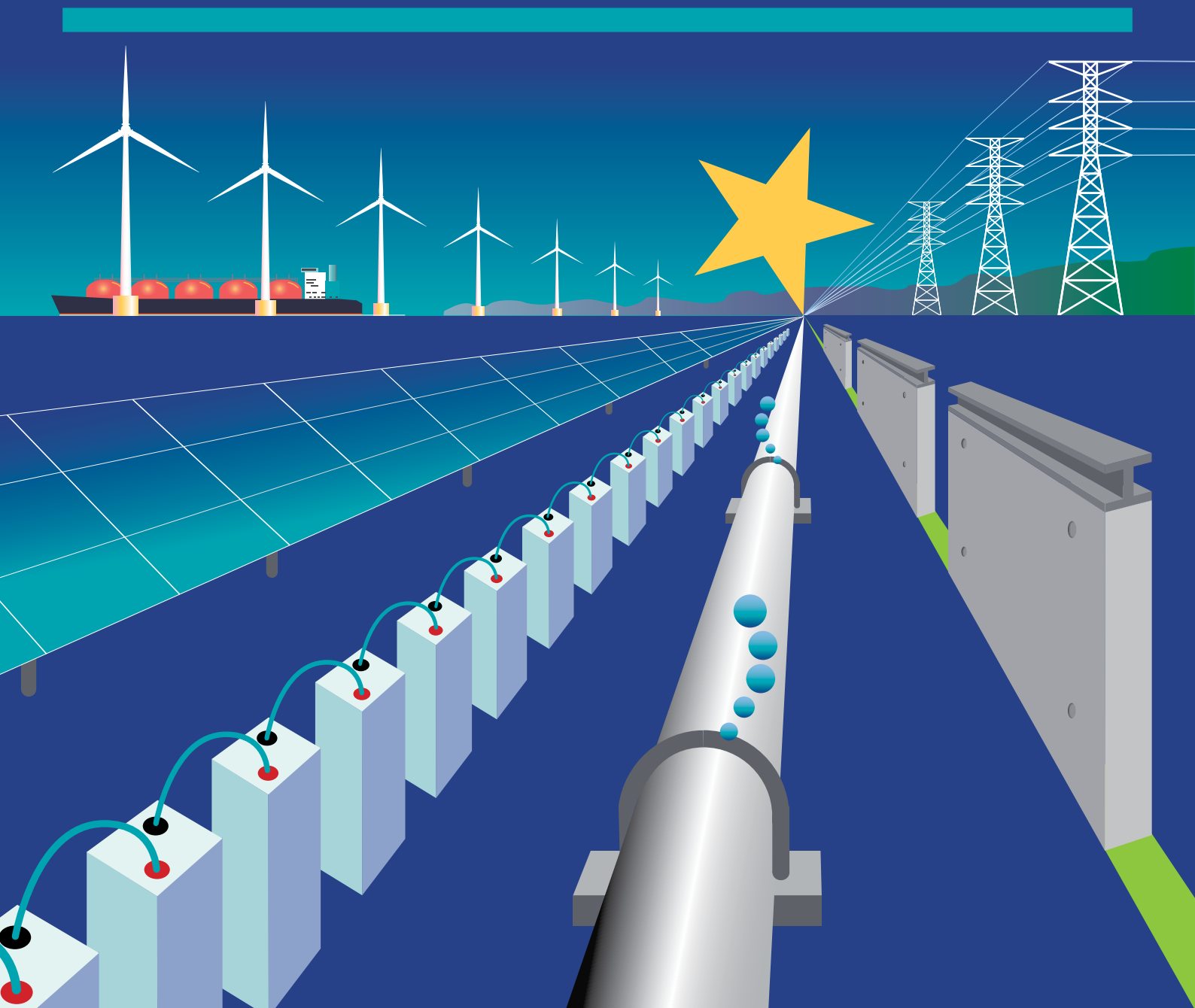


Rapid Transition to Energy Sovereignty

How to insulate the EU from global shocks and deliver energy security in five steps



Climate Bonds INITIATIVE

Prepared by the Climate Bonds Initiative

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1. Summary

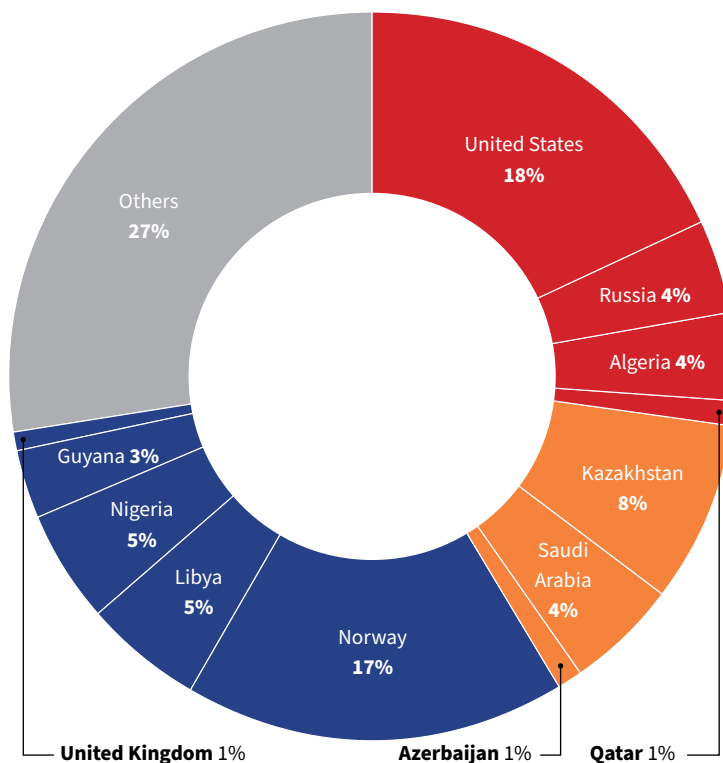
As the European Union (EU) faces a turning point in how it responds to the latest global energy shock driven by the Middle East war, acceleration of the clean energy transition has clearly emerged as the way to insulate the bloc from global energy shocks. The transition can deliver energy security, competitiveness, and climate targets.

Recent geopolitical developments have repeatedly shown how the EU’s reliance on fossil fuel imports (nearly 60% of primary energy supply) is a crucial vulnerability for the bloc. Energy shocks and disruption to supply are no longer hypothetical risks; they are a structural feature of today’s geopolitical landscape. The Russian invasion of Ukraine and the Middle East war have starkly demonstrated the constraints that fossil fuel imports impose on the EU’s defence capabilities, geopolitical strategies, industrial competitiveness, and ultimately, its sovereignty.

40% of European fossil fuel imports come from suppliers that have made, or discussed, threats to cut off supply to the EU, increasing its vulnerability in the face of another energy shock.¹ The Russian invasion represented a chance for the EU to significantly accelerate its clean energy transition, yet its immediate response has maintained import dependencies that continue to undermine its energy sovereignty and resilience (see Figure 1). Over the past two years, the EU has rapidly reduced its reliance on Russian pipeline gas while increasing its exposure to the United States (US), now the EU’s largest supplier of liquefied natural gas (LNG) and second largest supplier of gas to the EU overall.² This represents a huge source of political risk for the EU. A step change in ambition, urgency and resolve from the 2022 response is clearly needed, setting out a clear and confident EU energy strategy to insulate the EU from both external coercion and recurring global shocks.

Figure 1: Fossil fuel import dependencies are a security threat: EU oil and gas imports by supplier country, 2024

- Countries that have formally threatened to cut off supplies to the EU or that have cut off supplies to the EU as retaliation for EU domestic or foreign policy
- Countries that have discussed using cutting off supply as a threat to the EU, or whose infrastructures have been used by other countries to cut off supplies to the EU, as retaliation for EU domestic or foreign policy
- Countries that have never discussed or issued threats to cut off supplies to the EU



Source: Climate Bonds Initiative analysis, data from Eurostat¹⁰

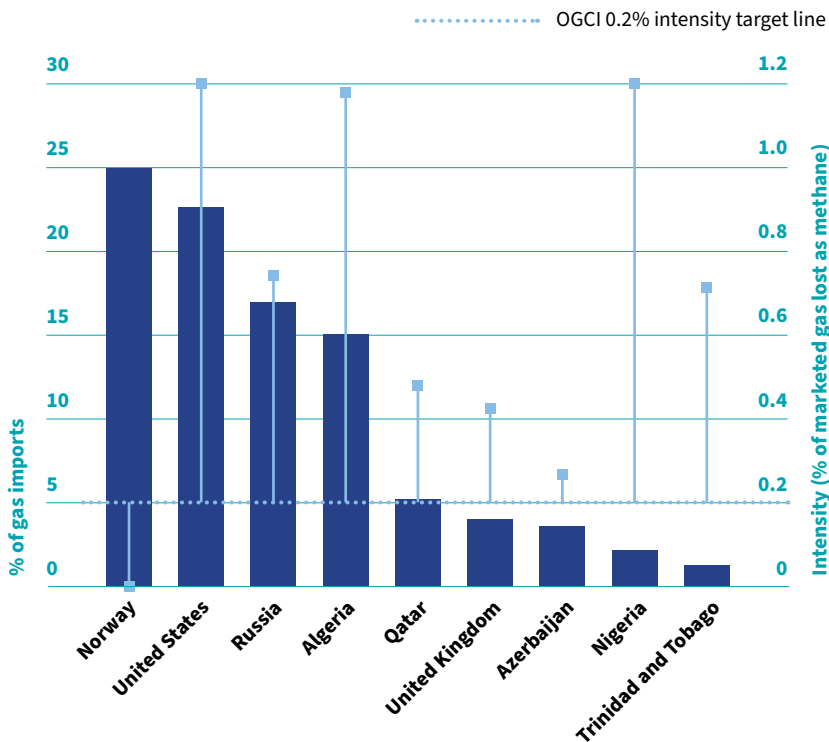
A rapid transition away from fossil fuels, prioritising decreasing import dependencies, is the only way to sustainably strengthen the bloc’s energy sovereignty, security, and resilience. The EU methane regulation (MER) offers an opportunity to rapidly transition away from some of the highest risk imports, given their methane intensity (see Figure 2). Monitoring, reporting, and verification requirements (from 2027), and methane-intensity standards (from 2030) will disincentivise imports from high-risk suppliers such as the US and Russia and allow the EU to better align climate objectives with energy-security objectives.

In the EU, 89% of final energy demand can be electrified with existing technologies.³ Ramping up electrification would sharply reduce exposure to fossil fuel supply shocks, as 81% of electricity generation is not dependent on imported fuels.⁴ Of the EUR450bn of fossil fuel imports in 2024, EUR150bn could have been saved by electrifying the EU car fleet and installing heat pumps in homes and businesses.⁵ A massive reduction in demand would enable reduction of the most vulnerable imports, while relying on trusted suppliers such as Norway and the United Kingdom (UK) for remaining needs.

Investment in European energy sovereignty is increasing, but it must accelerate to reach the EUR1.5tn per year through to 2050 required to achieve the EU-wide clean energy transition.⁶ Clean energy investment is a cost-efficient way of investing in Europe’s security. However, in 2025, EU investment in clean energy reached around EUR346bn, only the third largest globally, and only 2.1% of gross domestic product (GDP), compared to a 2.9% global average.⁷

As outlined in the Draghi report, a shift to domestically produced clean energy would materially strengthen the EU’s competitiveness and allow it to access the EUR1.9tn (2035) clean-tech market.^{8,9} Clean and domestic energy sources, a flexible and resilient power sector, and efficient and flexible consumption would help to mitigate energy supply risks and price shocks. Such a shift would reinforce the EU’s industrial base and sustain a virtuous cycle by boosting the EU’s attractiveness as a place to invest in green technology.

Figure 2: A robust methane intensity target in the EU MER would be difficult for US and Russian gas to meet



Source: Climate Bonds Initiative, data from Eurostat, the International Energy Agency and the Energy Institute¹¹

The transition away from fossil fuel requirements is not meeting the pace demanded by geopolitical security concerns. Policy ambition lags technological potential and regulatory uncertainty distorts signals. Structural constraints, including ageing grids and connection backlogs, significantly delay deployment. Distorted price signals and fragmented energy markets continue to undermine the investment case for transition. The EU’s target to reduce emissions by 90% (compared to 1990 levels) by 2040 can and must become an anchor for action.

The EU can accelerate its transition to energy sovereignty and competitiveness by taking action across five key areas (Table 1). With strategic focus and political will, the clean energy transition can become Europe’s defining security project of this decade, safeguarding the rapid transition away from fossil fuel imports.

Table 1: Five key steps to fast-track EU transition away from vulnerable fossil fuel imports

Target type	Key recommendations for the European Commission and Member States
<p>1. Electrify: Rapidly transition energy end use from fossil fuels to domestic low carbon electricity.</p>	<ul style="list-style-type: none"> • 89% of final energy demand can be electrified with existing technology; however, the 2030 electrification target is only 32% and can be significantly strengthened. • Reform of electricity markets, energy taxation, and fossil fuel subsidies will address structural biases favouring gas over electricity.
<p>2. Connect: Ensure an interconnected EU grid that balances RE supply across regions.</p>	<ul style="list-style-type: none"> • Prioritise electricity highways under the Grids Package and accelerate permitting for grid projects to meet Member States’ 15% interconnection targets. • Develop extra-EU connections with trusted neighbours to safeguard near-term supply.
<p>3. Flex: Deploy battery storage, pumped hydro, and demand management to reduce demand for gas as a balancing fuel.</p>	<ul style="list-style-type: none"> • Fast track permitting for storage technologies. • Reform electricity markets to give storage and demand side resources full access to capacity markets, and shorter duration contracts. • Scale smart meter rollout and time of use incentives to deliver flexible and efficient demand.
<p>4. Decarbonise: Transition fossil fuels consumption in industry and build a competitive green industrial base.</p>	<ul style="list-style-type: none"> • Set clear transition pathways aligned to EU Taxonomy thresholds for steel, cement, and chemicals. • Introduce product mandates and mandatory green public procurement to tilt private and public markets for industrial products. • Expand hydrogen valley/cluster development.
<p>5. Shield: Leverage the EU MER to reduce exposure to high risk fossil suppliers and strengthen sovereignty.</p>	<ul style="list-style-type: none"> • Use MER rules to prioritise low risk, low methane suppliers and accelerate phase out of Russian fossil fuels before 2027, supported by a strong methane intensity standard. • Set an ambitious and science-based upstream methane intensity standard and maintain expected implementation timings and penalty mechanisms, which, alongside monitoring, reporting, and verification measures, will limit uncertainty risks in the supply chain and tilt purchases away from highest emitting producers.

2. Fossil fuel imports are a risk to European energy sovereignty, security, and competitiveness

The past few years have seen the emergence of existential threats to European security. First, the Russian invasion of Ukraine brought war closer to the EU’s borders. More recently, a close ally and growing energy supplier, the US, threatened EU security and autonomy by seeking to annex Greenland and further threatened EU energy security through initiating the Middle East war that has destabilised global energy markets.¹³

Today, 40% of European fossil fuel imports come from suppliers that have made, or discussed, threats to cut off supply to the EU, leaving the EU exposed to both security and economic risks (see Figure 3).¹⁴ As of 2024, fossil fuel (oil, gas, and coal) imports provided almost 60% of the EU’s primary energy. This is much higher than other major economic competitors, such as the US (17%), China (24%), or India (37%).^{15,16}

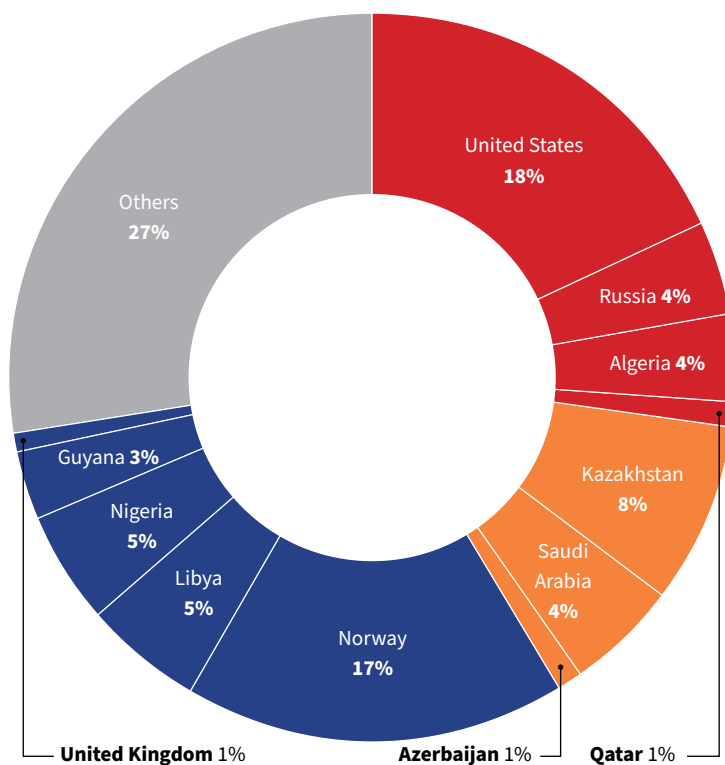
This high import dependency imposes constraints on the EU’s defence and geopolitical strategies and ultimately, its sovereignty. It is harder for the EU to make the necessary geopolitical decisions towards key suppliers who can retaliate by cutting off fossil fuel supply. This vulnerability has already been exploited, such as in 2021 when Russia’s Gazprom manipulated pricing by reducing pipeline flows and not replenishing EU gas reserves prior to the invasion of Ukraine (see Box 1).¹⁷

By defining diversification as reducing reliance on Russian gas, the EU has largely exchanged one dependency risk for another, as exposure to US LNG imports has increased (see Figure 4).¹⁸ While REPowerEU actions to phase out Russian gas imports by 2027 have resulted in a significant drop in the volume of Russian gas imports, and a decline in consumption, overall import dependency has remained high, at 86% of gas supply (2024).¹⁹ US gas imports increased almost fourfold from 2021 to 2024; the US is now the EU’s top supplier of oil and LNG and the second largest of gas in all forms, after Norway.²⁰ If efforts to reduce gas demand falter, the EU may source 75–80% of its LNG imports from the US in 2030.²¹

EU purchasers are increasingly reliant on certain US LNG suppliers, without clarity on whether they can access the supply to meet contracted delivery quantities. BP won a USD1bn+ arbitration case against Venture Global, the largest US supplier to the EU, for prioritising spot market sales over delivering on long-term (lower-priced) contracts in 2025 while cases from Repsol, Edison, and Galp are still pending.²²

Figure 3: EU oil and gas imports by supplier country, indicating those that have threatened supply 2024

- Countries that have formally threatened to cut off supplies to the EU or that have cut off supplies to the EU as retaliation for EU domestic or foreign policy
- Countries that have discussed using cutting off supply as a threat to the EU, or whose infrastructures have been used by other countries to cut off supplies to the EU, as retaliation for EU domestic or foreign policy
- Countries that have never discussed or issued threats to cut off supplies to the EU



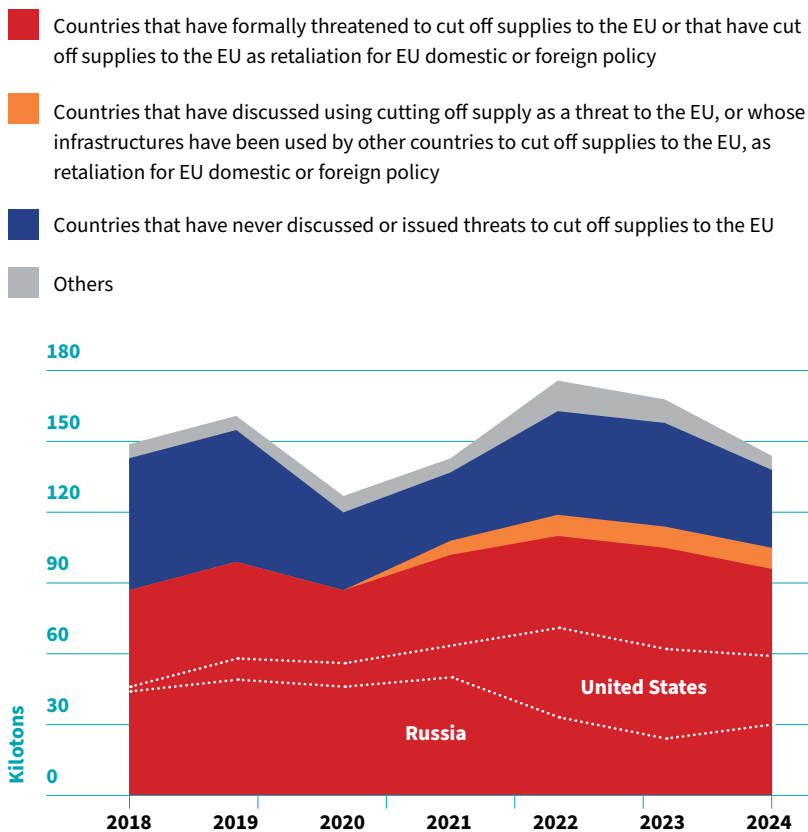
Source: Climate Bonds Initiative analysis, data from Eurostat¹²

Fossil fuel import reliance also exposes the EU to volatile pricing, undermining competitiveness and exposing households to high and uncertain pricing. The steep drop in Russian gas imports following the invasion of Ukraine drove gas prices to a record high, with an increase of 180% in the two weeks following the invasion.²³ Volatility has since remained high, largely because the transition away from Russian gas has increased purchasing of LNG on global markets, increasing exposure to volatile spot pricing, with a falling share of demand met by long-term contracts.²⁴ The 2024–2025 winter saw the highest gas pricing in two years, exacerbated by tightened natural gas supplies with the halt of transit of Russian pipeline gas through Ukraine in January 2025.²⁵ The conflict in the Middle East has further injected volatility into global and EU energy markets, with European gas prices rising by over 60% in March 2026.²⁶

The EU pivot to LNG exposes it to structurally higher supply costs, given the higher costs of liquefaction in addition to the cost of shipping from the Gulf of Mexico, and increased price linkage to US pricing.^{27,28} The Middle East conflict saw global LNG supply decline by 20% in March 2026, contributing to major European gas price rises.²⁹ Severe US winter storms in January 2026 caused a spike in US prices and reduced supply, compounding elevated EU gas prices due to the impact on LNG pricing.³⁰ This pricing is carried through to EU residents and industry, with energy prices for households and enterprises at record highs.³¹

The EU is keenly aware of the importance of phasing out fossil fuel imports as President von der Leyen said in 2025: ‘As our energy dependency on fossil fuel goes down, our energy security goes up.’³² European Commission analysis shows that fossil import dependency can be halved by 2040 through energy efficiency gains and renewable energy (RE) buildout. RE accounts for a growing proportion of final energy consumption (25.2% in 2024) but is still off-track for the 2030 target of 42.5% set out in Renewable Energy Directive (RED) III.³³ By accelerating its energy transition, and strategically reducing the highest-risk fossil imports, the EU can meet its targets to phase out Russian gas in 2027, while reducing its demand for LNG imports.

Figure 4: While import dependency on Russia has been reduced, dependency on the US has grown: Gas imported by the EU (Kilotons)



Source: Climate Bonds Initiative, data from World Bank³⁴

Box 1: Threats from fossil fuel suppliers to the bloc have increasingly constrained EU foreign and domestic policies.

In recent years, several fossil fuel suppliers to the EU have leveraged supply as a tool to impose their interests in the EU. Such threats have been made by both allies and adversaries alike, demonstrating that fossil fuel imports are always a potential vulnerability regardless of the current relationship with the supplier.

- In 2021, following proposed EU sanctions against the Belarusian regime, President Lukashenko threatened to shut down the Yamal-Europe pipeline, which carries Russian natural gas through Belarus to Poland and Germany.³⁵
- In 2022, following Spain's policy shift towards Western Sahara, Algeria threatened to terminate gas contracts with Spain if it were to divert or re-export any Algerian gas to Morocco. While supply was not interrupted, Algeria suspended its 'Treaty of Friendship' with Spain and restricted other trade.³⁶
- In 2022, as a retaliation for EU sanctions, Russia issued a decree requiring 'unfriendly' countries (including all EU member states) to pay for natural gas in rubles rather than euros or dollars and with failure to comply resulting in immediate suspension of existing contracts. Gas to Poland, Bulgaria, and Finland was then cut off in early 2022, and flows through Nord Stream 1 were drastically reduced.³⁷
- In 2022, Russia ordered a 30-day shutdown of the Caspian Pipeline Consortium, which carries 80% of Kazakh oil exports to the Black Sea for delivery to Europe, based on 'technical irregularities' regarding oil spills. This happened two days after the Kazakh President told the EU Council that Kazakhstan was 'ready to help stabilize' the European energy market to offset Russian losses.³⁸
- In October 2025, the US and Qatar issued warnings regarding what they perceived to be the extraterritoriality of labour and environmental rules in the corporate sustainability due diligence directive.³⁹ Qatar warned that the directive could 'threaten [its] energy security' and force it to redirect LNG supplies to Asian markets.
- In late 2025, the US Government issued a formal demand to the EU to either repeal or drastically delay the EU Methane Regulation (EU MER). US lobbying efforts, backed by the threat of supply disruption, are likely to intensify as the largest US oil and gas lobby, the American Petroleum Institute, explicitly targets EU climate laws in its 2026 policy agenda, signalling a coordinated industry-government front.⁴⁰
- In the first quarter of 2026, US-Israeli strikes on Iran and the rapidly evolving war in the Middle East led to halted production in Qatar and other producers, closure of the Strait of Hormuz, and a month-on-month jump of more than 60% in EU gas prices in March 2026.⁴¹

2.1. Structural, policy, and market barriers continue to inhibit transition

Europe's energy system continues to face deep-rooted structural constraints that hinder rapid change. Barriers include major grid infrastructure challenges, with ageing networks, insufficient interconnection, and grid connection backlogs delaying renewable projects and storage at scale (see section 3.2). Flexibility infrastructure has not yet scaled to match renewable deployment, with limited smart-meter penetration, inconsistent access to demand-side tools, and inadequate storage integration contributing to continued reliance on fossil-fuels (see section 3.3). Supply-chain bottlenecks, for transformers, grid components, and clean tech, impact deployment timelines and raise costs.⁴²

Policy ambition and regulatory frameworks have not yet caught up with the pace of clean tech development. Electrification targets remain far below what is technically feasible, and regulatory uncertainty over the Clean Industrial Deal, Electricity Market Reform, and upcoming grid legislation continues to delay investment decisions. Slow and complex permitting processes hinder deployment of key energy infrastructure.

Distorted price signals and fragmented energy markets undermine the investment case for the clean energy transition. Cross-border electricity price disparities reduce incentives for renewable investment. Fiscal structures still favour fossil fuels in many Member States, making electrification less financially attractive for households and industry. High upfront capital costs and uncertain long-term demand continue to slow industrial decarbonisation, particularly in hard-to-abate sectors. Market design barriers also prevent storage, demand response, and vehicle-to-grid solutions from fully participating in wholesale and balancing markets.

3. Accelerating domestic clean energy supply to replace fossil fuel imports

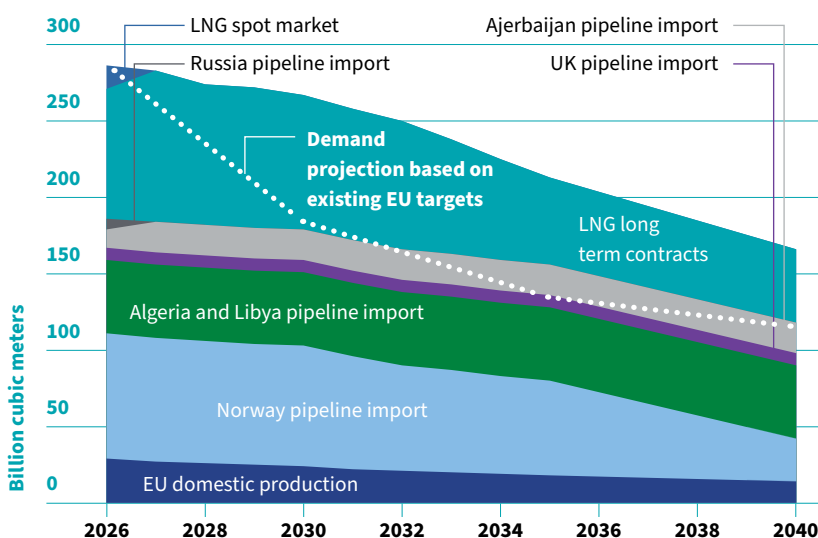
Ambitious domestic clean energy policies and a faster pace of transition can deliver energy security. Increasing the pace of grids and clean energy buildout will strengthen sovereignty, stabilise prices, and provide energy certainty for business and citizens. The European Green Deal has committed the EU to a 55% reduction in emissions by 2030 and 90% by 2040, while RED III includes a mandatory target of a 42.5% (45% non-mandatory target) share of RE in the EU’s gross final consumption of energy in 2030.⁴³ Meeting these targets would enable a reduction in the most vulnerable energy imports. By 2035, the EU could eliminate LNG imports altogether, with remaining gas needs met by domestic supply and pipeline imports, the majority of which comes from countries that have not discussed cutting off supply (Figure 5).⁴⁴

Low-carbon electricity can become the primary energy source for the EU, but key structural, policy, and market barriers must be addressed first. To meet targets, the role of renewables must significantly expand while fossil fuels diminish to a residual fuel, alongside a 25% (2025–2050) reduction in final energy consumption (Figure 6). This is made possible by the wide-ranging electrification of many energy uses.

However, the EU is currently not on track to meet these targets. Member States’ National Energy and Climate Plans will only deliver a 39% renewables share by 2030 – acceleration is clearly needed to meet even the lower-bound mandatory target of 42.5%.⁴⁵ Targets on electricity interconnection, use of renewables in industry, and use of renewable hydrogen are also off-track. All these solutions need to match the pace of RE deployment.

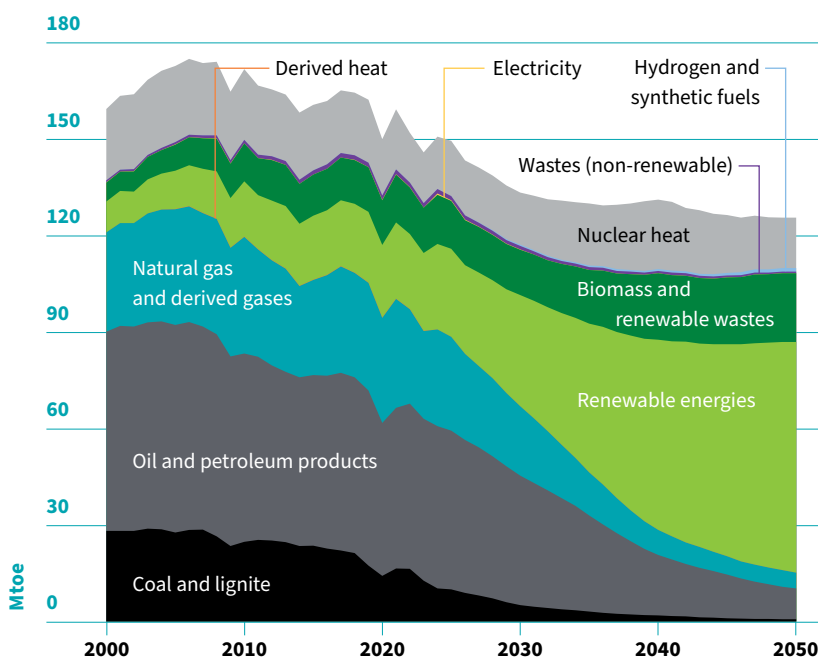
The EU’s persistently high energy costs, with electricity and gas prices up to three and five times those in the US, are undermining its competitiveness.⁴⁶ Among industrialised economies, only the UK was more expensive than the EU in terms of final industrial electricity prices (2022–2024).⁴⁷ Higher energy prices raise production costs and make European goods and services more expensive than those produced in lower-cost markets, discouraging investment. Around 60% of European companies cited energy prices as a major impediment to investment in 2023.⁴⁸

Figure 5: Pivot away from most vulnerable energy imports: Projected EU supply and demand of gas



Source: Climate Bonds Initiative, data from Strategic Perspectives⁵⁹

Figure 6: The declining role for fossil fuels: Gross available energy by fuel type in the EU



Source: Climate Bonds Initiative, data from Clean Energy Technology Observatory, POTEnCIA 2025 scenario⁶⁰

The clean energy transition provides a buffer against global energy market volatility, underscoring its importance even in the face of price shocks.

Within the first month of the Middle East war, at least 18 European nations had introduced measures to help households and industry with rising energy costs.⁴⁹ Measures which address the root cause of the vulnerability are key to insulating the EU from future shocks as demonstrated by the lower impact on electricity pricing in countries that are less reliant on gas for electricity generation. In the first week of March 2026, Spain's average weekly electricity prices remained below gas power costs, while Germany, the Netherlands, Italy and Belgium saw significant price spikes.⁵⁰ In April 2026, France's Prime Minister announced a doubling of state support for electrification to EUR10bn a year to 2030, in order to cut fossil fuel dependency.⁵¹

The RE transition also presents an opportunity for EU industry to capture a share of the global clean tech market, which is expected to triple to EUR1.9tn between 2023 and 2035.

⁵² China remains the largest manufacturer across clean technologies (solar, wind, batteries, electrolysers, and heat pumps).⁵³ While the EU is also a major manufacturer in these sectors (apart from solar), it continues to lag China. The EU's previously high market share in wind turbine components has declined significantly, from 58% in 2017 to 30% in 2022.⁵⁴ Measures contained in the Clean Industrial Deal to accelerate state aid funding to the RE industry, alongside the introduction of criteria for EU-made clean products in public and private procurements as per the Industrial Accelerator Act, should help to support EU industry and competitiveness.⁵⁵

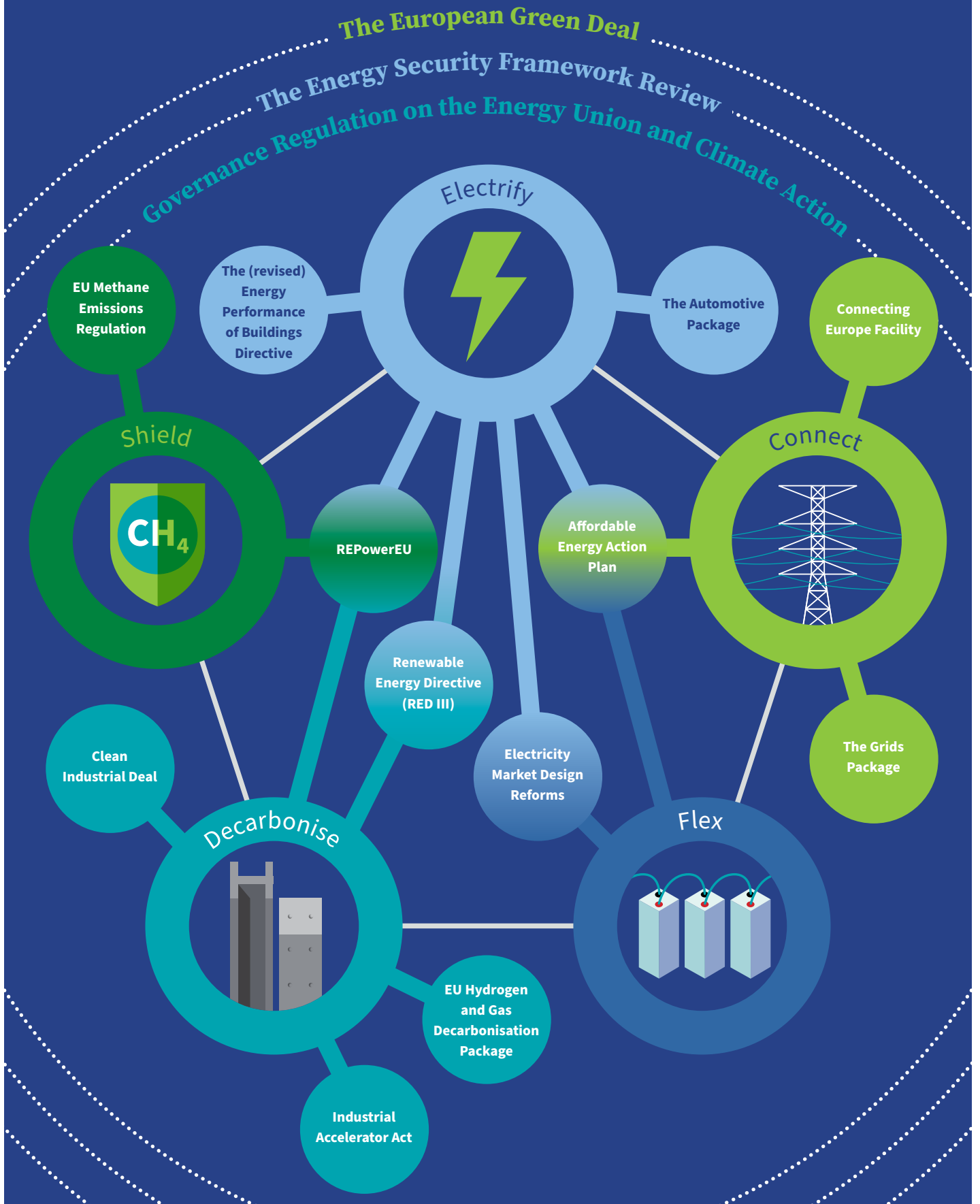
While energy investment is positioned as an EU strategic priority, to scale and accelerate efforts a clearer delineation against competing priorities is needed.

Private finance is expected to deliver the bulk of this investment. For advanced economies, 70% of RE sector investment was private in 2022–2023.⁵⁶ The current Multiannual Financial Framework (MFF), 2021–2027, dedicates at least 30% of spending to climate action. The next iteration, 2028–2034, increases the target to 35%, while widening the scope to climate and environment.⁵⁷ However, the lack of dedicated funding for clean energy investment means that these projects will compete with other funding priorities. Establishing clean energy investment as a European security priority will help to ensure the acceleration of financing as part of the European Competitiveness Fund.

A fast track to energy sovereignty is possible, if efforts are focused on addressing these key barriers.

The five steps set out in this report represent the fastest route to a resilient, affordable and independent European energy system, aligned with the EU's 2050 and interim 2030 climate targets. These are aligned with the Policy-Orientated Tool for Energy and Climate change Impact Assessment (POTEnCIA) deep decarbonisation scenario and with EU climate objectives developed by the European Commission's Clean Energy Technology Observatory.⁵⁸

Figure 7: The EU policy landscape for delivering the five steps



3.1. Electrify: 89% energy demand can be electrified; EU ambitions on electrification can be raised



The EU target of 32% electrification by 2030 does not match its potential: 89% of energy demand can be electrified with existing technologies.^{61,62} Electrification share has stagnated at around 22% for 10 years.⁶³ The upcoming Electrification Action Plan (see Appendix 2), represents an opportunity to increase the ambition of the 2030 target from the existing 32%. This is key to not only meeting REPowerEU targets but also reflecting industrial reality. Indeed, RE industry players have called for this target to be seen as a ‘floor, not a ceiling.’⁶⁴

Compared to the rest of the energy mix, EU electricity generation has a low reliance on imported fossil fuels, thereby reducing geopolitical vulnerabilities. In 2024, the share of EU electricity generated from imported fuels was just 19% (Figure 8). This means that 81% of EU electricity generation was based on local sources (of this, 88% can be estimated as from low-carbon sources).⁶⁵ This compares to less than 10% for oil or 20% for gas. This will continue to rise as electricity generation increases and by 2040 virtually all generation will be based on EU sources.⁶⁶

Electrification allows power supply to be decoupled from fossil fuel imports and their associated security risks.⁶⁷ While these technologies bring supply chain dependencies, they present a lower risk of abrupt disruption because they utilise upfront materials and components rather than continuous fuel deliveries.

In addition, electricity generation is already 71% low carbon (renewables and nuclear), meaning that electrification provides a buffer from global energy shocks.⁶⁸ The decoupling of wholesale electricity prices from gas prices seen in the price shock from the Middle East war demonstrates this buffer. While European gas prices surged 80% between the start of 2026 and end-March, average wholesale electricity prices for the five largest eurozone economies barely changed, reflecting growth in low-carbon generation.⁶⁹ As electricity generation is increasingly domestic and clean, the major challenge is ensuring energy end uses can run on electricity.

Delayed electrification has a huge cost: in 2024 alone, the EU imported EUR450bn of fossil fuels. Much of the electrification-ready demand mentioned above is concentrated in a few sectors; namely road vehicles (30%) and households

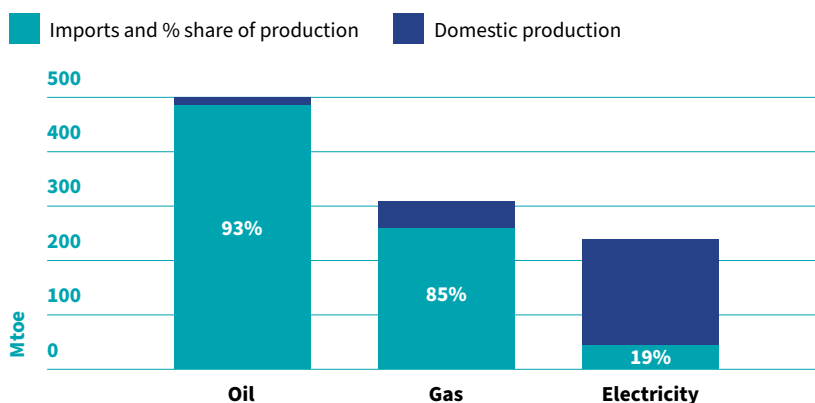
(30%), where already proven electric vehicle (EV) and heat pump technologies are likely playing a key role.⁷⁰ However, the EU is on course to miss its REPowerEU target of 60 million new heat pumps installed by 2030 (from 2021 levels), and the Commission has rowed back on the planned ban on new internal combustion engines from 2035.^{71,72} Of the EUR450bn of fossil fuel imports in 2024, EUR150bn could have been saved by transitioning the EU car fleet to EVs and installing heat pumps in all homes and businesses to reduce demand.⁷³

Uptake in EV and heat pump technology represents an opportunity for European industry. The IEA projects that by 2030, the EU will significantly expand its heat pump manufacturing capacity to become the largest manufacturer in the world, with almost 40% of the global capacity.⁷⁴ EVs are becoming increasingly cost-competitive with internal combustion engines across Europe, with upfront costs competitive in the premium segment.⁷⁵ European EV carmakers have the potential, with supportive policy measures, to grow their domestic market share to a little over 80% by 2035.⁷⁶ In this way, ramping up electrification will also reap benefits for European industry. However, the recent U-turn on the 2035 ban on internal combustion engines brings market uncertainty that may limit this potential.⁷⁷

Cost-of-living policies, such as reduced VAT on heating fuels, that subsidise fossil fuel consumption can be reformed to support transition investment instead.⁷⁸ In 2024, heat pump sales fell by 20%, likely due to the high upfront cost – which can be as high as EUR10,000 – and a lack of financial support for lower-income households.⁷⁹ Subsidies originate at the Member State level, and most lack concrete plans for phase out, meaning the EU Environmental Action Plan call for phaseout ‘without delay’ is unlikely to be met at present.⁸⁰ Phaseout of fossil fuel subsidies ensures clarity of signals on climate, disincentivises fossil fuel investment, and frees up budgetary space to support transition.

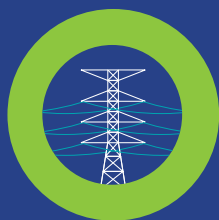
The revised Energy Performance of Buildings Directive requirements for new builds will begin to drive electrification. Over a third of the 89% electrification potential is in households.⁸¹ The Directive (to be transposed into national law in early 2026) will introduce standards for new buildings, including promoting solar energy installation as standard, along with efforts to phase out boilers powered by fossil fuels.

Figure 8: Share of energy production from domestic and imported sources



Source: Climate Bonds Initiative, data from Eurostat and Ember¹²⁶

3.2. Connect: Realise Europe's interconnectivity potential



The EU's electricity grids are a core security asset and enabling greater interconnectivity should be a top priority.

Deep cross-border interconnection enables energy demand and supply to be balanced across geographical regions, reducing storage or baseload (often gas) generation needs, and lowering prices.⁸² A well-designed grid is also crucial to the power system's resilience to attack. The restoration of power following the 2025 Iberian Peninsula blackout was made possible by cross-country interconnection. This demonstrates the role that interconnectors play in rapid system recovery.⁸³

The EU holds huge potential for region-wide grid balancing but this requires significant growth of intra-EU transfer capabilities (Figure 9).

The EU's diverse geography results in a range of RE hubs, from offshore wind hubs in the north to solar hubs in the south. This offers potential for complementary supply patterns. The POTEnCIA scenario sees intra-EU interconnectors' net transfer capacities grow from 70 gigawatts (GW) in 2023 to 97 GW in 2030 and 168 GW in 2050, while extra-EU capacities grow from 28 to 37 GW from 2023 to 2050.⁸⁵ Many of these future interconnectors will rely on high-voltage direct current technology, which is essential for long-distance transmission across Europe. Investment in power grids is estimated to have grown to more than EUR62bn in 2025, with annual spending now double that of a decade ago. However, deployment is still lagging.⁸⁶

The EU is not on track to meet its 2030 interconnection targets despite having one of the most extensive electricity networks in the world, at 11 million km.

The EU has set an interconnection target of at least 15% by 2030, i.e., each Member State should be able to import at least 15% of its own electricity capacity from its neighbouring countries.⁸⁷ However, 11 countries, representing 80% of EU power generation, are on course to miss 2030 interconnection targets, as the scale of expansion and public investment required surpasses current plans.⁸⁸ In 2025, eight Member States were still less than half way to the target, including France (6%), Italy (5%), and Spain (4%).⁸⁹

The enhanced coordination powers for the Commission and priority 'Energy Highways' in the Grids Package are key to help prioritise grid investments where they are most needed.

The Grids Package (Appendix 2), presented by the Commission in December 2025, includes new powers to survey grid infrastructure needs at an EU-wide level and to propose projects to fill gaps.⁹⁰ The Energy Highways initiative is intended to accelerate progress on the most urgent infrastructure needs that also require additional political commitment for implementation highways (predominantly intra-EU, with some extra-EU connections).⁹¹ The 'gap filling' powers and prioritisation of the five electricity Highways can help to ensure that the electricity grid can deliver mass electrification.⁹² Central planning is key and could be delivered by a European Independent System Operator and Planner, as recommended by E3G's 'Capturing the benefits of the EU's electrification: Better governance for delivering the grids agenda'.⁹³

Benefits sharing, such as shared ownership schemes or financial compensation for local populations, as proposed in the Grids Package, will help to overcome the inertia and local opposition that currently delay many projects.

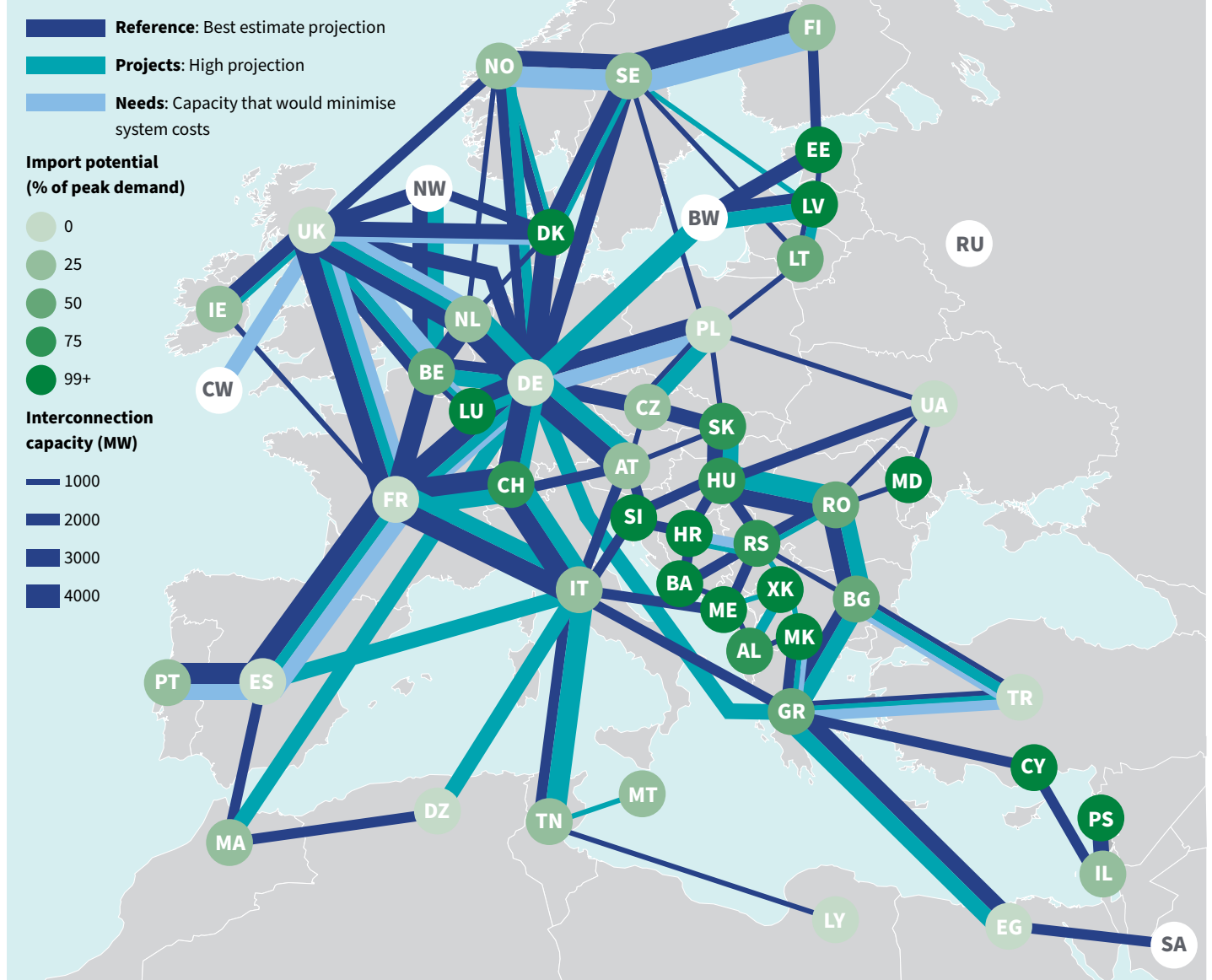
⁹⁴ Due to the lead time on infrastructure construction (up to ten years for transmission grids), it is important that no time is wasted at approval stage.⁹⁵ Inertia and local opposition in France, in particular, has long been cited as a bottleneck against further integration in the Iberian Peninsula.⁹⁶ Enhanced cross-border electricity trade is already lowering prices for EU citizens, delivering EUR34bn in savings in 2021.⁹⁷

Case Study 1: Bornholm Energy Island

The Bornholm Energy Island, a large interconnector project centralising Baltic Sea offshore wind power and transmitting it to Denmark and Germany and one of the eight 'Energy Highways', has received the largest single Connecting Europe Facility grant to date at EUR645m.¹²⁷ Cross border transmission is a core priority for the Connecting Europe Facility.¹²⁸ It was also listed as a flagship Project of Common Interest in 2024.

The project is co-financed by transmission system operators (TSOs) Energinet (Denmark) and 50Hertz (Germany), with the German and Danish governments committed to sharing the operating costs in line with the resulting distribution of energy.¹²⁹ It acts as a hybrid interconnector linking Denmark and Germany, while integrating large offshore wind into the European grid.¹³⁰ The energy island presents a new model of interconnection, with multi-country, multisource hubs rather than several point-to-point interconnections, improving system efficiency. However, such nodes must be assessed on security grounds, to ensure they do not present a vulnerability to attack.

Figure 9: Projected cross-border transmission capacities across European and neighbouring countries (2040)



Source: Europe Electricity Interconnection Data Tool, Ember¹³¹

Extra-EU interconnections will help to deliver and diversify near-term supply and should be planned and expanded with a view to energy security and sovereignty. By 2040, the Commission expects that virtually all electricity will be generated domestically, but in the interim non-EU suppliers will prevent shortfalls.⁹⁸ In 2025, the EU’s largest external electricity source was Norway, at 12,952 GWh (net), and its largest market was the UK, receiving 22,955 GWh (net).⁹⁹ Examples include the relevant extra-EU Energy Highways as mentioned above, as well as ongoing cooperation among EU countries bordering the North Sea and the UK to share wind and hydrogen energy, committing to 300 GW of offshore wind capacity by 2050 in the North Sea.¹⁰⁰

The Grids Package will also need to ensure resilience to potential physical and cyberattacks on the grid. Russia’s attacks on Ukraine’s power system have demonstrated the need for decentralised systems, without single points of failure, which, if physically disabled, bring down the whole network. Strong cybersecurity has helped to maintain grid functionality in Ukraine, operating the network as discrete segments or running the system manually if digital systems fail.¹⁰¹

3.3. Flex: Deploy flexibility at scale



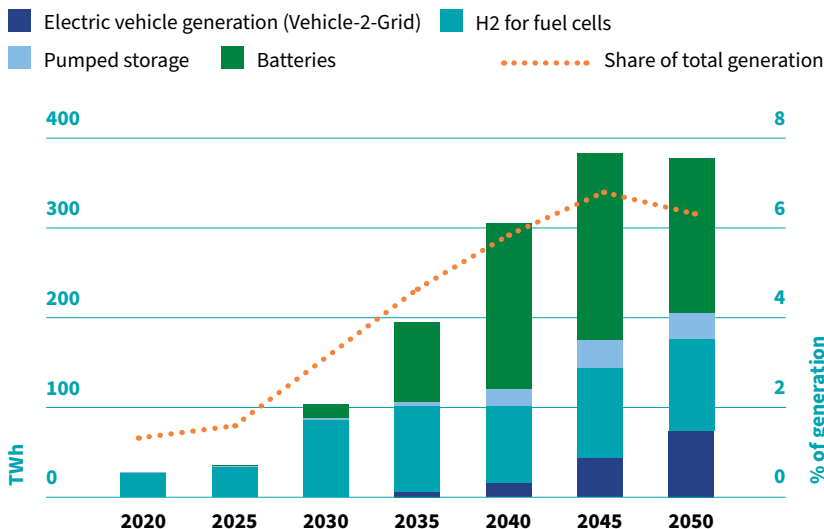
Rapid and large-scale RE expansion will require significant scale-up of both storage and demand management capabilities. A resilient system must be able to balance supply and demand not only across geographical regions via the grid, but also in real time, addressing seasonal, diurnal, and weather-related variability, increasingly via storage (batteries, pumped hydro and hydrogen-based storage) and demand management measures.

The required fourfold increase in storage capacity (stationary storage and fuel cells), from 49 GW in 2023 to 208 GW by 2050, is possible, given the exponential growth of battery installations.^{102,103} This expansion enables the storage of excess electricity generated during periods of low demand and its discharge during peak demand hours. Storage will initially be dominated by pumped hydro (83% capacity in 2030), while battery storage will grow to account for 64% of storage capacity in the 2040s (Figure 10).¹⁰⁴ However, in its latest report on clean technology, the EU Commission highlighted the urgent need to quickly deploy more energy storage infrastructure across the EU and increase investment in research and development for new battery technologies.¹⁰⁵

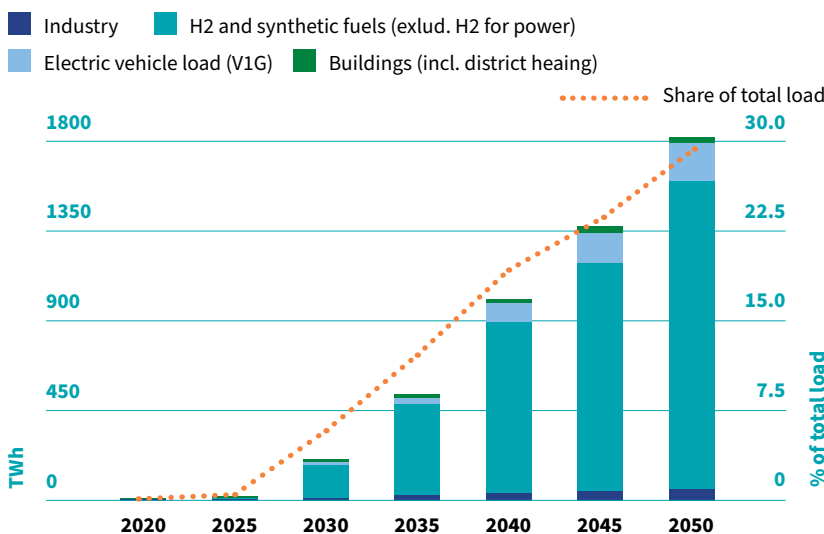
The expansion of energy storage capacity in the near-term is possible due to the rapid decline of battery costs. Battery costs have declined by 20% per year over the last ten years, helping to boost deployment. Capacity reached 10 GW in 2025, a more than two-fold increase in two years. There are early signs of batteries meeting demand during high-gas, high-price hours and providing a potentially cheaper alternative. In Italy, batteries are discharging during evening peak gas hours, meeting 3% of demand, compared to gas at 52%. This could cost around EUR64/MWh in Italy, a competitive price when compared with gas-fired power, which averaged EUR111/MWh in Italy in 2025.¹⁰⁶

Figure 10: Growth of storage and demand flexibility in the EU

Power supply from storage units



Flexible demand by sector



Source: Clean Energy Technology Observatory, POTEnCIA 2025 scenario¹²²

Streamlined permitting and access to electricity markets will further accelerate investment in battery storage capacity and demand-side measures.

Adapting grid connection rules in the proposed Grids Package to allow co-location of batteries at renewables connection points, accelerated permitting, and central planning of flexibility will help to provide investor certainty.¹⁰⁷ Removal of restrictions – such as minimum size thresholds and long contract durations that prevent battery systems and demand side measures from participating in capacity markets and grid services such as frequency response – would help to improve grid stability, improve the business case for such measures, and drive down energy costs.

The EU has yet to fully leverage consumer policy to match electricity demand with electricity supply while supporting household energy costs.

Demand flexibility has the potential to improve system efficiency by up to 30%.¹⁰⁸ Expanding the use of smart metering, as highlighted in the Action Plan for Affordable Energy, would enable households and businesses to adjust consumption in response to system needs.¹⁰⁹ Beyond reducing pressure on supply resources and lowering the need for fossil-based backup capacity, this also gives consumers more control over energy bills. Time-of-use tariffs, with lower pricing at certain times of day, have been used in Europe since the 1960s and can be adapted to encourage consumption to align with RE supply peaks.

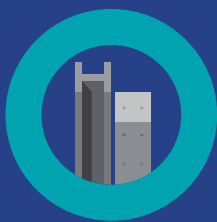
While the role of electrolyzers in grid balancing is less certain than batteries, they may be able to provide demand flexibility.

Running electrolyzers on surplus renewable electricity to produce hydrogen could minimise curtailment of excess RE generation. This provides the majority of seasonal flexibility under the POTEnCIA scenario after 2030. The role of hydrogen in grid balancing is often dismissed due to the significant inefficiencies of hydrogen use for power generation. The POTEnCIA scenario therefore outlines a much larger role for hydrogen in providing flexible load than in hydrogen fuel cells for power (<0.5% generation in 2050), as shown in Figure 10.¹¹⁰ The generated hydrogen will instead be used in heavy industry and areas where electrification is not possible (see section 3.4).

Preferential permitting for electrolyzers built in areas where energy is frequently curtailed, such as offshore hubs, can maximise this potential.

In addition to system flexibility, this can help to lower the cost of hydrogen production, as producers are able to take advantage of near-zero wholesale prices.¹¹¹ Ensuring hydrogen produced using surplus RE is easily defined as renewable hydrogen in the RED III Delegated Regulation for the production of renewable fuels of non-biological origin can ensure sustainability rules for hydrogen reward flexibility. Currently, the rules risk discouraging variable, flexible-load hydrogen because they will require hourly matching for production from 2030.¹¹² This could be adjusted to count hydrogen produced during periods of documented renewable surplus as renewable, even if strict hourly matching is not met.

3.4. Decarbonise: Transition industry for competitiveness and resilience

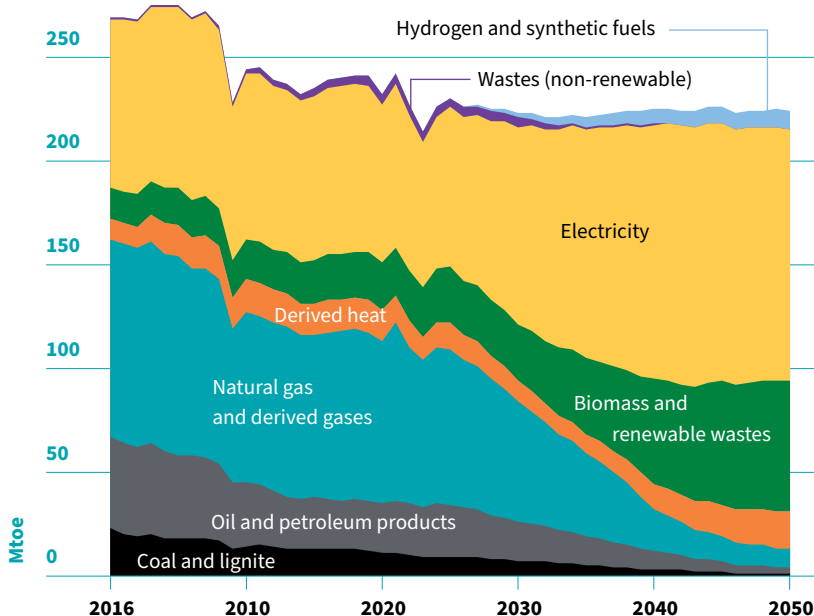


Up to 60% of final energy demand in European industry could be electrified by 2040, delivering around a fifth of the 89% electrification potential.¹¹³ Meeting demand for high-grade heat and addressing process-related emissions is a major challenge for the sector’s transition, as electrification cannot address these issues – hence the descriptor, ‘hard-to-abate’. Significant expansion of energy efficiency and other transition solutions is required (Figure 11).

Transitioning industrial energy demand away from fossil fuel reliance will address much of the 24.6% gas demand that the sector represents, safeguarding industry from price volatility and improving competitiveness.¹¹⁴ High-emissions production is also more expensive in Europe than the global average due to high energy costs and ageing infrastructure, meaning a business-as-usual approach could stymie competitiveness.¹¹⁵

Despite the small impact – around 1% or less – of green materials on prices for end products such as cars, industrial producers face limited demand for clean industrial products. Coupled with the increased costs of green technologies to producers, this presents a major limitation to transition. Accelerated policy action is required to overcome supply and demand issues to encourage producers to make the transition, while leaving the industry with room to innovate and reshape supply chains. The pipeline of decarbonisation projects in ammonia, cement, aluminium, and steel production already totals EUR100bn, but momentum to deliver these projects is stalling.¹¹⁶

Figure 11: Final energy consumption in EU industry (Mtoe)



Source: Clean Energy Technology Observatory, POTenCIA 2025 scenario¹¹³

Product mandates are crucial to drive private sector demand and can help to establish lead markets for green products, while limiting the level of public expenditure required.¹¹⁷ Product mandate regulations would require an increasing share of green materials to be used in products sold in the EU. This could follow similar precedents set with Sustainable Aviation Fuel blending mandates. For example, a 10% clean steel and aluminium mandate would increase the final cost of a car by only 0.1% in 2030.¹¹⁸

With the EU spending EUR2tn/yr (14% of GDP) on public procurement, replacement of voluntary green public procurement criteria with mandatory criteria will help to transition a large proportion of demand for steel and cement.¹¹⁹ In heavy industry sectors, public procurement can represent a large portion of demand for these products, accounting for 31% of the total EU cement market, and up to 50% in some countries.¹²⁰ The 2025 Clean Industrial Deal proposed new sustainability and resilience criteria in public procurement. The Industrial Accelerator Act (proposed in March 2026) would require 25% of steel products bought for use in construction or transport through public procurement to meet low-carbon standards. For aluminium and cement, 25% and 5% of purchases, respectively, must meet both low-carbon and made-in-EU criteria. Definitions of low-carbon and a voluntary labelling scheme will be developed in delegated legislation.¹²¹

Use of existing, climate-aligned standards, such as those set out in the EU Taxonomy, will ensure consistent demand signals across the EU and facilitate alignment.

A recent Commission evaluation of the EU Public Procurement Directives found that the ability to assess sustainability of products and a lack of labels were clear barriers to uptake of voluntary green criteria.¹²² The EU Taxonomy provides emissions thresholds for manufacture of steel, cement, and chemicals. Adoption of clear transition pathways for industry to meet these thresholds would guide investment to credible transition activity and provide investors with clarity in complex sectors. Such transition pathways could also be used when setting regulations and incentives for sector decarbonisation.

Supply-side measures, such as hydrogen clusters, can help to provide supply chain certainty to industry while encouraging hydrogen production.

'Hydrogen valleys' are a key part of the EU Hydrogen Strategy, receiving financial and technical support through the Clean Hydrogen Joint Undertaking.¹²³ This co-location of supply and demand can help to overcome the specific challenges of the hydrogen value chain, as the simultaneous development of production, storage, transport, and use can de-risk investment and help to unlock hydrogen for sectors lacking other options.

With over 70% of EU blast furnace capacity set to reach end-of-life and requiring reinvestment before 2030, capital expenditure cycles create a narrow window in which to determine these sectors' long-term future.¹²⁴

To meet EU decarbonisation targets, fossil fuel demand in the industrial sector needs to decline by 22% between 2025 and 2030, and by 88% by 2050.¹²⁵ While the sector is expected to undergo a less rapid transition than others, the long lifetimes of industrial infrastructure means that transition efforts need to begin now to avoid asset stranding.

Case Study 2: Stegra green steel

Stegra, the world's first large-scale green steel plant, provides a replicable model for European industry. The Swedish plant, currently under construction, will produce green hydrogen, powering green iron reduction for electric arc furnace steelmaking on one site. This integrated approach reduces supply chain concerns and is expected to produce 5Mt green steel/yr by 2030.

The project has secured approximately EUR6.5bn to date, through a mix of EUR4.2bn in project finance debt (with the majority of this supported by Riksgälden (Swedish National Debt Office) green credit guarantees) and EUR2.1bn in equity, alongside multiple large-scale public grants.¹³⁴ The company has also secured long-term offtake agreements with automotive and industrial companies, acting as revenue guarantees.¹³⁵

3.5. Shield: Leverage the EU MER to accelerate transition away from vulnerable imports



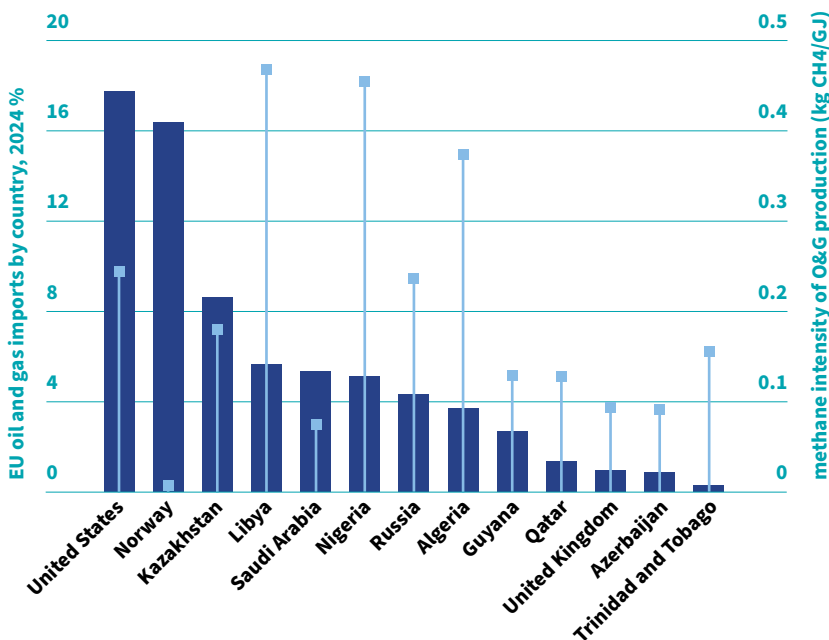
EU policymakers are limited in the tools they have to reduce fossil fuel imports from specific countries, beyond outright bans on aggressor nations, which can be difficult to design and implement. The steps outlined above will help reduce demand for oil and gas across the board. The EU has limited control over who private energy companies buy from. Policymakers need feasible mechanisms to tilt purchase away from vulnerable imports.

The EU MER is expected to disincentivise imports of oil, gas, and coal from sources without sufficient monitoring, reporting, and verification (MRV) and will begin to disincentivise imports of high-emitting oil and gas (Figure 12), as methane emissions standards come into effect in 2030.

The EU MER introduces requirements around the quantification, MRV, and mitigation of methane emissions for both importers and domestic producers. Both monitoring capabilities and the methane intensity of fossil fuel production vary widely between countries. This is largely driven by the extent of their regulatory frameworks. This means that the EU MER will not impact oil and gas imports uniformly. Instead, it will first disincentivise imports from producers without sufficient MRV, followed by those with high methane intensities of production.

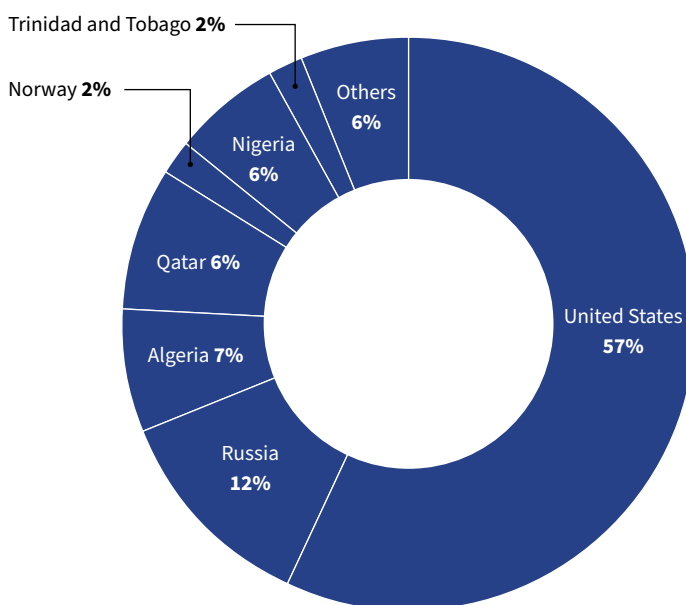
The EU MER could accelerate the EU’s achievement of the REPowerEU target to stop all imports of Russian pipeline gas and oil by the end of 2027.¹³⁶ Russian gas is some of the most methane-intensive in the world.¹³⁷ Emissions monitoring is not widespread in Russia, which will make it very difficult for Russian-originated gas to meet the EU MER reporting requirements already in force. Some countries that import LNG may be at greater risk of a drop in EU demand under the EU MER (Figure 13). While methane intensity will vary within a country, this does provide an indication of those countries that may see a reduction in demand as the emissions standards come into effect.

Figure 12: Estimated methane intensities of oil and gas production in EU top oil and gas suppliers



Source: Climate Bonds Initiative, data from Eurostat, the International Energy Agency and the Energy Institute¹⁴³

Figure 13: EU imports of liquefied natural gas by partner (share (%) of EU LNG import mix), first half of 2025



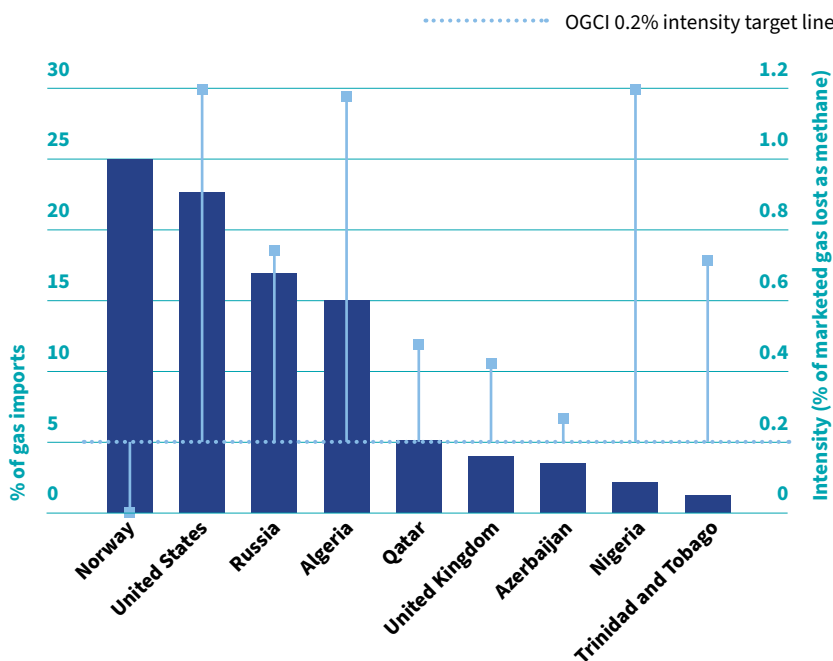
Source: Climate Bonds Initiative, data from the Institute for Energy Economics and Financial Analysis¹⁴⁴

The EU MER can help to disincentivise LNG imports in the long term (Figure 5), as US LNG exporters will face greater barriers in meeting requirements, given that US feedgas for LNG is highly blended. The US is the EU’s largest source of LNG (Figure 13). US LNG exporters, in particular, will face greater complexities in meeting EU MER requirements, largely due to LNG exporters aggregating gas from multiple producers, which constrains data availability and quality, and the high emissions intensity of US fracking.¹³⁸ While still possible, this may reduce appetite for US LNG.¹³⁹ In addition, growing policy divergence, such as the repeal of the Inflation Reduction Act methane fee in early 2025, means that US gas producers may lack incentives to address methane emissions.¹⁴⁰

Setting an ambitious and science-based upstream methane intensity standard, alongside the MRV measures mentioned above, despite heightened industry and political pressures, will help to tilt purchase away from highest-emitting producers. The Oil and Gas Climate Initiative has set an industry standard for natural gas-related emissions of 0.2%, and there are broad expectations that the EU methane intensity standard will align with this.¹⁴¹ Currently, no supplier countries (except Norway) meet the standard for average methane intensity from natural gas production (Figure 14). The Commission will need to provide clarity on the future intensity standard to give importers time to align their processes. Against the backdrop of the Middle East war, the EU MER has been under intensifying calls from industry groups and US politicians to soften the requirements, including the enforcement of penalties for non-compliance.¹⁴² Maintaining the expected timings for implementation and prioritising robust standards and penalty mechanisms will help to limit uncertainty risks in the supply chain, provide investor certainty, and enable the use of the EU MER as a tool to help tilt away from the highest-emitting producers.

Ringfencing proceeds of EU MER fines to finance transition investment can ensure productive use of this additional, but temporary, source of funding. For example, EU Neighbourhood importers may face challenges in meeting the EU MER and could be supported in abatement efforts. Currently, the revenues are set to remain with the national authorities that impose them.

Figure 14: Methane intensity of natural gas production in the EU’s top gas suppliers



Source: Climate Bonds Initiative, data from Eurostat, the International Energy Agency and the Energy Institute¹⁴⁵

4. Financing energy sovereignty

Under the POTEnCIA scenario, an average of EUR1.5tn per year through to 2050 is required to achieve the EU-wide transition to a clean and secure system, with a rapid increase in investment from EUR1.1tn in 2025.¹⁴⁶ In 2025, EU investment in clean energy reached around EUR346bn, only the third largest globally, and only 2.1% of GDP, compared to a 2.9% global average.¹⁴⁷ While estimates vary, often driven by the scope of investments included, there is a clear need for investment to ramp up in the near term.¹⁴⁸

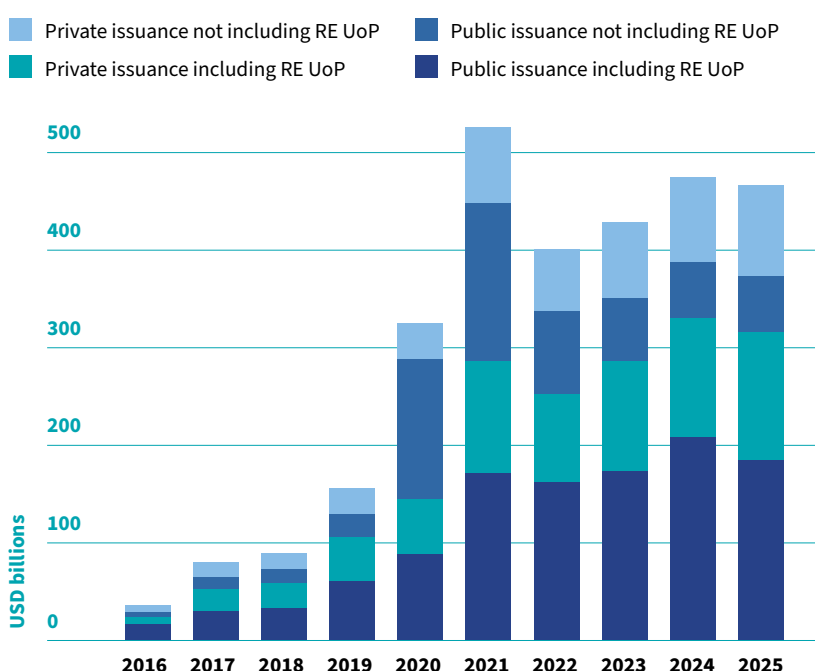
The Green, Social, Sustainability, and Sustainability-Linked (GSS+) bond market is crucial to financing Europe’s energy transition. Figure 15 shows the dominance of renewables in European issuance. 63%, by volume, of bonds issued since market initiation have included RE.¹⁴⁹

Continued reliance on fossil fuels is also not without capital expenditure requirements, which could instead be diverted to finance the transition. Between 2022–2024, EUR84bn of LNG import terminal and gas pipeline projects were commissioned in Europe, largely to meet new trade patterns.¹⁵⁰ The average life of a gas turbine is estimated at 33 years.¹⁵¹ Half of the EU’s gas turbine fleet is over 20 years old and will therefore soon require major refurbishment or replacement.¹⁵²

Transitioning existing fossil fuel expenditure will help to meet the clean energy investment need. The Commission estimates that the EU will reduce its spending on fossil fuel imports by 50–63% between 2020–2040, by increasing energy efficiency and installing RE.¹⁵³ This could offset much of the required clean energy investment cost. The EU’s overall spend on fossil fuel imports in 2025 totalled EUR396bn.¹⁵⁴ Public expenditure on fossil fuel subsidies was EUR111bn in 2023. While much of this reflects short-term crisis measures following the 2022 price spike, with almost half of these subsidies set to end by 2025, Member States still lack concrete plans to phase out remaining expenditure, while emergence of new price shocks risks further extension of these measures.¹⁵⁵ However, investment is already shifting; in 2015 the investment ratio of renewable generation to unabated fossil fuel power was 6:1; by 2025 this ratio had risen dramatically to close to 35:1.¹⁵⁶

Clean energy investment can be seen as a cost-efficient way of investing in European security. Establishing clean energy investment as a European security priority will help to ensure prioritisation in the European Competitiveness Fund. In 2025, Member States are estimated to have spent EUR381bn on defence expenditure, an increase of 62.8% since 2020.¹⁵⁷

Figure 15: Total annual GSS+ issuance in Europe by inclusion or absence of renewable energy in the listed use of proceeds



Source: Climate Bonds Initiative

While the proposed 2028–2034 MFF positions energy investment as a strategic priority, the lack of dedicated funding pools for clean energy investment means that these projects will compete with other strategic priorities for public investment. The current MFF, 2021–2027, dedicates at least 30% of spending to climate action. The proposed MFF for 2028–2034 increases the target to 35%, while widening the scope to climate and environment.¹⁵⁸ It includes clean transition and decarbonisation as one of four priority areas for the European Competitiveness Fund and proposes expansion of the Connecting Europe Facility budget nearly fivefold, to almost EUR30bn.¹⁵⁹

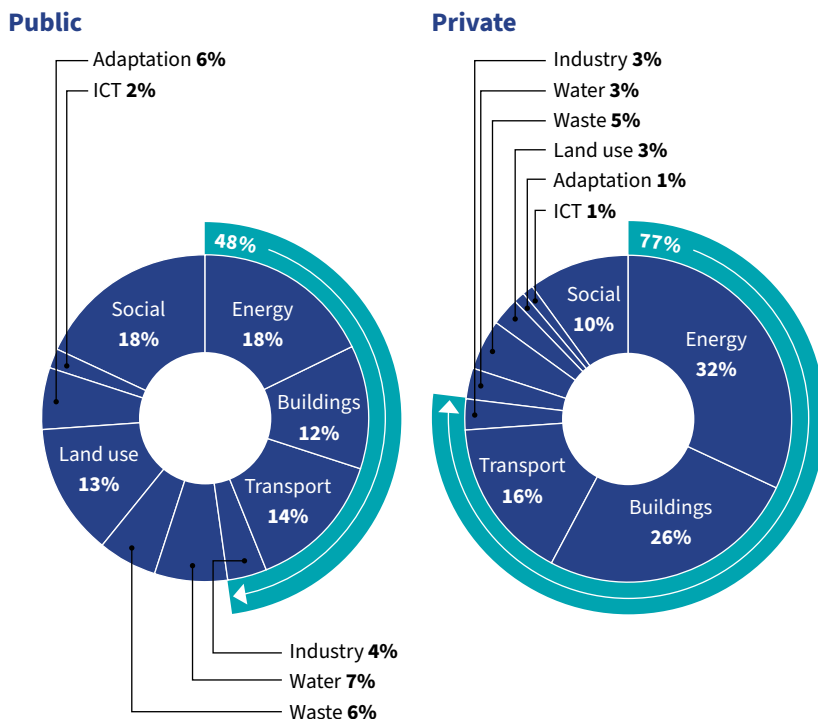
Private finance is expected to deliver the bulk of EU transition investment, consistent with advanced economy funding where 70% of RE sector investment was from private sources in 2022–2023.¹⁶⁰ The European Central Bank (ECB) has specified that bank lending will remain vital to large-scale clean energy and grid infrastructure, while deeper and more integrated capital markets are needed to support scale-up.¹⁶¹ This will increase the supply of domestic green investment opportunities to meet strong domestic and international demand for stable, low-risk EU green assets.¹⁶² Private GSS+ issuance is much more heavily skewed towards energy and energy transition-related investments than public, with bond frameworks indicating 77% allocation to energy, buildings, transport, and industry (Figure 16), although this is not reflective of final allocation as per post-issuance reporting.

Cross-border infrastructure may see more complex financing models, as benefits may not be equally distributed between the two countries, but still offers attractive investment opportunities. For example, the cross-border cost allocation for the 700 MW Celtic Interconnector between Ireland and France resulted in a 65:35 split between Ireland and France, reflecting the relative benefits of the project, with each TSO individually responsible for raising its portion of the financing.¹⁶³ The NeuConnect project, linking the UK and Germany, demonstrates the possibility to build cross-border energy infrastructure between countries and TSOs with different energy pricing regimes. The project, currently under construction, will provide 1.4 GW of bi-directional transmission capacity. While privately financed, revenues are underpinned by a 35-year cap and floor regime in the UK. In Germany, the project receives statutory revenues based on the assessed cost base from the local TSO.¹⁶⁴

Regulatory certainty is central to growing energy transition investment. This is important to stimulate both project development and investor appetite, as acknowledged in the Clean Industrial Deal. A group of institutional investors, representing EUR4.85tn assets under management, signed a letter in January 2026 calling for the swift implementation of the EU MER, citing the need for regulatory clarity.¹⁶⁵ And more than 150 Italian scientists and economists wrote an open letter to the Italian government in February 2026, warning against proposals that risk undermining the EU’s Emissions Trading Scheme, a key policy tool to achieve Green Deal objectives (see Appendix 2).¹⁶⁶

The EU sustainable finance regulatory regime can help to steer capital towards clean energy investments. Emerging evidence suggests that markets are beginning to price transition risk; the ECB has found that euro area banks are already charging a higher interest rate to firms with higher carbon emissions.¹⁶⁷ RE investments are among the most straightforward to demonstrate alignment with Taxonomy criteria, making them attractive for banks seeking to improve their Green Asset Ratio and for asset managers designing Sustainable Finance Disclosure Regulation-labelled products.¹⁶⁸

Figure 16: Estimated use of proceeds split of public and private European labelled issuance, 2025



Source: Climate Bonds Initiative

Case Study 3: Netherlands sovereign green bonds

The Netherlands green sovereign bond programme shows how existing national debt programmes can be utilised to finance energy transition. The Netherlands was the first EU nation to issue a Climate Bonds-certified Sovereign Green Bond in 2019.¹⁶⁹ Outstanding issuance stands at almost EUR29bn as of Q1 2026 but despite regular issuance, green accounts for less than 1% of outstanding Dutch sovereign debt.^{170,171}

The bonds support the Netherlands’ transition by incentivising RE roll-out and clean transport uptake.¹⁷² Uses of proceeds include incentives and subsidies to crowd in private investment for transition:

- Contracts for difference schemes for wind and solar energy producers;
- Capital injections to the state-owned grid company TenneT, which is responsible for the high voltage electricity grid in the Netherlands and for a large part of the high voltage grid in Germany. TenneT plays a key role in connecting RE to the electricity network, especially connecting North Sea wind farms;
- Tax breaks for households and small businesses’ private solar panels when they return excess electricity to grid;
- Motor vehicle tax exemptions and reductions for zero emission and plug-in hybrid vehicles;
- Subsidies to the state-owned ProRail for continued electrification of the national rail network.

Sovereign issuance also provides an important demonstration effect, helping to encourage private issuance. Figure 15 shows how proportions of labelled issuance from private entities have grown in recent years.

5. Conclusion

Europe's dependence on imported fossil fuels remains a core vulnerability for its security, economic growth, and geopolitical autonomy.

As recent crises have shown, changing suppliers does not resolve this vulnerability. The only route to energy sovereignty is a rapid transition to domestically produced clean energy.



A fast-track transition is both technically feasible and economically advantageous but in the face of policy, structural, and market barriers, current transition efforts are not resulting in the pace of change required to address the scale of geopolitical and economic risks facing the bloc.

The five steps in this report offer a practical and coherent pathway to a resilient and competitive energy system.

By accelerating action now, Europe can reduce its exposure to external shocks, stabilise energy prices for households and industry, and position itself as a leader in the global clean-energy economy.

To accelerate change, the European Commission can immediately take action across all five steps:

Electrify: Set electrification targets in line with technological reality and strengthen the Electrification Action Plan.

Connect: Accelerate grid permitting and prioritise the electricity highways in the Grids Package.

Flex: Enable storage and demand-side technologies to fully access electricity markets and fulfil balancing potential.

Decarbonise: Prioritise mandatory green public procurement and clean product labels in the Industrial Accelerator Act.

Shield: Implement the EU MER with an ambitious and science-based upstream methane intensity standard to tilt purchase away from the highest-emitting producers.

6. Appendices

Appendix 1: The EU Methane Regulation is core to EU efforts to minimise energy sector methane emissions

The EU Methane Regulation (EU MER) is a core part of the EU’s policy response to minimise its methane emissions from energy supply chains. It focuses on increasing transparency of emissions for domestic and imported fuel, and (over time) imposes methane intensity standards on imported fossil fuels.

The real strength of the EU MER is that it places the same requirements on imported fossil fuels. The EU is a major fossil fuel importer, with the majority of energy sector emissions occurring outside its borders. Fossil fuel operators exporting into the EU face a series of measures designed to increase the transparency and tracking of methane emissions and, beginning in January 2027, new import contracts for oil, gas, and coal must meet the same MRV requirements.¹⁷³ Table 2 sets out the staging of the requirements for importers into the EU. Penalties for non-compliance have been in place in some Member States since August 2025.¹⁷⁴

Granular information on the methane emissions of the entire energy supply chain of Europe’s fossil fuel imports is critical before any meaningful action can be taken at the scale and pace needed to meet methane reduction commitments.

Unlike CO₂ emissions, only a small fraction of global methane emissions is currently regulated.¹⁷⁵ The EU MER aims to provide that transparency. For fossil fuel operations within the EU, the regulations around MRV and leak detection and repair represent a crucial first step in tackling methane emissions. The regulation introduces mandatory MRV requirements (including for non-operated assets) and mandates leak detection and repair of equipment for all oil and gas facilities. It also seeks to tackle emissions from routine venting and flaring, as well as abandoned facilities.

While the EU MER has seen some early wins, further commitment is needed to keep at the same pace, especially in the face of political threats. It has prompted some oil companies, such as Sonatrach in Algeria, to set methane emission targets and invest in carbon capture as well as RE

Table 2: EU Methane Regulation: key implementation milestones for imported fuels

Timeframe	Regulatory requirement
May 2025	Importers must start reporting data on emissions and abatement measures for fossil fuels entering the EU.
From 2027	Imported fossil fuels must comply with the EU’s MRV requirements or an equivalent standard.
August 2028	Importers must disclose methane intensity for all oil and gas entering the EU, based on a methodology to be determined by the Commission.
From 2030	Imported fossil fuels must meet a methane intensity performance standard.

solutions.¹⁷⁶ Oil producers in the Caspian region, bordered by Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan, also joined the Oil & Gas Methane Partnership 2.0, partly because of the new EU regulation.¹⁷⁷ However, some details, including reporting methodologies and penalty levels, need to be filled out in subsequent legislation. In December 2025, in the wake of the US energy secretary calling out the EU MER as preventing the US from exporting LNG, a document shared with EU member countries suggested a simpler route for suppliers to comply with the regulations.^{178,179}

Methane abatement and phaseout decisions need to be considered together. Measures to reduce methane emissions should be tied to phaseout plans, to avoid locking in new infrastructure that would soon need to be retired, for example.¹⁸⁰ Equally, phaseout plans should take account of methane abatement by prioritising actions with the greatest potential to cut methane emissions. This is important not only because action on methane reductions can make a large contribution to meeting climate targets, but also for defence reasons, as these actions tend to align with the highest-risk suppliers.

Appendix 2: The EU energy transition policy landscape

Table 1: Five key steps to fast-track EU transition away from vulnerable fossil fuel imports

Key policy	Importance for energy transition
<p>The European Green Deal (2019) introduced the 2050 climate neutrality goal into European Law.¹⁸¹</p>	<p>Setting overarching climate ambition with the target of net-zero greenhouse gas emissions by 2050, and a binding interim objective to reduce emissions by at least 55% by 2030 compared to 1990 levels. In March 2026, the European Parliament and Council agreed the binding 90% by 2040 target.¹⁸²</p> <p>The 2030 interim objective is supported by the Fit-for-55 (FF55) package, which includes: reform and expansion of the Emissions Trading Scheme; the introduction of a carbon border adjustment mechanism; and a Social Fund to support households and small and medium-sized enterprises with the cost of transition.</p>
<p>Energy Security Review (launched 2025) revising the legislative framework on energy security of gas and electricity, proposals expected H1 2026.¹⁸³</p>	<p>Upcoming revision of the energy security framework aims to ensure that the EU energy system is sufficiently secure and resilient in a fast-evolving energy, climate, and geopolitical context.</p> <p>The Gas Security of Supply and Electricity Risk Preparedness Regulations are expected to be revised. Commission evaluation found that these have broadly prevented major disruptions in recent years but require updating.¹⁸⁴</p>
<p>Governance Regulation on the Energy Union and Climate Action (2018) established a governance mechanism to help reach climate and energy targets, aiming to facilitate and monitor planning through National Energy and Climate Plans.</p>	<p>Upcoming revision aims to align the governance framework more closely with Europe's strategic priorities, streamline planning and reporting obligations and reduce administrative burden. In addition, the revision will aim to support progress on climate objectives 2030–2040.</p>
<p>REPowerEU (2022) followed Russia's invasion of Ukraine, with the aim to phase out Russian fossil fuel imports, ramp up RE, and increase energy efficiency.¹⁸⁵ It was refreshed in 2025 and from early 2026 will be supported by a legal ban on Russian gas.¹⁸⁶</p>	<p>ELECTRIFY: Increased the Energy Efficiency Directive binding target to 13% reduction in consumption. Boosted RED III targets and recommended accelerate permitting for RE. Targets a doubling of heat pumps installed every four years.</p> <p>DECARBONISE: Boosted Innovation Fund to support industrial transition, set targets for renewable hydrogen production and imports.</p> <p>SHIELD: Introduces a legal ban on Russian gas in stages, with all imports restricted no later than September 2027. For Russian oil, EU countries must already present national diversification plans to end imports by the end of 2027, but the Commission intends to extend the legal ban to oil and advance the timelines for the most important imports.¹⁸⁷</p>
<p>The Renewable Energy Directive (RED III) (2023) revised as part of the FF55 package, raising ambition to further support the REPowerEU package.¹⁸⁸</p>	<p>ELECTRIFY: Introduces a strong policy framework for electrification in sectors such as transport and heating and cooling. Sets a target for the share of renewables in energy consumption of 42.5% by 2030 but 'aiming for 45%'.</p> <p>DECARBONISE: Includes binding targets for the uptake of renewable fuels of non-biological origin (i.e., hydrogen) in sectors where electrification is less feasible.¹⁸⁹</p>

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