Financing the climate transition in the European Union

Background document for the informal ECOFIN meeting 13-14 September 2024

FOREWORD

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Executive Summary

1. The European Union (EU) faces a significant challenge in boosting investment in climate change mitigation to achieve its ambitious climate targets. The amount of investment required to reach net zero emissions by 2050 is estimated to be around 2 ¾ percent of gross domestic product (GDP) annually. At the same time, high public debt levels, long-term fiscal pressures from an ageing population, and costs associated with geopolitical tensions, limit the fiscal space available to finance such a transition.

2. To fund the climate transition, while achieving strong, sustainable, resilient, and inclusive growth, the EU and its Member States must work together to mobilise private investment. The EU has a significant current account surplus and is therefore a "net exporter" of investment. The objective should be to tap more into these private funds for the climate transition. This requires policymakers to improve the business case for the climate transition in the EU. This requires action on multiple fronts:

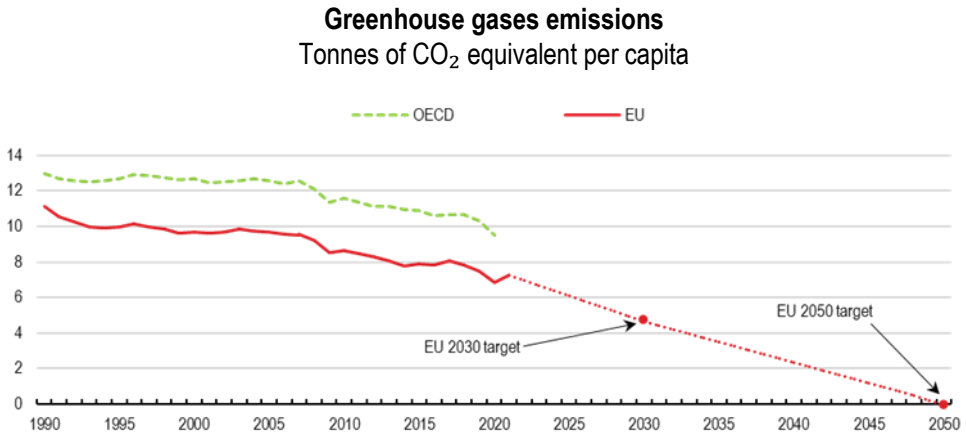
- *Public financing of investment and R&D*: Public investment will remain fundamental, particularly in infrastructure and innovation, where the private sector may be unlikely to step in. Such investments will not only stimulate economic growth but also drive the development and deployment of green technologies.
- *Stringent, transparent and predictable climate policies:* The EU and its Members are among world leaders in climate policies, relying on multiple instruments ranging from carbon pricing and regulatory standards to subsidies and R&D tax incentives. Such policies help channel private investment to climate-consistent projects, by improving returns on them and will need to be ramped up further. However, policies need to be made more coherent, transparent and less uncertain to improve the risk-return balance of climate investment and make them more attractive for private investors. Clear regulatory frameworks and long-term policy commitments are necessary to provide the stability that investors require.
- *Infrastructure and regulatory alignment:* Aligning infrastructure planning and regulatory frameworks with emission reduction targets will further reduce policy uncertainty and enhance investment directed towards projects that contribute to climate goals.
- *Enhanced Investor Information*: Ensuring that investors have sufficient information to evaluate firms' exposure to climate change is vital. Improved disclosure practices and reporting can help investors make informed decisions, thereby directing capital towards sustainable investments.
- *Improving the EU's attractiveness as an investment destination:* To attract more private investment – including for the climate transition – the EU and its Members States need to double down on structural reforms. Reform priorities include the completion of the Single Market, deepening the Banking and Capital Markets Union and progress towards a unified energy market. EU Member

States need to reduce bureaucratic hurdles, enhance the ease of business entry and exit, strengthen competition and flexibility, and improve access to financing – in particular in equity markets, for small and medium-sized enterprises (SMEs) and start-ups, for example by reviewing regulation on equity investments of institutional investors.

Introduction: How can the EU boost investment in climate change mitigation?

3. The EU and its Member States have adopted an ambitious objective of net zero emissions (NZE) by 2050. Significant progress has been made in reducing greenhouse gas emissions in the past decades (Figure 1), with the EU being one of the leading regions in clean energy deployment. However, delivering on the NZE target while securing the objectives of achieving sustainable and resilient economic growth alongside energy security and affordability, will require coordinated efforts across a broad range of policies – spanning macroeconomic, environmental, energy, financial and structural issues at the EU, national and subnational levels. In particular, the significant investment required to reduce emissions in an economically efficient and socially acceptable manner amid limited fiscal space will require improving the incentives and the market conditions for the private sector to mobilise and reallocate large investment flows.

Figure 1. Reductions in greenhouse gas emissions need to accelerate



Note: Greenhouse gas (GHG) emissions include those from the land use/land use change and forestry sector (LULUCF). Data on the EU's GHG emissions for 2021 are taken from the European Environment Agency (2022).
Source: Eurostat; OECD Environment database; OECD Population database; European Environment Agency; IPCC (2022[5]); United Nations (2022[6]); and OECD calculations.

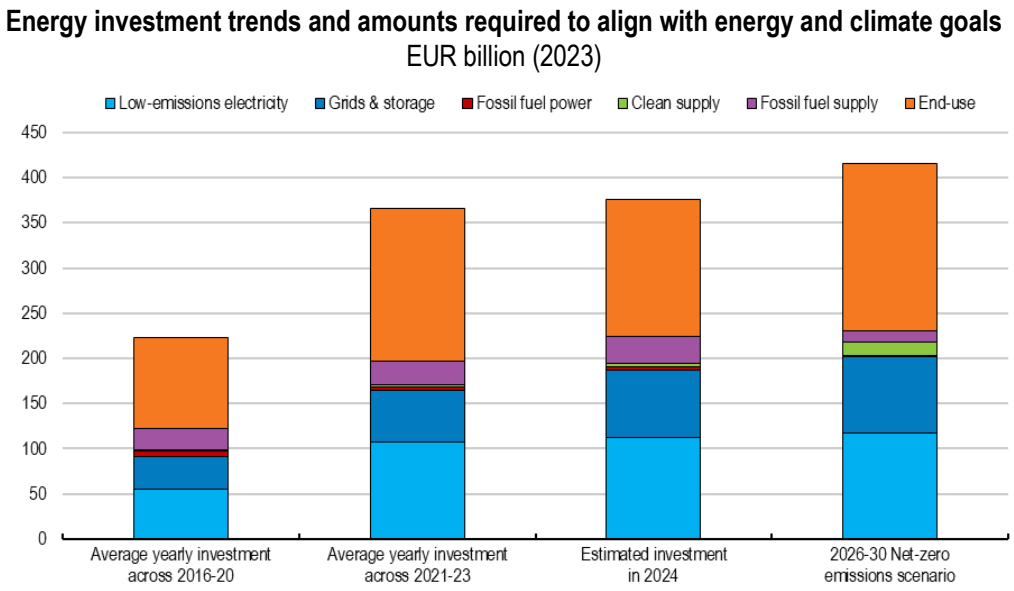
What are the financing requirements for the climate transition in Europe?

4. The investment needs to achieve climate targets are large. The investment required to meet the European Green Deal climate targets by 2030, in particular reducing emissions by 55% with respect to 1990 levels, is estimated to be around EUR 400 billion annually (2 ¾ percent of EU 27 GDP) (EEA, 2023[1]), including EUR 7 billion spending on research and development. Estimates from the International Energy Agency (IEA) suggest that similar rates of investment are needed to meet NZE targets by 2050 (Figure 2). Investment is primarily needed to increase the share of low-emission electricity production and use, and to curb emissions from transportation and buildings, including by improving their energy efficiency. The IEA estimates that EU investment flows into the energy sector totalled around EUR 220 billion on average during 2016-2020 - the equivalent of roughly 1 ¾ percent of GDP. Hence, overall, investment would almost need to double from the annual investment flows prior to the COVID-19 pandemic (Figure 2) (IEA, 2024[2]).

5. The European Environment Agency (EEA) and IEA scenarios are in the same order of magnitude indicating an overall need to sustain a large amount of investment in the climate transition. Notably, following the energy crisis sparked by Russia's war of aggression against Ukraine, energy investment in the EU has increased to levels in line with longer-term needs (Figure 2). In particular, in 2023, investment in renewable energy generation totalled almost EUR 100 billion, an increase of more than 6% from the previous year (IEA, 2024[2]). Investment in power grids, which includes interconnections, rose by more than 20% in 2023, nearly reaching EUR 60 billion. Europe also added significant new liquified natural gas (LNG) import capacity to switch away from Russian gas.

6. While recent investment figures have been in line with the long-term requirements of the green transition (IEA, 2024[2]), ensuring the profitability of investments has often proven challenging in the past. Moreover, the investment needs are based on assumptions regarding how the costs and efficiency of technologies will evolve in the future and how widely they are adopted. Hence, the costs of achieving the same emission reductions may increase, for example because of heightened geopolitical tensions, global value chain disruptions and increasing barriers to trade. The concentration of raw materials or products central for the green transition with limited to no possibility for diversification constitutes another important chokepoint. More generally, a more fragmented world could delay cleaner technology adoption and weaken countries' policy commitments and implementation of the green transition.

Figure 2. Estimated investment needs are substantial



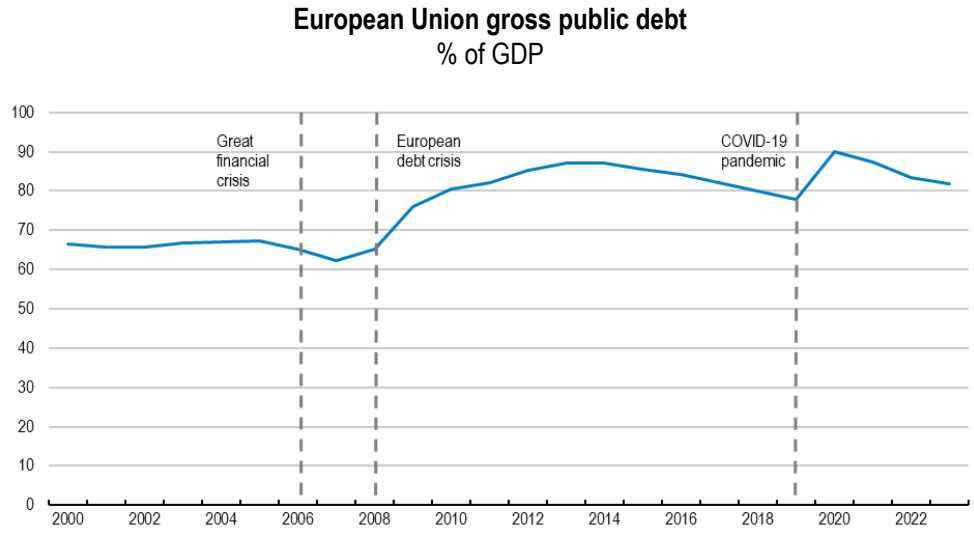
Note: "Clean supply" includes low-emissions fuels, direct air capture, and measures to reduce the emissions intensity of fossil fuel production. "Low-emissions electricity" includes output from renewable energy technologies, nuclear power, fossil fuels fitted with carbon capture, utilisation, and storage, hydrogen and ammonia. "End-use" sectors include industry, transport, buildings and others. Figures are shown in 2023 prices. Figures have been converted into EUR from USD using 2023 exchange rate. Net zero emissions scenario is a scenario which sets out a pathway for the global energy sector to achieve net zero CO2 emissions by 2050. It does not rely on emissions reductions from outside the energy sector to achieve its goals. Universal access to electricity and clean cooking are achieved by 2030. The scenario was fully updated in 2023.
Source: IEA (2024), World Energy Investment 2024, IEA, Paris.

How to boost green investment in the EU?

Fiscal space will likely remain limited

7. The ability of fiscal policy to support the climate transition is constrained by the fiscal outlook of the EU. A sequence of shocks - the Great Financial Crisis, the European debt crisis, the COVID-19 pandemic, and Russia's war of aggression against Ukraine - saw a succession of large-scale government interventions to contain the economic fallout. As a result, public debt across EU countries surged, reaching 82% of GDP by the end of 2023 - nearly 20 percentage points higher than in 2007 and significantly above the 60% of GDP stipulated in the Maastricht Treaty (Figure 3). High interest rates coupled with increased public debt levels imply higher debt-servicing costs that constrain fiscal space even further (OECD, 2024a[3]).

Figure 3. A sequence of shocks led to a surge in public debt

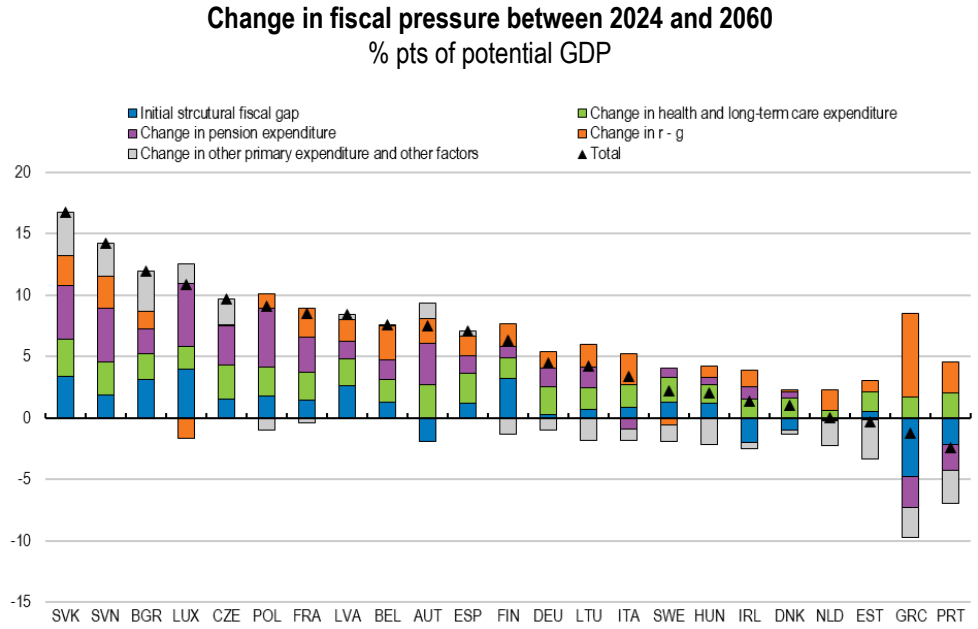


Note: Chart shows the Maastricht definition of public debt.
Source: Eurostat.

8. At the same time, several long-term trends are increasing pressure on public expenditures. The EU is ageing rapidly: on current policies, population ageing costs (primarily pensions, health care and long-term care) are expected to increase by over 1 percentage point of GDP by 2070 across the EU, with the majority of this increase occurring by 2045 (EC, 2024[4]). In many individual countries, such costs are expected to be much higher. In addition, increased geopolitical tensions are boosting defence spending (OECD, 2023b[5]).

9. OECD long-term simulations suggest that primary structural balances would need to increase significantly by 2060 just to stabilise public debt at current levels (Figure 4). In the median EU country, structural balances would need to tighten by more than 6% of GDP and in several EU economies by even more than 10% of GDP. Reducing public debt rather than merely stabilising it would require even higher improvements in structural balances. These simulations do not take into account increased public expenditures on climate adaptation and mitigation, which will put further pressure on public finances. Overall, the ability of EU countries' public finances to fund the investment needs for the green transition is limited.

Figure 4. Mounting spending pressures further constrain fiscal space



Note: The charts show how the ratio of structural primary revenue to GDP must evolve between 2024 and 2060 to keep the gross debt-to-GDP ratio stable near its current value over the projection period (which also implies a stable net debt-to-GDP ratio given the assumption that government financial assets remain stable as a share of GDP). The underlying projected growth rates, interest rates, etc., are from the baseline long-term scenario. The necessary change in structural primary revenue is decomposed into specific spending categories. Source: Guillemette, Y. and J. Château (2023), "Long-term scenarios: incorporating the energy transition", OECD Economic Policy Papers, No. 33, OECD Publishing, Paris.

How can the EU fund the green transition?

10. Given the large investment needs required for the green transition and the significant fiscal constraints, the private sector will have to play a major role in the climate transition. For this to happen, green investment projects will need to generate attractive risk-adjusted returns. To this end, governments of EU countries and the European Union should coordinate their actions on:

1. focusing public resources and investment on projects where private investment is unlikely and finding ways to catalyse private investment;
2. pursuing an effective, transparent and predictable climate policy environment so as to reduce uncertainty and help shift private investment towards NZE projects; and
3. improving the overall attractiveness of investing in the EU.

Focusing public resources in particular on investment in infrastructure and innovation will be crucial

11. Public intervention at national and EU levels should focus on areas and projects that are too risky or unlikely to generate attractive returns for the private sector. Public funding should aim to address market failures with a view to triggering private investment that would not take place otherwise. Potential priority areas include: (i) electricity grids and storage, (ii) cross-border energy interconnections, (iii) complementing the private sector in developing charging stations for electric vehicles, and (iv) improvements in the energy efficiency of public buildings.

12. Public procurement amounts to about 14% of the EU's GDP and makes up a large share of the market in high emission areas like transport and construction. Public procurement can encourage investment and innovation in green technologies, thereby creating demand. For example, by introducing sustainability requirements, the EU could prioritise clean technologies produced to European standards without resorting to more contentious measures, such as local content requirements (OECD, 2023c[6]).

13. Boosting green innovation is key to developing clean technologies and lowering the costs of a climate transition while ensuring access to affordable and secure energy. For example, the IEA's NZE scenarios foresee that over a third of emission reductions by 2050 will come from technologies that are not yet market ready. While most of the clean energy innovation will need to come from the private sector, the government can play an important role by funding basic research, providing early-stage support and in creating a business environment that spurs private-sector green innovation.

14. In the EU, Emission Trading Scheme (ETS) revenues are used to support innovation, including EUR 40 billion (or 2% of the EU budget) for low-carbon technologies under the Innovation Fund (assuming an ETS price of EUR 75 per tonne of CO_2) (OECD, 2023c[6]). However, despite these efforts, climate-related innovation, as measured by patent filings and venture capital funding going to climate-related start-ups, decreased over the past half decade.

15. The EU's Important Projects of Common European Interest (IPCEI) support pooling of public resources across several countries in areas where markets alone cannot deliver breakthrough innovation. IPCEIs involve state aid with specific rules and substantial amounts of financing compared to other channels of public support. However, IPCEIs remain national exercises with wide variation in procedures and reporting, resulting in a fragmented landscape and unnecessary burdens to enterprises. Improvements to IPCEI programme by enhancing the governance of IPCEIs to achieve better coordination and harmonisation across countries, improved monitoring, and broadening start-ups and SMEs' participation (which remains limited) should help to reverse the downward EU trend in green innovation (OECD, 2023c[6]).

16. The EU provides considerable support for renewable energy production. There is scope to re-direct existing EU budgetary resources towards support for green R&D, innovation, and early-stage support, co-ordinated at the EU level. Redirecting and better coordinating scarce resources could allow for expanding aids for green R&D, innovation, and early-stage deployment of next-generation climate technologies through existing programmes (OECD, 2023c[6]). Measures such as tax incentives have been increasingly popular as they can be designed to let eligible companies choose which R&D projects to invest in, being easier to administer and in line with trade and competition rules regarding state aid. In particular, EU support should encourage participation of small firms and start-ups, including through minimising the associated administrative burdens.

Effective, transparent and predictable climate policies will reduce uncertainty and accelerate the shift of resources towards green investment projects

17. Because of multiple market failures, climate policy packages are crucial for increasing the risk-adjusted returns on climate related investments. These policy mixes combine emission pricing, standards and regulations, and enabling complementary policies, including innovation support mechanisms, infrastructure investment, and others, to offset adverse distributional effects and help people in transition (D'Arcangelo, 2022[7]) (Pisani-Ferry, 2023[8])

18. The EU is at the forefront of climate policies. OECD analysis of climate change mitigation policies in OECD and G20 countries over the past 20 years suggests that EU countries employ a larger set of policy instruments than other countries. In addition to emission trading, EU countries pursue climate objectives through a variety of EU-wide and domestic policies, including subsidies and regulatory measures. EU countries have also introduced relatively more phase-outs and bans, such as stricter

minimum energy efficiency standards for buildings and more stringent emissions standards for cars (D'Arcangelo, Kruse and Pisu, 2023[9]). As in many other jurisdictions, fossil fuel subsidies remain pervasive in EU countries and most have still to develop concrete plans on how and when to phase out fossil fuel subsidies.[1]

19. Achieving emission reduction targets of EU countries and the EU, as well as shifting investment towards clean energy and production processes will require further increasing the stringency of policies and phasing out fossil fuel subsides. In particular, adjusting existing tax expenditures to facilitate investment in the climate transition and offsetting any shortfall in tax revenues with the permanent withdrawal of fossil fuel subsides would send clear policy signals and make green investment more profitable. However, such support needs to be carefully evaluated against the concerns over the efficiency of such measures and a subsidy race within the EU and between the EU and other countries.

20. More generally, a predictable climate policy environment is key to ensuring attractive returns of green investment projects. Policy uncertainty delays firms' investment decisions, in particular for capital-intensive and irreversible investments such as in clean energy infrastructure. OECD evidence suggests that higher climate policy uncertainty lowers business investment, especially in the pollution-intensive sectors most exposed to climate policies and among capital-intensive companies (Berestycki et al., 2022[10]).

21. Climate change mitigation policy packages can contribute to a more predictable policy environment as they enjoy broader public support than individual climate policies. Policy packages perceived to be effective, progressive, or both are more likely to gather public support (Dechezleprêtre et al., 2022[11]), lowering the chances of future policy backtracking.

22. Improved transparency and communication, both at national and EU levels, can also help reduce uncertainty about policies. A radical possibility would be to set legally binding emission-reduction targets to signal a government's commitment to lowering emissions. Such targets can shape expectations of private investors more strongly than non-binding targets as courts may enforce those targets.[2] For instance, the pronouncement of Germany's Constitutional Court in 2021 highlighted the importance of including climate change targets into laws. Countries that adopt climate laws experience significantly larger emissions reductions in subsequent years than those that do not (OECD, 2024b[12]).

Towards a more integrated Single Market for energy and transport

23. The EU's Single Market is an essential driver of long-term growth, with considerable potential for further deepening. Fully leveraging its benefits in the context of the climate transition requires a coordinated approach across the EU to ensure the interoperability of infrastructure and avoid market fragmentation. Implementation of comprehensive infrastructure planning, especially in energy and transport, given these sectors account for about 80% of EU emissions (Figure 5), would align infrastructure development with emission reduction targets and strengthen their credibility, making it easier to attract investors.

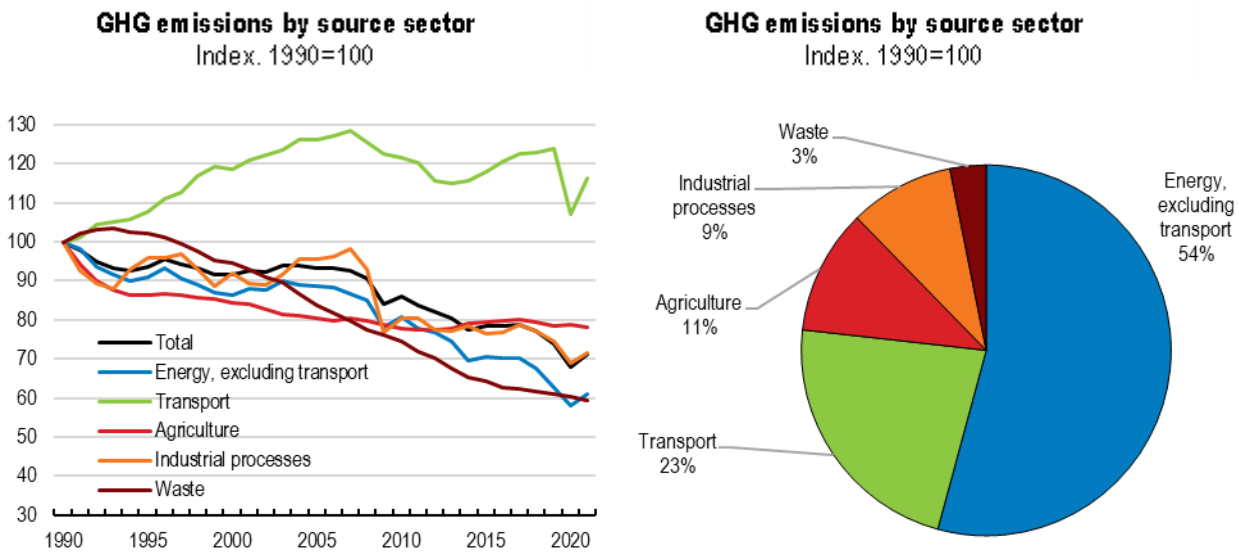
24. In the transport sector, the European Commission has designed comprehensive plans aiming at strengthening intercountry connections, improving intermodal transport nodes, and increasing passenger and freight rail transport. The Trans-European Transport Network aims to create a network of nine core corridors connecting railway lines with roads, inland waterways, maritime routes, ports and airports across

[1] Fossil fuel subsidies | European Environment Agency's home page (europa.eu).

[2] In May 2021 Germany's Constitutional Court ruled that the 2030 target included in the 2019 Climate Law (reduction of GHG emission by 55% with respect the 1990 level) was insufficient to reach carbon neutrality by 2050. Following this the government has raised the 2030 GHG reduction target to 65%. A similar case is provided by the Netherlands, where in 2015 the government was ordered by the Hague Court to increase emissions reduction ambition from -17% to -25% with respect to 1900 by 2020, after being sued by the Urgenda Foundation and a group of 900 citizens.

the EU. Yet, cross-border rail traffic remains underdeveloped, despite having on average lower emissions per passenger than other forms of transportation. This is because of still common discriminatory practices against foreign train operators and failures to open the rail transport market to competition in many countries. These are preventing the creation of a single European railway area, contributing to high transport costs and high emissions from the transport sector.

Figure 5. Energy and transport account for a large share of EU emissions



Note: Excluding land-use, land-use change and forestry (LULUCF).
Source: OECD Environmental Statistics database.

25. In the energy sector, increasing the share of renewable sources in EU countries' electricity consumption is key to progressing towards emission reduction targets. The rising share of renewable sources will also require a deep transformation of the European electricity market as prices in competitive wholesale electricity markets may not cover the upfront capital costs of renewable energy investment. For this reason, with some exceptions, investments in clean electricity generation have so far largely relied on support measures and subsidies to lower risks caused by high upfront capital costs.

26. The EU electricity market reform approved in March 2024 makes some steps towards a more stable, predictable, and sustainable electricity market while strengthening security of supply, albeit potentially at a fiscal cost. This reform fosters greater reliance on long-term contracts, such as power purchase agreements (PPAs) in which prices better reflect the high upfront capital costs of renewable energy than spot prices in the wholesale electricity market. The reform also allows EU Member States to support investment in renewables under PPAs through state aid, including by setting up guarantee schemes and measures to increase price stability.

27. For this reform to be effective, EU countries should promote the development of transparent PPA markets. This involves lowering entry barriers (in the EU, PPAs have been mostly used by large generators and customers (Fabra, 2023[13])), providing information on signed PPAs to market participants, and removing regulatory barriers hindering cross-border PPAs – such as discriminatory procedures or charges and guarantees of origin. Progress in this direction may help to lower generators' high bargaining power in PPA contracts. Moreover, committing to a clear and transparent schedule of contract-for-difference

auctions within a fixed period (e.g., five years) would reduce uncertainty about the expected evolution of electricity market and allow green investors to plan.

28. At the national level, infrastructure planning needs to be integrated into domestic long-term decarbonisation strategies. More consistency between infrastructure planning and decarbonisation strategies will also help to build infrastructure project pipelines (i.e., a list of specific, investment-ready and bankable infrastructure projects) aligned with emission reduction targets. Progress in this direction can accelerate the shift of private finance towards green infrastructure projects. Dedicated project preparation facilities (PPFs) can be useful in this area as they can expedite projects' preparation, including those involving public-private partnerships, and bring forward investment-ready projects. Green infrastructure project pipelines can ease market access. This is because fixed costs of understanding the regulatory settings can deter international investors if there is limited chance of securing a project or if the project is too small on its own.

Ensuring investors have sufficient information to evaluate firms' balance sheets exposure to climate change

29. Encouraging emission disclosures in the presence of stringent climate change mitigation policies could help investors to gauge firms' emission performance, thus contributing to a shift of capital towards low-carbon production processes. By reducing information failures, this could help foster market efficiency and investor protection.

30. OECD, G20 and Financial Stability Board jurisdictions are moving towards sustainability-related disclosure, at least for large, listed companies. Even where sustainability-related disclosure is not mandatory, a significant number of companies have been reporting on sustainability risks and opportunities. Empirical evidence suggests that sustainability-related disclosure can help mitigate some of the transition risks, resulting in lower costs of debt and accelerating the climate transition (D'Arcangelo, 2023[14]).[3]

31. The EU is making gradual steps towards improving the accuracy and reliability of sustainability reporting and the verification of embedded emissions as part of the Corporate Sustainability Reporting Directive (CSRD) and the Carbon Border Adjustment Mechanism (CBAM). These initiatives can drive progress towards corporates' disclosure comparable emission data, thus helping investors to price climate policy risks and hence guide funds into green investment. Implementing the EU new assurance rules for corporates' emissions would help to promote the gradual development of the assurance market and limit firms' reporting costs.

The European market needs to be more attractive for investors

32. While the steer towards climate objectives should come from climate policy packages, structural reforms are needed to improve the conditions for investment in the EU and invigorate private investments in the climate transition. This includes a wide range of reforms at the national level, such as those improving the allocation of capital by reducing barriers to firm entry and exit, boosting competition and skills, and improving labour market flexibility (OECD, 2023a[15]).

33. At the EU level, reform priorities include the completion of the Single Market, deepening the Banking and Capital Markets Union and progress towards a unified energy market. In particular, deepening the capital markets union would help institutional investors to allocate capital more efficiently across

[3] Out of the 43 970 listed companies globally, almost 9 600 disclosed sustainability-related information in 2022 or later. The companies that disclosed sustainability-related information represent 86% of the global market capitalisation. The EU ranks above the global average, with 42% of listed companies representing 96% of the regional market capitalisation disclosing sustainability-related information.

countries and assets, thus encouraging more long-term and equity financing. European financial markets could mobilise massive financial resources. There are significant surplus savings in European countries available that could be channelled more into green investments. In 2023, the EU overall had a current account surplus of roughly 2 ½ % of GDP, forecast to rise to 2 ¾ % of GDP in 2025 (OECD Economic Outlook). The surplus is comparable to the total annual investment needed for the climate transition. However, most of these surplus savings of households and corporates are currently invested into foreign debt securities (Figure 6). Tapping into more of these savings to invest in the EU requires making Europe more attractive for investment.

34. Removing barriers hindering the development and integration of capital markets has great potential to boost green investment in Europe as these tend to be more sensitive to financing constraints. Policies aimed at deepening equity markets, spurring both the demand and supply of equity, could help mobilise risk capital to finance the green transition, in particular for SMEs. These could include removing tax advantages provided to debt-over-equity financing; simplifying administrative procedures for Initial Public Offerings and increasing awareness of equity instruments through financial literacy to enlarge the market and enhancing the comparability and standardisation of sustainable finance products and their verification and supervision (Costa et al., 2024[16]) (Pisu, 2017[17])

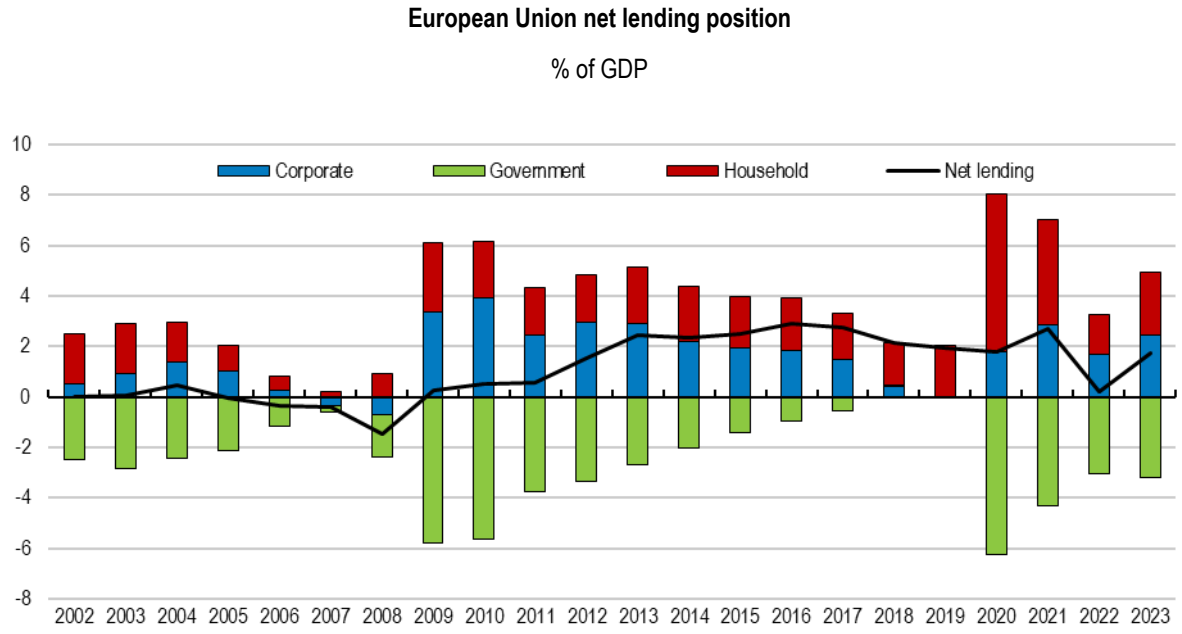
35. Green bonds can further help mobilise financial resources for the climate transition. The EU has been the most active region in the sustainable bonds market in corporate and official sectors, accounting for roughly half of the global sustainable bond market issuance. The share of green bonds in total EU bond issuance has risen rapidly from 0.6% of all bonds in 2014 to almost 9% in 2022, with a particularly rapid rise in corporate issuance.

36. Policymakers should likewise seek to strengthen green real estate bond and mortgage-loan frameworks. They should also support the development of green real estate finance instruments to underpin the expansion of green real estate finance markets needed to fund the transition to net zero carbon emissions.

37. Making progress towards a unified energy market would increase the level of competition, and hence innovation and investment, in a sector which typically faces long investment times and high degrees of concentration in national markets. Deepening cross-border connections among EU countries' energy market would not only enhance energy security, but also boost market dynamism, encouraging participants to innovate and invest to gain a competitive edge. For instance, EU legislation requires that grid operators ensure at least 70% of their capacity is available for electricity trading with neighbours by the end of 2025. Many EU Member States are not on track to meet this target (Letta, 2024[18]). Moreover, more co-operation among EU Member States is needed in relation to potential offshore wind projects that span across national borders and procuring flexibility and demand response across the Single Market, for example, by allocating new renewable power capacity through joint auctions. The EU Energy Platform launched in 2022 – to pool the demand for gas from EU countries, conduct joint purchases (thus avoiding EU countries outbidding each other) and efficient use of existing infrastructure – is an example of successful and effective cooperation in this area. In the future, the same mechanism is foreseen to be expanded to hydrogen purchases.

38. More generally, at the domestic level, structural policies can increase the level of investment by improving access to finance, reforming unfavourable regulatory settings, and increasing the efficiency of insolvency regimes so as not to trap capital in low productivity firms (Égert, 2021[19]). Less stringent product market regulations can boost aggregate investment – if the direct and indirect costs of starting a business are low, the number of start-ups will increase. This can translate into more investment and innovation. Moreover, reducing financing constraints and enhancing green managerial capacity can rise firms' probability of investing in green technologies (Costa et al., 2024[16]). This adds to the importance and urgency of deepening the EU capital market union and aligning managerial incentives with emission reduction goals.

Figure 6. Channelling more surplus savings into green investments could help close the financing gap



Source: Eurostat; OECD National Accounts; and OECD calculations.

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