

REVISED DRAFT

EIB energy lending policy

Supporting the energy transformation



**European
Investment
Bank**

The EU bank 

EIB ENERGY LENDING POLICY

Supporting the energy transformation

Revised draft submitted for decision to the October Board

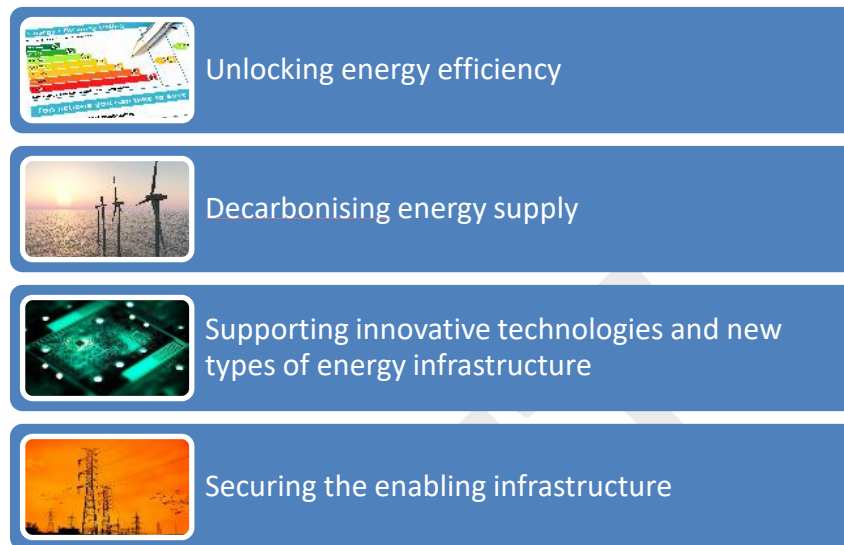
Table of Contents

Executive Summary	2
1. Introduction	5
2. Investing to transform energy systems	7
The world is not on track to meet the targets of the Paris Agreement.....	7
The energy transformation	7
EU energy and climate policy.....	9
Investment required within the EU	10
Investment required outside the EU.....	11
3. Approach of the energy lending policy.....	13
4. The core components of the energy lending policy	19
Unlocking energy efficiency	20
Decarbonising energy supply.....	22
Supporting innovation and new energy infrastructure	24
Securing the enabling infrastructure	27
ANNEXES.....	29
Introduction	29
Annex I: Energy efficiency.....	30
Annex II: Energy supply.....	33
Annex III: Innovation and new types of energy infrastructure.....	38
Annex IV: Enabling infrastructure	41
Annex V: Carbon pricing.....	44

Executive Summary

1. To meet the objectives of the Paris Agreement, energy systems across the world must transform rapidly. This profound challenge requires significant, sustained investment in the energy sector over the coming decades. The European Investment Bank is the EU bank and one of the world's largest multilateral financiers of climate action. It can help to foster this investment.
2. The EU continues to lead the world in tackling climate change. In 2019 it adopted a comprehensive legal framework to deliver ambitious climate and energy targets for 2030, including further reducing greenhouse gas emissions, increasing energy efficiency and promoting the use of energy from renewable sources. This framework builds upon all dimensions of the Energy Union, including energy security, a fully integrated internal energy market and research and innovation. In line with the temperature objectives of the Paris Agreement, the EU is pursuing the long-term aim of a climate-neutral economy.
3. Delivering on these EU targets requires long-term investment, the majority of which will come from the private sector. The Bank's energy lending policy (ELP) sets out how the Bank, as a public bank, can help support the EU in meeting this challenge. It focuses the Bank's activities on those areas in which it can provide a high degree of additional value by: (i) overcoming persistent investment gaps, which remain despite existing policies; (ii) focusing on infrastructure needed over the long term, including the important dimension of innovation and scaling up of low-carbon technologies; (iii) supporting new market-based investment in the energy sector, in particular for relatively new types of infrastructure (auctions, demand response, storage).
4. In practice, the value the Bank can bring depends significantly on the context within which it operates. The Bank therefore intends to **strengthen its dialogue with Member States** to explore how its lending and advisory services can be most effective in supporting national energy and climate plans. Similarly, outside the Union, in light of the **nationally determined contributions**, the Bank's activities will focus on achieving the Sustainable Development Goals and the objectives of the Paris Agreement. In adopting this policy, the Bank's activities in the energy sector are fully aligned with the Paris Agreement.
5. The Bank's activities focus on four separate themes (see Figure 1). **Energy efficiency** investment, notably in residential buildings, needs to double in the coming decade. Despite numerous policy measures, a persistent investment gap remains. The Bank has been very active in this field for a number of years ~~and~~, in cooperation with the European Commission, it will establish a new **European Initiative for Building Renovation (EIB-R)** to support new ways to attract finance for building rehabilitation. This will examine the development of relatively new sources of energy efficiency finance, such as models of mortgage-based lending. ~~Given the pressing need to accelerate market uptake for energy efficiency, and as an exception to its general rule, the Bank will consider financing up to 75% of eligible capital expenditures under this initiative.~~
6. **Decarbonising energy supply** to meet the 2030 targets requires at least a doubling of today's EU renewable power generation capacity. In close cooperation with the European Commission and other partners, the Bank will endeavour to **support the market integration of renewable electricity projects**, as well as increased regional cooperation. In addition, there is a need to support other types of renewables (renewable heating), the **production and integration of low-carbon gases** (such as hydrogen) and low-carbon fuels. The Bank will reinforce its technical and financial advisory services to project developers and public authorities seeking to scale up investment programmes. Finally, it will look to support the development of a sustainable internal supply of critical raw materials needed for the transformation.

Figure 1: The themes of the ELP



7. Investment in **innovative low-carbon technology** needs to increase. This will reduce the cost of meeting long-term targets, as well as increasing the global competitiveness of European industry. Building on its experience, the Bank will continue to support innovation from the earliest stage in the research laboratory to the demonstration of pre-commercial technologies, in close alignment with the EU Strategic Energy Technology Plan and the new Innovation Fund being established under the Emissions Trading Directive. The Bank will also support initial commercial production lines related to breakthrough technologies.
8. New investment opportunities in power markets are emerging, often associated with new business models that respond to improvements in market design. Battery storage and demand response are beginning to be deployed, together with small-scale decentralised energy sources. New participants are entering the market, consumers are becoming more active and communities are set to play an increasing role. The Bank will seek to support these **new types of energy infrastructure** to stimulate their market uptake.
9. The Bank will continue to support the development of electricity networks, including the interconnection target agreed for 2030 and European projects of common interest. It will look to prioritise investments that increase network flexibility.
10. It is important to stress at the outset that the Bank appreciates the necessary role that gas will continue to play to decarbonise energy systems. Natural gas will be progressively replaced by low-carbon gases such as biogas, synthetic gas and hydrogen. This transition to low-carbon gas is a significant challenge to the industry. The Bank will therefore focus its support within the gas sector on this issue, ranging from the production of low-carbon gases, transportation and distribution to integration within the power and heat sector. In the case of power generation, the GHG emission threshold is set at a reduced level to focus Bank support towards low-carbon power plants, including renewables and carbon capture and storage, as well as the most efficient combined heat and power projects.

~~11.~~ Focusing on ~~this~~ long-term energy investment represents an ambitious challenge ~~for the Bank. As a result, and thus~~ the Bank will phase out support to energy projects reliant on unabated fossil fuels. This implies that the Bank will phase out support to (i) the production of oil and gas production, natural gas; (ii) traditional gas infrastructure primarily dedicated to natural gas, power generation or heat (networks, storage, refining facilities); (iii) power generation technologies resulting in GHG emissions above 250 gCO₂ per kWh of electricity generated, averaged over the lifetime for gas-fired power plants seeking to integrate low carbon fuels and (iv) large-scale heat production infrastructure based on unabated oil, natural gas, coal or peat.

~~10.12.~~ Phasing out fossil fuels. These types of projects will not be presented ~~fuels~~ represents a significant change for ~~approval to the Bank~~. In order to manage this change, the Bank will continue to approve projects already under appraisal ("within the EIB ~~Board beyond~~ system") until the end of 2020. While it fully understands the role fossil fuels will continue to play within EU energy systems for at least the coming decade, ~~the Bank provides higher additionality by focusing on the longer term challenge~~ and investment needs of the energy sector. As a result, ~~all the Bank's activities in the energy sector will be fully aligned~~ In addition, during this period, the Bank will support gas infrastructure projects included under the 4th list of Projects of Common Interest co-financed with ~~the Paris Agreement~~. EU budget.

~~11.13.~~ This The long-term ~~transition~~ energy transformation is profound. Solidarity is required to ensure that potentially vulnerable groups or regions are supported. As part of its broader climate strategy, the Bank will therefore establish an **Energy Transition Package** to provide extra support to those Member States or regions with a more challenging transition path. At the level of national energy systems, the package focuses existing Bank assistance, including advisory services, on energy projects that support the transition in those Member States that benefit under the EU Modernisation Fund. As an exception to its general rule, the Bank will consider financing up to 75% of the eligible project cost.

~~12.14.~~ More broadly, at the regional level, building on its existing experience and in close cooperation with wider European initiatives in this area, the Bank will reinforce its support for economic development and job creation in regions transitioning away from fossil fuels, including through activities that go beyond energy lending that will be addressed in the framework of the Bank's climate strategy.

~~13.15.~~ This energy lending policy represents a significant change in the Bank's approach to the energy sector and an important input into the Bank's overall climate strategy. It is also important to stress that it applies alongside other Bank policies and operational documents, including notably the overall EIB Operational Plan, credit risk principles, or other sector lending policies. It should be stressed that the capacity of the Bank to support some of the priorities outlined in this policy will depend to a significant degree on access to risk capital or grant support, in particular through InvestEU or the Neighbourhood, Development and International Cooperation Instrument outside the EU. Moreover, Bank-wide principles and standards defined in the Guide to Procurement, Environmental and Social Standards or Gender Strategy have important implications for all Bank activities, including in the energy sector.

1. Introduction

1. The European Investment Bank (EIB or the Bank) has been investing in the energy sector since its establishment under the Treaty of Rome in 1957. During the intervening 60-year period, the Bank has made a significant contribution to the financing of the energy infrastructure which underpins today's European internal energy market, helping to deliver sustainable, secure and affordable energy to EU citizens and businesses.
2. Over time, the Bank has steadily increased its activity in the energy sector outside the EU, working under various mandates to support energy projects which further European policy objectives, notably in regions neighbouring the Union and across the developing world.
3. Over the last five years, the Bank's energy lending represented on average approximately EUR 12 to 14 billion of investment in the energy sector per year. This has largely supported energy efficiency, renewable energy and energy grids. In recent years, a wide range of advisory services has increasingly complemented the Bank's lending activity.
4. Energy lending also forms a core component of the Bank's climate finance. The Bank is one of the world's largest multilateral providers of finance for climate action projects, for example financing to the tune of over EUR 16 billion in 2018. ~~In 2015,~~ The Bank adopted a [climate strategy](#) that sets out its ambition to play a leading role in mobilising the finance needed to achieve the temperature objectives contained in the Paris Agreement.
5. The Bank's previous energy lending policy was adopted in 2013, at the height of the financial and economic crisis. It had a natural focus on helping to maintain the investment needed to meet European energy policy goals, including the 2020 targets. As confirmed by a recent [ex-post evaluation](#), the 2013 policy was "a major step forward for the Bank," not least in focusing the Bank's operations on the largest investment needs in the energy sector.
6. This update of the Bank's energy lending policy reflects several important recent changes. Firstly, the EU has adopted a comprehensive legal framework to deliver ambitious 2030 targets. Secondly, the Paris Agreement provides greater clarity on the nature of the investment needed for the long-term energy transformation. Many energy projects that the Bank supports today will potentially be operating beyond 2030 and hence need to be aligned with the Paris Agreement. Thirdly, access to finance has significantly improved for parts of the energy market, compared to the time of the previous policy. This policy provides an opportunity for the EIB, as the EU bank, to set out how it can best stimulate the overall investment required.
7. The operating environment of the Bank itself has evolved considerably, in particular through a strategic partnership with the European Commission in the Investment Plan for Europe. This is currently evolving still further in the context of the next European multiannual financial framework 2021-2027 and in particular InvestEU.
8. The document is structured as follows. Chapter 2 outlines the context of the energy transformation and the expected implications for capital investment, both within and outside the Union. The subsequent two chapters focus on how the Bank will support these investments. Chapter 3 sets out the general approach of the energy lending policy. Chapter 4 provides more detail along the four themes of the policy: unlocking energy efficiency, decarbonising energy supply, supporting innovative technologies and new types of energy infrastructure and securing the enabling infrastructure.

9. Five annexes are included in the policy. The first four present systematically the project eligibility and technical and economic assessment criteria applied by the Bank, including the key criteria it uses to record a project as providing a relatively high contribution to the policy. A final annex concerns the cost of carbon used by the Bank. The annexes are available on a dedicated energy lending policy webpage and contain more technical information, which may be of particular interest to potential customers.
10. This policy has benefitted from an extensive set of written contributions from stakeholders, as well as a public consultation meeting held in Brussels on 25 February 2019. The Bank's response to the public consultation responses can be found on the EIB website ([here](#)). The Bank would like to thank all those stakeholders who took the time to respond to this exercise.
11. The energy lending policy is consistent with the Bank's overarching climate strategy and sits alongside the other sector policies of the Bank. For instance, the policy does not cover clean mobility, or industrial processes. The exact scope of the energy sector policy – which can be complex in practice for an integrated energy system – ~~are~~^{is} set out in the technical annexes.
12. The energy lending policy also works within the given wider operating environment and risk capacity set out in the EIB [Operational Plans](#), based on EIB credit risk principles and approval procedures. Equally, compliance with the Bank's [Guide to Procurement](#) and [Environmental and Social Standards](#) are required for the Bank's support to energy projects through investment loans or framework loans. These latter documents provide standalone guidelines and rules covering all relevant Bank operations, including energy.
13. The energy lending policy covers all EIB activity in the energy sector – namely financial support, advisory services and technical assistance, regardless of the channel of support. In other words, this policy applies not only to direct investment loans but also to all intermediated operations of the Bank, including those carried out through commercial banks and investment funds.

Reporting and follow-up

14. As agreed as part of the action plan resulting from the ex-post evaluation of the 2013 Energy Lending Criteria, a dedicated webpage for this policy provides (i) links to the policy, including annexes, and (ii) relevant public presentations given by the Bank on its energy activities.
15. As part of its annual reporting commitments, the Bank will provide a breakdown of energy activity by the core themes of this policy. This will include an indicator on the percentage of operations recorded as providing a high contribution to the energy lending policy as set out in the annexes. In addition, the annual report will include an update on the main initiatives announced under this policy. Finally, the annual report will be used as an opportunity to provide an update on any technical changes to the policy. Revised versions of the policy annexes will duly be uploaded onto the dedicated energy lending policy webpages.

2. Investing to transform energy systems

The world is not on track to meet the targets of the Paris Agreement

1. At the 21st session of the Conference of Parties to the United Nations Framework Convention on Climate Change in Paris in December 2015, nearly 200 countries [agreed](#) to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C.”
2. A recent report¹ issued by the Intergovernmental Panel on Climate Change concludes that in order to limit the temperature increase to 1.5°C, global anthropogenic greenhouse gas emissions need to reach net zero by 2050. The equivalent target in the case of limiting the increase to 2°C is to reach net-zero emissions around 2070.
3. Even taking into account all the contributions to the Paris Agreement, the world is currently not on track to reach either of these targets. For instance, despite the recent increase in investment in renewable energy, the EU is still largely dependent on fossil fuels for transport, industry and heating and, in many EU Member States, for power generation. This highlights the considerable challenge the EU faces in meeting the long-term targets of the Paris Agreement. At the same time, energy systems will need to ensure energy security and affordability – for both citizens and businesses operating in a competitive global market.
4. Outside the EU, energy demand continues to grow globally and most countries still rely on fossil fuels. Access to energy for the 600 million people without modern sources of cooking, heat or electricity is an important priority. The current lack of energy access, mainly in Africa, has a disproportionate negative impact on women and girls. The UN 2030 Agenda for Sustainable Development, adopted by UN member states in 2015, includes 17 [Sustainable Development Goals](#), including one specifically designed to ensure universal access to reliable and modern energy by 2030, to increase substantially the share of renewable energy, and to double the global rate of energy efficiency.

The energy transformation

5. Energy systems need a substantial transformation to meet long-term climate targets. There is broad consensus on the following core elements of the transformation.
 - Significant investment in **energy efficiency** is required to reduce the energy needed to meet rising demand for energy services (heating/cooling, lighting, power, transport);
 - Based on recent dramatic cost reductions, the share of **renewable** energy technologies will increase substantially. Wind and solar power, in particular, are projected to represent the majority of low-carbon energy sources by 2050. These technologies are variable in nature – i.e. they fluctuate depending on whether the sun shines or the wind blows. As a result, there is a need to increase the **flexibility** of energy systems, including different forms of storage, ~~dedicated~~ flexible ~~units~~[capacity](#) and demand response;
 - **Decentralised** energy will account for an increasing share of the new investment in power generation: i.e. power will increasingly be injected into the low- and medium-voltage distribution network, rather than being injected from centralised sources into the high-voltage transmission system;

¹ Intergovernmental Panel on Climate Change, 2018, [Special Report](#) on Global Warming of 1.5°C.

- As in the economy at large, energy systems will become increasingly **digitalised**, helping to integrate decentralised resources into the energy system, and increasing consumer participation in energy markets more directly;
 - The heat, industry and transport sectors are expected to become increasingly **electrified**, as a way to reduce greenhouse gas emissions, driving up electricity demand and increasing sector integration;
 - Achieving net-zero emissions will require a diverse **portfolio of technologies** including renewables, but also nuclear, carbon capture and storage, low-carbon gases, power-to-X (converting surplus renewable power into a different energy carrier)², as well as bioenergy, storage and digital technologies. Increased innovation and deployment is needed across the portfolio.
6. Whilst these core elements are increasingly clear, modelling exercises highlight that there are many different pathways compatible with the overall transformation. The future energy and technology mix will depend in particular on the evolution of the relative costs of different technologies, behavioural responses of people and businesses towards opportunities to save energy, or the willingness of people to adjust current lifestyles. As a result, there is a pervasive uncertainty surrounding each pathway.
7. Today, energy systems remain largely based on fossil fuels. All decarbonisation scenarios imply that by mid-century this will change, driven by the deployment of renewables. While coal disappears, the gas infrastructure can continue to be used to shift away from coal in certain countries in the next decade and to transport low-carbon gases. The power sector has to be almost fully decarbonised before 2050 and have negative emissions in some scenario to reach net-zero emissions in the energy sector.
- 7.8. Despite this consensus on the necessary direction of travel, the scale of investment and progress across individual technologies differs widely. As monitored by the International Energy Agency report on [Tracking Clean Energy Progress](#), the scale of investments in energy efficiency, clean mobility, decarbonisation of heating, carbon capture and storage and nuclear are considered to be not on track to reach the Paris Agreement.
- 8.9. Progress along the energy transformation pathway will inevitably entail complex challenges around social acceptability, both at local and national level. More broadly, different pathways may have distinct impacts on affordability, regional employment, productivity and international competitiveness.
- 9-10. Energy security must be maintained during the energy transformation. The energy system itself has to become more cyber-secure and climate-resilient. Modern, digitalised economies rely on an uninterrupted energy supply. ~~Higher shares of~~ Renewable energy reduce dependence on imported fossil fuels, but integrating a high share of renewables, ~~particularly variable renewables,~~ may raise new issues ~~for to deal with their seasonal variability and ensure~~ the adequacy of power systems. ~~These~~ The power system currently enjoys excess capacity in most markets. But there are uncertainties ~~can be compounded introduced~~ by phase-out policies for coal power plants and nuclear lifetime extensions in some countries. ~~In addition, The energy system itself has to become more cyber-secure and climate-resilient.~~
- 10.11. Government policy will play a central role in providing a robust regulatory framework to help overcome some of this uncertainty around the energy transformation and, thus, facilitate the

² This term refers to the idea of converting surplus renewable power into a different energy carrier ("X"). Options include power to ammonia, power to hydrogen, power to syngas, power to liquids, etc.

investment needed. As presented briefly in the next section, the EU is playing a leading role in this field.

EU energy and climate policy

11.12. The EU, which emits around 10% of global greenhouse gases, is a leader in the energy transition. Over a decade ago, the EU agreed on the so-called 20-20-20 package of energy and climate targets for 2020, aiming to reduce greenhouse gas emissions by 20% on 1990 levels, to increase the share of renewable energy in the EU energy mix to 20%, and to increase energy efficiency by 20%. The EU is largely on track³ to deliver these targets, in a period in which the EU economy has grown by 58%.

12.13. Building on this success, the EU has adopted targets that are more ambitious for 2030: to reduce greenhouse gases (compared to 1990 levels) by 40%, to reach at least a 32% share of renewable energy consumption and to achieve energy savings of at least 32.5%. These commitments for 2030 have been submitted as the EU contribution under the Paris Agreement.

13.14. In late 2018, the EC adopted the [Clean Planet for all](#) communication⁴, presenting a long-term strategic vision for a climate-neutral economy, with a target to reach net-zero emissions within the EU by 2050. This vision is supported by detailed long-term modelling results, which illustrate a range of impacts under different scenarios.

14.15. At the same time, the EU has agreed a comprehensive legislative framework to ensure that it delivers on the 2030 targets. This required the amendment of the EU Emission Trading System Directive⁵, plus agreement on the eight legislative proposals made by the EC in the [Clean Energy for All Europeans](#) package.

15.16. Whilst adopting Union-wide targets, the package leaves flexibility for Member States as to how to achieve them. As part of the Energy Union's governance, therefore, Member States are submitting integrated [National Energy and Climate Plans](#) for the period 2021-2030. These plans cover all five dimensions of the [Energy Union](#): (i) security and solidarity, (ii) the integrated internal energy market, (iii) energy efficiency, (iv) decarbonisation, and (v) research, innovation and competitiveness.

17. The incoming European Commission announced in September 2019 ambitious objectives to further increase decarbonisation efforts with the proposal for a European Green Deal aiming at making the EU the world's first climate neutral continent and increasing climate ambitions by 2030. This includes calls for the Bank to increase its support to climate action.

³ This paragraph, including the statistics, is drawn from the EC Fourth Report on the [State of the Energy Union](#). Preliminary data suggests that GHG emissions in 2017 were 22% below 1990 levels. Moreover, in 2017, the share of renewable energy in the EU energy mix was 17.5%, although the pace of increase has slowed since 2014. Further effort is required to increase energy efficiency, with recent data suggesting that primary energy consumption was 1 561 million tonnes of oil equivalent in 2017 – still significantly above the target of 1 483 million tonnes for 2020.

⁴ Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. A Clean Planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, COM/2018/773 final.

⁵ Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, as amended by Directive (EU) 2018/410.

~~16-18.~~ In addition, a wide range of European and national policies have a strong influence on the energy sector. With the electrification and development of digitalisation, smart cities and the circular economy, sectors are increasingly integrated. Policies to promote alternative fuels for clean mobility have important implications for investments in the energy sector as well.

~~17-19.~~ Consistent with the objectives of the Internal Energy Market, the EU aims to promote market-driven investments. This is increasingly visible in some recent renewable energy investments, which benefit from very limited government support and are driven by electricity market prices. The Clean Energy for All Europeans package further improves the design of the electricity market, with the aim of providing more efficient price signals.

~~18-20.~~ In addition to relying on the market, the EU also provides direct financial support to incentivise energy investment, currently foreseen in the next Multi-annual Financial Framework through the InvestEU Facility, Structural Funds within the Union, and the Neighbourhood, Development and International Cooperation Instrument outside the Union. The EIB, as the EU bank, is an important additional source of finance. Before turning to the role of the EIB, it is useful to present briefly the likely investment needed to deliver the 2030 package and the Paris Agreement more generally.

Investment required within the EU

~~19-21.~~ Decarbonisation involves the deployment of technologies with high upfront investment costs. According to the modelling used to underpin the EC long-term vision for 2050, energy investments in the EU need to almost double during the decade 2021-30, i.e. from EUR 229 billion per year on average over the period 2011-20 to EUR 396 billion per year from 2021 to 2030. This increases to EUR 520-575 billion per year in the subsequent decades, more than 2.5 times the current level.

~~20-22.~~ Energy efficiency investments in buildings and industry represent approximately three-quarters of the total energy investment required in the period 2021-30, equal to EUR 281 billion per year. ~~Power generation investments remain stable at EUR 55 billion per year, with the required increase~~ The energy efficiency target is expected to reduce overall energy consumption in renewable capacity largely offset the EU by 2030 and therefore the expected future reduction investment needs in unit costs. Investment in power grids increases by 70% in new energy infrastructure on the decade 2021-30 to reach EUR 59 billion per year supply side.

~~21-23.~~ This modelling exercise projects that the use of all fossil fuels will decrease dramatically in Europe. Coal, in the absence of carbon capture and storage, is the most carbon-intensive fuel and its use dwindles to close to zero by 2050. Oil consumption decreases gradually in the transport and agricultural sectors, but almost disappears from the building sector. The share of oil declines from 30% today to 8-12% of primary energy consumption by 2050, contributing to reduced energy imports and reduced air pollution.

~~22-24.~~ Similarly, investments in new gas infrastructure decline sharply in all scenarios. While natural gas continues to be used in the EU, its in long term decarbonisation scenarios. It will be progressively replaced by low-carbon gases such as e-gases, biogas or hydrogen. Natural gas consumption is expected to decline by 20% from today's level by 2030 and by 70 to 85% by 2050. Investments in new gas infrastructure decline sharply in the coming decade. According to the International Energy Agency's [Sustainable Development Scenario](#), consistent with the goals of the Paris Agreement, investments in gas transmission and distribution networks represent around 2% of total EU investment needs over the two decades to 2040. These investments are needed primarily to maintain the gas network, with higher levels required in eastern Member States to alleviate existing bottlenecks and integrate low-carbon gases.

25. Power generation investment will continue to be dominated by renewables, in particular wind and solar PV. Power generation investments remain stable at EUR 55 billion per year, with the required increase in renewable capacity largely offset by the expected future reduction in unit costs. Given the existing installed conventional generation, capacity additions of new gas power plants are expected to be limited, representing around 1% of total investment, and to take place mainly in some countries to replace ageing or polluting capacity.

26. Investment in power grids is driven by the increased electrification and the need to integrate high shares of renewable capacity across Europe. It increases by 70% in the decade 2021-30 to reach EUR 59 billion per year. Investment takes place both at transmission and distribution networks, in order to further deploy smart grids, integrate decentralised energy sources, electric vehicles and enable the active participation in energy markets of energy consumers.

23-27. The relative burden of investment to reach 2030 goals may differ across the EU, with a potentially higher burden on lower-income Member States. According to analysis by the EC⁶, the increase in annual average investment to meet the 2030 targets is 38 percentage points above the reference case for those Member States with a per capita income below 60% of the EU average. By contrast, for the remaining 18 Member States, the increase is only 19 percentage points. Various measures, notably the EU Modernisation Fund⁷, are helping to redress this imbalance.

Investment required outside the EU

24-28. Demand for energy is increasing rapidly in many regions of the world, in particular Asia, the Middle East, Africa and Latin America. According to the International Energy Agency, total energy investment is projected to be around EUR 2.5 trillion per year by 2030, seven times the level of investment within the EU. Developing countries are investing in new energy infrastructure and it is important that the majority of this investment be compatible with the Paris Agreement.

25-29. [Nationally Determined Contributions](#), which are at the heart of the Paris Agreement, will consist of plans that describe the efforts that each country intends to make to reduce national emissions and to adapt to the impacts of climate change. While many countries will continue to rely on fossil fuels to meet growing demand, many will take advantage of the rapid cost decline of renewables and make progress in integrating renewables into energy systems, as well as improving energy efficiency. Given the scale of energy investment needed outside the EU, there is a need to focus EU action on investments that can have a significant impact on decarbonising existing systems.

26-30. At the same time, it is important to recognise the different needs of countries outside the EU. Access to energy remains a fundamental issue. According to the International Energy Agency, achieving universal energy access, as targeted by UN Sustainable Development Goal 7, would require investment of some EUR 48 billion per year between 2018 and 2030, representing about 2% of total annual energy sector investment. In addition, air pollution is a major health and environmental issue and a core driver in transforming energy systems in certain countries.

⁶ EC Staff Working Document, Impact Assessment accompanying the Communication on a policy framework for climate and energy in the period from 2020 up to 2030, SWD(2014) 15 Final, of 22.1.2014.

⁷ The Modernisation Fund is established under Article 10(d) of Directive (EU) 2018/410 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814.

27-31. The EU Neighbourhood, Development and International Cooperation Instrument for the period 2021-27 introduces financial mechanisms to leverage the EU budget and crowd in private investments. External action in the energy sector is embedded in other EU international objectives and energy and climate change diplomacy. In the energy sector, the focus of the EU is on access to basic energy services, addressing climate change mitigation and adaptation, increasing energy efficiency and deploying renewable energy.

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3. Approach of the energy lending policy

1. The primary objective of the energy lending policy is to ensure that the EIB, as the EU bank, makes the most effective use of its limited resources to support the new EU energy policy framework. This chapter focuses on this objective, in the context of the required investment to meet the 2030 targets and beyond, as outlined in Chapter 2.
2. The chapter begins by emphasising the Bank's focus on supporting ambitious EU targets for 2030 and beyond. It then presents, in general terms, how the Bank can provide a higher degree of additionality in helping support EU policy, including outside the Union. Finally, it sets out the implications with respect to fossil fuel projects – namely that the Bank will phase out support to such energy projects by the end of 2020.

Supporting ambitious EU energy and climate targets

3. Meeting the 2030 targets will require sustained increased investment within the EU over the next decade. There is a need to boost energy efficiency, generate an increasing share of power and heat from low-carbon sources, reinforce and expand electricity networks and innovate towards new low-carbon technologies, including low-carbon gases such as hydrogen.
4. The Bank will support the EU in delivering these targets. The Bank ~~has a limited ability to support the energy sector~~—typically supported around EUR 10-12 billion per year in the EU in recent years. It will therefore focus on deploying its support most effectively to foster the overall EUR 400 billion investment needed and on catalysing the private sector.
5. The investment challenge to meet the 32.5% energy efficiency target by 2030 is considerable. Despite significant policy attention over recent years, for various reasons many investment opportunities to save energy are not taken. The Bank believes it can help address this persistent investment gap.
6. On the supply side, meeting the target of a share of at least 32% for renewable energy by 2030 is likely to require at least doubling Europe's current capacity in renewable power generation. Much of this will be met from variable sources (wind and solar) that are increasingly being integrated into electricity markets. Meeting the target will also require further investment in heating from renewable sources and low-carbon gases. The Bank will focus on helping Europe deliver the renewable energy target.
7. As noted in the Paris Agreement, significant innovation and deployment will be required to enable an effective long-term response to climate change. The EU [Strategic Energy Technology Plan](#) provides a roadmap to improve technology performance, complemented by detailed [implementation plans](#) to help deliver the improvements through particular projects. The Bank will continue to support projects developed under these plans, as well as the wider deployment of mature technologies. This includes the development of alternative energy carriers, such as hydrogen.
8. In addition to innovation, there is a need to invest in new types of energy infrastructure, such as different types of storage, demand response and new digital technologies. This can help to integrate high shares of renewables across different sectors of the economy. The new EU electricity directive opens up new opportunities for investment. The Bank will seek to support these new types of investment.

9. Finally, reinforcing electricity grid infrastructure is important to enable increased electrification and integration of renewables and new types of energy infrastructure in energy systems. Investment in national electricity networks is likely to increase in the next decade, both at transmission and distribution level. The EU has an interconnection target of 15% of installed capacity for 2030, following the 10% target for 2020. The Bank will continue to support the development of the electricity network.

Providing additionality

10. The EIB can in principle support a variety of energy investment projects, ranging from energy efficiency investments, power plants and energy grids to new business models and innovation. This section focuses on how, at the general level of the energy sector as a whole, the Bank can provide a significant degree of additional value, in the context of existing energy policies implemented by the EU and Member States and considering the need to mobilise private sector finance for the large majority of the overall investment needed.
11. As a public bank, the EIB is invited to consider areas of investment in which markets may fail to invest (either at all, quickly enough or to the same extent) in infrastructure needed to meet the requirements of society-as-a-whole. Box 1 summarises the main types of market failures associated with the energy sector. In the light of the Clean Energy for All package, as well as the scale and type of investment needed to meet the ambitious EU goals, there are three areas where the Bank can potentially provide particularly significant additional value.
12. Firstly, the Bank can contribute to the closing of persistent investment gaps. There are areas in which, despite policy support and the availability of finance, there is substantial evidence that investment remains too low. This is relevant for energy efficiency, in particular the renovation rates of buildings, or investment in low-carbon innovation. Overcoming these investment barriers will be essential to meeting 2030 targets.
13. Secondly, as a long-term investor, the Bank supports investment decisions taken to meet long-term goals. Energy infrastructure is largely a very long-term business. The Bank can help focus its support on infrastructure that will be used for decades to come, when energy systems will need to be low-carbon. This is particularly relevant for energy grids, infrastructure enabling sector integration and innovation more broadly.
14. Finally, the Bank can support new market-based investment in the energy sector. This includes projects deriving their revenues (in part or in full) from energy markets or tendered using market mechanisms such as auctions. Increasing shares of solar and wind production mean that electricity markets will be characterised by frequent switching between periods of relative production surplus and periods with relative shortage. Market prices can help send important signals about the need for investment in different types of system flexibility, such as storage, interconnection, demand response, further variable renewables, etc. This is a relatively new development within the EU, but also with a limited track record upon which to raise finance. The Bank can help to support projects structured appropriately for this new regulatory framework.
15. This general approach has been used in Chapter 4 to identify more detailed areas in which the Bank can bring higher additional value. Furthermore, the annex contains clear guidance on the types of energy projects that the Bank will record as providing a high contribution to the energy lending policy.

Box 1: Additionality and market failures in the energy sector

In economic theory, private markets lead to efficient decisions – including investment decisions – under a demanding set of conditions. In reality, these conditions are only met to varying degrees. Investment decisions are likely in practice to be hampered for a number of reasons. In the energy sector, these include:

- The presence of environmental externalities – notably carbon emissions and local air pollutants – that are only partially internalised;
- Externalities that are not captured in the return on investment, notably for companies investing in low-carbon innovation and industrialisation, and for energy efficiency investments;
- Some public goods characteristics of energy security that cannot be captured by investors;
- The incomplete nature of markets, particularly due to the lack of liquid futures markets to hedge investments, compounded by the time required to change the design of markets;
- The imperfect nature of competition, in activities which have been only relatively recently opened to competition, but also in the case of electricity grids, which are natural monopolies;
- The presence of informational barriers, particularly for smaller actors, and coordination failures between Member States.

EU and national energy policies are largely directed at addressing these shortcomings and thus ensuring that European energy markets function well. Nevertheless, despite this policy and regulatory framework, investment levels in practice tend to remain too low, particularly for the types of energy assets required for the energy transformation. The Bank cannot necessarily solve this problem alone. However, by supporting particular types of projects, it can complement and reinforce climate and energy policy.

Working with Member States to build on the national and energy climate plans

16. To put this general approach towards providing high additional value into practice, it is necessary to apply this within the specific circumstances of a project, i.e. a specific business model or counterparty operating within a specific regulatory and market environment. The new national energy and climate plans provide a new opportunity to assess the strategic role of the Bank within a national context.
17. The Bank will therefore seek to **strengthen its dialogue with Member State governments** and relevant actors in the energy sector on the basis of the final national energy and climate plans. The national plans are required to present, where applicable, financing measures both at the national and European level. As one significant additional source of EU-level financial support, the Bank will therefore offer to organise dedicated **Energy Finance Workshops** with interested Member States to identify how its lending and advisory services can be most effectively directed towards supporting these plans.

Phasing out lending to fossil-fuel energy projects

18. As set out above, the Bank will focus on meeting the long-term investment challenge associated with required to meet the EU 2030 targets and 2050 objectives, which present high investment gaps, a longer-term perspective and a greater investment challenge. A consequence of the focus on these priorities is that the Bank will **phase out the financing of investment in support to energy infrastructure directly associated with unabated fossil fuels.**

19. Once in effect, this means that the Bank will ~~have a clear position not to~~ support upstream oil or natural gas production, coal mining, infrastructure dedicated to coal, oil and natural gas (networks, liquefied natural gas terminals, storage),~~),).~~

20. Instead, in the energy sector⁸ the Bank will support the development of low-carbon fuel projects and the infrastructure needed to integrate low carbon gases into existing gas infrastructure. The Bank will continue to support the purchase of efficient gas-fired boilers as part of wider energy efficiency programmes for buildings or SMEs.

19-21. Regarding power generation~~or,~~ the EIB will support power projects resulting in specific emissions below a certain threshold. The level of this emission standard is set at 250 gCO₂ per kWh of electricity generated⁹. This level was set to allow the Bank to focus on the most efficient combined heat production¹⁰ ~~from fossil fuel sources (coal, gas, oil, peat) and power projects~~. For power plants progressively increasing the share of low-carbon gases, the emission standard can be met on average over the plant's economic lifetime. The Bank will also seek to support research and development into the use of hydrogen by gas turbine technology.

20-22. The Bank's decision to phase out lending to fossil fuels energy projects is a significant change in its policy. To manage this change smoothly, the Bank will ~~no longer originate projects after the adoption of this policy and will stop~~¹¹ ~~lending to fossil fuel energy projects by~~ continue to potentially approve gas infrastructure projects already formally under appraisal ("in the EIB system") until the end of 2020. Moreover, during this period, the Bank will consider any gas infrastructure project on the 4th PCI list¹² co-financed with EU budget to be eligible for support.

21-23. Phasing-out support for fossil fuel projects reflects a decision by the Bank to focus its limited resources on investments needed to meet the EU 2030 targets. The Bank acknowledges that fossil fuels will continue to play a role within the global energy system up to 2030 and that switching from oil or coal to natural gas may reduce greenhouse gas emissions in the short term. ~~Such~~ These investments are very likely to take place even without EIB financing, ~~in any case~~. ~~Phasing out support for fossil fuel projects reflects a decision by the Bank to focus its limited resources on investments needed to meet the EU 2030 targets and 2050 objectives, which present high investment needs, a longer-term perspective and a greater investment challenge.~~

22-24. It is important to note that the Bank will continue to support security of supply, ~~albeit no longer through~~ without relying on fossil fuels. This support will be channelled directly by reinforcing electricity networks, as well as indirectly by reducing energy demand through energy efficiency projects, or through low-carbon power generation. The Bank wishes to focus on newer dimensions of security, such as through demand response or storage, which need to be deployed at scale.

⁸ Infrastructure dedicated to providing fuel for transportation is covered by the bank's transport lending policy. Under the current policy, alternative transport fuels are supported by the bank.

⁹ The level of emission is above the benchmark being proposed under the EU taxonomy for sustainable investment in its 18 June 2019 report, which is 100 gCO₂/kWh.

¹⁰ The only exception to this principle is for high-efficiency gas-fired co/tri-generation meeting the Bank's criteria, including resulting in greenhouse gas emissions of less than 250 gCO₂ per kWh, and efficient gas boilers included within building renovation programmes. Full details are presented in Annex II, including the need to meet an economic test based on a comparison with relevant low-carbon alternatives.

¹¹ Fossil fuel energy projects will not be presented for approval to the EIB Board beyond the end of 2020. Such projects will be appraised in line with the 2013 Energy Lending Criteria.

¹² The European Commission has noted the importance of continued Bank support towards gas projects of common interest. The EC publishes its list of PCIs every two years and the fourth list is expected by end 2019.

Providing new support for the transition

23-25. Meeting long-term energy and climate targets may have different impacts across the Union.

As mentioned in paragraph 23 of Chapter 2, some Member States need to increase investment more than others to meet the 2030 targets. Traditional energy industries such as coal mining are important economic activities in regions throughout the Union, providing significant local employment. These issues touch upon questions of social justice and solidarity. The Bank is committed to ensuring the success of the transformation and will therefore create a dedicated **Energy Transition Package (ETP)**.

24-26. As recognised in the Emissions Trading Systems Directive, some countries are eligible for support under the **Modernisation Fund**¹³. Under the Energy Transition Package, and as an exception to its general rule, the Bank will consider financing up to 75% of the eligible cost of all energy projects eligible under this energy lending policy¹⁴ situated within those Member States benefitting under the Modernisation Fund. In the context of the national energy and climate plans, the Bank will also look to provide advisory services to support the transition. This is partly underway through the JASPERS initiative and, in close cooperation with the EC, could potentially be reinforced in the framework of additional project development services.

25-27. The transition also has an important regional and social dimension. There is a need to address the impact of the phasing out of fossil fuel activities on employment and economic activity at a local level, ensuring economic restructuring which gives rise to new employment opportunities. The Bank is already active in several **coal and carbon-intensive regions** providing framework loans to support integrated territorial development strategies. Through the Energy Transition Package, and in close cooperation with current and future EU initiatives, the Bank will reinforce its support for regions transitioning away from fossil fuels. Note that this support for integrated development strategies goes beyond the scope of this energy lending policy, and will be addressed more comprehensively over time in the framework of the Bank's climate strategy.

Supporting the energy transformation and energy access outside the Union

26-28. Outside the Union, the Bank will ~~also~~ support the development of energy systems that are low-carbon, efficient and reliable, and which improve access to modern and affordable energy. In large parts of the developing world, demand for energy services is growing rapidly and requires the construction of new energy infrastructure that will help foster sustainable economic growth for decades to come. The Bank will focus its support on energy technologies consistent with decarbonisation and the energy transformation. By applying its environmental and social standards and procurement processes, the Bank will continue to ensure the support of sustainable, high-quality infrastructure that delivers long-term economic benefits.

27-29. As part of its commitment to inclusive and sustainable growth, the Bank will continue to support energy projects that contribute to the aims of the 2030 UN Agenda for Sustainable Development, notably ensuring universal access, accelerating improvement in energy efficiency and doubling the share of renewable energy by 2030 (Sustainable Development Goal 7). Clean energy improves air quality for local populations. Energy is a necessary condition for essential services (education, health) for industrialisation, job creation and economic development

¹³ The beneficiaries are listed in Annex IIb of Directive (EU) 2018/410 as Bulgaria, Czech Republic, Estonia, Croatia, Latvia, Lithuania, Hungary, Poland, Romania and Slovakia. However, in order to respect the Emissions Trading Systems Directive, the Energy Transition Package will also include projects "aiming at the decarbonisation of the electricity supply of Greece's islands."

¹⁴ To avoid doubt, this refers to all projects ~~which can be supported eligible for support~~ under this energy lending policy from 2021 onwards, ~~i.e. once support for fossil fuel projects has been phased out.~~

(Sustainable Development Goal 8), improving health and well-being (Sustainable Development Goal 3) and poverty alleviation (Sustainable Development Goal 1).

28-30. The Bank will focus support on the energy transformation within Europe's neighbouring regions: the European energy community, the eastern neighbourhood and southern neighbourhood. The Bank will also support projects in sub-Saharan Africa, where the share of the population with access to modern energy services remains very low. More generally, the Bank will also seek to support the energy transformation in other regions, in particular Asia and Latin America. The Bank will strive to continue to develop a range of financial and non-financial instruments addressing the needs of different regions, in particular in the context of the EU Neighbourhood Development and International Cooperation Instrument initiative and in accordance with the Bank's mandates in these different regions.

29-31. The Bank's energy lending volume represents only a tiny fraction of the required investment outside the EU. The Bank will continue to reinforce its activities with donors to blend its financial support with technical assistance and investment grants. A wide range of technical and financial advisory support is required across the project cycle, including capacity building. Although the Bank clearly understands that national climate ambitions embodied in the Nationally Determined Contributions are differentiated, the Bank will seek to advance the global leadership of the EU on sustainable development, including climate action. **The Bank will therefore look to support projects that reinforce the Nationally Determined Contributions.**

4. The core components of the energy lending policy

1. This chapter summarises the new policy. It is structured around four themes:
 - Unlocking energy efficiency;
 - Decarbonising the supply of energy;
 - Supporting innovative technologies and new types of energy infrastructure;
 - Securing the enabling infrastructure.
2. The Bank recognises that the “energy efficiency first” principle applies across all energy investment activities. This refers to the need *“to consider, before taking energy...investment decisions, whether cost-efficient, technically, economically and environmentally sound alternative energy efficiency measures could replace in whole or in part the envisaged...investment measures”*. For the Bank, this translates in practice into a requirement to consider carefully the impacts of energy efficiency on future energy demand, when assessing the economic case for energy investments. In this sense, this principle applies to the entire energy lending policy.
3. Annexes I-IV provide further material on the technical and economic criteria used by the Bank in the appraisal of potential projects. These annexes are structured according to the same themes as this report, specifying criteria for all the Bank’s operations, both inside and outside the Union.

Figure 1: Themes of the energy lending policy



Unlocking energy efficiency

4. The EU has agreed on an energy efficiency target of 32.5% by 2030. Outside the Union, the UN sustainable development goals seek to double the global rate of improvement in energy efficiency by 2030. Given the persistent investment gap in this area described above, the Bank has an important role to play in supporting EU and national policies to stimulate the necessary investment, both within and outside the Union.
5. Energy efficiency concerns all sectors of the economy and hence is relevant across the Bank's activities. As set out in more detail in Annex 1, the energy lending policy focuses on investments required to reduce demand for energy in buildings and industry, as well as in the supply of energy. To be eligible on energy efficiency grounds, a project needs to demonstrate credible energy savings compared to a baseline.
6. This section sets out three areas on which the Bank will focus in the years ahead: an initiative to increase the renovation rates of buildings; support for high levels of energy performance in new buildings; and the increase of energy efficiency investment by SMEs and industry more broadly. There is an urgent need to invest, and financing energy efficiency remains complex. To accelerate the uptake of energy efficiency investment, the **Bank will finance up to 75% of the eligible portfolio capital cost**, both within and outside the Union.

A European Initiative for Building Renovation

7. Recent European Commission modelling work shows that investment in energy efficiency in Europe will have to more than double in the coming decade. There is a persistent investment gap in building renovation. Owners and other stakeholders have to make decisions to invest in energy efficiency measures. The availability of attractive financing conditions can help encourage that decision.
8. Most of the required individual renovation investment projects are relatively small. The Bank can reach these projects by working in partnership with cities, municipalities, housing companies, funds and corporates, as well as through financial intermediaries with local retail networks. Although the regulatory environment differs across Europe, the Bank has considerable experience in providing finance to partners through a variety of channels, including climate action credit lines, sharing the underlying risks contained within the partner's portfolio of energy efficiency loans, and ensuring access to technical assistance and advisory services that help develop internal capacities to appraise energy efficiency investments. These elements have been put in practice through a number of recent initiatives, including the [Private Finance for Energy Efficiency](#) and Smart Finance for Smart Buildings Facility.
9. Experience has shown that support for project development can be particularly helpful in overcoming investment barriers in building renovation. Indeed, solely improving the terms and availability of debt for energy efficiency projects is rarely sufficient. Many investment opportunities, even those offering relatively short payback periods, are not taken. Technical assistance is usually provided in cooperation with the EC for a wide range of energy efficiency activities, from upstream policy development to capacity building and project development, which includes the provision of energy audits.
10. In the EU, together with the EC, the Bank has developed the [European Local Energy Assistance](#) (ELENA) facility, which has worked for over ten years to help devise large-scale bankable energy efficiency projects and programmes. The facility focused initially on supporting public authorities, but now also includes private entities, such as banks. The facility has been expanded with a further

EUR 97 million that the Bank will seek to deploy over the period until 2023. This additional funding is focused on residential buildings and aims to support the joint Smart Finance for Smart Buildings initiative.

11. Building on this experience, the Bank will establish a **European Initiative for Building Renovation**. This new facility will increase the visibility of the Bank's activities, give priority to renovation and reinforce Bank support for:

- The aggregation into portfolios of building renovation projects and the provision of tailored financial support, ranging from traditional long-term loans to guarantees, equity or receivables financing. This support can be provided alongside national or regional financial support programmes;
- New sources of finance. The Bank will consider supporting new ways to attract finance for building rehabilitation, which may include unlocking new markets in energy efficiency mortgage-based lending or securitisation;
- Linking the financial products developed with dedicated technical assistance, notably under ELENA, which can help further increase volume and impact.

The Bank will work in cooperation with the EC to seek further opportunities to develop and support activities in building renovation, with the objective of scaling up lending to this sector, which is facing the biggest investment gap in the EU.

12. There are tremendous opportunities to save energy outside the EU as well. In the Bank's experience, access to funding to help support the preparation and implementation of projects, as well as investment grants, can help deliver significant additional investment. The Bank will therefore seek to increase its cooperation with the EC and other partners to develop and implement programmes to deliver finance and technical assistance for building rehabilitation programmes, notably in the partner and southern and eastern neighbouring countries.

Support to new buildings that exceed national mandatory standards

13. The Bank has supported the initial development of the market for "nearly zero energy buildings" in Europe over the last five years. It intends to continue to support construction of new buildings with high energy-performance standards.

14. To be considered an energy efficiency project, the energy performance standard of new buildings supported by the Bank¹⁵ will need to exceed national mandated standards and building codes transposing the Energy Performance of Buildings Directive¹⁶. Moreover, as set out in detail in Annex 2, the Bank will focus its support on housing or buildings that serve a wider public function.

¹⁵ The Bank will continue – under different public policy goals – to support the construction of certain types of new buildings that meet minimum legal standards. However, they will be eligible under those different policy goals and not as energy efficiency projects.

¹⁶ Directive 2010/31/EU on the energy performance of buildings, as amended by Directive (EU) 2018/844. The implementation of the Energy Performance of Buildings Directive requires that national nearly zero energy buildings standards apply to all buildings from 2021. This implies that private buildings achieving nearly zero energy buildings levels, which obtain a building permit until end-2020, remain eligible for EIB financing. The Energy Efficiency Directive requires that savings that result from the implementation of mandatory Union standards shall not be claimed as energy savings.

15. Outside the EU, the rapid pace of new building construction in many countries plays an important role for future energy efficiency. Applying the same principle as within the EU, the Bank will therefore support new construction that goes significantly beyond current practice in a given country, even in the absence of mandatory targets.

Small and Medium-sized Enterprises (SMEs)

16. SMEs, as well as the heating and cooling sectors, represent another important domain in which to target energy efficiency. While major industry tends to be already energy-efficient in the EU, industrial and service SMEs collectively represent one of the largest untapped markets for energy efficiency. SMEs face various barriers that deter the adoption of energy efficiency measures, such as the fragmentation and small scale of the investments, the lack of internal energy-specific capabilities, insufficient information and the limited access to suitable financial products.
17. Given the similarities between SME programmes and building renovation programmes, in terms of delivery channels and investment barriers, the Bank will seek, in close cooperation with the EC, to integrate SME lending into the European Initiative for Building Renovation. This will allow the Bank to provide an integrated package of advisory support and tailored financial support to financial intermediaries.

Decarbonising energy supply

18. The EU has agreed to reduce greenhouse gas emissions by 2030 by at least 40% from 1990 levels. To achieve this target, the EU has revised the Emissions Trading Scheme, which covers power and heat generation and energy-intensive industry. In addition, the EU climate and energy framework includes a binding target of at least a 32% share of renewables in the final energy mix by 2030. This is likely to translate into a share of around 60% of renewables in the electricity energy mix by 2030, with around 30% from variable sources (wind and solar).

Supporting renewables

19. Meeting the EU 2030 target is likely to involve doubling or tripling today's capacity in renewable power generation¹⁷. The competitive tendering of new capacity and increasing market integration is expected to achieve further cost reduction and deployment of efficient technologies. Deploying this massive capacity of renewables is likely to pose some challenges in terms of system integration, local acceptability and coordination between actors responsible for energy and climate policy. An increasing portion of investments will also be required to maintain and repower existing capacity. The Bank will look to support the roll out of renewables as set out in national energy and climate plans developed by Member States, which collectively need to achieve the EU 2030 target.
20. Moreover, the new European legal framework for renewables seeks to enhance regional cooperation between Member States, including through joint projects and schemes. The Bank will give particular attention to supporting such renewable projects, including cross border schemes,

¹⁷ The Communication on A Clean Planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, COM(2018) 773 final, (Section 4.2.2.3) forecasts wind capacity to increase from 140 GW in 2015 to 350 GW in 2030 and then to between 700 and 1200 GW by 2050 depending on the scenario. Solar capacity grows from 95 GW in 2015 to 320 GW in 2030 and 500 to 970 GW in 2050 depending on the scenario.

and will cooperate closely with the European Commission in the context of the Union's renewable energy financing mechanism¹⁸.

21. As the market share of renewables increases, EU policy seeks to further integrate renewables into power markets. Market integration is necessary to reduce levels of public support and ensure that market revenues increasingly reveal the different values of particular technologies in particular locations. There is a shift from a cost-based approach to a value approach to assessing renewable projects. When appraising the benefits of wind or solar, the Bank considers the profile of generation and takes into account the evolution of the value of production as the market share of variable renewables increases over time.
22. Renewable projects without government support have become an emerging trend in the market. The new legal framework – in particular the EU Emissions Trading Scheme, the renewable and electricity directives – aim to strengthen market price signals. Corporate power purchase agreements are being signed in Europe. Nevertheless, it is still relatively early to conclude how these improvements in the functioning of the wholesale electricity market will impact on investment incentives, including on the availability and cost of finance.
23. Given the large investment needs, the Bank sees a continued role in helping support the market integration process, in particular where exposure to new sources of risk may impinge upon the terms and conditions available in the commercial banking market for renewable projects. The Bank will seek to use the risk-sharing capacity available through InvestEU, or other sources of funding, to reinforce its activities in this area. In particular, the Bank will explore in consultation with the EC the possibility of providing a targeted financial instrument to help support the development of the emerging corporate power purchase agreement market.

Investing in technologies needed for decarbonisation

24. In addition to wind and solar, long-term decarbonisation targets are expected to require investment in a wide portfolio of technologies, including some renewables which currently have relatively high costs. Available evidence¹⁹ suggests that there is strong potential for cost reduction as the deployment of some promising technologies increases. The Bank will therefore continue to focus its support on the early deployment of these technologies with the aim of increasing industrial learning and promoting future cost reduction. When appraising such projects, however, it is difficult to estimate the contribution of an individual project to future cost reductions. As set out in Annex II, the Bank will in general assume a positive overall economic justification for such projects.
25. Other low-carbon technologies are also playing an important role in long-term net-zero emission scenarios by 2050. The Bank's eligibility conditions for support for nuclear power generation and fuel cycle projects, which remain unchanged from the previous policy, and approved by the Board in 2013, are set out in Annex II. They are based on stringent environmental and safety criteria.
26. The decision to phase out power and heat generation from fossil fuel sources results in the application of a new emission standard by the Bank. The technologies and types of projects affected are identified in Annexes II and III: renewable projects with GHGs (e.g. large hydro or geothermal), thermal power plants using a high proportion of low carbon fuels (e.g. low-carbon

¹⁸ This is established under Article 33 of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action.

¹⁹ For a recent survey, see JRC Technical Report (2018), Cost development of low-carbon energy technologies: scenario-based cost trajectories to 2050.

gases, bioliquid fuels), highly efficient gas-fired co-generation of heat, power and/or cooling, decentralised energy (e.g. decentralised hybrid systems in islands).

27. The emission standard is set at a level that enables the Bank to finance efficient flexible cogeneration of heat and power projects. Based on recent projects appraised by the Bank, the emission standard is set at 250 gCO₂/kWh_e. This level is above a proposed EU benchmark for sustainable investment but it enables the Bank to focus on projects needed over the long term by encouraging innovation, focusing on the development of new sources of flexibility and accelerating the development of low-carbon gases.

26-28. In comparison with power generation, renewable heat is still at a relatively early stage of adoption. Under the recast Renewable Energy Directive²⁰, Member States will endeavour to increase the share of renewable energy supplied for heating and cooling. As set out in detail in the Annex, renewable heating technologies (e.g. geothermal, ambient air, biomass, solar) are all eligible for support by the Bank.

27-29. In addition, the Bank will also support the production of low-carbon gases, including hydrogen, biogas and synthetic gas, as well as renewable liquid fuels. These energy carriers can play an important role in long-term decarbonisation and require the development of an appropriate regulatory framework in the coming years. The conditions for support to low-carbon gas infrastructure are set out in Annex IV.

~~28. The decision to no longer finance power or heat generation from fossil fuel sources implies that the Bank will discontinue the Emissions Performance Standard introduced in 2013. It is replaced by a greenhouse gas emissions eligibility criterion for relevant renewable technologies (e.g. large hydro or geothermal) as well as highly efficient gas-fired co-generation of heat and power (Annex II). It will follow regulatory developments in the context of low-carbon gases.~~

Supporting innovation and new energy infrastructure

Supporting innovative technologies

29-30. As noted in the Paris Agreement, significant innovation – and deployment of this innovation through commercial production – is required to accelerate and enable an effective long-term response to climate change. The Bank will support the competitiveness of EU industry in low-carbon technology, including by strengthening the sustainable internal supply of critical raw materials. In addition to improving existing technologies, there is also a need to explore new technological pathways and develop new solutions to manage the interactions between different sectors and integrate the increasing share of renewable energy.

30-31. A key cornerstone of the energy transformation is the possibility of benefitting from the contributions of a wide portfolio of energy technologies and services. Many of these technologies are still at the RDI stage and need to achieve substantial performance and cost improvements. The EU [Strategic Energy Technology Plan](#) provides a roadmap to improve technology performance, complemented by detailed [implementation plans](#) to help deliver the improvements through particular projects. **The Bank will continue to support projects aligned with the Strategic Energy Technology Plan**, with particular attention paid to the underlying implementation plans.

²⁰ Article 23 of Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources.

~~31-32.~~ Demonstrating relatively early stage technologies usually requires public support, such as renewable energy support schemes or grants. Within the context of the fourth phase of the EU Emissions Trading Scheme, the EU has agreed to develop what will become one of the world's largest funding programmes for innovative energy technologies, the **EU Innovation Fund**. Based on its experience, the Bank has worked closely with the European Commission on the design of the new fund. Moreover, in due course, the Bank will seek to provide additional financial support to those projects that are awarded funding under this scheme.

~~32-33.~~ Standalone large-scale demonstration projects, however, need to be accompanied by significant deployment of key energy technologies. Development of new production lines for innovative technologies helps to boost European industrial competitiveness. The EU supports innovation and industrialisation of key energy transformation technologies in Europe. In that perspective, in addition to RDI programmes, the Bank will also support investment in pilot and demonstration plants, or initial full-scale commercial production lines related to breakthrough technologies supported under the Strategic Energy Technology Plan and Horizon Europe, such as promising, innovative renewable energy, energy efficiency, heating and cooling or storage technologies.

~~33-34.~~ Innovation and its commercialisation is also required to ensure the diffusion of new technologies for consumers, building on opportunities created through the wider trend of digitalisation and decentralisation. Smaller companies are critical in this regard, although often confronted with particular challenges in raising financing. The EIB will continue to deploy its tailored instruments in this field, including through venture debt and equity funds.

~~34-35.~~ To conclude, the development and commercialisation of innovative technologies requires significant investment. However, given the inherent risks involved, conventional debt finance is often unavailable. This has led the Bank, working closely with the European Commission, to develop dedicated financial instruments, which provide direct support to a project, but also serve a wider function in signalling to other potential financiers. **The Bank will look to consolidate this experience to reinforce its support for innovative energy technologies, including for initial production lines**, in particular through InvestEU. The technical and financial expertise of the Bank stands ready to support the origination and implementation of projects via its portfolio of advisory services.

New types of energy infrastructure: battery storage, demand response and decentralised energy sources

~~35-36.~~ New technologies, market rules and players are leading to the rapid development of new sources of energy and flexibility. This includes: (i) the provision of flexible sources to the power system derived from battery storage, increasing electrification and demand response; and (ii) the deployment of small-scale decentralised energy sources, enabled by the digitalisation of energy.

~~36-37.~~ The capital investment needs for these new types of energy infrastructure are difficult to estimate. New entrants are often involved – energy consumers, energy service companies, energy communities or aggregators – and tend to rely on relatively novel business models for energy producers or consumers.

~~37-38.~~ New entrants are likely to encounter difficulties in raising finance in general. This is potentially exacerbated if they are exposed to the risk of wholesale market prices. New market design rules have recently been adopted and financiers cannot take comfort from an established track record.

~~38-39.~~ The Bank will seek to support these new types of market-driven energy infrastructure, including with upstream advisory services to help develop robust business models. Nevertheless, the financial risks around new energy business models can be high. The Bank therefore expects to support such projects and counterparties using appropriate financing solutions, potentially supported by EC risk-sharing mandates. Bank financing volumes may remain modest, but they can have a strong early demonstration effect, helping to leverage additional private sector investment.

~~39-40.~~ Finally, many new sources of flexibility are still at an early stage of deployment and have relatively high costs. This is expected to change as the capacity deployed increases. For the purpose of its appraisal of such projects, the Bank will adopt a similar approach to that taken for technologies still at an early stage of deployment. It will assume in general that the long-term economic benefits can justify higher initial costs, in particular when there are novel features associated with the technology, revenue streams or market rules. However, in appraising a particular project, the Bank will benchmark it against available sector evidence, notably in terms of cost and expected revenues.

Securing the enabling infrastructure

Investing in strengthening electricity networks

[40-41.](#) For the electricity market, the energy policy framework adopted in 2018 confirms an interconnection target of 15% of installed capacity²¹ for 2030, following on from the 10% target for 2020. Such projects typically face coordination issues between Member States. The third list of projects of common interest contains 106 electricity transmission and storage projects, and four smart grids that can benefit from EU grants under the Connecting Europe Facility. The EIB will also continue to support these projects.

[41-42.](#) Besides interconnections, investment in national electricity networks is likely to remain high for the next decade, both at transmission and distribution level. The new Directive on common rules for the internal market in electricity (Electricity Directive) introduces measures to ensure that distribution system operators develop investment plans supporting the integration of renewables. The Directive promotes the use of flexibility sources in distribution networks and requires distribution system operators to cooperate with transmission system operators for the effective participation of these distribution-connected flexibility sources (including renewables, demand response, energy storage and market participants engaged in aggregation) in the internal market (including retail, wholesale and balancing markets). This infrastructure needs to be developed in a timely fashion and anticipate future long-term flexibility needs in order to avoid the risk of slowing the deployment of renewables.

[42-43.](#) Electricity network investment decisions are taken for the long term and this makes the sector a natural fit for a long-term lender such as the Bank. The growth in these types of project will depend on network companies' investment plans and national regulatory frameworks.

[43-44.](#) The Bank will give high priority to projects that will enable the integration of renewables (connection, increase in maximum hosting capacity, reduction of curtailment, etc.) and infrastructure that will be needed to support the development of electromobility and of decentralised flexibility sources connected to distribution networks. The Bank will support the development of energy communities and microgrids, enabling investment in new types of energy infrastructure, including in small isolated systems. This may include, in particular, projects increasing the degree of automation, digitalisation and "smartness" of power systems.

[44-45.](#) In countries outside the EU, the action of the EIB focuses on access to electricity as a fundamental requirement for economic development and regional integration.

Supporting the transition to low-carbon gas networks

[45-46.](#) The Bank will support projects that are designed to connect networks to new sources of production of low-carbon gases. In addition, the Bank will also support investments designed to adapt existing infrastructure towards a credible and imminent high blend of low-carbon gases. ~~However,~~ As set out in Chapter 3, from 2021 onwards the Bank will no longer support investment in other natural gas infrastructure.

Heat networks

[46-47.](#) District heating networks can play an important role in certain markets both in the EU and outside the EU, and can be used by decarbonised sources of heat supply. The Bank will continue

²¹ Communication on strengthening Europe's energy networks, COM(2017) 718.

to finance the expansion and rehabilitation of these networks under the conditions set out in Annex IV. In parallel to its financing, the Bank is providing project preparation and implementation support to public authorities and promoters developing strategies to decarbonise district heating systems.

47-48. Outside the EU, the EIB will continue to work with the EC and other partners to develop and implement programmes to deliver energy efficiency finance and capacity building technical assistance for district heating, notably in the partner and southern and eastern neighbouring countries.

DRAFT

ANNEXES

EIB ENERGY LENDING POLICY

Supporting the energy transformation

Revised draft

Introduction

These annexes provide further details on the Bank's energy lending policy. The first four annexes refer to the themes outlined in the main report. Each is structured in a similar manner. Section 1 defines the classes of projects that the Bank will seek to support. Based on the rationale presented in Chapter 3 of the main document, the second section indicates those types of projects that the Bank sees as providing a particularly high level of support to the Bank's energy lending policy. Finally, Section 3 sets out specific technical and economic criteria that the Bank will apply in general when appraising a particular type of project. Please note that this is not exhaustive, and as part of its due diligence process the Bank's technical team reserves the right to require additional criteria on a case-by-case basis.

Note that these annexes present information which is additional to the general requirements of the Bank, covering the Bank's [Guide to Procurement](#), [Environmental and Social Standards](#), [Carbon Footprinting](#) methodology, the [Economic Appraisal](#) of projects, or the projects which are recorded by the Bank as contributing to [Climate Action](#). Please note this latter point may be adjusted in due course with the ongoing work within the EU on [Sustainable Finance](#).

The final annex presents an update of the Bank's cost of carbon. This will replace Annex 2 of the Bank's Climate Action Strategy.

Technical changes to these annexes may be made over time. If so, the revised version will be uploaded in due course onto the dedicated Bank webpage.

Annex I: Energy efficiency

This annex covers energy efficiency in buildings, industry and SMEs, public lighting, cogeneration. It does not cover energy efficiency in transport.

1. Eligibility

In principle, the Bank can support the following types of projects:

- Renovation projects which improve the energy performance of existing buildings;
- For new constructions, buildings exceeding minimum regulatory requirements, promoting best market practice and in addition contributing to wider public policy goals such as urban regeneration, education, public research or the provision of healthcare services;
- Investments in public lighting, industrial facilities and SMEs motivated by energy efficiency.

Please note that the Bank's criteria for considering co/tri-generation and district heating as energy efficiency projects are presented in Annexes II and IV respectively.

The same criteria apply both inside and outside EU. However, in order to establish a relevant baseline, it may be necessary to carry out detailed analysis of the minimum requirements and/or applicable market standards in certain jurisdictions.

In order to provide specific technical criteria, detailed eligibility rules for different energy efficiency sub-sectors are provided in section 3.

2. High contribution to ELP

When appraising projects, the Bank will deem the following types of projects to have a high alignment with EIB lending policy:

- Renovation of the existing building stock. The rate of building renovation remains very low (at around 0.4% to 1.2% per year), while a rate of around 2% to 3% per year would be needed to accomplish the Union's EE ambitions;
- Integrated innovative building measures, based on their innovative nature.
- Energy efficiency in SMEs. Collectively SMEs represent one of the largest untapped markets for EE measures, due to the fragmentation and small scale of the investments, lack of internal sector expertise, insufficient information and limited access to suitable financial products;
- Outside the EU, projects which contribute to increasing energy efficiency in line with Nationally Determined Contributions (NDCs) under the Paris Agreement.

3. Technical and economic assessment criteria

SECTOR	SUB-SECTOR	CRITERIA
Buildings	Renovations of existing buildings inside the EU	<p>Eligibility: All capital expenditure related to energy efficiency improvements to the building envelope and building systems. The expected energy savings can be estimated through an energy audit, comparison between the energy performance certificate before and after the works, or any other transparent and proportionate method acceptable to the Bank.</p> <p>National energy performance standards for buildings comply with the EPBD, i.e. are in line with the cost optimum level. Project promoters must ensure that their renovation measures are compliant with national energy performance standards.</p> <p>Economic assessment: In the case of investment loans, the Bank's economic assessment is based on a cost-benefit analysis that includes energy savings and reduction in GHG emissions [tier 1 benefits], but also other economic benefits such as the extension of the economic life and reduction in maintenance costs [tier 2 benefits], when they are measurable and quantifiable. In the case of bank-intermediated operations, the economic case is assumed ex-ante to be met on the basis of the cost optimality of the national standard.</p>
	New construction inside the EU	<p>Eligibility New buildings are eligible for Bank support as energy efficiency projects if (i) the energy performance of the building will exceed minimum regulatory requirements with the aim of achieving best market standards. The definition of these standards will be refined in the future when the taxonomy for sustainable finance is formally finalised; and (ii) the building contributes to increasing the stock of housing or wider public policy goals such as urban regeneration, education, public research or the provision of healthcare services.</p> <p>Economic assessment: In the case of investment loans, the economic assessment is based on adjusting the financial returns, considering the economic value of the heat and electricity saved and the externalities – CO₂ savings and security of supply – and whenever possible, other benefits related to energy savings, such as lower maintenance costs, longer asset life, thermal comfort benefits, improved working environment, or higher employee productivity. The expected energy savings will derive from a comparison between the expected performance of the new building and the minimum regulatory requirements for new construction. In the case of intermediated operations, simplified methods are applied.</p>
	Renovations and new construction outside the EU	<p>Eligibility: Projects are required to adopt best energy standards as compared to a baseline which will be defined on a case-by-case basis by the Bank's services through a transparent, practical method, such as the IFC's EDGE tool. The Bank will also consider partial energy efficiency eligibility for less ambitious buildings, based on evidence of energy-related individual measures. New buildings should contribute to other public policy goals, such as housing, urban regeneration, education, public research or the provision of healthcare services.</p> <p>Economic assessment: As per inside EU.</p>

Public lighting projects		<p>Eligibility: Investments to improve the energy performance of public lighting are eligible. Extension or construction of new public lighting systems is generally excluded. Only measures identified by an energy audit carried out in line with EN 16247 (or another equivalent standard) are eligible.</p> <p>Economic assessment: A cost-benefit analysis that includes the multiple benefits of energy efficiency, when they are measurable and quantifiable, and the externalities. The expected energy savings will derive from a comparison with the baseline.</p>
Industrial facilities and SMEs	Energy efficiency improvements	<p>Eligibility: The investment is eligible as energy efficiency if it is primarily motivated by energy savings and will not increase the capacity of the facility significantly.</p> <p>Energy savings must be defined on the basis of either:</p> <ul style="list-style-type: none"> • an energy audit (in line with the European Standard EN 16247 Energy or equivalent), or • compliance with a white certificate scheme, or • a list of measures set up by the EIB or any other transparent and proportionate method acceptable to the Bank that shows the improvement in energy performance <p>Capacity is deemed not to have increased significantly if the overall GHG emissions of the industrial facility will not increase as a result of the project. In other words, any increase in emissions resulting from the increase in capacity needs to be fully offset by emissions savings from the energy efficiency measures on the existing capacity.</p> <p>Economic assessment: A cost-benefit analysis that includes the multiple benefits of energy efficiency, when they are measurable and quantifiable, and the externalities. The expected energy savings will derive from a comparison with the baseline.</p>

Annex II: Energy supply

This annex covers the generation of power and heat, as well as the production of fuels, from renewable²² and low-carbon energy sources. Please note that small-scale ~~RES^{23,24}~~, decentralised energy and innovation projects²⁵ are included in Annex III.

1. Eligibility

In principle, the Bank can support the following types of projects:

- ~~Power and heat generation~~ CHP resulting in GHG below an emission standard set out below;
- ~~Heat production from low-carbon energy~~ renewable sources. Production using fossil fuels would only be eligible if combined with abatement technology;
- ~~Power and heat generation from high efficiency gas-fired CHPs;~~
- Efficient gas-fired small boilers applicable for buildings or SMEs;
- In the case of nuclear, in addition to power generation, the entire nuclear fuel cycle, decommissioning and waste management;
- Production and storage of gaseous, liquid and solid energy carriers from low-carbon energy sources;
- Supply of Critical Raw Material (CRM) in the EU needed for low-carbon technologies.

For the avoidance of doubt, exploration and production of non-renewable energy sources is not eligible. Petroleum refineries would only be eligible subject to meeting the energy efficiency criteria set out in Annex 1.

2. High contribution to the ELP

When appraising projects, the Bank will deem the following types of projects to have a high alignment with EIB lending policy:

- Within the EU, projects involving core aspects of the renewable energy directive, including market integration, community schemes, the European renewable energy financing mechanism and cross border aspects;
- The scaling-up of low-carbon technologies at an early-stage of deployment;
- Flexible combined heat and power (CHP);
- Outside EU, projects contributing to increasing the share of renewables in line with Nationally Determined Contributions (NDCs) under the Paris Agreement.

²² The Bank defines renewable energy sources in accordance with Article 2 of Directive (EU) 2018/2001, i.e. as “energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic) and, geothermal energy, ambient energy, tidal, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases.”

²³ ~~Following the tendering threshold established under paragraph 127 of the Commission Guidelines on state aid for environmental protection and energy, small-scale is defined as installations with an installed electrical capacity of less than 1 MW (and 6 MW of 6 units for wind energy).~~

²⁴ Following the tendering threshold established under paragraph 127 of the Commission Guidelines on state aid for environmental protection and energy, small-scale is defined as installations with an installed electrical capacity of less than 1 MW (and 6 MW of 6 units for wind energy).

²⁵ This annex covers mature technologies – i.e. those that have reached [Technology Readiness Level](#) 9. Innovative projects, with a lower technology readiness level, are covered in Annex III.

3. Technical and economic assessment criteria

SECTOR	SUB-SECTOR/ISSUE	CRITERIA
Power generation	Low-carbon energy sources <u>Emission Standard</u>	Only In general, the Bank will only support power generation projects which emit less than 250 gCO ₂ e per kWh. This criterion applies to all technologies including to power generation based on low-carbon energy sources is eligible for Bank support. Depending on local conditions, some renewable technologies can be associated with GHG emissions, (e.g. geothermal, large-scale hydro, biofuel or biomass. The Bank will not), Carbon Capture and Storage (CCS) or using a high proportion of low carbon fuels, combined heat and power (see below) and decentralised energy sources (see annex III). As an exception to this general rule, the Bank will support a renewable power gas-fired power plants which provide a credible plan to blend increasing shares of low-carbon gas over the economic lifetime of the project which results in emissions of more than 250 gCO₂-equivalent per kWh, such that the emission standard above is met on average.
	Economic assessment	<p>The Bank's standard assessment compares the net present value of the social costs associated with the project to the benefits of the power generated, estimated through the long-run marginal social cost to the system, with adjustment where appropriate for profiling and system adequacy. The costs estimate includes the external costs associated with greenhouse gas emissions and local air pollutants.</p> <p>This framework can also be used to estimate the benefit from storage (see Annex 3). Short-term balancing, flexibility and power quality services (voltage control) are typically estimated from market evidence.</p> <p>In general, the economic cost of the project will include the investment in the network required to export power. Note that this may differ from the fixed cost associated with wider system reinforcement.</p> <p>The Bank does not follow this approach in two cases. Firstly, with respect to renewable energy technologies which in general are at an early stage of development – see the section below. Secondly, in the case of projects generating power from waste, the Bank assesses the economic case based on the cost efficiency of waste treatment required by the relevant EU waste directives.</p>
Additional requirements for renewable energy sources	Resource assessment (all RE sub-sectors)	<p>The Bank requires an adequate resource assessment, conducted by qualified specialists. In the case of project finance, this will typically necessitate an independent study or review of the promoter's study, i.e. conducted by a party other than the promoter. This includes a careful consideration of the resource uncertainty. In the case of wind and solar, the study should also address the likely variation in the pattern of resource on a daily and seasonal basis (e.g. 24/12 study showing average hourly output by month or season).</p> <p>Additional criteria apply for certain renewable energy sub-sectors, as specified in the rows below.</p>
	Biomass	<p>The Bank requires all projects to be compliant with sustainability of biomass sourcing and greenhouse gas emissions saving criteria laid down in Directive (EU) 2018/2001. Additional criteria may be required by the Bank on sustainability and security of biomass supply.</p> <p>In the case of power only projects, the Bank's experience is that these projects often do not meet the Bank's economic test (see above).</p>

	Waste to energy	Inside the EU, energy production from waste must be compatible with the objectives of the EU Circular Economy package and be supported by relevant national and regional waste management plans approved by public authorities. Outside the EU, equivalent principles apply.
	Geothermal	<p>In general, the Bank is not able to finance standalone exploration activities, though these costs may be eligible as part of a geothermal production project.</p> <p>Artificial stimulation and resulting environmental impacts will be closely scrutinised by the Bank on a case-by-case basis, including heightened scrutiny of environmental and water management, and the capability of robust ongoing regulatory oversight.</p>
	Competitive renewable energy technologies	The Bank closely follows the development of costs within the renewable industry. It deems a renewable technology to be competitive when it is likely to meet the Bank's standard economic test on sites with good resource availability. The Bank deems the following technologies to be cost competitive: onshore wind, hydropower, solar photovoltaic, conventional biomass and conventional geothermal.
	Renewable energy technologies at an early stage of deployment	<p>The Bank recognises that many renewable technologies are not yet cost competitive but, since they have not been deployed at significant scale, have untapped potential to reduce costs substantially over the medium term and become competitive.</p> <p>For these technologies, since learning benefits²⁶ cannot be quantified within the context of an individual project, the Bank will not run the standard economic test and will instead presume in favour of their economic case.</p> <p>However, in the case that the cost of the project appears significantly higher than other uses of the same technology, the Bank may decide not to support a project solely on economic grounds. This analysis will also consider the impact of the project on local electricity prices.</p> <p>The Bank deems offshore wind and concentrated solar power to be technologies at an early stage of deployment. It will closely follow the further development of offshore wind as this technology may be considered competitive in a few years once there is sufficient evidence of it being so from completed projects across various geographies.</p> <p>For these technologies the Bank will calculate the levelised cost of electricity (LCOE) of projects for comparative purposes and for keeping track of their progress.</p>
Nuclear power	Regulation	<p>Nuclear projects require a positive opinion from the European Commission in accordance with Articles 41-43 of the EURATOM Treaty. This de facto prevents the Bank from supporting nuclear projects outside the EU.</p> <p>The Bank reviews the legal framework in the host country of the project including the implementation of the relevant international conventions and treaties. The Bank will assess the legal, regulatory and institutional framework in relation to nuclear safety, security, safeguards, licensing, liability for nuclear damage and sector regulation. Nuclear projects are likely to present particularly complex environmental and social issues especially because of the wide range of potential impacts and the large number of stakeholders and authorities involved. Projects will be</p>

²⁶ For a comprehensive survey of learning rates, see JRC Technical Report (2018), Cost development of low-carbon energy technologies: scenario-based cost trajectories to 2050.

		carefully assessed in terms of their compliance with relevant international, EU and national legislation and regulations.
	Technical	<p>The selection and design of the nuclear technology will be agreed between the promoter and the regulatory authorities. The Bank will nonetheless require promoters to demonstrate that</p> <ul style="list-style-type: none"> the proposed technology is compliant with the license obligations (including safety and environmental obligations) and the IAEA safety standards; it is the best available technology (in line with the EIB's normal procedures); and that the promoter has the capability and experience to safely implement the project and operate the nuclear facility after project implementation. <p>The Bank appraisal will have to address the full fuel cycle, including handling of spent fuel and radioactive waste and in some cases re-processing and cross-border transportation of radioactive materials. The Bank will review the promoter's spent fuel and radioactive waste management plans including the final disposal solution and assess their alignment with best practices and national and international standards and regulations.</p>
	Economic assessment	The Bank's economic assessment will include the costs associated with the full fuel and project cycle including waste and spent fuel management as well as decommissioning costs. Although difficult to estimate, the Bank will also seek to include appropriate contingencies for construction cost overruns and the costs of nuclear accidents in excess of the costs covered by the promoter.
Heating and cooling; co/tri-generation	Renewable sources <u>Technology</u>	In general, only projects using renewable energy sources are eligible for Bank support. All the technical criteria set out above with respect to renewable energy for power generation apply equally to heat production; including a threshold on GHG emissions. However, as an exception to this general rule, gas-fired co/tri-generation projects may be eligible as energy efficiency projects – see below. <u>In addition, efficient gas-fired small boilers applicable for buildings or SMEs will be eligible where in line with the EU Eco-Design Directive, or appropriate standards outside the EU.</u>
	Economic assessment	In the case of heating or cooling production, the Bank compares the project against the least cost economic alternative, taking into account all relevant external costs. In the case of cogeneration, the Bank will compare the project against the separate generation of power and heat.
High efficiency co/tri generation	Contribution to energy efficiency	<p>To be considered by the Bank as an energy efficiency investment, the project will need to meet both criteria listed below. Calculations will be made using the methodology for high-efficient cogeneration as provided by the EED and its related Decisions 2011/877/EU and 2008/952/EC:</p> <ol style="list-style-type: none"> At least 50% of generated electricity comes from high-efficiency cogeneration, i.e. at least 50% of generated electricity is cogenerated and Primary Energy Savings (PES) for this cogenerated electricity and useful heat reach at least 10% (principal criterion); At least 5% net PES is achieved on an annual basis for the entire generated electricity and useful heat (additional safeguarding criterion).

		<p>Recovery of industrial waste gas or heat is considered to be energy efficient and therefore not subject to the minimum efficiency requirements of the Directive.</p> <p>In the case of gas-fired co/tri-generation, the project is eligible for Bank support if it results in emissions in the production of power of less than 250 g CO₂ per kWh_e. <u>GHG emissions are allocated between heat and power on using the basis of the published EIB Methodology for the Assessment of Project GHG Emissions heat bonus approach.</u></p>
Production of fuels from low-carbon energy sources, including alternative energy carriers such as synthetic fuels or hydrogen	Economic assessment	<p>Projects involving the production of biofuels will be assessed according to the methodology set for biofuels in the “Economic Appraisal of Investment Projects at the EIB”. New carriers in general will be subject to similar economic tests. If the scope of a project also entails environmental services these will also be taken into account.</p> <p>For technologies that are still at an early stage of deployment, the Bank will assume that the long-term economic case can justify higher initial costs under certain conditions on a case-by-case basis. The Bank will also treat synthetic gas from non-biogenic sources (e.g. renewable hydrogen) as such.</p>
	Technical requirements	<p>All projects will have to comply with the sustainability and GHG emission savings criteria of Directive (EU) 2018/2001 and Directive (EU) 2009/30. The technologies considered should demonstrate {acceptable} energy conversion efficiency. For projects outside the EU, equivalent principles will apply.</p> <p>For projects based on biomass feedstock, additional criteria may be required by the Bank on sustainability and security of biomass supply and independent resource assessments by qualified specialists will be required. Projects involving the use of wastes for the production of energy or fuels will have to demonstrate alignment with the circular economy strategy of the EU and the relevant national and regional waste management plans.</p>

Annex III: Innovation and new types of energy infrastructure

This annex covers (i) research and innovation in energy, including the commercial demonstration of innovative technologies, and (ii) new types of energy infrastructure.

1. Eligibility

The Bank is able to consider supporting the following types of projects:

- Corporate or national RDI programmes;
- Commercial demonstration of innovative technologies, including both demonstration projects and innovative manufacturing processes;
- All technologies are eligible for innovation financing including renewables, carbon capture and storage, nuclear fission and fusion;
- New types of energy infrastructure including batteries, demand response, market participants engaged in aggregation, electrification of transport, heating, digitalisation projects in the energy sector. More generally, all projects that contribute towards sector coupling and increased flexibility of energy systems can be considered.

Given the potential for innovation in the energy sector, the EIB will consider supporting other technologies, new energy infrastructure and business models compatible with the Paris Agreement and the EU ~~policy objectives~~long-term net-zero emission objective.

2. High contribution to EIB lending policy

When appraising projects, the Bank will deem the following types of projects to have a high alignment with EIB lending policy:

- Projects supporting the aims of the SET Plan, including the RDI activities and projects identified through the Implementation Plans;
- Innovation and industrialisation of key energy transformation technologies in Europe: pilot and demonstration plants, or initial full-scale commercial production lines related to breakthrough technologies supported under the SET Plan / Horizon Europe, such as promising innovative renewable energy and storage technologies;
- Deployment of innovative technologies or technologies at an early stage of deployment or business models that can be scaled-up;
- New business models associated with decentralised and small-scale technologies for the decarbonisation of energy by end-users;
- Projects consisting in aggregating small renewable and flexibility sources;
- Outside the EU, projects increasing access to energy with mini-grids and off-grid solutions.

3. Technical and economic assessment criteria

SECTOR	SUB-SECTOR	CRITERIA
Innovation	Innovation, general	<p>The Bank will seek to support technologies which demonstrate significant innovation compared to the state of the art.</p> <p>The promoter should demonstrate the ability to</p> <ul style="list-style-type: none"> (i) reach financial close with the required equity contribution (as applicable), (ii) deliver a sound project on budget and on time and (iii) commercialise and replicate the technology further in order to achieve meaningful GHG emission reduction. <p>In the cases where public support is necessary for RDI operations, for example through RDI grants or support for innovative projects with special support schemes (e.g. feed in tariffs), it is expected that projects are presented to the Bank with sufficient comfort that such support will be in place²⁷.</p>
	Commercial demonstration of innovative technologies and manufacturing processes	<p>Technologies should have been demonstrated at scale and be about to enter into commercialisation, i.e. Technology Readiness Level 7 or 8. The promoter should present the technology development track record, preferably with audited data and certifications. For RES technologies, projects need to conform to the criteria presented in Annex II.</p> <p>In the case of initial full-scale commercial production lines, projects should be related to breakthrough technologies supported under the SET Plan and Horizon Europe, such as promising innovative energy efficiency or renewable energy and storage technologies (e.g. Power-to-X).</p>
New types of energy infrastructure and decentralised energy sources	General	<p>The Bank will seek to support new types of energy infrastructure that are at an early stage of deployment and suffer from a lack of investment compared to EU objectives. For new energy business models, attention will be paid to the regulatory and contractual framework enabling the delivery of the flexibility service and justifying the new nature of the business model.</p>
	Economic assessment	<p>Similar to the approach taken in Annex II for renewable energy technologies at an early stage of deployment, given the difficulties in assessing learning benefits, the Bank will presume in favour of the economic case for new energy infrastructure projects when there is a new feature associated with the technology, the revenue streams or market rules. However, the Bank will benchmark costs or expected revenues of individual projects before deciding to support them.</p> <p>The same approach holds for decentralised energy sources. The Bank will benchmark the levelised and unit costs at the portfolio level.</p>
	Battery storage	<p>The proposed technical solutions must fit with the product or service to be provided: chemistry and sizing of batteries must be consistent with the technical, regulatory and market needs.</p>

²⁷ Both the State Aid Guidelines for Environmental Protection and Energy (2014/C 200/01, par. 3.3.2.1) and the new Renewable Energy Directive (2018/2001, art. 4) give sufficient flexibility to Member States to exempt demonstration projects from tendering procedures.

	Demand response	The Bank will finance components related to hardware, software and installation, at the exclusion of commercial and consumer acquisition costs.
	Electrification/ sector coupling	The project needs to show the benefit in terms of decarbonisation or flexibility for the energy sector.
	Digitalisation	For digital components including applications, platforms, communication and hardware components, the technology solutions must be proven or have reached adequate technology readiness.
	Decentralised energy sources	<p>Please see footnote 3 in Annex II for the definition of small-scale projects. Additional technical requirements: <u>for decentralised energy projects, (including isolated and small-sale renewable or hybrid projects):</u></p> <ul style="list-style-type: none"> - Individual investments in power generation must comply with the EIB Emission Performance Standard result in GHG emissions of power of less than 250 gCO₂ per kWh. - Distributed off-grid systems need to provide an acceptable e-waste handling strategy (outside EU) - For rooftop PV: state-of-the-art technology and components and efficient resource utilisation.

Annex IV: Enabling infrastructure

This annex covers (i) electricity grid infrastructure, (ii) gas infrastructure and (iii) district heating and cooling networks. Please note that dedicated CO₂ infrastructure is regarded as part of a CCS project and thus considered in Annex III.

1. Eligibility

The Bank is able to consider supporting the following types of projects:

- All electricity transmission and distribution infrastructure, with the exception of direct connection of generating capacity based on coal and lignite;
- In the case of gas infrastructure,
 - a. connection to new sources of low-carbon gases
 - b. adaptation of existing infrastructure towards a credible, imminent use of a high blend of low-carbon gases
- District heating and cooling infrastructure.

For avoidance of doubt, oil infrastructure is not eligible for Bank support, nor gas transmission (including LNG terminals²⁸ and storage) and distribution networks, with the exceptions mentioned above.

2. High contribution to EIB lending policy

When appraising projects, the Bank will deem the following types of projects to have a high alignment with EIB lending policy:

- Improvement of flexibility of the power system;
- Digitalisation, smart grid investments;
- Promotion of energy communities and microgrids;
- EU Projects of Common Interest with significant benefits in terms of decarbonisation;
- Outside EU, projects which significantly expand and improve access to electricity.

²⁸ In line with paragraph 12 of the Introduction to the ELP, this statement does not cover transport infrastructure dedicated to alternative fuels, which falls under the Bank's transport lending policy.

3. Technical and economic assessment criteria

SECTOR	SUB-SECTOR	CRITERIA
Electricity networks	T&D general	<p>Technical requirement:</p> <ul style="list-style-type: none"> - Planning for network infrastructure must be carried out in line with best industry practice. The design of networks must be sound to ensure reliable and safe operation. - For technologies with limited or no operational experience, qualification tests must be successful and carried out according to industry standards. - Replacement and lifetime extension of assets must be driven by the consideration of performance and remaining economic life. - Distributed off-grid systems need to provide an acceptable e-waste handling strategy (outside EU). <p>Economic assessment: All projects should be economically justified based on the EIB methodology. For this purpose, the promoter needs to provide sufficient quantitative information to assess the effect of the project on the system generation cost, network losses, energy not served, demand served, renewable capacity connected, curtailment of RES and CO₂ emissions. When several feasible alternatives exist, the promoters will need to provide evidence that the retained alternative will be the most cost-effective.</p>
	Projects of Common Interest	<p>Economic assessment: The promoter needs to provide the Bank with a cost-benefit analysis for the project (for instance ENTSO-E CBA used for TYNDP) including variation in social economic welfare, CO₂ emissions, security of supply and congestion costs/rents. The Bank will review this analysis and potentially adjust the results to account for the Bank's assumptions, notably on carbon cost and fuel costs.</p>
Gas infrastructure	<u>Low-carbon gases integration</u>	<p>The Bank will support connections to new sources of low-carbon gas, or the adaptation of existing infrastructure towards a credible, imminent use of a high blend of low-carbon gases.</p>
	<u>Projects of Common Interest</u>	<p>Regulatory: <u>The project must be included in the 4th list of projects of PCIs, co-funded by the EC under the Connecting Europe Facility (CEF), and approved by the EIB Board before end 2020.</u></p> <p>Technical requirement: <u>Planning and design for network investments must be carried out in line with best industry practice.</u></p> <p>Economic assessment: <u>The promoter needs to provide the bank with a cost benefit analysis for the project (for instance ENTSG CBA). The Bank will review this analysis and potentially adjust results to account for the Bank's assumptions, notably of carbon cost and fuel costs.</u></p>
District heating/cooling networks	Eligibility	<p>The Bank will support the rehabilitation or extension of existing networks, or construction of new networks if, <u>as a result of the project, there will not result be no increase in any generation of heat from</u> combustion of coal, peat, oil or non-organic waste. <u>This criterion should apply to each and every year of operation of the project. – on an annual basis.</u></p> <p>Note that the production of heat is covered in Annex II. Thermal storage facilities are considered to be a network investment.</p>
	Economic assessment	<p>For new and extended networks, the Bank compares the cost of the project against a least-cost alternative form of individual heat supply, including all externalities. For rehabilitation, the Bank compares the costs to the expected savings.</p>

	Contribution to energy efficiency	In order to be considered by the Bank as contributing to energy efficiency, the project will need to be part of an “efficient district heating and cooling system”, as defined in the EU energy efficiency directive.
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Annex V: Carbon pricing

Summary

The Bank's carbon prices are shown in the Figure below.

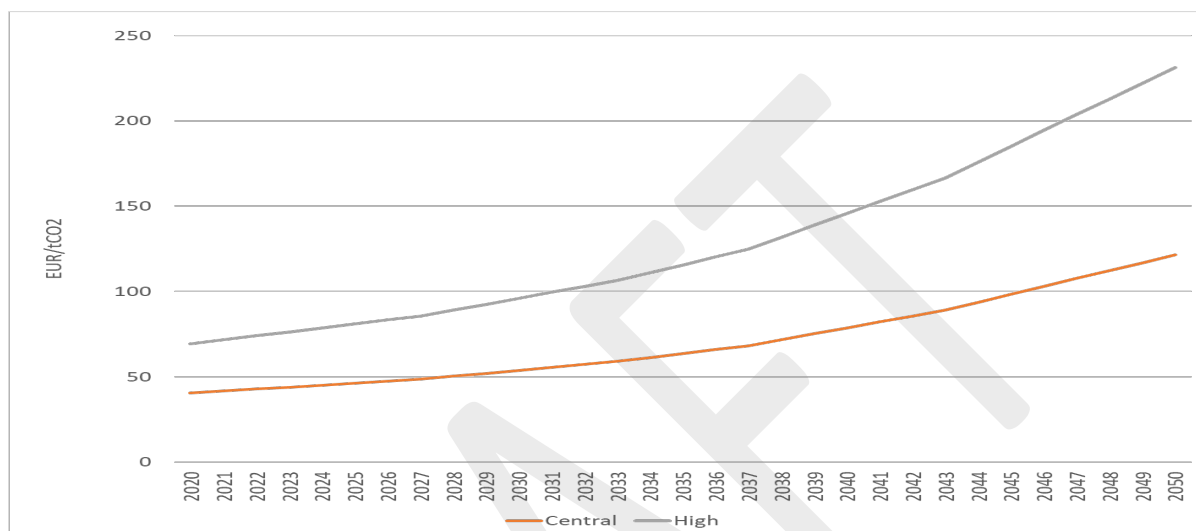


Figure 1 EIB carbon prices

Background

As set out in the Bank's guide to the [Economic Appraisal of Investment Projects](#), the cost of GHG emissions and air pollutants is systematically incorporated into the economic assessment of energy projects. The Bank began to integrate these costs into energy project assessment during the 1990s, and has periodically reviewed its approach subsequently. Most recently, as part of the Bank's [Climate Strategy](#), cost estimates up to 2050 were adopted. This included a range of values: high, central and low, though in practice the Bank did not apply the low values.

These values predate the Paris Agreement. In particular, in 2017, a [High Level Commission on Carbon Prices](#) (HLCCP), under the co-chairmanship of Professor Joseph Stiglitz and Lord Nicholas Stern, published a report²⁹ designed to identify indicative corridors of carbon prices that can be used to guide the design of policy to help deliver the temperature targets. The Commission concludes (p. 3) that: *"the explicit carbon-price level consistent with achieving the Paris temperature target is at least US\$40-80 t/CO₂ by 2020 and US\$50-100/tCO₂ by 2030, provided a supportive policy environment is in place."* The range of values is well aligned to the EIB's central to high range of carbon values. As a result, in line with the evidence on alignment with the Paris Agreement³⁰, the Bank will discontinue reporting the lower value, and **henceforth only apply and report carbon costs within its central to high range**. This is shown in Figure 1 above.

²⁹ High-Level Commission on Carbon Prices. 2017. Report of the High-Level Commission on Carbon Prices, Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO. The report is available at <https://www.carbonpricingleadership.org>

³⁰ The HLCCP results are based on a 2 degree target. As discussed below, the Bank will continue to monitor the evidence around carbon pricing consistent with the Paris temperature targets and adjust as necessary in the context of any future climate activities-revision to its Climate Strategy.

In order to understand how these values are incorporated in practice into the economic assessment of energy projects, it is important to stress three points.

Firstly, the Bank will continue to work with a range of values – from the central to the high values. As discussed in the 2013 Guide to the [Economic Appraisal of Investment Projects](#), the Bank uses a high price of carbon to appraise the economic case for low-carbon projects, thus only screening out competitive technologies³¹ if a cost of carbon above the high value is required to justify the economic case for the project. By contrast, for conventional technologies, the central value is used, i.e. a project would be screened out if a cost of carbon below the Bank's central value is required to justify the economic case for the project.

Secondly, it is important to stress that the Bank's cost of carbon estimates provide a reference point. The way in which values are applied to the appraisal of a particular project in practice depends in general on the policy setting. As set out in the 2013 Guide, the cost-benefit analysis of an energy project needs to account for the degree to which the external costs of the project have already been internalised through policy measures. For example, in principle, if the consumer price of heat and electricity were to incorporate a tax on carbon emissions equal to the Bank's carbon value, there would be no need to adjust the financial return of the project for GHG externalities. In the absence of any other external costs or benefits, the financial rate of return of the project would approximate the economic rate of return. This is rarely the case in practice – and hence careful attention is required in principle to adjust financial flows into economic flows in light of the regulatory framework of the project. This might include the presence of a tradeable permit scheme such as the European ETS³², potentially combined in some countries with a floor on the carbon price³³, national or regional renewable energy and energy efficiency targets³⁴, as well as subsidies for fossil fuels more generally.

Thirdly, and following on from the last point, the Bank needs on occasion to use long-term forecasts of ETS prices for the financial appraisal of energy projects in the EU. It does this based on a review of a range of forecasts from specialised consultancies and scenarios from relevant energy bodies (e.g. ENTSO-E). Given its occasional role of monetising allowances on behalf of other parties, however, the Bank does not make these forecasts public.

The Bank will continue to monitor this field closely, including working closely with other MDBs to ensure a consistent approach towards the cost of carbon.

³¹ See Annex II for more details on the economic assessment of power generation technologies.

³² For a discussion on the differences between carbon taxes and tradeable permits, see Chapter 3.6 of Cost-Benefit Analysis (2018) by Per-Olov Johansson and Bengt Kriström, or Jorge-Calderón, D. and Johansson, P.-O. (2017) Emissions trading and taxes: an application to airport investment appraisals, *Journal of Transport Economics and Policy*, 51, 249-265.

³³ For a review of the discussion on a carbon floor price within the EU, see David Newbery et al. (2019) The Political Economy of a Carbon Price Floor for Power Generation, *The Energy Journal*, 40(1). From a cost-benefit perspective, this article provides an overview of some of the wider market distortions present in the power generation market – and links well with the discussion on additionality in the section on the general approach of the new policy above.

³⁴ There is a long tradition of considering cost-benefit analysis in a second best setting – see Johansson and Kriström cited above. In the case of power markets, there are often several instruments targeting one – or potentially more – externalities. For example, an optimal carbon tax or tradeable permit price will also depend on the number of (overlapping) instruments being applied – as recognised by HLCCP (2018), Stern (2006) or Bohringer (2009).

EIB energy lending policy

Supporting the energy transformation



European Investment Bank
98-100, boulevard Konrad Adenauer
L-2950 Luxembourg
☎ +352 4379-22000
✉ +352 4379-62000
www.eib.org – info@eib.org