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The background of the slide features a collage of images related to energy and security. It includes a silhouette of an oil pumpjack, a silhouette of a worker in a hard hat talking on a radio, a large missile, and a wind turbine. Overlaid on these images is a white candlestick chart, a common financial tool for tracking price movements. The entire scene is set against a dark, blue-tinted background.

The Great Energy and Climate Security Divide

Accelerated Green Transition
vs. the Kremlin Playbook in Europe

THE GREAT ENERGY AND CLIMATE SECURITY DIVIDE

**ACCELERATED GREEN TRANSITION
VS. THE KREMLIN PLAYBOOK IN EUROPE**



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The Russian invasion of Ukraine has put the European energy and climate security through its most difficult test so far. Although the current energy crisis began before the war, it was exacerbated by Russia in an effort to blackmail the EU and its members to abandon their common energy security and foreign policy stance in support of Ukraine. The spike in energy prices aggravated by the slow pace of energy transition in Europe and an overreliance on Russian fossil fuel imports have clearly demonstrated the need for a new European Energy and Climate Security Strategy.

The report presents the [Energy and Climate Security Risk Index](#), a data-driven policy instrument. The index dissects the vulnerabilities of selected Member States and the EU as a whole and provides guidance on possible energy and climate security policy pathways.

Authors:

Martin Vladimirov, Director, Energy and Climate Program, Center for the Study of Democracy
Kostantsa Rangelova, Senior Analyst, Energy and Climate Program, Center for the Study of Democracy
Anna Dimitrova, Senior Associate Fellow, Applied Research and Communications Fund

Editorial Board:

Dr. Ognian Shentov
Ruslan Stefanov
Dr. Todor Galev

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ABBREVIATIONS

AMLA	Anti-Money Laundering Authority
Bcm/yr	Billion Cubic Meters per Year
CO ₂	Carbon Dioxide
DSO	District System Operator
EU	European Union
ECSRI	Energy and Climate Security Risk Index
ETS	Emission Trading Scheme of the EU
FSRU	Floating, Storage and Regasification Unit
GHG	Greenhouse Gas Emission
GW	Gigawatt
IEA	International Energy Agency
kWh	Kilowatt per Hour
kW	Kilowatt
LCOE	Levelized Cost of Electricity
LNG	Liquified Natural Gas
MW	Megawatt
MWh	Megawatt per Hour
NECP	National Energy and Climate Plan
OECD	Organization of Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
PPA	Power Purchasing Agreement
RES	Renewable Energy Sources
R&D	Research and Development
SEE	Southeast Europe
TAP	Transadriatic Pipeline
Toe	Tons of Oil Equivalent
TSO	Transmission System Operator
UK	United Kingdom

EXECUTIVE SUMMARY

Russia has long weaponized its energy supplies to Europe through oligarchic networks of state capture and strategic corruption. As it planned and initiated the war in Ukraine, the Kremlin cut natural gas supplies to Europe in an effort to drive a wedge into European unity against the Russian aggression. It is high time **the European Union escapes the Kremlin playbook** and neutralizes Russia's energy blackmail. By imposing embargoes on Russian oil and coal at the outset of Moscow's invasion of Ukraine, the EU took for granted its ability to decide when to scale back its reliance on Russian gas. This accelerated Vladimir Putin's plan to deploy his most potent economic weapon, cutting the gas supply to Europe, in a bid to undermine its unity on sanctions.

The energy crisis in Europe has starkly demonstrated that the EU needs **more reliable tools to map its energy and climate vulnerabilities and to use the results of this analysis to rapidly deploy targeted policies** and measures. EU-wide challenges could only then be addressed in a way that both resolves Member State-level weaknesses and harnesses local and regional potential.

The data-driven policy instrument known as the **Energy and Climate Security Risk Index (ECSRI)**, developed by CSD, aims to provide the grounds for this analysis. It breaks down the vulnerabilities of Member States and the EU as a whole into four risk dimensions within the energy policy trilemma: achieving security of supply, affordability, and sustainability, all while minimizing geopolitical risks.

The pilot assessment of the ECSRI demonstrates that Europe's energy and climate security risks have increased markedly since the annexation of Crimea in 2014. A number of European countries increased their dependence on Russian natural gas imports, with Italy and Germany alone accounting for half of this growth. To enable its influence over European energy markets, **Russia entrenched powerful patronage networks to influence strategic decisions** and undermine the common European energy and climate security policy.

A vivid example has been Gazprom's ability to stoke panic on natural gas, and by extension, on electricity markets in Europe, by purposefully reducing supplies in some of the largest European natural gas storage facilities below their normal levels ahead of the 2021/2022 winter season. Europe's excessive reliance on natural gas in the power and industry sectors has led to a sharp increase in affordability risks on the back of skyrocketing prices and few alternative sources of supply.

ECSRI confirms that fossil fuel prices are the leading factor for the rise in national energy expenditures in Europe, although the uptake of renewable energy sources has weakened this dependence. A return to higher coal and natural gas-based power generation has reversed some of the improvement in sustainability indicators and enabled a rebound in energy-related emissions. The decision in Germany to restart some coal-fired power plants is set to further intensify the tension between short-term measures to tackle sup-

ply-side security and long-term decarbonisation goals, while also sending a misleading signal to countries in Central and Eastern Europe struggling to end their addiction to coal. Without a significant acceleration in the uptake of renewable energy, the **slow-down of decarbonization efforts** is bound to continue with disastrous consequences for the EU's long-term climate neutrality objectives.

In the REPowerEU strategy, the European Commission emphasizes the twin approach of maximizing non-Russian gas imports while also increasing renewable energy, electrification, energy efficiency, and innovation. However, the EU has failed to formulate a more comprehensive energy and climate security strategy that clearly defines (i) emergency/short term measures to alleviate Europe's critical vulnerabilities before the next heating season, (ii) medium-term measures that further reduce Europe's fossil fuel dependence and improve Europe's resilience to foreign political and economic influence, and (iii) long-term measures that strengthen Europe's energy and climate security through full decarbonisation of the economy and an alignment of transatlantic energy security policy. Synchronising energy security priorities with decarbonisation is a crucial first step to ensure the long-term consistency of measures and investments.

Bridging the policy ambition gap between the development and the implementation of a new energy and climate strategy calls for an objective, comparative assessment, which will assist the EU in deepening the coordination of national policies across sectors and policy areas on the back of a long-term political, financial, and social commitment. The pilot ECSRI results show that the most important among these commitments are:

- Clearly establish the dependence on **oil and gas imports from Russia as a primary long-term energy and climate security risk** in the EU member-states' long-term energy and national security strategies. The EU should define energy and climate security goals for 2030 and 2050 based on a comprehensive data-driven analysis and a coherent strategic vision.
- **Align transatlantic energy and climate security priorities** to reemphasize three key components:
 - ✓ Decouple from Russian economic and political influence;
 - ✓ Diversify the supply of fossil fuels and key resources for the energy transition;
 - ✓ Decarbonize the economy and the implement global climate agreements.
- **Screen and block all Russian strategic investments in Europe** linked to Russian state-owned companies and oligarchic networks close to the Kremlin.
- **Prioritize diversification efforts** by striking new supply agreements for LNG deliveries and pipeline imports from non-Russian suppliers including Norway, Algeria, and Azerbaijan.

- Ensure that all member states implement gas solidarity agreements with a focus on **optimizing West-to-East gas flows** with a priority on improving links between the LNG regasification capacity in Spain and France and the gas-starved markets in Central and Eastern Europe.
- Complete a **fossil fuel phaseout** in the long run as the most sustainable way to improve energy and climate security. Decarbonizing energy markets will also deliver a blow to the Kremlin's ambition to increase its economic and political influence in Europe.
- Mitigate affordability issues by focusing on **individual and community-level incentives** and by avoiding abuse of public spending due to low governance standards in many member states.
- **Reduce overall gas demand** with an accelerated energy efficiency investment strategy, focusing specifically on energy-poor households.
- Invest in **cutting-edge energy technologies** such as offshore wind, storage, and green hydrogen to transform the European economy on a climate-neutral and energy-independent basis.
- Complete the **liberalization of European energy markets**, removing bottlenecks that cause regional price divergence and stoke energy nationalism.
- Unlock the deployment potential of renewable energy sources on a massive scale, via the **removal of regulatory and administrative barriers to wind and solar investments**, including those linked to property issues, construction permits, and conflicts with other activities.

INTRODUCTION

The misguided Ostpolitik based on the premise of “Wandel durch Handel” (‘change through trade’) is crumbling after the rude wake-up call that has been the Russian invasion in Ukraine. This period of Russian aggression has put European energy and climate security through its most difficult test so far. The **growing geopolitical and economic risks stemming from excessive reliance on Russian gas** have already materialized, with the Kremlin unilaterally cutting the supply to most of Europe since late April 2022. Gazprom’s brazen geopolitical games are destroying its international reputation, along with the Kremlin’s longstanding narrative that Russia is a reliable gas supplier.

The reduction of the Russian gas deliveries even to its most loyal clients in Germany, Italy, Austria, and Bulgaria clearly demonstrates that the **EU can no longer underestimate the Kremlin’s playbook, and must decouple its energy sector from Russia.**¹ By imposing embargoes on Russian oil and coal to pressure the Kremlin to stop its invasion of Ukraine, the EU was taking for granted that it can decide when to scale back its reliance on Russian gas. Instead, President Vladimir Putin proved ready to use his most potent economic weapon: cutting the gas supply to Europe in a bid to undermine its unity on sanctions.²

The EU’s most important responsibility is a political one: to accept sharp economic pain over the next few years. Either Putin will tighten the gas screws even more, or the EU will back up its pledge to lower consumption of Russian gas by two-thirds in 2022 with more comprehensive action. This is important not just for the EU’s immediate foreign-policy objectives, but also for the bloc’s longer-term geopolitical and climate goals. A recession in 2023 is a real possibility for Europe, which must grit its teeth in return for the ultimate reward of sidelining Russia and protecting EU interests. As in Putin’s favorite sport, judo, Europe needs to knock the Kremlin off-balance by accelerating the phaseout of Russian gas.

The current geopolitical crisis has clearly demonstrated that **Europe must put energy security at the top of its policy priorities** and ensure that it stays there, even after the peak of the crisis subsides.³ Clearly establishing energy security as a core element of the EU’s energy strategy and synchronising energy security priorities with decarbonisation and market integration and liberalisation policies is a crucial first step with implications for the medium-term and long-term policy objectives. It is essential to take this step as soon as possible to ensure the long-term consistency of measures and investments.

¹ Shentov, O., Stefanov, R., and Vladimirov, M. (eds.), *The Kremlin Playbook in Europe*, Sofia: Center for the Study of Democracy, 2020.

² Center for the Study of Democracy, *EU Energy and Climate Security Strategy to Counter the Russian Aggression in Europe*, Policy Brief No. 108, March 2022.

³ Vladimirov, M. and Stefanov, R., “The missing element of Europe’s energy and climate security policy”, *Euractiv*, January 31, 2022.

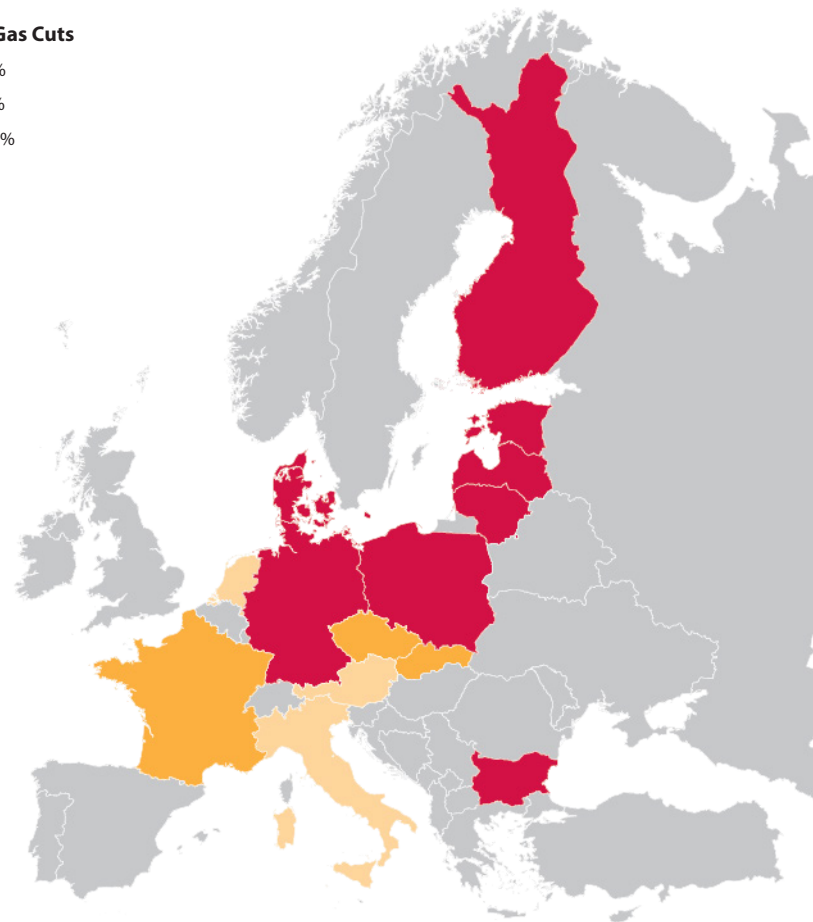
Progress towards achieving common European goals has been hindered by a policy ambition gap due to widespread energy sector governance deficits. **Evidence-based policy instruments** are necessary to **monitor member-states' progress** and ensure an objective, comparative assessment. Such instruments would enable the EU to further and deepen coordination of national policies across sectors and policy areas on the back of a long-term political, financial and social commitment.

If anything, the war in Ukraine has brought forward the actual state of Europe's dependence on **Russian energy deliveries**, and the **pervasive, asymmetric effect** of that dependence on overarching economic, political, and social challenges such as inflation, elections, and looming energy costs. The EU must move away from political declarations to concrete actions, such as an ambitious rollout of renewable energy, energy efficiency measures, and decentralization and diversification of energy generation and supply. The ECS-RI provides objective metrics for addressing the most critical vulnerabilities and underscoring the strengths of the different energy and climate security strategies.

Figure 1. Gazprom Supply Cuts to Europe since April 2022

Russian Gas Cuts

- 25 – 50%
- 50 – 75%
- 75 – 100%



Source: CSD.

The [Energy and Climate Security Risk Index \(ECSRI\)](#) breaks down the vulnerabilities of each Member State and the EU as a whole into four risk dimensions as part of the energy policy trilemma: achieving security of supply, affordability and sustainability, all while minimizing geopolitical risks.

The index also serves to design country-specific strategies for countering these governance deficits, which undermine the creation of a consistent and effective European energy and climate security strategy. This report reveals the key takeaways from its piloting in five EU member-states and the result for Europe as a whole. It also offers targeted policy action to overcome the most difficult governance challenges to the development of a common European energy and climate security strategy.⁴

⁴ A detailed description of the Index's analytical framework can be found at www.ces.csd.bg together with an interactive tool for comparing the different indicators for five European countries, and the EU, as a whole.

MEASURING ENERGY AND CLIMATE SECURITY RISKS IN EUROPE

ECSRI categorizes the vulnerability of each Member State and the EU as a whole, into four energy and climate security **risk dimensions**: Geopolitical risks, Affordability of energy consumption, Sustainability of energy production/consumption, and Reliability of energy supply. ECSRI was built out of the conviction that EU and national decision-makers need a dynamic, reliable, and data-driven comparison tool that would allow them to develop and choose priority actions that enhance the energy security of both the Union as a whole and each member state.

The Index uses thousands of data points spread over a period from 2008 to 2021, covering 42 individual risk indicators used to analyze the situation in five member states: Germany and Italy (the two most heavily dependent European countries on Russian energy imports) along with Bulgaria, Greece, and Romania (located in the region most vulnerable to geopolitical and affordability risks). These are the most important elements of a coherent energy and climate security strategy, as they could have a direct impact on internal social and political stability, macroeconomic competitiveness, and most critically on national security and independence.

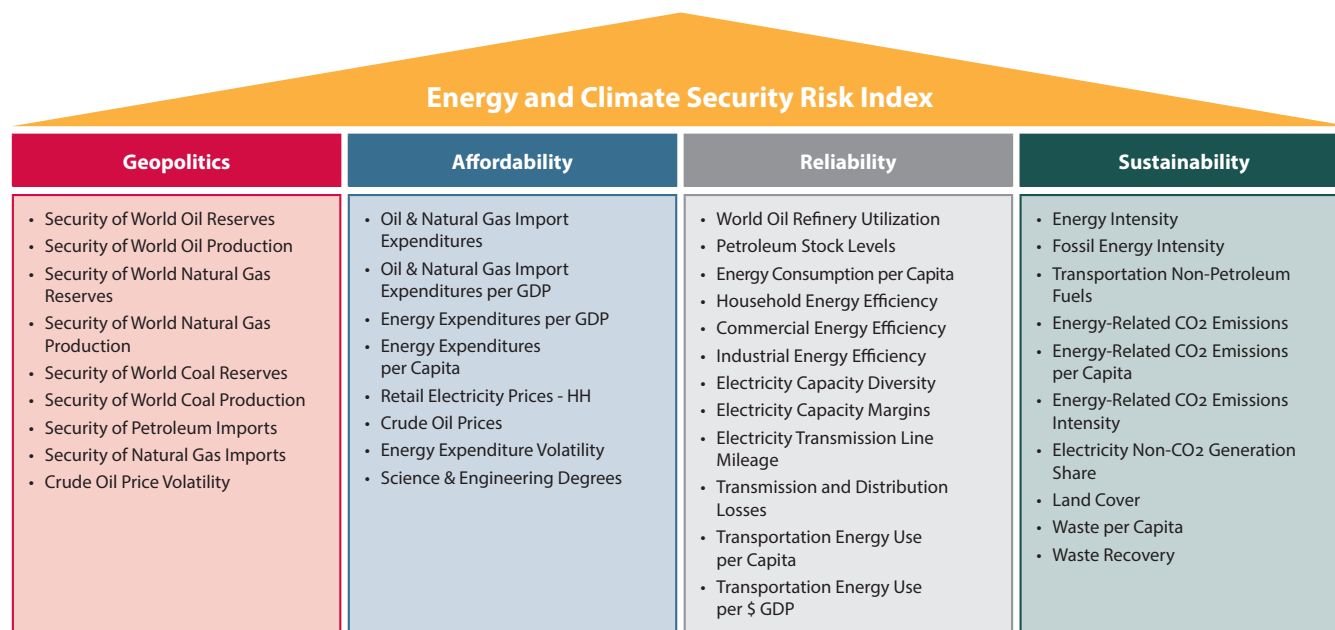
While these factors apply to different elements of energy and climate security, they are often interdependent, allowing for a **systemic analysis of energy and climate policy trends**. For instance, there is a strong link between the movement of crude oil prices, energy expenditures, and the fossil-fuel energy intensity of the economy, which provides for a more in-depth understanding of the decarbonization/energy poverty nexus. Similarly, the rate of oil and gas consumption on the national level impacts energy import expenditures, especially for countries with a high degree of import risk (reflected in the Geopolitical dimension). Meanwhile, oil and gas consumption patterns also directly impact the carbon intensity of the economy and its level of greenhouse gas (GHG) emissions, a key indicator in the Sustainability dimension.

The individual risks are measured in different units, such as EUR cents per kWh for retail electricity prices or tons of oil equivalent (toe) per EUR 1000 GDP for the fossil energy intensity of the economy. However, they have been normalized into comparable indicators and assembled into an index.⁵ The index reflects the change of the level of energy and climate security risk over time, relative to 2015.⁶

⁵ Some data trajectories undergo a normalisation procedure to ensure that all individual risk indicators are designed so that a higher value reflects a higher level of risk for energy and climate security. For most risk metrics, this is also their own internal logic (e.g. higher fossil energy intensity leads to higher energy and climate security risks). For some other metrics, however, such as the energy efficiency-related indicators, an upwards trend improves national energy and climate security.

⁶ The weights applied to the individual risk indicators are determined as fixed values that remain unchanged over the 2008-2021 period. The weights are assigned to reflect the relative importance and relevance of each risk indicator for the respective sub-index (Geopolitics, Affordability, Reliability, and Sustainability) and the overall ECSRI. The assignment of the weights also ensures that the relative weight of the four sub-indexes is balanced. The Geopolitical and Affordability risk will be given slightly higher weights, to reflect the idea that they have a greater priority for national security and macroeconomic stability

Figure 2. The Dimensions of the Energy and Climate Security Risks Index



Source: CSD.

The choice of 2015 as the base year reflects the immediate aftermath of the Russian annexation of Crimea, a key turning point in the geopolitics of European energy which represents a missed opportunity for improving the continent's energy security. The decline in oil and gas prices in 2015 created favorable conditions for the diversification of energy supply, while the Kremlin aggression in Crimea and Donbas should have incentivized European countries to reconsider their structural energy dependence on Russia.

Observing a state's performance over the specified period across all four dimensions allows policy-makers to clearly trace how historical decisions have contributed to certain paths of dependence. The long-term lock-in a specific energy policy framework tend to undermine countries' ability to reduce specific energy and climate security risks and therefore decide on concrete policy action.

The Great Divide

The state of European energy and climate security can be summarized in one phrase: The Great Divide. European energy policy over the last 15 years has been driven by conflicting and contradictory objectives, lacking sufficient coordination but maintaining sufficient leeway for individual European countries to carve out their own national strategic priorities even when they undermine the common EU ones.⁷

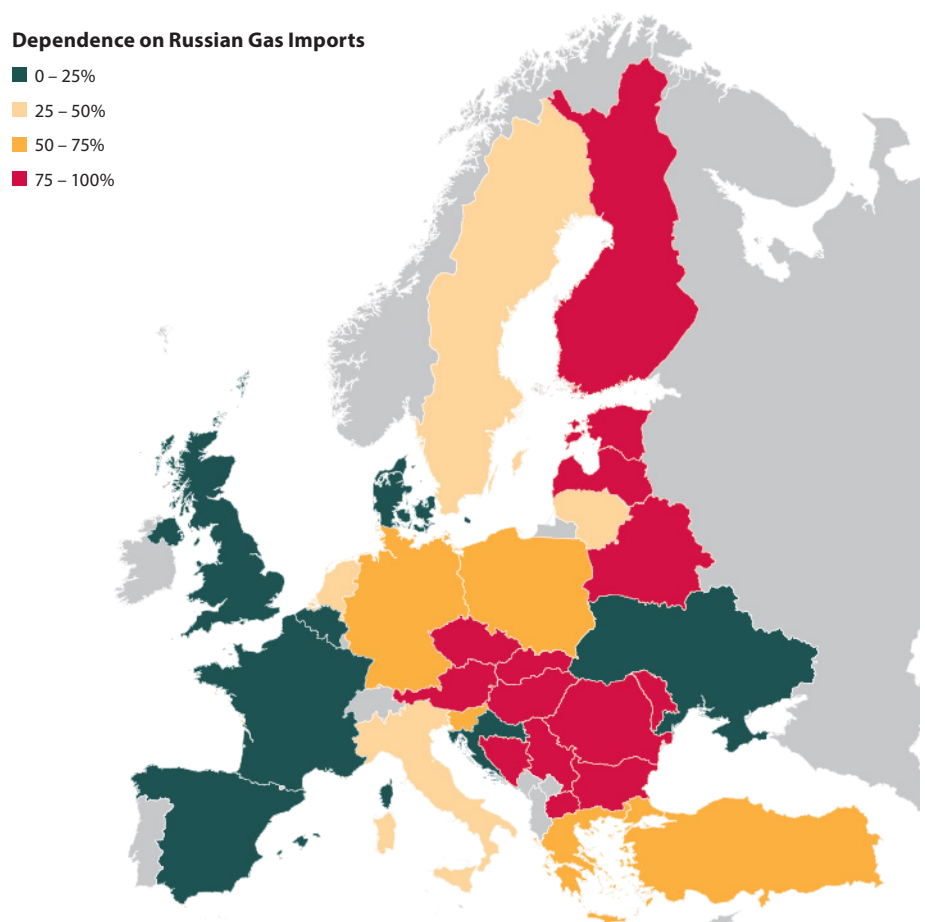
Despite the establishment of the European Energy Union in 2015, the EU has failed to enforce a common approach to the diversification of the energy supply

⁷ Center for the Study of Democracy, *Energy Transition Governance for Better Energy Security in Europe*, Policy Brief No.88, October 2019.

mix of individual countries, the reduction of energy use, and the transition to low-carbon energy technologies.⁸ The discrepancies in member states' policies have hampered the EU goals of secure, affordable, and sustainable energy for Europe's citizens and businesses. Until the Russian invasion in Ukraine, Russia remained the EU's largest supplier of crude oil, natural gas, and coal, with shares of total imports at 33% for oil, 45% for natural gas and 50% for coal.⁹

Nine member states relied almost entirely on Russian gas on the eve of the Russian invasion in Ukraine: Bulgaria, Estonia, Finland, Slovakia, Latvia, Lithuania, Austria, Czechia, and Hungary. Meanwhile, the two largest natural gas consumers, Italy and Germany, have accounted for the bulk of EU's growing dependence on Russian gas imports over the past decade. These two countries have almost doubled their reliance on Russian gas and have together dragged Europe into a much closer energy relationship with the Kremlin, spearheading strategic alliances and joint infrastructure projects including Nord Stream and South/TurkStream.¹⁰

Figure 3. Dependence on Russian Gas in Europe on the Eve of the Russian Invasion of Ukraine in February 2022



Source: CSD based on Eurostat data.

⁸ Shentov, O., Stefanov, R., and Vladimirov, M., *The Kremlin Playbook in Europe*, Sofia: Center for the Study of Democracy, 2020.

⁹ Reuters, "EU to phase out Russian gas, oil, coal imports - leaders' draft", March 7, 2022.

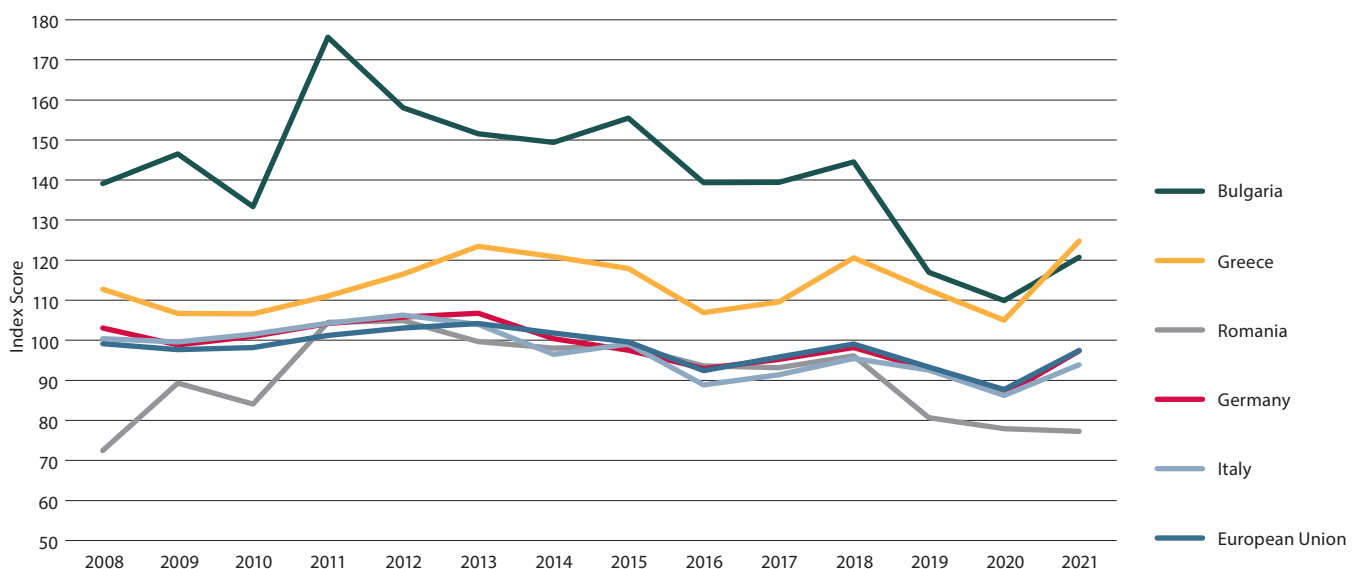
¹⁰ Nitzov, B., and Rangelova, K., *How to Deal with Kremlin's Desire to Starve Europe of Energy: The Case of Nord Stream 1 and Beyond*, CSD Working paper, August 2022.

The increase in **Europe's gas dependence has been magnified by other factors**, such as the decline of existing generating capacities (particularly nuclear in the UK), the decision to close all nuclear power stations in Germany in the 2020s, and the switch away from coal as part of the EU's decarbonization objectives.

The role of Germany and Italy in undermining the EU's common goal of diversifying energy supply cannot be emphasized enough. The two countries' industrial conglomerates have emerged as the most vulnerable to a Russian supply cut and the main naysayers to the formation of a united position to phase out Russian energy imports. For Germany, Russian gas rose to 49% of its total gas imports by 2019, compared to 34% in 2009. For Italy, the rise in import dependence has been even steeper – from 29% to 47% over the same period. Almost half of power generation in Italy comes from burning natural gas, with little alternative to provide balancing for intermittent renewables. Thanks to Germany's overreliance on Russian gas to power its manufacturing boom, the entirety of the German political and business elite has enabled the deep penetration of Russian influence in the European energy sector.

Although the overall Index Score (the weighted average of the sub-indices) for the EU has remained more or less unchanged since 2008, there has been a steep deterioration (30%) of the affordability risks compared to the base values from 2015, driven by the surge in energy prices. There has also been a significant increase in geopolitical risks since 2008 (25%) on the back of the growing dependence on Russian imports, the slow pace of diversification efforts, and the increased concentration of energy resources in the hands of authoritarian states. Instead of stepping up efforts to improve security of supply after the annexation of Crimea, the Index results reveal that Europe expanded its oil, gas, coal and nuclear reliance on Russia by another 8%.

Figure 4. Evolution of Energy and Climate Security Risks in the EU-27 and Selected European Countries (2008-2021)



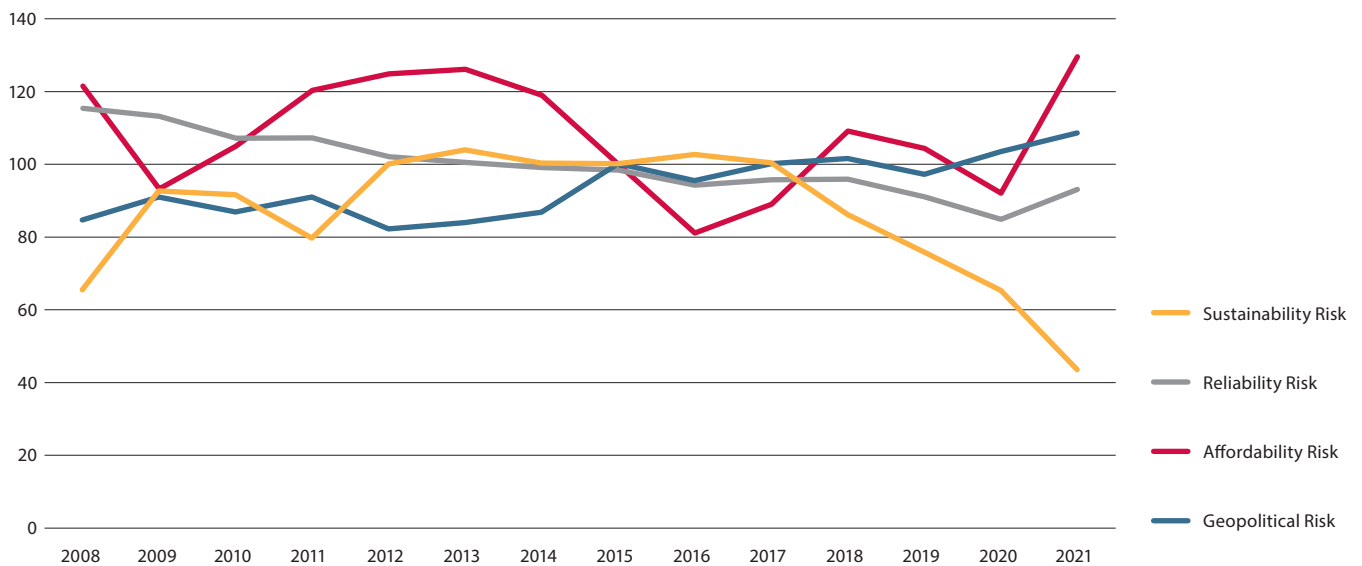
Source: CSD.

The Russian invasion in Ukraine and the Kremlin's decision to cut gas supply to Europe to a trickle between March and September 2022, has caused both geopolitical and affordability risks to skyrocket. Gas and electricity prices have already seen a ten-fold increase, and a number of energy-intensive industries across the continent are shutting down.

Affordability risks have risen sharply across Europe in 2021 and 2022, largely due to the surge in fossil fuel prices and CO₂ costs. The high CO₂ costs reveal that despite the success of the energy transition in many EU countries, the European economy remains highly carbon intensive. Retail electricity, fuel, and gas prices have skyrocketed across the continent, prompting demands for an EU-wide reform of energy markets and comprehensive aid packages for households and businesses.

The EU's insufficient efforts to ensure energy supply diversification or accelerate the pace of the low-carbon energy transition have led to a perfect storm of inflation, low economic growth, and rising social unrest. Among the countries assessed, only Romania has managed to escape this conundrum, mainly thanks to its domestic oil and gas production - the country is self-reliant for its oil consumption, and imports only around 10% of its needs from Gazprom.

Figure 5. Deterioration of the EU's Energy and Climate Security Risks on the Eve of the Russian Invasion of Ukraine



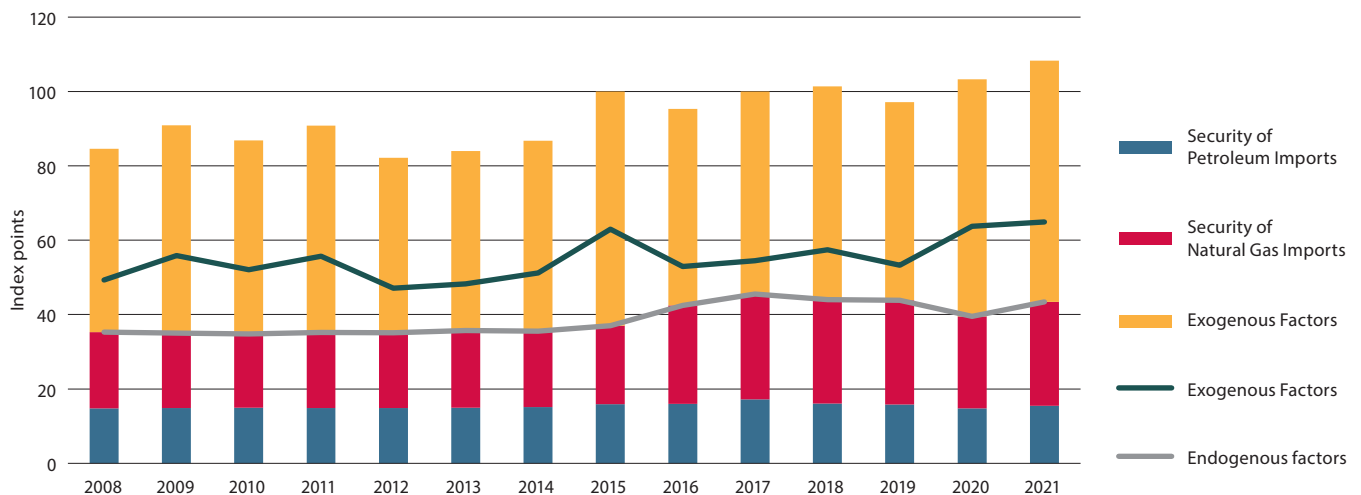
Source: CSD.

Geopolitics

The geopolitical risk indicators mainly reflect global energy market trends and the level of energy import dependence. Hence, individual countries have little control over these factors, and can only focus on ensuring a more diverse energy mix capable of diminishing reliance on supply from the authoritarian states which control a large share of the available energy resources in the vicinity of European markets. Finding alternative deliveries can also shield countries to some extent from the volatility of global oil and gas prices and optimize the costs of energy.

Global fossil fuel production and reserves are largely concentrated in the hands of a few authoritarian states, contributing to higher geopolitical risks for most EU member states that are net energy importers. Ultimately, Europe's dependence on gas as a transition fuel for energy and on Gazprom for gas supplies has led to the current situation, and allowed the Kremlin's gas monopoly to blackmail its European customers. This practice has spiked most notably since the beginning of June 2022, as the Kremlin unilaterally reduces gas supplies while keeping the same level of revenues due to a sharp rise in prices in mid-2022. These revenues then flow directly into Kremlin's war machine in Ukraine.

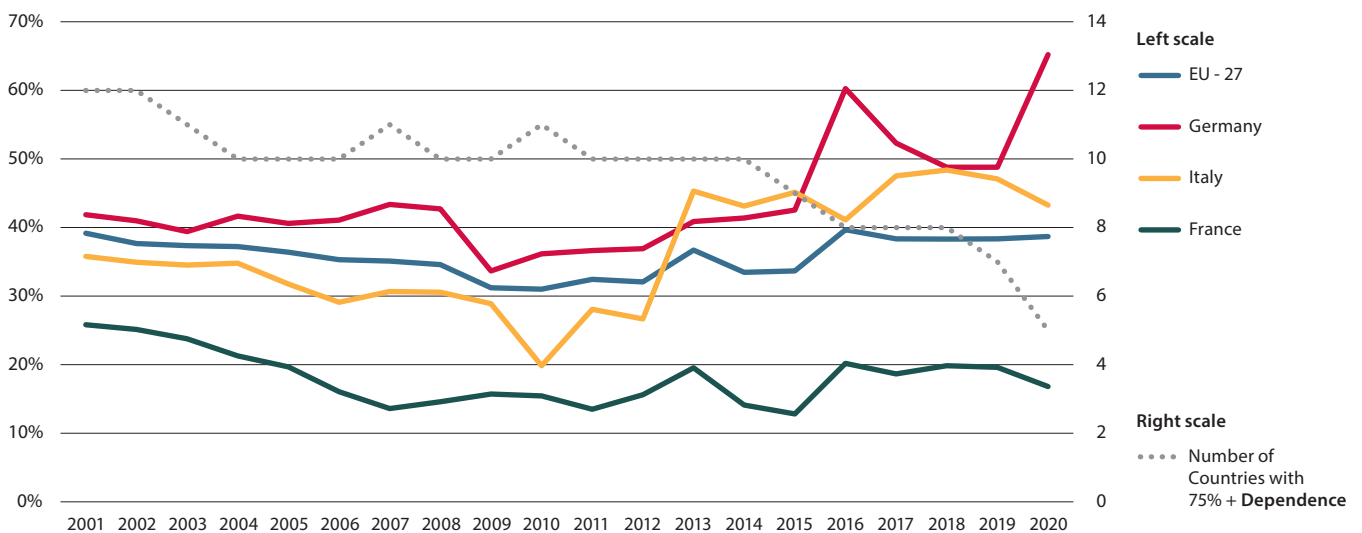
Figure 6. Key Factors for the Geopolitical Risks to the EU's Energy and Climate Security



Source: CSD.

Geopolitical risks linked to excessive oil and gas dependence have increased across Europe since the annexation of Crimea. **Italy and Germany alone account for half of this growth in reliance on Russia.** In absolute terms, the EU's imports of Russian gas have increased by 46% between 2014 and 2021, with Italy contributing 18% of this increase and Germany – 17%.

Figure 7. Share of Russian Gas in Total Gas Imports in Selected European Countries and in the EU-27



Source: CSD calculations based on Eurostat data.

The EU's continued demand for imported fossil fuels, primarily from Russia, has been caused by four main factors:

- 1) A gradual decline of the total technical reserves and production of natural gas on EU's territory and in time-tested EU allies such as Norway and Algeria leading to an increase in the share of Russian imports from 33.65% in 2015 to 38.35% in 2021;
- 2) The systemic conclusion of strategic trade and fields development agreements between EU and Russian companies,
- 3) The locking-in the natural gas market through large-scale Gazprom-led projects such as Nord Stream and South/TurkStream,
- 4) The rising role that natural gas plays in the power generation and the industrial sectors.

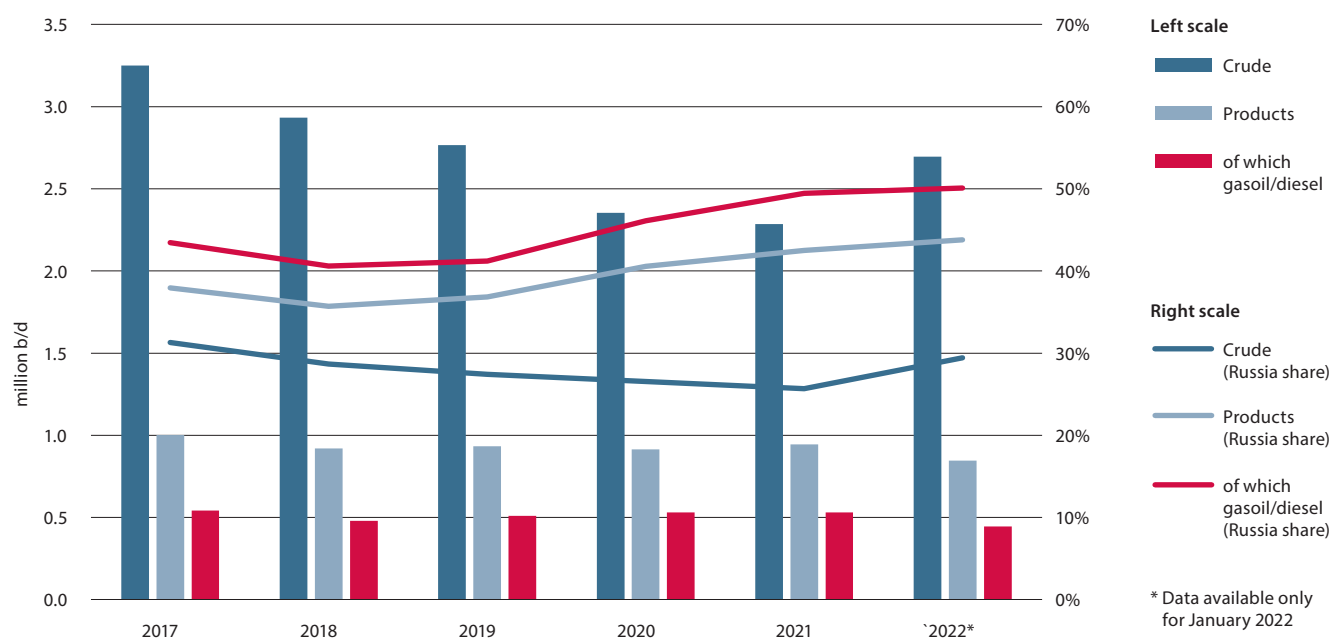
Russia has leveraged its control of oil refineries, gas storage facilities, and pipelines to squeeze supply and pressure governments to drop their support for Ukraine. The EU has agreed on a ban of Russian oil and oil products imports, effective January 2023. Yet so far, **Russian crude flows to Europe have continued unabated**, mostly to countries with Russian refining and storage infrastructure in place, including Bulgaria, Italy, Germany, the Netherlands, and Hungary. Bulgaria and the landlocked countries have received a sanctions exemption, which creates a serious risk of backdoor entry of Russian oil into the broader European market.

Europe can survive without Russian oil. There is sufficient alternative supply to keep the oil market running, while the logistical and pricing arguments against the embargo have been exaggerated to serve other political purposes. A close examination of Europe's current dependencies and the global crude and refined oil markets clearly demonstrates that Europe can make do with-

out Russian oil. Typically, Europe relies on Russian crude oil for over a quarter of its imports, with the share of Russian crude oil in total imports standing at 30% in January 2022 (see Figure 8). The reliance on Russia for the imports of refined oil is even stronger, with Russia accounting for over 40% of total refined oil imports. For diesel, the reliance on imports from Russia stands at 50%.

The challenge of replacing Russian oil has two key elements: 1) securing alternative supply, and 2) impact on prices. Neither of these two issues represents an insurmountable challenge for the global oil market.¹¹ The EIA's current projections for the global oil supply and demand shows OECD commercial oil inventories rising over the second half of 2022 due to a consistent supply surplus. The main contributor to the higher surplus is rising US supply (+1.2 million b/d y-o-y by December 2022). OECD commercial oil inventories are expected to surpass 2021 levels by the end of the year.

Figure 8. EU-27 Crude Oil and Refined Products Imports from Russia and Share in Total Imports



Source: CSD based on Eurostat data.

In terms of the **typical quality of crude oil** used in European refineries, replacing the Russian medium heavy, sour barrels will also not be a significant challenge. The loss of the Russian supply and the higher U.S. oil production will result a lightening of the global crude slate, which leads to lower availability of heavy fuel oil. As Middle Eastern crude is generally very similar to Russian Ural crude, potentially higher OPEC supply would actually offset the change in the global crude slate.

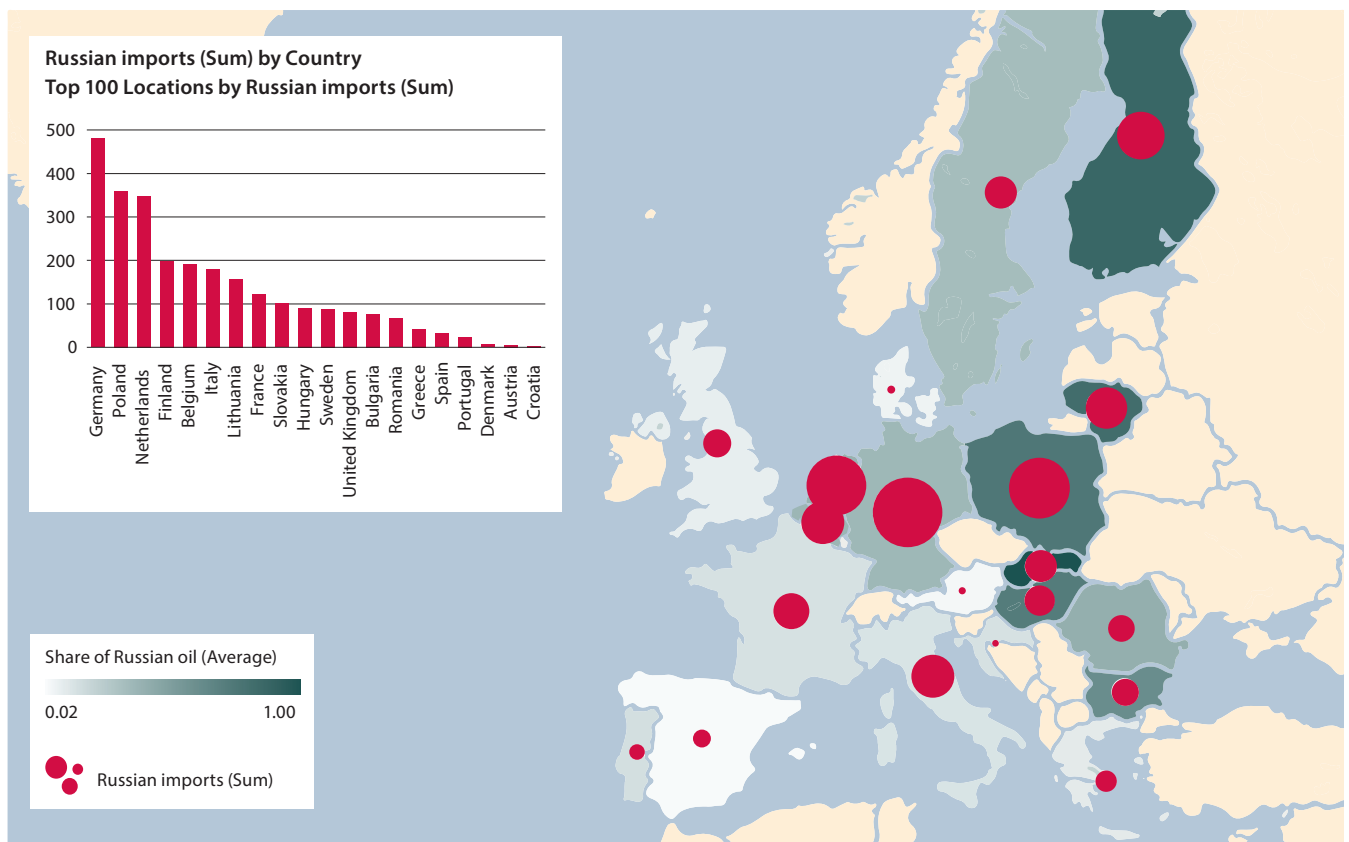
In terms of **logistical costs**, the impact of replacing Russian crude would also be insignificant. Typically, refiners source the crude they process from all over the world to maximize their margins. The additional logistical costs

¹¹ Center for the Study of Democracy, *Europe Will Make Do Without Russian Oil*, Policy Brief No.111, May 2022.

linked to the longer distance travelled by crude tankers would largely be offset by the high insurance and financing costs that Russian crude purchases currently require.

The largest logistical challenge is faced by landlocked countries which rely on the Druzhba pipeline to receive Russian crude through Belarus.¹² However, a cut in the supply through the Druzhba pipeline is not without precedent. In 2019, the pipeline suffered a major outage due to the contamination of the oil with organic chlorides. Countries dependent on Druzhba overcame the unexpected disruption relatively smoothly through a combination of inventory draws and maximization of alternative supply deliveries. In fact, the Adriatic pipeline from Croatia's Omisalj terminal can supply refineries in Croatia, Hungary, Czechia, and Slovakia. The pipeline's installed capacity of 400,000 b/d is more than enough to cover their normal operating needs at a utilisation rate of around 80%. The use of drag-reducing agents could also increase the operational capacity of the pipeline, allowing for even higher utilisation rates. Additionally, the Transalpine pipeline connecting the Trieste port in Italy to Austria, South Germany, and Czechia offers further alternative oil supply routes, and connecting the Austrian refinery near Vienna and the Slovak refinery near Bratislava would require minimal infrastructure investment due to their geographical proximity.

Figure 9. Imports of Russian Crude by Country ('000 b/d) and Share in Total Imports



Source: CSD calculations based on DG Energy data (2018-2019 average imports).

¹² Ibid.

The European Commission's proposal to reduce Russian gas imports by two-thirds by the end of 2022 seemed difficult this March, even with dedicated and coherent efforts across the continent. Six months later, the EU's dependence on Russian gas has fallen to 9%. Gas stocks in storages reached 82% in mid-September, well ahead of the 80% target the EU set for the end of October. It bears noting that Germany and Italy have both gone on a buying spree to ink long-term deals with liquefied-natural-gas suppliers, including the U.S., Qatar, and Algeria. Spain, Greece, and the Baltic countries have followed suit, importing record amounts of LNG. LNG will account for close to 50% of the EU's supply by the end of 2022. The Kremlin's ability to exploit internal European divisions on energy has largely failed despite the fact that Gazprom still have strong leverage over the national energy industry leaders in many EU countries.

New emerging risks related to the **dependence on mineral resources** linked to the process of energy transition is looming next on Europe's agenda. In addition, the COVID pandemic has underscored the importance of environmental factors, including the risk of increasing deforestation and wildlife intervention, as a trigger for public health, economic, political, and social crises. Climate change and sustainable development will increasingly underpin the national security of the 21st century. Therefore, the political fallout from the current energy crisis and the specter of rampant inflation require strong political willpower to push through necessary reforms that maintain energy security without comprising the climate transition process.

Affordability

The Affordability pillar assesses the impact of energy prices and energy imports on macroeconomic stability, as well as the level of energy poverty. Some of the indicators directly demonstrate the effect of energy prices, in particular of crude oil, natural gas, and electricity, on household and business consumers. Furthermore, the Affordability sub-index considers national expenditures on oil and gas imports and their weight relative to national GDP. Additionally, overall energy expenditures are considered major risk factors. They are strongly affected not only by the price level of different energy sources, but also by the fuel mix, consumer choices, and energy efficiency. In this sense, high energy consumption and the use of more expensive fuels strongly influence affordability risks.

The worsening of affordability risks across Europe since 2021 has largely been driven by the **natural gas/electricity conundrum**. Gas supply shortages, coupled with a strong economic recovery after the end of the COVID lockdowns, led to skyrocketing gas prices. Due to the structure of the European power market, in which the most expensive power producer sets the equilibrium price, electricity prices shot up dramatically in the fall and winter of 2021, and have not fallen ever since. The situation was exacerbated by the increase in crude oil, coal, and ETS quota prices that raised the overall energy import

bill of European countries and the electricity production cost for all fossil-fuel-based plants.

Figure 10. Affordability Risks Surging Across Europe Since 2021

% Increase of Affordability Risk Since 2020

- 0 – 25% price increase
- 25 – 50% price increase
- > 100% price increase



Source: CSD.

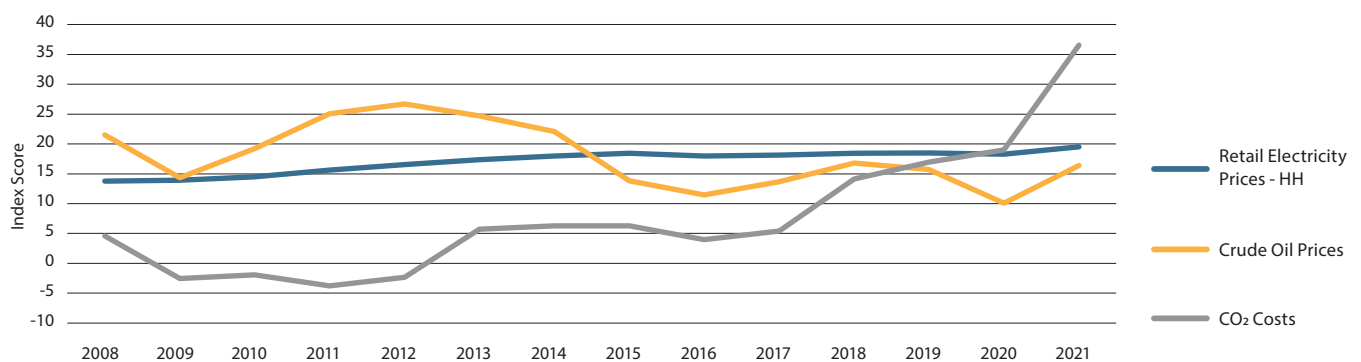
This crisis has revealed how the overreliance on fossil fuels can significantly increase energy and climate security risks, and could undermine the viability of the energy transition. It has also bolstered voices urging for the revision or even the halting of the European Green Deal. This would be the wrong response. The European Green Deal is not the cause of the energy crisis, but the solution. It is also potentially the strongest instrument for reversing climate change and increasing the energy security of the EU and its members.

Higher energy prices are, in theory, necessary to justify the economic viability of energy efficiency investments and more rapid deployment of cutting-edge renewable energy technologies. However, their short-term detrimental impact on industrial competitiveness and household living standards have pushed governments to adopt market-distorting measures and adopt a populist agenda that could undermine long-term energy and climate policy.

The Russian policy of squeezing European gas markets in order to worsen the stability of power markets has forced European governments to take drastic action to blunt the Russian attack and shield their energy markets and economies from the fallout. The total financial support in the form of direct sub-

sidies and tax deductions across EU countries for households and businesses has reached EUR 350 billion, an amount deemed necessary to mitigate the impact of skyrocketing prices. The EU also unveiled a proposal to cap electricity prices at EUR 180/MWh for power producers not using natural gas, in addition to capping extra profits from oil and gas companies and using the revenues from sales above this price (estimated at EUR 150 billion) to finance support measures by member states. This emergency measure, which should remain in place through the end of March 2023, has been met by a wave of criticism that the Commission is undermining the foundations of European electricity markets.

Figure 11. Key Factors for the Surge in Affordability Risks in the EU



Source: CSD based on Eurostat Data.

From an energy security point of view, the proposal aims to **prevent a potential breakdown of energy markets in the winter of 2022/2023** as power and gas prices surge to record levels. In addition, the increase in the prices will be unevenly distributed across the EU due to the uneven effect of supply shortages. The rise in energy poverty levels across Europe could undermine the popular support for maintaining European sanctions against Russia. In any case, support programs for both households and businesses should be linked to energy savings measures and optimization processes in energy-intensive sectors, to ensure that subsidies are not merely financing higher energy consumption.

The Index results show that **energy poverty** may undermine the acceptability and feasibility of the deep decarbonization of the energy sector. The increase in CO₂ prices will raise energy poverty risks, and could cause a social backlash against renewable investments. However, most of the improvements in sustainability result from rising carbon prices that disincentivize fossil fuel-based power production. Indirect effects on low-carbon technology uptake are less clear, though. A critical policy conclusion is that achieving the right market signals for decarbonization efforts is not the only prerequisite for a successful transition. Unless affordability is guaranteed, or basic support mechanisms are planned to avoid extreme outcomes, it would remain the primary barrier to lasting and structural changes.

National expenditures on oil and gas imports and their weight relative to national GDP are the key components of the Affordability subindex. They are strongly affected not only by the price level of different energy sources, but

also by the fuel mix, consumer choices, and energy efficiency. In this sense, high energy consumption and the use of more expensive fuels strongly influence affordability risks. This also significantly limits short-term solutions and measures that policymakers may take in order to reduce the effect of extreme prices on households and businesses. Improvements that structurally change the population's response to price shocks require a long-term commitment that five-year political cycles are insufficient to guarantee.

Related to this, the EU should show leadership by mandating that member states redirect the additional tax revenues from the power price caps on non-gas power producers towards strategic investments aimed at ensuring long-term supply security and diversification, the uptake of cutting edge low-carbon technologies, and the radical transformation of energy demand in transportation, industry, and buildings.

Reliability

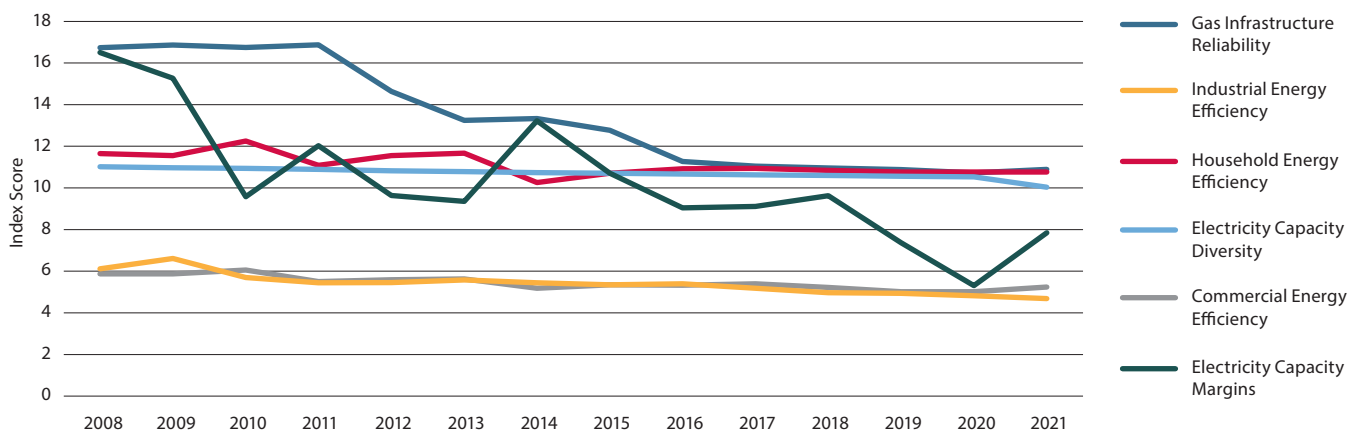
The Reliability pillar reflects the exposure of the national economy and different sectors to potential energy supply disruptions. This includes a wide variety of factors, such as national petroleum/gas stocks, the spare capacity of the global oil refining industry, the resilience of the national electricity system, the energy intensity of the national industrial, commercial, and household sectors, and the role of the transport sector in the national economy. The risks faced by the electricity and natural gas system are of particular importance amid growing electrification, as are the mounting challenges linked to the excessive dependence on Russian energy supply.

The reliability of energy supply has been improving steadily since 2008 due to the reduction of energy consumption, the increase of power supply diversity, and the expansion of the gas supply security infrastructure, including the size and number of gas storage facilities, LNG regasification terminals, and interconnecting gas pipelines. Apart from the expansion of gas infrastructure for the delivery of alternative supply, the reliability risk profile of the EU has benefitted thanks to rising capacity margins, the proportion by which the total expected available generation exceeds the maximum expected level of electricity demand, at the time when that demand occurs. Investments in new plants and smart management systems have made power outages a rarity and allowed for the deep penetration of renewables into the electricity system.

Still, Europe continues to face congestion issues in natural gas and power transmission, the incomplete power and gas markets, and the overall availability of electricity capacity. It is true that both gas infrastructure reliability and power capacity margins have improved and that the reduction of energy consumption has reduced the pressure on the grid during peak demand. However, the **management of the largest gas storage facilities** in Europe has emerged as a key risk for the security of supply. A mix of structural supply shortages on the global gas market and Russia's purposeful cut in storage in-

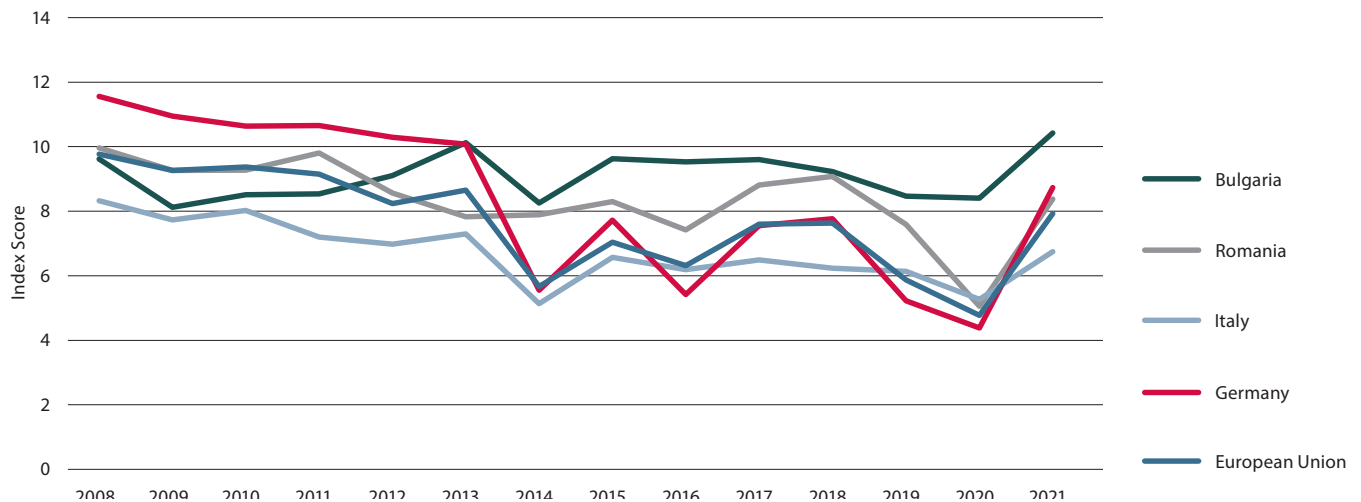
jections has led to a price overshoot. As the European natural gas market remains fragmented, it has become difficult for European gas users dependent on Gazprom to swiftly replace the Russian supply with LNG imports from Spain, Portugal, and France, where there is excess regasification capacity. Due to technical and regulatory bottlenecks in expanding and operating the existing gas interconnectors, even when there is abundant alternative supply, vulnerable countries have failed to secure these volumes.

Figure 12. Key Factors for the Decline of Reliability Risks in the EU



Source: CSD based on Eurostat Data.

Figure 13. Decline of European Natural Gas Stocks Leading to Surging Gas and Power Prices



Source: CSD based on ENTSO-G data. *The data for Greece is zero because the country does not have a storage facility.

Increased cooperation between Spain, France and Germany on alleviating bottlenecks in the summer of 2022 significantly expanded the share of LNG on the European gas market, helping gas prices slowly decline from all-time highs of EUR 300/MWh to around EUR 200/MWh, even with an almost complete cut of the Russian gas supply (Russian gas flows have fallen by around two thirds since February 24). EU countries will need to also boost LNG regasification capacity in the Mediterranean, North, and Baltic Seas if Russian gas

is to be fully phased out. Germany is planning at least three floating storage and regasification units (FSRUs), the Netherlands unveiled one new terminal in September, and Greece has expanded the existing Revithoussa facility while also aiming to launch a second FSRU by the end of 2023 that will open Southeast Europe and the Western Balkans to alternative gas supply sources. Additional terminals in Poland and the Baltic countries are also under discussion. There is an urgent need to complete the North-South natural gas corridor and connect all the available terminals to the network of interconnectors between Central European countries. Even more importantly, the EU should help increase the interconnectedness between alternative gas supply outlets.

For all the improvements in gas supply infrastructure, the most sustainable long-term measure to improve energy security is a complete phaseout of natural gas from the energy system, so that it can be replaced by renewable, efficient energy technologies. The immediate pressure to shrink Russia's share of the European energy markets risks a new long-term gas lock-in via LNG imports, some of it from dictatorships. The push for new contracts with alternative suppliers promoted by Germany, Italy, and a number of Central and Eastern European countries is at odds with the EU's green vision, and raises the specter of stranded assets in gas infrastructure after 2035.

The energy crisis has demonstrated that natural gas cannot be a viable transition fuel. Considering that the global LNG market is expected to remain undersupplied until at least 2023 according to the most optimistic market forecasts, gas prices are likely to remain abnormally high. Relying on natural gas for balancing intermittent renewables exposes Europe to high costs and price volatility.

Addressing the root cause of the energy crisis (high gas prices and reliance on natural gas in power generation) requires measures to reduce dependence on natural gas by accelerating demand reduction through efficiency, fuel switching (including to locally produced biogas), and deep electrification based on renewable energy sources.

Such an extensive transformation requires that European countries not only maintain their push for decarbonization, but use the crisis to **accelerate the transition across all sectors, not just electricity**. This in turn requires a focus on transformative solutions, which, unlike what some voices in the political debate might argue, are already viable replacements for natural gas and fossil fuels as a whole. The accelerated transition also requires an even stronger focus on energy efficiency. In many cases, electrification itself results in gains in energy efficiency. Electrification of low-temperature heat in buildings based on heat pumps creates such efficiency gains, given that heat pumps are four times more efficient than conventional boilers.¹³ Moreover, electrification is also possible for medium and high-temperature industrial heat demand, with electricity-based technologies for high-temperature processes such as steel production requiring similar capital investment and efficiency as conventional alternatives.¹⁴ Hence, the argument that investments in new LNG infra-

¹³ International Energy Agency, "Net zero by 2050 hinges on a global push to increase energy efficiency", June 10, 2021.

¹⁴ Roelofsen, O. et al., "Plugging in: What electrification can do for industry", McKinsey, May 28, 2020.

structure do not delay the green transition because natural gas will continue to play an important role as a bridge fuel, and European demand for natural gas will not drop in line with the IEA's optimistic forecast, is internally flawed in its logic. At the fundamental level, this position already assumes a delayed transition relative to what Europe must do to achieve carbon neutrality by 2050.

A natural gas lock-in, including via the expansion of gas transmission and regasification infrastructure, will slow down renewable buildout and lead to wasteful spending of EU public money. Instead, these funds could be leveraged for achieving a faster green hydrogen switch after 2030 and a more comprehensive penetration of storage technologies. Early investments (but not before 2030) into hydrogen-ready capacities hedge against stranded natural gas assets. Storage capacities would be especially useful in covering the expected rise in power demand linked to the electrification of buildings, transportation, and industry.

Sustainability

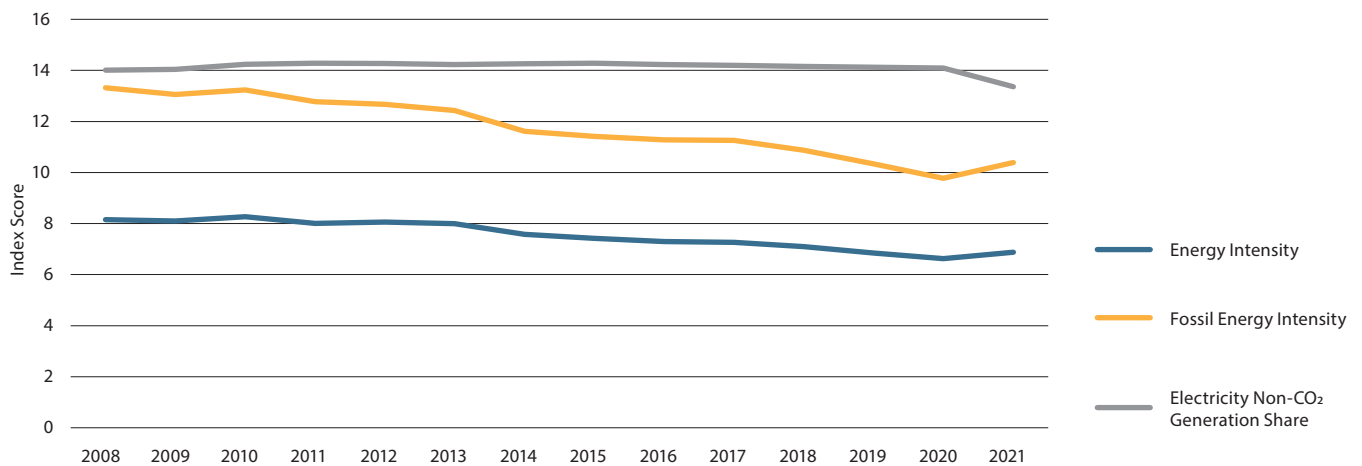
The Sustainability pillar includes the climate and environmental factors that affect the sustainability of the national economy and its alignment with key EU climate objectives. Key risk factors include the emission intensity of the energy sector and the share of fossil fuels in key sectors such as electricity generation and transport, as well as in the overall national economy. It also includes a risk metric that evaluates the level of circularity of the national economy and the sustainability of land use.

Despite close to two decades of lavish EU support for energy transition in the form of higher renewable energy technology uptake and energy efficiency measures, the lightning pace of green investments has markedly slowed down. Sustainability risks have increased over the past five years due to a return to higher rates of coal and natural gas-based power generation. The decision of Germany to restart of some coal plants sends the wrong signal to CEE countries looking to phase out coal. It is noteworthy that ambitious decarbonization goals have been reflected in the share of non-CO₂ sources in electricity generation, which increased steadily until 2020 thanks to the expansion of renewables. However, the success of the energy transition process has been a mixed bag across Europe, as some of the largest EU economies have lagged behind their renewables targets. The energy crisis could be used by European policymakers as the engine for the acceleration of the coal and gas phaseout, as well as the unleashing of cutting-edge low-carbon technology investments such as green hydrogen, offshore wind, and storage solutions.

Overall, a harmonization of national policies among the different economic sectors is needed in all countries in order to achieve the EU's decarbonization goals. To that end, a **diversification of energy supply sources, incl. beyond renewables**, is deemed fundamental. The countries included in this analysis have also chosen differing energy transition pathways that strongly influence

the quality, speed, and trend of the transition, e.g. nuclear-based vs. nuclear phaseout transition respectively in France and Germany. Thus, the energy transition governance has not only internal but also geopolitical aspects that can be explained by the other pillars of the energy and climate security risk framework.

Figure 14. Key Factors for the Decline of Sustainability Risks in the EU



Source: CSD based on Eurostat Data.

The most important factor contributing to the decline in sustainability risks is the **rising cost of ETS allowances** since 2017. Most of the other significant factors have largely remained unchanged since 2015. Non-CO₂ electricity generation capacity has actually gone down in 2021, as renewable energy investments have been unable to catch up with rising electricity demand in many EU countries.¹⁵ However, some countries such as Germany, Spain, Portugal, Greece, Austria and Nordic countries have been much more ambitious in expanding the share of renewables in electricity generation. Others, including Italy and most Central European member states, have lagged behind the EU decarbonization targets despite their enormous renewable energy potential.

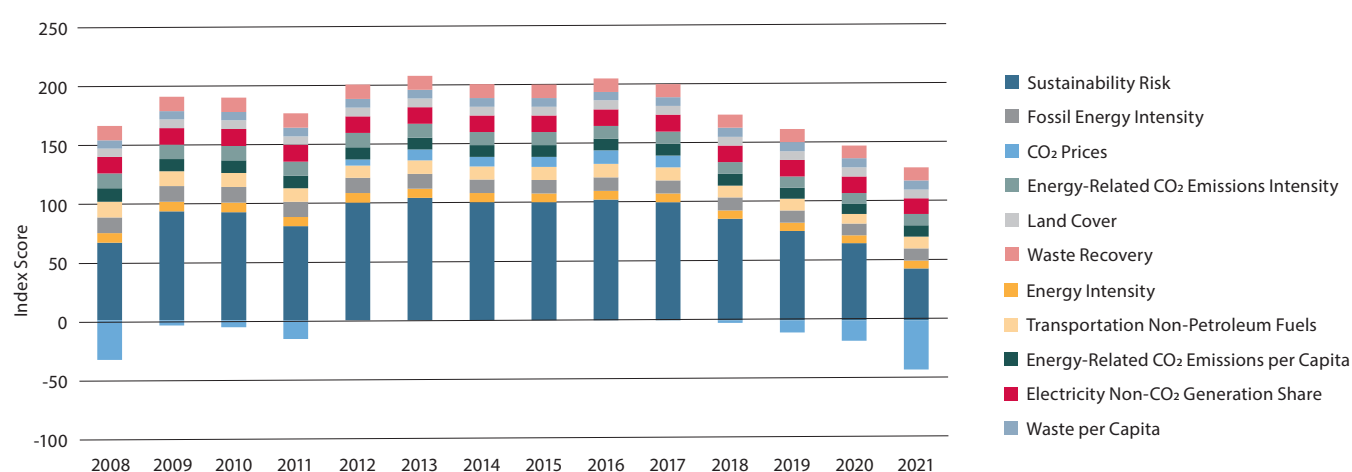
Despite the differences in the policy frameworks of various EU countries, several common challenges in the design and implementation of energy transition governance in Europe can be listed. One of the prevailing issues is the **unstable political commitment to the energy transition**, which has usually led to a “stop-and-go” approach in the existing low-carbon support mechanisms. Although there is a common EU regulatory framework, some countries have delayed important bylaws and relevant procedures such as the delivery of permits, grid connections, charging infrastructure, R&D support, etc. Furthermore, existing carbon-intensive power generation, including coal power plants, is not systematically phased out to make way for renewables due to socio-economic resistance and the capture of energy policies by vested fossil fuel interests.

Decarbonisation policies are also facing strong headwinds from **poorly designed legislation**, leading to procedural and administrative bottlenecks.

¹⁵ Moore, Ch., “European Electricity Review 2022”, *Ember*, February 1, 2022.

In addition, the lack of complete power market liberalization constitutes a major impediment for decarbonisation and investment in renewables. The **liberalization process has not been completed**, even in the countries with the most advanced market design. In many cases, support mechanisms do exist as defined under the corresponding EU Directives, but their implementation is not well adapted to each country, and is often deployed in a “one size fits all” manner. At the same time, the lack of well-functioning one-stop-shops in many EU member states makes the implementation and the management of renewable energy projects cumbersome and slow (a typical onshore wind power park takes between 5 and 7 years to be commissioned at minimum).

Figure 15. Decline of Sustainability Risks due to Rising CO₂ Prices and Energy Efficiency Improvements



Source: CSD.

Public acceptance and support are fundamental to the energy transition, and the lack thereof often translates into a lack of political will to take necessary measures, opaque reforms, inconsistent commitments, or energy populism. Institutional barriers and politically motivated populism lead to a scarcity of information and a misleading end-user knowledge that often translate into reluctant behaviour, regarding both the potential benefits of renewables and the negative consequences of the use of fossil fuels. Renewable projects often compete with specific local groups’ interests and raise environmental concerns (impact on landscapes, biodiversity) along with security considerations (e.g. wind mills and civil and military radars in the UK).¹⁶ The energy crisis has exacerbated these concerns. It has also led to a strong popular backlash against EU decarbonisation policy, as climate-sceptic narratives have painted a distorted picture, in which the cause of the energy price spike is an “excessive” renewable energy buildup and unfair carbon pricing, not the broken European gas market manipulated by Russia.

The paradox is that now renewables are not replacing coal-fired power generation as before the crisis (80% of new renewables replaced coal), but expensive gas plants (more than 52% of the new renewables capacity shuts down gas

¹⁶ The UK Ministry of Defence initially objected to a number of large-scale wind-park developments along the coast over fears that they will interfere with the new mobile radar systems, part of the Britain’s early warning system. A coalition of large energy companies has conducted broad and highly-costed tests on the issue, to overcome these concerns.

facilities). Coal facilities are still booming across the continent, slowing down the fulfillment of EU carbon emission reduction targets. Since 2020, coal-fired power generation has fallen only in countries with advanced phaseout strategies such as Spain and Greece, but this decline has been offset by an increase in coal-fired power production in Poland, Bulgaria, Czechia, and Germany, among others. Increased nuclear outages, most worryingly in France (down by half in 2022) and Germany (due to shut down all nuclear plants by the end of the year) are also increasing the need for coal-based baseload capacity to come back online. The expectation is that at least 20 GW of nuclear capacity could go offline by 2026 as Germany and Belgium decommission their facilities. However, the nuclear phaseout could be even steeper if we take into consideration the failure of the French nuclear operators to maintain their plants in full capacity operation.

This is not to say that renewable energy investment has not been booming in Europe. On the contrary, renewable energy-based power production has increased five-fold since 2008, largely on the back of solar and wind capacity additions, and now makes up an equal share of power generation to fossil fuels.¹⁷ With the decline of nuclear, the increase of renewable energy capacity must accelerate if the EU is to meet its 2030 decarbonization targets. Emission intensity is on the rise, and the volatile power market provides an opportunity for coal to stage a comeback. Signs are also visible that renewable investment is stagnating, despite the fact that the levelized cost of electricity (LCOE) of renewables is already lower than all alternative power plants, and that the wholesale market price has cut in half the repayment period of new renewable investments. The likely extension of the natural gas crisis beyond 2023 means that there is significant room for further expansion of low-carbon energy investments. Yet, the success of this process hinges upon the overcoming of the governance bottlenecks described above, and the better alignment of EU and national financial resources with decarbonization targets.

Decarbonizing energy markets will deliver a blow to the Kremlin's ambition to increase its economic and political influence in Europe. Around a fifth of Russia's budget revenues come from the sale of gas to Europe, which is more than what the Kremlin spends every day to continue bombing Ukrainian cities.

The massive uptake of renewables also puts an effective ceiling on electricity prices by 2030, when most coal capacity in Europe will be out of the system. Choosing to decarbonize the energy system while requiring massive investments in renewable energy, storage technologies and smart grids, could also solve the **supply security conundrum linked to the exit of fossil fuel-based baseload capacity**. High electricity prices are incentivizing investments in previously prohibitively expensive technologies such as floating offshore wind, power storage, and green hydrogen. However, the growing reliance on renewables instead of natural gas would require increasing the capacity of power interconnections and the joint development of new low-carbon cross-border projects.

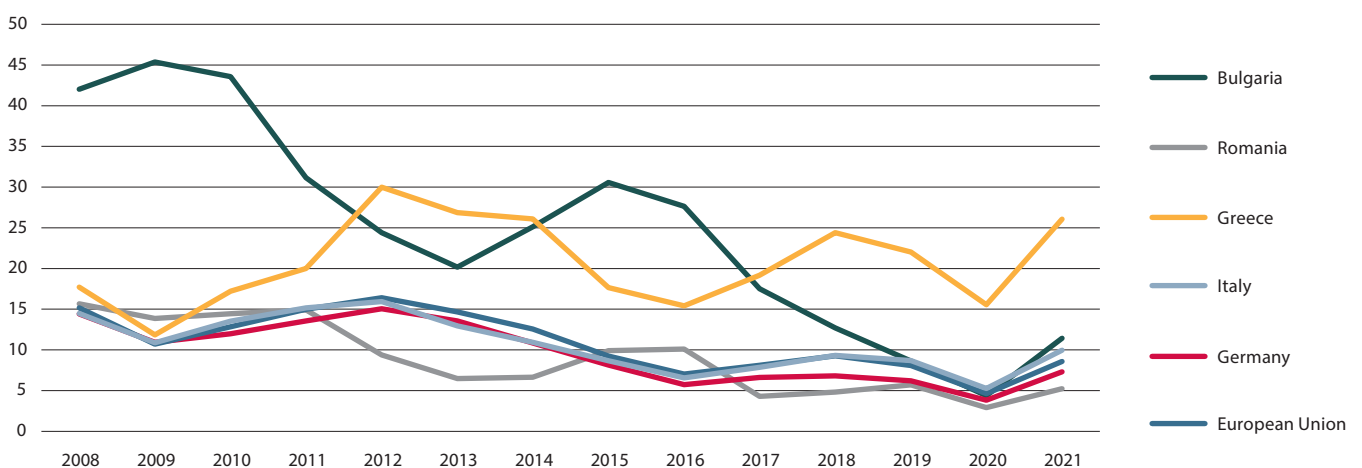
¹⁷ Moore, Ch., "European Electricity Review 2022", *Ember*, February 1, 2022.

THE WEAKEST LINKS

The most vulnerable European countries to the energy and climate security risks linked to the dependence on Russia are Germany, Italy, and the three SEE EU member-states – Greece, Romania, and Bulgaria. Germany and Italy combined imported more than 82 bcm of Russian gas in 2021, or 54% of the EU total. Germany and Italy have not only been the key drivers behind the European failure to reduce its exposure to Gazprom after the annexation of Crimea in 2014, but also the key supporters of deepening ties between their national industry leaders and the largest Russian companies operating in Europe. The two countries' industrial conglomerates have emerged as the most vulnerable to a Russian supply cut and the main naysayers to the formation of a united position to phase out Russian energy imports until well after the Russian invasion.

Germany and Italy are also two of the largest importers of Russian crude oil and oil products, and have continued buying them even after the EU voted to impose a Russian oil import ban beginning on 1 January, 2023. German and Italian companies are among the largest foreign investors in Russia, serving as key supporters to its long-term economic growth. Doing business with Russian companies close to the Kremlin for decades has brought lucrative business deals to a number of European oil and gas companies. The profits generated by these deals have been used for transferred and layered in European and other offshore tax havens, obfuscating their final beneficiaries. In turn, such political-oligarchic beneficiaries have often become key enablers of the Kremlin's political and economic influence in Europe.

Figure 16. Oil and Natural Gas Import Expenditures as % Share of GDP



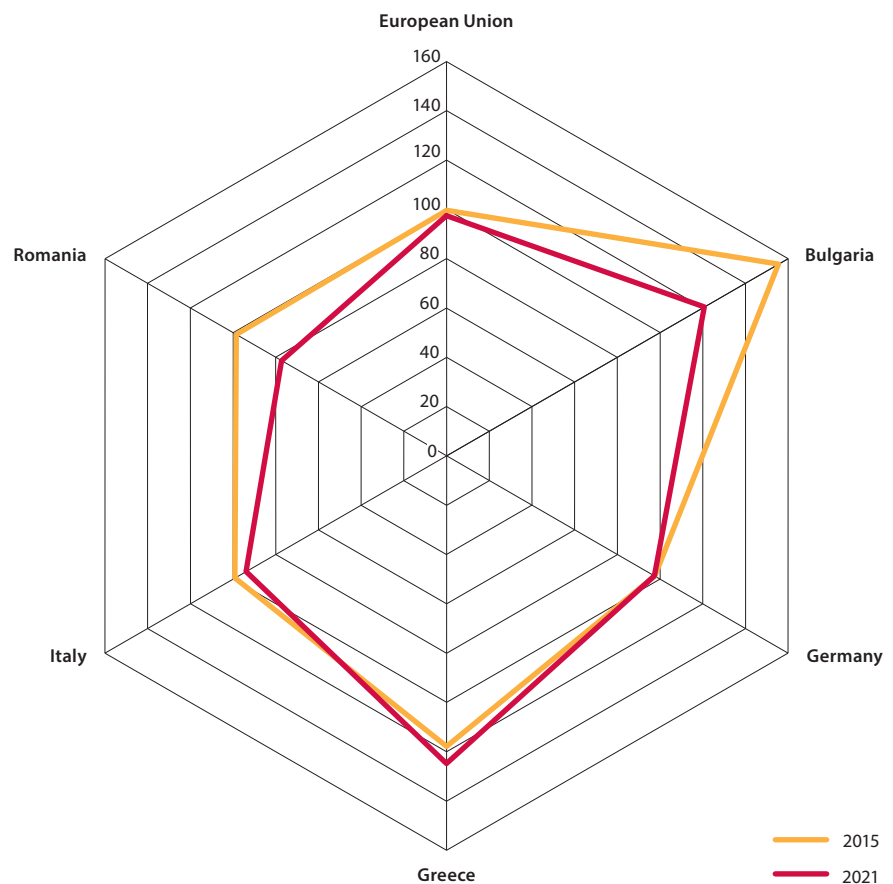
Source: CSD based on Eurostat Data.

Germany and Italy are two of the motors of the European energy transition process. The German *Energiewende* has spearheaded investments in renewable energy technologies for the past three decades, and Italy is one of the countries with the largest potential for new renewable capacity additions un-

til 2050. Both countries, however, have stalled their decarbonization efforts by locking themselves into coal and natural gas dependence in the power sector, with phaseout plans on the line amid the energy crisis. The decision to close all nuclear power plants in Germany and the inability of the Italian government to remove regulatory and administrative barriers for low-carbon investments could undermine the feasibility of the EU climate neutrality objectives. This is especially true considering that Central and Eastern Europe is living through a coal and gas renaissance, and France is failing to keep its enormous nuclear fleet running smoothly.

Meanwhile, Southeast Europe (SEE) is especially vulnerable to energy and climate security risks. Most of the region's political leaders have asserted that they would guarantee the security of supply in case of an actual physical disruption of Russian flows, but they are yet to undertake concrete measures to mitigate the risks and to seek viable long-term gas alternatives. The region's historical lack of diversification alternatives to Russian oil and gas, the slow pace of the energy transition, and the more acute energy poverty issues have made the potential economic pain from sanctions against Russia particularly unwelcome by policy makers and the society. As a result, many SEE countries have acted hesitantly, asked for exemptions from common EU sanctions, or even openly opposed measures to reduce the region's dependence on Russia.

Figure 17. Assessing Energy and Climate Security Risks in Some of Europe's Weakest Links



Source: CSD.

The overall energy and climate security risk assessment reveals that all three countries have significantly improved their energy and climate security position over the last decade. The common drivers supporting this trend are the increase in energy efficiency, the decline in oil and gas import expenditures, the diversification of natural gas sources, and the expansion of renewable energy sources in the structure of power generation.

The most vulnerable EU member state on the eve of the Russian invasion of Ukraine was Greece, closely followed by Bulgaria. Greece's main vulnerability comes first from its strong dependence on energy imports (oil, gas, and electricity), and second from the insufficient transition of its energy supply to locally-sourced renewable energy. The decline of energy expenditures per capita has driven down the level of affordability risk. Nevertheless, compared to Romania and Bulgaria, energy expenditures in Greece remain noticeably higher.

Greece has positioned itself as a natural gas hub in the SEE region, receiving large volumes via pipeline from Azerbaijan and Russia and LNG via its regasification facility at Revithousa near Athens. However, a long-term vulnerability is that Greece has continued to increase its overall dependence on natural gas, mainly in the power sector. This is bound to expand the share of Russian gas in the mix, despite commitments by the Greek state to reduce the share of Gazprom on the market. Two of the largest gas companies in Greece extended their long-term contracts with Gazprom in 2016 and 2019, with terms running until the latter part of the 2020s.

Unlike Greece, which has seen its energy and climate security risk score stay unchanged since 2015, Bulgaria improved its energy and climate security position by 25% between 2015 and 2021, the fastest improvement of all countries assessed (See Figure 14). The main reason for this is the relative decline in energy poverty and the pressure on macroeconomic stability from oil and gas imports, coupled with a significant expansion of renewable energy sources in final energy consumption. In addition, a diverse power supply system, with nuclear power contributing up to a third of electricity generation, and the opening of LNG imports in 2019 brought down traditionally high risks for the reliability of energy supply for the country.

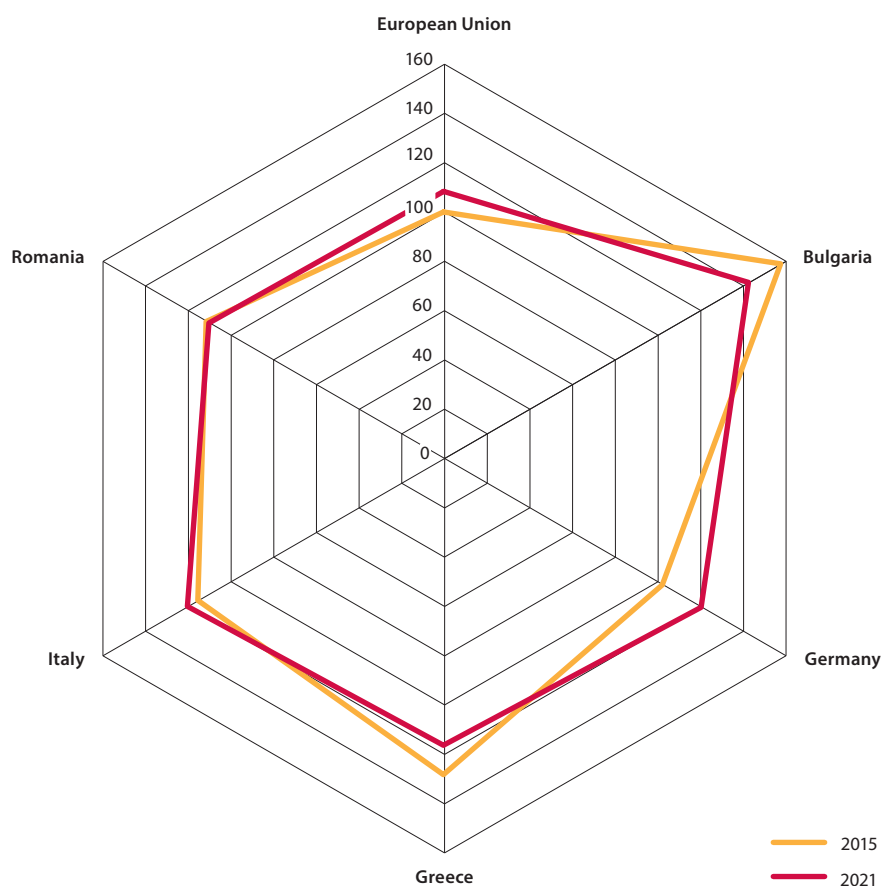
However, Bulgaria remains the most vulnerable country to **geopolitical risks**. Successive governments have failed to implement the strategic power and gas interconnection projects that would allow the country to fully replace the Russian gas supply. Instead, Bulgaria constructed over 12 months a European expansion of the Gazprom-led TurkStream pipeline that has been leveraged by Russia to prevent alternative supply routes from becoming commercially viable options for the SEE region.

Accordingly, after Russia cut its gas supply to Bulgaria on 27 April 2022, Bulgaria has been scrambling to secure the necessary gas volumes, often resorting to buying gas on a monthly basis from gas traders reselling gas from their long-term contracts with Gazprom. The failure to complete the Greece-Bulgaria Interconnector has prevented Bulgaria from importing the full 1 bcm/yr of Azeri gas at the contracted price indexed to the price of oil derivatives. As a result, Bulgaria has failed to fully take advantage of the much lower price of Azeri gas compared to spot deliveries in the region. In addition, the govern-

ment has not been able to strike a long-term LNG import agreement despite offers submitted by some of the largest LNG exporters in the world. Due to the sporadic delivery of LNG tankers in a tight global gas market, Bulgaria has remained very vulnerable to gas price volatilities.

The security of petroleum imports in Bulgaria has improved over the past several years thanks to some supply diversification, but progress has been slow, highlighting a key missed opportunity in securing alternative oil supplies to Russian crude when the global oil market was well supplied. Bulgaria's only oil refinery is owned by Russia's Lukoil, which helps explain the reluctance towards a stronger push for alternative crude oil supplies, although the coastal position of the refinery offers flexibility in terms of supply sources. After the introduction of the EU ban on Russian oil imports, Bulgaria lobbied to receive an exemption until the end of 2024, becoming a Trojan horse for increased Russian oil deliveries to the rest of Europe after the sanctions kick in on 1 January 2023. Russia has already increased oil exports to Bulgaria since March 2022 by 30%, earning around USD 200 million in profits each month due to the difference between the highly discounted import price (the result of the global shunning of Russian oil sales) and the price of the sold final fuel products on the regional SEE market¹⁸.

Figure 18. Comparing Geopolitical Risks in the EU and Selected Member States



Source: CSD.

¹⁸ Nitzov, B., *Can Bulgaria Survive without Russian Oil?*, CSD Working Paper, May 2022.

The least vulnerable country has been Romania, a large oil and gas producer that is mostly self-sufficient with regard to hydrocarbons and a major exporter of electricity. Similar to Bulgaria, it has improved its energy and climate security position since 2015 by reducing affordability issues, energy consumption, and coal-based power generation dependence. Romania's prospect of becoming a major exporter of natural gas thanks to its development of Black Sea offshore fields will likely accelerate its transformation into an energy hub. Bulgaria and Romania have enormous potential to unlock investment also in the offshore wind energy sector, which would accelerate the decarbonization efforts of the entire SEE region. With a nuclear power plant in place and enough planned renewable energy capacity to cover 100% of the region's electricity demand, a complete fossil fuel phaseout is a real possibility in the future. Further improvements of energy efficiency and reductions of energy poverty might be more challenging due to the countries' limited resources, but a well-targeted implementation of EU Green Deal financial instruments could likely bridge the spending gap and achieve a structural energy transformation.

Germany and Italy have emerged as some of the most vulnerable EU countries in terms of security of supply vis-à-vis Russia, according to the Index results. Their growing dependence on imports of Russian natural gas has contributed to an abrupt increase in geopolitical risks since the start of the war in Ukraine. Germany's natural gas supply security has worsened by 75% since 2014, and is the main driver behind the deterioration of the country's geopolitical risk profile (See Figure 15).¹⁹

Germany has seen the largest influx of politically-driven Russian capital over the last decade with the largest Russian companies forming successful cooperative agreements with German firms. They have jointly developed politically-driven gas pipeline projects such as Nord Stream 1 and 2, which circumvent Ukrainian gas transit and impact negatively the security of supply and transit revenues for CEE countries. In exchange, German companies have invested more than EUR 19 billion worth of foreign direct investment stock in Russia as of the end of 2021, making it the third largest investor in the country following Cyprus and the Netherlands. A number of German energy companies have long-term gas import contracts and jointly develop exploration and production projects with Gazprom in Siberia. Large German companies, including Siemens, Bayer, Henkel, BMW, Mercedes-Benz, Volkswagen and UNIPRO all have major manufacturing and sales operations in Russia. According to the Russian-German Chamber of Commerce, around 4,500 German companies operated in Russia in 2021, with total revenues hovering between USD 60 and 70 billion per annum over the last decade, and employing around 200,000 employees.²⁰

The reliance on Russian gas was also welcomed by the German industrial sector, which makes up 37% of the country's total gas consumption and has strongly benefitted from the comparatively lower prices of Russian pipeline

¹⁹ Center for the Study of Democracy, *Energy Security Risks and Russian Economic Influence in Germany: Towards Economic Decoupling*, Policy Brief No. 113, June 2022.

²⁰ Financial Times, "Nord Stream 2 backer Wintershall Dea says it expects compensation for investment," February 24, 2022.

gas.²¹ Therefore, it comes as no surprise that the CEO of BASF, among others, has recently warned of the destruction of Germany's economy if Russian gas imports were to stop abruptly. Many German industrial leaders have cooperated with Gazprom time and again since the 1990s in numerous projects and joint ventures, and have unwittingly increased their dependence on Russian gas for their manufacturing processes, despite the mounting signs of ever worsening business environment in Russia, on the back of tightening state control over the private sector. Since 2014, Russian gas imports have averaged at around 52% of Germany's annual gas imports which is reflected in Germany's below-average gas supply diversity and freedom scores.

Germany also remains the largest importer of Russian oil in the EU by volume and the share of Russian oil in its total imports is above the EU average. A more sensitive aspect of the oil supply security is the ownership of the oil refinery in Schwedt, which Rosneft took over from Shell in November 2021 and is now holding 91.67% of the shares. Not only is the refinery a crucial supplier of gasoline, diesel and heating oil for Eastern Germany, but it is also the endpoint of the Druzhba pipeline through which 25% of Germany's oil demand is satisfied²². Allowing Rosneft to acquire this piece of critical infrastructure at a time when Russia was already amassing troops at the Ukrainian border has now left the German government fighting an uphill battle to take back control, while the refinery has been pushing to keep processing Russian oil in defiance of the EU's oil embargo.²³

The energy and climate security risk position of Italy has moved more or less in sync with the general EU trend since 2015.²⁴ Together with Germany, Italy has accounted for the bulk of EU's growing dependence on Russian gas imports over the decade preceding the war in Ukraine. The share of Russian gas in Italy has increased from 29% in 2009 to 47% by 2021. In addition, leading Italian oil and gas companies have been engaged in some of Russia's strategic energy infrastructure projects that have indirectly enabled the war in Ukraine. Italy's ENI sourced 36% of its total gas supplies in 2020 from Russia. The company also has a 50% stake in the BlueStream pipeline, a key part of Russia's strategy to reduce Ukraine's geoeconomic leverage by circumventing Ukrainian gas transit.

Additionally, Russian oil companies have a strong presence on the Italian market. Lukoil has full ownership of the Priolo refinery, which has a strategic role as the main supplier of oil products and electricity in Sicily. This most obvious red flag is just the tip of the iceberg of the deeply rooted corporate networks linked to the Kremlin, which channel Russia's economic and political influence, and help undermine European energy and climate security.

²¹ BDEW, [Gasfluss](#), May 12, 2022.

²² Spiegel, "[Wirtschaftsministerium prüft Anteilskauf an deutscher Raffinerie durch Rosneft](#)," February 25, 2022.

²³ Reuters, "[Germany takes control of Russian-owned refinery amid energy crisis](#)", September 16, 2022.

²⁴ Center for the Study of Democracy, *Tackling the Kremlin Playbook in Italy: Energy Security Risks and Economic Decoupling*, Policy Brief No. 112, June 2022.

Figure 19. Natural Gas Supply Security Risk in Germany and the EU-27 (A) and Russian Gas Import Development in 2014 vs. 2020 (B)*



Source: CSD based on Eurostat data. *The higher the Index score in the natural gas import security, the bigger the risk.

Italy's increased gas dependence on Russia has been surprising provided the wide array of options the country has had at its disposal to diversify its natural gas imports, through existing trade and infrastructure ties with other producers. Italy has access to two alternative pipeline routes, the Greenstream connection to Algeria and the Transadriatic Pipeline (TAP) link to Greece (and to Azeri gas by extension). The two pipelines have spare capacity of 7.8 and 11.5 billion cubic meters, respectively. Italy also has three LNG regasification terminals that are underutilized and can potentially provide a diverse and abundant gas supply from the global market.²⁵ LNG deliveries are the more viable option, as both Algeria and Azerbaijan have a very limited potential to raise gas exports.

In terms of **affordability risks**, Bulgaria is by far the most vulnerable country, although there has again been significant improvement in key affordability

²⁵ Bianchi, M. and Raimondi, P., *Russian Energy Exports and the Conflict in Ukraine: What Options for Italy and the EU?*, Istituto Affari Internazionali, March 12, 2022.

factors such as the share of oil and gas imports in GDP and the energy expenditures per capita. Still, the global rise in oil and gas prices, together with the high volatility of energy expenditures has led to this high risk score for Bulgaria. **Bulgaria** still stands out as underperformer relative to Greece and Romania. In 2019, estimated energy expenditures in Bulgaria for every EUR 1000 of GDP stood at over EUR 65, 37% higher than in Romania.

Figure 20. Comparing Affordability Risks in the EU and Selected Member States



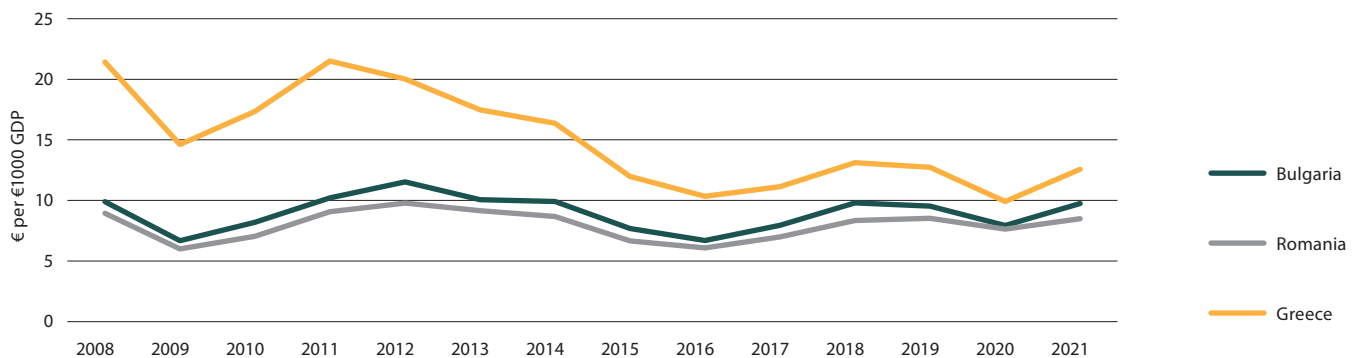
Source: CSD.

Greece has not seen any major improvement in its affordability risk position since 2015. Greece has suffered one of its worst energy poverty crises after the 2009 economic collapse, when one in two Greek citizens was considered energy poor. The fall in oil and gas prices after 2014 did not resolve the structural problem of high national levels of energy poverty, but has somewhat reduced the pressure on household budgets. The 2021 energy crisis has likely led to the deterioration of energy poverty indicators, although the government did cut energy taxes and increased the subsidies to the most vulnerable segments of society.

As in the other two SEE countries, the decline in oil and gas prices from 2015 to 2020 before the recent surge, along with the shrinking of energy poverty, has reduced the **affordability risks** in Romania. Energy poverty is probably, has reduced the single largest energy security risk faced by Romania, as close to 14% of Romanians struggled to pay their utility bills in 2020 and around a

third of households fell below the poverty line when they have covered their energy needs.²⁶ In addition, Romania is vulnerable to strong energy expenditure volatility and to the increase of the energy intensity of the economy, particularly in the transport sector.

Figure 21. Energy Expenditures per Capita in Bulgaria, Greece, and Romania



Source: CSD based on Eurostat Data.

The domino effect of electricity tariffs, coupled with global oil market disruptions, led to a severe deterioration of the **affordability risks** in Italy. The energy poverty levels among households rose, and Italy faced an ever-greater energy import bill.²⁷ From a macroeconomic point of view, however, total energy expenditures and their weight in national GDP have decreased by between 5 and 10% in Italy over the past decade. This is the result of the improvement of energy and transportation efficiency, the increase of the share of electricity in the energy mix, and the relative decline in the volatility of energy prices at least until 2021. Nonetheless, Affordability is the most important component of the total energy and climate security risk in Italy and is mainly driven by the high share of oil and gas in final energy demand. Together they account for over 50% of the households' and 70% of the non-households' final energy demand.

CO₂ prices²⁸ make up the largest share (around 25%) of the Affordability sub-index in 2021, up from less than 5% in 2015. The rising fossil fuel energy prices on global markets, exacerbated further by the war in Ukraine, has focused popular and policy attention on the EU's carbon pricing, putting pressure on EU's energy transition goals. This is a key pressure point that the Kremlin would seek to exploit as the war of attrition drags on. Increasing carbon costs are a critical market signal for the acceleration of the energy transition process. They speed up the phaseout of inherently volatile fossil fuels from the market and they enable higher investments in renewable energy, which would subsequently make energy cheaper, secure and more readily available. But the short-term affordability pain of the co-occurrence of rising fossil fuel and carbon prices could break the political support for energy transition, the

²⁶ CSD assessment based on Eurostat national-level data.

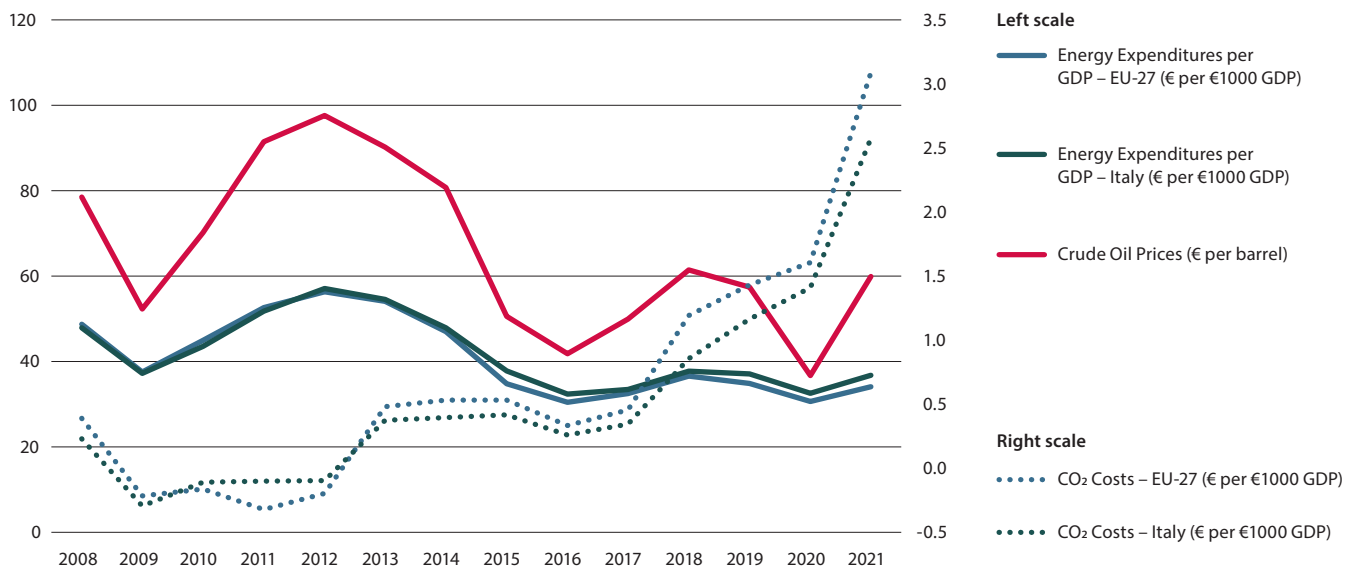
²⁷ Rangelova, K. and Valdimirov, M., "Beasts from the East and Energy Price Horrors in Europe", *CSD Blog post*, December 23, 2021.

²⁸ The CO₂ costs indicator measures the cost of verified emissions based on ETS prices and the difference between total verified emissions and freely allocated emissions (the cost is negative when freely allocated emissions exceed total verified emissions)

sanctions on Russia, or both. Italy is particularly vulnerable to pressure in this respect.

Italy was one of the hardest hit EU member states by skyrocketing power prices (energy import costs are set to double to EUR 100 billion in 2022),²⁹ which have shot up due to the excessive dependence of power generation on natural gas. The high gas and power prices have undermined the competitiveness of the Italian industry, putting additional downward pressure on already sluggish economic growth in the past decade. Wholesale power prices have almost tripled in 2021 due to the country's dependence on natural gas. As retail power prices increased precipitously and Italians took to the streets in early 2022,³⁰ the Italian government implemented a EUR 6 billion price-capping scheme to support households and enterprises in covering their energy bills,³¹ on top of direct social transfers to low-income households³² and support for energy efficiency upgrades.³³ The rising costs of financing on the global markets are likely to put a hard ceiling on the Italian government's capacity to further ease affordability pains through fiscal spending. This will make Italy more vulnerable to continuing short-term gas blackmail from the Kremlin.

Figure 22. Energy Expenditures per GDP vs. Crude Oil Prices and CO₂ Costs (Italy vs. EU-27)



Source: CSD.

Structurally, the most important factor exacerbating the nexus between the energy supply and affordability pressures in **Italy** is the expanding dependence of the Italian power sector on natural gas. The share of gas in power generation rose from 24.4% in 2016 to 46.5% in 2021. Italy has 44.2 GW of in-

²⁹ Reuters, "Italy's costs to import energy will double to 100 billion euros", September 4, 2022.

³⁰ Il Sole 24 Ore, "Caro bollette: dallo sport ai comuni, monta la protesta. Oggi i sindaci spengono le città", February 10, 2022.

³¹ Fonte, G. and Jones, G., "Italy approves 8 bln euro package to help economy, curb energy bills", Reuters, February 18, 2022.

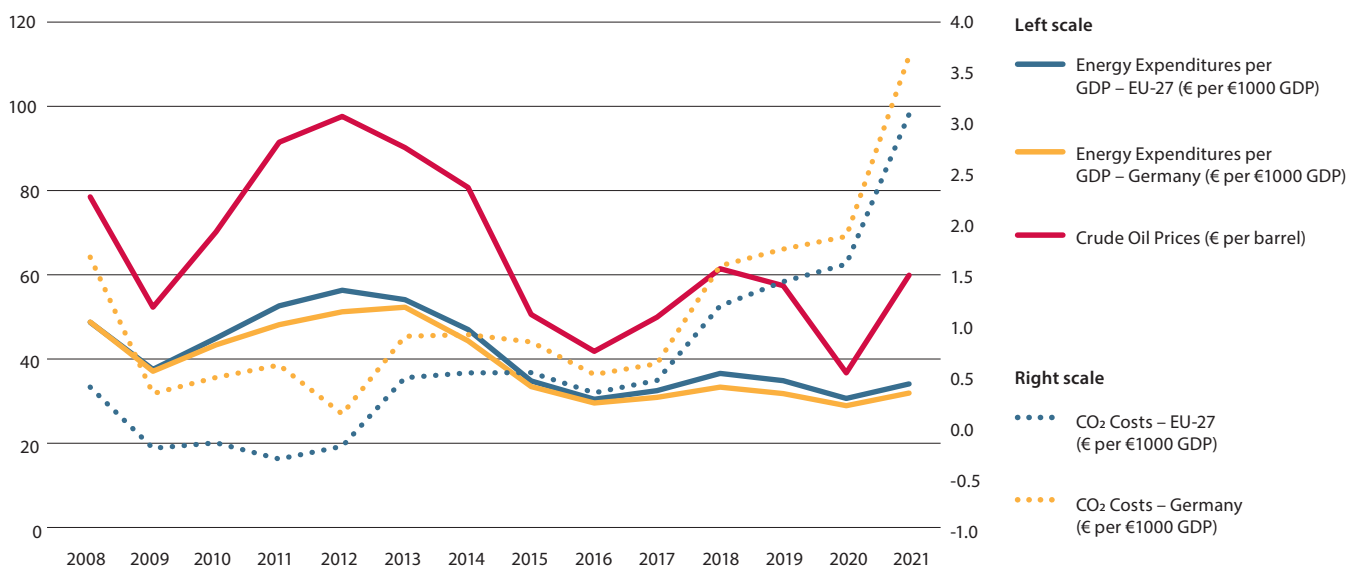
³² Autorità di Regolazione per Energia Reti e Ambiente, [Bonus sociali](#).

³³ Ministero dello sviluppo economico, [Incentivi per l'efficienza energetica](#).

stalled natural gas plants and another close to 14 GW (38 more units) in the pipeline to be added to the electricity system by 2030. Installed natural gas capacity more than doubled over the same period as the Italian energy industry leaders have moved to replace the oil-based generation units, still a major component in the power mix in many parts of the country, with natural gas.

Germany has also been hard hit by the energy crisis since 2021, as affordability risks jumped 14% in comparison to 2022, but will likely deteriorate much more sharply in 2022 when consumers feel the pain of much higher fuels, gas, CO₂, and electricity prices in their bills. The high CO₂ costs reveal that despite the success in its energy transition, Germany remains a highly carbon intensive economy. Retail electricity prices in Germany were 27% higher than the EU average in 2021 and amongst the highest on the continent leading to a gradual increase in energy poverty levels, as energy efficiency has not caught up with rising costs.

Figure 23. Main Drivers of Affordability Risks in Germany



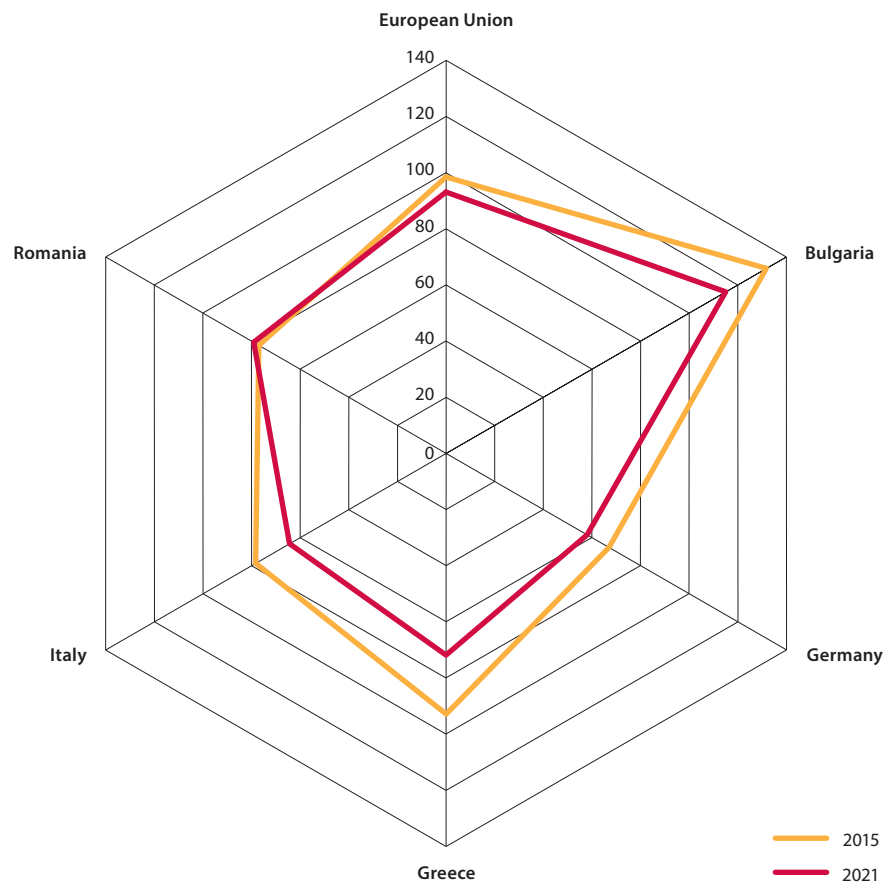
Source: CSD based on Eurostat data.

Reliability risks have declined sharply in all countries except in Romania, where they remain generally low due to the country's diverse electricity generation mix, the gains in energy efficiency in the past decade and the very low level of energy import dependence. On the opposite end of the spectrum is Bulgaria, which is the most vulnerable country as in the case of the other subindices. The relatively low energy efficiency of the Bulgarian economy means that supply disruptions can more easily lead to oil, power, and gas shortages. Bulgaria has the lowest number of days of normal oil consumption covered by storage, compared to Romania and Greece. The reliability of electricity supply in Bulgaria benefits from a diverse power generation mix. Yet excessive spikes in peak electricity demand in winter undermine the system as seen by the 2017 winter crisis, when the Bulgarian government cut electricity exports to neighbouring states. Modelling assessments show that the power system remains adequate even with a full coal phaseout. Hence, decarbonisation of electricity generation is also feasible from an energy

security point of view, even if it means that Bulgaria becomes a net importer of electricity by 2030.³⁴

The increase of natural gas power generation capacity in Greece's electricity mix has supported healthier capacity margins, and helps balance the huge influx of intermittent renewables. While this contributes to lower reliability risk, it also exposes the country to the high volatility of oil and gas prices, and contributes to higher affordability risks driven by excessive energy expenditures per capita and energy cost vulnerability. Greece remains a net importer of electricity, a trend that may be reversed with the increase in renewable energy and storage penetration.

Figure 24. Reliability Risks in the EU and Selected Member States



Source: CSD.

The risk indicators in the ECSRI to Germany's **reliability of supply** have been steadily declining over the last five years, and are below the EU average levels, although there has been a slight uptick in 2021. According to the results of the Index results, the main drivers of Germany's reliability risk profile are its high energy intensity, empty gas storages (before the winter of 2021), the still heavily oil-dependent transport sector, and the low capacity-diversity of the electricity sector, which is below the EU average. This low capacity-diversity has worsened partly due to the government's decision to phase out all nuclear

³⁴ László, S. et al., *Accelerated lignite exit in Bulgaria, Romania and Greece*, Joint Report by REKK, TU Wien, CSD, EPG, FACETS, 2020.

power plants by 2022. This missing baseload capacity has to be replaced by alternative energy sources.

The reliability risks in Italy have declined by 40% since 2008. The main **Reliability risk indicator** in Italy is its low electricity capacity diversity, which has not improved since 2008 and is close to 70% below the EU average. The excessive dependence on natural gas in the power sector is the main factor contributing to the country's low capacity diversity. As Italy imports most of the natural gas it consumes, the reliability of power supply is the direct product of the predictability and diversity of gas deliveries from a few, largely authoritarian, countries. As the Kremlin's war in Ukraine has demonstrated, Italy is vulnerable to import shocks related to geopolitical crises that could cripple its electricity system. Italy imports around 40% of its natural gas from Russia (29 billion cubic meters per year), making it difficult to fully diversify away from Gazprom in the short run despite pledges by the Italian government to do so. A potential Russian cut in natural gas supply could cause disruptions on the power market, or at the very least increase electricity prices to politically unsustainable levels. The alternative to Russia would be even greater dependence on Algeria, which already supplies around a third of the country's needs, and several other sources including Qatar and Azerbaijan. This is not a long-term solution, as security of supply risks would persist albeit at a lower intensity. Hence, there is a clear urgency to reduce Italy's overall natural gas consumption and gradually phase it out from power generation by replacing it with renewables and power storage systems.

In terms of **sustainability risks**, all countries have made enormous steps to achieving their decarbonization objectives. The average decline in sustainability risks is 40% from 2015 to 2021, with Bulgaria remaining the most vulnerable state due to its limited uptake of renewable energy sources since 2014.

There is a realistic path to carbon neutrality for all three SEE countries by 2050, but this would require a new, much more ambitious energy and climate strategy. A clear coal phaseout timeline is a must; without it, for example, the current pledge of the Bulgarian government to reduce CO₂ emissions by 40% until 2026 is unrealistic, and risks leading to even more subsidies for the country's outdated coal fleet. Meanwhile, the boom of private investment in renewable energy sources (24,000 MW of new RES capacity has been announced by private companies by 2022) faces considerable administrative bottlenecks. The unclear regulatory framework, lack of transparency of administrative procedures, and corruption and state capture risks all contribute to low public acceptability of renewables.³⁵

Romania has seen its overall sustainability risk fall by 60% by 2021 relative to 2015, mainly thanks to lower energy intensity (mirroring similar improvements across Southeast Europe). An increase in the share of renewables in power generation and the gradual reduction of coal-fired power generation in the supply mix have also contributed to lower energy-related CO₂ emissions. RES expansion is likely to accelerate over the coming decade, in combination with a rapid coal phaseout as the operation of the country's lignite fleet is no

³⁵ Center for the Study of Democracy, *Technological and Policy Innovation Scenarios for the Low-Carbon Transition of the Bulgarian Energy Sector*, Policy Brief No. 109, April 2022.

longer economically feasible at the current price of ETS emissions and given lack of available public funding support schemes for coal. A full decarbonisation of the energy system and the transformation of the economy would require a much greater focus on the industrial and transportation sectors, where there is a need for a consistent, long-term policy for electrification via RES-based sources, and the uptake of cutting-edge technologies for optimization of business processes, the optimization of the use of materials and low-carbon fuels.

Figure 25. Sustainability Risks in the EU and Selected Member States



Source: CSD.

Although much more energy efficient than its neighbours, the energy and fossil fuel intensity of the Greek economy have barely decreased despite the acceleration of RES-based investment. The sustainability risk trends of Greece are likely to improve significantly in the 2020s amid an ambitious lignite exit plan, targeting the full decommissioning of lignite-fired power plants by 2028. Already by the end of 2022, 1700 MW will be shut down permanently out of the 3904 MW currently in operation. The aggressive coal phaseout strategy is coupled with an even more ambitious strategy for RES uptake in power generation. A total of 19 GW of renewables are expected to be operational by 2030. Nevertheless, the slow uptake of electrification of the transportation and industrial sectors and the delayed decline of energy intensity are key future risks.

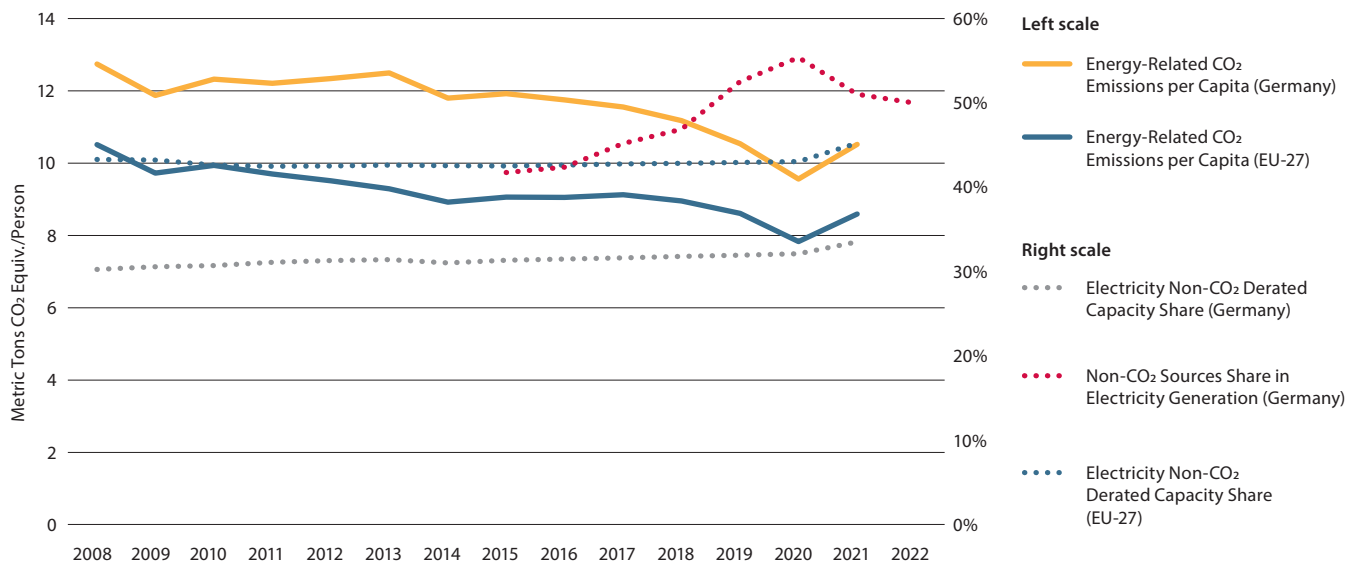
Since the expansion of the renewable energy-based power plants has not been fast enough, **Germany** has increased its reliance on fossil fuels including (Russian) coal and natural gas to cover the gap. Respectively, before the Russian invasion of Ukraine, there was also a strong push by a number of European policy-makers and businesses to accelerate the European energy transition strategy on the back of the development of blue hydrogen, which would utilise the existing gas infrastructure (and by extension Russian gas supplies). Electricity generation by burning natural gas has increased from 3% in 2015 to 11% in 2022, all while the share of the installed capacity has actually dropped slightly from 10.1% to 8.5%, staying below the EU average. Hence, natural gas still plays a subordinate role in Germany's power mix and likewise power production makes up only a small fraction of Germany's total gas consumption (12%).³⁶ Still, natural gas plants are often the generation units that are clearing the wholesale market at peak demand, as their relatively high marginal cost place them at the end of the merit order, and come online often in the case of a sudden drop of RES-based generation. A stronger focus on demand response and power storage are necessary to reduce the role played by natural gas in the system. There is a crucial need to implement demand response measures that include tertiary sector tenders that will compensate and incentivise large industrial gas consumers to reduce their gas consumption or optimise production profiles as to reduce Germany's overall gas demand in the winter.

Germany experienced a remarkable economic recovery after the end of the COVID pandemic restrictions. The corresponding increase in demand could not be satisfied by an increase in its carbon-free generation capacity. In fact, post-2020, the share of carbon-free generation in its electricity mix fell despite the increase in the cost of burning fossil fuels. A return to higher coal and gas power generation has reversed some of the reductions in the level of Germany's sustainability risks, contributing to a rebound of energy-related emissions. Germany risks a long-term lock-in in stranded fossil fuel assets without a significant acceleration of the uptake of renewable energy sources as a key measure to counter the energy crisis.

Germany has seen an improvement, akin to the one of the EU, of its sustainability risk subindex of the ECSRI since 2015 (around 21%). Although Germany has above-average energy-related CO₂ emissions per capita, this risk metric has improved much faster since 2015 (down 11.8%) compared to a 5.2% decline of the EU average, implying that the pace of energy transition has accelerated. Ambitious decarbonisation goals are also reflected in the share of non-CO₂ sources in electricity generation which has been going up steadily until 2020, thanks to the expansion of renewables. However, this positive trend reversed into a slight downturn in 2021 and 2022, as the newly added capacity by renewables did not entirely replace the capacity lost by the phasing out of several nuclear power plants. Between January and May 2022, nuclear power generation was on average operating at 3.8 GW compared to 6.9 GW in 2020. Natural gas has so far played a negligible role for the decarbonization of Germany's electricity generation as its share remains marginal compared to non-CO₂ sources, despite a significant increase in the use of gas after 2015.

³⁶ BDEW, [Gasfluss](#), May 12, 2022.

Figure 26. Dynamics of Key Indicators in the Sustainability Subindex for Germany



Source: CSD based on data from Eurostat and ENTSO-E.

Over the past decade, Italy's sustainability risks have gone down by 50% on the back of the rise in renewable energy's share in final energy demand. In addition, reliability risks have also followed suit as both businesses and households have invested heavily in reducing energy demand. Despite these significant improvements, Italy's total energy and climate security risk index score has actually stayed flat due to the sharp increases in geopolitical and related affordability risks linked to the rise in global energy prices and the increase in the country's dependence on Russian natural gas imports most notably in 2021.

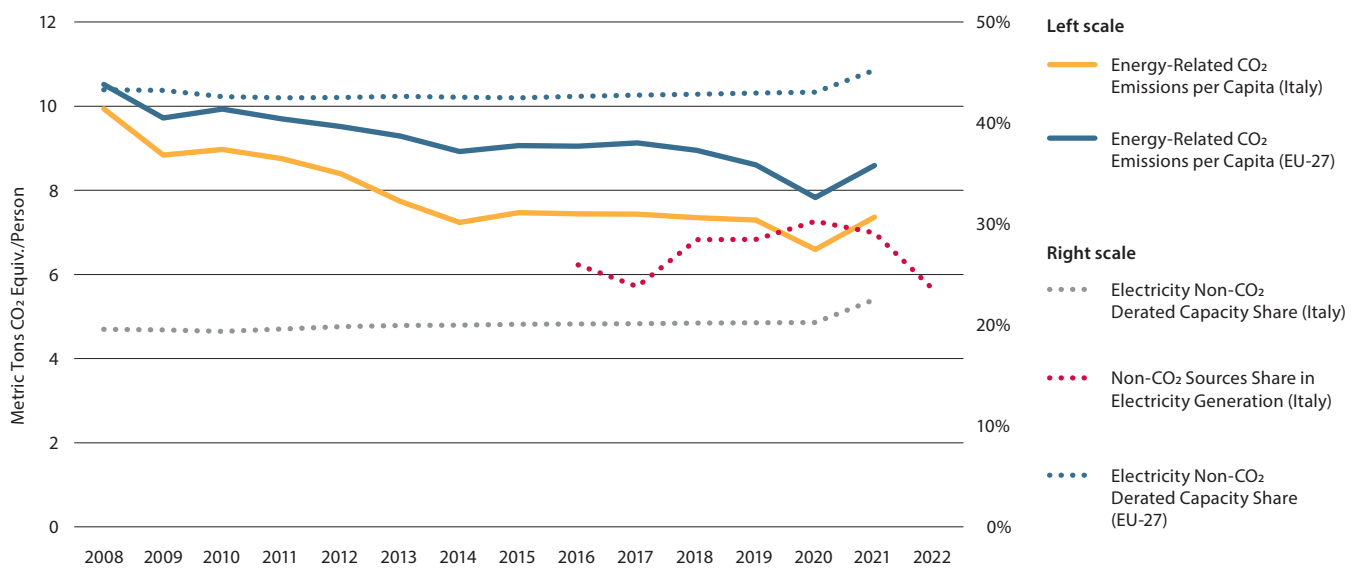
The Italian government does not have major plans to reduce the country's natural gas dependence to the same degree as most of the other EU member states. By 2030, according to the country's National Energy and Climate Plan (NECP), natural gas will still make up 38% of the power generation mix, one of the highest in Europe. The decision to extend the natural gas reliance has been closely associated with the existence of a state capacity mechanism that provides for long-term power purchasing agreements (PPAs) from 2024 to 2040. Through the PPAs the Italian state provides gas plant investors through a competitive bidding procedure with a financial incentive worth around EUR 70/kW/year (so around EUR 35 million for a 500 MW plant for example). This guarantees a secured cashflow for new gas installations even if they cannot reach their technical capacity factor of 60%. The decision to remain hooked on gas comes even when generating electricity in Italy from natural gas has already become three times more expensive than onshore wind and solar PV-based plants³⁷.

At the backdrop of this long-term gas lock-in, Italy's ambitions in terms of new renewables deployment is certainly modest compared to its potential but also pledges of other EU states. Italy has added just 5 GW of wind and solar,

³⁷ Brown, S., "Gas-reliant Italy lags behind in Europe's race to renewables", *Ember*, December 9, 2021.

while in the same period, four times more gas-fired generation capacity was constructed. So, while the Index shows a significant decrease in the sustainability sub-risk, this trend must not be overestimated as it is largely due to the high CO₂ prices than concrete Italian government measures to support renewable investment. In fact, the short-term affordability pain of the concurrently rising fossil fuel and carbon prices could break the political support for accelerating the energy transition process.

Figure 27. Sustainability Risk Subindex: Key Metrics (Italy vs. EU)



Source: CSD based on the EECRI, ENTSOE data (electricity generation data).

Moreover, Italy's sustainability risks could further deteriorate as a result of the geopolitical crisis and the affordability nexus. The rise of natural gas prices and the growing Russia-related security of supply risks has expanded the role of coal in the power mix. Coal-fired power generation doubled year-on-year since the start of the war in Ukraine in February 2022, reaching a 10% market share in power generation. At the same time, hydropower generation has halved, as water reservoirs have dropped to historical lows.

Unlocking the wind and solar energy potential of the country and integrating demand response in balancing services is critical for tackling the overreliance on natural gas and the geopolitical, affordability, and reliability risks associated with it. Italy's weak ambition on key sustainability policies, such as renewable energy development and energy efficiency, have limited the country's ability to deal with the current energy crisis and become more resilient to external shocks. To improve the investment climate for renewables, the government should reform the capacity market so that natural gas does not receive preferential treatment. Natural gas investment could lead to stranded assets worth EUR 11 billion, funds that could be diverted to the improvement of the grid and in storage capacity to enable a smoother integration of renewables en masse³⁸.

³⁸ Carbon Tracker, [Foot Off the Gas: Why Italy should invest in clean energy](#), March 23, 2021.

The massive uptake of renewables will put an effective ceiling on electricity prices by 2030, when most coal capacity in Europe will be out of the system. Choosing to decarbonize the energy system, while requiring massive investment in renewable energy, storage technologies, and smart grids, could also solve the security of supply conundrum linked to the exit of fossil-fuel-based baseload capacity. High electricity prices are incentivizing investments in previously prohibitively expensive technologies such as floating offshore wind, power storage, and green hydrogen. However, the growing reliance on renewables instead of natural gas would require increasing the capacity of power interconnections and the joint development of new low-carbon energy sources.

WHAT'S NEXT

This geopolitical crisis has demonstrated that **Europe must improve its energy sector governance** to decouple from the **Kremlin's malign economic and political influence** and further dismantle its oligarchic networks across the continent. Hence, there is an urgent need to redefine the European energy and climate security strategy, and base it on:

- Phasing out Russian fossil fuel imports by 2025;
- Accelerating the uptake of renewable energy and energy efficiency; and
- Unleashing Europe's enormous potential for R&D and innovation in cutting-edge, low-carbon technologies.

The EU should **define energy and climate security goals** for 2030 and 2050 based on a comprehensive, data-driven analysis and a coherent strategic vision. Current strategic documents propose unrealistic goals with poorly coordinated measures that may be in conflict with EU priorities. To bridge this policy gap, there is a need for coordination of political, financial and social commitments across the various policy areas on both the national and European level.

The ECSRI assessment clearly demonstrates that **Europe's energy and climate security risks have increased** markedly since the annexation of Crimea in 2014, as a number of European countries have deepened their dependence on Russian natural gas imports, with Italy and Germany alone accounting for half of this growth. To enable its influence over European energy markets, Russia entrenched powerful patronage networks to sway strategic decisions and undermine the common European energy and climate security policy.

A vivid example is Gazprom's ability to stoke a panic on natural gas, and by extension, on electricity markets in Europe, by purposefully reducing the natural gas supply to some of the largest European natural gas storage facilities below their normal levels ahead of the 2021/2022 winter season. The excessive reliance on natural gas in the power and industry sectors has led to a **sharp increase in affordability risks** along with skyrocketing prices and few alternative sources of supply.

The assessment confirms that fossil fuel prices are the leading factor for the rise in national energy expenditures, although the uptake of renewable energy sources has weakened this dependence. A return to higher levels of coal and natural gas-based power generation has reversed some of the improvements in sustainability indicators, and has enabled a rebound in energy-related emissions. The recent decision in Germany to restart some coal-fired power capacity is set to further intensify the tension between short-term measures to tackle supply security and long-term decarbonisation measures, while also **sending a misleading signal** to countries in Central and Eastern Europe struggling to end their addiction to coal. Without a significant acceleration of the uptake of renewable energy, the slow-down of decarbonization

efforts is bound to continue with disastrous consequences for the EU's long-term climate neutrality objectives.

In the REPowerEU strategy, the European Commission emphasizes exactly this **twin approach** of maximizing non-Russian gas imports, as well as the increase in renewable energy, electrification, energy efficiency, and innovation. However, the EU plan fails to formulate **a more comprehensive energy and climate security strategy** that clearly defines (i) emergency/short term measures that aim to alleviate Europe's critical vulnerabilities before the next heating season; (ii) medium-term measures that further reduce Europe's fossil fuel dependence and improve Europe's resilience to foreign political and economic influence; and (iii) long-term measures that strengthen Europe's energy and climate security through full decarbonisation of the economy and an alignment of Transatlantic energy security policy. Clearly synchronising energy security priorities with decarbonisation is a crucial first step to ensure the long-term consistency of measures and investments.

The following are a set of a non-conclusive list of policy measures that the EU and member-states could introduce to **improve energy and climate security along five key objectives**:

Strategic Decoupling from Russia

- The EU and the U.S. should **align** their **energy and climate security priorities** to reemphasize three key components:
 - ✓ Strategic economic and political decoupling from Russia;
 - ✓ Ensuring the diversification of the supply of fossil fuels and key resources for the energy transition;
 - ✓ Accelerating the decarbonization of the economy and the implementation of global climate agreements.
- The EU needs to clearly establish the dependence on oil and gas imports from Russia as a primary long-term energy and climate security risk in the member states' long-term energy and national security strategies.
- The most sustainable long-term way to **reduce geopolitical risks** to energy and climate security is to lower as much as possible Europe's dependence on importing energy and mineral resources from authoritarian states. This means diversifying away from fossil fuel imports from Russia, in the short run, and phasing them out completely in the long run.
- The EU should sign **new supply agreements for LNG deliveries** and pipeline imports from non-Russian suppliers including Norway, Algeria, and Azerbaijan. LNG already makes up 40% of the EU gas imports and both Norway and Algeria have pledged a moderate increase in exports to Europe. The EU needs to increase diplomatic efforts to **unlock the enormous gas export potential of the Eastern Mediterranean** by developing a trilateral framework for using idle LNG export capacity in Egypt to ship natural gas developed in Israel and Cyprus. In addition, the EU needs to strengthen the energy dialogue with Turkey and its most important Cas-

pian and Middle Eastern gas trading partners to increase supplies from the giant gas fields in Turkmenistan and Iran that could fully replace the lost roughly 200 bcm/yr of Russian gas delivered to Europe.

- Russia's effort to turn the EU into a gas hostage is the latest major test for the EU. It is high time to call the Kremlin's bluff and **double down on a Russian gas phaseout**. For all its high-handedness, Gazprom lacks an alternative to the European market. Russia's gas exports to Europe represent more than half the country's gas sales abroad. Moreover, deliveries are almost exclusively via pipelines and cannot be easily redirected to other markets.
- In natural gas, the EU should **set up a strategic natural gas reserve stock** following the example of the strategic oil reserve and implement strictly a mandatory 90% target for natural gas storage injection by 1 December of each year.
- The EU should ban Russian companies from owning or operating natural gas storage facilities, pipelines and LNG terminals that could be used to manipulate the European markets. European governments should complete the takeover of all natural gas infrastructure in the hands of Russian companies.
- The EU should ensure that all member-states **implement gas solidarity agreements** with a focus on optimizing West-to-East gas flows with a priority on improving links between the LNG regasification capacity in Spain and France with gas-starved markets in Central and Eastern Europe.
- EU member-states should temporarily **raise domestic gas production** in key fields such as Groningen, accelerate strategic interconnectors, new LNG regasification terminals in Germany, Italy and Greece, and gas storage facility projects, as well as phase out existing long-term contracts with Gazprom. To protect vulnerable countries, which depend excessively on Russian gas imports, the EU should accelerate the introduction of a common EU gas purchasing mechanism to secure gas stocks and achieve economies of scale in mobilizing alternative gas supplies.
- There is an urgent need for **screening and halting all Russian strategic investments** in Europe linked to Russian state-owned companies and oligarchic networks close to the Kremlin. To prevent Russian companies from evading sanctions, as well as track and seize the assets of Kremlin-linked energy companies and oligarchs, the EU should prioritize the stopping of Russian illicit financial flows including by **accelerating the roll-out of the newly designed Anti-Money Laundering Authority (AMLA)**. AMLA should coordinate its actions closely with U.S. FinCEN and the financial intelligence institutions in the different EU member-states.
- The EU should prepare an adequate **strategic communications response** strategy, as price pressures are likely to create even better conditions for Kremlin-driven propaganda to berate the energy transition and seek to stoke social unrest in Europe to weaken its support for Ukraine and for the energy transition.

Natural Gas Phaseout

- In addition to cutting the dependence on Russia, the EU should reduce the overall role that natural gas plays in Europe's energy mix by replacing it with **locally-sourced renewable energy**. This would not only limit the exposure to Russian imports and geopolitical risks more generally, but also to the inherent volatility of fossil fuel prices. Natural gas has proven to be a key driver behind skyrocketing electricity prices. Forward markets are pricing in continued supply scarcity through to at least 2024. **Natural gas phaseout is possible** if European countries strengthen efforts to:
 - ✓ Replace natural gas in heating with heat pump rollout strategies and electrification;
 - ✓ Reduce overall gas demand with an accelerated energy efficiency investment strategy, focusing specifically on energy poor households;
 - ✓ Accelerate offshore wind and power storage projects to replace natural gas power plant use for covering peak power demand;
 - ✓ Avoid a natural gas lock-in by abolishing any new EU-financed natural gas transmission and gas-fired power plant projects;
 - ✓ Ensure that only green hydrogen projects will be supported.
- LNG supply contracts should be limited to five years at most and preference should be given to floating instead of fixed LNG terminals as to **prevent a long-term natural gas lock-in** with alternative suppliers that does not solve the key energy security risks linked to excessive import dependence.
- The EU should avoid a blue hydrogen lock-in, **linking any hydrogen project plans to renewable energy sources**, such as solar and wind. In the industrial sector, accelerate the uptake of green hydrogen by repurposing the vast gas transmission network in Central Europe by 2030.
- Where possible, industrial decarbonisation measures should be directed towards the **electrification of production**, especially in the most energy-intensive sectors such as mining, metallurgy and cement.
- The key reliability of supply risk in Europe remains **the untapped potential for energy efficiency**. Reducing the overall natural gas demand will mean less need for fossil fuel imports and, thus, more energy independence. EU countries should undergo an accelerated energy efficiency investment strategy, focusing specifically on energy poor households and via deep renovation programs to reduce consumption faster than the current 2030 targets.

Reducing Energy Poverty Risks

- A coherent European energy and climate security strategy should **put energy consumers first**. The high energy prices have sharply increased energy poverty across Europe, with CEE and Southern European countries hit especially hard. At least 35 million Europeans will not be able to keep their homes adequately warm this winter. This calls for a more profound

EU-wide policy providing incentives for energy efficiency upgrades and switching to local energy self-production.

- The EU should mitigate affordability issues by **focusing on individual and community level incentives** and by avoiding abuse of public spending due to low governance standards in many member-states.
- To protect vulnerable consumers, EU needs to develop an emergency spending package based on the national ETS revenues and the shifting of resources in the national recovery and resilience plans. A 10% share of the national recovery and resilience plans could be redirected to the **financing of energy security measures**.
- Recently introduced fossil fuel subsidies, such as the widespread measures to reduce the prices of gasoline and diesel at the pump, need to be phased out as soon as possible, as they benefit more affluent households with typically higher consumption, while doing little to support vulnerable groups.
- Roll out **demand response tenders** for industrial gas and electricity consumers to urgently reduce energy demand and protect large business losses in the upcoming winter season. Direct compensation to businesses and energy price caps should be avoided as not to distort market signals and prevent wasteful consumption.
- Compensation mechanisms should be linked to concrete measures for improving energy efficiency and replacing the use of fossil fuels in production processes with alternative low-carbon solutions including renewable energy plants and synthetic fuels.
- The EU should **roll out a common energy poverty definition** and a synchronized strategy with mitigation measures that include the introduction of fiscal support for the most vulnerable consumers, micro-finance schemes for improving energy efficiency, the phaseout of air-polluting heating methods and cross-European information awareness campaigns that advocate energy savings. Energy poverty reduction measures should not come at the expense of energy market liberalization that could undermine the investment incentives that utilities and power producers need to strengthen the grid and complete the energy transition
- Energy poverty should be tackled through measures that **accelerate the decentralization of the energy supply**. Empowering consumers to become producers of energy should be a priority. Specifically-designed policies on national and European level, including publicly subsidized programs and new financial models for socially inclusive investments in renewables have been implemented by public and private stakeholders in many countries but still large groups of the European citizens can't afford to benefit from the low-carbon options.
- The European Commission's initiative for tackling extreme prices on the electricity market is a step in the right direction. In the long run, however, the growing fleet of variable renewable electricity sources requires

well-designed market reforms to limit extreme market volatility and help balance supply and demand at the lowest possible cost for the system and consumers. These reforms need to preserve the market efficiency of marginal pricing, but better integrate demand response and storage solutions into the market design.

Strengthening the European Energy Market

- Reliability of supply is also about **strengthening energy grids**. Europe should complete and liberalize its energy markets, removing bottlenecks that cause regional price divergence and wake up energy nationalism. Current investments in upgrading power transmission lines and smart grids, pledged by just a handful of European countries, are insufficient to integrate many renewable energy-based power plants in the electricity system, which creates bottlenecks in the transportation of electricity, for example, from wind-rich regions to fossil-fuel dependent ones.
- **Digitalization and the introduction of smart grids** should be a paramount focus of state support as to improve grid resilience in times of large RES uptake as a big chunk of renewables investment happens in low-voltage grids and would aid the process of power supply decentralization so crucial for both alleviating energy poverty and diminishing structural import dependencies.
- Improved integration and liberalization of natural gas and power markets in Europe will also be a crucial step to removing bottlenecks that cause regional price divergence and stir up energy nationalism.
- European governments should **increase investments in power storage** but based on a sound bottom-up approach, which matches consumption profiles of large consumers with their own production potential. Locking-in utility scale battery project could open Europe to a new vulnerability linked to the dependence on raw material imports from authoritarian and politically instable countries.
- An often-neglected aspect of reliability risks is the **management of transportation demand**. To reduce Europe's dependence on crude oil and oil products, EU governments should accelerate efforts to develop a much wider network of **e-charging stations** that will enable the penetration of low-emission vehicles.
- The sector needs massive and target-oriented investments in urban, rail and charging infrastructure as well as a 'consumer-focused' perspective in order to decrease transport emissions and respond to altering consumer habits and needs.

Decarbonization of the European Economy

- In the long run, a full fossil fuel phaseout is the most sustainable way to improve energy and climate security. Decarbonizing energy markets will also deliver a blow to Kremlin's ambition to increase its economic and political influence in Europe.
- Higher renewable energy integration in the system leads to overall lower prices. As overall market prices are expected to remain high over the next decade, the cost of support mechanisms, which could be in the form of tenders, would be minimal if any. This calls for the government to **reallocate state revenues from selling carbon certificates on the European market to supporting new renewables projects**; a policy instrument not used enough so far.
- Europe should promote renewables deployment with strategic investments in the grid resilience and in power storage systems that will take away the need for fossil fuel-based balancing.
- Most renewable energy investment will be done by private companies. However, European governments should better coordinate their long-term decarbonization targets including a 2035 clean power commitment from all governments. To unlock the deployment of renewable energy sources on a massive scale, there is a need to **eliminate regulatory and administrative barriers** to wind and solar investments including those linked to property issues, construction permits and conflicts with other activities.
- An accelerated decarbonization strategy also requires **deep electrification** based on cutting-edge renewable energy technologies such as offshore wind, green hydrogen and synthetic fuels in industry and low-carbon transport infrastructure. A strong focus on **market-oriented R&D and innovation** must become the primary driver of the transition.
- Despite the large-scale energy efficiency programs for residential and public buildings in the proposed EU and national funding instruments until 2027, these efforts need to be streamlined to **achieve a meaningful reduction of energy consumption**. There needs to be a considerable increase in both the rate of and its depth. Deeper renovations entail a transition to near-zero energy buildings where renewable energy heating and power production become integrated into the overall demand structure of buildings. Measures here should prioritize the worst performing buildings and target households suffering from energy poverty as key beneficiaries.
- In order to prevent the rise of energy demand and emissions, **behavioral changes** in patterns of consumption will be necessary, such as a decrease in the per capita demand for additional residential surface and the available living space per person. This requires more efficient use of existing and new building stock.

- The European governments' ambition to boost the uptake of hydrogen should be cautioned in the medium term as investment costs are much higher in comparison to RES alternatives. In fact, the most sustainable way to reduce the dependence on local and imported fossil fuels and at the same time to decarbonize the energy mix will be to replace coal and gas power plants with a locally-sourced renewable energy supply.
- The EU government should further **ease the conclusion of corporate power purchase agreements** (PPAs) where businesses can invest in the development of renewable energy-based power generation units for own consumption. This would require both the removal of administrative burdens for the installation of new plants and close coordination with the transmission system operators (TSOs) and the distribution system operators (DSOs) who can better streamline capacity addition approval processes and improve long-term planning for infrastructure upgrades to allow faster integration of business-linked RES plants.
- European governments should also **support the development of energy communities** that could pool financial resources in decentralized energy supply options. This means also ensuring stronger bottom-up approach and wider stakeholders' involvement, as well as overcoming the "stop-and-go" approach in national and EU energy transition policies.
- The EU should also ensure stronger links in the planning and implementation of European Structural and Investment Funds' programs on national level to the 2030 and 2050 frameworks' targets and priorities.

