ENERGY SECTOR ORIENTATION

POWERING COMPETITIVENESS, CLIMATE AND STRATEGIC AUTONOMY

European Investment Bank | Group

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CONTENTS

EXECUTIVE SUMMARY

The **European Investment Bank Group (EIB Group) Energy Sector Orientation ("the orientation")** outlines the strategic direction for the EIB Group's energy-related financing activities under the second phase (2026–2030) of the **Climate Bank Roadmap**. It reaffirms the EIB Group's commitment to supporting the European Union's energy transition, climate goals and strategic autonomy through targeted investments and advisory services.

The orientation supports EU policy frameworks such as the **European Green Deal**, **REPowerEU**, the **Net Zero Industry Act**, the **Clean Industrial Deal** and the **Affordable Energy Action Plan**.

The Energy Sector Orientation is structured around **three interrelated and complementary strategic objectives**, each with four priorities:

Competitiveness and affordability

Lower energy prices and costs, and ensure inclusive growth.

- **Scale up clean energy supply:** Bolster cost-competitive low-carbon energy for power, heat and transport.
- **Boost efficiency:** Promote energy efficiency initiatives and solutions to enable households and industry to reduce emissions, cut costs and optimise resource use.
- **Build the backbone:** Develop enabling infrastructure, build up energy networks and storage, and integrate energy markets.
- **Leave no one behind:** Facilitate a just transition, reduce energy poverty and promote inclusive economic growth.

Climate and sustainability

Decarbonise energy supply and demand, develop clean technologies and finance sustainable growth.

- **Electrify to decarbonise:** Drive down emissions through electrification of demand, and scale up low-carbon power generation.
- **Build alternatives:** Develop decarbonisation solutions for sectors that are hard to electrify.
- **Lead in innovation:** Accelerate innovation and industrial transformation by funding research and development, and scale up the manufacturing of clean technologies.
- **Finance green growth in Europe and globally:** Mobilise private capital to scale sustainable investment throughout the energy value chain.

Security and reliability

Strengthen system resilience, energy autonomy and global partnerships.

- **Strengthen critical infrastructure:** Enhance energy system resilience and strengthen the European Union's energy security.
- **Store smarter:** Invest in energy storage and demand-side flexibility, to balance supply and demand effectively.
- **Cut dependence:** Diversify energy and equipment sources and develop alternatives to fossil fuels to reduce dependence on imports.
- **Partner globally:** Reinforce strategic global partnerships to secure stable and sustainable energy for the European Union and access to clean energy and sustainable living globally.

Key commitments and impact

The EIB Group renews its commitment to align with the goals of the **Paris Agreement** and its support for the energy transition. It offers financing and advisory support throughout the **entire energy value chain**, and a strong role as a catalyst for **private investment and innovation**.

The EIB Group will support and prioritise energy projects in line with its strategic objectives and in alignment with EU policy goals. This will result in:

- reduced energy costs for consumers and improved competitiveness;
- reduced greenhouse gas emissions, increased low-carbon energy supply and more efficient energy use;
- improved EU energy security, higher system resilience, lower fossil fuel imports and a diversification of critical materials and products.

The EIB Group will continue to take a leadership role and build global partnerships to ensure access to affordable energy, security and sustainable living.

EIB GROUP ENERGY FINANCING IN CONTEXT

The European Investment Bank (EIB) has been investing in the energy sector since its establishment in 1957. The EIB Group[1] has financed a significant portion of the energy infrastructure underpinning Europe's internal energy market, **helping to deliver sustainable, secure and affordable energy to EU residents and businesses**.

With its ambitious 2019 Energy Lending Policy, the EIB achieved a milestone in the fight against climate change by phasing out the financing of unabated fossil fuel energy projects, and by firmly committing **to decarbonisation in Europe and around the world**. The ambitions set by the EIB Climate Bank Roadmap and the REPowerEU packages provided further impetus to boost clean energy lending. As a result, **the EIB Group's energy financing has increased significantly**. Within the last 4 years alone, annual volumes more than doubled, from close to €15 billion in 2021 **to a record level of €31 billion in 2024**.

Under the Energy Lending Policy, investments have supported **renewable and other low-carbon energy supply, energy networks and energy efficiency investments**. The Bank also increased its support for **research, development and innovation, and for the manufacturing of critical components** in the energy transition, such as wind turbines, heat pumps, high-voltage cables and building materials.

This Energy Sector Orientation sets out the **strategic objectives and priorities** for EIB Group support in the energy sector and its value chain, in line with the EIB Group Climate Bank Roadmap Phase 2 (2026-2030) and previous policies.

THE CLIMATE BANK ROADMAP

The **EIB Group Climate Bank Roadmap**, published in 2020, set out the framework for the European Investment Bank's transformation into **the EU climate bank**, including its Paris Alignment Framework.

The EIB Group is now moving into the **second phase of its Climate Bank Roadmap (2026-2030)**, which builds on existing commitments to deliver green finance for global climate mitigation and resilience.

In its first phase, the roadmap committed the European Investment Bank to dedicate at least 50% of its annual lending to green finance. The second phase confirms this ambition and extends it to the entire EIB Group i.e. the European Investment Bank and the European Investment Fund. It also reaffirms the Group commitment to support **€1 trillion of green investment** in the decade 2020-2030.

It also commits **€30 billion of green financing specifically to climate resilience** between 2026 and 2030. The second phase of the Climate Bank Roadmap continues to align all new EIB Group financing with the principles and goals of the Paris Agreement. It **sharpens focus** by targeting investments for maximum impact, **increasing reliance** on the maturing EU policy framework, and **simplifying processes** to better serve clients.

Phase two of the Climate Bank Roadmap also sets out how the EIB Group is stepping up support for EU policy goals by:

- driving European economic growth and competitiveness through clean solutions;
- supporting inclusive prosperity, by addressing potential negative social impacts through investments in a just transition and wider social inclusion;
- providing stability for businesses and cities, and supporting vulnerable sectors and regions, by investing in security and resilience to climate change.

[1] Consisting of the European Investment Bank (EIB) and the European Investment Fund (EIF), established in 1994.

A RENEWED FRAMEWORK

Recent global developments have highlighted how supporting domestic low-carbon energy production, efficient energy use, industrial innovation and resilient infrastructure is not just critical for ensuring decarbonisation and the energy transition. It is also vital for **Europe's strategic energy autonomy and competitive advantage** in a world that is increasingly polarised.

We have seen severe disruptions to European gas supplies caused by Russia's aggression against Ukraine, and a significant realignment of geopolitical relationships that have put into question not just the supply of energy and technology to Europe, but the continent's security as a whole. We are also increasingly seeing the impacts of climate change in Europe, including extreme weather events that cause significant material damage and loss of life.

As highlighted by the Evaluation of the EIB Energy Lending Policy, the "solid but sufficiently flexible framework" of the policy enabled the "EIB's strong commitment to the EU energy transition" in this challenging environment.

Decarbonising Europe's energy mix remains the wisest choice, not only to mitigate the impact of climate change, but also **to reduce Europe's reliance on imported fossil fuels**. In a context of volatile prices and geopolitical instability, the competitiveness of Europe's industry can be enhanced by making energy more affordable and by scaling up the EU's manufacturing capacity and supply chains for net zero technologies and products.

When European energy markets were first liberalised in the late 20th and early 21st century, the aim was to create efficiencies that would **benefit consumers and lower energy bills**. Unfortunately, many of the savings realised have been overshadowed the upfront costs of the energy transition. As a result, consumer energy costs have generally risen, not fallen. The issue of energy affordability, and its impact on both **industrial competitiveness and social cohesion**, has also been recognised in the European Commission's Clean Industrial Deal[2] and the accompanying Affordable Energy Action Plan,[3] and deserves more attention.

To meet its energy and climate targets, the European Commission estimates that the European Union needs to invest an estimated €570 billion a year between 2021 and 2030, and €690 billion annually between 2031 and 2040. This covers continued investment in renewable energy and other low-carbon energy sources, energy efficiency, as well as a major build-out of energy grids and energy storage. **The scale of this investment need is unprecedented**.

The EIB Group is convinced of the long-term benefits of the energy transition, and it remains committed to its goals. The Group's role as a **catalyst for public and private investments** is well recognised.

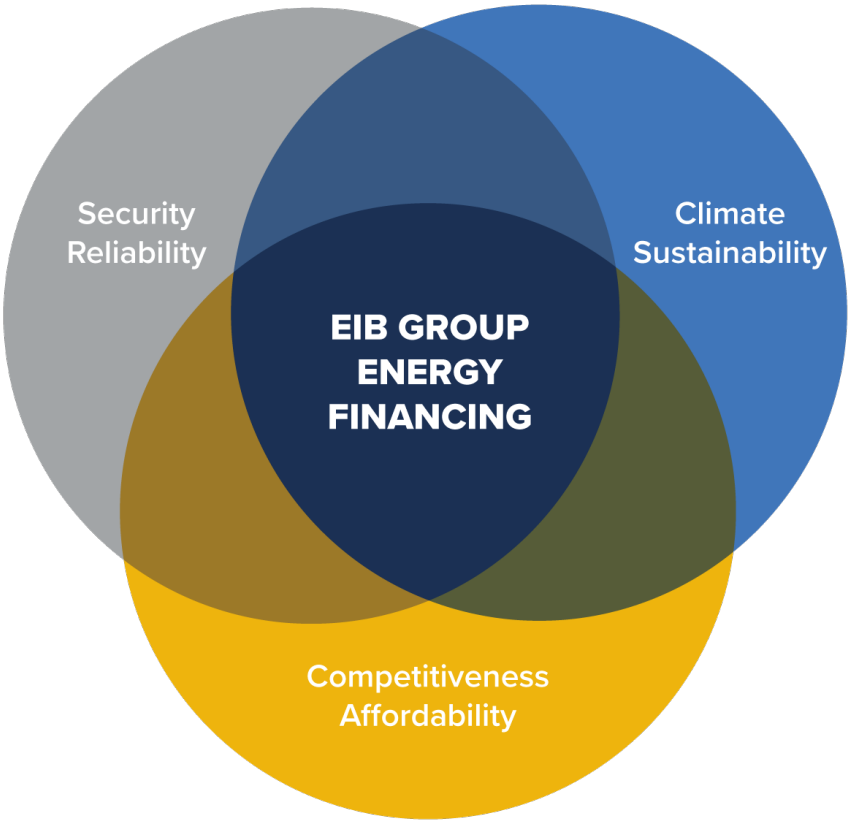
The EIB Group has a responsibility to **offer clarity and stability to project promoters and investors** through its lending and financing framework. Stability is not inconsistent with flexibility: the EIB Group will continue to assess and interpret the framework in light of emerging technological and political developments, and adapt its financing activities when necessary, to address funding gaps and serve new policy initiatives.

It is important to commit to high-level principles while remaining flexible and agile in implementation. The 2019 Energy Lending Policy did so, **aligning clearly with the European Union's energy and climate goals** by committing to finance necessary investments in renewable and other low-carbon energy technologies and supporting infrastructure, while phasing out support for unabated fossil fuel energy projects .During the second phase of the Climate Bank Roadmap, the EIB Group intends to maintain its ambition and commitment to alignment with the goals of the Paris Agreement. For the energy sector specifically, this means that **the EIB Group reaffirms its commitment not to finance any unabated fossil fuel projects** in the future. Building on this commitment, and

[2] Clean Industrial Deal – European Commission
[3] Affordable Energy – European Commission

on the EU policy priorities outlined above, the EIB Group's continued financial support for energy will be anchored in **three interrelated and complementary strategic objectives**: **competitiveness and affordability, climate and sustainability,** and **security and reliability**.

Graphic 1: Strategic objectives guiding the EIB Group Energy Sector Orientation



Support for investments is prioritised according to their **contribution to the objectives** shown in Graphic 1, in line with the EIB Group's public policy goals and subject to the availability of financial resources.

STRATEGIC OBJECTIVE: COMPETITIVENESS AND AFFORDABILITY

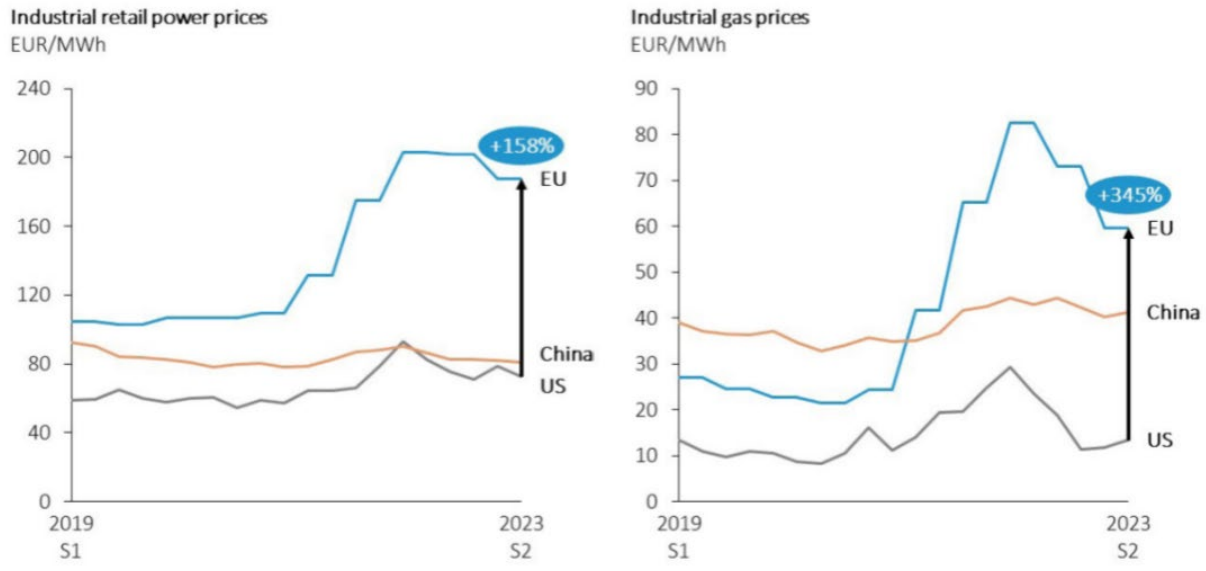
Affordable, clean energy is fundamental to the European Union's economic competitiveness, as highlighted in a number of recent prominent EU reports and studies.

The Letta report[4] stresses the **importance of the single market** as a basis to ensure fair competition, cooperation and solidarity in Europe, including the critical role of secure energy supplies and the role of clean technologies.

The Draghi report[5] identifies Europe's **need for a joint decarbonisation and competitiveness plan** where all policies are aligned behind EU objectives. The Clean Industrial Deal and Affordable Energy Action Package aim to meet this need.

High and volatile natural gas and electricity prices, together with dependence on imports, put the European industry - especially energy-intensive sectors - at a competitive disadvantage, a trend that has become more pronounced in recent years (see Figure 1 below). As long as electricity prices remain largely linked to natural gas prices, investment in technologies based on direct electrification (such as electric arc furnaces and/or industrial heat pumps) is also held back. While temporarily high energy prices pose a serious obstacle to growth, decarbonisation remains Europe's most promising pathway **to lower energy prices in the longer term, strengthen energy security, take an industrial lead** in clean technologies, and improve health and quality of life through reduced pollution.

Figure 1 – EU industrial energy prices, 2019-2023



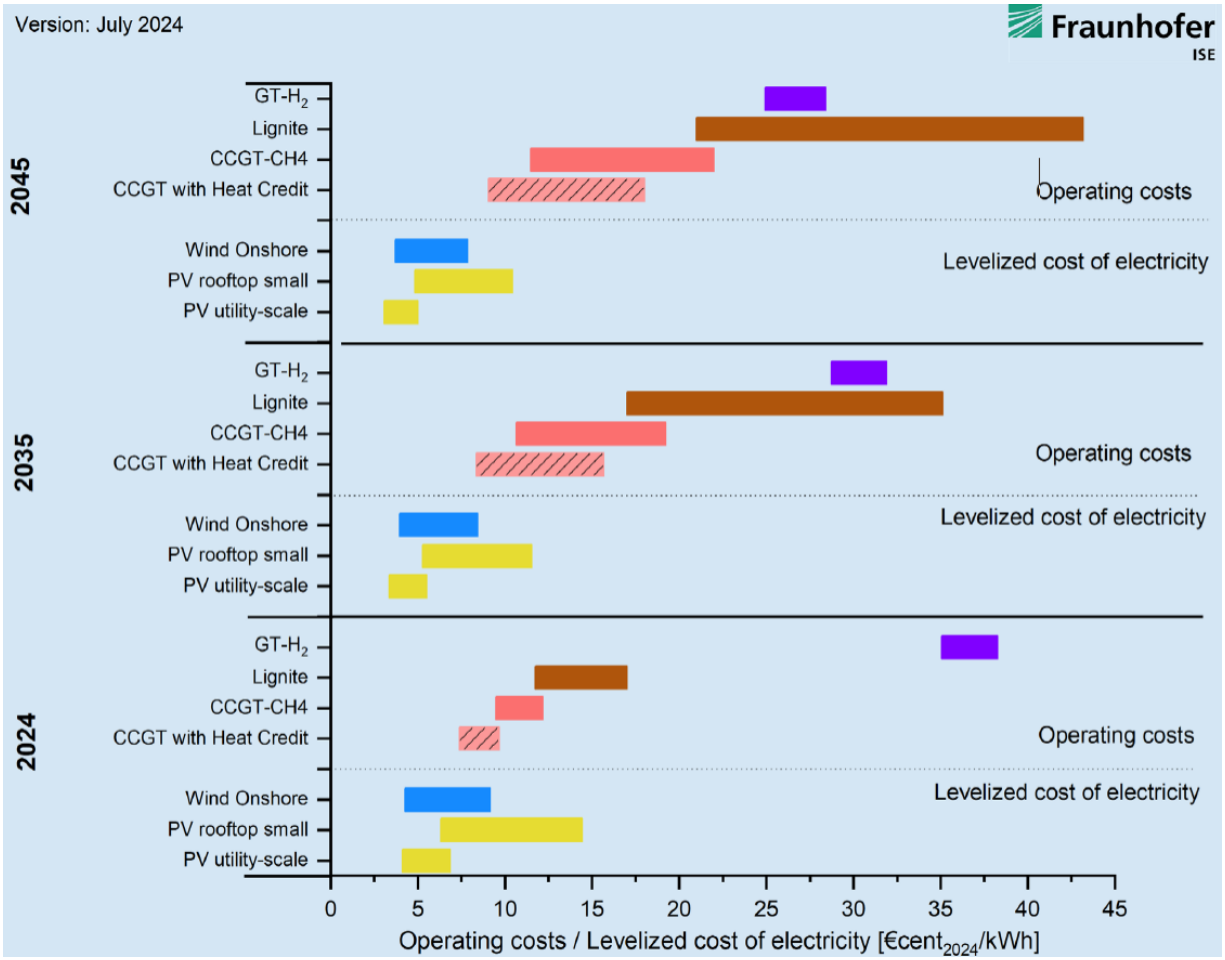
Source: European Union, The future of European Competitiveness (Draghi report), 2024

[4] Much more than a market; April 2024
[5] The future of European competitiveness; September 2024

The clean energy transition must deliver greater benefits to European consumers. This requires decoupling electricity prices from fossil fuel prices – especially natural gas – and making the electricity system smarter and more flexible. Achieving this will require further **investment in low-carbon power generation, energy efficiency and energy grids**, alongside greater system flexibility and stronger demand-side measures.

Over the past decade, the cost of renewable energy sources has fallen dramatically. Mature technologies like wind and solar are now competitive, and in some cases cheaper than fossil fuel alternatives. This trend is expected to continue, making low-cost renewables a cornerstone of Europe's future low-cost energy mix.

Figure 2 – Comparison of levelized cost of electricity of renewables with operating costs of existing conventional fossil fuel power plants, 2024, 2035 and 2045



Source: Fraunhofer Institute, Levelized Cost of Electricity Renewable Energy Technologies [in Germany], 2024

To ramp up the energy transition, the supporting industrial ecosystem must also grow, innovate and adapt. **Scaling up the manufacturing** and deployment of critical energy system components is needed on both the supply and demand sides. **Innovation and industrial transformation** are key to maintaining Europe's competitive advantage.

This needs to be complemented by cost-effective decarbonisation, pursued with a technology-neutral approach. It requires massive **mobilisation of private and public finance,** faster permitting and the availability of de-risking tools to lower the cost of financing.

To advance these goals, the EIB Group seeks to provide support in all areas that help **boost European competitiveness and ease the impact of energy prices** on consumers and industry.

SCALE UP CLEAN ENERGY SUPPLY

Bolster cost-competitive low-carbon energy for power, heat and transport.

The **production of renewable and other low-carbon energy** remains a key priority for the energy transition. It helps to reduce greenhouse gas emissions and contributes to energy competitiveness and energy security. This requires not only massive scaling up of mature renewable technologies, such as wind and solar energy, but also further nurturing new or emerging sectors and clean technologies, new nuclear technologies (such as small modular reactors, advanced modular reactors or fusion energy), low-carbon gases (such as biogas or hydrogen), renewable heat and transport fuels.

Mature renewable technologies, especially wind and solar, **are cost competitive** and there is significant potential to **scale them up**. In addition to adding new installations, there is also a growing need to repower older wind and solar installations. Wind and solar plants built during the initial European renewables boom of the late 1990s and early 2000s are now reaching the end of their technical lives, and will face decisions on whether they are to be replaced or upgraded, potentially increasing generation and integrating hybrid storage capacities. Some challenges remain, including regulatory and financing barriers, as well as the ability of underlying network and system infrastructure to accommodate new renewable connections.

Supporting the uptake of power purchase agreements and contracts for difference or similar financial instruments and extending them to more clean power generation assets could help to **decouple natural gas and electricity prices**, reduce market price volatility and **reduce the risks of investing in power generation**.

Renewable energy and innovative technologies also have the potential to provide **essential grid services**, better contributing to system reliability and stability through technologies such as grid-forming converters, advanced inverters, smart storage systems, demand-side flexibility and digital grid management solutions. This could enable greater use of renewables and improve the security resilience of the European power grid.

BOOST EFFICIENCY

Promote energy efficiency initiatives and solutions to enable households and industry to reduce emissions, cut costs and optimise resource use.

The EIB Group is **committed to the Energy Efficiency First principle.** Promoting energy efficiency is critical to reducing fossil fuel consumption and emissions, improving health and well-being, and to reducing energy bills. Lower bills alleviate energy poverty and help to make European industry more cost competitive. The potential for savings is very large: according to the European Commission, EU energy labelling and eco-design rules saved an estimated €120 billion on bills in 2023.[6] This will become even more important as demand for electricity grows due to the electrification and decarbonisation of industries and energy-intensive processes, and the electrification of transport and heating.

There is significant potential to improve energy efficiency across all sectors. However, certain areas – such as existing buildings and small and medium-sized enterprises (SMEs) – face unique challenges. Buildings are responsible for about one-third of greenhouse gas emissions in the European Union and 75% of the building

[6] Affordable Energy – European Commission

stock has very low energy efficiency. Stronger support is therefore vital for activities and technology that **optimise and reduce energy consumption in buildings, industry and across all sectors**. Support to prosumers (consumers producing electricity) and energy communities (which collectively produce and consume electricity) can play an important role.

The EIB Group will continue to support the development of energy-efficient, affordable and social housing. However, the greatest investment needs and the greatest potential energy savings are in the **renovation of existing buildings** and in the phasing out of fossil fuels for heating and cooling. Renovations will remain the key priority area for EIB Group energy efficiency investments, in line with the Energy Performance of Buildings Directive's[7] 2050 vision for a decarbonised building stock. Projects targeting major renovations of existing buildings and low-carbon heating and cooling solutions (such as heat pumps, efficient district heating/cooling systems, etc.) are essential to meeting EU targets. To address affordability concerns and energy poverty, particular attention should also be paid to improving the market uptake of energy efficiency solutions and building renovation for vulnerable households. EIB Advisory (InvestEU, ELENA and the Green Gateway) are contributing to the creation of an enabling framework and helping overcome barriers to energy efficiency-improving renovations.

Energy efficiency in industry remains a priority across all sectors, from SMEs to large energy-intensive industries. Maintaining competitiveness means supporting **pragmatic, viable and cost-effective energy efficiency solutions**.

The EIB Group plans to continue streamlining **support for energy efficiency projects in industry** and the development of energy efficiency technologies. **Helping SMEs navigate the energy transition** is a particular priority. The EIB Group's commitment is embodied in the new Energy Efficiency in SMEs initiative,[8] which covers the entire range of EIB Group financing for small firms and mid-caps. This holistic approach enables the EIB Group to offer a one-stop-shop for energy efficiency support for smaller firms. These investments will help to reduce costs and promote improved competitiveness and resilience. Furthermore, investments in advanced manufacturing and digital technologies will support both industrial productivity and energy efficiency.

In this context, another growing priority is **circular economy initiatives** to support infrastructure and research for improved **recycling and reuse of materials** where possible.

BUILD THE BACKBONE

Develop enabling infrastructure, build up energy networks and storage, and integrate energy markets.

Rapid **upgrades to energy grids, storage systems, and flexibility solutions** are essential to supporting the increase in electricity generation, enabling widespread electrification and effectively managing the variable output of renewable energy sources. To meet this demand and ensure a successful energy transition, the European Commission's Grid Action Plan[9] estimates that approximately €584 billion will need to be invested by 2030 in both transmission and distribution networks across the European Union.

These investments may contribute to short-term increases in system fixed costs and tariffs, but in the long term will enable a reduction in primary energy consumption, better access to cheaper energy, and, ultimately, **lower energy bills for all consumers**.

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7 Directive - EU - 2024/1275 - EN - EUR-Lex
8 Energy Efficiency in SMEs initiative – EIB
9 Actions to accelerate the roll-out of electricity grids – European Commission

The Grid Action Plan puts particular emphasis on **investment needs in distribution networks**. The nature of energy consumption is changing, with reductions from end consumers due to energy efficiency gains, but also increased demand from industry, e-mobility, heat pumps and data centres, for example. A growing share of electricity generation is now connected to shorter distance distribution networks, rather than long-distance transmission networks as in the past. Combined with the need to maintain and refurbish ageing infrastructure, investment volumes in distribution networks are expected to double compared to historic levels.

Electricity transmission grids will also continue to expand, bringing energy from where it is abundant to demand hubs and increasing resilience. Additional cross-border infrastructure (such as the European Projects of Common or Mutual Interest) will further enhance the integration of the European energy market and mutual reliance.

To make the energy transition competitive, **grids need to become smarter and the electricity system more flexible**. This can be achieved through various approaches, including: stronger interconnections between countries, dynamic technologies to use the grid more efficiently, better demand-side management and flexibility, and a combination of flexible generation and storage solutions. The combination of smart meters, AI and digitalisation creates a powerful synergy for improving energy efficiency and ensuring seamless integration and real-time management of energy systems.

Developing the internal energy market is a key goal of the European Union, anchored in the Treaty on the Functioning of the European Union. The aim is to open up national markets, share resources across borders and improve the security of Europe's energy supply so as to lower system costs and energy prices across the continent.

Interconnection infrastructure plays a key role in furthering the integration of Europe's energy markets. They enhance security of supply, help the development and sharing of renewable resources across the continent, and contribute to lower market prices. Of particular strategic importance are interconnection projects designated **EU Projects of Common Interest** (projects between Member States) or **Projects of Mutual Interest** (projects with third countries) under the current EU Trans-European Networks for Energy regulation.[10] The regulation sets priority areas for electricity transmission, offshore grids and hydrogen networks, as well as smart grids and CO_2 networks. The EIB Group will prioritise support for bankable projects with clear economic benefits and proportionate impacts on consumer tariffs.

Storage is critical to delivering the clean energy transition, making the most out of intermittent renewable energy sources, protecting energy security and supporting a resilient energy grid. Electricity storage capacity in the European Union is expected to quadruple by 2040. While the potential for additional new pumped hydro storage is limited in Europe, we are seeing growing innovation and improvements in battery systems, and the emergence of a diverse range of new utility-scale storage technologies.

LEAVE NO ONE BEHIND

Facilitate a just transition, reduce energy poverty and promote inclusive economic growth.

The opportunities of the energy transition come with challenges. A **just transition** will attempt to maximise benefits while minimising negative impacts and **providing support to the most vulnerable members of our society**.

[10] Trans-European Networks for Energy – European Commission

The EIB Group will continue to identify and prioritise clean technology projects that reduce regional disparities and protect vulnerable communities. This includes projects that provide **employment or reskilling in geographical areas that were previously reliant on fossil fuel production**.

The EIB is operating dedicated **technical assistance programmes and mandates** to support just transition efforts. To reach more vulnerable customers, the EIB Group will also make use of all available tools to **leverage impact and attract private finance to support employment**, including through intermediated financing, and SMEs and mid-caps.

Through **Just Energy Transition Partnerships**[11] and similar initiatives, the EIB Group can help third countries move away from fossil fuels by supporting their decarbonisation, fostering development, improving quality of life and expanding the market for clean technologies.

Support for energy efficiency, renovations and access to energy projects are a way to **combat energy poverty**. The EIB Group Action Plan for Affordable and Sustainable Housing will support local and national efforts to build more affordable homes, renovate existing housing stocks to be more energy efficient and encourage more sustainable and innovative building materials and equipment.

The EIB Group remains committed to supporting the UN Sustainable Development Goal of **access to affordable and clean energy globally (SDG 7)**, with projects that promote renewable energy projects, energy efficiency and increased productivity, or clean cooking, to name but a few. In 2024, the Group signed **€47.9 billion** in new financing for SDG 7, supporting operations worth more than **€226 billion.**

[11] Joint article on Just Energy Transition Partnerships – European Commission

STRATEGIC OBJECTIVE: CLIMATE AND SUSTAINABILITY

The European Union continues to lead the world in tackling climate change. It has set **ambitious climate and energy targets** including further greenhouse gas emission reductions, increased energy efficiency, promoting the use of energy from renewable and other low-carbon sources, and decarbonising hard-to-abate sectors. In line with the temperature objectives of the Paris Agreement, the European Union continues to pursue the long-term aim of a climate-neutral economy.

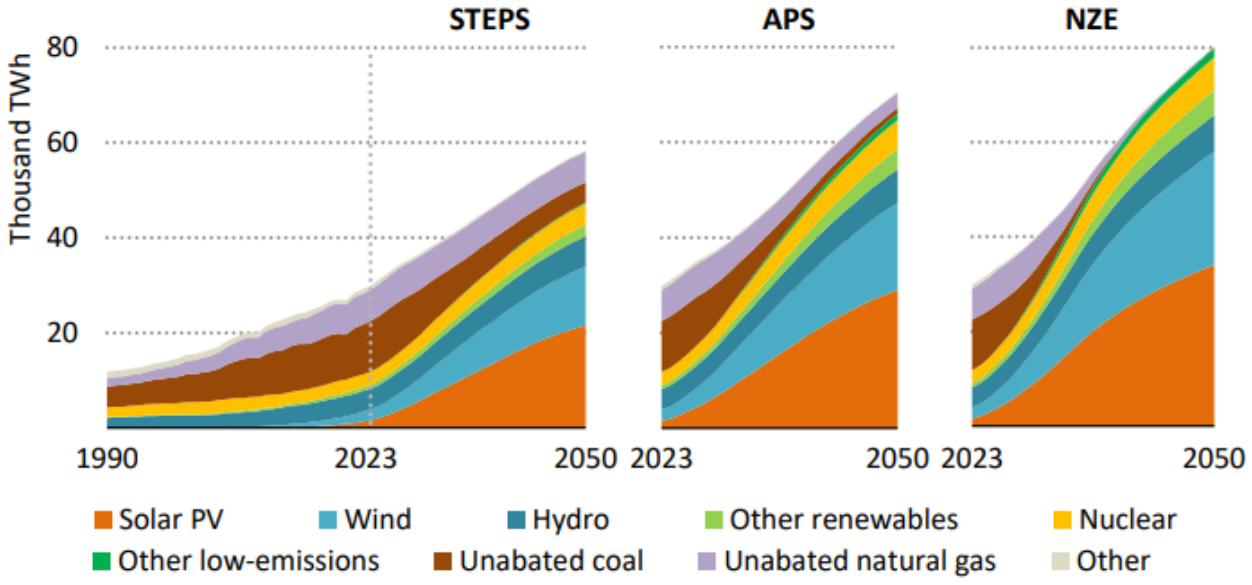
EU support for climate action is not restricted to Europe. The effects of climate change are global and, more than ever, climate mitigation and climate adaptation **efforts are required on a global scale**.

Tackling climate change requires long-term investment, the majority of which will come from the private sector. The EIB Group focuses its activities on those areas in which it can provide a **high degree of additional value**: tackling persistent investment gaps and market failures, focusing on long-term infrastructure, promoting innovation and scaling up low-carbon and clean technologies.

From an energy sector perspective, **decarbonisation of the power sector**, coupled with large-scale **electrification** of end-use sectors, is key to decarbonising the wider economy.

The International Energy Agency's annually updated World Energy Outlook projects different evolutions of power generation sources under different policy commitment and impact scenarios: Stated Policies (STEPS), Net Zero Emissions by 2050 (NZE) and Announced Pledges (APS). One common element in all the scenarios is that low-carbon power generation sources, especially **solar and wind power, continue to grow** at unprecedented rates globally, as shown in Figure 3 below. These technologies will produce the majority of all power supplied within the next 20 years, with a corresponding need (and opportunity) for investment.

Figure 3 – Global electricity generation by source and scenario, 1990-2050



Source: International Energy Agency (IEA), World Energy Outlook 2024, Licence: CCBY 4.0

The EIB Group will continue its support for global efforts to decarbonise energy supplies, adapt to the consequences of climate change and promote sustainability, in line with the approach set out in the EIB Group 2024-2027 Strategic Roadmap[12] and the EIB Global Strategic Roadmap.[13]

ELECTRIFY TO DECARBONISE

Drive down emissions through electrification of demand and scale up low-carbon power generation.

Switching from fossil fuels to electricity for heating, transport and industry is one of the most effective ways to reduce greenhouse gas emissions. Using low-carbon electricity instead of burning fossil fuels can eliminate most of the emissions these activities would otherwise produce.

A large range of electrification technologies have significant **scale-up potential**. Heat pumps and e-mobility, for example, are already resulting in lower operating costs for consumers.

Energy-intensive industries where energy represents a large share of production costs (such as steel, chemicals or semiconductors) have corresponding potential for reducing greenhouse gas emissions. These require tailored solutions including on-site renewable generation, long-term power purchase agreements and process electrification support.

As more activities are powered by electricity, demand for electricity will rise. This means we will **need to build much more low-carbon power generation and grid infrastructure**. To reach the necessary volumes at an affordable cost, all appropriate technologies will be needed, particularly those with the potential to scale up considerably. This includes competitive mature renewable generation technologies such as wind and solar, but also emerging renewables and other low-carbon technologies such as carbon capture and storage, as well as small and advanced modular nuclear reactors. The cost of investing in this additional generation capacity will be offset by benefits such as lower fossil fuel imports, lower emissions and increased energy security.

The growth of new sources of demand with greater flexibility, such as e-mobility or electric heat pumps, also offers the potential to **better integrate consumers into the market**. Demand-side flexibility can help mitigate supply side intermittency, increasing system efficiency and lowering costs.

BUILD ALTERNATIVES

Develop decarbonisation solutions for sectors that are hard to electrify.

According to Eurostat,[14] almost 50% of the European Union's final energy consumption is for **heating and cooling**. To decarbonise heat supply, the main options today are **low-carbon district heating systems**, especially in urban environments, and individual heat pumps or renewable energy solutions where district heating is not an option. These not only lower greenhouse gas emissions, but also often significantly reduce running costs for consumers. When combined with the use of geothermal energy, waste heat sources, heat pumps, heat storage and other

12 EIB Group 2024-2027 Strategic Roadmap
13 EIB Global Strategic Roadmap
14 Heating and cooling from renewables gradually increasing – News articles – Eurostat

low-carbon technologies, this diversification of supply creates an opportunity to further increase the security of the European energy sector and reduce its dependence on natural gas.

The EIB Group supports the **decarbonisation of transport**, as also outlined in the EIB Transport Lending Policy,[15] with efforts towards **electrification** and the development of **low-carbon fuel alternatives,** especially for hard-to-abate use cases such as longer distance aviation and shipping.

Support for the development of **competitive alternatives to natural gas and fuels based on crude oil** will further help reduce the importance of imported fossil fuels in the European fuel mix. This creates a need for new low-carbon fuel production or import facilities, as well as the potential for repurposing parts of existing natural gas or fuel transportation infrastructure.

Biogas can substitute natural gas relatively easily within existing gas grids. **Biogas and biofuels** have been developed at different rates within the European Union, and some countries have the potential to significantly increase their production of biogas, synergising with sustainable agriculture and agro-industrial production.

Low-carbon hydrogen is expected to increasingly substitute today's uses of natural gas-based hydrogen and enter new industrial applications, especially in sectors that are otherwise hard to decarbonise. With a view to developing direct alternatives to natural gas in the longer term, **scaling up and lowering the cost of low-carbon hydrogen** production, and especially renewable hydrogen production, is a key prerequisite to developing a viable and competitive renewable hydrogen market in Europe.

The deployment of carbon capture and storage infrastructure is still at an early stage in Europe. The sector faces challenges due to a fragmented value chain (capture, transportation and storage) but offers significant opportunities for greenhouse gas emission reductions in hard-to-abate industries by minimising the impact of continued fossil fuel use where needed.

LEAD IN INNOVATION

Accelerate industrial transformation through research and development and scale up manufacturing and deployment of clean technologies.

Decarbonising our energy supply requires the consideration of all available options. This includes scaling up competitive mature technologies, but also the development and deployment of new alternatives.

In recent years, the EIB Group has been active in supporting significant investment in projects and technological solutions related to **the decarbonisation of industry**, electrification, digitalisation and manufacturing, all with a specific focus on innovation and increasingly with reference to their critical raw material supply chains.

Continued support for research and innovation is needed to maintain a competitive advantage, along with demonstration projects to fill the gap between innovation and commercialisation, in line with the EIB's Innovation, Digital and Human Capital Orientation.[16]

After initial development, **the manufacturing and deployment of clean technologies also requires scaling up,** especially in fields where Europe has a lead or where there is a strategic case for developing competitive domestic capacity. This includes scaling up emerging technologies and the **manufacturing of established, but critical,**

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15 Transport Lending Policy 2022: The Way Forward

16 Innovation for inclusive Green and Digital Transition

energy system components needed for the energy transition. The EU Net Zero Industry Act[17] sets out a framework for **scaling up European manufacturing capacity for net zero technologies**.

Next generation renewables, or new nuclear generation technologies such as small modular reactors and advanced modular reactors, offer **high growth potential and better system flexibility**. New clean technologies are exploring **advanced sustainable alternatives** to fossil fuels and materials. Process optimisation and industrial symbiosis – where waste streams from one process become valuable inputs for another – help **reduce resource use**. New carbon capture and storage technologies **reduce and sequester residual greenhouse emissions** in hard-to-abate sectors. Digital energy management systems and smart manufacturing help optimise consumption patterns and reduce peak demand. Investments in resilient supply chains for **critical raw materials**, including sustainable extraction, refining, processing and recycling, will be crucial to maintaining Europe's strong manufacturing leadership and global competitiveness.

The EIB Group can support this through initiatives such as TechEU, which supports innovation, manufacturing and deployment scale-up in multiple key EU priority sectors, including clean tech for climate and energy.

The EIB Group offers financing and advisory **products tailored to the needs of companies throughout their growth cycle**: equity and quasi-equity during the initial startup phase, guarantees and venture debt to help de-risk growth and scaling up, and debt to support innovation and full commercialisation. The EIB Group can help attract and mobilise finance for R&D and manufacturing deployment in large corporates and provide support for sustainable supplies of critical raw materials and enabling infrastructure in key strategic industries, including clean tech. Through its advisory services like **project development assistance** under the Innovation Fund,[18] the EIB can support the early development stage of innovative, low-carbon technology demonstration projects in energy-intensive industries, such as low-carbon product substitutes, renewable energy or carbon capture and use or storage.

FINANCE GREEN GROWTH IN EUROPE AND GLOBALLY

Mobilise private capital to scale sustainable investment across the energy value chain.

The EIB Group has a long track record of direct and intermediated financing for energy infrastructure projects and enterprises. The Group can also offer long tenors that align with the long life of many energy infrastructure assets. However, the i**nvestment gaps to achieve the European Union's climate and energy transition** objectives remain significant. The European Central Bank estimates that around 20-25% of total green investment needs can be covered by the public sector, while for the remainder, private capital will need to be mobilised to meet EU green and digital targets.[19]

In addition to its established role in financing large infrastructure projects, the **EIB Group will continue to catalyse investment across the energy value chain** by mobilising private capital through risk-sharing instruments, credit enhancement, lending and equity investments, green securitisation, as well as leveraging complementary public resources from the EU budget, Member States and promotional banks and institutions.

There are multiple barriers to scaling up the energy transition. Some of these are regulatory or legal, some are financial. The EIB Group is engaging with market players to identify key financial bottlenecks and risks and to

17 Regulation – EU – 2024/1735 – EN – EUR-Lex
18 Innovation Fund – European Commission
19 Massive investment needs to meet EU green and digital targets

help design solutions and products that can help continued investment and **leverage private investment and capital markets**.

Based on these interactions, and in line with the Clean Industrial Deal, the EIB has launched several initiatives, including the Wind Power Package, the Grids Manufacturing Package and the pilot programme for corporate power purchase agreements.

Supply chain bottlenecks have become a recurring issue for large energy infrastructure projects. This has led the EIB Group to **expand support for critical manufacturing supply chains** with new products such as counter guarantees. Guaranteeing access to finance to respond to a rapidly growing order book is key to strengthening European value chains in strategic net zero industries.

The EIB Group will continue to **explore and develop new financing products** targeting identified market needs and bottlenecks. The EIB Group continues to expand its support for SMEs, mid-sized companies, energy service providers and households. It will do this by offering more **intermediated financing through commercial banks and national promotional banks**. Tools such as the Green Eligibility Checker[20] can help streamline and simplify access to finance.

Beyond guarantees and loans, the EIB Group provides risk capital by investing in equity funds and through venture debt. It is Europe's biggest institutional backer of venture capital and private equity funds and its biggest provider of venture debt. Through the TechEU Initiative, the EIB Group will accelerate venture capital investments and attract global investors to Europe. Additional financing can be attracted by **leveraging capital markets** though venture debt financing, infrastructure equity funds, private credit funds, co-investment products, blended finance mechanisms and green bonds.

To further assist the development of projects, the EIB Group offers a range of **advisory services** that provide support and technical assistance for the development of specific projects, general capacity building and strategic development, as well as targeted market or sector studies.[21]

Finally, on the funding side, the EIB continues to issue **green bonds** on international financial markets to collect proceeds from a range of private and public investors. These proceeds are then allocated exclusively to eligible EIB lending activities, including most of its energy lending operations. In April 2025, the EIB issued its inaugural bond under the European Green Bond Standard.

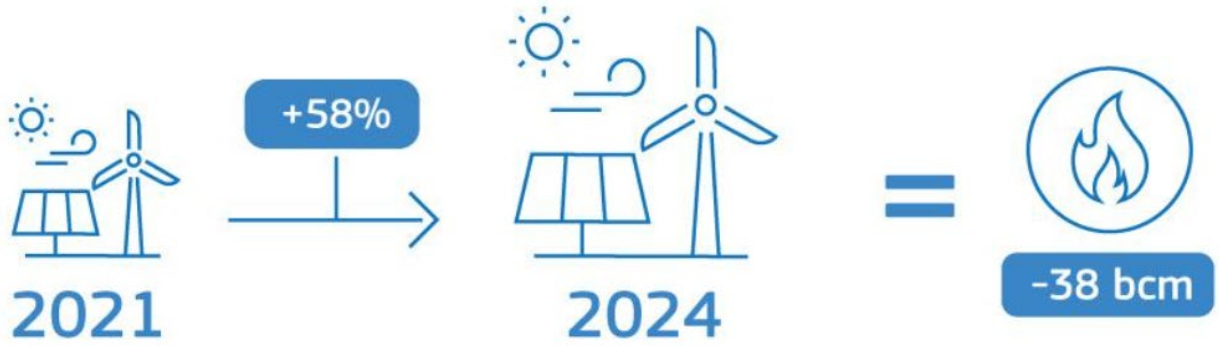
[20] Green Eligibility Checker
[21] For more information, see Advisory services.

STRATEGIC OBJECTIVE: SECURITY AND RELIABILITY

The European economy's **dependence on imports of fossil fuels, high-tech products and systems, equipment and critical raw materials** makes it vulnerable. Russia's war against Ukraine has also highlighted how **energy infrastructure is often** targeted during hostilities. Certain types of assets, such as subsea cables and pipelines, have been subject to sabotage. This raises the importance of measures that **improve the physical and cyber security of critical energy infrastructure**, as well as overall system resilience.

In its mid-term review of the REPowerEU plan,[22] the European Commission reported that additional renewable energy capacity has helped reduce gas consumption by 38 billion cubic metres, or close to 10% of EU demand, in just three years. This shows how **developing indigenous renewable energy supplies, coupled with energy efficiency and demand-side management**, can significantly enhance Europe's energy autonomy.

Figure 4 – REPowerEU: reducing dependence on fossil fuel imports



Source: European Commission (2025): REPowerEU – 3 years on

STRENGTHEN CRITICAL INFRASTRUCTURE

Enhance energy system resilience and strengthen the European Union's energy security.

EU energy policy initiatives in recent years (the European Green Deal, REPowerEU, Clean Industrial Deal and Affordable Energy Action Package) have increasingly highlighted the positive contributions and synergies of non-fossil energy not just to climate mitigation and adaptation, but also to Europe's **strategic energy autonomy and security**.

Reducing fossil fuel dependence and vulnerability to volatile prices and critical resource import disruptions remains a key priority. This can be achieved by **developing alternative generation sources and infrastructure**, including renewable generation, nuclear power, grids and interconnections, and storage. However, the greater number of remote and dispersed sources of energy and energy storage, as well as the new connections they require (such as subsea cables), bring new challenges in terms of infrastructure protection.

Increasing system resilience to disruptions – whether from climate change, natural disasters, cyberattacks, sabotage, supply chain disruptions or other extreme events – is key to maintaining a reliable energy supply.

[22] REPowerEU – 3 years on – European Commission

Supporting grid investments should aim **to maintain and improve on minimum reliability standards** such as n-1,[23] or higher, if required to protect the uninterrupted power supply of critical infrastructure (large power plants, key industrial sites, hospitals, data centres, etc.).

Improving energy system resilience also involves managing physical risks from climate change. The second phase of the Climate Bank Roadmap sets a clear target for **investment in climate resilience**. The EIB Group will offer financing and advisory services to help alleviate the impacts of climate change and ensure the provision of basic services for people and businesses.

Finding the right **balance between costs and security** is a challenge for system planners. The continued development of the European single energy market, with growing interconnection and optimisation of resources across the continent, promotes more cost-effective sharing of resources and mutual reliance in Europe.

STORE SMARTER

Invest in energy storage and demand-side flexibility to balance supply and demand effectively.

The intermittent nature of many renewable energy sources creates a **growing need for flexibility and storage** to match energy demand and supply. Smart energy grids can automatically monitor energy flows and adjust to fluctuating generation and demand patterns. Storage solutions are needed both to balance intermittent generation in the short term (intra-day or intra-week storage), but also in the longer term (long-duration, seasonal or multi-year storage).

While there is still some potential to expand traditional energy storage solutions such as pumped hydro storage plants, the large majority of future energy storage needs are expected to be come from **battery systems, heat storage solutions or other technologies**. In addition, renewable energy generation will increasingly need to provide grid system services such as voltage and frequency control to enhance grid reliability while expanding the use of renewable energy.

Uncertain revenue streams, mainly due to market price volatility or weather and climate risks, are a key barrier to many storage projects today. The EIB Group is open to supporting alternative business models or financing solutions that can **de-risk storage projects**, such as long-term capacity agreements or contracts for difference.

Demand-side management and demand response are critical to optimising consumption, improving energy efficiency and enhancing flexibility. They can shift demand to periods where the supply of energy from renewables is abundant. This optimises grid infrastructure usage, reduces system costs and dependence on fossil fuel imports, and contributes to the security of energy supply of the European Union.

Technological and business innovation can further enhance the **flexibility available from consumers and prosumers** (energy consumers that also produce energy) with digital tools, energy management systems, small-scale storage and new business models. Support for players like energy service companies, which aggregate and scale up energy services, will help reduce both consumer bills and overall system costs.

[23] The ability of a system to withstand the loss of a single component and continue functioning.

CUT DEPENDENCE

Diversify energy and equipment sources and develop alternatives to fossil fuels to reduce dependence on imports.

Europe has limited access to cheap indigenous fossil energy or critical raw materials. It has historically relied on trade with trusted partners. To reduce dependence on fossil fuel imports and complement fuel switching and electrification, the **development of direct substitutes for fossil fuels** can mitigate the impact for final consumers and hard-to-abate sectors, especially when accompanied by energy efficiency measures. Low-carbon gases and fuels can substitute some current fossil fuel use with adequate investment in production and transportation infrastructure, where economically justified.

The energy transition is reliant on many **critical raw materials**. While trade remains a key pillar of economic development, supply chains are just as vulnerable to geopolitical risks as fossil fuels. Support for **new global production** projects with reliable partners can help secure access. In parallel, improving circular economy efforts to **recycle and reuse**, as well as **supporting research** to develop substitution alternatives, will improve resilience to supply shocks. **To reduce imports, Europe must make better use of its limited fuel and critical raw material resources**.

In the **nuclear fuel cycle**, EU utilities depend on imports of materials, conversion and enrichment services and fuel fabrication from third countries. The European Commission's roadmap towards ending Russian energy imports[24] stresses the importance of phasing out imports of nuclear materials and services from Russia in particular, creating a need for additional conversion and enrichment capacity in the European Union or other partner countries. Supporting EU nuclear power generation also requires further infrastructure for the management of radioactive waste and spent fuel, and spent fuel reprocessing installations.

PARTNER GLOBALLY

Reinforce strategic global partnerships to secure stable and sustainable energy for the European Union and access to clean energy and sustainable living globally.

The geopolitical system based on globalisation, free trade and financial interconnectedness is giving way to a new reality, with heightened conflict and economic and financial volatility. This creates new **economic and security challenges**, but also an opportunity to **strengthen international partnerships based on converging interests and values**.

The European Union remains a democratic trade and technology superpower able to provide stability and certainty in uncertain times, strengthening its influence around the world. There is a strong call for closer **alignment of investments** inside and outside the European Union in support of **European competitiveness**, with a more strategic approach to international procurement, focusing on reliable partnerships.

The EIB Group's approach to global partnerships is based on **visible, high-impact, scalable and mutually beneficial cooperation** between the European Union and its partners around the world, adapted to regional priorities and needs. The EIB Group supports projects that are clearly **aligned with the European Union's political, security, environmental and economic priorities and that offer clear benefits to partner countries**.

[24] EUR-Lex – 52025DC0440R(01) – EN – EUR-Lex

The approach will also look to **mobilise the EU private sector** to take part in such partnerships by expanding direct lending to European corporates investing outside the European Union. The approach also involves increasing project finance support for EU companies sponsoring high-impact infrastructure projects, and expanding support for trade finance across key value chains, as well as enhanced support for export credit agencies across the European Union.

With a focus on the energy sector, the EIB Group will continue to support cooperation for the strategic procurement of **critical raw materials**, industrial partnerships for **energy or fuel** offtake agreements, and energy infrastructure investments to support **EU neighbourhood and enlargement** policies.

Development finance is an area that is often considered risky for commercial banks. The EIB Group will continue to promote European Union goals for **peace, security and sustainable living**, and cooperate with EU initiatives, such as the Global Gateway, to leverage the necessary investments and provide advisory services. It will build on strong partnerships with EU companies and with other multilateral development banks, including the Mission 300 Technical Assistance Facility that will bring electricity access to 300 million people in Africa.

EIB Group development support in the form of **finance and advisory services** provided to the world's poorest and most vulnerable communities will continue to promote climate action and economic resilience. This includes **access to clean, modern and sustainable energy, improving resilience to climate change, fighting energy poverty and supporting the ability of women to participate equally in society and business.**

CONCLUSION AND IMPACT

As part of the second phase of the EIB Group Climate Bank Roadmap, the EIB renews its **commitment to support the energy transition**. It will deploy financing and advisory support across the **entire low-carbon energy value chain**, including energy supply and fuel production, energy efficiency, enabling infrastructure, electrification of end-use sectors and the manufacturing of key energy components. In addition, the EIB Group will back innovation, the scale-up of emerging technologies and the deployment of system flexibility solutions such as storage and demand-side management. EIB Group financing and support acts as a **catalyst for attracting and accelerating investments** in a sector that is undergoing rapid change.

The EIB Group will strive to **meet the needs of EU businesses and residents**, ensuring that the clean transition not only secures a sustainable future, but also strengthens Europe's competitiveness, social cohesion and security.

The EIB Group will offer support to and prioritise projects in line with the strategic objectives and priorities outlined in this sector orientation. This will result in outcomes that will contribute to EU policy goals:

- reduced greenhouse gas emissions, increased renewable and low-carbon energy supply and greater energy efficiency in support of EU climate and energy targets for 2030 and beyond;
- reduced energy prices for consumers and improved energy competitiveness, supporting the ambitions of the EU Clean Industrial Deal and the Affordable Energy Action Package;
- improved EU energy security, with better system reliability, lower fossil fuel imports and diversification of the supply of critical materials and products.

The EIB Group will make use of all the tools at its disposal, from **tailored financing products to advisory services**. By partnering with private investors, national promotional banks and international financial institutions, it will support the development of **critical infrastructure** and the scale-up of both **established and emerging technologies** needed for the **energy transition**.

The EIB Group will continue to take a leadership role and **build global partnerships** to ensure **peace, security and sustainable living.**

ENERGY SECTOR ORIENTATION

POWERING COMPETITIVENESS, CLIMATE AND STRATEGIC AUTONOMY

European Investment Bank | Group

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