



Towards EU climate neutrality

Progress, policy gaps and opportunities

Chapter 12: Finance and investments

Assessment Report 2024

Contents

- 12 Finance and investments 5**
- Key messages5
- 12.1 Context, scope and overview8
- 12.2 Progress on climate-related investments9
- 12.3 Fossil fuel subsidies 13
- 12.4 Mobilising the EU budget 14
- 12.5 Mobilising national budgets 17
- 12.6 Mobilising private finance..... 18
- 12.7 EU green bond market 21
- 12.8 Summary table..... 23

12 Finance and investments

Key messages

As an estimate, investments in clean energy and transport need to at least quadruple to achieve the EU's climate goals. This can be achieved by increasing the absolute level of investments in these sectors towards an annual average of EUR 1 241 billion (an increase of about EUR 500 billion) and reorienting all existing investments in these sectors towards mitigation technologies.

Needs. The European Commission's modelled scenarios estimate that investments related to mitigation in energy and transport sectors need to reach an average annual level of about EUR 1 241 billion over 2021–2030, to achieve the EU's climate objectives. According to recent research (IPCC, EIB, Bloomberg New Energy Finance (BNEF)), only a small share of current investments in energy and transport is climate related (about EUR 200–300 billion per year). Given this evidence, the Advisory Board estimates that investments in mitigation technologies in energy and transport need to increase by at least a factor of four (as illustrated in Figure 77 below), through a combination of increasing total investments in energy and transport (by at least EUR 500 billion annually) and redirecting existing finance flows towards mitigation technologies. Given the size and scope of the investment gap, a concerted effort by both public and private sectors is required.

Gaps. The above estimates are based on a variety of sources with different scopes and levels of granularity. Currently, there is insufficient information available on the investments required to fund the transition towards climate neutrality. There is also a lack of available indicators to track progress at the sectoral level. This knowledge gap is mainly due to the lack of a harmonised methodology for identifying and estimating climate-related investment needs (**policy gap**).

Recommendation F1. The EU should strive for a more granular and accurate overview of required and actual investments in climate mitigation to monitor and assess progress. Specific recommendations on how to effectively increase both public and private climate investments are included in the key messages below.

Fossil fuel subsidies need to be phased out completely and urgently. The share of subsidies that is aimed at supporting vulnerable households should be well targeted, without undermining the incentives for energy efficiency and savings or the shift towards RES.

Needs. Fossil fuel subsidies hinder the reorientation of private financial flows towards climate mitigation and increase the risk of locking in GHG emissions. They also reduce the public budget available to support climate investments. Therefore, they need to be phased out rapidly, as also called for in the COP26 Glasgow Climate Pact, the European Green Deal and the 8th EAP.

Gaps. Despite repeated political commitments, EU State aid guidelines continue to allow fossil fuel subsidies (**policy inconsistency**). Fossil fuel subsidies remained relatively stable in the last decade (around EUR 50 billion per year), and even increased sharply in 2022 (to EUR 120 billion) in the context of the energy crisis. The 8th EAP requires the European Commission and Member States to set a deadline for the phasing out of fossil fuel subsidies consistent with the 1.5 °C objectives, but so far only a few Member States have enacted laws or set out clear plans that specify how and by when this will be achieved (**implementation gap**).

Recommendation F2. Member States should clearly specify in their updated NECPs how and by when they will phase out fossil fuel subsidies, including a clear trajectory towards a full phase-out by a specific year in the immediate future. The European Commission should assess during their review of these NECPs whether this requirement is met.

Support measures for vulnerable households that constitute a fossil fuel subsidy should be transformed into well-targeted interventions that do not undermine the incentive for energy savings or the shift towards RES (see also Section 11.4).

The EU budget aims to make a significant contribution towards reaching the required investments needed to reach climate neutrality. However, this is hindered by flaws in the methodology for tracking climate-related spending and by the lack of information about what happens after the RRF ends, which increases uncertainty.

Needs. The EU budget needs to contribute towards the EU's climate objectives, by supporting investments in climate action and avoiding investments in GHG-intensive activities (in other words, by climate mainstreaming). Furthermore, the EU has committed to spending at least 30 % of its long-term budget under the MFF and at least 37 % of the RRF on climate-related objectives. Combined, this corresponds to an estimated average of EUR 83 billion a year of EU public budget to be spent on climate action in 2021–2027.

Gaps. There are substantial flaws in the methodology applied to track the spending of the EU budget on climate action, which result in overestimating the EU budget's contribution towards the EU's climate objectives (**ambition gap**). These include the reliance on high-level coefficients in combination with overly optimistic assumptions about the climate impact of spendings (with the CAP a primary example), the lack of an *ex post* assessment of whether budgets planned for or committed to climate action were actually spent on that, and a lack of reporting about spending on activities that increase GHG emissions; such reporting would be in line with the 'do no significant harm' principle. The methodology applied under the RRF is more robust, as it is partially aligned with the EU Taxonomy to prevent harmful investments, but it still relies on coefficients in tracking climate contribution (**ambition gap**). Furthermore, the RRF itself is expected to cease after 2026 and it is not clear whether it will be succeeded by a similar instrument, reflecting a lack of long-termism (**policy gap**).

Recommendation F3. The reporting methodology to track climate spending under the EU budget should be improved to more accurately track expenditures that effectively contribute towards the EU's climate objectives. The reporting methodology should also track spending on activities that breach the 'do no significant harm' principle; for example, it could do this by aligning with the principles of the EU Taxonomy framework.

Recommendation F4. The EU should consider continuing the approach of the current RRF beyond 2026. The framework is financed by common debt and supports the EU budget, to boost EU public investment, strengthen the EU's sovereignty and accelerate the climate transition.

State aid rules have been relaxed to allow increased spending by Member States in response to the pandemic and the energy crisis. However, their fiscal space is constrained by increased demands on public expenditures, decreasing revenues and the fiscal rules set out in the Stability and Growth Pact. Member States' divergent fiscal headroom increases the risks of fragmentation in the single market. The EU's response to this risk (the Strategic Technologies for Europe Platform) has so far been inadequate.

Needs. In addition to the EU budget, Member States also need to increase their climate spending to close the investment gap. State aid rules need to strengthen the single market and support the further development of mitigation technologies, addressing the investment gap in the energy and transport sectors.

Gaps. The potential for increasing Member State borrowing to support investment needs related to the transition to climate neutrality is limited by the requirements of the Stability and Growth Pact. Despite calls from policymakers and experts to provide specific rules for climate-related public investments, the European Commission's recent proposal to reform the Stability and Growth Pact does not differentiate investments related to the climate transition (**ambition gap**).

In the meantime, the relaxation of State aid rules increases the risk of fragmenting the EU single market. Proposals from European Commission to address this (the proposed Strategic Technologies for Europe Platform, as a first step towards an EU Sovereignty Fund) include too limited a budget (EUR 10 billion compared with more than EUR 300 billion per year in State aid in 2021) to be sufficiently effective (**ambition gap**).

Recommendation F5. A rapid phase-out of fossil fuel subsidies (see recommendation F2) would increase Member States' revenues or reduce their expenditures, which could then be reoriented to finance climate investments. A structural common fiscal capacity based on a common debt (see recommendation F4) would help to mitigate the risk of fragmenting the single market.

The private sector will need to deliver most of the required climate-related investments. This needs to be driven by ambitious EU policies, to build a pipeline of bankable projects across the EU.

Needs. Given the magnitude of the investment gap and the difficulty of increasing (both EU and national) public spending on climate, the private sector will need to make a substantial contribution to achieve the required level of climate-related investments. This needs to be driven by sufficiently ambitious EU policies to improve the bankability of climate-related investments, and by tailored financing solutions. There is also a need for an effective policy mix that addresses standards and regulations, support infrastructure, faster issuing of permits, technical assistance and capacity building. Stable investment conditions and better use of public funds will play a key role in this respect (see also Chapters 4–10). Various policy options are discussed in other chapters of this report, and in particular in Chapters 4–9 on the different sectors and Chapter 10 'Pricing emissions and rewarding removals'.

Claims on sustainable investments need to be based on harmonised and science-backed frameworks.

Needs. Sustainable investments (taking into account environmental, social and governance (ESG) criteria) and green bonds have become increasingly popular in recent years. The increasing appetite of the market for these financial products can contribute to the financing of required climate-related investments, provided that they are based on credible and transparent sustainability criteria to avoid greenwashing.

Gaps. In the past, the environmental integrity and credibility of sustainable investments and green bonds could not be ensured, for lack of a harmonised, robust classification system. The EU aims to address this with the development of the EU Taxonomy framework in 2020, and the EU Green Bond Standard in 2023. While these are overall steps in the right direction, the EU Taxonomy labels certain fossil gas activities as sustainable. Despite the specific criteria, that increases the risk of fossil fuel lock-ins (**policy inconsistency**). Furthermore, whereas many private entities in the EU will have to report on the alignment of their investments and activities with the EU Taxonomy, there is no requirement to meet a minimum degree of alignment. Such alignment's contribution to shifting investments towards sustainable activities will thus primarily rely on investors' preferences. Similarly, the green bond standard is voluntary, and its effectiveness will therefore depend on whether bond issuers will choose to apply it in the future. So far, green bonds issued under NextGenerationEU are not necessarily aligned with the EU Taxonomy and the EU Green Bond Standard, which reduces transparency on the use of proceeds and can undermine credibility in the credit market, resulting in higher borrowing costs (**ambition gap**).

Recommendation F6. The regular updates of the TSC of the EU Taxonomy should lead towards full alignment of the EU Taxonomy with the climate neutrality objective and treat investments in natural gas as non-sustainable, to avoid the risk of creating lock-ins.

Recommendation F7. As a minimum, the European Commission should start to apply the EU Green Bond Standard to green bonds issued to finance NextGenerationEU, to strengthen reporting transparency on the use of proceeds and foster market confidence, which can result in lower borrowing costs.

12.1 Context, scope and overview

The Paris Agreement, IPCC AR6 and the European Green Deal emphasise the role of finance as a critical enabling factor for the achievement of ambitious climate objectives (UNFCCC, 2015; EC, 2019c; IPCC, 2022n). Achieving the objectives of the European Green Deal would require a substantial increase in investments, the magnitude of which would require mobilising both the public and the private sector. The current economic context, characterised by slower economic growth, constrained public budgets, inflation and elevated interest rates, affects the EU's capacity to finance the climate transition (see also Section 1.1).

The aim of this chapter is to assess progress in financing the climate transition in the EU, and to what extent EU policies are driving the necessary mobilisation of public and private finance. It starts with an overview of current and required investments in the climate transition, based on available data. It then provides an assessment of the potential and required policies to mobilise the EU budget, national public budgets and private capital to reach the required investments. It then proceeds to assess progress and policies on the phase-out of fossil fuel subsidies, and the potential roles of the EU Taxonomy and green bond market to close the climate investment gap. A thorough assessment of the EU's progress towards

achieving its commitments on climate finance is beyond the scope of this report, but it is briefly discussed in Box 7 'international climate finance'.

Box 7 international climate finance

The EU remains committed to supporting the developed economies' goal of jointly mobilising USD 100 billion per year up to 2025 to support developing economies. Between 2014 and 2021, EU support to developing countries increased by 50 %, reaching EUR 23 billion a year, which includes contributions from the EU budget, Member States and the EIB. In 2021, over 54 % of EU funding to developing economies was related to climate adaptation or a combination of climate mitigation and adaptation, and almost half of the funding was in the form of grants (EEA, 2023j). Currently there is limited public information available on the uses of funding reported under EU contributions to international climate finance. This hinders the assessment of policy effectiveness. More detailed reporting on a project-by-project basis would improve transparency and could attract more interest from private funding initiatives.

In its advice on an EU 2040 objective, the Advisory Board has identified the need for the EU to contribute to climate mitigation outside the EU, to close the gap between what it can feasibly do to reduce domestic net emissions and what it should do in line with its fair share towards the global 1.5 °C objective (ESABCC, 2023b). This could be achieved by, among other methods, providing finance for climate mitigation projects outside the EU.

12.2 Progress on climate-related investments

Assessing progress in climate-related investments faces methodological challenges.

This section aims to assess progress towards financing the climate transition in the EU by comparing actual with required climate-related investments (also referred to as investment needs). Investment needs are widely used as an indicator for measuring the required system change (when compared with current flows and asset bases). They usually focus on investments required to realise new infrastructure. One of the benefits of this indicator is that it is relatively easy to compare with private sector investment flows. However, it also has limitations, as it does not capture the need to build institutional capacity to strengthen knowledge and skills; nor does it measure needs for investment to address economic losses due to physical climate risks or investment needs related to adaptation (IPCC, 2022m).

There are two main challenges in assessing progress in climate-related investments. Firstly, there is no clear and verifiable definition of what constitutes climate finance flows or climate-related investments. This presents a difficulty in estimating progress and identifying investment gaps, as using different definitions can lead to different conclusions (Yeo, 2019). Boundaries between private and public finance can also be unclear, as private climate-related investments often benefit from public support in the form of co-financing, guarantees or fiscal measures (Weikmans and Roberts, 2019). In addition, the accuracy of modelled investment needs is also influenced by multiple, inherent sources of uncertainty. One source of uncertainty is change in technology costs, such as the levelised cost of energy of different renewable energy technologies. The relatively high share of investments since the early 2000s in the renewables sector has contributed to the rapidly declining technology costs of solar PV and wind in more recent years ("Energy Transition Investment Trends 2023," ; IEA and IRENA, 2017). Cost reductions could free up investment and financing capacities for potential use in other climate-related activities. Another source of uncertainty about financing needs is the interplays between:

- the economic growth rate,
- the link between growth and energy demand, including rebound effects of energy efficiency gains,
- changes in variables such as fossil fuel prices, inflation and real interest rates (IPCC, 2018).

Since 2020 the European Commission has prepared multiple estimates on different investment needs for achieving specific strategies (e.g. the hydrogen strategy and REPowerEU). Estimated investment needs varied considerably, partly because of rapid changes in the macroeconomic context (COVID-19, energy crisis, inflation) and technology costs, but also because different definitions and methodologies were applied in different periods (EEA, 2023I). The lack of a unified methodology to estimate investment needs undermines comparability and makes it challenging to accurately track progress.

The progress assessment in this chapter is based on the best available data on historical and required climate-related investments within the EU, covering both public and private sources of funding. As the different sources use different definitions and scopes, and given the inherent uncertainties described above, the results should be interpreted as an indicative estimate to illustrate the order of magnitude.

Climate-related investments in the EU need to at least quadruple, both by reorienting existing investments and by increasing total energy investments.

IPCC AR6 estimated that total investments supporting climate mitigation in Europe ⁽¹⁾ were on average about EUR 220 billion per year in 2017–2020 ⁽²⁾. This would need to increase to EUR 960 billion per year (which represents more than a quadrupling) until 2030 to be consistent with pathways that limit global warming to well below 2 °C (IPCC, 2022n) (see Figure TS.25).

The EIB's estimates of climate-related investments in the EU are in the same order of magnitude, increasing from about EUR 240 billion in 2019–2020 to about EUR 310 billion in 2021. It concludes that current spending on climate mitigation needs to increase significantly to achieve climate neutrality by 2050 (EIB, 2023b). BNEF also reports an increase in climate-related investments in the EU, from on average EUR 70 billion per year in 2011–2019 to almost EUR 200 billion in 2022 (BNEF, 2023). Both the EIB and BNEF have identified an increase in climate-related investments in recent years, which is mainly driven by the increased uptake of electric vehicles, the deployment of solar and wind energy, and energy efficiency improvements (FS-UNEP and BNEF, 2018).

Finally, the European Commission's scenarios that underpin the EU climate objectives also include data on historical and required investments. The MIX scenarios of the impact assessments accompanying the climate target plan and the Fit for 55 package estimate that overall investments in energy and transport need to increase by 62 %, from an average of EUR 764 billion per year in 2011–2022 to EUR 1 241 billion per year on average in 2021–2030. Under the REPowerEU plan, investments would need to increase even further to about EUR 1 276 billion per year up to 2030. The scenario data does not distinguish between climate- and non-climate-related energy investments (EC, 2023I, 2020a, 2022p). However, given the need to fully decarbonise the energy system, all future investments should be aligned with European climate targets. This is also consistent with the IPCC data described above, which estimated that climate-related investments in Europe would need to increase to almost EUR 1 trillion per year to be compatible with 'well below 2 °C' pathways (with even higher investment needs likely for compatibility with 1.5 °C pathways).

All the sources above cover different scopes in terms of geography, years and sectors/technologies, as summarised in Table 18.

⁽¹⁾ This include some countries beyond the EU-27: Norway, Switzerland, Turkey and the United Kingdom.

⁽²⁾ All values are converted into 2022 euro.

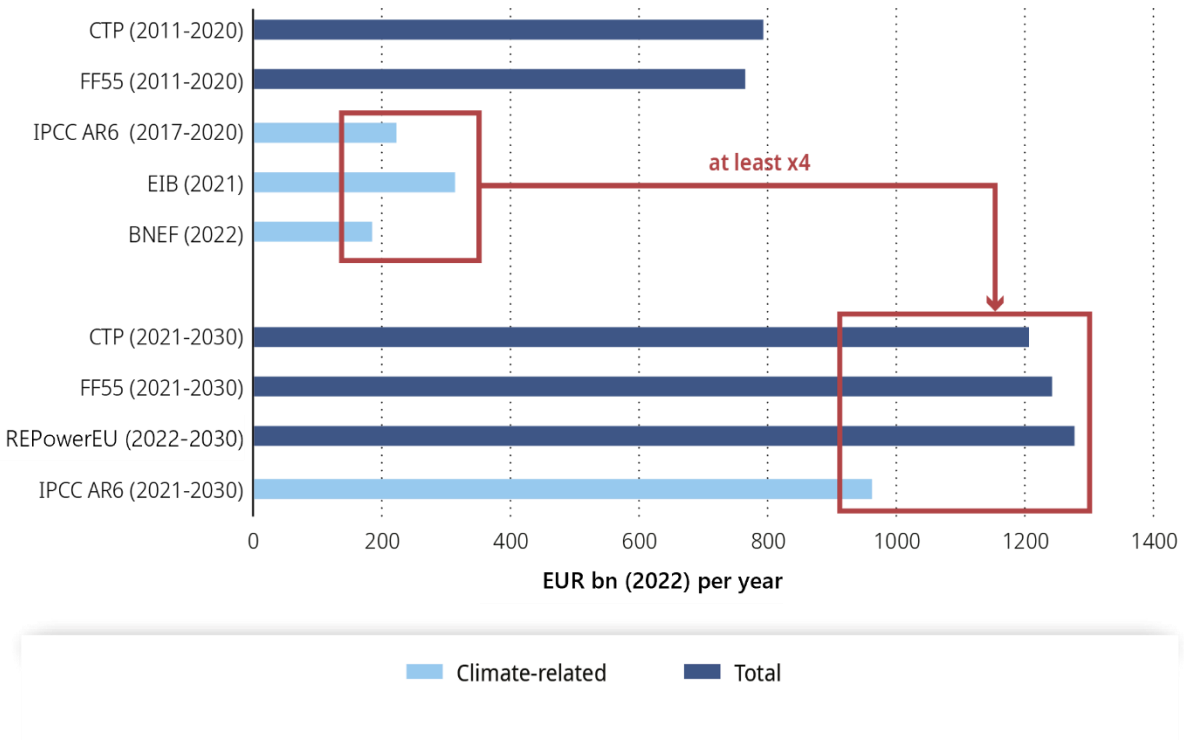
Table 18 Overview of the scopes of the different data sources used for assessing investment needs

Data source	Scope
IPCC AR6	<ul style="list-style-type: none"> - 2017–2020 average for Europe (including non-EU countries) - Energy supply: low-emission electricity generation and electricity grids - End use sectors: energy efficiency in buildings and industry, transport
EIB	<ul style="list-style-type: none"> - 2019–2021 data for EU-27 - Energy supply: renewable energy - End use sectors: energy efficiency, sustainable transport - Others: climate-related R&D, forestry (very low share in total investments)
BNEF	<ul style="list-style-type: none"> - 2022 data for EU-27 - Energy supply: renewables, nuclear, hydrogen (electrolysis, storage and pipelines), energy storage, CCS - End use sectors: ZEVs and recharging/refuelling infrastructure, heat pumps - Others: sustainable materials
European Commission climate target plan and Fit for 55	<ul style="list-style-type: none"> - Average 2011–2020 data for EU-27 - Energy supply: all electricity generation (RESs, fossil, nuclear), electricity grid, boilers, production and transport of new fuels - End use sectors: energy-related investments in residential, tertiary and industry sectors, all vehicles and recharging/refuelling infrastructure in transport

Based on the available data, the Advisory Board estimates that climate-related investments need to at least quadruple, from between about EUR 200 billion and EUR 300 billion per year in recent years to about EUR 1 000 billion per year up to 2030, as illustrated in Figure 77. This would require the redirection of existing investment flows into the energy system, as well as an overall increase in energy and transport investments (+ EUR 500 billion per year ⁽³⁾).

⁽³⁾ The EUR 500 billion a year of investments in energy and transport exclude the additional investments required for REPowerEU (EUR 35 billion a year) and the Net-Zero Industry Act (EUR 12 billion a year). Including these figures would increase the additional investments needed (for example, the ECB (2023c) has estimated the required additional investments to achieve the objectives of the European Green Deal and Net-Zeron Industry Act at EUR 620 billion a year). The 2023 climate action progress report (EC, 2023ax) advises against adding these figures, given their different scopes, timeframes and estimation methods.

Figure 77 Historical versus required climate-related energy investments



Notes: CTP is based on the Climate Target Plan impact assessment, FF55 data is based on the Net-Zero Industry Act staff working document. REPowerEU data includes an additional €300 billion on top of FF55. All data is converted to 2022 euro values.

Sources: Climate Target Plan impact assessment (EC, 2020s) (Table 46), staff working document accompanying REPowerEU (EC, 2022s), Net-Zero Industry Act staff working document (EC, 2023I) (Table 9), IPCC (2022I) (Figure TS.25), EIB Investment Report 2022/2023 (2023b) (Figure 31), BNEF (2022).

Meeting the investment needs requires a combined effort of the public and private sector.

The magnitude of the total investment flows in the real economy can be approximated by the gross fixed capital formation, which includes investments in both tangible assets (notably infrastructure and equipment) and intangible assets (intellectual property) (Eurostat, 2022c). Current gross fixed capital formation is estimated at about EUR 2.8 trillion (approximately 23 % of the EU’s GDP) (Eurostat, 2022c). This suggests that the EU has sufficient investment capacity to meet its climate objectives, but that it would require redirecting approximately 30–40 % of the current total investment flows towards climate mitigation projects, or less if gross fixed capital formation is increased through climate mitigation. It should be emphasised here that these investments lead to later savings of expenditure on fossil fuels and climate damage and hence should not be misread as costs of mitigation. The magnitude of the gap is beyond the sole capacity of either the public or the private sector and will require a combined effort by both.

The EU action plan on financing sustainable growth outlines the overarching strategy to meet the required investments.

The European Commission’s overall approach to meet the required investments is outlined in the 2018 action plan on financing sustainable growth, which was updated in 2020 as a follow-up to the European Green Deal (EC, 2018c). It outlines 10 action points in three categories:

- actions to redirect capital flows towards a more sustainable economy (including actions such as the EU Taxonomy classification system, the development of an EU Green Bond Standard and the sustainable Europe investment plan (also referred to as the Green Deal investment plan),
- actions to mainstream sustainability into risk management,
- actions to foster transparency and long-termism (including the revision of the non-financial reporting directive, which is now referred to as the corporate sustainability reporting directive).

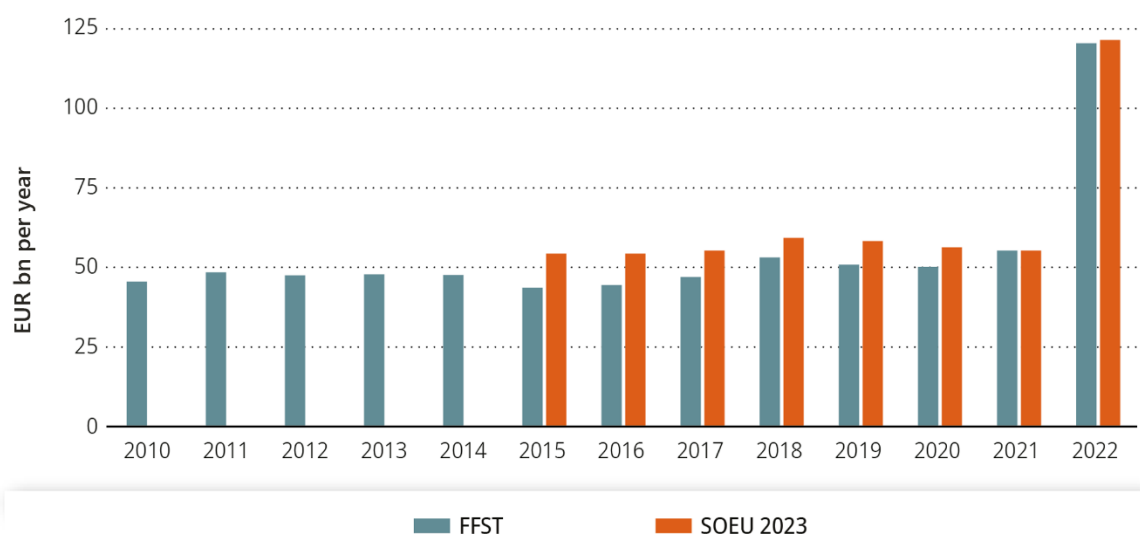
Whereas a full assessment of this action plan is beyond the scope of this report, some of its components (the EU Taxonomy framework, the green bond standard and the green deal investment plan) are assessed in more detail in subsequent sections.

12.3 Fossil fuel subsidies

Fossil fuel subsidies persist and have even increased in the context of the energy crisis.

Several sources report on fossil fuel subsidies in the EU, including the European Commission’s annual state of the energy union report (EC, 2023aw), Member States’ annual national energy and climate progress reports, and independent assessments by organisations such as the EEA and the OECD (OECD and IISD, 2023; EEA, 2023i). As shown in Figure 78, the EU has made little progress towards phasing out fossil fuel subsidies. Reported fossil fuel subsidies remained stable between 2010 and 2020 at around EUR 50 billion per year. In 2022, they more than doubled to ca. EUR 120 billion, as governments provided substantial amounts of support to both households and businesses to mitigate the impact of the energy crisis.

Figure 78 Changes in fossil fuel subsidies in the EU



Sources: Fossil Fuel Subsidy Tracker (OECD and IISD, 2023), EC (2023aw)

The share of fossil fuel subsidies in total energy subsidies reduced gradually from 31 % in 2015 to 26 % in 2021, as they remained stable while other types of energy subsidies increased. However, in 2022 the share of fossil fuel subsidies in total energy subsidies rebounded to 31 %, and in absolute amounts fossil fuel subsidies (EUR 123 billion in 2023) exceeded the amount of subsidies for RES (EUR 87 billion in 2022) (EC, 2023aw).

In addition to these fossil fuel subsidies, the EU and its Member States have provided other forms of energy subsidies to shield households and businesses from the impacts of the energy crisis. The IEA tracked more than EUR 325 billion in total support to reduce energy bills during 2022 in the EU (IEA, 2023d). Similarly, the European Commission reports that overall energy subsidies increased from about EUR 200 billion in 2018–2021 to between EUR 350 billion and EUR 390 billion in 2022 (including EUR 112 billion to ‘all energies’, which also includes fossil fuels) (EC, 2023aw). Although not all this spending is captured by the definition of ‘fossil fuel subsidies’ as applied by the European Commission and the OECD, the Advisory Board has assessed that in many cases it has distorted the price signal, which reduced the incentive for making energy efficiency investments, rationalising energy consumption or switching to RES (ESABCC, 2023a). Furthermore, these expenditures have not always been well targeted towards the most vulnerable consumers and have posed a substantial fiscal burden on Member States (EC, 2023n).

There is no clear phase-out plan or deadline for the majority of fossil fuel subsidies.

The eighth EAP requires the European Commission and Member States to ‘set a deadline for the phasing out of fossil fuel subsidies consistent with the ambition of limiting global warming to 1.5 °C’ (EC, 2022q). Member States are required to include in their biennial national energy and climate progress reports an assessment of progress towards phasing out energy subsidies, in particular for fossil fuels (EU, 2018e). According to these reports, although many Member States confirm their intention to phase out fossil fuel subsidies, only five Member States have enacted laws or clear plans that specify how and by when (EEA, 2023i). For more than half of all fossil fuel subsidies, there is either no end-date or an end-date after 2030 (EC, 2023aw).

Fossil fuel subsidies can hinder the climate transition by undermining the reorientation of private investments, reducing the available budget for public investments and locking in fossil fuels.

Fossil fuel subsidies ⁽⁴⁾ are a major obstacle to the transition towards climate neutrality. By lowering the cost of fossil fuel use, they hinder the required reorientation of financial flows towards non-fossil, climate-friendly alternatives. Furthermore, they also decrease the amount of public funding that is available to finance the climate transition. By supporting the use and financing of fossil fuel-related assets, they lock in future GHG emissions, which is inconsistent with emission pathways necessary to reach the Paris Agreement goals. This inconsistency exposes investors and asset owners to the risk of stranded assets (Semieniuk et al., 2022). A rapid phase-out of fossil fuel subsidies is therefore considered to be a top priority to close the climate investment gap. In line with international commitments such as the COP26 Glasgow Climate Pact, both the European Green Deal and the 8th EAP call for the phase-out of subsidies for fossil fuels.

12.4 Mobilising the EU budget

Approximately EUR 580 billion of EU funds are earmarked for climate action for 2021–2027.

The EU’s long-term budget (referred to as the MFF) totals EUR 1.2 trillion for 2021–2027. It has the aim of supporting the long-term objectives of the EU, including the climate transition. For 2021–2027, the EU committed to spending 30 % of the MFF (EUR 360 billion) on climate action, compared with at least 20 % in 2014–2020 (EC, 2016b). NextGenerationEU is the EU’s recovery instrument to support its economic recovery after the COVID-19 pandemic. It provides an additional budget of EUR 800 billion for 2021–2026. The vast majority of this (EUR 723 billion) will be spent through the RRF, in the form of

⁽⁴⁾ Fossil fuel subsidies exist in different forms, including price/income support (e.g. price caps), tax reductions (e.g. lower rates, exemptions and rebates) and direct transfers (e.g. energy vouchers and direct subsidies).

grants and loans to support investments. Member States are required to spend at least 37 % of the funds they receive via the RRF on climate-related investments and reforms (EU, 2021a). The European Commission reported that all Member States have exceeded this threshold, and that in total 40 % (or EUR 203 billion) will be spent on climate-related activities. The European Commission has assessed that the EU plans to spend EUR 578 billion of its total budget (MFF and RRF) on climate action in 2021–2027 (on average about EUR 72 billion per year) (EC, 2023ax).

The discussions on the revision of the MFF for the period after 2027 will start in the next few years. Some experts have already flagged the need to increase the overall budget and reorient spendings, in particular to support the EU's climate and energy objectives (Franco-German working group on EU institutional reform, 2023). NextGenerationEU and the RRF, however, are currently intended to cease by the end of 2026, with no follow-up instrument planned. This would lead to a substantial drop in EU public climate spending after 2026.

The effectiveness of the EU budget is undermined by flaws in the methodology to track climate spending.

The methodology for estimating climate spending in the MFF is based on coefficients (EC, 2016b) ⁽⁵⁾ that are applied to the planned expenditure on different intervention fields, as a proxy for their expected contributions towards climate change mitigation and climate change adaptation. The main advantage of this approach is the light administrative burden and ease of use. More specifically, the European Commission uses three coefficients (EC, 2016b):

- a 100 % coefficient is applied to programmes that are expected to have a significant climate impact;
- a 40 % coefficient is applied to planned spending that is expected to make a 'moderate' contribution to climate objectives;
- a 0 % coefficient is applied to projects with an insignificant contribution.

Overall, this methodology implies significant approximations in estimating expected contribution to climate objectives, as the Rio markers do not enable precise quantification of the monitored spending (Cremins and Kevany, 2018). A high-percentage coefficient is applied to budget items that are expected to contribute more positively to climate objectives, and a low-percentage coefficient is applied to budget items from which little benefit is expected in terms of climate.

A report by the ECA (2022c) identified several flaws in this methodology, which can be summarised as follows.

- It allowed for overly optimistic assumptions about the relevance of certain expenditures to climate action. The CAP is a prime example: it accounted for EUR 100 billion of EU climate spending in 2014–2020 (half of the EU's total climate spending in that period), even though it had little impact on actual agricultural GHG emissions (ECA, 2021). For 2021–2027, the CAP continues to account for a substantial share of total EU climate spending (EUR 146 billion, or 25 % of the total), even though it is unlikely to deliver substantial GHG emission reductions (see Chapter 8 'Agriculture').
- It does not track potentially negative climate impacts of EU budget expenditures. The ECA's recommendation to enhance reporting under the MFF by identifying spending with potential negative impacts on climate was not accepted by the European Commission (EC, 2022ac).
- Reporting on climate spending is primarily based on *ex ante* plans, without checking *ex post* if planned climate spending was realised.

⁽⁵⁾ These are based on the Rio markers for climate, developed by the OECD in 2018.

- It allowed for inconsistencies, with similar types of projects receiving different coefficients, illustrating the subjectivity involved and the unclear criteria. For example, rail transport projects in the trans-European network funded by the Connecting Europe Facility were assigned a 100 % coefficient in estimating climate contribution, whereas similar projects under the European Regional Development Fund or the Cohesion Fund were assigned only a 40 % coefficient.

Overall, the ECA report (ECA, 2022c) concludes that, for 2014–2020, these flaws resulted in an overestimation of climate spending by at least EUR 72 billion (33 % of the total EUR 216 billion climate spending reported by the European Commission). The majority (80 %) of this is linked to an overestimation of the climate contribution of the CAP. It furthermore concluded that, despite some limited improvements, these flaws continue to undermine accurate reporting on climate spending under the 2021–2027 MFF.

The methodology used for the EU's RRF, which is the core of NextGenerationEU, has been updated to reflect definitions from the EU's sustainable finance taxonomy including the 'do no significant harm' principle. However, the methodology used to track spending on climate objectives remains broadly unchanged and continues to rely on coefficients (Baccianti, 2023). The recent review of the RRF by the ECA (ECA, 2023c) finds that the current performance monitoring framework does not sufficiently capture performance on climate and other intended objectives.

The European Commission also does not differentiate between spending on climate change mitigation and climate change adaptation. Aggregating both climate objectives under a single reporting line means that it is not possible to reliably estimate progress towards meeting investment needs for each objective. The lack of relevant and reliable reporting on investments that support climate adaptation objectives hinders the mainstreaming of climate resilience across the EU policies that are supported by intervention instruments funded through the EU budget.

The EU budget on its own is insufficient to close the investment gap, even when taking into account the crowding-in effect.

The EUR 578 billion of the EU budget that is earmarked for climate action is a substantial amount, but on its own insufficient to meet the total required investment identified in Section 12.2. One of the three key pillars of the Green Deal investment plan is therefore to use the EU budget as a lever to crowd in private and other (national) public investments. One mechanism is InvestEU, which provides the EIB and other multilateral banks with an EU budget guarantee to allow them to increase their risk taking and to crowd in additional investments. With this approach, it aims to double the impact of the EU budget for climate action, and to mobilise EUR 1 trillion for climate investments over 2021–2030 (EC, 2020s).

Although generally welcoming it as a step in the right direction, independent analysts have warned that it will not be sufficient to cover the required investment needs. The independent think tank Bruegel (2020) assessed that, even if the EUR 1 trillion objective is achieved, it will only cover up to one third of the required investments. When considering the investment needs identified in Section 12.2 (which showed that climate-related investments would need to increase by roughly EUR 1 trillion per year), the Green Deal investment plan will cover only 10 % of total investment needs. The gap becomes even larger when taking into account that not everything classed as climate spending in the EU budget will actually contribute to the climate mitigation objectives, given the flaws in the monitoring methodology explained above.

12.5 Mobilising national budgets

State aid guidelines have been loosened and allow more public climate funding at the national level, but they are not yet fully aligned with the EU's climate objectives and risk undermining the single market.

The national budgets of EU Member States can also play an important role, especially in supporting investments in mitigation enablers, stimulating demand for net zero technologies and implementing adaptation projects. Some types of support might, however, be subject to EU State aid rules ⁽⁶⁾.

In recent years, EU State aid rules have been adjusted several times, which has resulted in, among other things, more leeway for Member States to financially support the climate transition. After a first temporary adjustment in 2020–2022 (in the context of the COVID-19 pandemic), State aid rules were temporarily relaxed in 2022–2023 by means of the temporary crisis and transition framework, to support investments supporting the green transition and alleviate the impact of the energy crisis (EC, 2022j). A positive element of this temporary framework is that the European Commission has abandoned its usual technology-neutral approach in order to allow selective subsidies for net zero technologies such as batteries, solar panels, wind turbines, heat pumps, electrolyzers and CCU/CCS, as well as related critical raw materials. This is a welcome development because, as explained by Anadón et al., 2022, 'in a context of innovation and structural change, policies will almost always advantage some technologies more than others. It is better to choose deliberately rather than accidentally, supporting innovation in low-carbon directions. Some policies intended to be neutral can have a bias towards incumbents, and incremental change'.

Meanwhile, the guidelines on state aid for climate, environmental protection and energy were also revised in 2022 to align them with the European Green Deal (EC, 2022i). As these guidelines are recent and have not yet been widely applied (owing to the temporary framework in force until 2025), the Advisory Board was not able to do a full assessment of these guidelines. Nevertheless, some inconsistencies with the EU's climate neutrality objective can already be highlighted. The guidelines do not ban support for fossil fuels. Instead, they allow further public funding in the form of tax incentives and capacity mechanisms for fossil gas operations under specific conditions, further relaxed under the temporary crisis framework (EC, 2023m) (see also Section 12.5)

A final concern is that, although State aid can address urgent investment needs, too much flexibility can also lead to market fragmentation, disadvantaging smaller Member States with less-developed capital markets and weaker economies. A long-term European strategy to finance the energy transition necessitates a stronger single market that gives businesses better access to finance across all Member States. To address this, the European Commission President, Ursula von der Leyen, launched the idea of an EU Sovereignty Fund. A first step to test this concept is the Strategic Technologies for Europe Platform, which was proposed in June 2023. The proposal includes the allocation of an additional EUR 10 billion to targeted programmes, including InvestEU, Horizon Europe and the Innovation Fund (EC, 2023d). However, the amount of available funding is dwarfed by comparison with the state support programmes approved by the European Commission, which have increased substantially in recent years to EUR 335 billion in 2021 (EC, 2023d).

⁽⁶⁾ State aid is defined as an advantage in any form conferred by national public authorities to undertakings on a selective basis, and is generally prohibited by the EU law (Article 107 of the Treaty on the Functioning of the EU). There are some exceptional circumstances in which State aid is not only allowed but also encouraged as a beneficial intervention from a socioeconomic perspective. Over the years, the European Commission's powers to set rules and make decisions about State aid have expanded, notably in terms of the exceptional circumstances in which State aid by the EU Member States is justified.

Member States' investment capacities are constrained by the recent crises and the EU's fiscal policy framework.

As previously described (see Sections 1.1 and 11.1), Member States' budgetary space has been substantially constrained in recent years by higher expenditures, lower economic growth and increasing interest rates.

One way to address this would be for Member States to increase borrowing to finance climate-related investments. However, the current EU fiscal policy framework, as recorded in the Maastricht Treaty (1992) and the Stability and Growth Pact (1997), aims to preserve fiscal discipline within the EU, by requiring Member States to limit their annual deficit to maximum 3 % of their GDP, and the aggregate debt to 60 % of their GDP (Karagounis et al., 2015). Whereas these rules might be recommendable from a fiscal perspective – as potential negative externalities from a spiralling debt crisis would have a direct systemic effect across the EU – they also limit the ability of Member States to borrow additional money to finance climate investments, even if such investments are recommendable from a long-term perspective. There have therefore been several calls to adjust the fiscal policy framework, for instance by allowing Member States to exclude investments related to the climate transition from the calculated deficit- and debt-to-GDP ratios (Darvas and Wolff, 2023). The rules of the Stability and Growth Pact were suspended for 2020–2023 to allow Member States to address the impacts of the COVID-19 pandemic and, subsequently, the energy crisis. In 2023, the European Commission published a proposal to revise the EU's fiscal rules, building on the Maastricht Treaty (EC, 2023d). However, although it allows for a more gradual (up to 7 years) fiscal adjustment path, it does not provide any specific treatment for public expenditures on climate action (Bruegel, 2023).

Another possible way for Member States to increase their climate spending without increasing their overall debt would be to increase revenues or decrease other public spending. However, this option also faces challenges. Increasing revenues, for instance by raising taxes, is politically difficult, and also risks undermining a Member State's competitiveness given the absence of a fiscal union. Decreasing expenditures might also be challenging, given that multiple other societal challenges also warrant increased public spending (e.g. digitalisation, social infrastructure or increased military spending in the context of the current geopolitical tensions) (EEA, 2023).

The assessment above highlights the challenge of substantially increasing national public spending on the climate transition. One possible way forward that can contribute to solving this conundrum is a rapid phase-out of fossil fuel subsidies, as further described in Section 12.3.

12.6 Mobilising private finance

Private finance will need to make a substantial contribution to close the investment gap.

The magnitude of the investment gap as described in Section 12.2, and the challenges of increasing public climate spending (see Sections 12.4 and 12.5), highlight the importance of private finance to close the investment gap. Different sources have estimated the required ratio of private to public climate investments ranging from 2:1 to 5:1, which implies that the private sector would need to deliver 66–83 % of the total required climate-related investments. However, wide variations could be possible between EU Member States. For example, the EIB projected that in central and eastern Europe about 60 % of additional investments will be funded from public sources and the share will be only 37 % in western and northern Europe (EEA, 2023).

The mobilisation of private finance requires ambitious policies to improve the bankability of climate-related investments.

Private actors generally seek positive returns on investments, and the required increase in private finance flows will not materialise unless policies provide favourable conditions for climate-related investments that can generate a sufficient supply of bankable projects. This can be facilitated by streamlining permit-issuing processes, carbon-pricing mechanisms, financial incentives (e.g. tax credits, public guarantees), technical assistance, institutional capacity building, standards and regulations, as well as enabling conditions such as infrastructures and regulatory stability. Such policies are covered in other chapters throughout this report, in particular Chapters 4-9 on the different sectors and Chapter 10 'Pricing emissions and rewarding removals'. The overarching conclusion of these chapters is that the EU's overall climate policy has been strengthened in recent years, although further improvements remain necessary (see Section 7.5, under 'Enabling condition: private investment').

In the domain of financial policies, private finance can be further mobilised towards climate investments by phasing out fossil fuel subsidies (see Section 12.3) and labelling (see Section 12.7).

The popularity of sustainable investments is growing, but their impact depends on a robust classification mechanism.

While scaling up climate finance remains a challenge, investments that take into account ESG sustainability criteria (measured following self-regulated standards) are increasingly popular (Maiti, 2021). A recent market analysis (Bloomberg, 2022) suggests that global ESG assets may surpass USD 50 trillion by 2025, compared with USD 35 trillion in 2020, with Europe remaining one of the most important markets. The primary ESG approaches focus on exclusion criteria, with shareholder activism and corporate engagement also gaining traction (GSIA, 2020). However, research indicates that ESG investing by itself is not enough to yield meaningful climate outcomes (Kölbel et al., 2020). ESG strategies and reporting tools are not sufficient to understand the tangible impact of the financial sector claiming to advance environmental and social outcomes climate change.

The EU Taxonomy provides a harmonised framework to label activities as 'environmentally sustainable', including certain types of fossil gas activities.

The European Commission has identified the need for more robust assessment and standardisation of ESG methodologies to understand climate and other environmental impacts (EC, 2018a). Responding to the challenge of a fragmented market for ESG ratings, which to a large extent remains self-regulated (Jonsdottir et al., 2022; Charlin et al., 2022), the European Commission launched the EU Taxonomy, which is a classification system with harmonised criteria for labelling economic activities as environmentally sustainable. For an economic activity to be classified as environmentally sustainable, it must (i) contribute to at least one of six sustainability objectives (which include climate change mitigation and adaptation), (ii) without significantly harming any of the other six objectives (referred to as the 'do no significant harm' principle), (iii) while complying with minimum social safeguards. To expand the utility of the EU Taxonomy, the regulation introduced two additional categories of activities qualifying as environmentally sustainable: enabling activities ⁽⁷⁾ and transitional activities ⁽⁸⁾.

⁽⁷⁾ Enabling activities are economic activities that enable other activities to make a substantial contribution to at least one of the six environmental objectives, if it does not lead to a lock-in of assets that undermine long-term environmental goals, and has a substantial positive environmental impact based on life cycle considerations.

⁽⁸⁾ Transitional activities are activities that can be considered to contribute substantially to climate objectives if their GHG emissions are substantially lower than the sector or industry average, they do not hamper the deployment of low-carbon alternatives and they do not lead to a lock-in of carbon intensive assets, considering the economic lifetimes of those assets.

Whereas the EU Taxonomy regulation sets out the overall framework, the specific criteria (referred to as TSC) are set out by the European Commission through delegated acts. To remain relevant to the latest research and market developments, these TSC are subject to regular review by the European Commission to reflect technological progress, ensuring that sectors and activities can be added or deleted through amendments to the regulation. The first act to be adopted under the EU Taxonomy regulation was the Climate Delegated Act (EC, 2021b), which established the TSC for the first two objectives of the EU Taxonomy: climate change mitigation and climate change adaptation. This initial delegated act covered about 40 % of EU-domiciled publicly listed companies, which are responsible for roughly 80 % of direct GHG emissions in Europe. One year later, the European Commission adopted a Complementary Climate Delegated Act (EC, 2022b), which established the TSC for fossil gas and nuclear activities. These allow the labelling of certain fossil gas activities as transitional activities contributing to climate change mitigation, provided they meet certain criteria (e.g. such activities would need to remain below certain emission intensity and energy efficiency thresholds). However, these thresholds are too high, and, even if the emissions can be lowered through CCU/CCS, such electricity plants should be marginal in the decarbonised energy systems (ESABCC, 2023b); see also Section 4.3, under 'Lever: coal and fossil gas phase-out' and 'Lever: targeted carbon capture and utilisation/storage'. Another example of the TSC under the EU Taxonomy potentially jeopardising the net zero transition pertains to the depth of building renovation, where reducing primary energy demand by 30 % can be considered sustainable without necessarily linking it to staged deep retrofits (see Section 7.5, under 'Enabling condition: private investment').

While an in-depth analysis of the TSC is beyond the scope of this report, the Advisory Board notes that not all EU Taxonomy thresholds for economic activities are currently in line with climate neutrality (see for example (Schütze and Stede, 2021)). In this respect, it is important that the European Commission initiate regular updates of the criteria in line with Article 19 of the EU Taxonomy regulation (EU, 2020).

Initial data shows large differences between sectors' alignment with the current TSC in the EU Taxonomy.

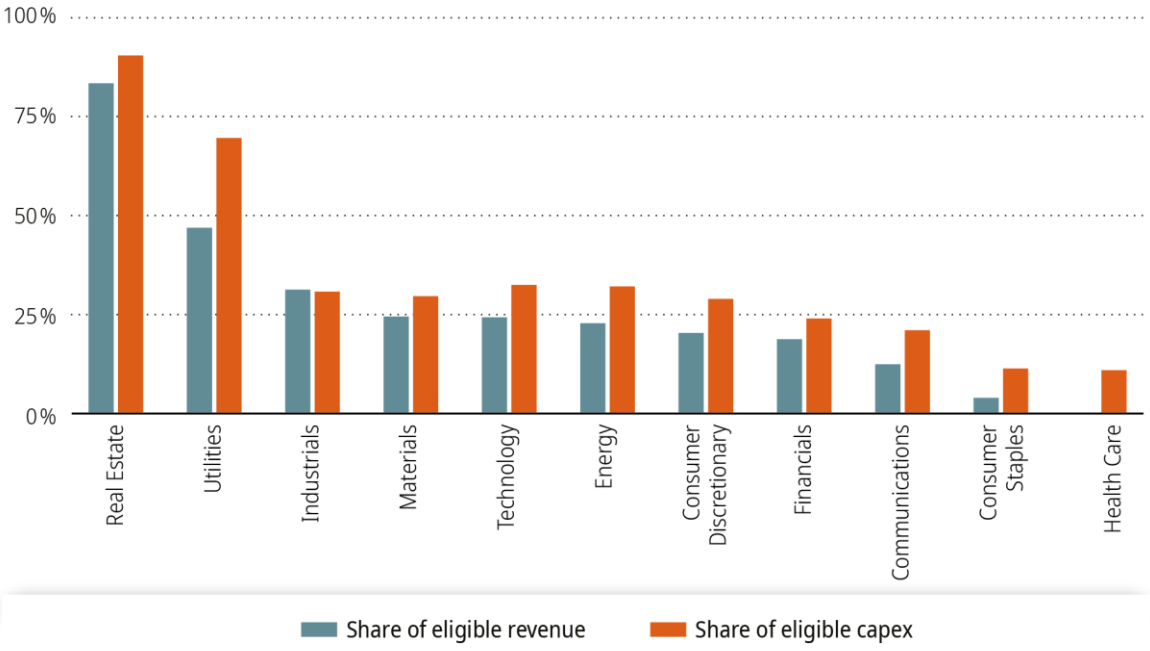
The Corporate Sustainability Reporting Directive ⁽⁹⁾ (EC, 2021l) and Sustainable Finance Disclosure Regulation (EC, 2018b) require certain entities to disclose information on the degree of alignment of their activities with the EU Taxonomy. However, they do not include a legal obligation for those entities to reach a minimum degree of alignment. Whereas the EU Taxonomy, the directive and the regulation are thus important steps forward to increase transparency and credibility, their effectiveness in shifting investments towards sustainable activities will purely rely on investors' preferences, which will also be determined by the bankability and marketability of sustainable investments.

Based on the data reported so far, there are large differences in different economic sectors' alignment with the EU Taxonomy (see Figure 79). On a positive note, in the real estate and utilities sectors (the latter of which includes the electricity sector) a large share of capital expenditure is already eligible under the EU Taxonomy, reflecting the plethora of available options for investments in projects that can potentially meet the TSC. However, for other key relevant sectors such as industry, materials, energy ⁽¹⁰⁾ and finance, only 30 % of capital expenditure can be eligible under the EU Taxonomy. For these sectors, there is still much room for improvement to shift existing investment flows towards sustainable activities.

⁽⁹⁾ This will replace the 2014 Non-Financial Reporting Directive.

⁽¹⁰⁾ This includes non-regulated energy companies, primarily in the oil and gas industry.

Figure 79 Eligibility of different sectors' revenues and capital expenditure under EU taxonomy



Source: Bloomberg terminal, based on company reported data (BNEF, 2022)

12.7 EU green bond market

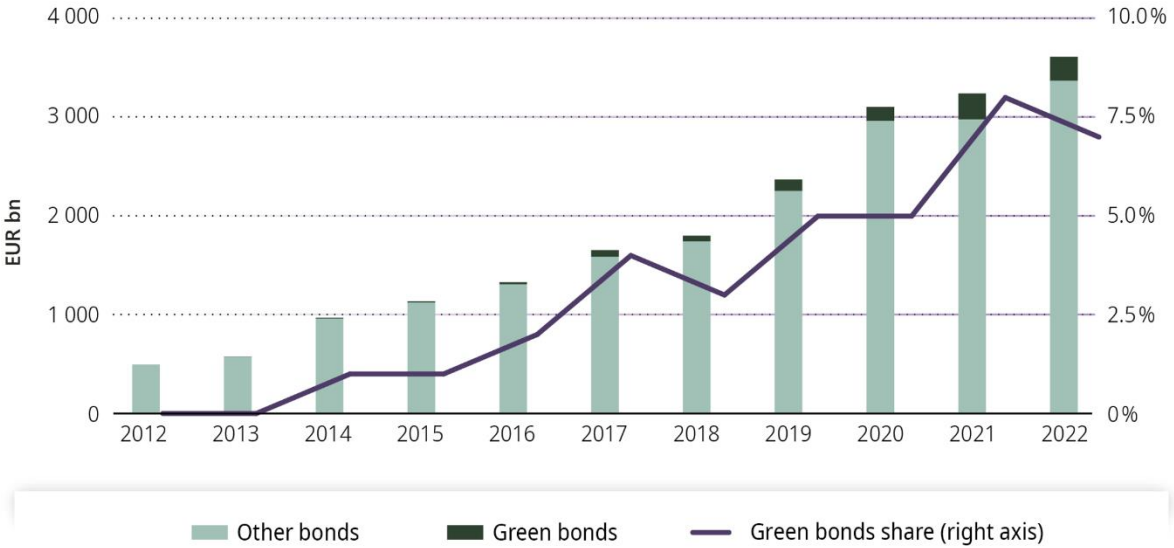
Green bonds could provide an opportunity to scale up climate finance, provided their additionality and environmental integrity are ensured.

Green bonds are fixed-income investment securities that provide financing to sustainable projects run by either companies or governments. Since the EIB inaugurated the green bond market in 2007 with the first climate awareness bond, the market has seen significant growth. In 2022 European companies and governments raised EUR 241 billion issuing green bonds, which represented 47 % of the global proceeds in that year. However, their share in the total EU bond market remains relatively low at 7 % (see Figure 80). Most assets financed with green bonds have been in renewables (21 % of the issuance activity), clean transport (16 %), and clean technologies and buildings (11 %) (Bloomberg, 2023).

The rapid rise of climate-related bond issuances could present an opportunity for scaling up climate finance (IPCC, 2022m). This is particular the case in the EU, as the European capital market relies more on debt instruments than on shareholder equity to finance new projects (Gaud et al., 2007). However, their actual impact depends greatly on their environmental integrity and additionality (Shishlov and Censkowsky, 2022). So far, this is not ensured: there is no common definition of or assessment framework for what constitutes a green bond. They are currently labelled as such based on criteria defined by the rating agent used by the bond issuer (Ehlers et al., 2022). This increases the risk of greenwashing.

Another limitation of green bonds is that they provide limited incentives for corporations to phase out harmful activities. This can be attributed to the design of the green bonds: it addresses only green projects, which on many occasions form only a small part of the overall activities in a diversified corporate structure.

Figure 80 Development of the EU green bond market



Source: Bloomberg terminal (Bloomberg, 2023)

The EU green bond standard could improve the transparency and credibility of green bonds, but is only voluntary. Its effectiveness will depend on the degree to which it is applied.

To address the fragmentation in the green bond market, the European Commission proposed in 2021 a European green bond standard, which was finally adopted in October 2023 (EC, 2021ae). Overall, the standard is aligned with the EU Taxonomy framework described in Section 12.6. The application of this harmonised standard is, however, strictly voluntary, and its effectiveness will therefore depend on the degree to which it is applied by bond issuers.

NextGenerationEU is largely (up to EUR 250 billion, representing almost 30 % of the total) funded by the issuance of green bonds, which will make the European Commission the largest green bond issuer in the world. However, these bonds currently do not follow the requirements of the EU Taxonomy, which also means they are not aligned with the European Green Bond Standard. This reduces transparency on the use of proceeds and can undermine credibility in the credit market, resulting in higher borrowing costs (Larcker and Watts, 2020; Löffler et al., 2021; Partridge and Medda, 2020).

12.8 Summary table

Table 19 Policy consistency summary – finance and investments

Policy inconsistencies	<ul style="list-style-type: none"> – EU State aid rules still allow fossil fuel subsidies. – The Stability and Growth Pact does not treat investment related to the climate transition differently from other types of investment.
Policy gaps	<ul style="list-style-type: none"> – There is no reporting on EU budget expenditure on activities that breach the ‘do no significant harm’ principle of the EU Taxonomy. – There is no structural, long-term common fiscal capacity based on a common EU debt (beyond the RRF).
Ambition gaps	<ul style="list-style-type: none"> – EU policies do not sufficiently encourage the creation of bankable projects that would attract private investment. – The Strategic Technologies for Europe Platform has so far been inadequate because of its limited budget (EUR 10 billion, compared with more than EUR 300 billion per year of State aid in 2021). – Only soft EU policy measures encourage EU Member States to phase out fossil fuel subsidies. – There are substantial flaws in the methodology for tracking EU spending on climate action, which undermine the EU budget’s contribution to the EU climate objectives.
Implementation gaps	<ul style="list-style-type: none"> – Only a few Member States have enacted laws or clear plans that specify how and by when the phase-out of fossil fuel subsidies will be achieved.



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