



COUNTRY REPORT LITHUANIA

Tomas Janeliūnas

Energy Without Russia

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

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Tomas Janeliūnas

Energy Without Russia: The Case of Lithuania

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

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INTRODUCTION

On 22 May 2022 the Energy Minister of Lithuania declared that Lithuania had successfully ceased importing Russian oil, gas, and electricity, making it the first EU member-state to declare itself free from Russian energy just three months after the Russian military invasion of Ukraine. 'Not only it is an extremely important milestone for Lithuania in its journey towards energy independence, but it is also an expression of our solidarity with Ukraine. We must stop financing the Russian war machine,' said Energy Minister Dainius Kreivys.¹

Lithuania had long been dependent on Russia for its energy needs, even after joining the EU and NATO in 2004, and had one of the highest energy import dependency rates in the EU, almost 70%, with 96.1% of all imported energy originating from Russia in 2020.²

Despite having an oil terminal since 1999, and a Floating Storage Regasification Unit (FSRU) that enabled importing gas from global energy markets since 2014, the majority of Lithuania's energy imports still came from Russia. In 2021, Lithuania spent more than €3 billion on Russian oil, gas, and electricity.³

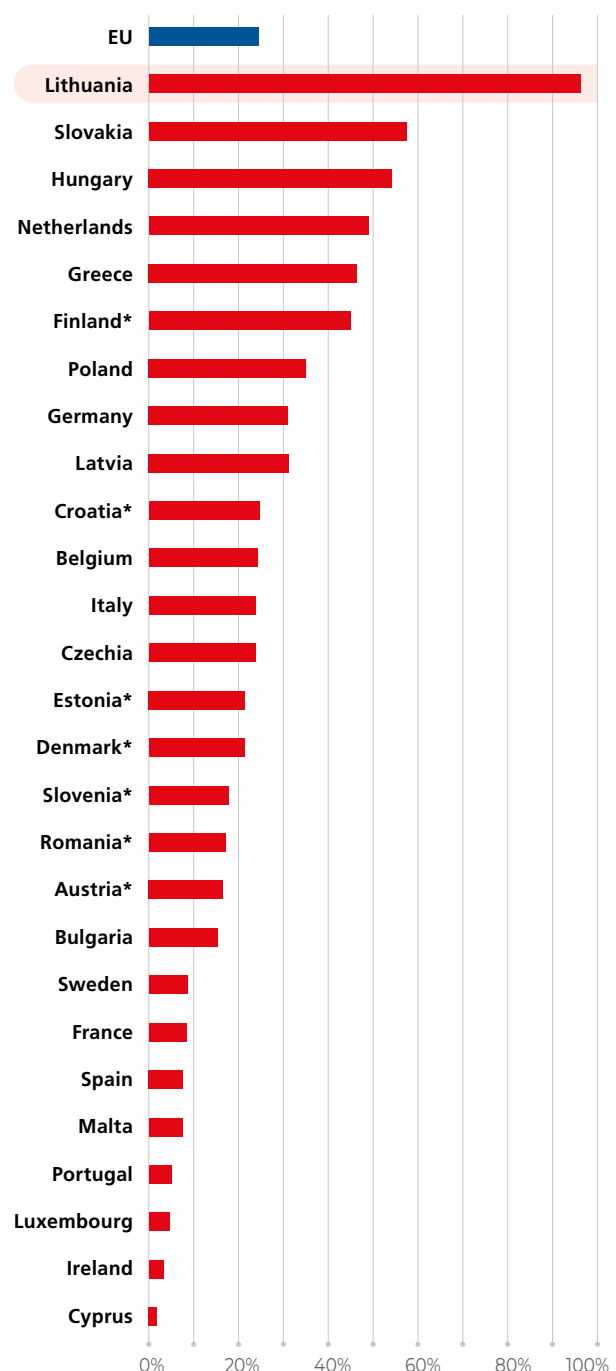
The full-scale war in Ukraine prompted almost all EU member-states to minimise their energy dependence on Russia. However, Lithuania became the first country to practically decouple from Russia's energy supply. This achievement was facilitated by the proactive preparation and implementation of infrastructure projects aimed at enhancing energy import diversification.

¹ Giedre Peseckyte, 'Lithuania Now Fully Independent of Russian Energy', [www.euractiv.com](https://www.euractiv.com/section/politics/short_news/lithuania-now-fully-independent-of-russian-energy/), 24 May 2022, https://www.euractiv.com/section/politics/short_news/lithuania-now-fully-independent-of-russian-energy/.

² Eurostat, 'EU Energy Mix and Import Dependency', accessed 18 April 2023, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_energy_mix_and_import_dependency.

³ 'Lithuania Pays €3 Billion for Russian Energy – Could the Dependence Be Cut?', [Irt.lt](https://www.lrt.lt/en/news-in-english/19/1631705/lithuania-pays-eur3-billion-for-russian-energy-could-the-dependence-be-cut), 2 March 2022, <https://www.lrt.lt/en/news-in-english/19/1631705/lithuania-pays-eur3-billion-for-russian-energy-could-the-dependence-be-cut>.

Figure 1
Imports from Russia in gross available energy, EU, 2020



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

1

ENERGY SITUATION BEFORE 2022

Lithuania has limited resources for energy production and has been dependent on Russia for energy since regaining independence in 1990. Until 2014, Gazprom held a monopoly on gas supplies, dictating prices and supply terms. In 2014, Lithuania acquired a Floating Storage Regasification Unit (FSRU) to diversify its gas supply. Lithuania has also relied on nuclear energy from the Ignalina Nuclear Power Plant (NPP) since 1984, but agreed to close the plant's two reactors during negotiations for EU accession. The closure of the Ignalina NPP in 2009 made Lithuania a net importer of electricity,⁴ and its energy import dependency rose from 48.55% in 2009 to 79% in 2010.⁵

Despite aiming to transition to a zero-carbon economy, Lithuania still relies heavily on oil and gas consumption, which

accounted for 62.6% and 15.9% of domestic consumption in 2021, respectively, with only 14.2% coming from renewable sources.

Lithuania's heavy industry is limited, but the chemistry sector stands out with PKN Orlen's ownership of the only oil refinery in the Baltic states (Mazeikiu nafta) and several large fertiliser manufacturers. As a result, Lithuania's industrial consumption of oil and gas is higher than in Latvia and Estonia. The transport sector (38.7% of all final consumption in 2021) and households (28.5% in 2021) consume the most energy. Industry accounts for approximately 18.6% of all final consumption, while services consume 11.3%.

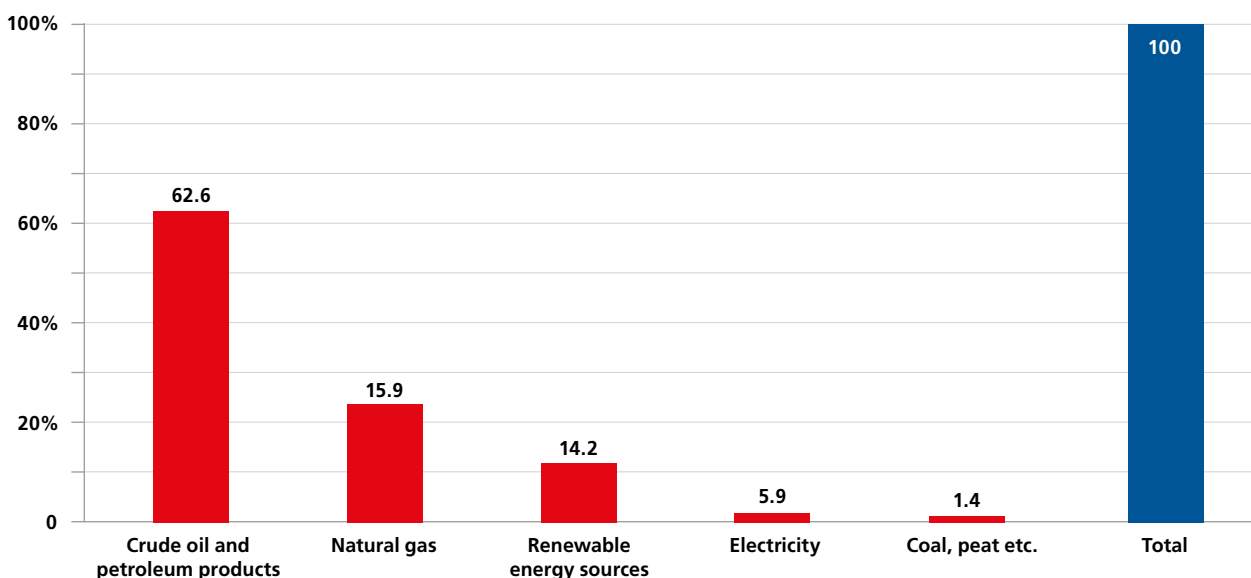
The energy consumption per capita increased steadily in recent years and reached 25.187 MhW per person in 2021, however, this is considerably still less than the EU average – 37.519 MhW per person.⁶

⁴ International Atomic Energy Agency, Country Nuclear Power Profiles, 'Lithuania 2020', accessed 20 April 2023, <https://cnpp.iaea.org/countryprofiles/Lithuania/Lithuania.htm>.

⁵ Tomas Janeliūnas, 'Lithuania: When a Transition to Zero-Carbon Energy Is the Only Option', in *The Palgrave Handbook of Zero Carbon Energy Systems and Energy Transitions*, ed. Geoffrey Wood et al., Palgrave Studies in Energy Transitions (Cham: Springer International Publishing, 2022), 1–20, https://doi.org/10.1007/978-3-030-74380-2_33-1.

⁶ OurWorldInData.org, Per capita energy consumption, accessed 10 May 2023, <https://ourworldindata.org/grapher/per-capita-energy-use?tab=Table>

Figure 2
Structure of gross domestic consumption, 2021



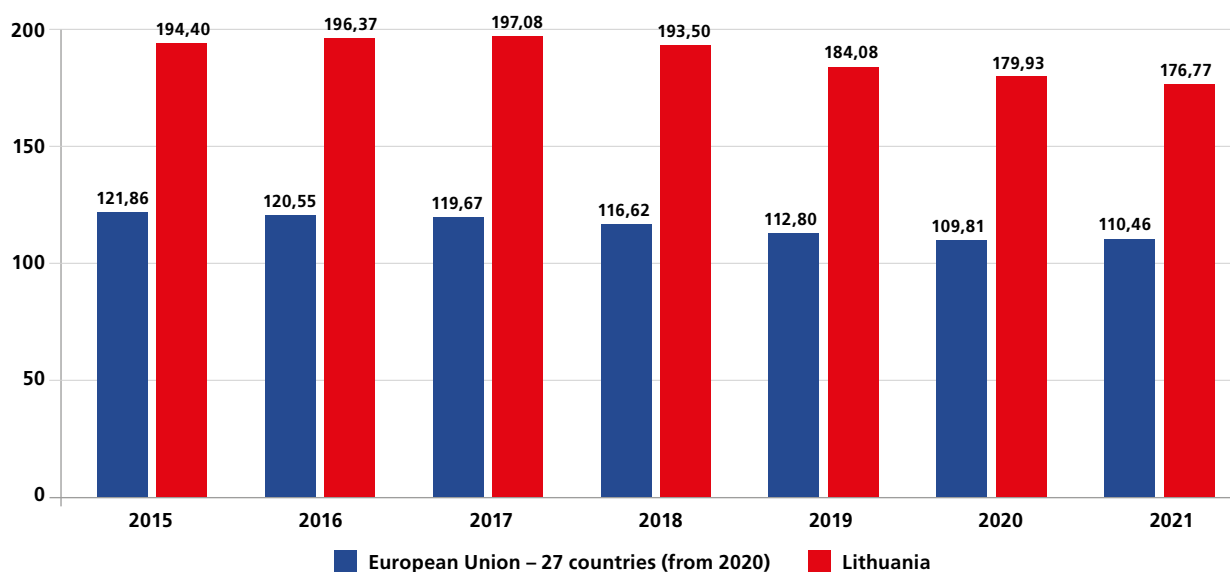
Source: Official statistics portal of Lithuania, *Environment, Agriculture and Energy in Lithuania* (edition 2022) <https://osp.stat.gov.lt/lietuvs-aplinka-zemes-ukis-ir-energetika-2022/energetika/energijos-balansas>

Table 1
Final consumption of fuel and energy by sector, 2020 and 2021 (in Terajoule)

	2020	2021
Transport	91,690	92,775
Households	60,011	68,228
Industry	41,068	44,632
Services and other activities	24,119	27,081
Agriculture	4,758	5,102
Construction	1,817	1,798
Fishing	36	42

Source: Official statistics portal of Lithuania, *Environment, Agriculture and Energy in Lithuania* (edition 2022) <https://osp.stat.gov.lt/lietuvs-aplinka-zemes-ukis-ir-energetika-2022/energetika/energijos-balansas>

Figure 3
Energy intensity of GDP (in chain linked volumes, 2015), kg of oil equivalent per thousand euro



Source: Eurostat, https://ec.europa.eu/eurostat/databrowser/view/NRG_IND_EI__custom_6023708/default/table?lang=en

However, the ‘energy intensity’ indicator is a more precise way of measuring energy efficiency in relation to economic performance. Although Lithuania has reduced its energy intensity in recent years, it still lags behind the EU average. In 2021, Lithuania used 176.77 kilograms of oil equivalent per thousand euros of GDP, which was 60% higher than the EU average.

Despite the progress made in Lithuania’s energy system, the electricity sector remains vulnerable after the closure of the Ignalinas NPP. To address this, Lithuania has focused on connecting with other EU countries to diversify electricity imports. The NordBalt interconnection line, a 700 MW submarine power cable connecting Lithuania and Sweden, and the LitPol Link, a 500 MW electricity link between Lithuania and

Poland, were installed by the end of 2015, offering access to the NordPool energy market and the ability to trade electricity with Poland. However, the reliance on electricity imports has hindered the development of Lithuania’s domestic generation, including gas-fired power plants and those based on renewable energy sources.⁷ As a result, Lithuania’s dependence on electricity imports is now among the highest in the EU.

In 2021, Lithuania produced 5,078.6 GWh of electricity while consuming 14,122.3 GWh. This means that the net import of electricity was 9,043.7 GWh, which is equivalent

⁷ Janeliūnas.

Table 2

Lithuania's electricity gross consumption, production, imports and exports 2019–2021 (GWh)

	2019	2020	2021
Gross consumption	13,315.2	13,426.0	14,122.3
Final consumption	10,541.1	10,355.3	11,154.2
Gross production	3,971.6	5,517.5	5,078.6
Import	13,385.1	11,260.7	11,915.6
Export	4,041.5	3,352.2	2,871.9

Source: Official statistics portal of Lithuania, *Environment, Agriculture and Energy in Lithuania* (edition 2022) <https://osp.stat.gov.lt/lietuvas-aplinka-zemes-ukis-ir-energetika-2022/energetika/energijos-balansas>

Table 3

Gross production of electricity by type of installation, 2017–2021 (GWh)

	2020	2021
Public CHP plants	1,941.2	1,735.1
Autoproducer CHP plants	609.1	504.6
Solar thermal electric plants	128.8	190.8
Hydroelectric plants	300.5	383.7
Hydro pumped storage	779.6	710.2
Wind turbines	1,551.7	1,361.7
Other plants (which use energy from chemical processes)	206.6	192.5

Source: Official statistics portal of Lithuania, *Environment, Agriculture and Energy in Lithuania* (edition 2022) <https://osp.stat.gov.lt/lietuvas-aplinka-zemes-ukis-ir-energetika-2022/energetika/energijos-balansas>

to 64% of the gross consumption.⁸ The top electricity suppliers for Lithuania in 2021 were Sweden (3.7 TWh or 31% of all imports), Latvia (2.5 TWh or 21%) and Russia, including Kaliningrad (2.0 TWh or 16.8%).⁹ Lithuania used its link with Poland mainly for exporting electricity.

While it is producing a modest share of electricity compared to gross consumption, the domestic electricity generation sector is moving quickly towards renewables. In 2021, 48% of total electricity production was from renewable energy sources (wind, solar, and hydro plants), while in 2022, it reached almost 60%.¹⁰

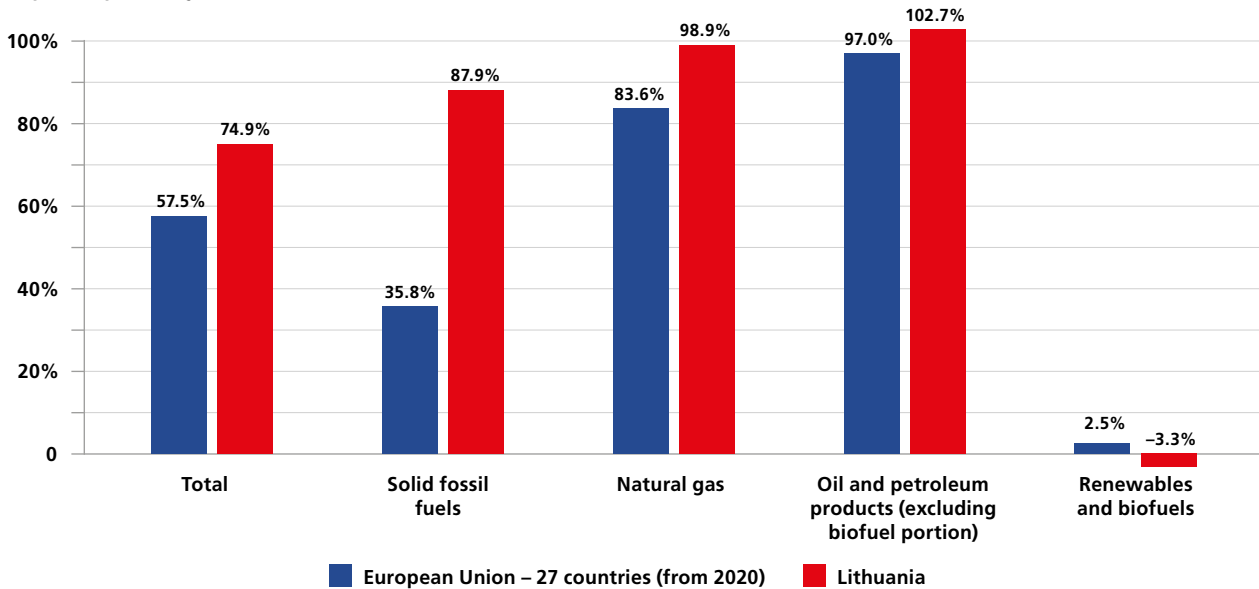
Until 2022, Lithuania's dependency on Russian energy imports was very high. Despite declaring a goal to diversify energy imports, the majority of energy and fuel imports still

⁸ Official statistics portal of Lithuania, *Environment, Agriculture and Energy in Lithuania* (edition 2022), accessed 20 April 2023, <https://osp.stat.gov.lt/lietuvas-aplinka-zemes-ukis-ir-energetika-2022/energetika/energijos-balansas>.

⁹ „Litgrid“: augant ekonomikai, 2021 m. elektros vartojimas Lietuvoje buvo didžiausias per 30 metų, 15min.lt accessed 10 May 2023, https://www.15min.lt/verslas/naujiena/energetika/litgrid-augant-ekonomikai-2021-m-elektros-vartojimas-lietuvoje-buvo-didziausias-per-30-metu-664-1645766?utm_medium=copied.

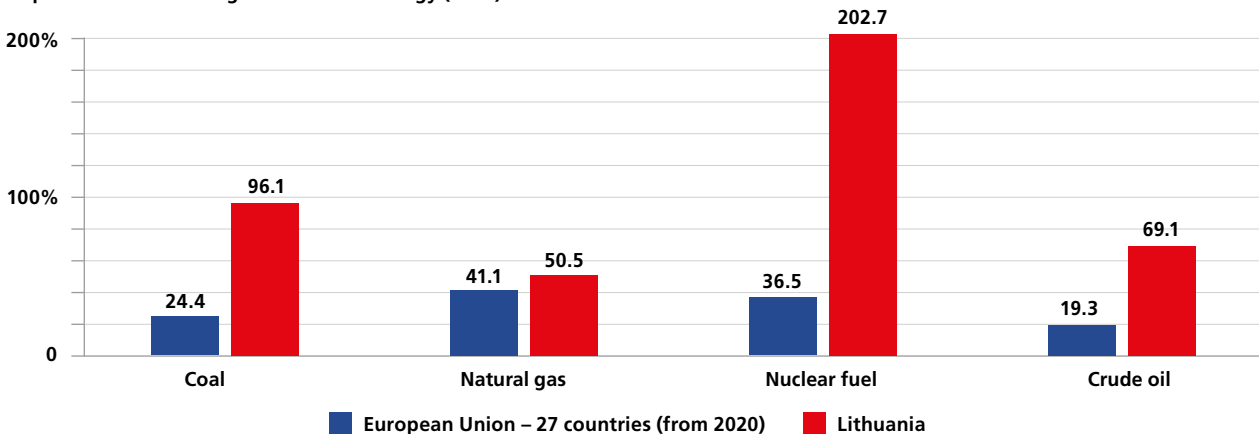
¹⁰ „Litgrid“: 60 proc. pernai Lietuvoje pagamintos elektros energijos – iš atsinaujinančių išteklių, lrt.lt, 10 February 2023, <https://www.lrt.lt/naujienos/verslas/4/1887046/litgrid-60-proc-pernai-lietuvoje-pagamintos-elektros-energijos-is-atsinaujinanciu-istekliu>.

Figure 4
Import Dependency (2020)



Source: Eurostat, https://ec.europa.eu/eurostat/statistics-explained/images/2/24/EnergyMixDependencyImports_25-03-2022.xlsx

Figure 5
Imports from Russia in gross available energy (2020)



Source: Eurostat, https://ec.europa.eu/eurostat/statistics-explained/images/2/24/EnergyMixDependencyImports_25-03-2022.xlsx

came from Russia. Eurostat calculated that in 2020, 96% of carbon-based fuel imports in Lithuania's overall energy mix came from Russia, the highest rate among EU states (see Figure 5). With a total import dependency rate of almost 75% in the energy sector (see Figure 4), it can be inferred that Lithuania was almost entirely reliant on Russia to meet its energy needs.

However, the situation may not be as dire as it seems. The high level of dependency on Russian energy imports is partially due to the operation of the Mazeikiu Nafta oil refinery, which used Russian crude oil in excess of domestic Lithuanian needs. Mazeikiu Nafta distributed its refined oil products to other Baltic States and Poland, leading to an oil import rate from Russia of more than 200% of Lithuania's needs. Since the closure of the branch of the Druzhba oil pipeline leading to Lithuania in 2006,¹¹ all crude oil has been ac-

quired through a sea-based oil terminal on global market terms. Similarly, the LNG terminal started operation in 2014 and has the potential to cover all of Lithuania's gas needs. Nevertheless, the nominal value of Russian energy imports was still significant, with Lithuania paying approximately €2.7 billion for Russian oil products, and an additional €140 million and €180 million spent on Russian gas and electricity, respectively, in 2021.¹² This comprised approximately 8% of all Lithuanian imports, making Russia the third-largest import partner in 2021.¹³

ber 2007, sec. Oil Report, <https://www.reuters.com/article/lithuania-russia-oil-idUKL1159854520071011>.

¹² LRT.lt, 'Lithuania Pays €3 Billion for Russian Energy – Could the Dependence Be Cut?'

¹³ Ministry of Foreign Affairs, Republic of Lithuania, 'Export, Investments and Tourism Promotion. Trade and Economic Relations. Economic Diplomacy', accessed 21 April 2023, <https://urm.lt/default/en/economic-diplomacy/trade-and-economic-relations/export-investments-and-tourism-promotion>.

¹¹ 'Russia Won't Re-Open Oil Pipeline, Lithuania Says', *Reuters*, 11 Octo-

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POLITICAL AND OPERATIONAL RESPONSES AFTER FEBRUARY 2022

Lithuania had long expressed concerns about the potential for Putin's aggression, but Russia's military attack on Ukraine in February 2022 came as a surprise. However, tensions had already escalated due to the energy war between Russia and the EU, which began in 2021. Gazprom, a major Russian gas supplier, was accused of market manipulation and withholding gas supply volumes from the European market, which contributed to the natural gas price crisis in Europe during the 2021–2022 period.¹⁴

The Lithuanian government and top energy companies quickly stopped importing Russian fuels, even before any EU-level sanctions were imposed on Russian energy. This

decision was influenced by strong political and societal support for Ukraine in Lithuania. The boycott of Russian energy became a major point of focus for Lithuanian foreign policy, and there was a lot of public pressure, particularly through social media, on businesses to stop working with Russian companies.

As a result, the import of main energy sources from Russia decreased rapidly. By 2022, the share of crude oil imported from Russia had fallen to 17.1% of the total import, compared to almost 80% in 2021. The import of gas fell from 69% to 42%, and the electricity import was just 6.9% of the total import (see Table 4).

In early March 2022, the Lithuanian operator of the LNG terminal stopped accepting LNG cargoes from Russia's Novatek after the EU imposed sanctions on the Russian oli-

¹⁴ Vladimir Milov, 'European Gas Price Crisis: Is Gazprom Responsible?', *European View* 21, no. 1 (1 April 2022): 66–73, <https://doi.org/10.1177/17816858221084761>.

Table 4
Gross production of electricity by type of installation, 2017–2021 (GWh)

Imports of fuel and energy resources, (natural units)	2022		2021	
		Share of Russia, %		Share of Russia, %
Hard coal, thous. tonnes. TOTAL	336.4		224.4	
Russia	254.4	75.6	224.4	100.0
Liquefied petroleum gases, thous. tonnes. TOTAL	130.8		55.5	
Russia	72.4	55.4	8.9	16.0
Road diesel (with biofuels), thous. tonnes. TOTAL	698.6		642.2	
Russia	34.6	5.0	386.8	60.2
Crude oil, thous. tonnes. TOTAL	8,188.9		8,006.6	
Russia	1,397.3	17.1	6,399	79.9
Natural gas, GWh. TOTAL	62,119.6		53,445	
Russia	26,008.2	41.9	37,032.8	69.3
Electricity, GWh. TOTAL	11,165.3		11,915.4	
Russia	770.8	6.9	2,047	17.2

Source: calculated by author, data from Official statistics portal of Lithuania, <https://osp.stat.gov.lt/statistiniu-rodikliu-analize?indicator=S1R134#/>

garch Gennady Timchenko.¹⁵ Lithuanian companies also cut off imports of pipelined Russian gas in April 2022 and, since then, procured all its gas (mainly from the US) through the Klaipėda LNG terminal. The Lithuanian Parliament passed a law in June 2022 prohibiting gas imports from Russia and other countries considered a threat to national security.¹⁶ That became a point of no return for Lithuania regarding pipeline-gas trade with Russia. However, Russian gas is allowed to transit through Lithuania to Kaliningrad, ensuring that only the volume needed for transit is transported.

PKN Orlen, the Polish energy firm running the oil refinery Mazeikiu Nafta, halted the purchase of Russian crude oil on the spot market in March, with no Russian oil deliveries to Lithuania since April.¹⁷ This switch encouraged the Lithuanian government to lobby for a Russian oil embargo across the EU.

On 22 May 2022, the Nord Pool power exchange ceased trading with Russian electricity suppliers due to payment failure risks.¹⁸ Consequently, Lithuanian customers stopped receiving Russian electricity as of May 2022, which usually accounts for 15–20% of all Lithuanian electricity imports. Belarussian electricity was also banned in 2020 following the launch of the Astravyets nuclear power plant, which is considered unsafe.¹⁹

International sanctions imposed on the Russian financial sector further aided the efforts to detach from the Russian energy sector, reducing the flow of money to the Russian budget. Lithuania's heavy reliance on energy imports and the post-Soviet infrastructure networks connecting it with Russia meant that decoupling from Russian energy sources came at a cost. The decision to construct an LNG terminal in 2014 sparked controversy due to high LNG prices compared to pipeline costs, adding extra fees to Lithuanian consumers' gas bills. However, the project served as an insurance policy, and according to the Financial Times, 'the insurance policy has been cashed in.'²⁰

¹⁵ Klaipėdos Nafta, 'KN Suspends Acceptance of Novatek's Cargoes at Lithuania's LNG Terminal', accessed 22 April 2023, <https://www.kn.lt/en/news/news/kn-suspends-acceptance-of-novateks-cargoes-at-lithuanias-lng-terminal/5141>.

¹⁶ 'Lithuania Bans Russian Gas, Leaves Exception for Transit to Kaliningrad', Irt.lt, 28 June 2022, <https://www.irt.lt/en/news-in-english/19/1728613/lithuania-bans-russian-gas-leaves-exception-for-transit-to-kaliningrad>.

¹⁷ 'Lithuania Breaks Free from Russian Energy – DW – 05/10/2022', dw.com, accessed 22 April 2023, <https://www.dw.com/en/how-lithuania-is-freeing-itself-from-russian-energy/a-61738474>.

¹⁸ 'Russia's Inter RAO Says Nord Pool Will Halt Trade for Its Subsidiaries', Reuters, 20 May 2022, sec. Energy, <https://www.reuters.com/business/energy/russias-inter-rao-says-nord-pool-will-halt-trade-its-subsidiaries-2022-05-20/>.

¹⁹ 'Lithuania Stops Power Trade with Belarus as Nuclear Plant Comes Online', Reuters, 3 November 2020, sec. Oil report, <https://www.reuters.com/article/litgrid-belarus-idINL8N2HP35A>.

²⁰ Richard Milne, 'Lithuania Proves Prescient on Risk of Russian Energy', Financial Times, 28 November 2022, sec. EU energy, <https://www.ft.com/content/52626e1c-0731-43db-a755-4b7680949cc2>.

3

SHORT-TERM IMPACT OF ENERGY DECOUPLING FROM RUSSIA

The major impact on energy prices in Lithuania came from global and European-level market conditions after February 2022. The increase in gas and electricity prices in the second half of 2022, compared to the previous period in 2021, was huge. According to National Energy Regulation Council of Lithuania, the average weighted price of imported natural gas in the second half of 2022 was 149.65 EUR/MWh, or 2.8 times higher than in the second half of 2021.²¹

Limiting electricity imports from Russia and Belarus contributed even more to price surges in 2022, with Lithuania and Latvia recording the highest electricity prices on the Nord Pool exchange on a number of days in the summer. Consequently, electricity prices have been reflected in the inflation rate, which reached 21.4% in November 2022, one of the highest rates among the European Union countries.²² The electricity price on Nord Pool, LT zone, reached their peak in August, when the monthly average was 480 euros/MWh.²³

There were also some positive trends shown for the Lithuanian gas sector. In May 2022, the gas interconnection between Poland and Lithuania (GIPL) started operations, allowing Lithuanian-imported LNG to flow to Poland. The finalisation of the gas interconnection has become all the more critical following Russia's unilateral decision to disrupt gas supplies to Poland. As a result, Lithuania, for the first time, became a significant player in gas transit to the other EU countries. The Lithuanian LNG terminal increased its operational efficiency almost to the maximum and became a gate for LNG import not only to Latvia and Estonia but also to Poland. Natural gas transportation to EU countries in the second half of 2022 reached 15,445 GWh and, compared to the second half of 2021, increased 11.4 times. The Lithuanian operator of the liquefied natural gas system gasified 19,080 GWh of natural gas in the second half of

2022, i.e. 2.7 times more than in 2021. That resulted in 34% greater revenue in the second half of 2022 compared to the same period in 2021.²⁴

However, despite the politically celebrated 'full decoupling' from Russian energy import, some trends showed the opposite. As Reuters announced in 2023, Russia more than doubled its liquefied petroleum gas (LPG) sales to the Baltic states in 2022.²⁵ LPG, mainly used as fuel for cars, heating, and in the production of other petrochemicals, has been exempt from Western sanctions imposed against Russia and accounted for only a tiny part of the total fuel imports in Lithuania. And still, the LPG supplies to Lithuania from Russia jumped 8.5 times to 72,000 tonnes in 2022, forcing the Lithuanian Ministry of Energy to look for excuses and public explanations. 'The import of Russian LPG and the business relations with Russia are to be seen as a moral issue, and the managers and shareholders of these companies could themselves comment more on the maintenance of business relations with Russia in these times of unprecedented war in Europe,' commented the Lithuanian Ministry of Energy.²⁶

The Lithuanian government implemented several measures to compensate affected consumers to address the rapidly increasing gas and electricity prices. For example, the revised 2022 state budget allocated €973 million for anti-inflation measures, of which around €570 million was set aside for household customers affected by the energy price increase. The proposed substantial package of financial support to address the energy price increase was described as one of the largest in the EU, measured as a share of GDP.²⁷

²¹ National Energy Regulatory Council, 'VERT Skelbia 2022 Metų II Pusmečio Gamtinių Dujų Rinkos Stebėsenos Ataskaitą', accessed 22 April 2023, <https://www.regula.lt/Puslapiai/naujienos/2023-metai/2023-04-19/vert-skelbia-2022-metu-ii-pusmecio-gamtiniu-duju-rinkos-stebesenos-ataskaita.aspx>.

²² Eurostat, 'Annual Inflation down to 10.1% in the Euro Area', 12 2022, <https://ec.europa.eu/eurostat/documents/2995521/15701156/2-16122-022-AP-EN.pdf/4eaa941a-8c7d-af89-37da-f29f1167c24c>.

²³ Nord Pool, Market Data, accessed 10 May 2023, <https://www.nordpoolgroup.com/>.

²⁴ National Energy Regulatory Council, 'VERT Skelbia 2022 Metų II Pusmečio Gamtinių Dujų Rinkos Stebėsenos Ataskaitą'.

²⁵ 'Exclusive: Baltic States Bought Twice as Much Russian LPG Last Year - Traders', *Reuters*, 26 January 2023, sec. Commodities, <https://www.reuters.com/markets/commodities/baltic-states-bought-twice-much-russian-lpg-last-year-traders-2023-01-26/>.

²⁶ 'Lithuanian Ministry Says Businesses Are Responsible for Increased Russian LPG Imports - LRT', accessed 22 April 2023, <https://www.lrt.lt/en/news-in-english/19/1880326/lithuanian-ministry-says-businesses-are-responsible-for-increased-russian-lpg-imports>.

²⁷ 'Lithuania Offers a Large Support Package on Energy Prices', *euronews*, 7 September 2022, <https://www.euronews.com/2022/09/07/lithuania-offers-a-large-support-package-on-energy-prices>.

One of the consequences of the tremendous increase in electricity prices was a rapid growth of business and household investments in solar energy. According to a report by Ember, solar generation in Lithuania increased by over 120% in 2022 on a year-over-year basis, making it the top country in the EU with the highest solar capacity growth.²⁸ This was the result of a successful model introduced by the Lithuanian government a few years ago, intended to support residential investment in photovoltaic generation. The Lithuanian government has decided to increase the 2022 budget for solar rebates by €35 million (originally, it had earmarked only €5 million) after the initial phases of the program showed substantial success among homeowners.²⁹ Although in nominal terms, the share of solar power plants is still not large, in 2022 the number of generating consumers in Lithuania increased by a factor greater than two. At the beginning of 2023, there were 42,000 producing consumers (or 'prosumers') in Lithuania, and the total power reached 572.3 MW. For comparison, in January 2022, there were 15,000 prosumers whose total photovoltaic generation amounted to 261.8 MW.³⁰

Overall, the war in Ukraine and sanctions on Russian energy sources significantly impacted gas and electricity prices in Lithuania, similar to the trend across Europe. Still, there was no energy shortage or tension regarding the capability to find an alternative gas or oil supply, as the infrastructure was already in place. Moreover, in some cases, the rapid detachment from Russia and the energy price shock even had positive effects, such as an increased efficiency of Lithuanian LNG and gas transit operations and a much more rapid growth of solar power plants.

²⁸ Simon Yuen, 'EU Solar Generation Increased by 24% in 2022, Capacity Additions to Accelerate by 2026 - Ember', *PV Tech* (blog), 31 January 2023, <https://www.pv-tech.org/eu-solar-generation-increased-by-24-in-2022-capacity-additions-to-accelerate-by-2026-ember/>.

²⁹ 'Lithuania Devotes €40 Million for Solar Rebates in 2022', *pV magazine International*, 3 February 2022, <https://www.pv-magazine.com/2022/02/03/lithuania-devotes-e40-million-for-solar-rebates-in-2022/>.

³⁰ The Government of the Republic of Lithuania, '2022 metais dvigubai išaugo gaminančių vartotojų skaičius', accessed 25 April 2023, <https://enmin.lrv.lt/lt/naujienos/2022-metais-dvigubai-isaugo-gaminanciu-vartotoju-skaicius>.

4

MEDIUM- AND LONG-TERM ANSWERS

It is somewhat paradoxical, but the energy crisis in 2022 did not change the fundamental direction of Lithuania's energy strategy.

For a long time, Lithuania had planned to increase its independence from Russia's energy resources for strategic purposes. In the last decade, the most critical strategic energy projects and investments were intended for this purpose. Currently, almost all energy diversification infrastructure projects have already been completed.³¹ Therefore, it is symbolic that it was in April 2022 that Lithuania finalised the gas infrastructure diversification and connection to the European networks project (interconnection Lithuania-Poland, GIPL). As a result, since 2022, Lithuania can satisfy its gas import needs without Russia.

The last massive investment project to complete the disconnection from Russian energy is the synchronisation of the power grid with continental Europe. The Baltic states still operate as a part of the BRELL (Belarus-Russia-Estonia-Latvia-Lithuania) grid, and Moscow controls the frequency of the network. Lithuania, Latvia, and Estonia intend to complete the synchronisation project (supported by the European Commission) by 2025.³² However, the war in Ukraine and the greater impulse to speed up the complete disengagement from Russia have encouraged Lithuanian politicians to strive for an even quicker completion of the project. Lithuania aims to formally disconnect from the BRELL frequency support agreement in 2023 and synchronise with continental Europe in 2024. One of the critical steps was the isolated operation test, which took place on 22 April 2023.³³ This test confirmed that, if necessary, Lithuanian electricity networks can function without frequency support from Moscow. However, Latvia and Estonia are not yet in a hurry to speed up synchronisation and claim that all the necessary infrastructure strengthening works have not yet been completed.

Although from 2022 till early 2023, the Lithuanian government did not adopt any new official medium or long-term energy strategies, it did make certain political efforts to increase the pace at which the already settled targets transitioning to zero-carbon energy would be reached.

In 2022, the government allocated an additional €1.12 billion for investments in energy independence, including funds to subsidise 30% of the renovation of multi-apartment building projects; to promote the private purchase and installation of solar power stations; and to support business initiatives for the deployment of solar, wind farm, and electricity storage batteries and hydrogen production equipment from renewable energy sources.³⁴

Following the REPowerEU strategy prepared by the European Commission, on 7 September 2022, the Lithuanian government approved the national plan for increasing energy efficiency. The proposed measures would allow spending on energy costs to be reduced by €800 million within two years. However, such calculations regarding potential energy cost savings may be viewed as overly optimistic. In principle, the government can only control measures implemented by the public sector to increase energy efficiency. It is planned that by obliging public sector institutions to reduce energy consumption by 20% in the next two years, implementing the proposed recommendations and using support for increasing energy efficiency, the costs of electricity and heating in the public sector will decrease by €100 million. In total, €1.3 billion will be allocated for increasing energy efficiency through support measures in 2021–2027, of which €207 million will be allocated to the public sector, €900 million to residents, and €225 million to businesses.³⁵

In 2022, the Ministry of Energy initiated the review and update of the National Energy and Climate Action Plan. The draft of the updated NECAP must be submitted to the European Commission by 30 June 2023. The revised plan could

³¹ Janeliūnas, 'Lithuania'.

³² Maris Andzans, 'The Baltic Road to Energy Independence from Russia Is Nearing Completion - Foreign Policy Research Institute', accessed 25 April 2023, <https://www.fpri.org/article/2022/05/the-baltic-road-to-energy-independence-from-russia-is-nearing-completion/>.

³³ 'Lithuania Completes Electricity Grid Test, "Giant Step towards Energy Independence"', lrt.lt, 24 April 2023, <https://www.lrt.lt/en/news-in-english/19/1969404/lithuania-completes-electricity-grid-test-giant-step-towards-energy-independence>.

³⁴ Ministry of Finance of the Republic of Lithuania, 'The EUR 2.26 Billion Package Presented to Counter the Effects of Inflation and to Strengthen Energy Independence', accessed 25 April 2023, <https://finmin.lrv.lt/en/news/the-eur-2-26-billion-package-presented-to-counter-the-effects-of-inflation-and-to-strengthen-energy-independence>.

³⁵ Ministry of Energy of the Republic of Lithuania, 'Vyriausybė pritarė energijos taupymo priemonių planui', accessed 25 April 2023, <https://enmin.lrv.lt/lt/naujienos/vyriausybe-pritare-energijos-taupymo-priemoniu-planui>.

include additional measures that would help speed up the implementation of the set goals and meet the ambitions of the European Commission with regard to the REPowerEU.

However, some planned works have been postponed due to the upheavals in 2022 and the need to respond to short-term crises. For example, the original plan was to prepare the National Hydrogen Development Guidelines by the end of 2022 – the first national-level strategic document to define the goals of hydrogen production, transportation, and consumption in Lithuania. However, the guidelines were still not finalised by 30 April 2023. On the other hand, some practical steps have been taken: in December 2022, Lithuanian transmission system operator Amber Grid, together with Gasgrid Finland (Finland), Elering (Estonia), Connexus Baltic Grid (Latvia), GAZ-SYSTEM (Poland) and ONTRAS (Germany) signed a cooperation agreement on the implementation of a cross-border project, the Nordic-Baltic Hydrogen Corridor. The project aims to connect Northern Europe's green energy production regions with Central Europe's main consumption centres, especially Germany. The project is expected to be completed by 2030.³⁶ The international tender for a pre-feasibility study was launched in April 2023.

³⁶ Amber Grid, 'Amber Grid Launches International Tender for Hydrogen Corridor Pre-Feasibility Study', accessed 26 April 2023, <https://www.ambergrid.lt/en/for-media/news/amber-grid-launches-international-tender-for-hydrogen-corridor-pre-feasibility-study/825>.

5

FORESEEABLE CONSEQUENCES CONCERNING EU CLIMATE GOALS AND TARGETS

The Lithuanian government endorsed the REPowerEU plan and renewed ambitions set by the European Commission to reduce the EU dependence on Russian gas and oil imports and to move more quickly with the green transition. In February 2023, the Council of the European Union and the Parliament officially approved the REPowerEU plan, according to which Lithuania is to be provided with a new €194 million grant to strengthen the energy system's resilience, security and sustainability. As the Minister of Finance Gintarė Skaistė explained, the Lithuanian government has set ambitious goals to produce all the electricity consumed in Lithuania from renewable resources by the end of the decade and to become an electricity exporting country.³⁷ This target is highly ambitious, considering that for the last few years, about 60–70% of gross electricity consumption comes from imports.

The government is currently working on supplementing the 'New Generation Lithuania' plan (adopted in 2021) to include a special REPowerEU section. The updated plan foresees using additional funds from the REPowerEU initiative and the borrowing option provided by the Economic Recovery and Resilience Facility and investing about €1 billion more in energy independence, renewable energy resources, and energy efficiency. The additional measures include, but are not limited to, the development of energy production from renewable resources, the development of energy infrastructure networks, increasing energy consumption efficiency in buildings, the decarbonisation of industry, and support for clean transport.³⁸

It is hard to predict the potential success of the announced ambitions, but Lithuania demonstrated reasonable progress in increasing the share of renewable energy sources (RES). The initial target for 2020 was to reach 23% of RES in gross final consumption, but this target had already been attained in 2014. In 2021, the total share of energy from renewable sources in gross final consumption was 28.1%.

However, as noted in the country's report by the International Energy Agency (IEA), progress in energy efficiency has

slowed down, as in other IEA countries. Lithuania did not meet its 2020 final energy consumption target of 4.3 million tonnes of oil equivalent (Mtoe). Additional measures are needed and envisaged, notably in building renovation and the transport sector. For 2030, the target is 4.5 Mtoe of final energy consumption.

According to the National Energy and Climate Action Plan (NECAP) for 2021–2030, Lithuania set the target to reach a 45% share of RES in final energy consumption by 2030.³⁹ A bit later, the 'New Generation Lithuania' plan set a higher goal – to reach 50% RES by 2030. It is likely that after updates of the NECAP in 2023, most of the energy and climate goals will be adjusted accordingly to higher ambitions set out in the REPowerEU.

Lithuania's most significant renewable energy potential comes from solid biofuel: firewood, wood, and agricultural waste used for fuel. In 2021, the largest amount was used for producing electricity and centralised heat supply (54.4%) and in households (33.1%). In 2021, the production of heat by energy producers which use firewood and wood waste accounted for 64% of total heat produced by power plants and heat plants and 14.4% of electricity produced by power plants.⁴⁰

The year 2022 showed a record increase in electricity production from renewable sources. The total electricity production of Lithuania in 2022 reached 4,250 TWh (9.4% less than in 2021). Solar generation increased from 0.157 TWh to 0.273 TWh, wind generation from 1.355 TWh to 1.513 TWh, and generation from hydroelectric plants increased from 0.380 TWh to 0.457 TWh. And the same time, thermal generation shrank from 1.722 TWh to 1.161 TWh. The total energy produced by renewable resources was 2,545 TWh per year, or 59.9% of all electricity production in Lithuania.⁴¹ However, it was just about 23% of all total electricity needs of Lithuania last year.

³⁷ Ministry of Finance of the Republic of Lithuania, 'For Strengthening of Lithuania's Energy Independence – Additional EUR 194 Million from the EU Budget', accessed 29 April 2023, <https://finmin.lrv.lt/en/news/for-strengthening-of-lithuanias-energy-independence-additional-eur-194-million-from-the-eu-budget>.

³⁸ Ministry of Finance of the Republic of Lithuania.

³⁹ Ministry of Energy of the Republic of Lithuania, 'National Energy and Climate Action Plan of the Republic of Lithuania for 2021–2030', 2020, https://energy.ec.europa.eu/system/files/2022-08/lt_final_necp_main_en.pdf.

⁴⁰ Official statistic portal of Lithuania, 'Renewable Energy Resources - Oficialiosios Statistikos Portalas', accessed 29 April 2023, <https://osp.stat.gov.lt/lietuvos-aplinka-zemes-ukis-ir-energetika-2022/energetika/atnaujinantys-energijos-istekliai>.

⁴¹ Lrt.lt, '„Litgrid“'.

Table 5

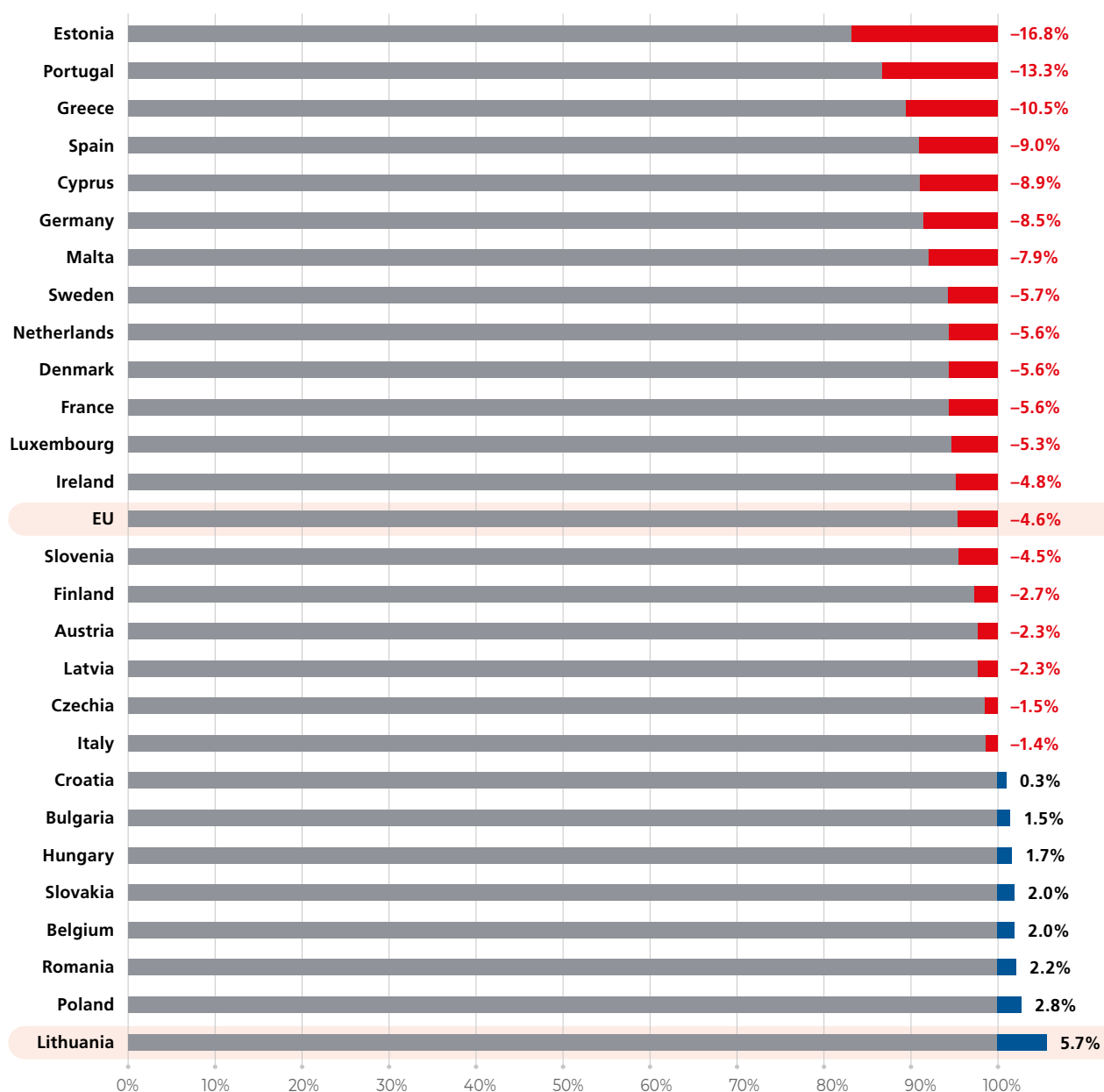
The share of energy from renewable sources, %

	The share of energy from renewable sources in gross final consumption of energy	The share of final consumption of energy from renewable sources for heating and cooling	The share of gross consumption of electricity from renewable energy sources	The share of final consumption of energy from renewable sources in transport
2021	28.1	48.62	20.92	6.69
2020	27.36	50.23	20.17	5.5
2019	25.47	47.38	18.79	4.04
2018	25.51	46.02	18.41	4.33
2017	26.04	46.5	18.25	4.29

Source: Official statistics portal of Lithuania, <https://osp.stat.gov.lt/statistiniu-rodikliu-analize?indicator=S1R127?hash=7811fded-51bd-405c-9cac-4bdc636ddbdb#/>

Figure 5

Changes in energy efficiency (2021 primary energy consumption compared with 2017–2019 average)

Source: Eurostat, Energy efficiency statistics, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_efficiency_statistics#Final_energy_consumption_and_distance_to_2020_and_2030_targets

The biggest expectation regarding a breakthrough in green energy is associated with two large offshore wind farms. The country's first two offshore wind farms will have a total capacity of 1400 MW and are expected to be fully commissioned by 2030. The two wind farms could produce up to 6 TWh of green electricity, covering approximately half of Lithuania's current electricity demand.⁴²

However, as noted in the country's report by the International Energy Agency (IEA), progress in energy efficiency has slowed down. As a result, Lithuania did not meet its 2020 final energy consumption target of 4.3 million tonnes of oil equivalent (Mtoe). Additional measures are needed and envisaged, notably in building renovation and transport. For 2030, the target is 4.5 Mtoe of final energy consumption for Lithuania.⁴³ That will be a considerable challenge, as in 2021, the final energy consumption was 5.66 Mtoe, and the direction is negative: when comparing 2021 with the 2017–2019 average, primary energy consumption in Lithuanian increased by 5.7% – which was the most significant increase in the EU.⁴⁴

In conclusion, Lithuania coped well with the task of diversifying energy imports. The sanctions for Russia became a good opportunity to take advantage of the completed infrastructure works before 2022. However, the trend towards increasing energy efficiency and achieving climate neutral energy is too slow. The electricity and gas price shock in 2022 forced businesses and households to save more on electricity, gas, and heat, and the government introduced almost mandatory energy saving requirements for public institutions. However, this trend may not be sustainable. Huge government compensations and a significant drop in energy prices in early 2023 could push consumers back to their old habits again. This means Lithuania will have considerable challenges in increasing energy efficiency by 2030 and attaining other green energy transition goals.

⁴² Adnan Memija, 'Lithuania Launches First Offshore Wind Tender', *Offshore Wind* (blog), 30 March 2023, <https://www.offshorewind.biz/2023/03/30/lithuania-launches-first-offshore-wind-tender/>.

⁴³ International Energy Agency, *Lithuania 2021 Energy Policy Review*.

⁴⁴ 'Energy Efficiency Statistics', accessed 30 April 2023, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_efficiency_statistics.

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