



COUNTRY REPORT GREECE

Georgia Nakou

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

Georgia Nakou is Features Editor at MacroPolis (www.macropolis.gr), a specialist website focused on political and economic analysis of Greek affairs.

Georgia Nakou

Energy Without Russia: The Case of Greece

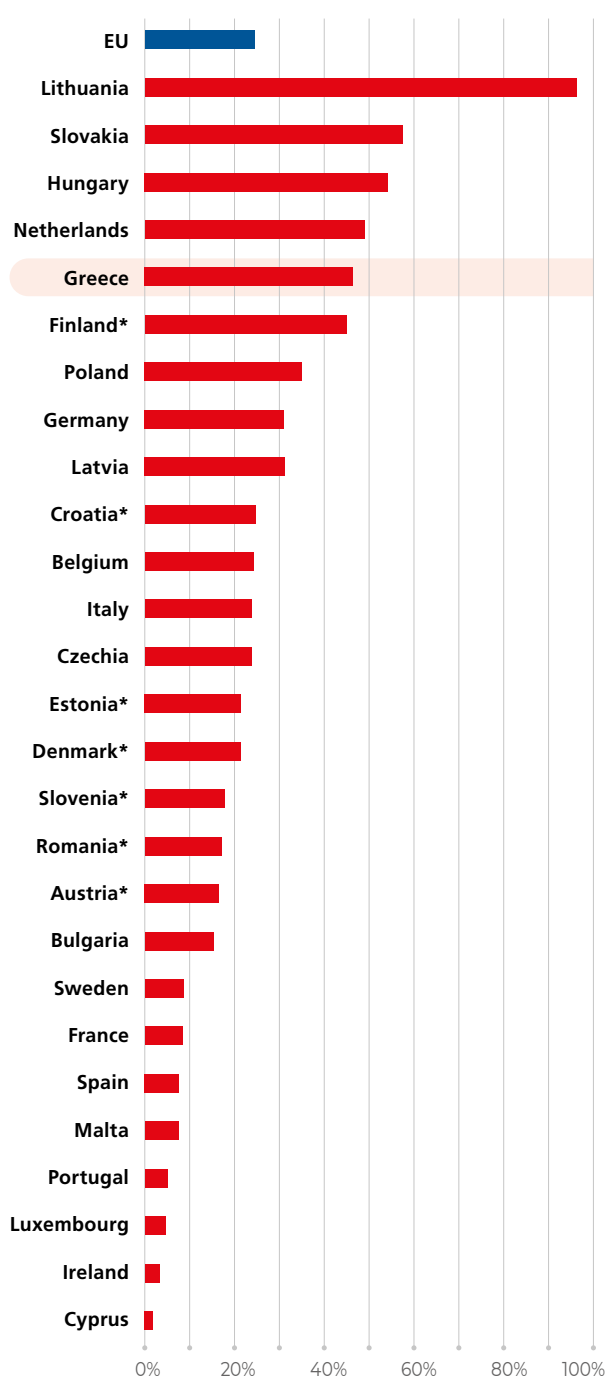
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INTRODUCTION

Greece's reliance on natural gas as a "transition fuel" left the country highly exposed to Russian energy imports on the eve of the Ukraine war. The efficacy with which the economy adapted to the energy crisis proved to be a valuable learning experience. The ability to adapt to a scenario with less natural gas suggests that further investment in gas infrastructure is not the only, or indeed the best, policy path to decarbonisation.

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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BACKGROUND – STATUS QUO ANTE

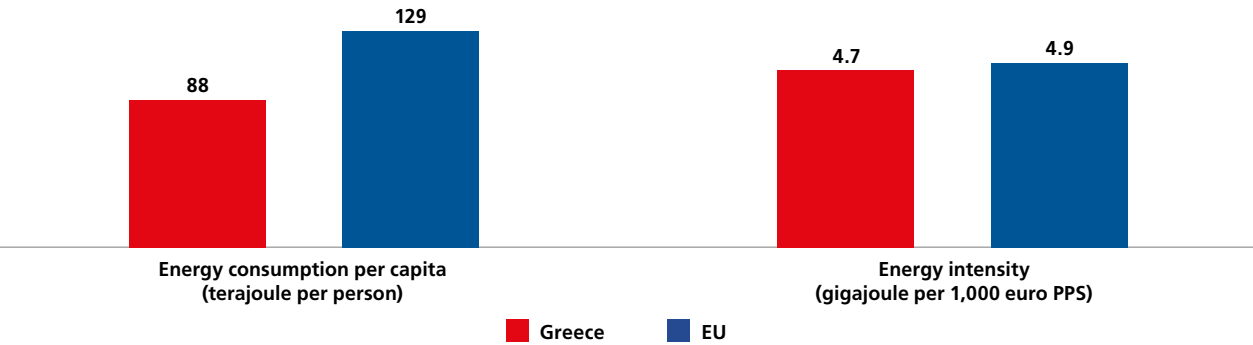
Energy consumption in Greece is among the lowest in the EU, having dropped almost 30 per cent during the financial crisis. In 2020, energy use per capita stood at just under 88 terajoule per person compared to the EU average of 129. The economy, however, is highly dependent on energy usage, with energy intensity measuring 4.7 gigajoule per unit of GDP compared to 4.9 across the EU (see Figure and Table 1).

As of 2021, Greece’s energy mix remained heavily dependent on fossil fuels, which made up 82% of the total supply, while renewables (including biofuels) provided 17% (see Figure and Table 1).

Over time, the use of solid fossil fuels (mainly domestically-sourced lignite) has declined from 26% in 2005 to 7% in 2021. Oil and petroleum products have declined from 61% of the mix to 52%, while almost halving in absolute terms from 20 million tonnes of oil equivalent (mtoe) to 12 mtoe.

The same period has seen a massive growth in the use of imported natural gas, which has risen from 7% of available energy to 23%, while the absolute quantity has grown from 2.8 billion cubic metres (bcm) to 6.4 bcm annually (Eurostat 2023).

Figure 2
Key energy use and energy dependency statistics



Source: Eurostat 2023

Table 1
Key energy use and energy dependency statistics

	Share in energy mix (% gross available energy)	Imported (% energy)	Imported from Russia (% imports)
Oil	52	98	20
Natural gas	23	99	41
Solid Fossil Fuels	7	10	96
Renewables	17		

Source: Eurostat 2023

Greece's energy dependency on exporting countries has grown from 68% in 2010 to 74% in 2021 (Eurostat 2023), largely as a result of the shift to gas.

Dependency on Russia, however, has been reduced over time both in absolute and in relative terms.

In 2021, 41% of natural gas imports came from Russia, compared to 85% in 2005. In absolute terms, the quantity imported from Russia has remained almost static, averaging around 2.5 bcm annually since the mid-2000s (Eurostat 2023). Russia remained the leading supplier of natural gas in 2021.

Just a month before the invasion of Ukraine, in January 2022, Greece's largest wholesale gas supplier, DEPA Commercial, signed a new contract to source 2 bcm annually of Russian gas from Gazprom until 2026 (Reuters 2022a). Separate agreements by Mytilineos, PPC and the Copelouzou Group (a Gazprom partner) would add a combined 1 bcm annually.

At the same time, however, Greece has been gradually diversifying its sources of natural gas, with pipelines bringing imports from Turkey and, since 2020, Azerbaijan. Around a third of natural gas was imported as LNG in 2021, with the US representing the largest supplier, followed by Algeria and Qatar (IEA 2023).

The Greek "dash for gas" since the early 1990s has been driven by a combination of energy and climate change policy, in which gas is viewed as a "transition fuel", and geopolitical aspirations, according to which successive governments have envisaged positioning Greece as an energy hub for southeast Europe (Nakou 2018).

Oil imports from Russia totalled 6.65 million tonnes in 2021, making up 20 per cent of the total. This marks a decline from the high of around 9 million tonnes which represented just over a third of the total in 2005.

In 2021 Greece imported around 47% of its total energy needs from Russia, compared to around 24% for the EU as a whole, making it among the most dependent countries in the bloc (see Figure 2).

The growth in demand for natural gas in recent years has been driven mostly by its increasingly significant role in electricity generation, where it has largely displaced lignite in the mix. Its contribution has grown from 14% in 2005 to 40 per cent in 2021, while lignite's role has shrunk from 59% to 10%. The contribution of renewables to the electricity mix has risen from 12% to 41% (Eurostat 2023).

In 2021, almost 69% of natural gas imports (4.2 bcm) were used for electricity generation. Industry absorbed only 12.5%, while grid users, including household heating, consumed close to 19 per cent (DESFA 2022).

Oil, which is almost entirely imported by sea, accounts for about half of Greece's energy mix, with transport absorbing about 44%. The transport sector depends on oil for 95% of

its energy needs, while it also covers 36% of industry demand, 21% of energy in buildings and 8.5% of electricity generation, mostly on the islands that are not fully connected to the electricity grid (IEA 2023).

At the same time, petroleum products from imported crude make up Greece's largest export sector. In 2021 it exported twice the volume of fuel products than it consumed domestically, worth over €10 billion (Bank of Greece 2023).

Overall, however, the energy balance is negative, contributing to a current account deficit, which was a major factor in the country's recent debt crisis. In 2021, coming out of the pandemic, the goods balance was €26.7 billion in deficit, with the oil balance contributing a deficit of €5.9 billion, making Greece vulnerable to energy price shocks.

THE POLICY FRAMEWORK

Greece's energy and climate change policy was enshrined in the National Energy and Climate Plan (NECP) (Hellenic Republic Ministry of Environment and Energy 2019), which was adopted in 2019; it formed the basis for the country's first climate law in May 2022, which sets targets for achieving net zero emissions by 2050. Efforts in this direction received a boost from the EU's Recovery and Resilience Facility (RRF), which includes over €10 billion of funding to support the "green transition", about a quarter of the total funding estimated by the government to be needed to hit the NECP's 2030 targets. The bulk of the crisis response measures were laid out in emergency legislation in July 2022.

Key targets include increasing the share of renewable energy to 35% of gross final consumption, 61% of electricity and 42.5% of heating and cooling demands by 2030, and bringing down greenhouse gas emissions by 55% within the same time scale. The EU's adoption of Fit-for-55 and REPowerEU are likely to push some of these targets higher as European goals to reduce emissions and end reliance on Russian energy become more ambitious.

2

AD HOC RESPONSES AFTER FEBRUARY 2022

PRICE MANAGEMENT

Government efforts to cushion the impact of global price rises, starting in September 2021, focussed primarily on various forms of support for households in the form of subsidy payments. The government opted for this approach over alternatives such as reducing indirect taxes on energy, which were advocated by opposition parties, on the grounds that the cuts would be regressive, would not be passed on to consumers, and would starve the state of funds.

Between September 2021 and the present day, the government channelled over €9.5 billion into energy support measures, equivalent to over 5% of GDP (detailed in Pierros and Theodoropoulou 2022, and Sgaravatti et al. 2021).

The main funding mechanism for the support measures was the Energy Transition Fund (ETF), initially funded through carbon and RES credits and later expanded through a series of emergency taxes on energy company profits. The initiatives included a windfall tax on the excess profits of power generators, a cap on wholesale electricity prices with the excess directed to the ETF, a retrospective tax on the margins of electricity providers, a 10% tax on natural gas used for power generation, as well as the EU-instigated emergency tax on refinery profits.

In the course of 2022, the ETF raised €5.9 billion, with the remainder supplemented by funds from the regular budget (Hellenic Republic Ministry of Finance 2022). Most funds were allocated to subsidising household electricity and gas bills, with much more modest portions directed to heating and transport fuel subsidies.

Wholesale electricity prices skyrocketed after the Ukraine invasion, peaking at €455 per MWh in August 2022 (IPTO 2023), which made them the highest in the EU. While initial versions of the support were targeted at vulnerable groups, the most extensive response launched in the summer of 2022 was horizontal in nature, effectively offsetting the rise in the unit price of electricity for all consumer groups. Natural gas bill subsidies similarly extended to all residential and business customers regardless of size, means or consumption.

In response to rising oil prices, the government relaxed the criteria for the existing oil heating allowance, a measure designed for vulnerable consumers, to embrace more house-

holds, while also providing extra payments to incentivise switching from gas-fired heating back to oil. To alleviate the impact of high petrol prices at the pump, it introduced vouchers known as the “Fuel Pass” funded through the ETF. Refinery profits were subjected to a 33% one-off tax along EU guidelines, with the proceeds used to support the so-called “Food Pass”, a subsidy on household food purchases (Reuters 2022b).

Greece continued to import oil from Russia until December 5, 2022, when the EU-wide ban on seaborne imports of Russian crude took effect.

SECURITY OF SUPPLY

To ensure the security of electricity supplies, in July 2022 the government passed emergency legislation. The law extended the use life of the lignite plants operated by PPC and the associated lignite mines to provide reserve generation capacity in the case of a disruption in natural gas imports. Generators scheduled for closure in 2025 were allowed to keep operating until 2028, and generation from lignite was allowed to increase by up to 50%, while the lignite mines which were already undergoing decommissioning were to increase extraction from 10 Mt to 15 Mt (Kathimerini 2022).

The emergency plans also required certain gas-fired plants to enable switching to diesel, but also made longer-term provisions for renewables, including clarifying the regulatory framework for energy storage.

To secure uninterrupted natural gas supplies, DEPA Commercial signed an agreement with France’s TotalEnergies for LNG supplies intended to substitute the totality of Russian natural gas supplies (eKathimerini 2022).

Greece has no strategic gas storage facilities. With the introduction of the EU requirement, it leased 100 mcm in a facility operated by Snam in Italy, with which it is linked via the TAP pipeline.

DEMAND REDUCTION

Explicit demand reduction incentives were far less generous and proved less straightforward to implement compared to

the price control measures, which effectively subsidised consumption. For example, households were offered an additional subsidy in exchange for cutting electricity consumption by 15% year on year, however the absence of real-time metering in most households made it hard to measure savings.

Mandatory electricity saving measures were implemented only in public sector buildings, specifying minimum and maximum levels for temperature controls and requiring the appointment of energy managers. The government also announced new targets to reduce overall energy consumption by 10% in the short term and 30% by 2030.

Greece agreed to the EU-wide mandatory target of a 15% reduction in natural gas consumption; however, it was able to obtain a derogation according to which it measured the reduction against 2021 consumption rather than the previous 5 years. This reduced its commitment significantly, but as we shall see below it significantly underestimated the potential for national-level cuts.

3

MAIN CONSEQUENCES OF THE SANCTIONS SO FAR

ENERGY USE

The most significant shift that was achieved in Greece's energy usage in response to the Ukraine crisis was a substantial cut in natural gas consumption, combined with a shift away from Russian gas. Between 2021 and 2022, gas consumption fell by 20%, with cuts achieved across all user groups (Figure 2). Industry cut its consumption by over two thirds, while the power sector used 14% less and grid users (households and small industry) cut their usage by 8%.

Calculations by Green Tank, an Athens-based environmental think-tank, show that over the crucial eight-month period during which the EU obligation was in force (August 2022 to March 2023), Greece reduced total gas consumption by 31.8% compared to the previous year and 20.9% compared to the previous five years, decisively overshooting its targets (Green Tank 2023).

In terms of the sources of natural gas, in 2022, Greece imported just 1 bcm of natural gas from Russia, which equates to 17% of total gas imports (IEA 2023). In the 12 months between February 2022 and January 2023, Greece reduced imports from Russia by almost 72%, compared to the EU average reduction of 37%, while in January 2023 pipeline imports from Russia dipped to zero (Green Tank 2023).

The majority of import substitution came in the form of LNG, which increased its share from around a third of total imports in 2021 to 44% in 2022 (DESFA 2023). The Revithoussa LNG terminal received a total 78 shipments from 10 countries in 2022, compared to 35 from 5 countries in 2021. Imports from the US, the largest source, increased by 63.5% from the previous year to make up just over half of LNG imports.

Given that power generation is by far the biggest consumer of natural gas on a national level, it is notable that natural gas's contribution to the electricity mix fell from 41% to 37% between 2021 and 2022. The portion contributed by renewables jumped from 41% to 47% within a year. Lignite generation also ramped up slightly from 10% to 12%, however the use of oil in the sector halved. Overall, the contribution of fossil fuels shrunk by six percentage points within a year when electricity demand increased as the economy shed the last Covid restrictions.

Despite the shift away from more expensive imported fuels, wholesale electricity prices rose by 139% on an annual basis, making Greece the fourth most expensive wholesale electricity market in the EU in 2022 (ACER 2023). The extreme prices have been blamed on flaws in the implementation of the EU "target model" in the Greek electricity market, which remains highly dependent on spot trading and very exposed to fluctuations in the price of natural gas (Source Material 2022).

The government's choice to tolerate high wholesale prices (in preference to alternatives such as the so-called "Iberian model", which decoupled electricity prices from gas prices) goes a long way to explain the size of the support package necessitated to cushion their effect on consumers.

The shift in energy use is all the more notable given the absence of any mandatory measures at national level to reduce gas consumption, while, to the contrary, household and business gas bills were subsidised. Price increases above the level of government support appear to have provided sufficient motivation for fuel switching and energy saving by both households and businesses. It is also notable that average industrial production in the 12 months to December 2022 grew by 2.3%, suggesting that there was not a corresponding reduction in the activity of industry (ELSTAT 2023), while the economy grew by 5.9%.

ECONOMY

The economic effects of the crisis have been significant on a macro level. The deficit in the oil balance jumped by 124 per cent to €13.2 billion, which along with natural gas imports drove the goods balance deficit up to €39 billion, a level not seen since the eve of the financial crisis, while the current account deficit shot up by 64 per cent to €20 billion (Bank of Greece 2023).

The effect has dissipated somewhat going into 2023 with the retreat in energy prices. Data from January and February show a halving of the oil deficit, while the goods deficit has shrunk by a third compared to the same period last year (Bank of Greece 2023).

There were some beneficiaries from the energy crisis. The spikes in energy prices led to record profits for companies in Greece's energy sector, including those in the renewables

sector, whose revenues were boosted by high wholesale electricity prices. Greece's shipping sector also experienced a bonanza driven from serving the increased global demand for LNG and crude transport – including, controversially, its willingness to play a leading role in the transport of Russian oil. However, the economic benefits on a national level have been less significant because of the structure and tax status of the industry (Nakou 2022).

Taken as a whole, the success of the policies enacted to tackle the energy crisis was mixed. On a macro level, the government argues that the measures protected the wider economy from fiscal derailment, in spite of the €6 billion added cost of gas imports. The dampening of energy prices through subsidies did not completely shield consumers, incentivising energy saving and fuel switching which resulted in savings well above the European average. Finally, there was no disruption in energy supplies, allowing the economy and society to continue functioning (Tsafos 2023).

Critics, however, have argued that the government's approach has failed to address the regressive impact of inflation. In an economy where real incomes have yet to recover from the economic crisis, with pre-existing high levels of energy poverty, it is argued that the heavy reliance on horizontal subsidies and the absence of targeted measures led to the most vulnerable households experiencing the crisis more acutely. As the authors of one study observe, "government support for households has been important, but inadequate for lower incomes and unnecessary for higher incomes" (Pierros and Theodoropoulou 2022).

4

MEDIUM- AND LONG-TERM ANSWERS

The prioritisation of security of supply above all other energy policy imperatives in response to the crisis created by Russia's invasion of Ukraine has led Greece to speed up some existing initiatives while delaying others. The long-term impact of this short-term reaction remains to be seen. However, some outlines are already visible.

At the same time that it cut domestic consumption, Greece significantly increased its natural gas exports. This was enabled in large part by overcoming the political obstacles that had delayed the opening of the IGB pipeline to Bulgaria. This allowed the export of almost 1 bcm to the neighbouring country in 2022 to plug the gap left by Russian gas, while exports to Italy via the TAP pipeline increased from 6.9 bcm in 2021 to 9.7 bcm in 2022 (IEA 2023). The operators of IGB are now assessing the commercial case for expanding the pipeline's capacity to handle increased export flows (Euro2day 2023a).

Such plans, combined with a planned increase in LNG capacity, would see Greece moving closer to its aspiration to become a regional energy hub. The most mature project in this sector is a new LNG terminal combined with a floating storage and regasification facility (FSRU) at the northern port of Alexandroupolis. Plans include a new gas-fired power plant close to the terminal with the primary aim of exporting electricity to neighbouring countries (Balkan Energy News 2023).

The commitment is less clear for several additional FSRU projects announced in recent months. Out of four units mooted by private developers, three are being reconsidered due to high costs and other issues (Euro2day 2023a). A temporary FSRU leased to add storage capacity at Revithoussa is being decommissioned after six months of operation. This suggests that some of the more bullish plans for natural gas infrastructure hatched at the peak of the crisis are being reconsidered as prices subside from their 2022 highs.

Prospects for strategic gas storage, meanwhile, remain in limbo. The latest attempt to develop the depleted South Kavala gas field, which has a potential capacity of 530 mcm according to official estimates, was abandoned in April 2023 after disputes over the allocation of costs. Press reports suggest the government privatisation fund which owns the site is considering re-launching it as a hydrogen storage facility (Euro2day 2023b).

The plan is in line with a greater emphasis on the future potential of "green hydrogen" and electricity exports, in line with the REPowerEU goals. The Greek hydrogen strategy foresees 1.2 GW of electrolysis capacity for hydrogen generation by 2030 and a €10 billion hydrogen supply chain by 2050, while immediate plans require that all new extensions to the gas grid be compatible with hydrogen transport (Kathimerini 2023). Meanwhile, two proposals have been put forward for electricity interconnectors joining Greece with Egypt (Euro2day 2023c).

The war in Ukraine rekindled Greece's hydrocarbon exploration. In the spring, the government announced plans to test for natural gas reserves in one offshore and five offshore plots, in a bid to lessen the country's reliance on imports (Reuters 2022c). Exploratory drilling due to take place in Epirus as early as 2023 would be the first in Greece in 22 years. Hydrocarbon exploration in Greece has a chequered history, with activity largely driven by political pressure rather than commercial interest. At least one opposition party in the upcoming national elections is pledging to block further extractive activities.

5

FORESEEABLE CONSEQUENCES WITH REGARD TO EU CLIMATE GOALS/TARGETS

While it is too early to assess the full impact of the emergency measures on Greece's energy and climate change goals, the government has indicated that it committed to its prior targets, including the closure of lignite power stations by 2028.

Our brief observations so far suggest that this would be a missed opportunity, especially as relates to the pivotal role given to natural gas in the green transition. The rapidity with which key sectors of the economy were able to adjust to the prospect of less natural gas should be seen an opportunity to pause and rethink whether further investment in gas infrastructure is indeed, as one senior official put it just weeks before the start of the war, "both rational and unavoidable" (Euractiv 2021).

This question, which some lone voices had already posed prior to the Ukraine crisis (e.g. Doukas and Oikonomou 2021), is all the more relevant given that in a post-Russian-energy world, the price of gas is expected to settle at a new high level, rendering what was already a risky and expensive strategy even more so.

Targets in the NECP include a 50% increase in natural gas use from 2017 levels by households, industry and transport, driving expansion of networks and private investment in equipment like household gas boilers. Despite targeting a 20% reduction in the use of gas for power generation, the plan also foresees the creation of another 2 GW installed capacity by 2030.

The most recent country report by the IEA advised Greek policy makers "to rethink and rationalise the role of gas in its energy sector planning and policies to avoid stranded assets", also suggesting that "investments in expanding the national gas network would be better directed at energy efficiency, renewables and energy storage".

The experience of 2022 suggests that a realignment of national policy towards less reliance on natural gas is feasible without great economic pain. This should be a prompt for policy makers to "think the unthinkable" and make the best of the available real-world evidence to consider alternative scenarios.

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Responsible for content and editing:

Ernst Hillebrand, Head, European Economies of the East

ernst.hillebrand@fes.de

Orders/Contact: fesbp@fesbp.hu

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