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Executive summary

Investing in clean energy and transport systems is essential if the European Union is to achieve the 2030 climate goal of a 55 percent emissions reduction from 2005. The 2016 Paris Agreement (1.9°C) has expanded rapidly, while industrial decarbonisation must be boosted and the green transformation of buildings and transport accelerated sharply.

Despite growing constraints on the public sector's ability to support the necessary investments. At EU level, potential obstacles include the end of the NextGenerationEU post-pandemic recovery instrument, the lack of a green carve-out in the reformed EU fiscal framework, the increasingly difficult trade-offs between decarbonisation, competitiveness and security, and the spreading false narratives on climate policy promoted by populist nationalist parties. The latter two challenges are set to be further exacerbated by the return of President Trump in the United States.

It is clear that Europe is not on track to reach its climate targets. It is at a juncture where political resistance to decarbonisation is mounting and where budgetary means to buy

1. How much green investment is needed to achieve the EU climate targets?

There is no green transition without green investment. Stimulating this will be the core challenge for the European Green Deal in the next five years, making or breaking the European Union's chances of achieving its climate targets and strengthening its competitiveness and security.

But how much green investment is really needed to achieve the EU climate targets? To assess this¹, good-quality country-level information is required. But despite the European Green Deal and the many initiatives it has triggered, this remains surprisingly incomplete and inconsistent. At best, some of the national energy and climate plans (NECPs) of EU countries² provide general estimates of the amount of investment needed to reach the 2030 target, without specifying how such estimates were calculated, making it impossible to assess their reliability, compare them in a consistent manner or monitor progress towards decarbonisation (ECA, 2023).

In the absence of reliable official national information, Europe's green investment needs can best be grasped by looking at European Commission *ex-ante* estimates for the EU as a whole, in the impact assessments underlying the 2030 and proposed 2040 climate targets (European Commission, 2020, 2024).

According to the Commission, between 2011 and 2020, total investments in energy supply (ie power plants and the power grid), energy demand (ie buildings, industry, agriculture) and transport (ie cars, trucks, public transport) averaged 5.8 percent of GDP. Achieving the EU 2030 climate target will require additional annual investments of about two percent of GDP between 2021 and 2030, a level that must be sustained for two decades to reach net-zero (Table 1).

1. European Commission (2023) *Impact Assessment of the 2030 Climate Target* (2023/02/20)

These estimates are broadly in line with the findings of Pisani-Ferry and Mahfouz (2023) for France and with global estimates from the International Energy Agency (IEA, 2023b), the International Renewable Energy Agency (IRENA, 2023) and Bloomberg New Energy Finance

1. European Commission (2023) *Impact Assessment of the 2030 Climate Target* (2023/02/20)

2. https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en.

(BNEF, 2024)³. They are also aligned with the estimates for additional green investment needs in 2025-2030 in the Draghi (2024) report on European competitiveness, which are themselves based on European Commission and European Central Bank calculations⁴. Finally, Bizien *et al* (2024) confirmed that the gap between current EU climate investments and Commission estimates of future needs amounted in 2022 to around 2.5 percent of GDP.

2. The European Commission's headline green-investment need estimates are flawed.

The European Commission's headline green-investment need estimates are flawed. The investment cost of some major items is overstated. Other important climate-related investment needs are not included. Even after adjusting for over- and understatements, the figures are subject to significant uncertainty.

2.1 The Commission's headline numbers have transport as the main spending item by far, but 60 percent of this investment need would arise from replacement of cars that would happen anyway (based on an average car lifespan of around 10 years; ACEA, 2023). If this is taken out, the Commission expects additional transport investments consistent with reaching net-zero to be limited: 0.5 percent of GDP annually from 2021 to 2030. Instead, the power sector and buildings are expected to be the main sectors requiring additional efforts to achieve climate targets. In these two sectors, investment needs are expected to almost double as a share of GDP over the same period.

The Commission's headline numbers also attempt to factor-in behavioural change. This is likely significant, as further behavioural measures (eg accelerated modal shifts and sustainable mobility patterns, energy conservation, recycling) could reduce EU green investment needs by about eight percent (Table 2).

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Table 2: Reduction in annual investment needs due to behavioural change, 2031-2050 (2023 prices)

	European Commission S2 scenario*	European Commission LIFE scenario*	Reduction in annual investment needs due to behavioural change
Energy supply	€308 billion	€272 billion	€36 billion
Energy demand	€356 billion	€345 billion	€11 billion
Transport	€873 billion	€791 billion	€82 billion
Total	1537 billion	1408 billion	129 billion

Source: Bruegel based on European Commission (2024). Note: * See note to Table 1.

3. Bruegel (2024) estimates that the Commission's headline numbers are overstated by around 10 percent. This is based on a comparison of the Commission's headline numbers with the estimates of the European Central Bank (ECB) and the European Investment Bank (EIB). The ECB estimates that the Commission's headline numbers are overstated by around 10 percent, while the EIB estimates that they are overstated by around 5 percent. The Commission's headline numbers are based on a number of assumptions, including that the cost of investment in transport is significantly higher than in other sectors, and that the cost of investment in buildings is significantly lower than in other sectors. The ECB and EIB estimates are based on a different set of assumptions, including that the cost of investment in transport is significantly lower than in other sectors, and that the cost of investment in buildings is significantly higher than in other sectors.

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2.2 Financing

The European Commission's numbers refer only to capital expenditures (CAPEX) and do not include financing costs. This is worth mentioning because while CAPEX represents the main cost item in the green transition, the cost of financing investment will be significant for cash-constrained agents and public finances will need to step in with de-risking instruments to facilitate private investment.

The Commission's numbers also only look at the deployment side of decarbonisation, and do not include its manufacturing side. That is, these figures do not take into account the clean-tech manufacturing costs required to reach EU industrial policy objectives, such as what is outlined in the Net-Zero Industry Act (NZIA, Regulation (EU) 2024/1735)⁵. The Commission estimates that ramping up clean-tech manufacturing capabilities in Europe to meet at least 40 percent of the EU's annual deployment needs by 2030 would require additional total investments of about €100 billion in the period 2024-2030. This is about 0.1 percent of GDP.

We consider this estimate to be very conservative, in particular because the NZIA focuses only on a limited selection of technologies and domestic supply chains, and overlooks the costs of skill-enhancement programmes and of securing access to underlying strategic critical raw materials. In addition, green investment needs in manufacturing might be much (a)21 (n (a)7 (t)1 (e)-2

otherwise have happened. The size of these excluded items is very uncertain, mostly because of uncertainty surrounding adaptation needs. Consequently, the total investment need for the green transition up to 2030 is likely to exceed the Commission's estimates by a wide margin.



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have been able to rethink their investment support for renewables⁹, and why the share of public investment to meet EU climate targets in the power sector is estimated in the relatively low range of 15 percent to 20 percent (Baccianti, 2022).

- *Financing electricity and transport infrastructure*, as well as renovation of public buildings. For example, public funding will need to pay for a significant share of investment in railway networks, public transport and district heating (Baccianti, 2022; OBR, 2021).
- *Provision of financial de-risking tools to lower the cost of capital for private investors in green projects*. Many clean technologies are characterised by high CAPEX and low operating costs (OPEX). This is true for wind and solar generation, electric vehicles and buildings retrofitting. The cost of capital thus plays a key role in the green transition, providing a critical benchmark to assess the risk and return preferences of investors, and acting as a lever for financial flows to influence prices and choices in the real energy economy (IEA, 2021). Lowering the cost of capital to foster private investment can be done through instruments such as preferential loans and guarantees to both firms and households. For instance, zero-interest loans in France, granted under the éco-Prêt à Taux Zéro (éco-PTZ) programme boosted energy-renovation rates across the country thanks to high take-up among the middle class (Eryzhenskiy et al, 2022).
- *Provision of direct financial support and compensation to the most vulnerable to ensure a socially fair transition*. For most vulnerable households, direct public support is needed to compensate for the higher energy costs linked to climate policy, and to ensure take-up of green alternatives. For example, the phase-in of an EU carbon price on household and road transport emissions¹⁰ will likely be regressive, disproportionately affecting vulnerable households that rely on fossil fuels for domestic heating and lack the resources needed to change their vehicles. Directing support to the most vulnerable would help reduce both emissions and energy poverty. For instance, prioritising grants for the worst-performing buildings, often occupied by vulnerable consumers, will yield climate benefits and benefits in terms of improved air quality, health, productivity, energy security and lower future government outlays to alleviate energy poverty (Vailles et al, 2023; Keliaskaite et al, 2024).

The upshot is that the EU has embarked on a transformational transition without mapping out in detail how much investment this transition will require, and without equipping itself with the capacity to monitor, either at EU-level or national level, the actual efforts and the remaining investment gap. Knowing the rough direction of travel is like crossing the Atlantic without a compass, and is not enough.

⁹ JRC (2024), *de facto* ... 2022, ... https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/ets2-buildings-road-transport-and-additional-sectors_en.

¹⁰ ... 2022. https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/ets2-buildings-road-transport-and-additional-sectors_en.

4 Investment needs 2025-2030

Even if governments can ensure the substitutability of public finance with private finance, achieving the EU's 2030 climate goal will still require public investment during 2025-2030 of at least 0.5 percent of GDP. Delivering this will be tough for five main reasons.

4.1 *Since the launch of the European Green Deal in 2019, the EU has played an increasingly direct role in fostering green investment, including through carbon pricing and regulations, and also by offering financial incentives. Balancing prohibitions and incentives is crucial to ensure the political viability of the green transition and to avoid a dangerous 'blame game' with national capitals (Pisani-Ferry *et al**

tivity-enhancing expenditures, it barely qualifies for being regarded as growth-enhancing (Pisani-Ferry, 2024).
The reformed EU fiscal framework could have been made more investment-friendly by

represents a clean-tech export opportunity for Europe. The EU must stick with its plan even as difficult trade-offs get tougher, and try to turn this situation into an opportunity to attract those clean investments that might now not materialise in the US, at least over the next four years.

It is important to stress that Trump's fossil-fuel agenda is in the selfish interest of the US but it has no content for the EU, which is not endowed with fossil-fuel resources. Trump will aim to make the US not just 'energy independent', but 'energy dominant'. He has pledged to halve natural gas and electricity prices within a year, largely through increased natural gas production. If this happens, it would widen the EU-US energy price gap, further undermining EU industrial competitiveness. As previously illustrated, the only way for Europe to provide a structural solution to this problem is to accelerate green investments. Trump's return should thus be taken as a substantial boost to the implementation of the EU's clean investment agenda.

5. Key recommendations

To reach the EU's 2030 climate target, the European Commission should put forward a new transformation programme, with both a private and a public strand. For the private strand, policy should aim at ensuring the credibility of the climate-policy strategy, and at creating the framework conditions for a full mobilisation of savings. For the public strand, the aim should be to maximise the re-power of limited fiscal resources.

5.1 Credibility of the EU climate-policy framework and overall policy consistency

Proposal 1: Ensure the credibility of the EU climate-policy framework and overall policy consistency

Credible carbon pricing signals and credible climate and environmental regulations drive expectations and underpin the green investment decisions of households and firms. Effective implementation of this toolkit can reduce the overall fiscal cost of the green transition.

The European Green Deal must thus be implemented fully, avoiding the temptation to water down its provisions because of competitiveness concerns. Reopening and weakening laws agreed after years of negotiations would do nothing to support the competitiveness of European industry and would only risk postponing the green investment decisions of families and businesses by undermining confidence in the reliability of Europe's green trajectory¹⁴.

An element that should not be neglected is taxation. Current European taxation systems still provide generous fossil-fuel subsidies and it is urgent to rethink them. After previous failed attempts, the now more than two-decades old EU Energy Taxation Directive (Council Directive 2003/96/EC) must be revised to align European taxation systems with EU climate policy, and to incentivise clean-tech uptake.

Proposal 2: Unleash green private investments through a capital markets union that works, an effective sustainable finance framework and a stronger European Investment Bank. As the private sector will have to account for most green investment, the capability to adequately leverage private investments will ultimately make or break the European Green Deal.

The EU can take two important actions on this: i) deliver an effective capital markets union

¹⁴ European Commission, 'The European Green Deal: A New Era of Sustainable Growth', 2023. https://ec.europa.eu/economy_finance/sites/default/files/2023-11/102223main_en.pdf.

(CMU); ii) deliver an effective sustainable finance framework and iii) increase the repositioning

iii) Increase the repower of the EIB

The EIB has played an important role in fostering clean investments under the auspices of the so-called Juncker Plan (now renamed InvestEU), a 2015 EU initiative to boost investment. EIB guarantees should amount to €33.7 billion to support about €370 billion in private investments by 2027. But more can and should be done to increase the role of the EIB in fostering investment across the EU, and also to increase its risk profile.

An important but still modest step has been taken by the EIB Board of Governors, which in 2024 proposed to change the statutory limit on its gearing ratio (ie how much it can lend in relation to its own resources), raising it from 250 percent to 290 percent¹⁷. With a total balance sheet close to €600 billion, the EIB has played an increasingly significant role in the financing of the green transition, in accordance with its 2019 decision to become ‘the EU’s climate bank,’ and to devote more than 50 percent of its investments to projects supporting climate action and environmental sustainability.

The EIB Board of Governors in June 2024 confirmed the financing of the green transition as the bank’s first priority, envisaging an increase in its lending to interconnectors and grids, energy efficiency, energy storage and renewables, and clean-tech manufacturing projects (EIB, 2024a). Financing activity of up to €95 billion is foreseen for 2024-2027, with well above half of investments going to the green transition. This compares to financing activity of €84 billion in 2023, of which more than half is already focused on the green transition (EIB, 2024b).

This is a good step but a modest one, given the scale of investment the EU needs in the coming years. The EIB should be more ambitious on the level of its financial activity. The EU should continue to provide the EIB with sufficient mandates and guarantees from the MFF, as these are essential to maintain the EIB’s current funding levels and to deploy more high-risk impact finance – similarly to national promotional banks (eg Germany’s KfW, France’s Groupe Caisse des Dépôts, Italy’s Cassa di Risparmio di Venezia and Spain’s Instituto de Crédito Oficial), which are underwritten by national guarantees.

An additional step to form up the EIB’s role in fostering private green investment was proposed by Letta (2024): the launch of a European Green Guarantee (EGG). This would entail the European Commission and EIB developing jointly an EU-wide scheme of guarantees to support bank lending to green investment projects and companies, with the EIB evaluating specific proposals from commercial banks and/or national financial institutions, and awarding the guarantee that would enable them to provide the necessary funding to companies. Based on a resource multiplier of 12 (like the original Juncker Plan), €25 billion to €30 billion in guarantees would trigger €300 billion to €350 billion in green investment. Under this scheme, European banks would be able to play a greater role in funding green companies, as the EGG would neutralise the so-called ‘green transition risk,’ which prices the inherent risk of lending to green companies. The EGG would thus allow the EIB to reinforce significantly its catalytic role in private green investment.

5.2 National energy and climate plans of EU countries remain bureaucratic exercises without substantial impact on national energy policies

Proposal 3: Turn NECPs into national green-investment strategies and attach conditions to the disbursement of EU funds

The national energy and climate plans (NECPs) of EU countries remain bureaucratic exercises without substantial impact on the formulation and implementation of national energy policies (Pisani-Ferry *et al*, 2023). NECPs must be turned into real national green-investment strategies, providing a point of reference for investors, stakeholders and citizens in making investment decisions. Governments should be obliged to set out in their NECPs a detailed, bottom-up analysis of their green investment needs, and an implementation roadmap with clear milestones or key performance indicators (KPIs).

17. EIB Board of Governors, 2024, ‘EIB Board of Governors approves new EIB financing strategy’, <https://www.eib.org/en/press/2024/06-10-24>.

National energy and climate plans of EU countries remain bureaucratic exercises without substantial impact on national energy policies

the disbursement of EU green funds should be made conditional on the efficient achievement of these KPIs. This would be in line with the approach of linking the future EU budget with national reforms and investments, put forward by Ursula von der Leyen ahead of the European elections¹⁸. As part of this, EU funds should be better focused on European green public goods with a high level of additionality (eg electricity interconnections) and measures that tackle the distributional impacts of climate policy.

Much more coordinated development of renewable energy and electricity-grid investment across Europe would yield substantial 'techno-economic' benefits, based on the design and operation of several European national electricity systems jointly, rather than individually.

These benefits will increase massively with the development of renewables because of the harnessing of regional advantages, reducing the need for expensive back-up capacity and enhancing resilience to shocks (Zachmann *et al*, 2024).

Proposal 4: Revise the EU fiscal framework to introduce a 'fiscally responsible public investment rule'

The reform of the EU fiscal framework has not left adequate room for green public investment. The framework should be revised by exempting well-specified public investment in decarbonisation, approved by the Council of the EU, from the application of minimum adjustments required under the EDP and the associated safeguards.

The problem with public investment in decarbonisation is that many of these investments are unprofitable at the current carbon price, taking into account the prevailing discount rate (for households) or the cost of capital (for businesses and local governments). Belle-Larant *et al* (2024) estimated that in France, only one-third of green investments in the transport and building sectors are profitable at the current carbon-price level. This implies that they won't happen without public support.

Governments should thus play an important role here. But the new EU fiscal rules prevent countries that are subject to the EDP from sustaining clean investments. The framework should be amended so that economically-sound public investment that is expected to result in measurable reductions in emissions can happen. As a rule, this exemption should be conditional on: (a) the allocation of the future savings from reductions in fossil-fuel consumption to the reduction of public deficits and (b) adequate monitoring of implementation.

Proposal 5: Put the EU budget at the service of the green transformation

Increasing the minimum green spending threshold in the EU Multiannual Financial Framework (MFF) from 20 percent in 2014-2020 to 30 percent in 2021-2027 was an important step,

the European Sovereignty Fund¹⁹, and should instead consider different funding options, including new EU joint borrowing as suggested by Draghi (2024). The European Competitiveness Fund should accompany the implementation of a truly European industrial policy, and could become the main EU industrial policy investment vehicle in the context of which other tools, such as the EU Innovation Fund, could be framed while maintaining their operational autonomy. That is, the European Competitiveness Fund should be a one-stop-shop able to ensure the availability and accessibility of EU funds for clean-tech manufacturing.

Availability and accessibility are essential to maximise the impact of public money. Without such a vehicle at EU level, public incentives to spur private investment in clean tech and other technologies would predominantly come from national state aid, which would create risks of single-market fragmentation. The new Competitiveness Fund should:

- Focus on supporting the development and scaling-up of pan-European public-private eco-systems, for instance topping-up national support for Important Projects of Common European Interest (IPCEIs);
- Support the whole innovation cycle in an integrated manner, from disruptive innovation to deployment at scale;
- Prioritise areas in which market, network and transition failures are most likely and government selection failures least likely, ensuring additionality and leveraging of other (member state) public and private funding (Tagliapietra *et al*, 2023).

Proposal 6: Maximise the use of ETS revenues

As the EU carbon price has increased significantly in recent years, so too have the revenues accruing to governments from auctioning of emission permits – rising from around €5 billion in 2017 to €38.8 billion in 2022. Of the total auction revenues generated in 2022, €30 billion went directly to EU countries, while the rest went into the EU Innovation Fund (€3.2 billion) and the Modernisation Fund (€3.4 billion) (EEA, 2023). However, while between 2013 and 2022 national governments only spent around three quarters of the total revenues they received on climate-related activities, the ETS rules now oblige them to spend all their revenues for green purposes²⁰.

In May 2023, EU countries agreed to introduce a second emissions trading scheme (ETS2).

It will put a price on emissions from direct fuel combustion, including gas and oil boilers in private homes, and fuel combustion in road transport. Taking effect in 2027, ETS2 will require upstream fossil-fuel suppliers to surrender carbon certificates equivalent to the emissions generated by consumers of their fuels. The auctioning of ETS2 allowances will also generate substantial revenues of about €50 billion annually at a carbon price of €45/tonne (in 2020 prices) – the level of the cap that will be in place during the first three years of operation of ETS2. A maximum of €65 billion from the 2026-2032 revenues will be allocated to the Social Climate Fund (SCF), which is intended to support vulnerable households, micro-enterprises and transport users who face higher costs.

To access the SCF, EU countries must develop by June 2025 social climate plans that outline how they will use these funds to support vulnerable communities. In addition, countries must contribute at least another 25 percent of the costs of their social climate plans, increasing SCF resources to at least €87 billion (Cludius *et al*, 2023). The remaining ETS2 revenues will be managed by national governments; EU rules require these revenues to be used to deploy low-emission solutions in transport and heating, or to mitigate social impacts.

Cautiously assuming an ETS carbon price of €75 in 2030, and an ETS2 carbon price of €45, total revenues would amount to €65 billion in that year, of which €50 billion would accrue to EU countries. If carbon prices rise by 2030 to €130 and €100 on the ETS and ETS2 markets respectively, total revenues would be €134 billion in that year, of which around €100 billion would accrue to member countries. Being in the order of €50 billion to €100 billion in 2030, ETS revenues accruing to member states would thus be significant, and should be used to maximum benefit for the transition. The EU should closely monitor member state policies to ensure the money is well spent.

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To achieve its climate targets, the EU will require additional annual investments of about two percent of GDP between 2025 and 2030, comparable to EU R&D spending in 2022 – estimated at 2.2 percent of GDP (Eurostat, 2024). These investment needs are significant, but manageable.

Finding the sums is also urgent and necessary. With the European Green Deal, the EU has positioned itself as the global frontrunner in climate policy. Given the political economy of global climate action and the likely withdrawal of the US from the Paris Agreement, the success of the European Green Deal is vital for global decarbonisation to stand a chance.

This is more important than ever, as climate-change impacts around the world are becoming increasingly visible and costly.

From this global perspective, it should be recalled that the cost of climate action is far lower than the cost of inaction, especially for Europe which is the fastest-warming continent. Extreme flooding in Slovenia in 2023, for example, caused damage estimated at around 16 percent of national GDP (IMF, 2024). Such events cause severe, direct impacts on settlements, infrastructure, agriculture and human health. They also led to wider economic impacts in the affected regions and major fiscal challenges at national levels.

As we have shown, the public share of the additional investments needed for the EU to meet its 2030 climate target should range between 0.5 percent and one percent of GDP in 2025-2030. Fiscal constraints must not stand in the way of mobilisation of these resources. Public debt for such investments should be seen as ‘good debt’, fully justified by the one-off financing needs of an extraordinary and temporary transition that will massively benefit future generations. It should also be stressed that public spending on climate mitigation today will lessen the potentially much higher needs for public spending on climate adaptation in the future. A responsible green investment framework along the lines we suggest would help convince markets that this green debt can and must be financed.

ACEA (2023) *Vehicles in use, Europe 2023*, European Automobile Manufacturers' Association. available at <https://www.acea.auto/publication/report-vehicles-in-use-europe-2023/>

Baccianti, C. (2022) 'The Public Spending Needs of Reaching the EU's Climate Targets,' in F. Cerniglia and F. Saraceno (eds) *Greening Europe, 2022 European Public Investment Outlook*, available at <https://www.openbookpublishers.com/books/10.11647/obp.0328>

Belle-Larant F., C. Bouvart, G. Claeys, R. Fotso, M. Gérardin and N. Zbalah (2024) 'Réindustrialisation de la France à horizon 2035 : besoins, contraintes et effets potentiels,' *Working Paper n° 2024-02*, France Stratégie, available at <https://www.strategie.gouv.fr/sites/strategie.gouv.fr/files/atoms/files/fs-2024-ns-reindustrialisation.pdf>

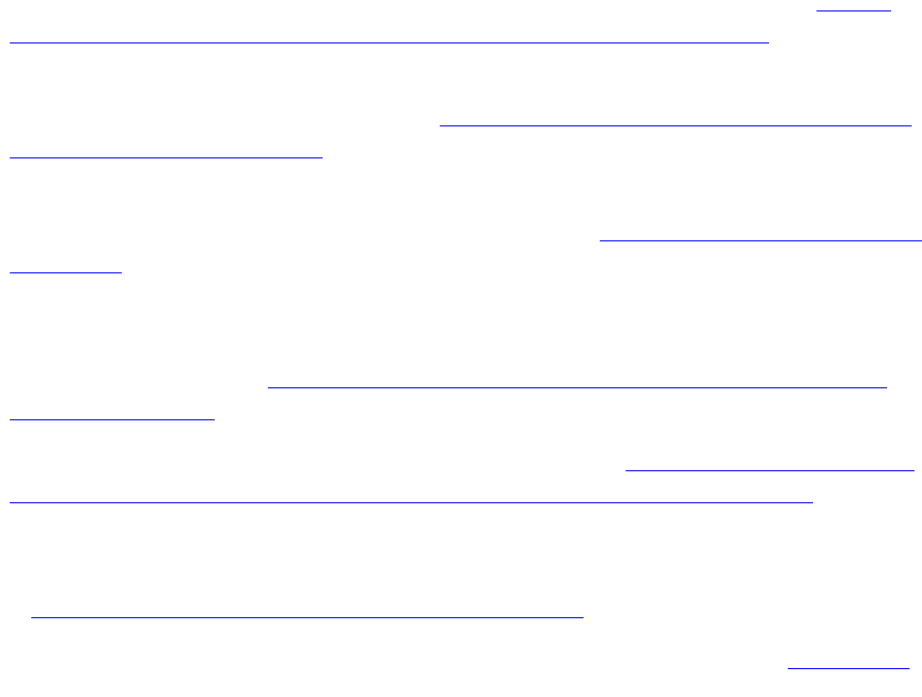
Bizien, A., C. Calipel and T. Pellerin-Carlin (2024) *European climate investment decarbonisation report, An investment pathway for Europe's future*, I4CE Institute for Climate Economics, available at <https://www.i4ce.org/en/publication/european-climate-investment-decarbonisation-report-investment-pathway-europe-future/>

BNEF (2024) *Energy Transition Investment Trends*, Bloomberg New Energy Finance, available at <https://about.bnef.com/energy-transition-investment/>

Branner, H., I. Haase, A. Reyneri and E.K. Velten (2022) 'The Use of Auctioning Revenues from the EU ETS for Climate Action,' Ecologic Institute, available at <https://www.ecologic.eu/sites/default/files/publication/2022/EcologicInstitute-2022-UseAucRevClimate-FullReport.pdf>

Cevik, S. and K. Ninomiya (2022) 'Chasing the Sun and Catching the Wind: Energy Transition and Electricity Prices in Europe,' *IMF Working Paper 22/220*, International Monetary Fund, available at <https://www.imf.org/en/Publications/WP/Issues/2022/11/04/Chasing-the-Sun-and-Catching-the-Wind-Energy-Transition-and-Electricity-Prices-in-Europe-525079>

Claeys, G., M. Le Mouel, S. Tagliapietra, G. Wolfrum and G. Zachmann (2024) 'The Impact of the EU ETS on the Energy Market,' *Energy Economics*, available at <https://www.sciencedirect.com/journal/energy-economics>



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