schemes: (1) net-metering (2) feed-in tariffs, and (3) government auctions.

### Renewable energy support and planned capacity

Support Scheme	Capacity limit	Responsible entity	Energy source	Tendered capacity*
Net-metering	Up to 200 kW	ANRE	Solar, wind	-
Feed-in tariff	Up to 1 MW (up to 4 MW for wind)	ANRE	Solar, wind, bio-gas, hydro	235 MW
Tender/auction	Over 1 MW (4 MW for wind)	Ministry of Infrastructure and Regional Development	Solar, wind	165 MW

Source: ANRE, \*planned capacities

However, an increase of variable renewable energy in the electricity system requires sufficient balancing capacity. Currently, only MGRES can provide balancing for right-bank Moldova, which is difficult to implement due to insufficient enforcement capacity of the regulator, ANRE, in the Transnistrian region. Therefore, Moldova is also exploring alternative options for balancing capacity, such as combined-cycle gas turbines.

### Increasing competition on the electricity market

Competition on the Moldovan wholesale electricity market is limited mostly to supply from MGRES and imports from Ukraine. There is no market operator and no spot markets (day-ahead, intraday) in place. In previous years, there were annual tenders for electricity supply, which MGRES usually won due to their low production costs. For example, their May 2022 bid was EUR 55/MWh, which puts MGRES well below wholesale prices in neighbouring countries (EUR 74/MWh in Ukraine and EUR 210/MWh in Romania).

The dominant position of MGRES keeps prices low for Moldovan consumers, but the power plant is also a player that does not fully operate on market principles. To improve competition in the Moldovan electricity market, an intermediary objective is market coupling with Ukraine. The final objective would be full EU energy integration, which includes the market coupling

with ENTSO-E enabling access for Romania and other EU suppliers.

### Outlook

The gas crisis and Russian invasion of Ukraine led to a reassessment of energy security in Moldova. The high dependence on Russian-owned MGRES poses a significant energy security risk. Increasing cross-border transmission capacity, expanding domestic generation capacity and more competition on the wholesale electricity market through market coupling with neighbouring countries are crucial ways to reduce the dependence on MGRES. While in the short and medium term such measures could increase prices for consumers, in the long term, they will contribute not only to increased energy security, but also help Moldova achieve its climate goals and create a long-term sustainable energy system.

#### Authors

Manuel von Mettenheim,  
[v.mettenheim@berlin-economics.com](mailto:v.mettenheim@berlin-economics.com)  
Carolin Busch, [busch@berlin-economics.com](mailto:busch@berlin-economics.com)

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#### Editors

Dr Ricardo Giucci, Carolin Busch

#### German Economic Team

[www.german-economic-team.com](http://www.german-economic-team.com)

Financed by the Federal Ministry for Economic Affairs and Climate Action, the German Economic Team (GET) advises the governments of Ukraine, Belarus\*, Moldova, Kosovo, Armenia, Georgia and Uzbekistan on economic policy matters. Berlin Economics has been commissioned with the implementation of the consultancy.

\*Advisory activities in Belarus are currently suspended.