



COUNTRY REPORT HUNGARY

Dóra Csernus

Energy Without Russia

The Consequences of the Ukraine war and the
EU Sanctions on the Energy Sector in Europe

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About the author

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Energy Without Russia: The Case of Hungary

The Consequences of the Ukraine War and the EU Sanctions
on the Energy Sector in Europe

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INTRODUCTION

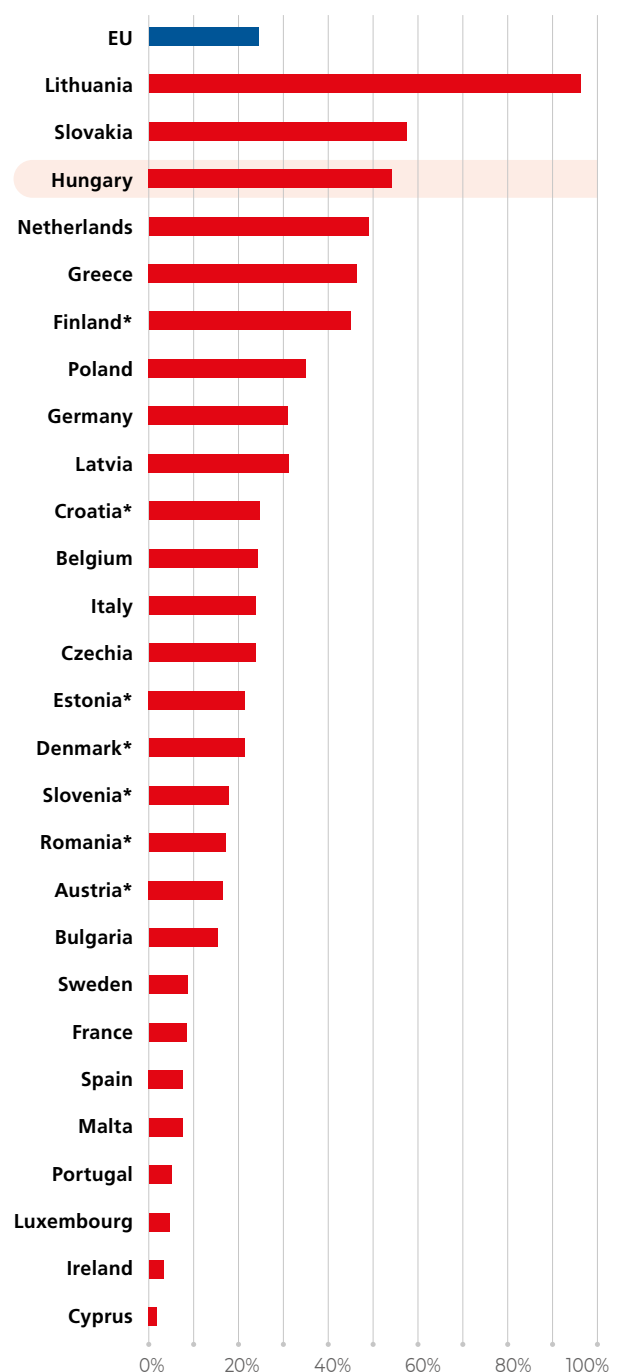
Hungary is one of the countries that are the most dependent on natural gas and oil imports in the EU, especially on imports from Russia. The energy dependency is above 50 per cent, and more than 90 per cent of oil and natural gas imports came from Russia before the war, making the country very sensitive to the geopolitical developments of the past year.

For the moment, EU sanctions do not cover nuclear fuels, but this topic is also conflictual in Hungary, as 100 per cent of the fuel used in the country's only nuclear installation, the Paks nuclear power plant, comes from Russia. The new nuclear power plant, Paks 2, is under construction with Rosatom as the constructor, although the war makes the feasibility of the project questionable.

Decoupling from Russia is among the objectives of the government, although the level of ambition of this decoupling is not clear. For nuclear energy, Hungary is trying to find new sources of imports, and is considering cooperation with the American company Westinghouse and the French Framatome. For natural gas, Hungary has a long-term contract with Russia, but it seems that with the shutdown of the Nord Stream pipelines, Russia will not be able to supply the contractual quantity, which will speed up Hungary's decoupling from Russia, which is already – slowly – happening with LNG, Azeri, and Romanian imports.

Figure 1

Imports from Russia in gross available energy, EU, 2020



Source: Eurostat, Including estimates for non-reported data for countries with*

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STATUS QUO BEFORE THE WAR

ENERGY DEPENDENCY

Before the war of aggression of Russia on Ukraine, Hungary was very much dependent on Russia with regard to natural gas, oil and nuclear fuel.

Hungary's energy dependence stood at 56.2 per cent in 2020 and at 53.7 per cent in 2021, which is the last available official data at the Central Statistical Office. If we also include in this figure the nuclear fuel imports used to operate the nuclear plant in Paks, Hungary's energy dependence exceeds 80 per cent.

Before the war, nearly 90 per cent of Hungary's oil and natural gas came from imports, with 64 per cent of imported oil and 95 per cent of imported gas coming from Russia. 100 per cent of nuclear fuels came from Russia.

The situation of households is very sensitive as the building sector is responsible for around 40 per cent of final energy consumption, and around 70 per cent of Hungarian households use solely or partly natural gas for heating. 73 per cent of final energy consumption of households in 2021 was dedicated to heating. Such a great dependency of households on natural gas plus the extremely high dependency on Russia in natural gas consumption leads to a situation that is politically very challenging: the Hungarian population is in a situation where all shortages in Russian gas can be felt immediately.

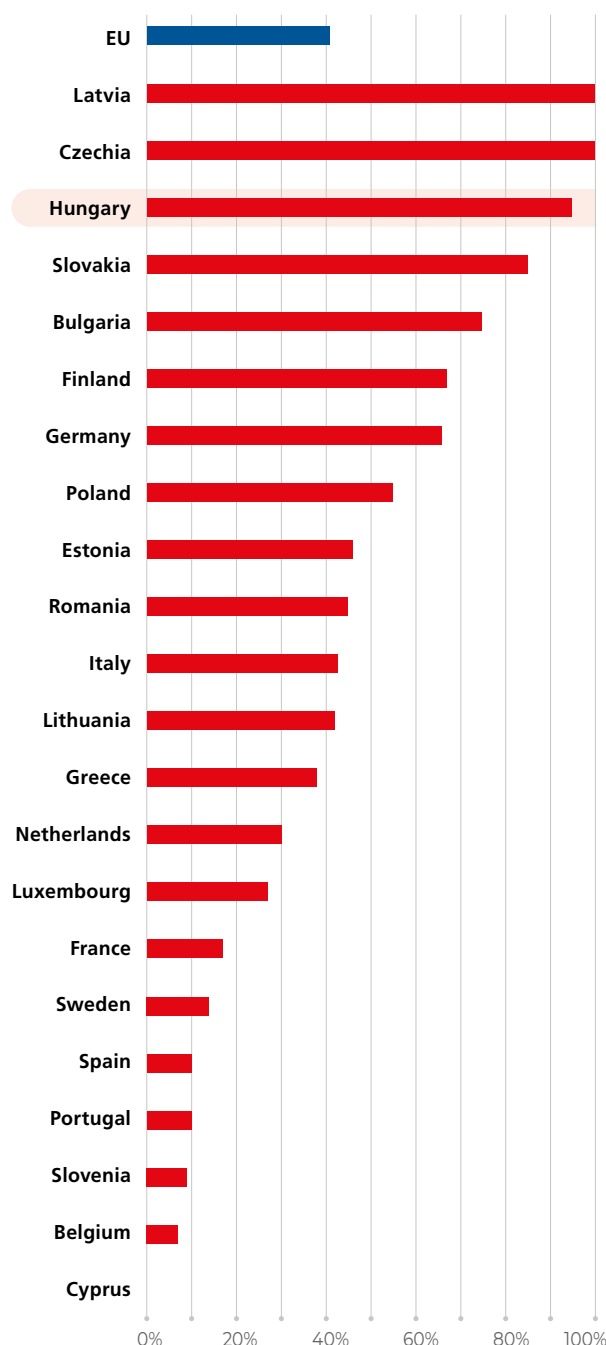
Although nearly the entirety of Hungary's coal imports come from Russia, imported coal represented only 0.6 per cent of the country's coal consumption and the share of coal in primary energy consumption was only 5.1 per cent in 2021.

The share of net electricity imports in Hungary's primary energy consumption was 4.1 per cent in 2021, and the share of imports in final electricity consumption stood at 26.5 per cent.

ENERGY IN GENERAL

Natural gas has been playing an important role in Hungary's energy mix for decades. Its share in the energy mix was at its maximum in 2003 with around 45 per cent of primary energy consumption, but it is still important today: according to the latest data (2021) it accounts for 34.3 per cent of primary energy consumption.

Figure 2
EU reliance on Russian gas
Share in total imports in 2020 of Russian natural gas in %



Source: Eurostat. Data not available for Malta, Croatia, Denmark, Ireland and Austria

The share of oil mostly stagnated in the past 20 years, with a peak in 2019 at a 30.4 per cent share in primary energy consumption and a 29.3 per cent share in 2021.

The share of coal is decreasing and was at 5.1 per cent in 2021 (Figure 3).

Renewable energies are mainly combustible renewables in the country's energy mix.

The share of renewables in Hungary's final energy consumption stood at 12.7 per cent in 2010, rose to 14.5 per cent in 2015, and dropped to 14.1 per cent in 2021¹ (Figure 4).

The population of the country is showing a decreasing trend. According to the 2022 census Hungary's population decreased to 9.6 million people compared to 9.9 million in 2011 and 9.8 million in 2016.

Primary energy production per capita stood at 47,300 Mj while primary energy consumption per capita was 120,300 Mj and final energy consumption was 82,000 Mj per capita (or 1.970 toe per capita). Both in 2020 and 2021, per capita energy consumption in Hungary was significantly lower than the EU average: 1.847 toe per capita compared to 2.027 in 2020 and 1.972 toe per capita compared to 2.165 in 2021.

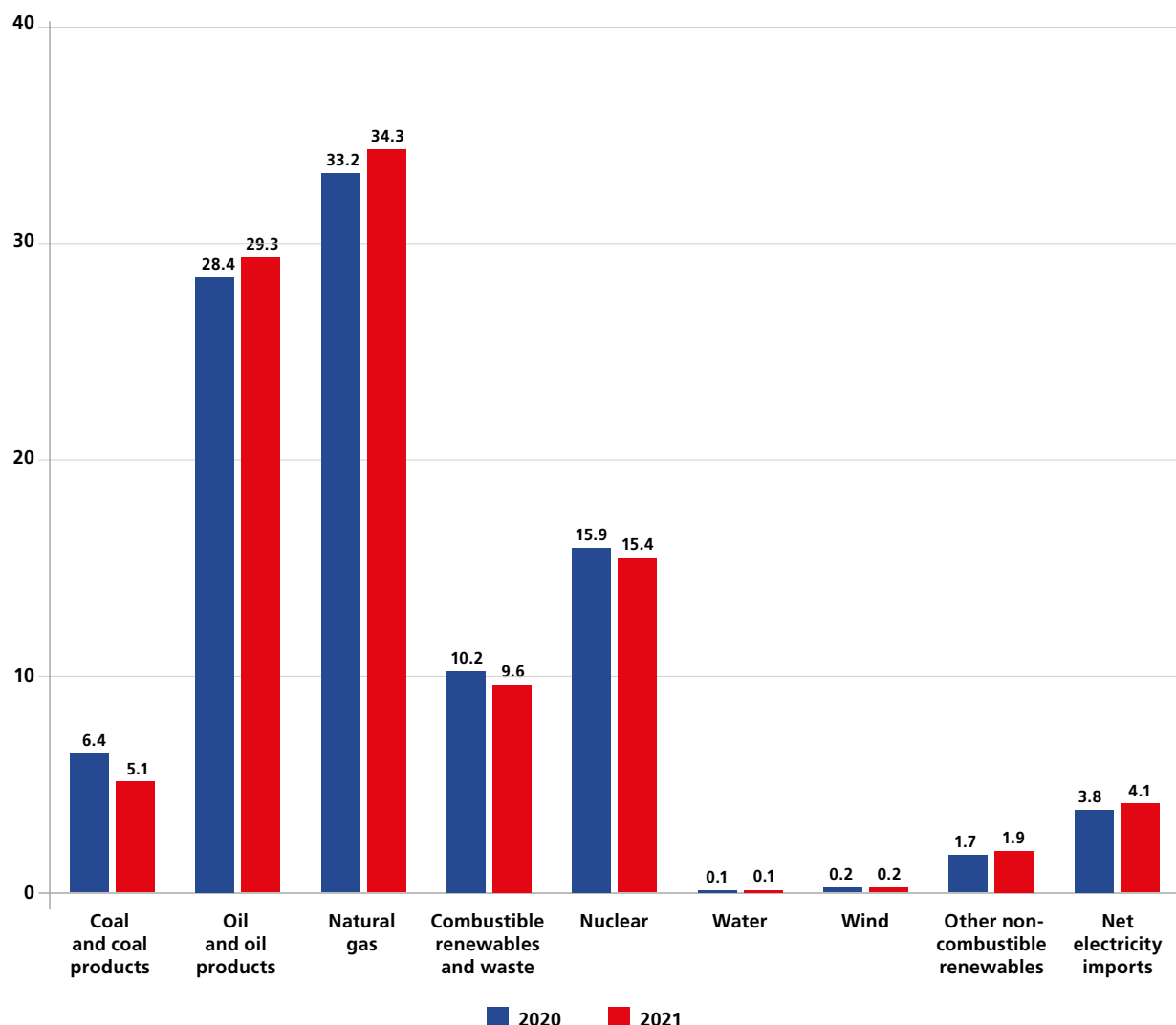
ELECTRICITY

The share of nuclear energy in electricity production was 44 per cent in 2021, the share of natural gas was 27 per cent, solar stood at 11 per cent, coal at 9 per cent and oil was almost non-existent with its 0.2 per cent share (Table 1).

The share of electricity produced from renewables in our gross final energy consumption was 13.7 per cent in 2021 (Figure 5).

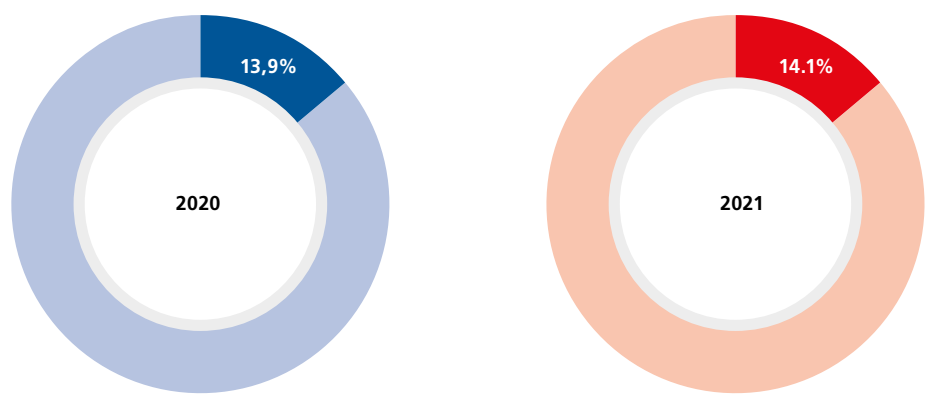
¹ https://www.ksh.hu/stadat_files/ene/hu/ene0001.html

Figure 3
Structure of Hungary's primary energy consumption (%)



Source: Central Statistical Office

Figure 4
Share of renewable energies in gross final energy consumption (%)



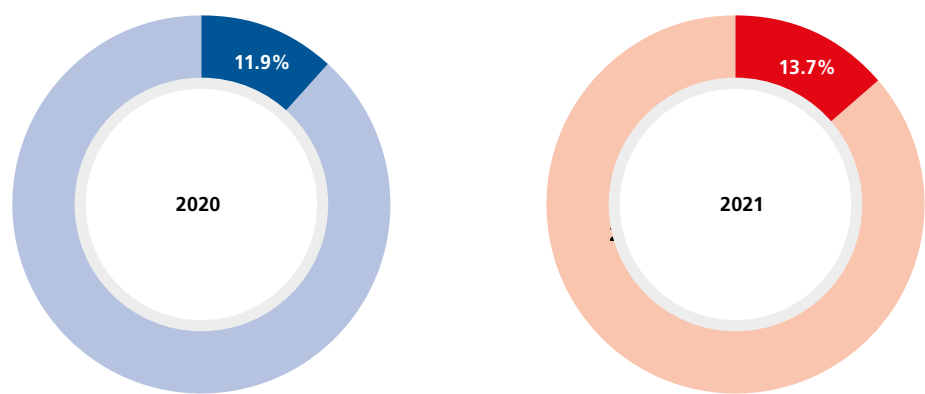
Source: Central Statistical Office

Table 1
Gross electricity production (GWh)

	2020	2021
Nuclear	16,055	15,990
Coal and coal products	3,826	3,105
Natural gas	9,091	9,653
Oil	45	59
Biomass	1,664	1,775
Biogas	324	295
Renewable fraction of waste	167	161
Water	244	212
Wind	655	664
Solar	2,459	3,796
Geothermal	16	12
Other	384	398
Total	34,930	36,120

Source: Central Statistical Office

Figure 5
Share of renewable energies in gross final electricity consumption (%)



Source: Central Statistical Office

Table 2

Net electricity consumption in different industrial sectors (GWh)

Net electricity consumption in different industrial sectors (GWh)	
Agriculture, wildlife management, forestry, and fishery	845
Mining	131
Manufacturing industry	13,925
Electricity, gas, heating supply	1,168
Construction industry	472
Commerce, reparation	2,080
Transportation, storage, post, and Telecommunications	1,928
Accommodations and catering	600
Other social or private services	1,296
Households	12,198
Other consumption	9,204
Total net consumption	43,848

Source: Hungarian Energy and Public Utility Regulatory Authority; https://www.mekh.hu/download/1/72/31000/MEKH_statistikai_kiadvany_villamos_energia_A4_web_V%C3%89GLEGE5.pdf – page 75

If we look at the structure of electricity consumption, the manufacturing industry and households are the biggest electricity consumers in Hungary.² In 2021, the structure was as shown above (Table 2).

² http://www.mekh.hu/download/1/72/31000/MEKH_statistikai_kiadvany_villamos_energia_A4_web_V%C3%89GLEGE5.pdf

2

AD HOC RESPONSES AFTER FEBRUARY 2022

From the beginning of the war, the government argued that Hungary wants to stay out of the war, and that Hungary cannot support the sanctions linked to fossil fuel imports. The latter was explained by the fact that Hungary is in a special situation stemming from high dependency on Russian oil and gas imports, and moreover Hungary is a landlocked country with fewer opportunities for import and energy carrier diversification.

PRICE CAPS FOR HOUSEHOLD ENERGY CONSUMPTION AND PETROL

Already before the war, there were two main measures aimed at dealing with high energy prices in Hungary. Both measures were price caps that did not differentiate based on revenues or wealth. These two measures were maintained after the war started (also because one of the key messages of the Fidesz party was that if they were re-elected in spring 2022, the price caps would be maintained), even though this became an increasing burden for the state budget.

From 2013 to August 2022, the end-user energy prices for the residential sector were fixed by law. The fixed end-user energy prices were in effect even when energy prices on the market were lower than the fixed price, but in the past few years, market prices were higher, causing a tremendous loss to the state budget. With the actual energy crisis, keeping the cap on the prices became impossible, even though before the spring elections, the government communicated that the low prices would stay. Despite this, at the end of July 2022, a ceiling was introduced for the amount of energy that can be purchased at the prices fixed by the government. In the new system, there is a so-called “average” consumption level for both natural gas and electricity. Below this level, the subsidised price is kept. Above this level, market prices are used. This measure, introduced within just a couple of days, put millions of households into a very difficult financial situation.

At the end of 2021, the government introduced a fixed end-user price on 95 petrol and gasoline (480 HUF/L = ~1.2 EUR). The related legislation was changed several times, first to stop “fuel tourism” or individual fuel storage: only drivers with individual cars registered in Hungary could buy at the lower price and the lower price could not be used for filling fuel cans. This measure, just like the one on fixed

household end-user energy prices, was developed before the energy crisis of 2022, but the government wanted to keep it even when the market prices got higher, thus putting an extremely heavy burden on the Hungarian state budget. This policy worked intensively against energy efficiency and the rationalisation of energy consumption. According to official data, in just 3 trimesters, petrol consumption rose by 40 per cent and gasoline consumption by 36 per cent compared to the previous year. The cap was taken out of the system at the beginning of December 2022, when serious shortages were observable at filling stations: MOL, the Hungarian oil company, was unable to supply enough fuel, and the fuel formerly imported was not available. Imports were not coming to the country anymore since the fixed prices made fuel trade loss-making.

3

MANAGEMENT OF THE SANCTIONS

Hungary managed to negotiate special exemptions from certain elements of the sanction packages decided against Russia. Particularly with regard to energy carriers, Hungary's position is very strict when opposing the EU sanctions. In May of 2022, prime minister Viktor Orbán blocked further steps towards EU sanctions on oil, using the country's veto right. This is how the Hungarian government first managed to reach a deal where it was exempted from the ban of Russian crude oil then a deal where it was exempted from the ban of Russian oil products. The Hungarian oil refinery, the Duna Refinery at Százhalombatta is running on Russian oil blends. Although the technology can be modified to be suitable for the use of different oil blends, this would take a few years. A similar amount of time would be needed for developing capacities that can produce the blended oil needed for the refinery somewhere other than in Russia.³ In July 2022, Hungary was the only Member State that voted against the EU package that aimed at reducing natural gas consumption, arguing that it was against the country's interests. The government argues that as a landlocked country very much dependent on energy carrier imports, especially Russian imports, Hungary does not have the alternatives that other EU Member States have.

The increase in gas and electricity prices is hitting the society hard, although households are somewhat protected from the shocks with the partly fixed household end-user energy prices. For private companies, skyrocketing energy prices pose an existential threat: many companies had to shut down their activities – temporarily or definitively – because of the high energy bills. According to a new analysis, there have been almost twice as many liquidation procedures against Hungarian companies in 2022 than one year earlier.⁴ Local authorities also found themselves in a tricky situation when they lost their protected consumer status in the summer of 2022. Previously, they were also eligible for fixed end-user energy prices that were lower than the market price, but this changed very quickly, leaving local authorities in a situation where they had to close sport centres and cultural centres, limit the lighting of public buildings, decrease street lighting, and close major parts of public buildings to save energy.

³ <https://novekedes.hu/elemzesek/honnan-lenne-olaj-ha-bevezetnek-az-embargot-terkepen-mutatjuk-az-europai-koolajszallitasi-utvonalatokat>

⁴ <https://www.portfolio.hu/gazdasag/20230405/kozel-duplajara-nott-a-csodok-szama-magyarorszagon-az-epitoipar-van-a-legnagyobb-vesze-lyben-607352>

4

MEDIUM- AND LONG-TERM ANSWERS

A more structured response to the crisis was presented in July 2022, when the government declared a state of emergency due to the energy crisis and announced a 7-point action plan to increase the country's resilience.

1. Increase in domestic natural gas production.
2. Secure additional gas supply sources and fill up natural gas reserves.
3. Ban the export of energy carriers and firewood.
4. Boost domestic lignite production.
5. Relaunch all the blocks of the Mátra lignite power plant as soon as possible.
6. Start the construction phase of Paks 2 nuclear power plant as soon as possible.
7. Change the system of fixed end-user energy prices for households by introducing an average consumption level above which the consumers have to pay the market price for gas and electricity as well.

Hungary is trying to **diversify** its oil and natural gas import routes:

- The country wishes to secure more **LNG** from the Krk LNG-terminal of Croatia.
- Hungary is trying to reduce and diversify its oil imports; it pushes forward electrification in the transport sector and the expansion of the **Southern Adria Oil Pipeline** to transit oil arriving from Croatia as an alternative to the Friendship Oil Pipeline bringing in Russian oil.
- The country decided to increase its own extraction of natural gas and to search for new import routes. It is considering two new directions for imports: from the **Romanian Neptun Deep** natural gas field and from the **Azeri Shah Deniz 2** gas field. The Romanian route needs a few more years and a lot of investments to be operational; the Azeri route already exists but the capacity of the pipelines must be upgraded, which also requires some time and significant funding.

Although energy efficiency and reduction of the use of fossil fuels are on the table theoretically, not much can be seen in practice. The market price signal is the tool that makes consumers reduce their energy demand, while demand side-management, smart metering solutions, and significant building renovation programmes seem to be missing from the set of solutions really considered by the government.

The new **National Energy and Climate Plan** is being developed giving new modelling numbers for energy planification too. This new planning with background modelling is not due to the crisis but to the fact that the NECPs must be revised this year.

The **energy mix** of the country is also reconsidered in light of the war and the energy crisis.

Hungary announced the construction of 3 new power plants running on **natural gas**. These are said to be aimed mostly at replacing power plants that are becoming obsolete, but what is clear is that the role of gas is not becoming less important in government plants, it is not being phased out gradually as energy security, and the fight against climate change would require doing so.

Coal was supposed to disappear from the electricity mix by 2025 when the licence of the only lignite power plant expires, but with the 7-point emergency plan presented in chapter 2, the government decided that it would be kept longer than planned in the electricity system. The Mátra Power Plant can operate only at high costs, as it is obsolete, thus has high maintenance costs, and being the largest carbon emitter in Hungary, it faces high CO₂-costs in the European Trading Scheme.⁵ Keeping the power plant in the energy mix goes against energy efficiency and the reduction of greenhouse gas emissions.

Wind energy is a special situation in Hungary. Since 2016, there is a law that bans the construction of new wind turbines within a 12-kilometre distance from inhabited settlements. Until now, this meant that there was no area in Hungary where it would have been possible to install new

⁵ <https://english.atlatszo.hu/2023/03/03/this-is-how-is-the-hungarian-government-is-dealing-with-the-energy-crisis/>

wind energy capacity. This might change now. The government announced that wind energy will receive a green light again: this is a rational decision considering the energy crisis, but it is also a prerequisite set by the European Commission for Recovery and Resilience Funds to be transferred to Hungary. Although the declaration was made in February 2023, there is still no concrete draft of the new legislation or information about when this new legislation will be passed.

Photovoltaic capacities in Hungary rose from 160 MW in 2015 to 4,000 MW in 2022. Household PV was an important part of that increase and demand for PV systems became more and more important with the increase in fossil fuel prices. Especially when the government modified the system of end-user energy prices, the demand for household PV systems skyrocketed. Causing great surprise and disappointment to the market, the government suspended new connections to the grid for new solar energy installations from November 2022, arguing that the grid was not suitable for integrating more PV-capacities at the moment. This decision put all the PV market actors in a difficult situation: the companies could observe a very significant increase in the demand for new PV systems, and thus they increased their capacities. With the ban on new connections to the grid, the demand for new PV fell sharply and companies had to dismiss people they hired just a few months earlier. Although the ban is supposed to be provisory, the negative effect on the market is already there, and one cannot be sure that qualified workforce will come back to the sector once the ban is lifted, creating a bottleneck in the development of solar electricity systems.

The national strategies are planning more renewables, but with the ban on wind power still in place and the ban on feeding PV into the grid, it is questionable how and at what pace renewables will have the chance to further develop.

As presented in Chapter 1, **nuclear energy** provides almost half of the country's electricity production with the help of the Paks power plant running 100 per cent on Russian nuclear fuel. To decrease this dependency, Hungary is trying to find new sources of imports, and considered co-operation with the American company Westinghouse and the French Framatome. The fate of the new nuclear power plant to be built in the upcoming years is unclear, as Hungary sticks to the original plan of constructing Paks 2 by the Russian Rosatom. The construction of the Paks 2 Power Plant is already in an important delay and its construction does not only depend on the Hungarian government's will but also on the geopolitical situation and on what window of action it leaves for Hungary. The geopolitical situation might easily lead to a situation where Rosatom will not have the possibility to build the power plant, as some elements need to be imported from Germany and France, and there is some resistance from their side. If Rosatom (or another company) cannot build Paks 2, Hungary might find itself in a situation of an electricity shortage at the end of the 2030s when Paks 1, which is currently providing 45 per cent of Hungarian electricity production, will be shut down.

Hungary has had a hydrogen strategy since 2021: it was finalised before the war, but it seems that we can observe a change in pace in the past months when it comes to the deployment of hydrogen. Hungary wishes to accelerate the development of hydrogen projects and use this fuel in transportation, in electricity generation but also to replace some of the natural gas used in sectors where it is difficult to decrease its use.⁶ Two green hydrogen projects are entering the trial phase in spring 2023 (in Bükkábrány⁷ and Kardoskút⁸).

Finally, what are the government's plans regarding energy efficiency and energy savings? The greatest potential is here, but energy efficiency strategies often fail to lead to concrete steps in Hungary. As mentioned earlier, in Hungary, over one third of final energy consumption is linked to buildings: there is a great potential for energy savings and for greenhouse gas emission reductions in this sector. Although households are using less energy since the system of fixed end-user energy prices was modified, this is still not a structural change, only a change driven by high prices, and there is no sign of a thorough building renovation programme that could lead to substantial reductions in energy consumption.

⁶ <https://greendex.hu/a-vartnal-elobb-johet-el-a-hidrogen-ideje-magyarorszagon/>

⁷ <https://www.portfolio.hu/uzlet/20230419/indul-a-magyar-projekt-hatol-sok-a-napenergia-akkor-zold-hidrogen-allitanak-elo-610030>

⁸ <https://www.agroinform.hu/program/kiserleti-hidrogen-projekt-indul-a-magyar-foldgaztarok-igenybeveteleivel-62095-001>

5

FORESEEABLE CONSEQUENCES WITH REGARD TO EU CLIMATE GOALS/TARGETS?

Based on the declarations of different members of the Hungarian government, it considers increasing energy security and decreasing energy dependency more important than reaching the climate goals.

The 7-point-crisis programme and the plan to build new electric power plants running on natural gas do not show a will to solve the problem of energy dependency and that of climate change at the same time. The Hungarian government does not seem (or want) to realise that increasing both energy security and climate security can go hand in hand.

The ban on feeding into the grid for new PV systems also poses a problem, as it is basically stopping new PV developments, which is once again a missed opportunity for increasing energy and climate security at the same time.

Another missed opportunity is hitting the potential that lies in the deep renovation of the building stock: that is, a significant decrease in greenhouse gas emissions and in energy consumption. A long-term building renovation programme would necessitate a long-term vision from the government that takes into account climate goals too, not only energy security.

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