September 2024

CLEANTECH

Making a Success of the Clean Industrial Deal

A step forward for green industrial policy, or another stumbling block?

Author: **Ciarán Humphreys**

I4CE is a non-profit research organization that provides independent policy analysis on climate change mitigation and adaptation. The Institute promote climate policies that are effective, efficient and socially-fair. Our 40 experts engage with national and local governments, the European Union, international financial institutions,civil society organizations and the media.

Our work covers three key transitions – energy, agriculture, forest – and addresses six economic challenges: investment, public financing, development finance, financial regulation, carbon pricing and carbon certification.

ACKNOWLEDGEMENTS

The author would like to thank I4CE colleagues **Clara Calipel**, **Damien Demailly**, **Dorthe Nielsen** and **Natasha Chaudhary,** as well as **Adriana Rodriguez** and **Peter Sweatman**, for their valuable contributions to this paper.

This report is part of the EU Financial Instruments for Cleantech and Climate Innovation project, with the support of Breakthrough Energy.

EXECUTIVE SUMMARY

Context. The world's largest economies are turning towards green industrial policy to support their cleantech manufacturing to accelerate their decarbonisation, competitiveness, and economic resilience. In this cleantech race, the EU has several disadvantages, including higher costs of energy and labour, a less dynamic investment environment, and the impacts of the Inflation Reduction Act and Made in China 2025.

The EU's green industrial policy has room for improvement. Repeated efforts to launch measures to support cleantech manufacturing have left Europe with a patchwork of policies, but no clear strategy. Meanwhile, public finance is not adequately targeted or designed to meet the needs of the market. The latest attempt, the Green Deal Industrial Plan, has not improved this picture.

The Clean Industrial Deal risks repeating the same mistakes. As part of her successful bid for re-election as Commission President, Ursula von der Leyen has announced a Clean Industrial Deal. The package contains a wide range of measures, many only loosely connected to green industrialisation. While there are encouraging elements in the package, there is a risk that the EU simply adds another layer to an already complex architecture.

The EU should build on what works. The EU has the tools and structures it needs for an effective green industrial policy. The Clean Industrial Dialogues are a strong model of forums for collaboration with the private sector, which can be deepened. The Innovation Fund and EIB support are examples of best practices to build upon. Finally, regulatory tools such as Sustainability and Resilience criteria, and financing mechanisms like fixed premium auctions and loan guarantees, can be better utilised.

To make a success of the Clean Industrial Deal, the Commission should:

- Be clear on the paramount objective of the Clean Industrial Deal - **supporting Europe's decarbonisation.**
- Create a **strengthened governance** for the Clean Industrial Deal and Green Deal Industrial Plan, with structured collaboration between the Executive Vice-President for Prosperity and Industrial Strategy and the Executive Vice-President for a Clean, Just, and Competitive Transition. Make better use of the **Clean Industrial Dialogues** and **European Industrial Alliances** to ensure that industrial policy aligns with the needs of the sector.
- The Clean Industrial Deal should **set a new benchmark for effective EU policymaking.** In the next mandate, introduce measures strengthening **Sustainability and Resilience criteria** in public procurement and improving the **Single Market for cleantech**.
- Launch a **Cleantech Investment Plan**, primarily directed by the EIB and Innovation Fund, to provide targeted support to cleantech manufacturing.
- Support Member States in investing in European competitiveness, by allowing for flexibilities under the **EU's fiscal governance framework and using unspent RRF funds** to support cleantech manufacturing.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

NAME	ABBREVIATION
> CARBON BORDER ADJUSTMENT MECHANISM	→ CBAM
> CLEAN ENERGY TECHNOLOGY OBSERVATORY	→ CETO
> CLEAN INDUSTRIAL DEAL	→ CID
> CLEAN TRADE AND INVESTMENT PARTNERSHIPS	→ CTIP
> CLEAN TRANSITION DIALOGUES	→ CTD
> CLIMATE, INFRASTRUCTURE, AND ENVIRONMENT EXECUTIVE AGENCY	→ CINEA
> CRITICAL RAW MATERIALS ACT	→ CRMA
> EUROPEAN BATTERY ALLIANCE	→ EBA
> EUROPEAN COURT OF AUDITORS	→ ECA
> EUROPEAN DEFENCE FUND	→ EDF
> EUROPEAN EMISSIONS TRADING SYSTEM	→ ETS
> EUROPEAN INVESTMENT BANK	→ EIB
> EUROPEAN UNION	→ EU
> FIRST OF A KIND	→ FOAK
> GREEN DEAL INDUSTRIAL PLAN	→ GDIP
> INFLATION REDUCTION ACT	→ IRA
> IMPORTANT PROJECTS OF COMMON EUROPEAN INTEREST	→ IPCEI
> NET ZERO INDUSTRY ACT	→ NZIA
> NEXT-OF-A-KIND	→ NOAK
> RECOVERY AND RESILIENCE FACILITY	→ RRF
> STRATEGIC TECHNOLOGIES FOR EUROPE PLATFORM	→ STEP
> TEMPORARY CRISIS AND TRANSITION FRAMEWORK	→ TCTF
> VENTURE CAPITAL	→ VC

INTRODUCTION

‘The fundamentals of the global economy are changing. Those who stand still will fall behind… The race is on, and I want Europe to switch gear.’

President Ursula von der Leyen (2024)

Green industrial policy is mainstream. The world’s largest economies are deploying public funds and institutional resources to build up domestic manufacturing capacity in cleantech.

The EU has also made significant strides, most recently in its Green Deal Industrial Plan, and is continuing this momentum in the 2024-29 mandate through the recently announced “Clean Industrial Deal”.

This paper will examine the challenges faced by EU cleantech manufacturing, the difficulties within the current EU industrial policy architecture in responding to those challenges, and propose key next steps which the second von der Leyen Commission should take to make the EU toolkit fit for this era of cleantech competition.

I. LESSONS FOR EUROPE'S GREEN INDUSTRIAL POLICY

During the 2019-2024 mandate, the EU positioned the European Green Deal as its growth strategy, echoing the neo-Keynesian "Green New Deals" that gained traction on both sides of the Atlantic in the late 2010s. With the Clean Industrial Deal set to succeed the Green Deal as the flagship initiative for the 2024-2029 von der Leyen presidency, the EU has clearly shifted its focus from climate policy to green industrial policy.

A growing body of literature explores the new economics of green industrial policy. Green industrial policy supports both national interests and the global public good of reducing emissions, by aligning economic objectives with climate goals. This dual focus fosters social acceptance of climate action through job creation and growth ("just transition"), while promoting technologies that yield positive externalities, thereby mitigating the "beggar-thy-neighbour" effects often associated with industrial policy *(Rodrik, 2014; Juhasz, Lane and Rodrik, 2023; Veugelers, Tagliapetra and Trasi, 2024)*[1].

The Clean Industrial Deal aims to support Europe in 'decarbonising and industrialising at the same time' (von der Leyen, 2024b), making it helpful to evaluate the Deal through this lens. Harvard's Dani Rodrik (2014) provides key principles for 21st-century green industrial policy: **embeddedness**, **discipline**, and **accountability**.

Instead of governments trying to pick winners, industrial policy should involve close collaboration between business and bureaucrats, ensuring that policies are informed by on-the-ground realities. This **embedded** approach, demonstrated successfully in South Korea's industrial policy and the US ARPA model, allows for co-creation of industrial strategies and better alignment with the needs of growing businesses *(Evans, 1995; Juhasz, Lane and Rodrik, 2023).* However, as Rodrik cautions, **'agencies need to be embedded in, but not in bed with, business'.** This can be achieved through limited, structured settings like sectoral roundtables and public-private venture funds.

Discipline is also essential: public support should be contingent on **clear, measurable objectives**, with funding withdrawn from underperforming firms. Having multiple, unrelated objectives therefore is a problem for the discipline of a system, as a failing company will always be able to find some oblique justification for the continuation of support.

Finally, green industrial policy requires **transparent and accountable** bureaucracy. Agencies must be well-resourced, independent, and able to publicly justify their decisions. Effective communication with citizens and stakeholders, led by a public-facing figure, is crucial for maintaining trust *(Rodrik, 2014; Tagliapetra and Veugelers, 2020).*

These principles provide **guidelines** for analysing and improving the EU's current and future industrial policy under the Clean Industrial Deal. **However, it is important to recognize that the EU is not a nation-state.** As a supranational organisation with limited powers, a relatively small budget, and the need to balance diverse Member State interests, the room for such an integrated, "embedded" model is more limited. Nonetheless, when it comes to awarding the funds it does have available, as well as designing and monitoring the EU's regulatory architecture, these principles are still useful in ensuring that efforts at "Europeanising" industrial policy are effective.

1. However, this counterbalancing effect is weakened when industrial policy turns towards reducing market access for foreign competitors. We have seen this already in the anti-China tariff regimes in the US, recent anti-dumping investigations against China in the EU, and the local content requirements of the US IRA.

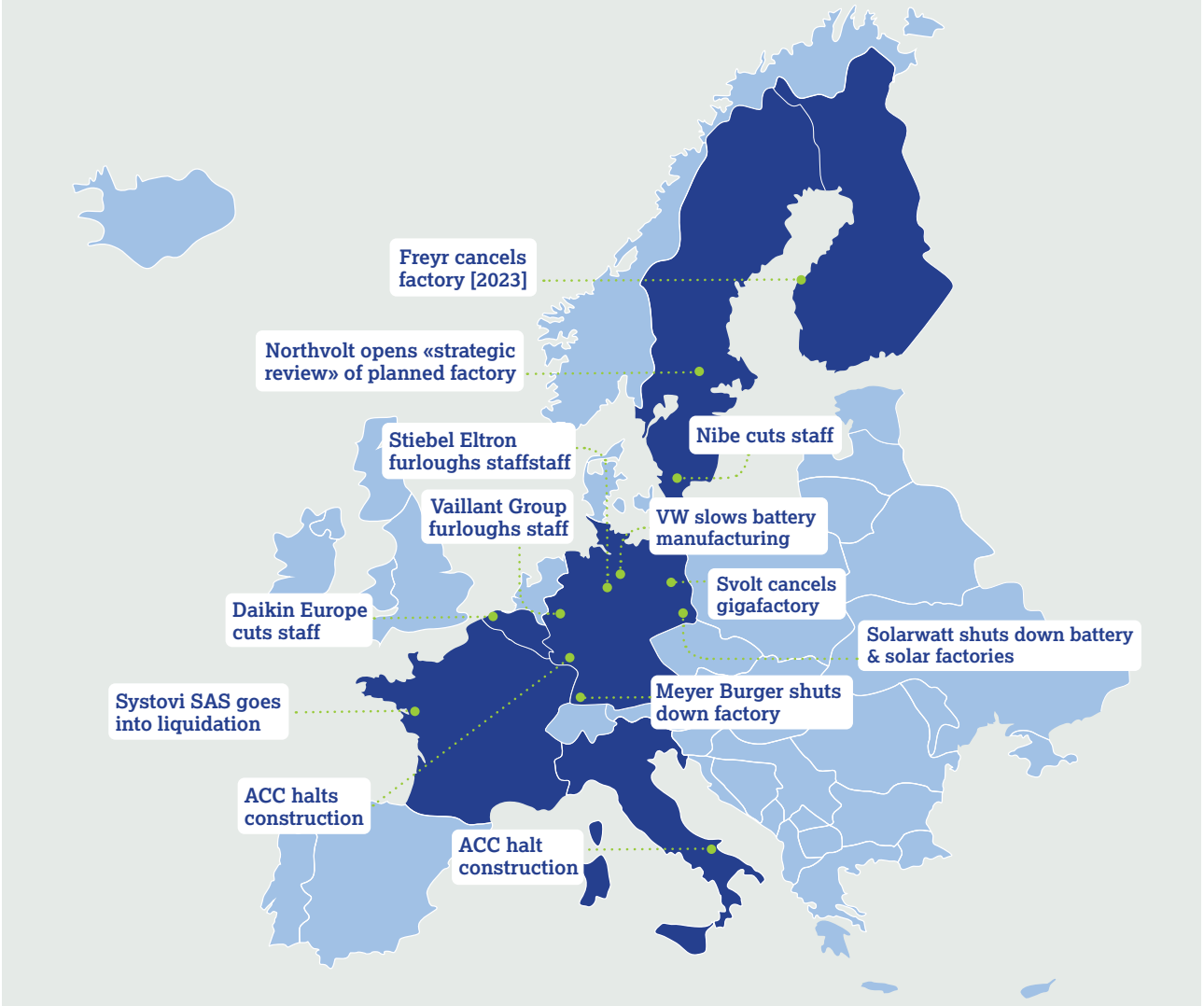
II. EU CLEANTECH FACES CHALLENGES AT HOME AND ABROAD

It is important to understand the challenges facing EU cleantech to clarify where the Clean Industrial Deal can provide the solution. European cleantech manufacturing is struggling, primarily due to a lack of cost competitiveness compared to China. This is exacerbated by the ambitious public investments of other countries (most notably the US), while a fragmented capital market, unprepared to support new companies in reaching industrial scale, makes the EU a less attractive location for investment.

The EU has been a global leader in cleantech since the early 2000s, although the road to growth was never smooth, with the boom-and-bust cycle of Cleantech 1.0 and the loss of its leading position in the solar market. The European Green Deal spurred a wave of renewed growth, and recent years have seen growing manufacturing capacities and an expanding project pipeline.

However, this upward trend is beginning to plateau. **Investment growth across Europe has slowed in 2024,** and factories are closing, cutting staff, or being cancelled before production begins.

FIGURE 1: EUROPEAN CLEANTECH FACES A WAVE OF CHALLENGES IN 2024



This downturn affects various industries. The EU battery sector, only recently on a rapid upward trajectory, is now consolidating, with projects being cancelled due to slowing EV demand and Chinese competition (*Dempsey et al., 2024*). The EU solar industry is also in jeopardy, with production capacity halving since November 2023 *(Millard and Chu, 2024)*.

With this wave of closures, European cleantech manufacturing is at a critical point. The Clean Industrial Deal, alongside the still-to-be-implemented Green Deal Industrial Plan, must address this crisis.

1. International Competition, Driven by Industrial Policy, is Intense

European cleantech manufacturing faces significant challenges in a competitive global environment. This is primarily because manufacturing is more expensive in the EU when compared to the US or China, in part because of the robust, well-financed industrial policies deployed in those countries and others.

Manufacturing cleantech in Europe is considerably more expensive. Compared to China, the world's leading cleantech producer, Europe's levelized cost of manufacturing[2] is 35-65% higher for solar panels, 22% higher for wind turbines, 20-35% higher for battery cells, and twice as expensive for heat pumps. **Capital and operational costs, including energy and labour, are significantly lower in China.** China also benefits from a higher proportion of vertically integrated producers, where the different stages of a supply chain are housed in one site or owned by one company, which also keeps costs lower. Costs between the US and EU are largely comparable, except for energy, where the US has a significant advantage *(IEA, 2024)*.

Industrial policies in other large countries further compound this disadvantage. US subsidies and tariffs on Chinese products are making US-produced cleantech increasingly cost-competitive, driving record investment growth and **diverting private investment from Europe to the US** *(Bansal, 2023; Bermel et al., 2024)*.

China, having invested trillions in its domestic industry over the past decade, dominates global green manufacturing. Chinese industrial overcapacity[3] has driven down unit costs, squeezing profit margins for both European and Chinese producers. **This price decline undermines the investment case for European cleantech,** with European tariffs unlikely to significantly reverse the trend *(McKerracher, 2024; Sebastian, Barkin and Kratz, 2024)*.

BOX 1: INNOVATION AS A KEY DRIVER OF EU COMPETITIVENESS

A key driver of Europe's economic competitiveness, particularly in sectors like cleantech, is its capacity for innovation and the speed at which cutting-edge ideas move from the lab to a First of a Kind plant, and then scale further into leading industrial players.

The EU has long been a world leader in cleantech R&D, with 40% of the world's innovative companies in the wind and heat pump sectors based in EU Member States. However, there are indications that the bloc is falling behind other leading economies. Overall private sector R&I investment, as a percentage of GDP, is lower than in the US. While the EU has successful R&I funding programs such as Horizon Europe and the European Innovation Council, these programs need to focus more on breakthrough innovation and are too fragmented *(Draghi, 2024)*.

To maintain a focused scope, this paper concentrates on industrial policy for cleantech manufacturing—specifically, more mature, technologically advanced technologies that are (almost) ready for mass market adoption. R&D support at the EU level will be the focus of a forthcoming I4CE publication.

2. The estimated total large scale manufacturing costs for a given product, taking account of 'variable costs (material, labour, and operating), fixed costs (capital & maintenance), financing structures (debt and equity financing), and tax implications (taxable income after equipment and building depreciation, debt interest payments, and expenses) of a notional manufacturing plant' *(Morrow, Shehabi and Smith, 2015)*
3. By 2030, China's annual manufacturing capacity in Solar PV will be at double the level of projected global demand, with battery capacity meeting projected demand *(Draghi, 2024)*.

2. Cleantech Scale-Ups Cannot Access the Right Finance to Scale

If, despite enticements to find alternative sites abroad, a cleantech company decides to launch its manufacturing operations in Europe, the road to industrial scale is not an easy one. Historically, as a tech sector funded by high-risk venture capital, cleantech manufacturing now needs to transition to more patient debt financing from industrial capital. However, this transition is difficult – traditional banks are wary of these "risky" new companies, and Europe's fragmented Single Market slows their growth to an internationally competitive scale.

Building a factory in Europe is a risky and capital-intensive endeavour. To move from the "Seed" stage to Series A funding and beyond, project developers must secure letters of intent from both customers and suppliers, identify sites, and begin permitting—all while raising funds primarily through venture capital and government support.

Once these hurdles are cleared, **the focus shifts to building a First of a Kind (FOAK) factory,** which is a kind of "proof of concept" before continued scaling. At this stage, funding should shift gradually away from equity and towards debt and project finance *(The Climate Brick, 2024)*. Success relies on converting letters of intent into offtake agreements and establishing secure supply chains, with a fast transition from FOAK to Next of a Kind (NOAK) needed to reduce costs.

However, **Europe's cleantech sector struggles to raise this debt. The ecosystem is heavily reliant on venture capital (VC), which is not sufficiently investing in scaling manufacturing.** Part of the reason is that many VCs lack the expertise to properly value cleantech hardware startups. Additionally, many VCs are reluctant to invest in cleantech manufacturing due to lower returns, longer exits, and high capital requirements *(Detzner et al., 2023; Planet A Ventures, 2024).*

Beyond the challenges of raising large amounts of capital through venture funds, there are broader systemic issues affecting not just cleantech but the overall landscape. Globally, the EU risk capital ecosystem compares unfavourably. EU stock market capitalisation (as a percentage of GDP) is lower than the US, Japan, China and the UK *(European Commission, 2024c)*. Beyond this, there is currently a general downturn in the VC space[4], which further strains EU cleantech investment, hindering scale-up and threatening the project pipeline.

This continued reliance on equity risks stifling the growth of the large-scale cleantech manufacturing sector. Venture finance, with its focus on high-risk, short-term returns, is poorly suited for the slow, steady progress needed for manufacturing investments. **Traditionally, European manufacturing has relied on debt finance and industrial capital from institutional investors, who are more comfortable with lower returns over longer periods.** However, cleantech struggles to be seen as comparable to traditional industries, as institutional investors hesitate to fund young, high-risk companies, particularly those without secure offtake agreements.

These challenges are amplified by **Europe's fragmented capital market and fractured Single Market.** With 27 different national architectures for capital market governance, standards, and permitting, cleantech companies face added complexity, increased costs, and delays when scaling across borders *(Draghi, 2024)*. The lack of harmonisation deters institutional investors, who see this complexity as a risk in the growth journey of a company. **More broadly, this makes it harder to achieve the economies of scale needed to lower costs and compete globally.**

4. Investors report a lowered investment appetite regarding EU firms, citing fears regarding the exit environment, leading to falling investments and a halving in the number active VC investors in 2024 compared to 2023 *(Hodgson, 2024; Invest Europe, 2024; State of European Tech, 2024).*

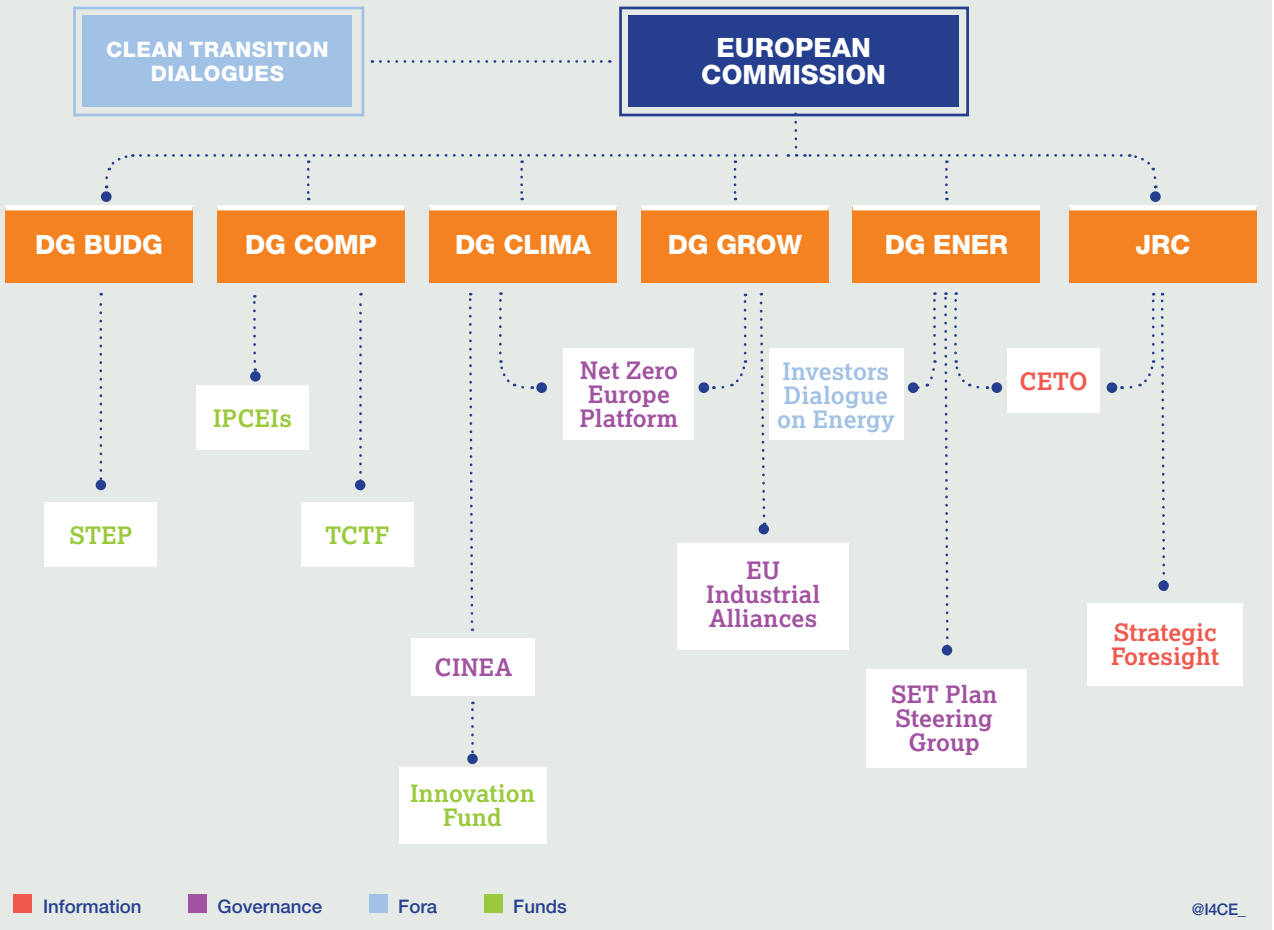
III. THE EU'S ATTEMPTS AT GREEN INDUSTRIAL POLICY HAVE FALTERED

The challenges to Europe's industrial competitiveness are not new. For decades, the EU has launched various initiatives aimed at promoting a European industrial strategy, and in recent years, several that align with climate goals. However, these repeated attempts have resulted in a complex layering of instruments that do not amount to a coordinated Green Industrial Strategy.

Recent efforts, such as the Green Deal Industrial Plan, have only exacerbated this complexity. Nonetheless, there are best practices for the EU to build upon, such as the Clean Industrial Dialogues, Industrial Alliances, and funding provided by the Innovation Fund and the EIB.

The Clean Industrial Deal is not Europe's first foray into industrial policy. Since at least the 1988 Cecchini report, The Cost of Non-Europe, international competitiveness has been a central focus. Recent crises have accelerated and "greened" these efforts, leading to the EU Industrial Strategy (2020), the Versailles Declaration and REPowerEU (2022), and the Green Deal Industrial Plan (2023) as a response to the IRA *(Vangenechten et al., 2024).*

FIGURE 2: THE EUROPEAN COMMISSION'S ARCHITECTURE FOR CLEANTECH MANUFACTURING[5]



5. This captures the principal bodies, funds and pieces of legislation, but is by no means exhaustive.

These initiatives have created a complex network of overlapping bodies, regulations, partnerships, and trade measures, organised by the European Commission as well as other entities such as the EIB. These include foresight bodies like the Clean Energy Technology Observatory, regulations like the Net Zero Industry Act, partnerships like the European Battery Alliance, and trade measures targeting critical materials[6].

The EU also has several **sources of funding** relevant to cleantech manufacturing:

- **EU Innovation Fund:** Financed by the European Emissions Trading System (ETS), it provides grants for FOAK projects and runs the Hydrogen Bank for hydrogen subsidies.

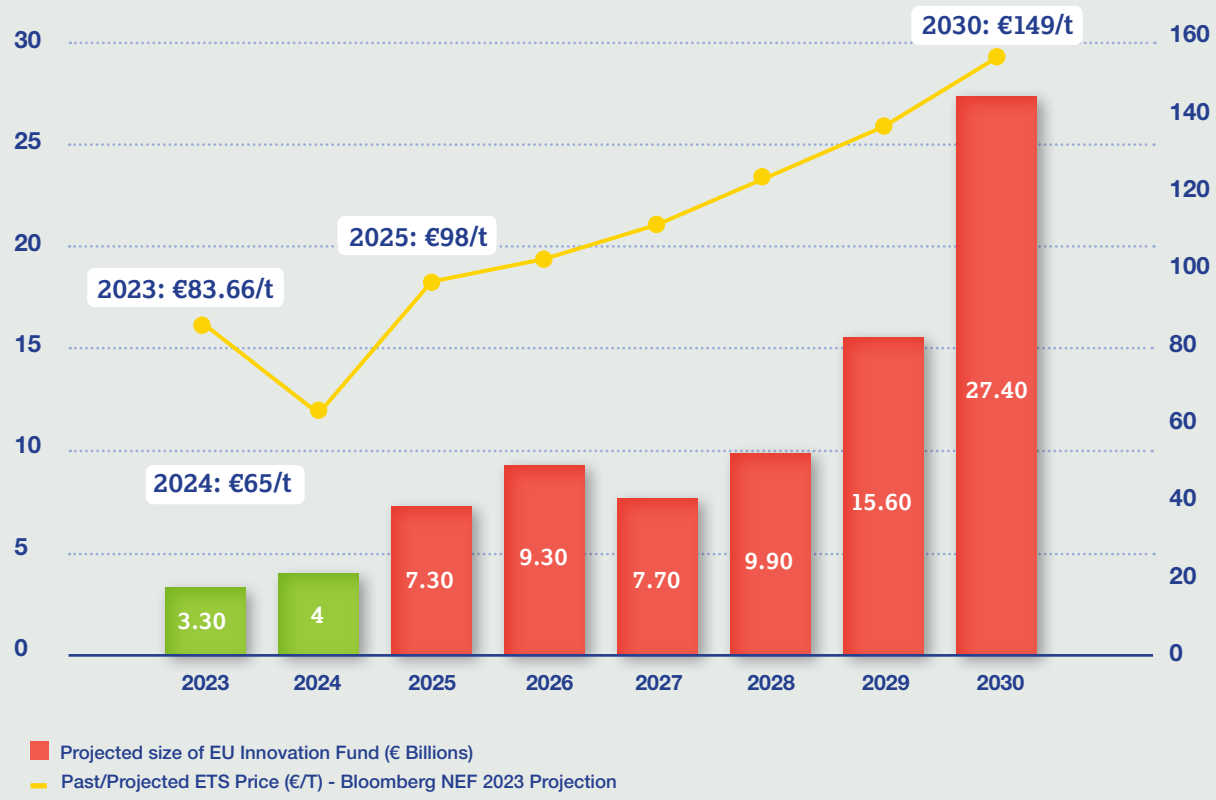
  The projected size of the Innovation Fund is €40 billion between 2020 and 2030, based on an ETS price of €75/tCO_2. This year's Innovation Fund call was set at €4 billion, with €3.1 billion of that dedicated to larger-scale projects and innovation in cleantech manufacturing. Meanwhile, the first Hydrogen Bank auction awarded €720 million to projects in 2024.

  Despite a recent drop in the carbon price, forecasts predict it will rise between 2025 and 2030, which would increase the size of the Innovation Fund available to support cleantech manufacturing and FOAK projects.

- **European Investment Bank (EIB):** As the EU's promotional and climate bank, the EIB plays a key role in financing cleantech policy, including providing counter-guarantees under the Wind Power Action Plan and the 2024 launch of the Cleantech Co-Investment Facility.

  While a full mapping of the EIB's support for cleantech is required, some recent efforts in supporting cleantech manufacturing are illustrative. The EIB has played an active role in lending to successful large-scale manufac-

FIGURE 3: PAST AND PROJECTED SIZE OF THE EU INNOVATION FUND 2023-2030 *(HUMPHREYS, 2023; KOPERNIKUS-PROJEKT ARIADNE, 2023)*



6. Beyond this specific focus on industrial policy tools relevant for cleantech manufacturing, a range of policies at EU level have an important impact on European cleantech, including R&I policy (such as the EU Framework Program), fiscal governance (most notably the revised Stability and Growth Pact) and the EU's carbon pricing regime, the Emissions Trading System (ETS) (Veugelers, Tagliapetra and Trasi, 2024).

turing projects in Europe, such as battery leaders Northvolt (€951 million, 13% of overall cost) and Verkor (€600 million, 31% of overall cost), as well as Sweden's H2 Green Steel (€314 million, 6% of overall cost).

This support is often combined with investment from national promotional banks. Furthermore, the EIB is increasingly using financial instruments beyond loans to support manufacturing, as seen in 2023's counter-guarantee of €5 billion under the Wind Power Action Plan, with the first €500 million tranche launched in collaboration with Deutsche Bank in 2024. The European Investment Fund's Cleantech Co-Investment Facility also allows for €200 million in equity investments in cleantech SMEs.

- **Important Projects of Common European Interest (IPCEIs):** These allow Member States to subsidise industrial policy-aligned projects with greater flexibility under EU competition law, with notable IPCEIs supporting hydrogen and batteries.

Of the ten IPCEIs approved from 2018 to 2024, six have focused on cleantech manufacturing, with two for batteries and four for hydrogen. In total, €25 billion has been approved by DG COMP as part of these six projects, with 75% of that targeted at Europe's hydrogen industry.

1. The Green Deal Industrial Plan Does Not Deliver the Step Change Needed

The latest addition to the EU's green industrial policy toolbox, and the most explicit attempt yet to merge industrial competitiveness and economic security with climate objectives, is the Green Deal Industrial Plan (GDIP). With a range of measures aimed at promoting the growth of EU manufacturing, supporting skills development, creating a secure supply of critical minerals, and financing the initiative through a loosening of State Aid rules and a new EU financing mechanism, the Plan is certainly ambitious in scope.

However, upon analysis, it falls short in terms of the embeddedness, discipline, and accountability principles outlined in Section 2. It is far from delivering a coherent green industrial policy and has not increased the scale of public financial support at the EU level.

Announced in 2023, the GDIP was conceived in response to the American Inflation Reduction Act (IRA) and its introduction of local content requirements[7]. Various sections of the plan were adopted or launched in the final two years of the 2019-2024 mandate.

- **Net Zero Industry Act (NZIA):** The NZIA establishes a regulatory framework to boost cleantech manufacturing within the EU, targeting 40% domestic production by 2030 and 15% of global market share by 2040. It aims to accelerate permitting, integrate sustainability criteria in procurement, support skills development, and provide preferential financing for Strategic Net Zero Projects. The Net Zero Europe Platform will oversee its implementation.

- **Critical Raw Materials Act (CRMA):** Like the NZIA, the CRMA focuses on raw materials supply, setting targets for extraction, processing, and recycling to meet 2030 EU demand. It also includes a diversification goal to avoid over-reliance on a single supplier. Strategic projects under the CRMA benefit from expedited permits and financing. Progress will be monitored by the Critical Raw Materials Board.

- **State Aid under Temporary Crisis and Transition Framework (TCTF):** The TCTF allows Member States to temporarily bypass State Aid restrictions to invest in strategic sectors like cleantech, including matching incentives from other regions. This measure, justified by the Ukraine crisis, is set to expire in 2026 unless extended.

- **Strategic Technologies for Europe Platform (STEP):** Regarding cleantech manufacturing, STEP allows Cohesion Funds to support strategic projects, offers a "one-stop-shop" for companies to access EU funds[8], and introduces the "STEP Seal" to ease financing access at EU and national levels.

While the GDIP represents a step forward for a European green industrial policy, it falls short in several ways.

7. The timing of the launch of GDIP as a reaction to American protectionism, and the design of the four pillars of the Plan, make clear that the focus of the legislation is largely economic security and defending the EU manufacturing base, rather than supporting manufacturing to be cost competitive globally.
8. That is, a web portal linking to relevant funding calls.

Firstly, the package of measures does not move Europe towards anything resembling a unified industrial policy and financing framework for the Single Market, which would be capable of competing with the industrial policies of other large economies. Instead, with four actions that each introduce a new patchwork of measures and reforms, it adds to the already complex and uncoordinated landscape at both EU and national levels. Indeed, the package does not even seem internally coordinated, with little to no guidance on how public authorities should award the various privileges that benefit strategic projects under NZIA, STEP, and CRMA.

Furthermore, when judged against the criteria outlined in Section 2, the GDIP underperforms. For the purposes of this assessment, it is worth focusing primarily on the NZIA, which is the most targeted at cleantech manufacturing.

The selection of regulatory measures and investment tools highlights a clear lack of the **embedded autonomy** that typically defines successful industrial policies. The NZIA was developed without a comprehensive impact assessment and was instead supported by a staff working document only after the initial legislative proposal was published. This is reflected in the policy design, where the chosen instruments focus on areas like national permitting processes, which do contribute to longer lead times, but are not the most significant barrier to scaling up European cleantech manufacturing *(Redeker, 2024).*

Moreover, the monitoring of NZIA's implementation does not model the kind of integration with the private sector that an embedded autonomy relationship demands. The consultative body, the Net Zero Europe Platform, is composed mainly of national civil servants and representatives from DG GROW and DG CLIMA. This platform does not include structured participation from civil society or Members of the European Parliament, except in an observer role, and lacks clear political or public-facing leadership. As a result, it is less accountable to both industry and citizens.

The NZIA does not create a clear structure to ensure **discipline** in the awarding or withdrawal of support from firms. Such discipline requires **a clear, measurable objective** against which interventions can be assessed. Instead, the NZIA creates a broad, EU-wide, cross-industry goal, without a clear rationale for assigning an aggregate target to a collection of very different industries, or for why a 40% target is justified. This objective is further muddied by the addition of a second, unrelated objective related to market share by 2040, added during negotiations by the European Parliament, as well as the persistence of sectoral targets established beforehand[9].

Additionally, although implementation is just beginning, **the process for allocating support appears likely to be opaque.** Companies will be able to apply for strategic status through one of three bodies: the Net Zero Europe Platform, the STEP Secretariat, or the Critical Raw Materials Board. However, these labels can be awarded based on a wide range of criteria—such as sustainability, job creation, and contribution to resilience—that have not been clearly prioritised, weighted, or even fully defined.

To complicate matters further, the decision to provide investment support does not rest with these bodies. Instead, it will be left to the discretion of the responsible authorities of the EU or Member State funding programmes, such as the Managing Authority of the European Regional Development Fund, the European Investment Fund, or CINEA, which manages the Innovation Fund.

This lack of clarity, coupled with an already complex set of overarching objectives and no clear mechanism to ensure that support is either granted or withdrawn appropriately, undermines the GDIP's effectiveness as a tool for green industrial policy.

Finally, **the GDIP failed to meaningfully increase the scale of public financial support for cleantech manufacturing.** When compared to the ambitious support offered elsewhere, this makes the EU a less appealing investment location. STEP was originally announced as an ambitious Sovereignty Fund, part of the mid-term review of the current EU budget. This fund would have been targeted at strategic technologies, including cleantech manufacturing, and would have provided the investment firepower at the EU level to counterbalance the potentially distortive effects of the state aid flexibility under the TCTF.

What resulted was a far cry from that initial ambition, with an originally proposed €10 billion fund (spread over four years) negotiated down to €1.5 billion by Member States, with that being channelled through the European Defence Fund (EDF) – and therefore having little impact on cleantech.

The Green Deal Industrial Plan, therefore, falls short as a cohesive and competitive green industrial policy, lacking coordination, transparency, clear objectives, and sufficient financial backing, leaving the EU struggling to compete with the more unified and ambitious policies of other major economies like the U.S. and China.

However, not all efforts at instituting an industrial policy architecture at EU level have been in vain. To improve the effectiveness of green industrial policy, the EU should build upon the existing examples that have been successful.

9. There are already-existing sectoral targets under the European Solar, Battery, Clean Hydrogen, and Renewable and Low-Carbon Fuels industrial alliances, as well as the RePowerEU plan.

2. The EU Already Has the Building Blocks of an Effective Industrial Policy

The above analysis of recent policy developments should not create the impression that attempts at industrial policy have been completely without success. For example, the European Court of Auditors (ECA) found that, 'despite shortcomings in monitoring, coordination, and targeting', the EU's industrial policy in support of its battery industry 'has been effective' *(European Court of Auditors, 2023a)*[10]. **The EU does have a range of structures that can be built upon to develop the embedded autonomy relationship with the private sector, which has been successful in the past, as well as to deliver targeted finance to scale the European cleantech sector.**

One of the pillars of the effective industrial policy for batteries has been the European Battery Alliance (EBA), launched in 2017. The EBA is one of a range of **"European Alliances"** [11], structured fora which bring together the private sector, national authorities, the European Commission, and the EIB.

The Alliances aim to create cross-border integrated ecosystems for cleantech, supported by using **IPCEIs**, which can then channel national state aid towards strategic projects. This use of state aid in a collaborative, cross-border manner allows Member States to support projects without compromising the integrity of the Single Market (unlike the TCTF). They could even, under the new EU fiscal rules, be combined with EU co-financing to allow countries with less fiscal space to continue making growth-enhancing investments in cleantech.

However, in practice, **the IPCEIs that have been launched so far have not functioned well** from the perspective of project promoters, being too slow to disburse funds and too complex for the private sector to engage with. Nonetheless, the model of active, structured public-private engagement is one that can be built upon in the next mandate.

Additionally, the EU has forums that can work with the private sector to develop policies together, including:

- The **Investors Dialogue on Energy**, chaired by the Commission and bringing together energy sector experts with those working in financial services, produces targeted reports on the use of financial instruments to support specific sectors, from energy storage to prosumer energy generation models *(European Commission, 2024b).*
- The **Energy Efficiency Financial Institutions Group** (EEFIG), which was responsible for delivering a database of energy savings investments in industry and buildings, as well as a series of tools requested by around 100 financial institutions as members *(EEFIG, 2023).*
- The **Clean Transition Dialogues** bring together the cleantech industry, industry associations, and civil society for a high-level series of discussions on the needs of the sector, with the Commission taking stock and outlining important next steps *(European Commission, 2024a).*

However, it is not clear that these discussions or recommendations affect the design of future policy proposals—giving the appearance of embeddedness without the practice of it.

The EU can also build on the **effectiveness of its funding bodies,** such as CINEA (which manages the Innovation Fund) and the EIB. The EIB, for example, co-invests with private investors, either through debt instruments or equity via funds of funds under the Cleantech Co-Investment Platform. This model, coupled with the professionalism and expertise of the EIB's agents (who themselves often have private sector experience), allows the development bank to overcome the information asymmetries that can lead to the misallocation of public funds. This attribute, along with the Bank's ability to provide the "patient capital" needed to scale innovative technologies and innovate with novel financing solutions (such as venture debt), makes it one of the most important actors in the EU's green industrial policy[12].

Finally, and most positively, there are already signals that the **funding architecture at the EU level is set to improve** regarding cleantech manufacturing. The expansion of the Innovation Fund's cleantech manufacturing call and soon-to-be-launched Battery Fund, along with the announcement of a Strategic Tech-EU programme under the EIB, indicate an encouraging direction of travel for the next mandate *(European Investment Bank, 2024).*

Looking at the existing industrial policy landscape, there is clear potential for stronger public-private collaboration and more effective use of financial tools.

10. The ECA, in the most recent report in this series, was less complementary of policy regarding renewable hydrogen, which it judged as 'partially effective' and in need of 'a reality check' *(European Court of Auditors, 2024).*
11. Other relevant Alliances for cleantech include zero-emission aviation, small modular reactors, raw materials, solar PV, clean hydrogen, and renewable and low carbon fuels.
12. As evidenced by the EIB's support of €45 billion for the GDIP and a further €5 billion for the Wind Power Action Plan *(European Investment Bank, 2023b, 2023a)*

3. The EU's Toolbox Can be Made Better Use Of

When designing the future of green industrial policy under the Clean Industrial Deal, it's important for policymakers to understand the available tools and how they can be used. The EU has already employed various regulatory and financial measures that could be further developed in this legislative package.

With the EU facing stiff international competition in cleantech, particularly in the face of Chinese dominance in supply chains and subsidised products entering European markets, the EU has begun to shift away from the market openness of the past and towards a more defensive posture – in line with other large economies such as the US.

As part of this defensive stance, the EU has trialled two regulatory and trade measures aimed at strengthening domestic manufacturing. The first is the inclusion of **sustainability and resilience criteria,** as introduced by the NZIA, into renewables auctions and public procurement calls. Public procurement, which represents over 14% of EU GDP, is a significant yet underutilised lever in promoting green industrial policy. The introduction of these criteria adds an element of economic security to procurement calls, mandating that public authorities consider both the environmental sustainability of a tender and its contribution to the EU's diversification of supply chains (with suppliers representing more than 65% of EU supply being penalised).

While these criteria do not function as an explicit "buy European" provision—unlike similar procurement reforms in Brazil and the US—they are designed to indirectly impact non-European suppliers on which the EU has strategic dependencies (particularly Chinese companies, given their dominance in global supply chains). However, the practical application of these criteria will be limited, as they are **expected to be enforced in only a minority of cases and will not be applied if price differentials exceed 10%** *(European Union, 2024).* Given the competitive pressure from Chinese industrial overcapacity and lower production costs, this is a gap that European manufacturers will struggle to bridge without further industrial policy interventions, such as subsidies.

Another tool being increasingly considered by the EU is the imposition of tariffs on goods produced in third countries, with a primary focus on China. The EU has already initiated anti-dumping investigations into imports of Chinese wind turbine towers, biodiesel, and battery electric vehicles (BEVs). **While tariffs can be an effective tool to protect European industries, their use should be approached with caution.** Stringent trade restrictions, like those pursued by the US, can undermine the positive decarbonisation spillover effects of green industrial policies—unless carbon emissions are embedded into the mechanism, as is the case with the recently launched Carbon Border Adjustment Mechanism (CBAM). Additionally, such measures can escalate trade tensions and provoke retaliatory actions, as demonstrated by recent Chinese investigations into EU agriculture. Moreover, tariffs may not be sufficient to counterbalance the current cost differential between EU and Chinese cleantech products *(Sebastian, Barkin and Kratz, 2024).*

Alongside these regulatory measures, financial support is vital to ensure the success of any green industrial policy. Long-term industrial competitiveness will depend on ensuring that innovative companies are able to grow to sufficient scale, with public support playing an important role.

The EU Innovation Fund and the European Investment Bank (EIB) have already started to provide significant support to cleantech ventures, and the introduction of new flexibilities, such as matching aid under the Temporary Crisis and Transition Framework (TCTF), further strengthens this foundation. **However, to ensure the effectiveness of this support in the future, selecting the right financial tools is important.**

Grants are a key component of the EU's financing toolbox, particularly under the EU budget and initiatives such as the Innovation Fund. These non-repayable funds are crucial for companies facing significant funding gaps, or "valleys of death", such as during research and development (R&D) or the First-of-a-Kind (FOAK) stage. While grants provide necessary financial bridges when private investment is scarce, they often come with bureaucratic hurdles and a low probability of success. Moreover, grants have limited capacity to "crowd in" private investment beyond their certification effect[13], making them less impactful in attracting additional private sector funding *(Brown and Lee, 2017; Criscuolo et al., 2022).*

With Member State budgets under pressure from new fiscal rules and competing priorities like defence spending, using public funds efficiently is more important than ever. One way to achieve this is by expanding the **"auctions-as-a-service"** model, successfully used by the European Hydrogen Bank. This model helps identify the lowest subsidy rates and works well for European industrial policy, as winning bids tend to be in regions best suited for green hydrogen production[14] *(McWilliams and Kneebone, 2024).*

13. Meaning that the fact that a project has been assessed positively by a grant program signals to investors that a project is of high quality.
14. In this case, the Nordics and the Iberian Peninsula.

In addition to grants, **financial instruments** play a crucial role in the EU's strategy to support cleantech manufacturing. These instruments, which include loans, guarantees, and equity, are designed to leverage private capital by "crowding in" private investment. Unlike grants, financial instruments are generally repayable, offering an effective way to fund projects while maintaining fiscal sustainability.

Public guarantees[15] can play a crucial role in improving access to finance, particularly for firms facing high technical and operational risks, such as those in the cleantech manufacturing sector. In a public guarantee scheme, the guarantor—whether the EU, a Member State, or a public bank—commits to covering a portion or the entirety of a loan if the borrower defaults or if the project's value declines. This mechanism has been effective in increasing access to private finance, especially for large, capital-intensive manufacturing projects, as public guarantees can be scaled more easily than direct public loans *(Habbel et al., 2021).* However, safeguards such as capping guarantees at 75% are essential to mitigate moral hazard[16] risks.

Quasi-equity instruments, which bridge the gap between debt and equity, offer a higher risk/return profile than debt but a lower one than equity[17]. These instruments, being patient and with a higher risk appetite, are particularly well-suited for scaling cleantech industries still reliant on venture capital, whereas traditional loan financing may be too restrictive and equity financing too dilutive. Quasi-equity instruments provide companies with greater flexibility in cash flow management, as repayment is conditional and often linked to the project's performance.

Tailored to the specific needs of the cleantech sector, quasi-equity supports long-term fiscal efficiency and potentially yields a better return on public investment due to its equity-like qualities. **However, the scale at which these instruments can be effectively deployed is currently limited, making them most effective for supporting FOAK and NOAK projects.** As these instruments are relatively new in the financial ecosystem, their real-world effectiveness will require close monitoring[18].

The EU already employs a mix of grants and financial instruments to support capital-intensive manufacturing projects facing strong international competition. However, these efforts have often been uncoordinated, limiting their overall effectiveness (European Court of Auditors, 2023b). By fostering a structured dialogue with investors and the private sector to better understand the barriers to investment, and finding synergies between different funding institutions[19], the EU can deliver a more coordinated industrial strategy that makes effective use of the tools already available.

15. Guarantees come in a range of forms *(FI Compass, 2015)*. A direct guarantee involves a straightforward agreement where the state covers losses incurred by the lender in case of default. In a first loss default/portfolio guarantee, the guarantor covers losses up to a set cap, with any further losses borne by the lender. Counter-guarantees place the public authority at a remove, where a private sector entity like a bank acts as the guarantor, with the state reimbursing them if the guarantee is invoked.
16. Moral hazard refers to the risk that people or companies may take more risks if they know they are protected from the consequences, such as when they have insurance or guarantees.
17. Quasi-equity products include subordinated loans (junior debt with higher interest and risk), prêt participatif (subordinated loans with interest plus performance-based returns), venture debt (non-dilutive, performance-based financing), convertible loans/bonds (debt that can convert to equity), and preferred shares (senior equity without strategic control) *(FI Compass, 2022)*.
18. Internal analysis by the EIB, the EU's main provider of quasi-equity, indicates a positive impact on growth, employment, and innovation, particularly for smaller, growing firms compared to larger ones nearing exit (European Investment Bank, 2022). EIB venture debt analysis also highlights significant growth and productivity improvements, along with a notable crowding-in of private sector debt finance *(Gatti et al., 2022).* While returns from the EIB's quasi-equity portfolio are not yet positive, largely due to its newness, returns from more mature sub-portfolios are promising, suggesting a positive future for the program.
19. Such as between the Innovation Fund and the EIB, a collaboration and combination of instruments which the Commission has recently explored in the context of the European Battery Fund *(CINEA, 2024)*.

IV. THE CLEAN INDUSTRIAL DEAL

In her July 2024 speech to the European Parliament, Ursula von der Leyen set out her vision for the next five years, in a bid to be re-elected as Commission President. The Clean Industrial Deal looks set to be as wide-ranging as its predecessor, the Green Deal, seeking to simultaneously 'channel investment in infrastructure and industry… create lead markets in everything from clean steel to clean tech and… speed up planning, tendering, and permitting' *(von der Leyen, 2024b).*

The new measures in the Deal raise concerns that they may repeat past mistakes by adding more uncoordinated layers to European green industrial policy. In terms of investment, shifting financing from central control to a national milestones approach could make things worse, not better, for supporting cleantech manufacturing.

1. From Cars to COP – a Wide-Ranging Proposal

In the political guidelines that accompanied her speech, the returning President and her team expand on the vision for the Clean Industrial Deal, although much remains vague and ill-defined *(von der Leyen, 2024a).*

FIGURE 4: THE CLEAN INDUSTRIAL DEAL

At the time of writing, the principal elements of the Clean Industrial Deal include:

- Revising the European Climate Law to include a **2040 90% emissions reduction target.**
- Introducing an **Industrial Decarbonisation Accelerator Act (IDAA)**. This could take the form of an NZIA for heavy industry, using regulation to support the adoption of decarbonisation technologies for industrial heat and other related uses. Specific reference is made to accelerating permitting, as well as channelling investment to these industries. While more concrete detail is currently missing, the IDAA might be expected to follow some of the recommendations brought forward by Industry and Member States under 2024's Antwerp Declaration *(CEFIC, 2024).*
- New measures to 'move further away from fossil fuels', including joint procurement for fuels and instating new governance for the **Energy Union.**
- Extending the aggregate demand mechanism, **AggregateEU**, to include hydrogen and critical materials, as well as gas.
- Revising the **2035 phaseout of internal combustion engines** to further include e-fuels.
- Introducing a **Single Digital Booking and Ticketing Regulation** to harmonise the passenger experience in cross-border train travel.
- Pursuing new **Clean Trade and Investment Partnerships** focused on cleantech and critical materials to diversify supply chains.
- Maintaining EU leadership in **climate diplomacy**, particularly at COP30 in 2025.

The Clean Industrial Deal is also committed to 'scale-up and prioritise investment in clean energy infrastructure and technologies' *(von der Leyen, 2024a)*. The political guidelines also make explicit reference to funding measures that will be relevant to cleantech manufacturing, such as:

- Proposing a **European Competitiveness Fund** (ECF), as part of the next EU budget beginning in 2028, targeted at strategic technologies[20]. The ECF will co-invest, alongside Member States and project promoters, into **'simpler and faster'** IPCEIs, which will be proposed starting in 2025.
- Maximising public funds to **de-risk private capital** through the EIB.
- Completing the long-delayed **Capital Markets Union**, as well as launching the proposal found in this year's Letta report of a **Savings and Investments Union** *(Letta, 2024).*
- Making better use of green public procurement, by revising the **Public Procurement Directive.**
- Making full use of remaining resources available under the **NextGen EU recovery fund.**

2. Will the Clean Industrial Deal Just Be More of the Same?

The Clean Industrial Deal will be a key focus of EU policymaking in the coming years. Von der Leyen's guidelines, to be further detailed in the 2024 Work Programme, offer promising initiatives for cleantech manufacturing, especially if the **IDAA** and revised **Public Procurement Directive** boost demand for clean technologies. The recognition of the **EIB's central role** in funding strategic industries, along with plans to let the Bank take on more risk, is a positive sign. Additionally, a **European Competitiveness Fund**, which could enhance **IPCEIs**, may significantly improve EU green industrial policy.

However, there is a risk that these proposals will simply add another layer to existing industrial policy without truly advancing it. The broad scope of the Clean Industrial Deal —covering everything from buying train tickets to EU performance at COP—lacks a clear, unified strategic vision. Without a cohesive approach, it could end up being just another disconnected layer on top of the GDIP, RePowerEU, and other past efforts.

In terms of financing, the European Competitiveness Fund may not provide the focused support cleantech

20. If we follow the logic of STEP, we can expect that this will include, but not be limited to, cleantech. In the current security paradigm, we can expect dual-use or military technologies also to be included, perhaps further squeezing the potential allocation for decarbonisation technologies.

manufacturing needs. While positioned as a streamlined, more impactful part of a reformed EU budget, there is some indication that it will be part of a move away from the centralised structure of the MFF, towards disbursing funds to Member States when approved milestones are hit, similar to the governance of the Recovery Funds *(Valero, 2024)*. This could mean dismantling successful existing programmes intended to support the best projects across Europe.

Just as the NZIA shifted from an EU-wide focus on key technology sectors to a more Member State-driven approach *(Redeker, 2024)*, the Competitiveness Fund could result in 27 uncoordinated national investment plans. Projects would reflect national political priorities rather than being located in regions where additional manufacturing capacity would most benefit EU competitiveness. Compared to the well-funded and unified industrial policies of China, the US, and Canada, this would be a weak strategy.

The Clean Industrial Deal (CID) risks repeating past mistakes by failing to learn the lessons from South Korea, the US, or even the EU's own GDIP. This could slow the EU's cleantech manufacturing growth. The problem lies both at the institutional level, where policy layering has replaced a cohesive strategy, and with Member States, which resist ceding authority to the EU.

To succeed, the EU and Member States must shift their approach. The Commission needs to prioritise a unified strategy, while Member States must put Europe's economic, climate, and security interests first. If this alignment occurs, the CID could deliver a stronger green industrial policy. This paper will conclude by exploring how the CID can achieve this.

V. HOW THE CLEAN INDUSTRIAL DEAL CAN IMPROVE EU GREEN INDUSTRIAL POLICY

The EU and its Member States have both the incentive and means to address cleantech challenges. With the global cleantech market set to exceed €580 billion by 2030, capturing a share is vital for Europe *(IEA, 2023).* **This will support a just transition, contribute to economic growth, and align with Europe's 2050 decarbonisation goals.**

An effective green industrial policy is key. Targeted regulations can address concerns around offtake, competition, and time-to-market, while public finance de-risks private investment.

Learning from the Green Deal Industrial Plan, the Clean Industrial Deal must address key challenges.

First, the **policy landscape is fragmented**, with initiatives sometimes conflicting or lacking robust analysis *(Veugelers, Tagliapetra and Trasi, 2024)*. Second, there's a need for better data, monitoring and governance (which connects to the private sector) at the EU level to inform policy and track impacts *(Jager, 2024)*. Lastly, **financial resources** from the EIB, Innovation Fund and other sources **must better align with project needs**, using instruments like loan guarantees and quasi-equity *(Sweatman, 2017; Besnainou and Karagianni, 2024).*

The Clean Industrial Deal offers the EU a chance to create an attractive investment environment and address past policy gaps. The Commission should focus on five key areas to ensure cleantech competitiveness and deliver a coordinated green industrial strategy.

1. Setting a clear objective to guide the Clean Industrial Deal

➜ PRIORITIES FOR THE CLEAN INDUSTRIAL DEAL

Make Europe's decarbonisation the principal objective of the Clean Industrial Deal, viewing competitiveness and resilience objectives through this lens.

The EU faces a range of challenges to its cleantech industry, including the price competition from China, the challenging investment environment for scale-ups, the social need to deliver jobs through the green transition, and concerns that an overreliance on a single supplier poses a geopolitical risk. Past efforts at green industrial policy have, in their overlapping objectives, tried to tackle all these important issues.

However, to be effective, green industrial policy requires a clear, guiding objective, against which policy interventions and funding decisions can be judged. Currently, the EU's approach has been one of overlapping objectives without a clear justification for their implementation (typified by the NZIA). This makes choosing when to introduce or suspend a policy, or award or withdraw financial support, more difficult.

The Clean Industrial Deal, as outlined by President von der Leyen, is an opportunity to refocus green industrial policy at EU level. Her political guidelines highlight that the achievement of the EU's **2030 decarbonisation target**, and the setting of a more ambitious **2040 interim target**, will be central. This, therefore, should be the primary target, with others being secondary. Policymakers need to ask themselves "how will this measure ensure Europe's decarbonisation, while contributing to job creation/security/industrial competitiveness".

Europe's decarbonisation pathway should be of top priority in the design of measures such as the Industrial Decarbonisation Accelerator Act. Conversely, concerns about competitiveness and job creation should be more explicitly addressed in the debate around the reform of the European Climate Law, including clear pathways for how clean technologies will contribute to the 2040 target and steer future industrial policy planning.

2. Developing an embedded European governance for green industrial policy

➜ PRIORITIES FOR THE CLEAN INDUSTRIAL DEAL

Under the Executive Vice-President for Prosperity and Industrial Strategy and the Executive Vice-President for a Clean, Just and Competitive Transition, strengthen the Clean Industrial Dialogues and European Industrial Alliances to ensure that industrial policy aligns with the needs of the sector.

The successful industrial policies of other nations, from South Korea to the United States, have relied on an **embedded autonomy relationship** with the private sector to ensure that policy interventions and funding programmes are effective and align with the needs of industry. Such a dynamic depends on public authorities being well-resourced, with strong data-gathering capacities, and in close collaboration with (but not captured by) industry through collaborative fora.

The EU's current governance architecture is far from this ideal, although there are elements that can be built upon to deliver coordinated governance for the Clean Industrial Deal. Mario Draghi, in his landmark report on European competitiveness, advocates for a wholesale restructuring of this architecture, with the development of **Competitiveness Coordination Frameworks** to consolidate the maze of bodies into a single new structure *(Draghi, 2024)*. This will now be taken forward in the form of a **Competitiveness Coordination Tool**. It is important that this tool builds upon what has already worked at EU-level, rather than dissolving already-effective teams and fora into a new format that will take time to be impactful.

The Clean Industrial Dialogues provide a model for structured collaboration between the highest levels of the Commission, industry, and civil society and should be expanded upon, under the leadership of the Executive Vice-President for Prosperity and Industrial Strategy and the Executive Vice-President for a Clean, Just, and Competitive Transition. The collaboration between these two Executive Vice-Presidents, and their division of roles, needs to be clearly structured to ensure that their overlapping mandates support, rather than hinder, the governance of green industrial policy.

The next wave of Clean Industrial Dialogues should focus on designing the Clean Industrial Deal and implementing the GDIP. They should be informed by analysis of financial instruments from the **Investors Dialogue on Energy** (with an expanded remit to include cleantech manufacturing), as well as the soon-to-be-launched monitoring platform for net zero manufacturing, which should provide more granular data on sector development. Following the conclusions of the Dialogues, **the Commission will need to be much more transparent about how it has implemented the findings (or where and why some were not implemented)**, with progress evaluated at the subsequent round of meetings.

To monitor implementation on the ground, the **European Industrial Alliances** can advise on key sectoral bottlenecks and identify where further public intervention will be most effective, as well as on improving sectoral financing plans. Given that the **EIB** and **national promotional banks** already participate in these Alliances, they are the best fora for enhancing the implementation of financial instruments in support of cleantech manufacturing. **The Alliances should be expanded to include sectors not currently covered,** such as carbon removals and grid technologies.

3. Improving the regulatory framework for cleantech

➜ PRIORITIES FOR THE CLEAN INDUSTRIAL DEAL

Under the leadership of the Commissioner for Implementation and Simplification, ensure that the Clean Industrial Deal sets a new benchmark for effective EU policymaking. In the next mandate, introduce measures to strengthen Sustainability and Resilience criteria in public procurement and improve the Single Market for cleantech.

In an encouraging signal, the EU will launch regular **Implementation Dialogues** and stress test the EU *acquis* under the Commissioner for Implementation and Simplification.

However, the policymaking processes of past EU efforts have fallen short of this standard. **The Clean Industrial Deal should set a new benchmark for effective EU policymaking.** The Commission should use this next mandate to conduct thorough impact assessments, particularly for the Industrial Decarbonisation Accelerator Act, which risks repeating NZIA's mistakes.

DGs GROW and CLIMA should review the current green industrial landscape, incorporating critiques from the European Court of Auditors to identify policies that truly benefit cleantech manufacturers.

Specific attention should be paid to new additions to the EU green industrial policy toolkit, such as **Sustainability and Resilience Criteria.** These recommendations should then be incorporated into the impact assessment of the reform of the **Public Procurement Directive**. The overall objective of this reform should be to build on the direction taken in NZIA and deliver a binding European framework for green public procurement. This framework should incentivise Member States to use this tool to create lead markets for European-manufactured cleantech, thus creating the conditions for innovative companies to scale quickly.

Another element of von der Leyen's political guidelines relevant to cleantech manufacturing is the pursuit of the **Capital Markets Union** and, more broadly, the **completion of the Single Market**. The next Commission should pursue the Letta report's proposal for a **European Savings and Investments Union**, Mario Draghi's suggestion to transform the European Securities and Markets Authority into a **European Securities and Exchange Commission**, and the implementation of the **'28th regime'** of harmonised standards for innovative companies. These initiatives have the potential to directly address some of the key barriers to scaling cleantech *(Draghi, 2024; Letta, 2024; von der Leyen, 2024a).*

These measures represent some of the clearest vehicles for improving the business environment for cleantech manufacturing in the EU. Combined with ambitious public investment to support promising companies, they provide a means to regain Europe's fading cleantech competitiveness.

4. Launching a Cleantech Investment Plan

➜ PRIORITIES FOR THE CLEAN INDUSTRIAL DEAL

Launch a Cleantech Investment Plan, primarily through the EIB and Innovation Fund, to deliver targeted support to cleantech manufacturing.

The current landscape of EU public finance for cleantech manufacturing features effective tools and institutions, but they are employed in an uncoordinated manner. There is also an overreliance on grant financing through calls for proposals, which is effective for supporting R&D and some FOAK projects but less impactful for large-scale manufacturing, which is less risky but more capital-intensive.

Although the Commission President's political guidelines anticipate the introduction of a **European Competitiveness Fund** (ECF), it will not come into force until 2028 at the earliest and will face intense political pressure during budget negotiations from 2025 to 2027. **As such, European cleantech manufacturing cannot rely on the ECF. Therefore, it is essential for Europe to make better use of the resources it already has.**

To bridge the gap to the ECF and address the finance challenges facing cleantech scale-ups, the EU should launch a **Cleantech Investment Plan** targeted at strategic manufacturing sectors[21]. This Plan should primarily be implemented through the **EIB**, in collaboration with the Innovation Fund, with its design and involved institutions informed by the **Clean Industrial Dialogues** and the **Investor's Dialogue on Energy**. The Plan could include the following actions:

- **Expand the Hydrogen Bank model of fixed premium auctions** to other strategic cleantech sectors or parts of the value chain, such as battery components or green steel.
- Reappraise the projected size of the **EU Innovation Fund** based on current, higher forecasts for the EU carbon price (see Figure 3). Allocate a greater proportion of projected revenues for the period 2024-2030 to calls within the 2024-2027 timeframe, before the next EU budget. **These frontloaded funds could either expand the size of grant calls or serve as a supplementary EU guarantee, through InvestEU, for EIB lending to cleantech manufacturing** *(Besnainou and Karagianni, 2024; CINEA, 2024).*
- **Align the EIB's proposed Strategic Tech-EU programme with the objectives of the Clean Industrial Deal** to ensure that sufficient guarantees and quasi-equity instruments, among others, are directed towards the cleantech value chain to enhance international competitiveness. The Wind Power Action Plan model of **counter-guarantees** could be replicated to support other strategic industries, such as batteries *(Draghi, 2024).*

21. The Cleantech Investment Plan should also include support for bringing new innovations to market (up to the FOAK stage) and R&D. This will be the subject of a future I4CE paper.

5. Supporting national contributions to a European green industrial policy

➜ PRIORITIES FOR THE CLEAN INDUSTRIAL DEAL

Support Member States in investing in European competitiveness by allowing flexibilities under the EU's fiscal governance framework and utilising unspent RRF funds to bolster cleantech manufacturing.

While European financing is preferable to an uncoordinated national approach, the EU competes with countries benefiting from continent-sized markets and substantial fiscal support for cleantech. **Therefore, it is crucial to introduce greater flexibilities in the use of national State Aid and the remaining RRF resources.**

Initiatives like the **TCTF** have supported cleantech investment but have **skewed the Single Market**, with larger Member States benefiting the most. Coordination of national fiscal support (IPCEIs) has been slow and complex. **With fiscal constraints looming under reformed EU rules,** the focus must be on empowering all Member States to invest in cleantech while respecting the new regime. **Co-investment** through EU programmes, which is not counted when assessing a Member State's debt sustainability, is a key way forward.

Ensuring Member States retain the flexibility and incentives to continue green investments is essential to supporting cleantech manufacturing. This can be achieved through:

- **Prioritising investments** that align with the Clean Industrial Deal **in national medium-term fiscal structural plans** under the new economic governance framework.
- **Increasing the scope for co-financing** between Member States and the EU regarding cleantech manufacturing, supported by **additional EU finances under the European Competitiveness Fund**.
- Making use of flexibilities introduced under STEP to **use unspent RRF** funds to increase Member State contributions to the **InvestEU guarantee**. National authorities should also be encouraged to launch domestic guarantees and quasi-equity schemes for cleantech using their own unspent Recovery Funds[22].
- Assess the barriers to Member State participation in the EU's **"auctions-as-a-service"**, proposing reforms to ensure a wider participation beyond Germany.
- **Reform IPCEIs** to increase the speed at which funds are disbursed.

22. As was recently demonstrated using Bulgarian recovery funds, under the direction of the EIF *(ACP Group, 2024)*

CONCLUSION

The past five years have seen success for European cleantech, but the industry now faces a crisis. Factory closures, uncertainty, and relentless global competition demand urgent action to maintain Europe's competitiveness. However, Europe struggles to match China's cost advantages or the US's IRA subsidies. Even when projects choose Europe, scaling up with the right type of finance remains a challenge.

The EU has introduced several green industrial policies, achieving some successes like the Innovation Fund and EIB finance. **Yet, the array of regulations and funding streams has created more of a policy maze than a cohesive strategy.**

Ursula von der Leyen's Clean Industrial Deal represents a step forward but risks repeating past mistakes. To compete globally, defend economic security, and support decarbonisation, the Deal must streamline existing tools into a coordinated strategy that secures the future of European cleantech manufacturing.

Bibliography

- ACP Group (2024) ***Record close for Accession Capital Partners with AMC V.*** Available at: https://acp-group.eu/record-close-for-accession-capital-partners-with-amc-v/ (Accessed: 18 July 2024).
- Bansal, K. (2023) '***The Inflation Reduction Act – a turning point for the global green hydrogen market',*** EY. Available at: https://www.ey.com/en_in/energy-resources/the-inflation-reduction-act-a-turning-point-for-the-global-green-hydrogen-market (Accessed: 17 July 2024).
- Bermel, L. et al. (2024) ***Clean Investment Monitor: Q1 2024 Update. Rhodium Group.*** Available at: https://rhg.com/research/clean-investment-monitor-q1-2024-update/ (Accessed: 17 July 2024).
- Besnainou, J. and Karagianni, S. (2024) ***A Cleantech Investment Plan for European Competitiveness. Cleantech for Europe.*** Available at: https://s3.amazonaws.com/i3.cleantech/uploads/additional_resources_pdf/49/349/EU_Cleantech_Investment_Plan_Report.pdf (Accessed: 14 March 2024).
- Brown, R. and Lee (2017) ***The theory and practice of financial instruments for small and medium-sized entreprises.*** OECD. Available at: https://www.oecd.org/cfe/regionaldevelopment/Brown_When-to-use-financial-instruments.pdf (Accessed: 22 March 2024).
- CEFIC (2024) ***The Antwerp Declaration for a European Industrial Deal.*** Available at: https://antwerp-declaration.eu/ (Accessed: 23 August 2024).
- CINEA (2024) ***Options paper for and Innovation Fund (IF) stakeholder consultation on support to the battery manufacturing industry in Europe.*** Available at: https://climate.ec.europa.eu/document/download/a36b3195-cf28-4628-83f3-ba51b3b0a00e_en?filename=policy_funding_if_bidding_battery_options_paper_en_0.pdf (Accessed: 30 July 2024).
- Criscuolo, C. et al. (2022) ***Are industrial policy instuments effective?*** OECD. Available at: https://www.oecd-ilibrary.org/docserver/57b3dae2-enpdf?expires=1711122177&id=id&accname=guest&checksum=B48A48171EC86F586238D04C62A49CAC (Accessed: 22 March 2024).
- Detzner, F. et al. (2023) ***Shaping the future is hard: Fostering sustainable transformation by improving access to finace for hardware-based climate tech startups. Sustainable Finance Beirat.*** Available at: https://sustainable-finance-beirat.de/wp-content/uploads/2023/12/SFB_Discussionpaper_Startups_Transformations_Finance_2023.pdf (Accessed: 14 March 2024).
- Draghi, M. (2024) ***The future of European competitiveness - Part B. European Commission.*** Available at: https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en?filename=The%20future%20of%20European%20competitiveness_%20In-depth%20analysis%20and%20recommendations_0.pdf (Accessed: 9 September 2024).
- EEFIG (2023) 2013-2023 ***A decade of achievements.*** Available at: https://wayback.archive-it.org/12090/20240119165556/https:/eefig.ec.europa.eu/system/files/2023-06/Final%20EEFIG%20brochure%2010%20years.pdf (Accessed: 9 August 2024).
- European Commission (2024a) ***Commission takes stock of the Clean Transition Dialogues with EU industry and social partners.*** Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_24_1884 (Accessed: 26 August 2024).
- European Commission (2024b) ***Investors Dialogue on Energy.*** Available at: https://energy.ec.europa.eu/topics/funding-and-financing/investors-dialogue-energy_en (Accessed: 26 August 2024).
- European Commission (2024c) ***The 2024 Annual Single Market and Competitiveness Report.*** Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52024DC0077 (Accessed: 30 July 2024).
- European Court of Auditors (2023a) ***Special report 15/2023: The EU's industrial policy on batteries – New strategic impetus needed. European Court of Auditors.*** Available at: https://www.eca.europa.eu/en/publications?ref=SR-2023-15 (Accessed: 18 July 2024).
- European Court of Auditors (2023b) ***The EU's financial landscape. European Court of Auditors.*** Available at: https://www.eca.europa.eu/Lists/ECADocuments/SR23_05/SR_EU-financial-landscape_EN.pdf (Accessed: 21 March 2024).
- European Court of Auditors (2024) ***Special report 11/2024: The EU's industrial policy on renewable hydrogen – Legal framework has been mostly adopted – time for a reality check.*** European Court of Auditors. Available at: https://www.eca.europa.eu/en/publications/SR-2024-11?mtm_campaign=YouMayAlsoBeInterestedIn&mtm_kwd=RelatedPublication&mtm_source=ECA_Sustainability_Report_2021&mtm_content=Special%20report%2011%2F2024%3A%20The%20EU%E2%80%99s%20industrial%20policy%20on%20renewable%20hydrogen (Accessed: 18 July 2024).
- European Investment Bank (2022) ***Evaluation of EIB Group equity and quasi-equity support for small businesses and mid-caps. Available at:*** https://www.eif.org/news_centre/publications/eib_group_equity_and_quasi_equity_for_smes_en.pdf (Accessed: 22 May 2024).
- European Investment Bank (2023a) ***EIB commits €5 billion to support Europe's wind manufacturers and approves over €20 billion in financing for new projects.*** Available at: https://www.eib.org/en/press/all/2023-510-eib-commits-eur5-billion-to-support-europe-s-wind-manufacturers-and-approves-over-eur20-billion-in-financing-for-new-projects (Accessed: 23 August 2024).
- European Investment Bank (2023b) EIB to support Green Deal Industrial Plan with €45 billion in additional financing. Available at: https://www.eib.org/en/press/all/2023-270-eib-to-support-green-deal-industrial-plan-with-eur45-billion-in-additional-financing (Accessed: 23 August 2024).

- European Investment Bank (2024) ***EIB Group 2024-2027 Strategic Roadmap.*** Available at: https://www.eib.org/attachments/lucalli/20240198_eib_group_2024_2027_strategic_roadmap_en.pdf (Accessed: 18 July 2024).
- European Union (2024) ***Regulation (EU) 2024/1735 of the European Parliament and of the Council of 13 June 2024 on establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem and amending Regulation (EU) 2018/1724.*** Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202401735 (Accessed: 18 July 2024).
- Evans, P. (1995) E***mbedded Autonomy: States and Industrial Transformation. Princeton University Press.*** Available at: https://www.jstor.org/stable/j.ctt7t0sr (Accessed: 21 August 2024).
- FI Compass (2015) ***Financial Instrument products. FI Compass.*** Available at: https://www.fi-compass.eu/sites/default/files/publications/ESIF-factsheet-FI-products.pdf (Accessed: 27 March 2024).
- FI Compass (2022) ***Quasi-equity finance for SMEs.*** Available at: https://www.fi-compass.eu/sites/default/files/publications/Quasi-equity%20finance%20for%20SMEs%20-%20A%20fi-compass%20model%20financial%20instrument_1.pdf (Accessed: 22 May 2024).
- Gatti, M. et al. (2022) ***Impact assessment of EIB venture debt.*** Available at: https://www.eib.org/attachments/publications/impact_assessment_of_eib_venture_debt_en.pdf (Accessed: 22 May 2024).
- Habbel, V. et al. (2021) ***Evaluating blended finance instruments and mechanisms:*** Approaches and methods. OECD. Available at: https://www.deval.org/fileadmin/Redaktion/Bilder/05-Publikationen/Externe_Publikationen/OECD_Working_Paper_101_Blended_Finance.pdf (Accessed: 9 April 2024).
- Hodgson, L. (2024) ***'Number of active VCs in Europe falls more than 50%',*** Pitchbook. Available at: https://pitchbook.com/news/articles/european-vc-active-investors-decrease (Accessed: 17 July 2024).
- Humphreys, C. (2023) ***The sharpest tool in the box: how to strengthen the EU Innovation Fund for climate, competitiveness and security.*** Institute for Climate Economics. Available at: https://www.i4ce.org/wp-content/uploads/2023/09/The-sharpest-tool-in-the-box_report.pdf (Accessed: 15 February 2024).
- IEA (2023) ***Energy technology perspectives 2023.*** International Energy Agency. Available at: https://iea.blob.core.windows.net/assets/a86b480e-2b03-4e25-bae1-da1395e0b620/EnergyTechnologyPerspectives2023.pdf.
- IEA (2024) ***Advancing Clean Technology Manufacturing.*** Available at: https://iea.blob.core.windows.net/assets/7e7f4b17-1bb2-48e4-8a92-fb9355b1d1bd/CleanTechnologyManufacturingRoadmap.pdf (Accessed: 16 July 2024).
- Invest Europe (2024) ***Investing in Europe: Private Equity Activity 2023.*** Available at: https://www.investeurope.eu/media/i4zpjz1m/20240507_invest-europe_pe-activity-data-2023-report.pdf (Accessed: 17 July 2024).
- Jager, P. (2024) ***Flying blind? Why EU administrations need better data and analytical capacities.*** Jacques Delors Centre. Available at: https://www.delorscentre.eu/fileadmin/2_Research/1_About_our_research/2_Research_centres/6_Jacques_Delors_Centre/Publications/Flying_blind__Why_EU_administrations_need_better_data_and_analytical_capacities_by_Philipp_Jaeger.pdf (Accessed: 23 August 2024).
- Juhasz, R., Lane, N.J. and Rodrik, D. (2023) ***The New Economics of Industrial Policy. National Bureau of Economic Research.*** Available at: https://www.nber.org/system/files/working_papers/w31538/w31538.pdf (Accessed: 16 July 2024).
- Kopernikus-Projekt Ariadne (2023) ***MSR through 2030: impact on market liquidity and considerations for the 2026 reform.*** Available at: https://ariadneprojekt.de/media/2023/12/Ariadne-Documentation_ETSWorkshopBruessel_December2023.pdf (Accessed: 3 September 2024).
- Letta, E. (2024) ***Much more than a market.*** Available at: https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf (Accessed: 18 July 2024).
- von der Leyen, U. (2024a) ***Europe's Choice.*** Available at: https://commission.europa.eu/document/download/e6cd4328-673c-4e7a-8683-f63ffb2cf648_en?filename=Political%20Guidelines%202024-2029_EN.pdf (Accessed: 18 July 2024).
- von der Leyen, U. (2024b) ***Statement at the European Parliament Plenary by President Ursula von der Leyen, candidate for a second mandate 2024-2029, European Commission.*** Available at: https://neighbourhood-enlargement.ec.europa.eu/news/statement-european-parliament-plenary-president-ursula-von-der-leyen-candidate-second-mandate-2024-2024-07-18_en (Accessed: 23 July 2024).
- McKerracher, C. (2024) '***China Already Makes as Many Batteries as the Entire World Wants',*** Bloomberg. Available at: https://www.bloomberg.com/news/newsletters/2024-04-12/china-already-makes-as-many-batteries-as-the-entire-world-wants?cmpid=BBD061224_GREENDAILY&utm_medium=email&utm_source=newsletter&utm_term=240612&utm_campaign=greendaily (Accessed: 17 July 2024).
- McWilliams, B. and Kneebone, J. (2024) ***Lessons from the European Union's inaugural Hydrogen Bank auction.*** Bruegel. Available at: https://www.bruegel.org/analysis/lessons-european-unions-inaugural-hydrogen-bank-auction (Accessed: 27 August 2024).
- Morrow, W.R., Shehabi, A. and Smith, S.J. (2015) Manufacturing Cost Levelization Model – A User's Guide. Ernest Orlando Lawrence Berkely • National Laboratory. Available at: https://www.osti.gov/servlets/purl/1237055 (Accessed: 9 February 2024).

- Planet A Ventures (2024) ***Building and Scaling Climate Hardware: A Playbook.*** Available at: https://planet-a.notion.site/BUILDING-AND-SCALING-CLIMATE-HARDWARE-A-PLAYBOOK-71e1b097041c49f69e31d4f3cb2de155 (Accessed: 22 March 2024).
- Redeker, N. (2024) ***Chasing Shadows: What the Net Zero Industry Act Teaches Us About EU Industrial Policy. Jacques Delors Centre.*** Available at: https://www.delorscentre.eu/en/publications/detail/publication/chasing-shadows-what-the-net-zero-industry-act-teaches-us-about-eu-industrial-policy (Accessed: 18 July 2024).
- Rodrik, D. (2014) ***'Green Industrial Policy',*** Oxford Review of Economic Policy. Available at: https://drodrik.scholar.harvard.edu/files/dani-rodrik/files/green_industrial_policy.pdf (Accessed: 30 July 2024).
- Sebastian, G., Barkin, N. and Kratz, A. (2024) ***Ain't No Duty High Enough. Rhodium Group.*** Available at: https://rhg.com/research/aint-no-duty-high-enough/ (Accessed: 17 July 2024).
- State of European Tech (2024) ***State of European Tech - Fundraising.*** Available at: https://stateofeuropeantech.com/fundraising (Accessed: 16 July 2024).
- Sweatman, P. (2017) ***Finance for innovation: Towards the ETS Innovation Fund. Climate Strategy & Partners.*** Available at: https://climate.ec.europa.eu/system/files/2017-06/20170612_report_en.pdf (Accessed: 10 April 2024).
- Tagliapetra, S. and Veugelers, R. (2020) ***A Green Industrial Policy for Europe. Bruegel.*** Available at: https://www.bruegel.org/system/files/wp_attachments/Bruegel_Blueprint_31_Complete_151220.pdf.
- The Climate Brick (2024) ***The Climate Brick - The missing manual for scaling climate tech.*** Available at: https://storage.googleapis.com/climatebrick-prod-file-storage/THE_CLIMATE_BRICK_THE_MISSING_MANUAL_FOR_SCALING_CLIMATE_TECH_3e28c820e3/THE_CLIMATE_BRICK_THE_MISSING_MANUAL_FOR_SCALING_CLIMATE_TECH_3e28c820e3.pdf (Accessed: 16 July 2024).
- Valero, J. (2024) EU Mulls Budget '***Big Bang' to Meet Challenging Era, Bloomberg.*** Available at: https://www.bloomberg.com/news/newsletters/2024-07-11/eu-mulls-budget-big-bang-to-meet-challenging-era (Accessed: 23 August 2024).
- Vangenechten, D. et al. (2024) B***uilding a New European Competitiveness Deal. E3G.*** Available at: https://www.e3g.org/wp-content/uploads/E3G-CISL-ZOE-briefing-Building-a-New-European-Competitiveness-Deal.pdf (Accessed: 17 July 2024).
- Veugelers, R., Tagliapetra, S. and Trasi, C. (2024) '***Green Industrial Policy in Europe: Past, Present, and Prospects'***, Journal of Industry, Competition and Trade, 24(4). Available at: https://link.springer.com/article/10.1007/s10842-024-00418-5 (Accessed: 21 August 2024).

I4CE
INSTITUTE FOR CLIMATE ECONOMICS
Une initiative de la Caisse des Dépôts et de l'Agence Française de Développement

www.i4ce.org

INSTITUTE FOR CLIMATE ECONOMICS
30 rue de Fleurus - 75006 Paris

www.i4ce.org
Contact : contact@i4ce.org

Suivez-nous sur

Création-réalisation : Laëtitia Colas