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Europe's decarbonisation imperative

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The Draghi Report concludes that decarbonisation is crucial for EU competitiveness. European companies face much higher energy costs than their US peers. In further contrast, the EU runs a fossil fuel trade deficit, weighing on resilience. Decarbonisation is also a growth opportunity and the EU already enjoys a leading position in several clean technologies.

This process of decarbonisation, however, faces an increasingly fragmented global environment, shaped by differing imperatives and diverging political visions.

The EU's new Clean Industrial Deal (CID) aims to advance GHG emissions' reduction, taking account of the shifting global realities. The CID promises many welcome developments, but we also see hurdles.

Investment needs are significant, around 3% of 2024 EU GDP per year until 2030 (or around €480bn per annum). The CID aims at mobilising over €100bn for EU-made clean manufacturing, including €1bn in additional guarantees out to 2027, with plans to do more. While welcome, this still leaves funding to be unlocked, especially on the private sector side.

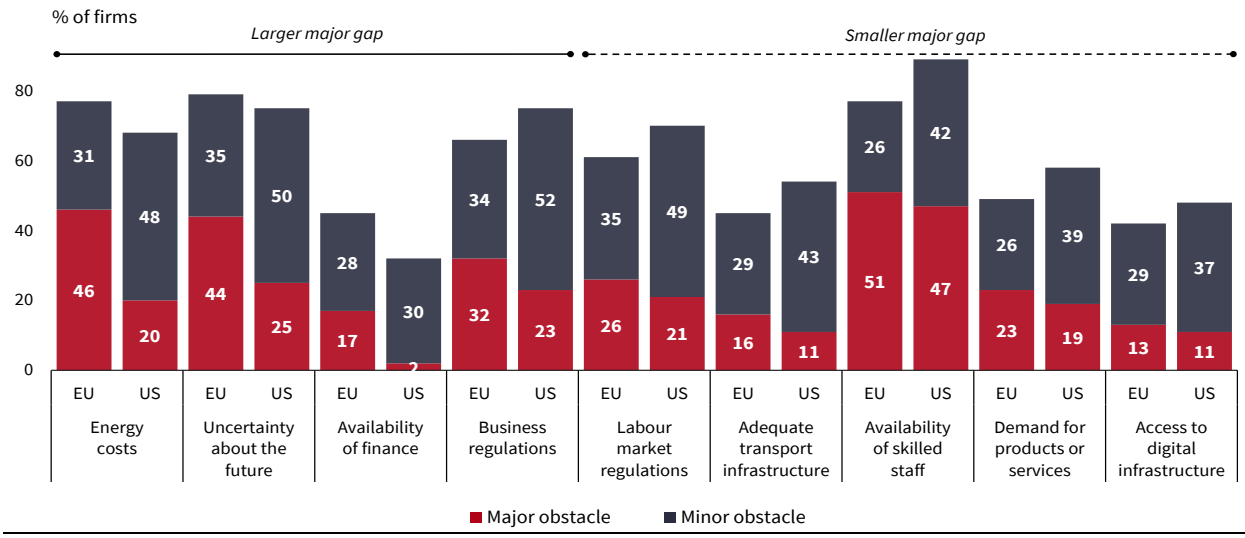
Drawing on past EU experiences, we zoom in here on potential hurdles for both public and private clean finance demand and supply. Overcoming these challenges is essential to achieving Europe's decarbonisation and thus its competitiveness goals.

1. Starting from energy and competitiveness

The Draghi Report identifies energy as a key driver of the EU's competitiveness gap vis-à-vis the United States and China, further accentuated by the economic impact of Russia's war on Ukraine. High price levels are not the only issue; price volatility and significant variation across member states present further challenges.

Contrasting EU and US firms, *Chart 1* from the 2024 European Investment Bank's (EIB) *Investment Survey* (EIBIS) illustrates areas where firms on both sides of the Atlantic have seen obstacles to investment in the past year, with the highest major gaps appearing on energy costs, uncertainty about the future, availability of finance and business regulations. While the recent increase in US policy uncertainty may have narrowed the uncertainty gap, the new US Administration's "*drill, baby, drill*" approach to fossil fuels may further increase the divide on energy costs, albeit at the risk of a disorderly US energy transition down the road.

Chart 1. EIB Investment Survey: Obstacles to investment (2024)



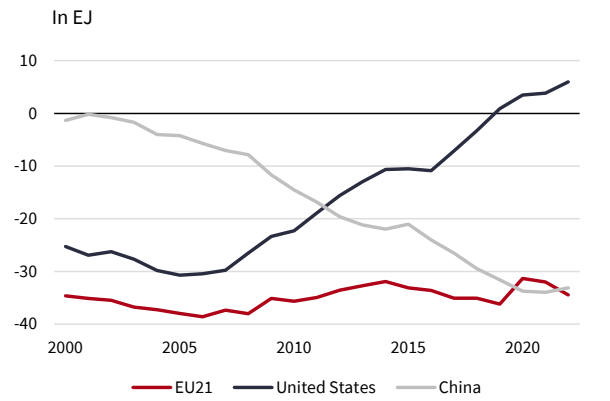
Question: 'Thinking about your investment activities, to what extent is each of the following an obstacle? Is it a major obstacle, a minor obstacle or not an obstacle at all?'

Source: EIB Investment Survey 2024.

External imbalances tell a further story. As illustrated below, the EU and China are net importers of fossil fuels, offering a strong incentive to decarbonise beyond the imperatives driven by physical risks stemming from climate change (*Chart 2*).

China's drive in the green technologies' space is visible in the sharp acceleration of its clean energy patents over the past decade (*Chart 3*). According to data in the Draghi report, Europe still holds 60% of global high-value patents and tops global rankings of the most innovative companies for low-carbon fuels, but as further noted in the report China is proving a formidable competitor.

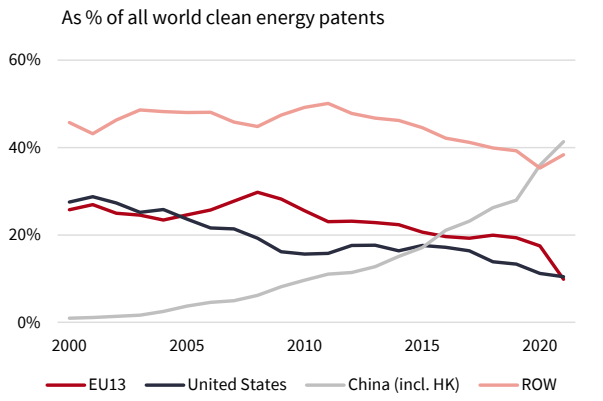
Chart 2. Fossil fuels' trade balance (2000-22)



Note: Calculated as the difference between exports and imports. Fossil fuels are defined as the sum of 'Coal, peat and oil shale', 'Crude, NGL and feedstock', 'Oil products' and 'Natural gas'. 'EU21' covers: Austria, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, and Sweden.

Source: IEA World Energy Balances Highlights (2024), SG Economic and Sector Studies.

Chart 3. Clean energy patents (2000-21)

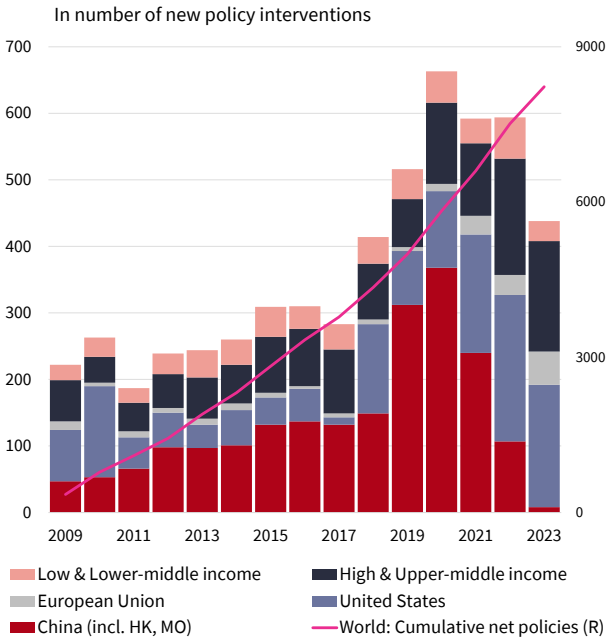


Note: The original data does not cover all 27 EU countries; hence, 'EU13' contains: Austria, Belgium, Czechia, Germany, Denmark, Spain, Finland, France, Hungary, Italy, Netherlands, Poland, and Sweden.

Source: IEA Energy Technology Patents (2024), SG Economic and Sector Studies.

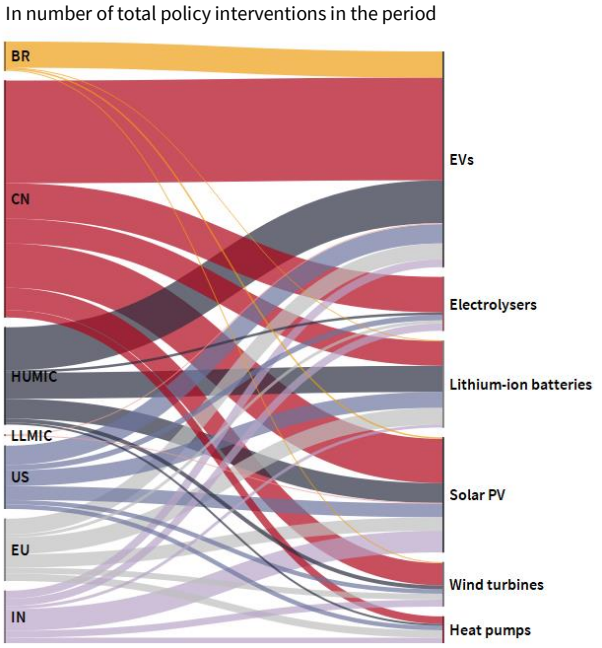
The rise in trade-distorting policies on environmental goods is also of concern. Key clean products, like electric vehicles (EVs) and solar PV, are object of subsidy interventions clustered in just a few countries, with China, India, and the US often being the most active in their implementation (*Chart 4 & Chart 5*).

Chart 4. New trade-distortive* national policies on environmental goods (2009-23)



*Note: *Trade-distortive policies evaluated by GTA: 'red' (intervention almost certainly discriminates against foreign commercial interests) and 'amber' (intervention likely involves discrimination). Intervention types are those defined in the GTA handbook (2022), among which state aid, export incentives, and import restrictions. The HS2012, 6-digit product codes were matched to the OECD Combined List of Environmental Goods (CLEG). The list has been updated to include lithium-ion batteries and electrolysers for hydrogen production. 'HK': Hong Kong; 'MO': Macao. World cumulative net policies are calculated as new yearly policies minus expired policies in the relative year.*
Sources: Global Trade Alert (2024), Sauvage (2014), World Bank (2024), SG Economic and Sector Studies.

Chart 5. Subsidies and state aid on six key green goods, national level (2009-23)



Note: 'BR': Brazil; China (incl. HK, MO); 'IN': India; 'HUMIC': High & Upper-middle income countries; 'EU': European Union (EU27); 'US': United States; 'LLMIC': Low & Lower-middle income countries. 'EVs': electric vehicles; 'Solar PV': solar photovoltaic. Electrolysers are for hydrogen production.
Sources: Global Trade Alert (2024), World Bank (2024), SG Economic and Sector Studies.

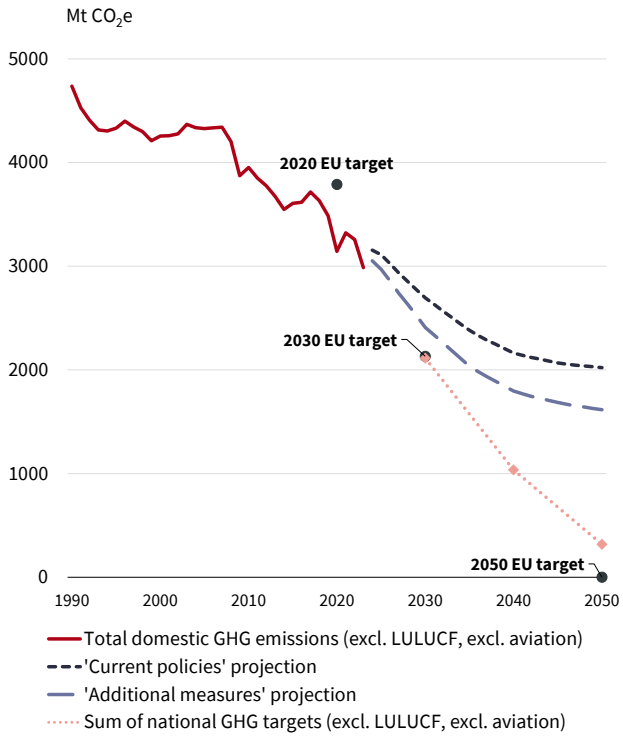
Challenges are significant, but Europe staying the course of decarbonisation remains crucial for its future competitiveness.

2. Closer to 2030 targets, but gaps remain

The EU institutions have long identified the multiple benefits of decarbonisation, and the shifting global environment only adds to the imperative. Member states have committed to reduce EU total net GHG emissions at least by 55% below 1990 levels by 2030. Although current policies are still "unfit for 55" (*Chart 6*), the European Commission (EC)'s recent assessment of the final *National Energy and Climate Plans*

(NCEPs)[1] of its member states suggests that the target could be reached (~54%) if the additional measures outlined in the plans are implemented out to 2030.

Chart 6. Total EU historical GHG emissions with projections and targets (1990-2050)



Note: LULUCF = Land Use, Land-Use Change and Forestry. EEA 'current policies' and 'additional measures' projections. Net GHG emissions are the ones under the scope of the European Climate Law. National GHG targets are obtained from states' National Climate and Energy Plans (NCEPs). Where missing, data from the National Climate and Energy Progress Reports are taken (NCEPRs). Historical data up to 2023 included.

Sources: EC (2023), EEA (2024), SG Economic and Sector Studies.

Table 7. EC's assessment of main targets in the final NECPs, EU27-level (2025)

Main targets	2030 targets under EU legislation	2030 contributions in the final NECPs	Gap
GHG emissions in ESR sectors (with respect to 2005, %)	-40.0	-38.3	**-1.7**
GHG emissions in LULUCF (Mt CO_2e net GHG removals)	-259.1	-217.5*	**-41.6**
Energy Efficiency (Primary energy consumption, Mtoe)	992.5	1039.8	**-47.3**
Energy Efficiency (Final energy consumption, Mtoe)	763.0	794.1	**-31.1**
Renewable Energy (Share of renewable energy in gross final consumption, %)	42.5 (45)**	41.0	**-1.5 (-4.0)**
Climate Adaptation (Countries embedding adaptation policies in final NCEPs, N°)	27***	7	**-20**

*Note: 'ESR' stands for 'Effort Sharing Regulation'; 'LULUCF' means 'Land use, Land-use change, and Forestry'. 'Mtoe' is megaton of oil equivalent. *With respect to the 2016-18 reference period. **The minimum target is 42.5% share of renewable energy, but the EC specifies "with a view to reaching 45%". ***No formal target at the 2030 horizon to embed adaptation strategies and/or policies in the NCEPs.*

Sources: EC (2025), EC (2025), SG Economic and Sector Studies.

In spite of significant improvement, gaps remain. Additional action is needed to reach the 2030 'Effort Sharing Regulation' (ESR) and 'Land Use, Land Use Change, and Forestry Regulation' (LULUCF) objectives[2] (*Table 7*). The binding target of renewables covering at least 42.5% of gross final energy consumption by the end of the decade is within reach, but the aspiration to reach 45% falls short in the current collective contributions. A significant gap is detected in both primary (47.3 Mtoe) and final (31.1 Mtoe) energy consumption, with lower clarity on member states' long-

[1] *The* National Energy and Climate Plans*, or* NCEPs*, are mandatory documents for EU member states in which they outline how they intend to address the five dimensions of the energy union (decarbonisation; energy efficiency; energy security; internal energy market; research, innovation and competitiveness). Member states had to submit the first version by December 2018 and a draft update by mid-2023. The most recent one appeared at the end of May 2025. A progress report (National Climate and Energy Progress Reports, or NCEPRs) is also required every two years.*

[2] *The* Effort Sharing Regulation (ESR) *establishes binding annual greenhouse gas emission targets concerning emissions from the following sectors: domestic transport (excluding aviation), buildings, agriculture, small industry, and waste (representing 60% of EU total emissions).*

term renovation strategies, which will require tripling the current energy renovation rate to achieve full decarbonisation of buildings by 2050. Finally, only seven countries sufficiently integrate adaptation to climate extremes in their NCEPs.

The already accomplished progress represents around €340bn of annual clean investments (as per 2024 estimates), but the future funding gap is substantial. According to different sources, **the additional green investment needs add up to 3% of 2024 EU GDP per annum from 2025 to 2030 (a median of €480bn**; *Table 8*). These numbers are just for mitigation and do not cover adaptation needs.

Table 8. Green investments in the EU: historical (2021-24) & additional needs per year (2025-30)

In EUR billion

				Gap re-estimation by author in the 2025-30 period			
	*Avg. 2021-23**	*2024*	*2023 to 2030***	*2025 to 2030*			
Source	**Annual historical investments**		**Annual investment needs (total)**	**Additional annual investments (gap)**	*of which…*	**Public sector (gap)**	**Private sector (gap)**
BloombergNEF (2025)	333	346	891	545		95	450
IEA (2024)	336	342	739	397		69	327
I4CE (2024)	407	-	813	406		71	335
EC (2023)	764	-	1241	477		83	394
EEA (2023)	-	-	-	522		91	431
MIN	**333**	**342**	**739**	**397**		**69**	**327**
MAX	**764**	**346**	**1241**	**545**		**95**	**450**
MEDIAN (ROUNDED)	**370**	**340**	**850**	**480**		**80**	**400**
MIN (% of EU GDP 2024)	*1.9%*	*1.9%*	*4.1%*	*2.2%*		*0.4%*	*1.8%*
MAX (% of EU GDP 2024)	*4.3%*	*1.9%*	*6.9%*	*3.0%*		*0.5%*	*2.5%*
MEDIAN (% of EU GDP 2024)	*2.1%*	*1.9%*	*4.7%*	*2.7%*		*0.4%*	*2.2%*

*Note: Projections from official sources at the 2050 horizon are scarce, as the current policy focus is out to 2030. Data has been rounded up to zero decimal places. *Historical investment refers to annual averages or single years, which are different according to sources: BloombergNEF-ECB (2023), IEA (2021-23), I4CE (2022), and the EC (2011-20). **Source estimates in terms of total annual needs and public-private gap are in the 2023-30 range from original sources; the gap has been re-estimated in the 2025-30 range when possible. The public-private ratio is assumed to be 0.175 across all sources, following Nerlich et al. (2025). Source data in USD has been converted in EUR with the respective average exchange rates on the years of interest. The median is rounded to the nearest 10 to ensure readability.*

Sources: EC (2023), EEA (2023), IEA (2024), I4CE (2024), BloombergNEF (2025), ECB (2025), SG Economic and Sector Studies.

Figures on historical and projected green investments vary widely across sources. This disparity is due to different sectorial coverage and methodologies. The EC estimates are, for instance, on the high-end of the data distribution: this is because they do not only account for gross fixed capital formation, but they also include investments in low-carbon goods, such as EVs and the associated recharging and refuelling infrastructures. The I4CE similarly includes the whole production cost of EVs, while the IEA focuses only on the battery pack prices. Historical figures are not harmonised across sources and years, although BloombergNEF and the IEA have produced comparable past estimates, based on a similar coverage of investment sources for cleantech (for instance, they both include hydrogen, nuclear, and CCS).

Despite varied starting points, the funding gap figures in the 2025-30 period remain closer across sources than the historical ones.

Overall, the ratio of public to private green financing is expected to be at 1:4 to 1:5, according to studies[3]. In 2024, we estimate that it has been slightly less than 1:3, in line with the expected crowding out of private capital investment by large public funds (*Chart 11*). In *Table 8*, we apply the 1:5 ratio equally across sources. Based on these numbers, we estimate a median public sector shortfall of €80bn and a private sector one of €400bn per annum in the 2025-30 period.

Projected figures in the table do not include announced, committed or deployed public or private funds in the 2025-30 period, but rather reflect the gap as it existed at the time of each study. As we will show in *Chart 11*, an important part of the estimated median green public funding gap can already be considered topped up by public funds so far, with higher coverage doubts emerging from 2026 onwards.

3. A new Clean Industrial Deal

The necessity to address the hurdle of high energy costs is clearly recognised in the EU's new **Clean Industrial Deal** (CID; February 26th, 2025). The CID builds on six core business drivers (*Chart 9*), underpinned by an urgent push for simplification.

Chart 9. EU Clean Industrial Deal: Six core business drivers (2025)

Source: EC Factsheet Clean Industrial Deal (2025).

[3] *See Darvas & Wolff (2021), the EC (2023), and the Draghi report (2024).*

The CID departs from the integrated policy framework of the 2019 European Green Deal (EGD), including the *Net-Zero Industry Act* (NZIA), entered into force in June 2024, with its objective of manufacturing at least 40% of the EU's annual deployment needs of key clean technologies by 2030. It also moves from various measures taken in the last years to enable climate neutrality by 2050 and further confirms the Commission's plan to legislate a 90% GHG emissions reduction target for 2040 (over 1990 levels).

The CID intends to mobilise €100bn to improve the business case for EU-made clean manufacturing through the establishment of an *Industrial Decarbonisation Bank* in 2Q26 (pilot expected by the end of 2025), planning to draw on available resources of the *Innovation Fund* (€20bn), additional EU *Emissions Trading System* (ETS) revenues (€30bn), and from revisions to the *InvestEU Programme* (€50bn). This amount includes an additional €1bn in guarantees under the current EU budget out to 2027.

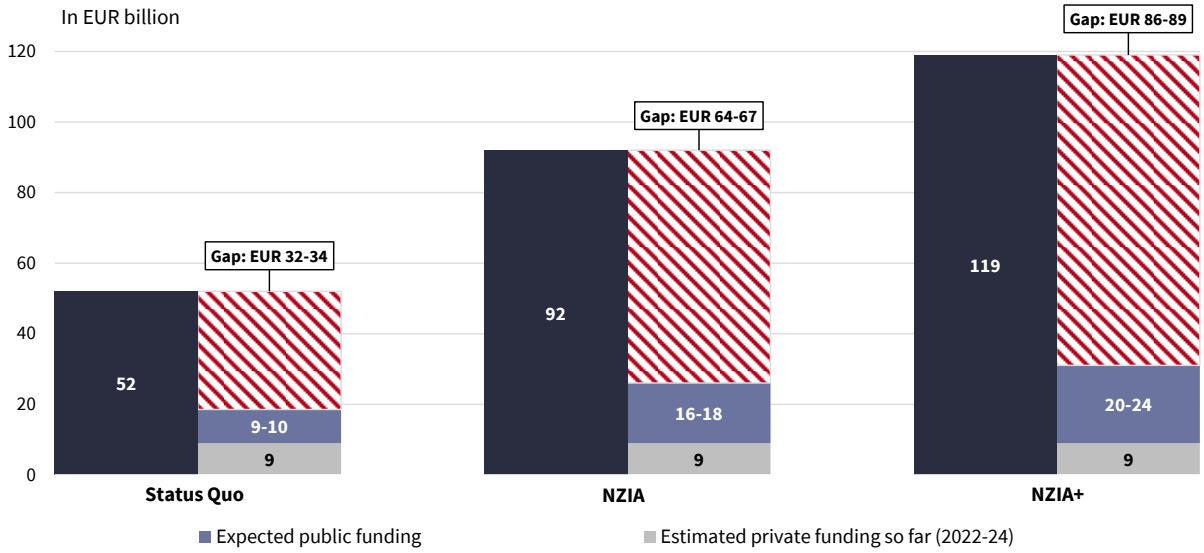
The €100bn from the CID would reduce the €480bn median annual additional investments' gap from 2025 to 2030 (as reported in *Table 8*) by about €17bn per year out to 2030, assuming full deployment and absorption in the same period.

Specifically, the CID aims to narrow the still large investment gap for EU domestic cleantech manufacturing. We zoom in here on the financing needs for exclusively producing six key green technologies as listed in the NZIA: wind, solar PV, heat pumps, battery cells, electrolysers, and carbon capture & storage (CCS). According to the EC, to meet the NZIA objective of manufacturing at least 40% of the EU's annual deployment needs of these six clean technologies by 2030, the EU would need an additional total €64-67bn out to 2030 on top of currently allocated public and private spending for them (*Chart 10*)[4]. Other technologies are not accounted for by the EC in their estimates because of data limitations (i.e., on geothermal, biogas, and battery recycling) or their production not happening in dedicated factories (i.e., power grids).

Even with the new CID, then, the issue remains as to how to upscale private sector also through public derisking initiatives. Looking at past experiences, the following sections consider the lessons that can help inform how best to secure future financing and the related investments.

[4] *Some estimates are starting to emerge on the technologies not part of the EC cleantech perimeter. See, for instance: Cleantech for Europe report (2024) and IMF (2024). When other net-zero technologies are factored in (tidal and wave technologies, storage other than batteries, geothermal, fuel cells, biogas, green steel and cement, electric trucks, battery and chemical recycling), the funding gap at least doubles.*

Chart 10. EU investment needs on six cleantech per scenario and funding gap (total: 2025-30)



Note: NZIA stands for 'Net Zero Industry Act'; NZIA+ covers an NZIA scenario with no dependence on clean imports. 'Status Quo': limited investments in solar PV as EU market share of only 3% in the sector; 'NZIA': 45% of deployment needs of solar PV produced in the EU, consolidation of wind and heat pump technologies, and 90% of annual battery demand met in-house; 'NZIA+': investment needs per the Bloomberg New Frontiers estimates for clean-energy demand. Following the EC, 17-20% of needed amounts per scenario are taken as estimates of expected public investment. The six considered cleantech are: wind, solar PV, heat pumps, battery cells, electrolysers, and CCS.
Sources: EC (2023), Cleantech Group (2024), SG Economic and Sector Studies.

4. The current state of clean public finance

Clean public finance comes from several sources: the EU budget, funds provided by the EIB and the European Investment Fund (EIF), and national plans. Auctioning revenues from the EU ETS (I and II) and the *Carbon Border Adjustment Mechanism* (CBAM)[5] as well as the proceeds from climate-linked and green bonds are recycled by member states and/or EU-level funds for clean investment use.

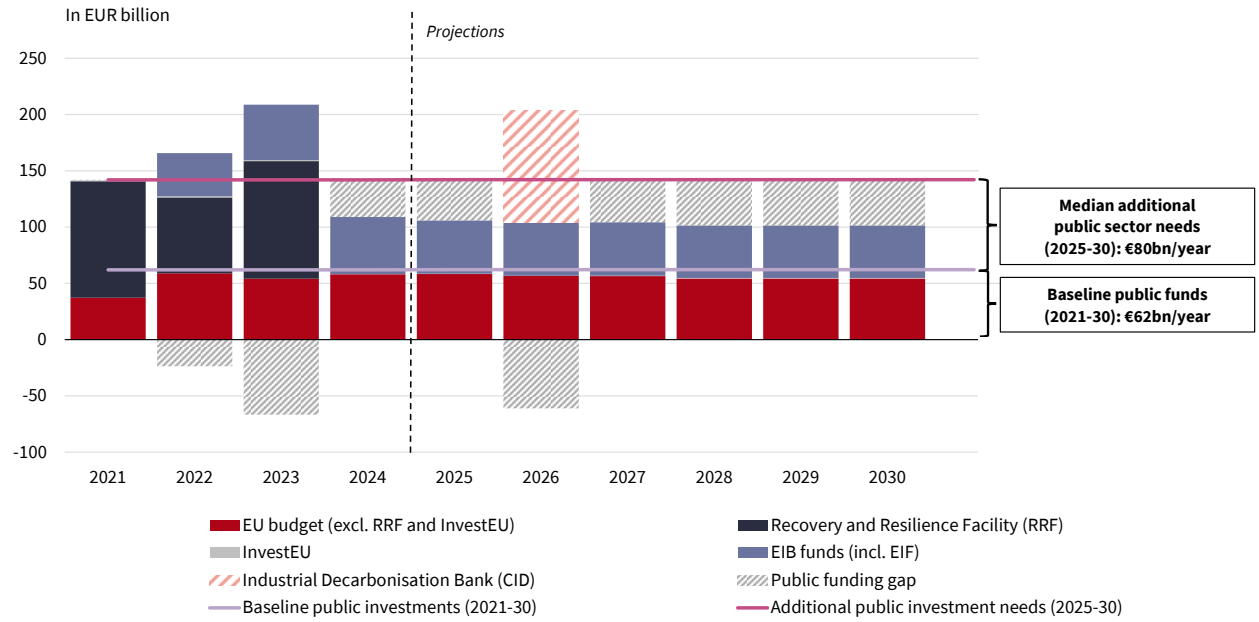
At the EU level, one third of the EU 2021-27 budget, about €658bn (ca. 4% of 2024 EU GDP), is directly contributing to climate-related objectives. This includes the *Recovery and Resilience Facility* (RRF) at the centre of the 2020 *NextGenerationEU* (NGEU) programme—the massive loans and grants EU-wide recovery plan adopted in the wake of the pandemic. The RRF alone has provided €276bn in budgetary commitments tagging the environment over the 2021-23 period.

The estimated public funding need is broadly covered by EU committed funds until 2026. Based on the historical estimates presented in *Table 8*, EU public funds should cover an average of €62bn/year of green finance in the 2021-30 period to respect the expected 1:5 public-private investment ratio (*Chart 11*). This rule holds when mean past investments in the 2021-24 period are assumed to remain constant

[5] *As of recent estimates, CBAM revenues' amounts are small (€1.5bn in 2018 prices per year out to 2028; Marcu et al., 2024). Current debate is whether to redistribute these resources to firms or governments within the EU or to channel them back to partners as international climate finance, in support to the "greening" of their exports.*

until 2030. This minimum theoretical amount, referred to as 'baseline', is already fully provisioned for by budgetary expenditures. As evoked, however, an additional €80bn/year from 2025 to 2030 is needed for the EU to be fully on track with its 2030 targets. We expect this amount to be offset by RRF commitments until 2026 included.

Chart 11. EU annual historical and projected green public investments with funding gap (2021-30)



Note: Please note that for the EU budget (including the RRF and the InvestEU), we account here for the dates of the committed (and not disbursed) amounts to allow for comparability across funds and to be consistent with the EC's estimates on the EU budget contributions to climate. National funds have not been considered. Revenues from the ETS and the CBAM have not been accounted for to avoid the risk of (at least partial) double-counting, as revenues could also be recycled by EU budget funds (or other initiatives) and absorption is already factored in the EC estimates.
Sources: EIB Group Operational Plans (2022-24), EC (2024), EC (2025), SG Economic and Sector Studies.

Yet, the absorption rate of investments is uneven across EU funds. Committed funds presented in *Chart 11* might not fully reveal the true annual dynamic of the funding gap, as some committed amounts have been disbursed at later periods than their announcements, still need to be disbursed, or risk of not being completely spent before the relative programme end. It is the case of the RRF, where only 60% of funds directly linked to the 'green transition' policy pillar have been disbursed by May 2025, with the programme set to expire by the end of 2026. This delay is partly due to administrative and governance bottlenecks and lack of qualified workforce.

Uncertainty remains as to how to close the public funding shortfall after 2026. If the CID enters into force under its actual design, it will help fill in the remaining gap also for 2027-28. In general, however, it is still unclear as to how its funding sources will be mobilised before the new EU 2028-34 budget, which will also see the creation of a *Competitiveness Fund*. This could divert funds from the planned *Industrial Decarbonisation Bank*. Moreover, the deal will need to be discussed by the European Parliament and the Council of the EU before entering into force, which might not happen before the year end.

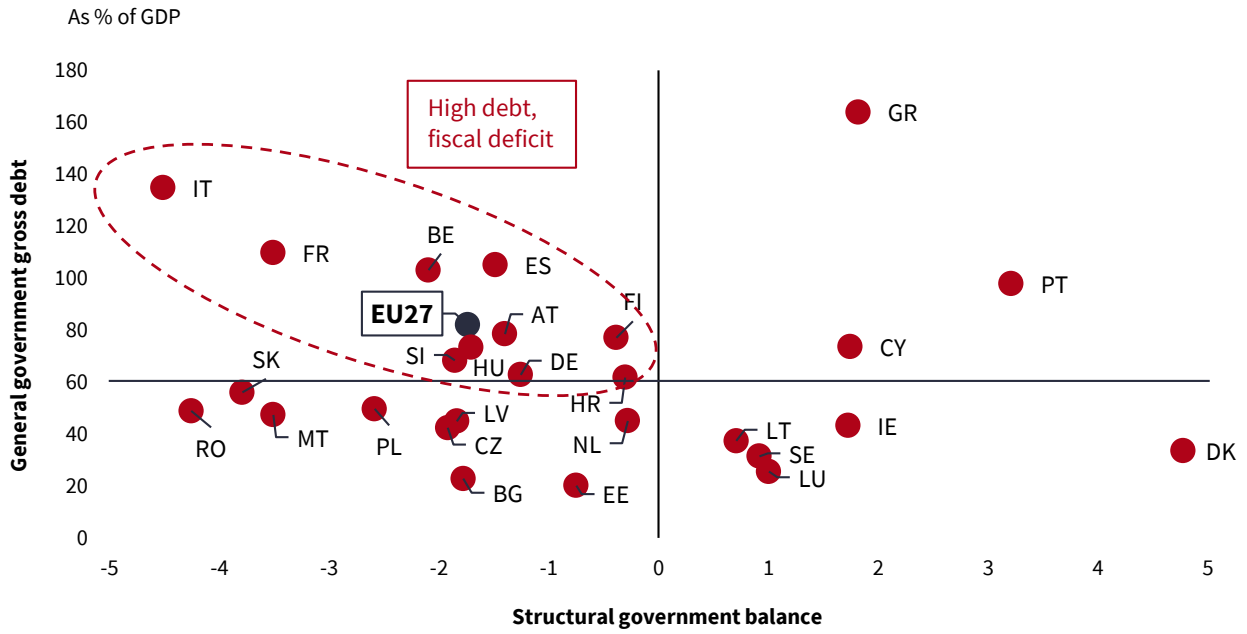
5. Hurdles to fill the public funding gap

In general, European governments struggle to increase budget spending on climate (general government expenditure on 'environmental protection' accounted for 0.8% of EU GDP in 2022, stable since 1995). Filling the void left by the depletion of the RRF resources after 2026 is not easy, as we outline through three key issues below.

1. LIMITED FISCAL ROOM IN SEVERAL KEY MEMBER STATES

As illustrated in *Chart 12*, several large member states have both high public debt and high deficit levels, which now also face a need to raise military spending.

Chart 12. Government gross debt and structural government balance, EU countries (2023)



Note: The horizontal threshold (60%) indicates the minimum level according to the EU fiscal governance that defines a high deficit country.
Source: LSEG, SG Economic and Sector Studies.

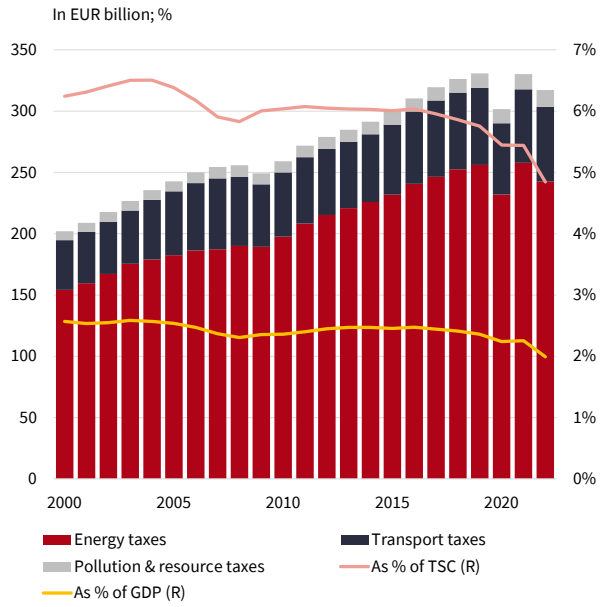
The *Stability and Growth Pact* rules, designed to ensure that EU members pursue sound public finances by managing their debts and deficits, had been paused at the onset of the Covid-19 to loosen budget requirements and allow higher debt-taking to overcome the crisis. Albeit reformed in 2024, the *Stability and Growth Pact* retained the rule that members' deficit should not surpass 3% of GDP. The need for fiscal consolidation thus remains and Belgium, France, Hungary, Italy, Malta, Poland, Slovakia and Romania are today subject to the excessive deficit procedure. The risk of seeing downgrades from rating agencies will also have to be carefully managed.

2. SHORTFALLS ON ENVIRONMENTAL TAXES

The European Green Deal (EGD) prompts member states to levy funds for the green transition through the redefinition of their tax mix. Still, at the EU level, the

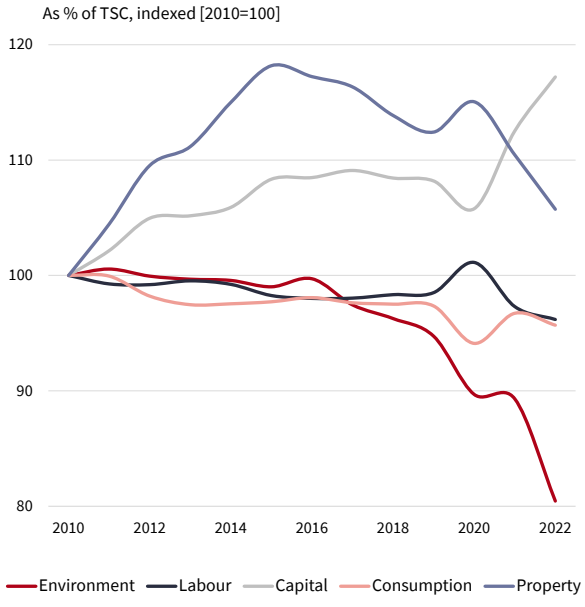
environmental tax share over total taxes and social contributions (TSC) remains low (5% of TSC in 2022) and is shrinking since 2000 (-1.4pp with respect to TSC; -0.6pp with respect to GDP in 2022). Energy taxes (which include carbon pricing measures) covered ~80% of all environmental taxes in the 2000-22 period (*Chart 13*).

Chart 13. Environmental tax revenues by type and as % of TSC and GDP, EU27 (2000-22)



Note: An environmental tax is defined as 'a tax whose tax base is a physical unit (or a proxy of a physical unit) of something that has a proven, specific negative impact on the environment, and which is identified in ESA 2010 as a tax' (EUROSTAT, 2024). 'TSC' means 'Total receipts from taxes and social contributions (including imputed social contributions) after deduction of amounts assessed but unlikely to be collected.'
Source: EUROSTAT (2024), SG Economic and Sector Studies.

Chart 14. Evolution of tax revenues as % of TSC by tax base, EU27 (2010-22)



Source: EUROSTAT (2024), SG Economic and Sector Studies.

Environmental taxes face two main hurdles, each with different time horizons.

The reduction of CO_2e emissions subject to ETS and decline in use of fossil fuels out to 2050 mean that the environmental tax base will progressively erode in the period. Ultimately, these revenues will need to be replaced. Environmental tax revenues have already begun to decline, a trend that was exacerbated by the 2022 energy crisis, which resulted in a reduced tax burden for households and businesses. There is no evidence, at the aggregate level, that the EU has shifted taxes from labour to environment to serve the EGD environmental objective of taxation[6]. Instead, environmental tax revenues have seen the highest decline since 2017 with respect to all other tax bases, while labour ones have remained relatively stable over time (*Chart 14*).

[6] *The objective, in accordance with the 'polluters pay' principle, is to "factor environmental damage, or negative externalities, into prices in order to steer production and consumption choices in a more eco-friendly direction" (EPRS, 2020).*

Already today, environmental taxes face a public opinion backlash. As Pisani-Ferry pointed out, carbon taxation is regressive, in that lower income households spend a larger chunk of their income on energy and transportation[7]. Public opinion backlashes have led EU countries to reconsider their environmental taxation plans under the prism of their social acceptability. Proposals are to redistribute the gains from carbon taxation to households and firms that suffer the most from it, for example channelling them through public assistance schemes, such as means-tested subsidies to housing retrofit.

3. SPEND BETTER, SPEND FULLY, SPEND QUICKLY

A crucial aspect of implementation is the need to spend *better, fully*, and *quickly*. Spend better, as it is not enough to merely have resources at hand, but they must be allocated through rigorous planning and strategic intent. Spend fully, as some resources risk being either underutilised or diverted to goals different from the ones for which they had been unlocked. Spend quickly, as some programmes that come to maturity risk end up disbursing only a fraction of committed funding, underpowering the depth and impact of public spending.

To illustrate this, we examine the RRF and the *European Maritime, Fisheries and Aquaculture Fund* (EMFAF) as case studies.

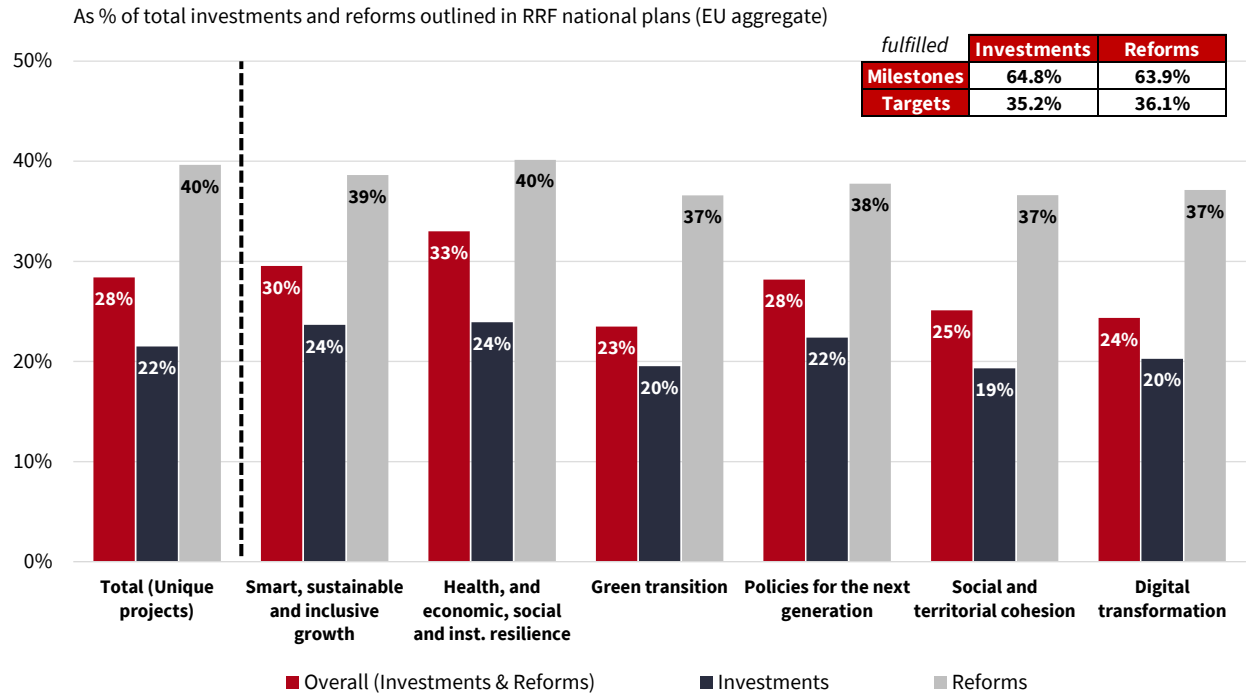
The RRF programme is performance-based, meaning that periodical disbursements are conditional on the attainment of specific objectives in terms of investments and reforms. Both of the latter can be further broken down into milestones and targets. The milestones are qualitative objectives with an administrative or legal nature (for instance, adopting a law). The targets are quantitative objectives that outline the expected results of a measure (for example, the number of square meters of buildings subject to energy efficiency retrofitting).

Delivering on RRF objectives requires state governance, skills, and execution finer than the one for other simpler public interventions, such as state aid to firms. Subsidies and fiscal incentives are relatively quick to decide and get approved, as in the case of the US *Inflation Reduction Act*, intended to boost private investments in cleantech through tax credits. With the RRF, however, the EC has chosen to let states directly make investment choices, with reforms intended as their enabler. But reforms, at less than a year and a half before the termination of the RRF, are still slowly coming up, and investments keep lagging. On the green transition policy pillar, for example, only 23% of projects (combining investments and reforms) has already been fulfilled (*Chart 15*). This aspect underscores the general difficulty of

[7] *Pisani-Ferry, J. (2021, August). Climate Policy is Macroeconomic Policy, and the Implications Will Be Significant. PIIE-Peterson Institute for International Economics, Policy Brief 21-20. https://tinyurl.com/ms27z5k9*

states to match the RRF tight schedule to their bureaucracy and to streamline funds to a complex web of implementing authorities.

Chart 15. Aggregate of fulfilled RRF investments and reforms per policy pillar (2021-March 2025)



Note: Several projects can belong to several policy pillars. The percentage of fulfilled investments and reforms is calculated over the respective total investments and reforms per pillar, while 'Overall (Investments & Reforms)' is calculated over the sum of the two policy interventions.
Sources: EC (2025), SG Economic and Sector Studies.

As of now, more than 60% of combined implemented (fulfilled) reforms and investments are qualitative in nature (hence, milestones), not offering a comparable benchmark to assess impact (see the matrix in *Chart 15*). And the longer-term maintenance of the objectives reached through the RRF remains in question, as there is no clarity on the enforcing or monitoring systems after 2026.

Solving the 'spend fully' puzzle entails strengthening capabilities at detecting and fixing inefficiencies. Take the example of the EU budget funds allocated to the sustainable development of aquaculture (EMFAF), which have increased since 2014. The ECA has questioned the utility of such funding supplement, whose impact on boosting environmental sustainability is unclear. Given the low absorption rate of these funds, states have rerouted them to measures of greater interest to the aquaculture sector, not necessarily in the perimeter of the initial financial plans approved by the EC. Paired with a lack of strict selection criteria by some EU members, this inefficient reallocation led to the financing of most eligible projects. No matter whether they aligned with the objectives of the EU-related funds or not[8].

[8] *European Court of Auditors. (2023, November 11). EU aquaculture policy – Stagnating production and unclear results despite increased EU funding. Special report, 25/2023. https://tinyurl.com/3964y4k7*

6. Onboarding the private sector

As Europe embarks on its ambitious decarbonisation journey, the successful engagement of the private sector has become increasingly crucial. However, this effort is fraught with challenges that dampen investment appetite and disrupt the dynamics of financial demand and supply (*Table 16* provides a summary of the key frictions).

Table 16. Main frictions on private capital demand and supply side for the green transition

Friction domain	Demand side *Cleantech firms*	Supply side *Financial sector*
Policy & Regulation	Regulatory complexity, uncertainty and fragmentation; long permitting procedures; red tape; compliance costs	Insufficient direction signalling from public de-risking instruments; prudential rules hindering risk-taking
Business case & Competitiveness	Concerns about competitiveness erosion due to high upfront CAPEX, costs of material and labour, and volatile energy prices; inefficient incentives; lack of mature markets; uncertain demand for some cleantech	Narrow range of financing options for corporates and shallow depth of EU capital markets; cross-border investment barriers; small investor base
Skills & Data	Green skills shortage; conversion from carbon-intensive to low carbon-intensive know-how	Limited past performance data affecting proper risk pricing; uneven technical expertise to evaluate projects
Security of supply & Diversification	Supply-chain bottlenecks; negative impacts of aggressive reshoring; import dependencies	Concentration on large ticket size projects; limited exposure to alternative assets (private equity, venture capital, infrastructure funds)

Source: SG Economic and Sector Studies.

Success in onboarding the private sector is not guaranteed as obstacles arise from investment appetite to invest in the transition, and from the demand and supply of finance. Leveraging finance as a strategic tool has long been essential in the EU's decarbonisation plan[9]. Critical issues such as low venture capital absorption, barriers to bankability for cleantech innovators, and the limitations of current financing options for corporates need however to be overcome.

In our discussion below, we explore:

- **Investment demand hurdles**: various investment demand hurdles, highlighting the impact of policy and regulation, business competitiveness, skills shortages, and supply chain vulnerabilities. Each of these factors plays a significant role in shaping the willingness of firms to invest in clean technologies.
- **The supply side of clean finance**, where we identify critical issues such as low venture capital absorption, barriers to bankability for cleantech innovators, and the limitations of current financing options for corporates.

[9] *The concept was articulated in initiatives such as the EU Sustainable Finance Action Plan (SFAP), which builds on three pillars: (1) reorienting capital flows toward investments that benefit sustainability; (2) mainstreaming sustainability and ESG factors into risk management; (3) fostering transparency and long-termism among market participants. Public-private partnerships (PPPs) are also an important policy tool, with the EIB at their core.*

- **The importance of de-risking initiatives** and the establishment of a Savings and Investments Union (SIU) and Banking Union (BU) as essential mechanisms to unlock private sector investment and foster a resilient financial ecosystem.

1. INVESTMENT DEMAND HURDLES

A. Policy & Regulation: Regulatory unpredictability and red tape

Low regulatory visibility is limiting firms' demand for the transition. Cleantech firms typically require substantial upfront capital investments on projects with extended, long-term development timelines, making steadfast regulatory support essential. Changes in the clean policy course or the imposition of one-size-fits-all targets risk hindering private investment. For instance, the NZIA applies the same 40% manufacturing target to different cleantech. This creates demand disparities among corporates, thereby putting the burden on less mature EU markets under pressure from foreign competition (solar PV) or under sudden import disruptions (battery manufacturing), while compressing other sectors on which the EU has a competitive edge (wind turbines)[10].

Complex and lengthy permit-granting processes are slowing down deployment. Administrative burdens, long investment approval time and procedures, missing general one-stop shops, and lack of harmonised legislation between the EU and the national level (for example on hydrofluorocarbons) are hindering the roll-out of grid, wind, and sustainable biogas technologies, electrolysers and fuel cells as well as energy storage projects. The CID intends to expedite the permitting process by building on the experience acquired from past permitting regulations, including the 2023 *Renewable Energy Directive* (RED III), which the EC indicates as having had a clear and positive effect on renewables' deployment so far[11].

Corporate efforts to comply with EU sustainability reporting regulations risk diverting funds from investments with direct impact on the clean transition. Directives like the 2022 *Corporate Sustainability Reporting Directive* (CSRD), which requires firms to disclose information on their extra-financial impact, are aimed at streamlining flows to low-carbon activities through enhanced transparency. Yet, compliance costs could limit corporates' efficient resources allocation to their own industrial innovation, modernisation and adaptation or weigh disproportionately on SMEs and small caps.

Although welcome, the Simplification Omnibus packages to cut unnecessary red tape could be a double-edged sword. These regulations, stemming from the

[10] *Ragonnaud, G. (2025, February). Implementing the EU's Net-Zero Industry Act. EPRS. https://tinyurl.com/yy96csvc*

[11] *European Commission. (2025, February 26). The Clean Industrial Deal: A joint roadmap for competitiveness and decarbonisation. Brussels. https://tinyurl.com/35xyrh8k*

EC's January 2025 *Competitiveness Compass* that builds on the Draghi report, aims at simplifying sustainable finance reporting, due diligence, and green taxonomy. On the one hand, it is a welcome advancement, as with them the EC foresees a 25% reduction in administrative burdens by 2029 (-35% for SMEs). On the other hand, making more disclosures voluntary and correcting recent EU law risks adding to legal uncertainty and pushbacks, especially from economic actors that have already adapted their internal structures to suit the obligations of the EU sustainable reporting directives.

B. Business case & Competitiveness: Levelling the playing field

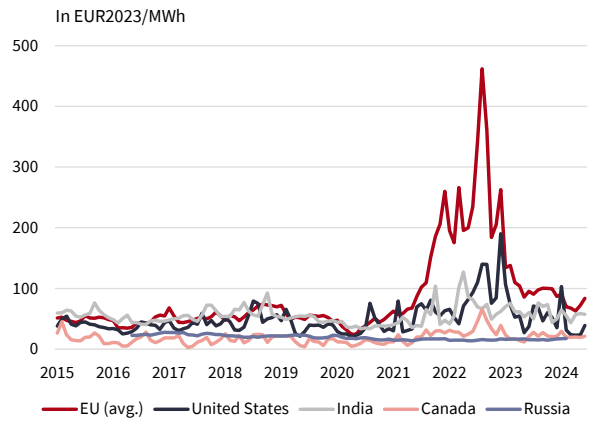
EU firms need a level-playing field to invest in the transition. The European industry faces higher and more volatile energy prices than other markets (e.g., China, US), is in global competition with players less ambitious on decarbonisation, and lacks an attractive business case for some cleantech (such as hydrogen). These hurdles put pressures on margins, risk being passed on to the end consumer through higher prices, and limit demand for decarbonisation with extra-EU relocation risk.

Energy prices in the EU have been higher and more volatile than in its main trading partners (*Chart 17*). One reason is the design of the *Energy Single Market*, for which the wholesale electricity price is determined by the marginal cost of natural gas, making Europe vulnerable to energy crises (such as the 2022 Russian invasion of Ukraine). In this regard, the EIB has already launched, on June 19th, new schemes to offer credit counter-guarantees for *Power Purchase Agreements* (PPAs) to expand the pool of industries able to secure contracts from clean energy developers to benefit from a pre-negotiated electricity price in the long term. Limited domestic access to and self-sufficiency in low-carbon energy are additional factors.

The EU has the highest CO_2 price across world income groups (*Chart 18*). EU carbon-intensive firms are squeezed by high carbon allowance costs while facing international competitors benefiting from laxer climate regulations. The CBAM aims at addressing this external imbalance by correcting the difference in carbon prices between imported and in-house produced goods (including steel, aluminium, and cement), so that imported products that have not (or unevenly) been taxed by the exporter country are on a level playing field with EU domestic goods.

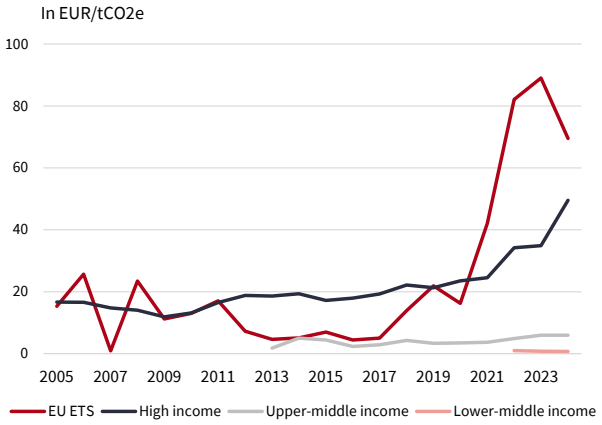
However, the CBAM scope is imports-only: EU producers selling abroad remain at a disadvantage vis-à-vis countries lacking a carbon price. At the same time, the CBAM imposes an additional administrative and financial burden on low-emitters firms. Indeed, 97% of emissions covered by the scheme are currently produced by only 20% of CBAM-covered companies. The approved Omnibus I package aims to ease this by exempting around 182,000 of the 200,000 EU importers from the CBAM regulation without impacting the EU decarbonisation targets, as these firms account for only 1% of overall European emissions.

Chart 17. Wholesale electricity prices, EU and main trade partners (2015-June 2024)



Source: EC (2025), SG Economic and Sector Studies.

Chart 18. Carbon prices set by ETSs and carbon taxes, average by income group (2005-24)



Note: "ETSs" stands for "Emissions Trading Systems". All price rate labels are considered in the aggregate.
Sources: LSEG, World Bank (2024), SG Economic and Sector Studies.

Firms are also asking for incentive schemes to cover a larger pool of cleantech in a wider range of EU countries. National measures to support cleantech demand in cleantech manufacturing exist, but they are highly clustered in just a few countries (notably, Germany and France) and are concentrated on some cleantech only (in particular, batteries, electrolysers, and solar PV, while grid, biogas, and CCUS still lack support). Incentive schemes are focused on early-stage tech development as well as installation and adoption, with missing direct support to production and scaling-up[12]. The EC is filling this gap through the *State Aid Framework* (adopted on June 25th), which complements existing state aid rules and has already earmarked more than €85bn in aid in June under the 'transition' sections of the Temporary Crisis and Transition Framework (TCTF). The EC has also adopted its *Recommendation on Tax Incentives* (July 2nd), in which it advocates for generous accelerated depreciation up to immediate expensing and flexible, refundable tax credits. The development of an EU-wide standard, beyond recommendations, on increasing capital allowances for climate-friendly investments by corporates beyond single countries' initiatives would also ensure green capital is upscaled.

Finally, EU cleantech firms lament the absence of a compelling business case for some clean investments. It is the case of hydrogen and its applications, which is early-stage and currently not cost-competitive, or steel. Encouraging demand for innovative low-carbon products could take the form of clear labelling (envisioned by the CID), making use of Contracts for Difference (CfD) schemes, and increasing visibility on public procurement (the CID plans a review of the public procurement framework in 2026). The latter—a market of about €2tr per year destined to increase

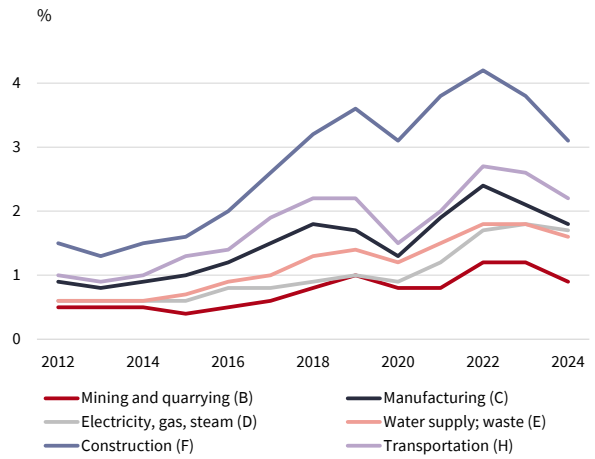
[12] *EC-DG for Energy. (2024, December 05). The Net-Zero Manufacturing Industry Landscape Across Member States. ECORYS. Rotterdam & Brussels. https://tinyurl.com/k6m45hee*

due to the European defence ramp-up (*ReArm Europe* plan, for instance)—could be stirred towards supporting European low-carbon industrial goods' production.

C. Skills & Data: Green skills shortage and reskilling

Policies to reach 2030 targets could create up to 2.5 million net jobs with respect to a business-as-usual scenario, according to sources[13]. However, in the 2024 EIBIS 51% of EU firms already finds skills shortage to be a major obstacle to their long-term business investments—the highest share across investment hurdles (*Chart 1*). This is particularly evident and increasing faster in sectors crucial to the green transition, like manufacturing, construction (heat pumps, solar PV installation), and electricity (*Chart 19*). For the key NZIA technologies alone, around 350,000 additional jobs will be needed at the 2030 horizon in manufacturing industries (*Chart 20*).

Chart 19. EU27 job vacancy rate in high climate impact sectors (2012-24)



Note: Letters in parenthesis correspond to NACE 1-digit codes. The chosen sectors are classified as 'high climate impact sectors' in the Commission Delegated Regulation (2022) on the 'do not significant harm' principle.
Source: EUROSTAT (2025), SG Economic and Sector Studies.

Chart 20. EU additional needs in jobs for clean technology production per scenario (2030)

In thousands

	Status Quo	NZIA	NZIA+
Wind	31	31	40
Solar PV	<1	25	66
Heat pump	28	28	60
Battery cell	139	261	294
Electrolysers	0	5	7
Total	198	350	468

Note: 'Status Quo': limited investments in solar PV as EU market share of only 3% in the sector; 'NZIA': 45% of deployment needs of solar PV produced in the EU, consolidation of wind and heat pump technologies, and 90% of annual battery demand met in-house; 'NZIA+': investment needs per the Bloomberg New Frontiers estimates for clean-energy demand.
Source: EC (2023), SG Economic and Sector Studies.

The scarcity of green skills affects innovation and demand. When cleantech firms cannot assemble the right teams on high-skilled, qualified occupations, their ability to innovate is compromised. The shortage of green skills imposes additional costs for firms, as they are forced to further invest in educating and reskilling both workers and managers, compressing demand. To fill this skills' gap, the EC has launched a strategic framework, called *The Union of Skills* (March 2025), aiming at upskilling and

[13] *Cedefop: up to 2.5 million net jobs (2030), compared to BAS; JRC: net increase in jobs of up to 884,000 (2030), compared to BAS; EC: one million additional quality jobs (2030) and two million by 2050; ESDE: create 1.2 million jobs (2030), up to 1.5-2 million jobs by 2050 (see ESDE, 2023).*

reskilling workers for the digital and green transitions. To meet the objectives of the CID, the EC will review and select, among existing *EU Skills Academies* coordinated by a *Skills Observatory*, the most successful models to deliver the skills needed by the industry.

D. Security of supply & Diversification: Exposure to supply chain disruptions

Firms' demand is also constrained by supply chain vulnerabilities and import dependency. The EU is heavily dependent on non-EU countries for several materials and components to manufacture cleantech (such as battery and PV cells, energy storage technologies). Most EU cleantech industries (solar PV, wind power) are also heavily reliant on imported critical raw materials (CRMs), in particularly rare earths, 70% of which are mined and 90% are refined in China, many of which have few cost-effective, performance-equivalent substitutes or for which the stock of end-of-life materials has not yet accumulated to support recycling.

Recognising this challenge, the EU had already introduced the *Critical Raw Materials Act* in May 2024, aiming to secure diversified and sustainable supply chains by promoting domestic mining, refining, and recycling, while capping dependency on any single third country at 65% of CRMs' annual consumption. The CID intends to operationalise this Act by launching an EU *Critical Raw Material Centre* to jointly purchase raw materials (one-stop shop), enabling companies to aggregate their demands for CRMs, thereby offering more leverage to collectively negotiate better prices and conditions vis-à-vis the exporter.

2. CLEAN FINANCE SUPPLY

Concerning clean finance supply, the EU is facing four main hurdles: modest venture capital (VC) absorption for clean projects' financing; weaker bankability of cleantech innovators relative to incumbents; narrow financing options for corporates; and risks of low penetration of clean supply policies and regulations.

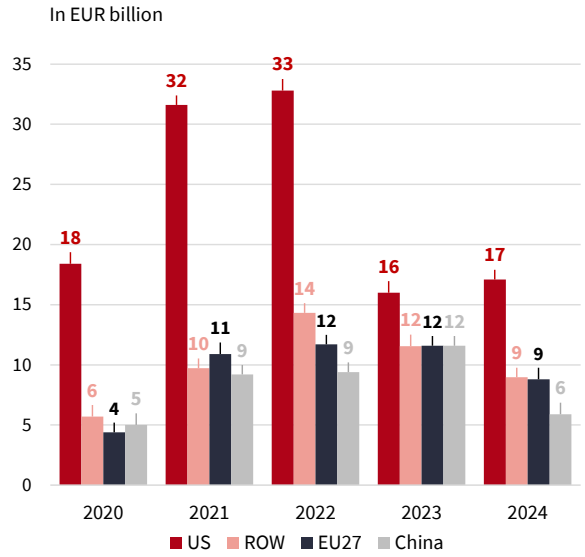
- **Low venture capital (VC) absorption**

Clean VC is picking up only slowly. While public lenders like the EIB and national bodies play a crucial role in de-risking overall cleantech investments, private sector engagements are still not enough supportive of cleantech, both at the start-up phase (equity funding) and at scaling up more mature projects, through debt and growth equity access. EU VC investment, key for financing early-stage clean innovation, represented €9bn in 2024, higher than China (€6bn), but twice as lower as the US (€17bn; *Chart 21*). The US has indeed maintained its leadership, covering 2% of global cleantech VC investment in 2024 (22% EU, 14% China, and 22% ROW).

Appetite for such high-risk asset classes remains low. EU households hold 31% of their assets in currency and deposits (vs 11% in the US) and allocate 41% of their

wealth towards low-risk, safe products (*Chart 22*). Institutional investors, notably pension funds and insurers, remain underexposed to alternative, higher-risk assets (private equity, VC) largely due to quantitative restrictions (ratios) applied by many EU countries and to prudential regulation still not adapted to this upside risk[14].

Chart 21. Global total cleantech venture capital (VC) investment (2020-24)



Note: This data covers all venture capital (VC) cleantech funding, not only the six cleantech seen as strategic by the EC.
Source: Cleantech Group (2025).

Chart 22. Financial assets' allocation, EU and US households (2024)

In EUR trillion

	EU27	% total	US	% total
Cash and deposits	12	31%	14	11%
Debt securities	1	3%	6	5%
Investment funds	4	10%	20	16%
Pension and insurance funds	11	28%	34	28%
Shares	10	26%	47	38%
Other financial assets	1	3%	3	2%
Total	38	100%	124	100%

Note: 'Other financial assets' include loans for both EU and US households, along with other accounts receivable/payable for EU, and miscellaneous assets for US. 2023 data for Ireland taken as 2024 missing.
Sources: EUROSTAT (2025), St. Louis Fed (2025), SG Economic and Sector Studies.

- **Barriers to bankability for cleantech innovators**

Banks are the main source of finance for European firms, well positioning them to support innovation by mature clean firms. Yet a financing gap persists for high-risk, early-stage or innovative green projects, not due to a lack of liquidity, but because these initiatives often fail to meet bankability criteria (i.e., an expected favourable ROI justifying the risk). Banks require investments that produce stable, predictable cash flows, secured by strong collateral and backed by a proven capacity for debt servicing. In contrast, many green projects demand substantial upfront capital, rely on emerging technologies lacking a proven track record, and involve long-term investment horizons (sometimes over 15 or even 25 years), with uncertain demand for these new technologies along the line.

Mobilising clean energy start-ups' intangible assets is a further challenge for them to raise funding, in particular from banks. The use of the intangible assets by many start-ups is hindered mainly by: (1) seeking financing while relying on patents still in

[14] *OECD (2023), OECD Economic Surveys: European Union and Euro Area 2023, OECD Publishing, Paris, https://tinyurl.com/36rrxtsy.*

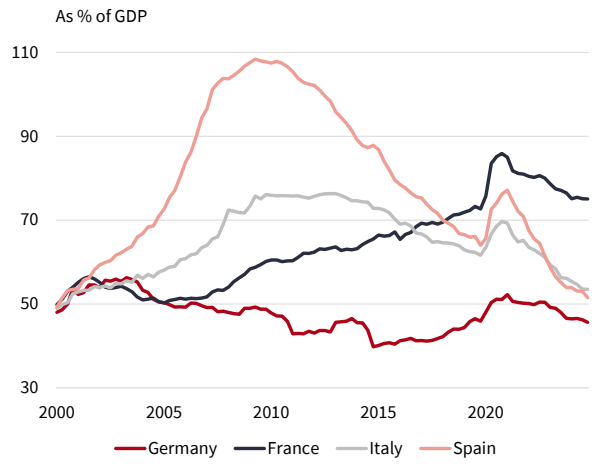
registration because the process is excessively lengthy; (2) even when registered, patents are hard to manage and enforce, suggesting the need for harmonised European intellectual property registers and financial guarantees; (3) EU prudential rules exclude intangible assets from eligible collateral.

- **Narrow financing options for corporates and investment capacity**

EU non-financial corporates (NFCs) clean investment capacity is constrained by increased corporate debt. Past and current multiple shocks, like the Covid-19 crisis and high energy prices, have brought up NFCs' indebtedness in Europe, albeit heterogeneously (*Chart 23*). Elevated corporate debt results in increased interest payments, reducing the amount of funds available for investment, including in green projects. This hurdle is expected to hasten in the current geopolitical fragmentation and high tariffs' world.

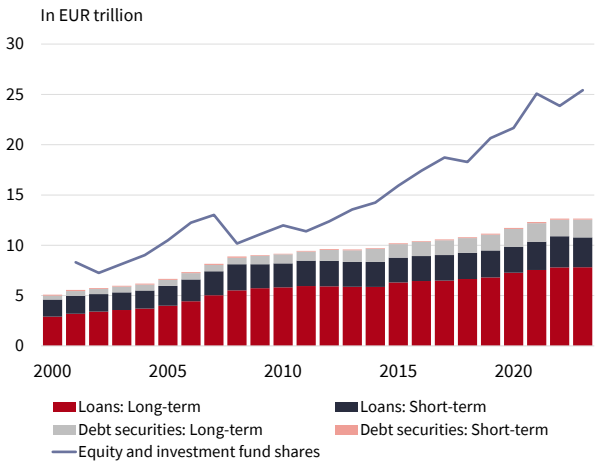
Corporate financing demand has been diversifying in the past years (*Chart 24*), but debt remains the main source of finance for the majority of EU corporates. Although the aggregate amount of outstanding firm bonds in 2023 reached €1.8tn, an almost 60% increase from the levels of 2012, bank loans still represented about 85% of EU NFCs' total debt financing in the same period. A more unified market for corporate bonds and the development of equity financing would improve NFCs' funding mix, ensuring higher macro-financial stability, better access to funds for developing resilience to climate change, enabling green growth.

Chart 23. Consolidated debt of NFCs, selected EU countries (2000-24)



Source: LSEG/Banque de France, SG Economic and Sector Studies.

Chart 24. Equity financing and debt breakdown of NFCs, EU27 (2000-23)



Source: EUROSTAT (2025), SG Economic and Sector Studies.

- **Low penetration of policies and regulation**

Policies aimed at redirecting finance supply to clean investments face leakage problems both externally, as Europe's large companies can easily tap into global

markets, and internally, as flows may move to market segments where policy measures could be less effective (i.e., from bank loans to corporate bonds).

The example of green bonds can well illustrate this point. Green bonds raise funds for financing environmental-related projects. Their issuance as percentage of total bonds in the EU has risen from 0.3% in 2014 to 6.8% in 2023, underscoring a growing demand for this vehicle. Green bonds offer long-term financing for cleantech projects, complementing traditional funding sources. Yet, its effectiveness is questioned based on risks of capital misallocation and green labelling costs.

The lack of homogenous definitions and methodologies for labelling and certifying green bonds creates uncertainty. So far, various regulatory frameworks disciplining their issuance (*Green Bond Principles, Climate Bonds Standard*…) have not prevented players to fund non-EU taxonomy-aligned projects. The EC has started applying only recently (December 2024) the first-ever binding European *Green Bond Standard* (EU GBS) which makes use of external reviewers to counter this problem, under the regulatory oversight from the *European Securities and Markets Authority* (ESMA). In addition, green bonds' effectiveness is marred by the cost associated with obtaining their "green" label. These can range from $10 000 to $100 000, creating a financial burden that deters some issuers from pursuing green bond issuance[15].

3. Risk-willing capital and the Savings and Investments Union

The solution to these hurdles relies on de-risking initiatives for the private sector and the development of the Savings and Investments Union (SIU) as well as the Banking Union (BU).

Public financing instruments are key to de-risk private investors and concretely follow-up on clean regulation. Public guarantees, first-loss, and blended mechanisms, for instance, can effectively support risk-willing capital from private investors, making it available at accessible rates. The recent agreement between Société Générale and the EIB, with the latter agreeing to provide a €500mn counter-guarantee to allow the bank to unlock €8bn in investments for wind energy manufacturing is an example. To support the CID and expand on these guarantees, the EIB plans to launch new instruments. These include a 'Grids Manufacturing Package' for counter-guarantees to grid component manufacturers. Cleantech innovators have welcomed this initiative, emphasising however the need to expand this mechanism expand this mechanism to other strategic cleantech sectors[16].

The public sector can serve as an initial risk-bearer. By absorbing early-stage and high-risk exposures, public funds diminish the perceived risk for private banks and

[15] *OECD (2017), Mobilising Bond Markets for a Low-Carbon Transition, Green Finance and Investment, OECD Publishing, Paris. https://tinyurl.com-/4xkfbfxt*

[16] *Cleantech for Europe, Joint Letter in Response to EIB Strategic Roadmap (2024).*

investors, thereby creating a "crowding-in" effect. This risk-sharing mechanism often materialises through public-private partnerships (PPPs), where public entities provide foundational backing, and the private sector subsequently scales up financing once preliminary public investments validate the project's viability. There is a strong call for EU cleantech innovators to reinforce the use of these partnerships and consider extending the model to additional cleantech sectors uncovered[17].

A significant gap in funding and public support remains for the scale-up phase of cleantech innovation, particularly for SMEs. While early-stage innovations have thrived under public funding, market-ready solutions are underfunded. For example, 2021 EU Innovation Fund results show that large industrial companies captured 70% to 100% of awards for both small- and large-scale projects. This gap highlights the urgent need for more accessible, targeted grants to developing pilots, deployment, and first-project plants.

BOX. SUPPORTING SMALL-SCALE PROJECTS FOR DRIVING SMES CLIMATE AMBITIONS

Supporting small-scale projects is key not to leave out the backbone of the EU's economy: SMEs and startups, representing ca. 50% of EU 2023 GDP. Institutions like the European Investment Bank (EIB) could act as gatekeepers of small-scale financing to overcome risk-aversion. Trusted institutions could use their technical and financial expertise to assess the bankability of small projects. The EIB, for instance, already offers support to the EU *Innovation Fund* through its *Project Development Assistance* program (PDA). The PDA is designed to improve the maturity of high-potential net-zero technologies for financial closing.

Access to finance is notoriously one of the key limits faced by SMEs to transition to net-zero. Most of SMEs' financing is obtained through debt instruments and only 35% of their 2023 investments have been funded by external sources (just 16% of external financing being sustainability-linked). Channelling Europeans' excess savings to SMEs and capital markets is paramount to ensure corporates have flows ready to invest. An example of an investment vehicle that could help ensure them is the French equity savings plan (PEA) that invests in small- and medium-sized companies, the PEA-PME. Its penalising conditions if withdrawal of funds happens before five years nudges savers to remain invested; its fiscal advantages after five years of continued investment (exempt from income tax) ensure risk-appetite is there in the medium term.

A fully operational Banking Union (BU) is essential for banks to finance projects on an EU-wide scale. Despite repeated calls from the ECB to accelerate the progress of a BU, bank liquidity still fails to circulate freely across the Euro area. National

[17] *Carbon Gap, Open letter: 13 signatories urge for stronger inclusion of cleantech research & innovation in the EU Competitiveness Deal (2025).*

authorities often restrict the use of deposits collected in one country to finance credits in another, hindering cross-border financial flows. To truly achieve a unified market, central banks under the ECB governing council should align their policies with the broader goal of facilitating EU-wide financing.

The fragmentation of the EU's stock exchanges hinders market efficiency and poses challenges for firms, investors, and brokers alike. The EU has more stock exchanges than member countries (41 stock exchanges versus 16 in the US), and many of these are small and inefficient. This fragmentation limits the diversity and depth of stock listings, suppresses IPO activity, and reduces liquidity. As a result, firms face greater challenges getting listed, investors struggle to sustain market engagement, and brokers find it harder to facilitate trade.

By unifying and deepening domestic capital markets, the Savings and Investments Union (SIU) can mobilise a larger share of household and institutional savings into long-term, market-based investment vehicles, supporting the growth of venture capital in the region, fostering the creation of larger, more competitive VC funds.

Several promising initiatives aimed at streamlining EU financial markets have been introduced. For instance, the *European Single Access Point* (ESAP) for accessing listed firms' financial and non-financial data from a single, public source, and the *Listing Act* to simplify and reduce the cost of going public in the EU. Additionally, the FASTER initiative introduces a common EU digital tax residence certificate in order to streamline procedures for cross-border withholding tax refunds.

An SIU, along with a consolidated pan-European savings product, could help unlock savings. With different pension funds, schemes, and related regulations per member state, private savers need to rationalise their retirement schemes before being offered a product on top of existing ones. The *Pan-European Pension Product* (PEPP) introduced in 2022 is a past example of the limited success of such vehicle. It confronted low supply, mainly due to costs and fees cap of 1% of yearly accumulated capital and implicit expenses. But it also faced limited consumers' appetite, especially driven by little participation and awareness of the PEPP and the 2022-23 cost of living crisis.

Political consensus is building around the development of a long-term European savings product standard. In the context of the Letta and Noyer reports[18] on relaunching the CMU/SIU, policymakers are discussing the creation of an investment fund having a recognisable designation (to be easily marketable), investing long-term (as pension funds or assurance-vie do), with harmonised standards for all EU member states[19]. If the product is to be offered at the country level, then further

[18] *Enrico Letta's Report on the Future of the Single Market; Christian Noyer's 'Developing European Capital Markets to Finance the Future' (2024).*

[19] *Christie, R., McCaffrey, C. & Pinkus, D. (2024, April 25). EU savers need a single-market place to invest. Bruegel Publications: Analysis. Brussels. https://tinyurl.com/pv63rnh7*

surveillance is needed. The lack of equal taxation regimes across member states should oblige members that offer said fund to fees' standardisation and comparable as well as advantageous tax treatment, at least the most favoured tax treatment existing in each country. This would ensure that such a product enjoys investors' appetite, no matter where it is offered. In that sense, an easy portability of such fund should also be guaranteed to signal investors that the product is part of the European single market's infrastructure from its conception to its final delivery.

7. Conclusion

Europe's decarbonisation is even more of an imperative in a fragmented world. The current policy focus places it under a push for reindustrialisation, open domestic autonomy, and competitiveness. The median annual clean funding gap of €480bn from 2025 to 2030 calls for a more rational use of existing public funds, in particular to de-risk private investment, which is estimated to represent 83% of this gap (€400bn). The CID goes in the right direction, as it addresses key hurdles at both the demand and supply sides of capital, especially on fast-permitting rules and on EIB credit-guarantees for PPAs. Yet, the CID is more of a blueprint of solutions than an implemented and coherent package, which is still heeding to uncertainty for the cleantech industry, not least due to the elevated energy prices. The completion of the single market through the BU and the SIU will ensure capital is upscaled and it will have to be done in coordination with the policies set out in the CID.

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