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The Competitiveness Coordination Tool:
How to make better choices in clean industrial policy

Paris,
October 2025

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This study is part of the EU Financial Instruments for Cleantech and Climate Innovation project, which the support of Founders Pledge and Breakthrough Energy.

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ACKNOWLEDGEMENTS

The authors would like to thank I4CE colleagues **Erwann Kerrand**, **Louise Kessler,** and **Dorthe Nielsen**, as well as **Till Eichler**, **Andreas Eisl**, **Victor van Hoorn**, **Philipp Jäger**, **Martin Porter**, **Adriana Rodriguez**, **Peter Sweatman**, and **Domien Vangenechten** for their valuable contributions to this paper.

EXECUTIVE SUMMARY

Europe is levelling up its industrial policy. From the Clean Industrial Deal to proposals for a more flexible EU budget, the European Commission has signalled a shift towards actively supporting competitiveness in strategic sectors.

Yet this new momentum risks losing impact if it is spread too thinly. Resources are limited. As the Draghi Report stressed, Europe needs a more strategic approach. A successful industrial strategy requires that the EU has a clear picture of the relative status of sectors; the ability to make informed choices about which to prioritise and why (and, by extension, which not to prioritise); and the concentration of funds, trade policy, regulation, and institutional capacity on those sectors.

However, Europe's coordination space for industrial policy is fragmented and unfocused, such that the limited funds available cannot be concentrated in a meaningful way to influence the emergence of a continent-wide industrial strategy. The recent EU budget proposal does little to alter this reality. **In the absence of a major fiscal expansion, deepening coordination is the most promising path towards a more strategic competitiveness agenda. The proposed Competitiveness Coordination Tool (CCT) can help deliver on this**.

It is not the first time the EU has sought to set priorities and coordinate action. Past analyses on strategic sectors for economic security and supporting the design of the Critical Raw Materials Act show how strategic prioritisation can work, while the experience of the Net Zero Industry Act illustrates how such priorities can be diluted under political pressure. In terms of governance, the European Semester and the Energy Union offer valuable lessons on how to align national and EU action through structured coordination.

Building on these precedents, this paper sets out how the Competitiveness Coordination Tool can combine a rigorous, expert-led assessment of Europe's industrial strengths and vulnerabilities with a governance model that enables Member States to act collectively on those findings.

First, it introduces a methodology for strategic prioritisation of technology sectors. This combines quantitative and qualitative indicators to assess sectors along two axes – *Competitiveness* and *Strategic Importance* – considering factors such as innovation capacity, supply dependencies, climate relevance, and dual-use potential.

Applied to cleantech – the sector where Europe's competitiveness, decarbonisation, and security goals most clearly intersect – **the approach organises five cleantech sectors into four quadrants (Figure 1):**

- **"Critical Leaders":** where Europe has, or could build, a strong competitive position in technology sectors of high strategic value;
- **"Competitive Opportunities":** less strategic/at risk technology sectors where the EU can build a lasting competitive advantage;
- **"Vulnerabilities":** technology sectors that need urgent support and;
- **"Limited Priority Areas":** which the EU can more safely deprioritise.

Such results can equip policymakers with the evidence needed to make hard industrial policy choices – and challenge entrenched assumptions. Flagship sectors such as wind and batteries may need safeguarding or stronger support; under-recognised sectors like heat pumps merit greater policy attention; and heavily subsidised ones such as hydrogen may require a "reality check" (European Court of Auditors 2024).

Second, the paper outlines how, drawing on existing governance models, **the EU can design the CCT as a coordination framework with a distinct place in the broader EU landscape**. Led by a "Project Group for Sustainable Competitiveness" at the highest levels of the Commission, and supported by the Secretariat General and the Joint Research Centre (JRC), **the Tool should identify strategic sectors and make policy recommendations**. Its place would be additive – complementing, rather than duplicating existing coordination frameworks such as the European Semester or Energy Union.

Through the Competitiveness Council and structured input from experts, industry, and civil society, the Tool should **enable joint actions and "coalitions of the willing" around agreed European priorities, rather than reproducing rigid national planning or enforcement mechanisms**. The CCT should operate through an annual coordination cycle, combining analysis, political debate, and implementation, and ensure transparency and accountability through reporting on its priorities and outcomes.

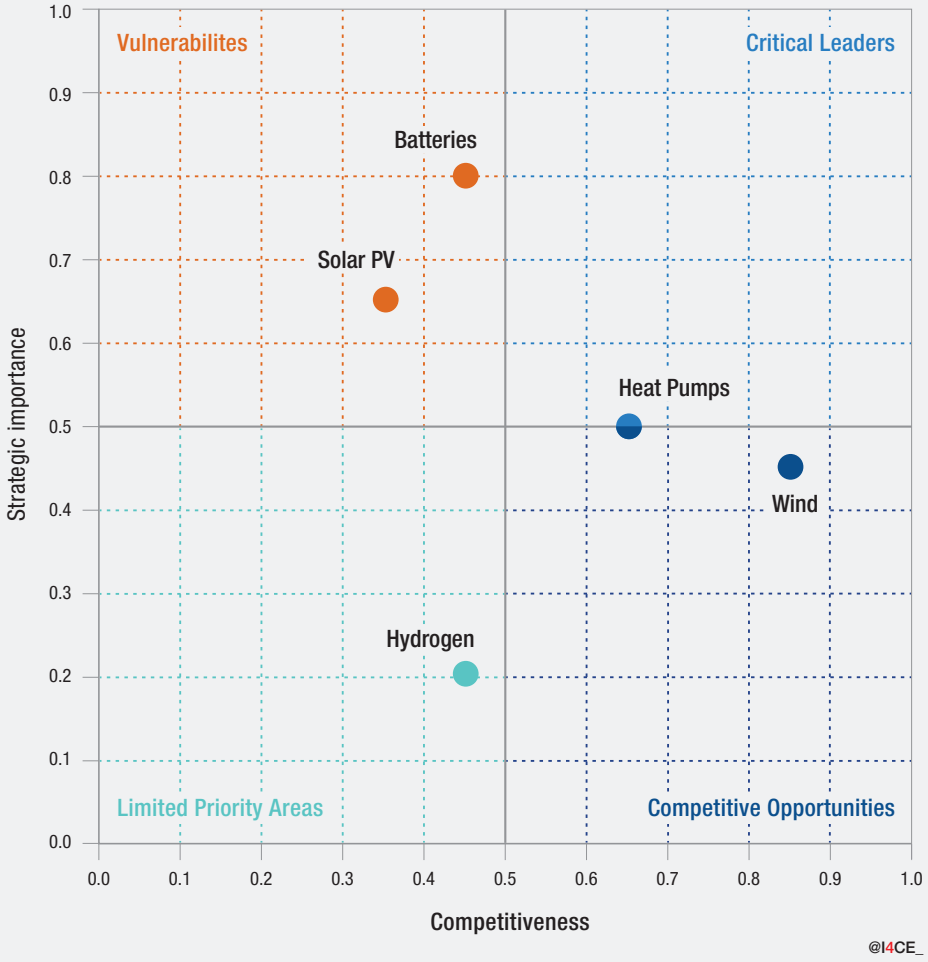
Given limited resources and legal competences at EU level, **the aim should not be the full *Europeanisation* of industrial policy, but rather to make it *more European*** – better aligned, more transparent, and directed toward shared goals.

Finally, the paper explores how the CCT can guide and connect the EU's instruments. **The European Competitiveness Fund should become the key financial vehicle for supporting strategic sectors**, co-financing national initiatives, and aligning its thematic windows with CCT priorities. **Complementary tools –**

from trade policy to regulatory initiatives – should be mobilised to reinforce Europe's strengths and reduce exposure in vulnerable sectors.

One year after the Draghi Report, Europe is beginning to realise its ambition. The Competitiveness Coordination Tool is the next step: a means to turn fragmented efforts into a coordinated industrial strategy. With transparent priorities, robust governance, and agile collective action, the CCT can help Europe act together on the sectors that will be central to its competitiveness, security, and decarbonisation in the decades ahead.

FIGURE 1. STRATEGIC PRIORITISATION OF FIVE CLEANTECH SECTORS



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INTRODUCTION

Few documents have shaped the EU's industrial policy debate as clearly as the Draghi report, which called for Europe to coordinate, prioritise, and build scale in strategic sectors. The second von der Leyen Commission has taken up this challenge – renewing its green industrial ambition through the Clean Industrial Deal, proposing a more flexible EU budget, and planning to introduce European Preference criteria in 2026.

Yet this new industrial policy momentum risks losing impact if it is spread too thinly. Europe must decide which sectors are truly of strategic importance, and which are not. So far, Member State pressures, lobbying, and institutional constraints have prevented the EU from making these choices consistently.

A successful European industrial strategy demands clearly defined priorities, and the coordination architecture necessary to align national and European industrial policy tools around them.

This paper examines how this can be advanced through the emerging Competitiveness Coordination Tool (CCT) – the new initiative announced by the European Commission to improve coordination on industrial policy.

If well designed and implemented, the CCT can strengthen how Europe identifies, decides, and acts on its industrial priorities – turning fragmented national initiatives into a coordinated strategy for long-term competitiveness, decarbonisation, and resilience.

1. SUCCESSFUL CLEAN INDUSTRIAL POLICY REQUIRES BETTER COORDINATION AND PRIORITISATION

> *"So far, Europe's response has fallen into two traps: uncoordinated national efforts, or blind faith that market forces will build new sectors."*
>
> Mario Draghi
>
> Keynote speech celebrating one year of the Draghi Report, September 2025[1].

Industrial policy is mainstream. Governments globally are increasingly marshalling public funds, regulation and trade policy to protect and nurture strategic industries at home – from space and defence to digital infrastructures and the critical clean technologies necessary to deliver decarbonisation.

Effective modern industrial policy rests on a few core governance principles (Rodrik 2014). Clear and measurable objectives must be established, against which support can be assessed. Support should be designed and disbursed through an "embedded" process that unites all relevant levels of government, businesses, experts and civil society, allowing for the effective design and redesign of interventions. Finally, the processes need to be managed through a transparent, accountable, well-resourced bureaucracy.

Chinese industrial policy, with its encouragement of vertical integration and singular focus on securing economic, energy, and military security, is the leading modern example of this approach[2]. **The US**, with the Inflation Reduction Act, the CHIPS and Science Act, and the activities of the Loan Programs Office, is the other – even if the second Trump White House is doing its best to undo some of this progress. Both of the world's leading economies have shown the power of selecting clear industrial policy priorities, then aligning their fiscal, trade and institutional might behind achieving the same.

The EU is focused on catching-up. The launch of the Clean Industrial Deal and Green Deal Industrial Plan at EU-level, coupled with increasingly robust trade measures, or national efforts such as France 2030 and Italy's Transition Plan 5.0, make this clear.

But the EU faces structural challenges that the US and China do not. A fragmented Single Market and capital market are a distinct disadvantage. Uncoordinated subsidy and procurement schemes present further barriers, pushing Member States into competition with each other, rather than making the most of the economies of scale that a coordinated approach could bring. Finally, industrial policy objectives are manyfold and incoherent, designed through individual, parallel-running, and sometimes overlapping policy processes in both Brussels institutions and European capitals.

The EU needs to overcome this uncoordinated approach – and doing so requires clear, European objectives which lend legitimacy to any attempts to coordinate industrial policy. Beyond a simple (and vague) focus on regaining competitiveness, the drive to remain relevant in rapidly evolving digital technologies can provide such framing, as can the green transition. As Rodrik (2014) argues, industrial policy is effective when it aligns with long-term societal missions that generate broad spillovers.

The green transition offers exactly this – demanding investment in infrastructure, skills, and innovation that underpin productivity across the economy. Placing EU industrial policy at the service of decarbonisation can lend coherence to the EU's overlapping objectives and justify the increased coordination of national efforts in the service of legally-enshrined European objectives (Tagliapetra and Veugelers 2020; Dennison and Engstrom 2024; CISL 2024).

With a clearer objective guiding European industrial policy, the next important step is to have the governance framework in place capable of coordinating action across levels of governance. The effectiveness of past coordination efforts can be questioned. One challenge is simply one of resources: national budgets are stretched thin, and governments are incentivised to spend in

1 (European Commission 2025j)
2 Although the country ranks weakly on the transparency dimension.

the national interest – even when pursuing overarching European strategic priorities would yield greater impact. The EU budget, meanwhile, is simply too small to act as a meaningful counterweight. Its most impactful new addition, the Recovery and Resilience Facility, a €650 billion post-pandemic recovery programme, is set to expire in 2026.

With resources limited and little prospect of a European Hamiltonian moment, Europe must do the best with what it has. In a situation of scarcity, choices need to be made. As Draghi called for, the EU needs to identify those sectors most critical to its economic security, competitiveness and decarbonisation. That also implies the harder political choice of deciding which sectors are not a priority. So far, the process behind such prioritisation has been opaque. A successful industrial policy requires greater rigour, transparency, and accountability in how these choices are made.

Enter the Competitiveness Coordination Tool. While its contours remain undefined, the Tool signals a clear intent to address the core challenge of coordinating strategic industrial policy in Europe. Its success will depend on whether it can enable targeted interventions – allowing Member States to act in concert on shared European priorities and to align existing EU instruments and functions toward the areas identified as most critical.

BOX 1. THE CASE OF CLEANTECH

Cleantech is a clear candidate for the kind of strategic steer that the Competitiveness Coordination Tool is intended to provide – and it is a cornerstone of global green industrial policy. Across all strategic dimensions of EU policy, the sector as a whole delivers high value: contributing to decarbonisation targets, driving innovation with many technologies making the transition to at-scale manufacturing, and playing a core role in Europe's long-term energy security.

However, past industrial policy efforts for cleantech, including the Net Zero Industry Act and the Clean Industrial Deal, have tended to treat the sector as a monolith. This approach obscures the vast differences between technologies in terms of economic maturity, innovation performance, and geopolitical relevance. A generalist "Action Plan for Cleantech" cannot deliver the targeted support needed to address these differences and risks producing recommendations too broad to have a meaningful impact on any sector.

A successful industrial strategy for cleantech requires that the EU:

1. Has a clear picture of the relative status and importance of technology sectors for the Union;
2. Can make choices about which sectors to prioritise, and for what reasons;
3. Can focus funds, trade policy, regulation, and institutional capacity on those sectors which offer the most value added for Europe's competitiveness, decarbonisation, and security.

The Competitiveness Coordination Tool, if properly designed, can provide exactly this.

1.1. The Competitiveness Coordination Tool

> *"We have to focus on the sectors that are most strategic to us."*
>
> Ursula von der Leyen
>
> Keynote speech celebrating one year of the Draghi Report, September 2025[3].

The Competitiveness Coordination Tool is a proposed initiative to support the coordination of EU and national investments and policies around areas of strategic importance. From what scant details are so far available, it appears to be intended as a forum bringing together EU institutions and Member States, experts, and stakeholders to identify common competitiveness priorities and strategies for achieving European leadership in those areas. In short, the space in which Europe can come together to agree a coherent industrial strategy.

The CCT is clearly influenced by the Draghi report, which proposed a "Competitiveness Coordination Framework". In the report, Draghi envisions a structure designed to "translate EU-wide competitiveness objectives into national policies, promote greater coordination between Member States and ensure financing for each strategic priority through a profound change to the structure and implementation of the EU budget" (Draghi 2024). This is reflected in what has been so far shared of the CCT, with one crucial exception: the reformed EU budget. Even with the consolidation and targeting of funds proposed, it does not represent the significant EU fiscal capacity which Draghi identified as necessary for the Framework's successful functioning (Zettelmeyer 2025).

The Competitiveness Compass gives the clearest picture to date of the actions which the CCT could undertake, and how it would fit into the wider EU coordination space (European Commission 2025a). Regarding its place in the EU's existing governance, it is set to sit alongside the European Semester. However, parallel mentions of the Tool in the proposals for the next Multiannual Financial Framework (MFF) indicate that it will also form part of the governance framework for the EU budget, raising questions about the level at which it will operate.

In terms of functioning, the CCT will identify common competitiveness priorities within a pilot set of sectors identified by the Commission and facilitate joint actions between Member States. The potential sectors identified in the Compass are "energy and transport infrastructure (*e.g.* electricity grids and storage and sustainable fuels and charging), digital infrastructure and AI vertical use cases, biotechnology, as well as other key manufacturing capacities (*e.g.* for critical medicines)" (European Commission 2025a). Given this broad scope, the level of granularity of the recommendations appears ambitious, with the CCT not only identifying sectoral priorities and relevant actions, but potentially also individual projects of strategic significance[4].

The CCT is also planned to introduce a methodology "to identify and define other strategic infrastructure networks, sectors or activities, suitable for investment and policy coordination [...], taking into account their potential for innovation, decarbonisation and economic security" (European Commission 2025a). **This is a step in the right direction towards a clear analysis of the EU's strengths, vulnerabilities and weaknesses as called for in the Draghi report.**

If the uncertainties concerning its place in EU governance, functioning, and the proposed methodology can be clarified, and the right design launched, the Competitiveness Coordination Tool can drive a step change in EU industrial policy. However, the need for better coordination and prioritisation is not novel in the EU, with both having been tried before in various forms. Before exploring possible design considerations for the CCT, the following sections outline where those attempts offer lessons to build upon – and pitfalls to avoid.

3 (European Commission 2025j)

4 The proposed regulation establishing the Competitiveness Fund hints at this: "Moreover, to foresee a strong connection with the Competitiveness Coordination Tool, the work programme of the ECF should ensure coherence with **the selected projects** and competitiveness priorities identified under the Tool." (European Commission 2025g) (Bolding author's own).

1.2. Past efforts at strategic prioritisation

The Draghi report made clear that the EU needs to be able to identify which sectors are of strategic importance, determine how they should therefore be prioritised, and define the form of support they require. While the classifications into which industries are to be sorted have been interpreted in different ways[5], the key insight from the report is that **the EU must move beyond designating broad areas of activity as strategic – such as the green and digital transitions – and adopt a more granular approach**. This means determining the specific industries and sectors which hold the greatest strategic value for Europe's competitiveness, and, by extension, those which do not.

The EU has implemented such granular prioritisation before. One leading example is the Commission's recommendations on critical technology areas for economic security (2023a). The communication assesses ten strategic sectors for the Union as a whole, on the basis of different categories of risk. The four most critical were identified as semiconductors, AI, quantum technologies, and biotech. However, the Commission's assessment process remains opaque. Furthermore, despite describing the list as a "living document" subject to revision, there has been little evidence of subsequent updates. Member States were likewise called upon to develop collective risk assessments, although there is little indication that this has been followed up on.

A similarly granular approach can be seen in the identification of critical raw materials under the Critical Raw Materials Act (CRMA). Its assessment of criticality was underpinned by a transparent methodology, assessing indicators of supply risk and economic importance (Tercero Espinoza 2023). The final list of critical raw materials enclosed in the Act closely mirrors those scoring highest in this analysis, with copper and nickel also included due to a high economic importance score despite low supply risk (Grohol and Veeh 2023).

Elsewhere, however, political pressures have undermined the EU's attempts at prioritisation. In the Net Zero Industry Act (NZIA), for instance, the Commission's initial list of eight strategic cleantech sectors expanded to nineteen through trilogue negotiations. Moreover, the final criteria for designating "Net-Zero Strategic Projects" do not operate cumulatively, allowing almost any cleantech project to qualify. This dilution weakens the Act's ability to direct support strategically, leaving greater space for Member States to promote national projects according to national preferences, rather than coordinating around shared EU priorities.

Similar dynamics are visible in the development of the Clean Industrial Deal (CID). While its broad scope aligns industrial policy with decarbonisation, its sectoral choices were shaped by lobbying, notably the Antwerp Declaration (2024) – a call for a "European Industrial Deal" backed by heavy industry and endorsed by Commission President von der Leyen, and then-holder of the Presidency of the Council of the EU, Belgian Prime Minister Alexander De Croo. The CID can be read as a direct response to this initiative, a link von der Leyen made symbolically clear when she unveiled the Deal in Antwerp before the Declaration's signatories a year later. The first CID Action Plans – steel & metals, chemicals, and automotive – align closely with these signatories. Their design has been criticised as rushed and untransparent, with limited input beyond industry actors (Bamas 2025).

Taken together, these initiatives show that the EU has made genuine progress towards a more evidence-based and sector-focused approach to industrial prioritisation. Yet they also expose persistent shortcomings. Efforts to define strategic sectors have been undermined by fragmented implementation, political bargaining, and weak institutional follow-up. **Furthermore, defining priorities is only half the task: the EU also needs the institutional capacity and political alignment to coordinate action around them**.

1.3. The EU's coordination architecture

The EU already has a wide range of coordination spaces from which the design of the CCT can draw inspiration. "Coordination space" here refers to the set of instruments, rules, and governance arrangements that enable the European Union and its Member States to align their objectives, share information, and coordinate interventions, even (and especially) where formal competences remain primarily national.

The clearest analogue to the proposed CCT, which is explicitly referenced in the Competitiveness Compass, is the European Semester and the accompanying fiscal rules. The European Semester is a platform for the assessment of national budgets and dialogue between Member States on the macroeconomic situation of the EU (with a focus on the Euro area). The Commission produces analysis on and recommendations for national budgetary policies and investments, while Member States prepare medium-term fiscal structural plans (MTPs) that outline how they plan to reach or maintain debt sustainability.

5 See (Jäger and Redeker 2025; Vavrova *et al.* 2025; Albora *et al.* 2025).

The Semester has its own enforcement mechanism under the Stability and Growth Pact, namely the Excessive Deficit Procedure. If the Commission's recommendations are not taken on board, the legislation opens the option of sanctions, including fines. This framework can, at least in principle, strengthen coordination in negative scenarios. Whether the new rulebook will also succeed in positively incentivising investments in European strategic priorities, however, remains to be seen.

Past efforts at EU guidance on investment choices, under the old version of the European Semester, were mostly unsuccessful, as country-specific recommendations (CSRs) were largely ignored (Efstahiou and Wolff 2018). This dynamic improved, however, following the introduction of the Recovery and Resilience Facility (RRF), where access to funding required Member States to address many of the CSRs. Disbursements could also be suspended if a Member State failed to take sufficient action to correct excessive deficits or imbalances (Darvas and Welslau 2023). The linkage between reform and financial support created an effective incentive structure, raising the implementation rate of CSRs by 17 percentage points (European Commission 2025h).

The RRF, set to conclude in 2026, is a powerful coordination space in its own right. It required Member States to submit integrated reform and investment plans aligned with EU-level priorities, primarily in the fields of the green and digital transitions. In its governance design, the RRF built on elements of the EU's structural funds, with the Commission conducting ex-ante evaluation of the National Recovery and Resilience Plans to assess their consistency with EU-level priorities and relevant Council recommendations, as well as their response to CSRs issued through the European Semester. Disbursements were tied to progress on agreed milestones, embedding a continuous cycle of dialogue, monitoring, and adjustment between national administrations and EU institutions. This created a degree of vertical coordination rarely achieved under the ordinary Semester (European Court of Auditors 2023).

On the sectoral level, the EU already has clear models for how better coordination of shared competence areas can be achieved – namely the Energy Union. Created to bring together the fragmented landscape of energy policies and steering bodies at EU level, the Energy Union faced a challenge of comparable scale: improving the coherence and coordination of largely national policies. Its governance mechanism, established through the Governance Regulation (Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action), guides Member States towards the 2030 energy and climate targets and ensures consistency with international commitments such as the Paris Agreement.

In the sphere of industrial policy, this level of coordination has so far been largely absent. Although industry is a supporting competence[6] (European Union 2025), where the EU can "support, coordinate or supplement the actions of the Member States", the Union has traditionally made little use of the coordination aspect of these albeit limited powers. It has rather tended to focus on areas of exclusive competence such as competition policy, aimed at preventing negative outcomes, such as market distortions or excessive concentration. State aid rules, for instance, provide a framework to prevent internal distortions of the Single Market, with some flexibilities introduced to support EU priorities under the Temporary Crisis and Transition Framework and the Clean Industrial Deal State Aid Framework (Jager 2024).

The EU's support and coordination for industry have so far concentrated largely on funding frameworks. Auctions-as-a-Service (AaaS) and the newer Grants-as-a-Service (GaaS) offer a stronger alignment of EU and national priorities by allowing Member States to fund EU-vetted projects, thereby reducing duplication and administrative costs (Sweatman and Rodriguez 2024). However, they do little to foster greater cross-border collaboration or the pooling of resources. Important Projects of Common European Interest (IPCEIs) perform better in this regard, channelling state aid support into cross-border projects in sectors like batteries and hydrogen. But they remain burdened by bureaucracy, delays, and a bias towards innovation over scale – sometimes even incentivising projects to postpone development to stay eligible for funding (Jager 2024; Hafele *et al.* 2025).

However, it can be increasingly observed that the EU is moving beyond financial support towards regulation as an instrument for industrial policy. Legally, this is done under the basis of Article 114 TFEU (internal market, a shared competence) instead of – or alongside – Article 173 (which concerns the competitiveness of the Union's industry). The Net Zero Industry Act and the Chips Act are clear examples of this shift, using regulation to strengthen Europe's industrial base in strategic sectors. But both of these initiatives have been criticised for falling short of a truly effective European industrial strategy (Kleinhans 2024; Redeker 2024).

Between the European Semester and the Energy Union, the EU already has established models for structured coordination involving Member States. The lack of comparable structures for industrial policy underlines the potential value of the Competitiveness Coordination Tool, which could work in concert with existing funding mechanisms to bring greater coherence and strategic direction to a currently fragmented landscape.

Across all these existing coordination spaces, however, compliance remains a central challenge. Greater incentives – such as those embedded in the RRF – have proven effective in addressing this. But with the Facility to conclude in 2026 and no successor in sight, such leverage will soon diminish. In this context, targeting the EU's limited financial resources towards a small number of strategic priorities offers the most promising path towards a more cohesive approach.

6 Other key elements for industrial policy, such as energy, R&D, and the internal market, are shared competences, with the EU able to legislate, while competition rules and the customs union are an exclusive competence of the EU (European Union 2025).

1.4. Lessons for the Competitiveness Coordination Tool

The EU's past attempts at prioritisation and coordination offer valuable insights for the design of the Competitiveness Coordination Tool. Past prioritisation initiatives as part of economic security efforts have identified strategic sectors through structured methodologies and evidence-based assessments – but the example of the Net Zero Industry Act demonstrates how quickly such exercises can become politicised, diluted, or disconnected from implementation.

As for the governance of such a coordination mechanism, it is clear that the CCT must not be designed from scratch. The European Semester and the Energy Union already provide templates for how the Commission and Member States can work together in structured cycles of analysis, political debate, and implementation. Valuable lessons for setting up such a space to coordinate industrial policy can be drawn from them.

Both the Semester and the Energy Union operate on clear annual or multiannual cycles. The Semester runs yearly from November to October, with the Autumn and Spring packages as key moments for the publication of recommendations and progress assessment. The Energy Union has more of a hybrid rhythm – ten-year NECPs complemented by annual and biannual progress reporting.

A shared feature across these cycles is their *ex-ante* logic. In each, the Commission is involved throughout the process, as it is consulted during the drafting stage, providing guidance before adoption, and conducting final assessment and continuous monitoring once plans are submitted. For the design of the CCT, adopting a similar *ex-ante* approach could be key to ensuring convergence between individual initiatives and the identified strategic priorities.

Another common feature of these frameworks is the use of national plans. The European Semester's Medium-Term Fiscal Structural Plans (MTPs) and National Energy and Climate Plans (NECPs) under the Energy Union create a process by which Member States outline their contributions to overarching EU objectives. Recovery and Resilience Plans (RRPs) go one step further, with investments and reforms a condition for funding. **However, given the status of industry as a supporting competence in the EU legal framework, such national plans would be difficult to replicate in the CCT, and indeed not aligned with this paper's proposed objectives for the Tool (cf. section 2.2).**

Institutional anchoring and political steering of the Semester and the Energy Union also offer useful lessons. The Secretariat General (SG) is responsible for the overall coordination of the Semester, supported by DG ECFIN and other Commission services, while the Economic and Financial Affairs Council (ECOFIN) of finance ministers provides political endorsement. The Energy Union, led by DG ENER and the Energy Council (TTE), has recently (2025) added a Task Force on the Energy Union – a high-level steering body, chaired and moderated by the Commission and with representatives from Member States and relevant agencies. The aim of the task force is not to oversee implementation of climate and energy governance *per se*, but to act as an informal coordination space, highlighting the most pressing areas of action and translating them into coordinated efforts between Member States. While all Member States are represented, the Task Force may focus its attention of specific geographies, as it currently does regarding South-East Europe (European Commission 2025d; 2025e).

Coordinating such broad governance processes requires the involvement of various services and DGs within the Commission. This is primarily achieved through inter-service groups and consultation processes. But for high priority sectors or objectives, other models exist on which to draw on. The current Commission has seen the launch of 19 "Commissioner's Project Groups", chaired by the Commissioner(s) responsible for key initiatives such as the Clean Industrial Deal, AI, and the Savings and Investment Union (European Commission 2025c). This builds on the more focused structure of seven thematic (not initiative) focused Project Teams under the Juncker Commission, which attempted to facilitate a kind of cross-institutional coordination on overarching challenges such as "Jobs, Growth, Investment and Competitiveness", the establishment of the Energy Union, or "Europe in the World" (Ivan 2017).

For a cross-sectoral initiative like the CCT, such a horizontal structure as the "Project Teams" could provide a useful model. It would ensure that the Tool's prioritisation and coordination function carry broad legitimacy, rather than being seen as a more narrowly sectoral exercise.

These examples show that the EU already possesses many of the ingredients needed for effective industrial coordination: the challenge for the Competitiveness Coordination Tool is to combine them into a coherent, expert-led and politically grounded framework. The following section turns to how the Competitiveness Coordination Tool can build on these examples – delivering a rigorous, expert-led assessment of Europe's industrial policy strengths, weaknesses, and priorities, and a governance framework that facilitates Member States to act on those recommendations.

2. DESIGNING THE COMPETITIVENESS COORDINATION TOOL: A METHOD FOR PRIORITISATION AND GOVERNANCE FOR COORDINATION

With the need to prioritise and coordinate EU industrial policy established, this section turns to how it could be achieved through the Competitiveness Coordination Tool. **The recommendations below hinge on two themes**:

- **Setting clear European sectoral priorities** through a transparent and evidence-based methodology;
- **Coordinating Member States around those priorities** through a new governance structure that facilitates joint action, and is supported by EU investment, trade tools and regulation.

2.1. A methodology for assessing European strategic priorities

As previously outlined, the Competitiveness Compass proposes that a methodology will be developed under the CCT to define priority action areas, taking into account "innovation, decarbonisation and economic security" (European Commission 2025a).

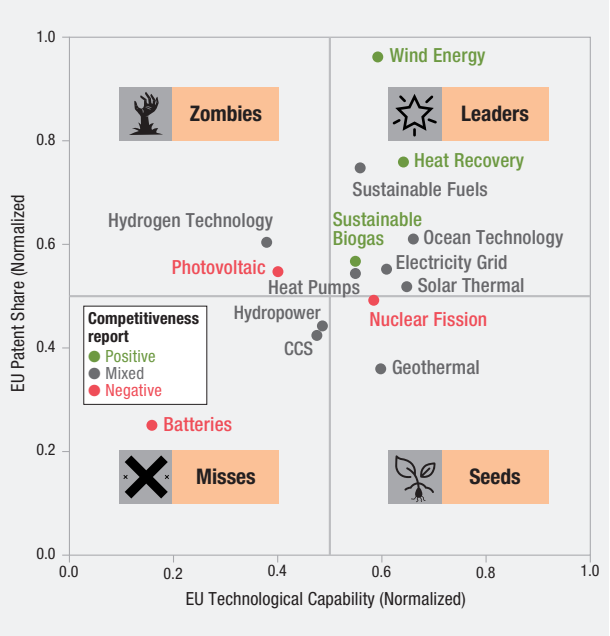
This section proposes how such a methodology could be designed in practice.

The EU already has experience of designing structured assessment frameworks, such as the methodology for identifying critical raw materials. Further insights from academic work can be drawn from the field of Technology Assessment (TA), which provides a range of quantitative methods for assessing the relative position and potential of technology sectors (European Commission 2025i; Bergeaud and Verluise 2023; Hidalgo and Hausmann 2009; Balland and Boschma 2019).

Two 2025 publications offer a particularly useful foundation for the design of such an approach. Vavrova *et al.* (2025) seek to operationalise the Draghi framework by assessing broad economic sectors[7] for supply dependencies, socio-economic importance, growth potential, and competitiveness. They then rank sectors on axes of "Competitiveness" and "Dependencies".

A complementary perspective is offered by Albora *et al.* (2025), whose analysis focuses on clean technologies. They assess these technologies against patent share and Technology Progression Probability (TPP)[8], classifying them into four categories, visually placed in four quadrants – "Leaders", "Zombies", "Misses" and "Seeds" – to indicate the relative position and future prospects of a sector in Europe from an innovation perspective[9].

FIGURE 2. EU POTENTIAL COMPETITIVENESS IN NET-ZERO TECHNOLOGIES IN 2021



Source: Albora et al. *2025.*

Both papers underline the importance of incorporating quantitative and qualitative approaches. Qualitative approaches like expert judgement, foresight, and institutionalised TA bodies can validate data-driven findings and integrate ethical, strategic, and resilience concerns. By combining both types of data, such analyses can equip policymakers with a clearer and more balanced picture of where action is most needed.

7 Such as food, beverages, textiles, pharmaceuticals, automotive, and a range of others.
8 TPP measures the likelihood the EU will gain a comparative advantage in the next five years, based on existing technological capabilities. Based on patent data, it uses pattern recognition to identify the capabilities required to specialise in a given field. Then they use statistical inference from the co-occurrence of different patenting activities across geographical location to estimate the chances of a country to be active in the field in the future (based on its current patent activities).
9 The paper also runs the same analysis in technology subsectors: namely options for Carbon Capture and Hydrogen.

Building on these precedents, this paper proposes a broader-scoped methodology for sectoral prioritisation under the CCT. It combines quantitative and qualitative indicators to produce a prioritisation matrix. Technology sectors[10] are rated along 2 axes:

- **The Competitiveness axis** captures the EU's ability to innovate, produce, and lead in a technology sector – today and in a future global economy that is decarbonising.
- **The Strategic Importance axis** captures a technology sector's value to Europe's broader resilience and security, including its role in addressing geopolitical, supply-chain, and climate threats to the bloc's security.

Each sector would receive a Competitiveness Score and a Strategic Importance Score (0-1), combining quantitative metrics and qualitative expert assessment. For illustrative purposes, indicators are presented here with equal weighting to highlight their relative contributions to the composite score.

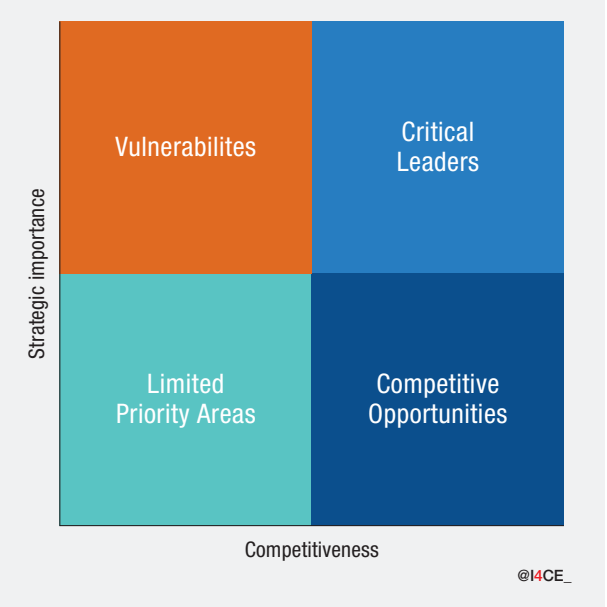
A full methodological framework would require sensitivity testing, review, and iterative refinement of indicator selection, weighting, and scoring logic – steps that fall beyond the scope of this paper but represent the natural next phase of development.

Based on the score on both axes, a technology sector would be placed on the prioritisation matrix (Figure 3).

The matrix would allow technology sectors to be categorised in four categories:

- **Quadrant I. Critical Leaders (High Competitiveness / High Strategic Importance)**: Sectors in which the EU has or could soon attain a strong competitive position *and* where this leadership is a geopolitical priority/at supply risk, making them critically important to secure from a strategic perspective. These are top-priority sectors – the EU stands to benefit economically from them and cannot afford risky dependencies.
- **Quadrant II. Competitive Opportunities (High Competitiveness / Low Strategic Importance)**: Sectors where Europe is (or can be) globally competitive, but the technology is less critical to security, has a secure domestic supply chain, or can be obtained elsewhere without grave risk. These can be seen as "competitive niches" or commercial opportunities that the EU should nurture for economic gain, albeit with a lighter strategic urgency.
- **Quadrant III. Vulnerabilities (Low Competitiveness / High Strategic Importance)**: Sectors in which the EU currently lags or is losing ground, yet are vital for resilience, making Europe uncomfortably dependent. These are strategic vulnerabilities or gaps – critical to address because they pose security risks, even though market forces alone have not made Europe a leader. They often justify significant intervention to build competitiveness or secure supply.
- **Quadrant IV. Limited Priority Areas (Low Competitiveness / Low Strategic Importance)**: Sectors where Europe is not competitive and, at the same time, reliance on others would not severely threaten EU security or economic stability. These are lower priority areas ("monitor or leverage global market") – the EU might not need to invest heavily here and can import these technologies relatively safely, focusing its resources elsewhere.

FIGURE 3. TECHNOLOGY PRIORITISATION MATRIX



2.1.1. The Competitiveness Axis

The Competitiveness axis measures the EU's ability to compete globally in a given technology sector in a global economy that is decarbonising. It captures how well Europe can innovate, produce, and scale technologies that underpin current and future competitiveness.

Key quantitative and qualitative indicators include:

- **Research and Innovation**: This indicator captures the EU's innovation performance and investment in a given technology sector, with two potential sub-indicators: *patent share* (as in Albora *et al.* (2025)), measuring the EU's share of global patenting output in the technology, to indicate current scientific leadership; and *R&D Intensity*, reflecting the level of R&D expenditure as a share of sector-value added, to signal a commitment by firms, investors, and governments to continue advancing the technological frontier.
- **Technological Capability**: A forward-looking indicator assessing the likelihood of future EU leadership in a technology. As the data point for this indicator, Albora *et al.'s* (2025) proposed *Technology Progression Probability* (TPP), which estimates the probability of the EU attaining a comparative technological advantage in the next five years, is a good candidate.

10 The proposed methodology focuses on technology sectors, building on the approach taken via the Commission Recommendation on "critical technology areas for the EU's economic security" (European Commission 2023c). If the CCT is to be applied to a wider range of economic sectors, an adaption of the methodology would be necessary.

- **Industrial Ecosystem & Bankability**: This indicator evaluates the maturity of the EU's industrial base for a given technology sector and its ability to scale from demonstration to full commercial deployment. A strong ecosystem goes beyond a handful of firms: it includes leading companies, specialist suppliers, clusters, skilled labour, and research institutions. *Bankability* reflects the sector's capacity to attract investment, (consistently) reach financial close, and expand manufacturing, ultimately progressing toward market viability without sustained public support[11]. Evidence may include: results from *Economic Complexity Analyses*, the presence of EU firms among global leaders, established clusters, skills base and reskilling opportunities, trends in cost competitiveness and aid intensity, and the share of projects reaching final investment decision (FID). Expert judgement will be essential to interpret these datapoints.
- **Trade position**: This indicator measures the EU's current market position in a given technology sector. This could be measured using *Revealed Comparative Advantage* (RCA) which gives an indication of a country's (or economic area's) competitive export strength (UN Trade & Development 2025). Since RCA cannot capture all elements which affect trade competitiveness (such as tariffs or subsidies), expert judgement would be needed to supplement this indicator.
- **Climate Contribution (Mitigation)**: This indicator assesses how critical a technology is for reducing emissions. Technologies that are indispensable to the EU's decarbonisation pathway should score highest, since leadership in such technologies offers a structural cost and market advantage as global markets increasingly internalise the cost of emissions and carbon prices rise. Assessment would rely on expert evaluation, informed by evidence, such as CO_2 abatement potential in EU climate scenarios, Innovation Fund analyses of technology sectors, and their explicit inclusion in 2030, 2040 and 2050 pathways.

FIGURE 4. COMPETITIVENESS AXIS – EXAMPLE INDICATORS, WEIGHTS[12], AND POTENTIAL DATA SOURCES

Competitiveness Metric	What it Measures	Weight	Data sources
Research and Innovation	Global patent share and R&D Intensity	20%	Patent data from the European Patent Office; R&D expenditure from Eurostat (sectoral, limited tech granularity) (Eurostat 2025c; European Patent Office 2025).
Technological Capability	Technology Progression Probability (TPP) – likelihood of tech leadership	20%	No open dataset; Joint Research Centre (JRC) produces TPP assessments (Albora *et al.* 2025).
Industrial Ecosystem & Bankability	Expert judgement on development of industrial base, how successfully projects scale, and investor confidence in the sector	20%	European Cluster Collaboration Platform, Clean Energy Technology Observatory (CETO) and similar sectoral bodies, Eurostat; industry associations for complementary data.
Trade position	Revealed Comparative Advantage (RCA) and expert input to assess the international competitiveness of a sector	20%	COMEXT database on trade (Eurostat 2025a); supplemented with expert interpretation.
Climate Contribution (Mitigation)	Contribution to the EU's decarbonisation goals	20%	No single database; derived from EU climate scenarios, IEA and JRC studies, and Innovation Fund analyses. Indicates potential CO_2 abatement but requires expert judgement.

2.1.2. The Strategic Importance Axis

The Strategic Importance axis measures a technology sector's value to Europe's broader resilience and security. It captures how critical the sector is in addressing geopolitical, supply-chain, and climate-related risks.

Key quantitative and qualitative indicators include:

- **Supply Dependence and Concentration**: This indicator captures how much the EU relies on imports for a given technology (or its critical inputs) and how diversified those imports are. High import reliance exposes Europe to disruption, while concentration in one or two supplier countries creates additional vulnerability. Metrics could include the *import reliance ratio* (share of EU demand met by imports), and the *Herfindahl–Hirschman Index* (HHI) of supplier concentration (Goodman 2023).
- **Domestic Substitutability**: This indicator assesses whether the EU could maintain supply if imports were disrupted, either through domestic production or alternative technologies. Low substitutability signals a strategic dependency. Evidence could include *EU production capacity as a share of demand*, *time required to scale domestic alternatives*, and the *availability of technological substitutes*. As no single indicator can capture this dimension on its own, the assessment should rely on expert judgement. **To maintain the consistency with the overall axis, this indicator should be scored inversely (high substitutability = a low score).**

11 For cleantech, this could specifically include an assessment of how quickly a given technology is expected to bridge the green premium.
12 Weights can be adjusted; here they are equally distributed for illustration.

- **Climate Contribution (Adaptation)**: This indicator evaluates how essential a technology sector is for strengthening resilience to physical climate risks. High scores denote that they/their products directly protect or reinforce critical systems exposed to heat, drought, flooding, or other hazards. Evidence could include *explicit inclusion in the EU Adaptation Strategy or national adaptation plans*, the technology's *role in safeguarding climate-exposed infrastructures* (energy grids, water systems, buildings), findings from *EEA risk assessments* or *stress tests*, and analyses of *avoided damages* or *risk-reduction benefits*.
- **Critical Infrastructure Role**: This indicator measures whether the assessed technology sector underpins essential services ("critical entities") like energy, transport, digital networks, or health[13]. High scores denote the risk of significant disruption to multiple core services, or if a technology is the single point of failure for one service sector with low scope for substitution. Evidence could include a technology sector's role in a sector designated under the *EU Critical Entities Directive*, the *number of dependent sectors*, and *replacement lead times* for key components.
- **Dual-Use and Security Sensitivity**: This indicator measures the extent to which a technology sector has significant overlap with defence or security applications, beyond its civilian role. Technology sectors with clear dual-use potential – such as drones, batteries, and semiconductors – carry higher strategic importance, as disruption could directly affect Europe's security. Evidence for expert assessment could include *EU designations of critical technologies* (European Commission 2023c), *NATO* or *Member State defence priority lists*, and a *mapping of the dual-use applications* of the product among major military powers. A high score indicates that the technology sector is essential to Europe's security posture.

FIGURE 5. RESILIENCE AXIS – EXAMPLE INDICATORS AND WEIGHTS[14], AND POTENTIAL DATA SOURCES

Resilience Metric	What it Measures	Weight	Data Sources
Supply Dependence and Concentration	Import dependence on single suppliers through the import reliance ratio and Herfindahl–Hirschman Index	20%	Eurostat COMEXT trade data (imports vs. domestic demand). Supplier concentration can be derived from the same datasets (Eurostat 2025a).
Domestic Substitutability	The difficulty with which the EU could substitute supply from domestic sources if imports were disrupted	20%	Eurostat PRODCOM data on manufacturing capacity; supplemented by expert assessment of substitutability and additional sectoral datasets (Eurostat 2025b).
Climate Contribution (Adaptation)	How essential a technology is for strengthening resilience to physical climate risks	20%	EU Climate-ADAPT platform and EEA analyses to inform expert judgement (EEA 2025).
Critical Infrastructure Role	Importance to important EU infrastructures where supply shocks would cause disruption	20%	Framework provided by the Critical Entities Resilience Directive (Critical Entities Resilience Directive 2022).
Dual-Use and Security Sensitivity	Level of overlap with or significance for military and security applications	20%	EU Control List of Dual-Use Items and NATO assessments to guide expert judgement (NATO 2025; European Commission 2023a).

Taken together, these indicators provide a transparent, structured way of assessing technology sectors on both their competitiveness and strategic importance. This would allow policymakers to distinguish between Europe's highest-priority sectors, those of strategic importance where vulnerabilities must be managed, those that need the right environment to scale, and those that can be more safely deprioritised.

The approach combines quantitative metrics with expert judgement, remains flexible enough to be applied across different domains, and ensures that climate contribution is mainstreamed rather than sidelined. The approach would not be directly applicable to all sectors of the European economy, but act as a valuable decision support framework to identify strategic technology sectors for priority support[15]. While further refinement and sensitivity testing would be needed in practice, the framework offers a practical means to help concentrate scarce resources on the technology sectors where coordinated EU action can deliver the greatest impact.

13 The full scope of critical infrastructure, or critical entities, is already outlined in the EU's Critical Entities Resilience Directive. They sectors are: energy, transport, banking, financial markets, health, drinking water, waste water, digital infrastructure, public administration, space, and food (European Commission 2023d).
14 Weights can be adjusted; here they are equally distributed for illustration.
15 The scope also aligns closely with that of the proposed European Competitiveness Fund (European Commission 2025g).

2.1.3. Applying the methodology: Illustrative prioritisation of cleantech sectors

To illustrate how the methodology could operate in practice, this section applies it to a selection of five cleantech sectors: wind, heat pumps, hydrogen[16], solar PV, and batteries[17].

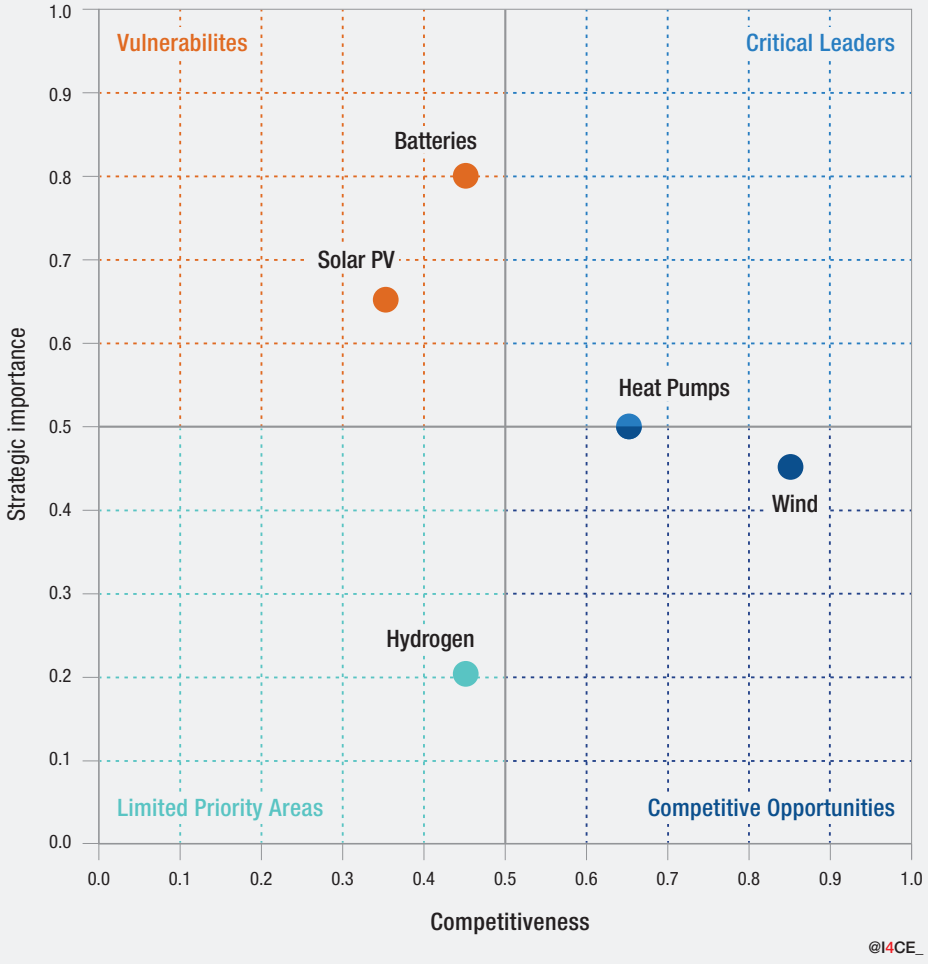
Given the scope of this paper, the method is applied illustratively rather than through the full depth of data collection and consultation that would accompany a formal prioritisation exercise. It therefore does not strictly follow the indicator framework outlined above. Instead, available assessments[18] for each indicator have been compiled and scored on a 0-1 scale, using increments of 0.25 to ensure consistency and interpretability across indicators while avoiding false precision unsupported by the underlying qualitative evidence[19].

The resulting prioritisation matrix (Figure 6) and accompanying summaries illustrate how a structured prioritisation approach can reveal strengths, vulnerabilities, and trade-offs across technology sectors. The evidence base and assumptions underlying these scores are detailed in the **Annex**.

This analysis is intended as a demonstration of approach rather than a definitive ranking of sectors. Developing this into a comprehensive, consultative prioritisation exercise would be a valuable next step for EU industrial policy.

Based on this approach, the assessment of cleantech sectors is presented in the following matrix:

FIGURE 6. STRATEGIC PRIORITISATION OF FIVE CLEANTECH SECTORS



16 This report does not disaggregate types of hydrogen, in line with the approach taken by the EU's Clean Energy Technology Observatory (CETO 2024d).
17 This selection aligns with the scope of cleantech analysed in I4CE's recent The State of Europe's Climate Investment (Calipel *et al.* 2025).
18 Building largely from the EU's own assessments of the chosen sectors in the Clean Energy Technology Observatory.
19 Each axis represents the average of five equally weighted indicators. While individual indicators were scored in 0.25 increments, averaging across them produces intermediate values between 0 and 1.

Wind energy scores very **strongly on competitiveness** (avg. 0.85), with the EU leading in R&I, maintaining high technological capability, a solid industrial base, and a trade surplus. Its climate contribution is also central to EU decarbonisation. **On the strategic importance side** (avg. 0.45), **vulnerabilities emerge**: supply chains depend heavily on Chinese inputs (notably permanent magnets), and domestic substitutability is limited. But while wind is critical infrastructure, it has little-to-no role in adaptation and only moderate security sensitivity. Overall, wind sits in the **Competitive Opportunities** quadrant, close to Critical Leaders.

Heat pumps show **solid but less dominant competitiveness** (avg. 0.65): the EU has strong R&I, a large manufacturing base, and is a global exporter, though recent trade deficits, slowed demand, and reliance on imported components weaken bankability. Their **strategic importance score is moderate** (avg. 0.5): diversified supply chains and domestic production capacity provide buffers, while their adaptation role (cooling) strengthens their relevance. However, dependencies on critical inputs like compressors, magnets, and semiconductors remain. Overall, heat pumps sit on the **borderline between Competitive Opportunities and Critical Leaders**, reflecting both strong decarbonisation importance and emerging vulnerabilities.

Hydrogen shows strong public financial support and R&I (score 0.75), but its **overall competitiveness is relatively weak** (avg. 0.45): technological capability is low, the industrial base is underutilised with fragile bankability, and trade potential is limited despite EU manufacturing capacity. Its **strategic importance score is weaker still** (avg. 0.2): its adaptation, infrastructure, and security roles remain marginal, although supply chains are highly dependent on critical minerals with limited substitutability. Overall, hydrogen sits in the **Limited Priority Areas** quadrant, though bordering Competitive Opportunities, reflecting high decarbonisation and scaling potential if offtake challenges are met – but with current market weaknesses and lower strategic value.

Solar PV demonstrates **low competitiveness** (avg. 0.35): R&I has declined, the EU's manufacturing base is weak and uncompetitive against China, and trade deficits are entrenched. Its only real strength lies in climate contribution, where solar is pivotal to decarbonisation. In addition, its **strategic importance score is somewhat higher** (avg. 0.65): the EU is highly import dependent on one single supplier, making the sector strategically exposed. Solar's growing role in the energy mix elevates its critical infrastructure importance. Overall, solar PV falls into the **Vulnerabilities quadrant**.

Batteries show **fragile competitiveness** (avg. 0.45): public R&I support has grown but technological capability still lags. And while the EU has developed a sizable manufacturing base integrated with its automotive sector, trade deficits and Chinese price and quality dominance undermine competitiveness. Their **strategic importance score is stronger** (avg. 0.8): batteries are deeply embedded in critical infrastructure and defence uses, but supply chains are highly dependent on China, with limited domestic substitution despite growing recycling efforts. Overall, batteries fall into the **Vulnerabilities quadrant**, bordering on Critical Leaders, reflecting both their indispensability and high external exposure.

So, from the perspective of a policymaker using the Competitiveness Coordination Tool, how might these results support industrial policy decisions?

From a Competitiveness perspective, we see that few European cleantech industries (of those assessed) **can be considered world-leading**. Those that are, such as **wind**, are dangerously close to being classed as "Critical Leaders", calling for pre-emptive action (as we have seen with 2023's Wind Power Action Plan) to halt the slide.

Other technology sectors of high-political salience, such as **batteries**, receive a stark warning of weak global competitiveness – and given the sector's high strategic value, more muscular support might be called for, such as local content requirements.

However, the real merits of this approach lies in its ability to challenge political assumptions, and point to technology sectors that are not already at the top of policymakers' agendas. **Heat pumps** emerge as a key sector hovering at the border between vulnerability and growth potential – suggesting the need for a greater focus and action, such as advancing on the long-delayed Heat Pump Action Plan. Conversely, **hydrogen**, which has received substantial political and financial attention, appears as a "limited priority area". This lends more weight to the European Court of Auditors' (2024) call for a "reality check" regarding EU policy on the sector.

2.1.4. Implications for the Competitiveness Coordination Tool

The proposed methodology distils diverse evidence into a transparent, replicable matrix that positions technologies by Competitiveness and Strategic Importance. It builds on established EU practice and emerging Commission work on sector benchmarking and innovation dynamics, while integrating qualitative expert judgement where data alone cannot capture the complexity required for effective policymaking.

Applied within the CCT context, this approach directly addresses the challenges of prioritisation identified above. It reduces opacity and politicisation by publishing indicators, weights, and underlying assumptions; counters fragmentation by providing a shared evidentiary baseline across Member States and technology sectors; and guides resource allocation by clarifying where concentrated support will yield the greatest strategic payoff – and where it cannot.

In short, the methodology equips the EU with a disciplined means to answer *"why these sectors, and why now?"* It brings coherence to prioritisation without pre-empting political choice over instruments or projects.

2.2. European governance for better industrial policy coordination

Putting sectoral prioritisation into action requires the right framework to align Member States and direct EU tools to where they can have the greatest impact. From what is known so far from the Competitiveness Compass, this is precisely the role that the Competitiveness Coordination Tool is intended to play.

Yet, its contours remain blurred: it is unclear how the Tool is meant to function, what authority it will carry, or how it will interact with existing EU governance architecture.

The Competitiveness Coordination Tool holds the potential to fill a long-standing gap in the EU's industrial policy architecture. As discussed in **section 1.3**, industrial policy is a supporting competence, allowing the Union to "support, coordinate or complement" national actions, but not to harmonise them. In practice, the EU has so far made only limited use of this coordinating role. Existing European governance frameworks such as the European Semester, the Energy Union, or the Recovery and Resilience Facility show that when the right incentives and coordination mechanisms are in place, the Union can effectively contribute to aligning national efforts around shared objectives. However, industrial policy lacks a comparable space for overall strategic coordination. The CCT could change that.

References to the European Semester in the Competitiveness Compass suggest that it might serve as model for the CCT, but greater clarity will be needed on several key dimensions before the Tool can be successfully launched:

- **Anchoring and added value**: its institutional form and position within the broader European governance architecture, and how it can complement rather than duplicate existing coordination frameworks.
- **Structures and procedures**: the institutional structures, decision-making cycles, and review processes it will encompass and feed into.
- **Powers and steering capacity**: what kind of mandate, influence, and accountability mechanisms it should possess.
- **Analytical function**: how its prioritisation methodology should inform political decision-making and resource allocation.
- **Consultation and participation**: how Member States, experts, industry, and civil society will be involved to ensure legitimacy and shared ownership.
- **Level of action**: how to balance central guidance with national initiative – through national plans, joint actions, or "coalitions of the willing"?
- **Scope and ambition**: clarity on what the CCT can – and equally what it cannot or should not – be expected to achieve.

Perhaps the crucial question that needs to be addressed is how "hard" or "soft" the proposed governance for industrial policy should be. In short, how much power will the EU have to incentivise Member States to act on collective priorities? Should the Tool embed stronger mechanisms linking access to funding or other EU instruments to the identified shared priorities, or will the facilitation of joint actions of "coalitions of the willing" be more expedient?

If designed with clarity on these dimensions, the CCT could help shift the logic of European industrial policy from one focused on regulation and ad hoc funding towards one of strategic coordination and positive incentivisation. Rather than prescribing national choices – something the EU neither can nor should do – the CCT should help identify shared priorities for Europe's competitiveness, mobilise common resources, and create coordination spaces where Member States can voluntarily align their actions in areas of strategic importance.

Conceived this way, the CCT would fulfil three distinct but interconnected functions:

1. **An evidence-based function**, identifying the technologies and sectors that are most relevant for Europe's competitiveness. This analytical basis should inform both EU-level policy making and guide Member States in their national policies.
2. **A coordination platform**, enabling the European Commission to facilitate cooperation among Member States, potentially through 'coalitions of the willing', to advance jointly on initiatives in strategic areas.
3. **A guiding instrument**, helping to align existing EU instruments and initiatives with the priorities identified.

Equally important is clarity on what the CCT is not. It is not intended to prescribe, centralise or harmonise national industrial policies. The Tool should respect national competences and diversity of approaches, and should not issue national recommendations or assess national policy choices (unlike the European Semester or the NECPs discussed above). Its added value lies in enabling a shared understanding of Europe's strategic priorities, guiding EU instruments accordingly, and fostering cooperation where national and European interests align.

2.2.1. The institutional design of the Competitiveness Coordination Tool

With these key design questions outlined, this section offers options for how the Competitiveness Coordination Tool could be structured to occupy a clear, additive place within the EU's architecture. For this, inspiration can be taken from existing EU governance that was more thoroughly discussed in **section 1**.

To provide clarity on its institutional anchoring and steering, the CCT should take the form of a Commission-managed governance structure designed to identify sectoral priorities, provide recommendations for joint action, guide Member States and EU services and funds around those actions, and monitor progress. In this way, it would build on the models established under the Semester and Energy Union, while taking a distinct role within the EU's architecture.

Given the cross-cutting scope of the CCT, its secretariat within the Commission could be led by a "Project Group for Sustainable Competitiveness", taking inspiration from the Junker-era "Project Teams", which proved effective as coordination spaces for high-level priorities (cf. **section 1.4**). It could be chaired by the EVPs for Industrial Strategy and/or a Clean, Just and Competitive Transition, supported by the Secretariat General (SG), with analytical input from the Joint Research Council (JRC) in the design and running of the prioritisation methodology.

The CCT should have a clear, additive role within the EU's governance landscape, avoiding duplication with existing frameworks.

Building on the recommendations of the Draghi report, it should focus on prioritising sectors, rather than specific priority projects, which are already within the remit of individual EU funds and Member States. Over time, it could consolidate the currently fragmented landscape and absorb relevant sectoral coordination bodies, such as the Net Zero Europe Platform for cleantech. By uniting existing and newly-established coordination functions under one roof, it could establish itself as the main strategic tool for aligning competitiveness priorities across the Union.

Internally, the CCT could be organised around four thematic sub-groups reflecting the structure of the European Competitiveness Fund – clean transition, health, biotech & agriculture, digital leadership, and security & space – each bringing together the relevant DGs, ministries and stakeholders. A steering committee would also be required, where final decisions on sectoral priorities and joint actions would need to be agreed politically. This schema would allow clear linkages to the ECF's work programme planning, as envisioned in the MFF proposal (European Commission 2025g; 2025f).

In terms of its mandate and steering capacity, the CCT should focus on reaping the positive benefits of better coordination, rather than act as an enforcement tool. The creation of "National Competitiveness Plans", modelled on the Semester and the Energy Union, would neither be feasible (without a significantly bigger EU budget, enforcement would remain weak – the Competitiveness Fund is no NextGen EU 2.0) nor desirable, normatively or politically, as country-specific recommendations would risk overstepping the Union's limited competence in industrial policy.

Therefore, a more feasible and positive goal should be the facilitation of joint actions on the identified competitiveness priorities. Much as seen with current Member State engagement with IPCEIs, Auctions-as-a-Service, or the Energy Union Task Force, the CCT should be the space to foster regional or thematic "coalitions of the willing" to tackle sectoral challenges in the identified priority areas or seize competitive opportunities. Such coalitions will be able to act more quickly and tailor responses to regional needs.

In fact, the CCT has already begun to take shape through such mechanisms. The Clean Transport Corridor Initiative, an inter-ministerial declaration between nine Member States to support charging infrastructure for zero-emission heavy goods vehicles, is formally "supported by the European Commission under the Competitiveness Coordination Tool" (European Commission 2025f). However, little is known about the role the CCT played in this, who sits on it, or when it acted – a reminder of the need for transparency and clarity on the Tool's design.

Once such joint initiatives are ratified by the CCT secretariat, EU instruments, such as trade and competition policy, as well as EU resources, particularly the European Competitiveness Fund, should be mobilised to support them. This approach also addresses the issue of competence. **In light of the resource and legal constraints facing the EU, the goal should not be the full "Europeanisation" of industrial policy, but rather to make it more European**.

The CCT should give recommendations on the kind of joint actions to take, and in which sectors, building from the results of the prioritisation exercise. Commission support and ratification of joint actions under the CCT should be judged against how closely these recommendations are followed.

The four classifications under the prioritisation matrix[20] should lead to differentiated types of policy recommendations, further nuanced by deeper analysis of the sector. **"Competitive Opportunities"** could receive targeted finance via the EIB and InvestEU, or regulatory action on permitting support, to achieve scale and reach bankability, while **"Critical Leaders"**, given their overriding strategic importance, might justify more direct public subsidies, a "European preference" approach, or emergency relief under the European Competitiveness Fund. Meanwhile, some technology sectors recognised as **"Vulnerabilities"**, by contrast, might have no clear path to viability without public support, and due to their critical nature, should be the focus of further stockpiling measures, or trade diversification through Clean Trade and Investment Partnerships and deals with partner countries.

The legitimacy and effectiveness of the CCT will depend on participation and ownership by Member States, industry, and civil society.

20 As a reminder, "Critical Leaders", "Competitive Opportunities", "Vulnerabilities" and "Limited Priority Areas".

Member States should be integrated through existing Council configurations, notably the Competitiveness Council, which should debate, amend and endorse the recommendations for joint action emerging from the CCT. The **prioritisation methodology** itself, however, should remain technical and not open to political negotiation, while its interpretation and implementation can be subject to Council debate.

The **European Parliament**, given its limited competence in industrial policy and the CCT's focus on joint action at Member State-level, should provide opinions or own-initiative reports on the Tool's findings and play a stronger role as co-legislator in shaping the financial and legislative follow-up to the CCT's recommendations, in addition to its role in the annual budget process.

Industry, expert and civil society stakeholders, including Industrial Alliances, should be involved at every stage of the process, from the design and updating of the prioritisation methodology, including selection of indicators, to the evaluation of the results of the CCT, such as joint actions. Their involvement should be highly structured, improving on the more *ad hoc* formats seen under the Stakeholder Dialogues around the Action Plans of the CID[21].

Finally, the CCT should follow the model of the European Semester, with an annual rhythm to structure analysis of competitiveness priorities and coordination around joint actions[22]:

FIGURE 7. THE COMPETITIVENESS COORDINATION TOOL ANNUAL CYCLE (PROPOSAL)

September	Commission and JRC work, together with stakeholders, to update the prioritisation methodology if needed.
November	The CCT runs a sectoral prioritisation process, identifying at risk, deprioritised and priority sectors for the EU.
January	Results of the sectoral analysis are published, potentially in the Annual Single Market Competitiveness Report, alongside recommendations for action. Work begins in the COMPET Council debating the results ahead of ratification.
March	The COMPET Council adopts conclusions endorsing (a version of) the sectoral prioritisation and recommendations.
March - July	Commission and Council meet to align potential joint actions to support the priorities identified by the CCT.
July	Commission begins work on funding or regulations to support if necessary. CCT gives guidance to the European Competitiveness Fund on priority sectors for the annual work programme.
September (expected)	Publication of ECF work programme.
September - October	Publication of report assessing the effectiveness of the CCT at enhancing industrial policy coordination and prioritisation which informs update of methodology.
Ongoing	Member States announce joint initiatives, Commission work on further supporting regulation/action plans/ trade measures for priority sectors. Launch of expedited "emergency" procedures for at-risk sectors under the ECF. Preparatory review of prioritisation methodology led by JRC.

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FIGURE 8. CORNERSTONES OF THE CCT'S ANNUAL CYCLE (SIMPLIFIED)

21 The CCT could indeed replace this process entirely.

22 This timeline is designed along the assumption that a) the methodology has been successfully tested and launched and b) that the CCT is operating under the next EU budget (2028-2034). The functioning may be different in the time before these conditions are fulfilled, but the broad rhythm would remain the same.

2.2.2. Implementing the Prioritisation Methodology in the Competitiveness Coordination Tool

If the prioritisation methodology outlined above is to be implemented in the CCT, there are some important elements to note regarding its use.

The prioritisation exercise should take place as soon as possible. The only mention of a methodology implies that the process might take some time to be established, at which point the CCT will already have entered into full operation. The sooner EU and national policymakers have a clear view of where Europe's comparative strengths and strategic vulnerabilities lie the better, and creating an evidence-based, depoliticised framework to guide the decision on joint actions quickly should lead to more efficient investment and policy decisions.

Once established, the prioritisation exercise should be repeated annually. Changes within quadrants, or from one quadrant to another, can act as a clearly legible early warning system for policymakers. If a former "Critical Leader" or "Limited Priority Area" sector is moving towards being a "Vulnerability", this should be cause for a change of course. Likewise, if a "Vulnerability" can be upgraded to a leader, this makes the case that the current policy mix is working – which is valuable information for policymakers and citizens alike.

In terms of the implementation of the methodology itself, the scope of technology sectors addressed should be as wide as is feasible[23] **(to ensure a fair comparison and create space for unexpected leaders or vulnerabilities to emerge) but also limited to more mature technologies that have at least been demonstrated with a first-of-a-kind project**. Technologies at a Technology Readiness Level of 1-4 (up to small prototype, as per the IEA's scale (IEA 2025a)) are better supported with an open, bottom-up, innovation policy, with any kind of political prioritisation taking the form of innovation missions (or, indeed, "moonshots", as proposed in the design of the next Horizon Europe programme).

The kind of top-down priority-setting which this paper outlines may indeed be counterproductive, and the proposed design of the methodology would penalise small, innovative technology sectors when compared to larger industrial players and scale-ups. **The CCT should be focused on the Union's near-term strategic priorities, and how to make the choice between capital-intensive sectors when public resources are scarce**. When a new technology sector emerges, it should be included in future assessment exercises, in order to capitalise on promising technologies and accelerate the transition from lab to market. **If more innovative technology sectors were to be included in the prioritisation exercise, it would require a separate exercise with a modified methodology, or a modification of the indicators in the overall prioritisation exercise**.

The development of the prioritisation methodology could also include greater granularity, both in terms of technology subsectors and regional strengths and weaknesses. A deeper analysis of (cross-) regional strengths and weaknesses in industrial and R&I ecosystems (rather than the EU-level approach outlined in this paper) could be valuable in specifically highlighting promising areas of action for groups of Member States, as well as regions requiring greater support. Meanwhile, following the model of Albora *et al.* (2025), sub-sectors of technology sectors could also be assessed, to highlight specific strengths where the EU could build a lasting competitive advantage, much as China has in Lithium Iron Phosphate (LFP) batteries. Combined, this dual granularity would allow the CCT to connect European priorities with place-based capabilities and concrete technological strengths.

Finally, the prioritisation exercise should not be used as a pretext to play the EU's policy priorities off against each other. With the trend towards increased flexibility in the EU budget (where, in theory, climate investment could be rerouted towards defence, for example), and the far-rightward turn in the EU political sphere, there is a clear risk that the Competitiveness Coordination Tool becomes a political front to justify the use of these flexibilities, to the detriment of the EU's climate ambition. The purpose is to enable intra-sector prioritisation – for example, identifying which clean technologies should receive the strongest EU support – rather than to generate a single ranking that would implicitly trade off climate priorities against defence or biotech. Once sectoral assessments are completed, results can then be integrated into the higher-level coordination process, where political decision-makers balance priorities across domains in line with overarching EU objectives.

2.2.3. Implications for the Competitiveness Coordination Tool

The governance model proposed above provides the institutional foundation to translate prioritisation into collective action. It builds on the functioning of the EU's most proven coordination mechanisms – the European Semester and the Energy Union – while adapting them to the specific context and competences of industrial policy.

Applied within the CCT, this governance design enables a balance between central guidance and national initiative. It combines the clarity of shared EU priorities with the flexibility for Member States to form coalitions of the willing and launch joint actions, supported by the European Competitiveness Fund and other EU instruments. In this way, it overcomes the challenge of fragmented national approaches without overstepping national competences. Crucially, by giving the CCT an annual rhythm of analysis, coordination, and implementation, the EU can embed industrial policy in a living governance cycle – one that learns, adjusts, and directs resources where they can have the greatest impact.

23 This question of scope raises the issue of how the methodological scope and governance of the CCT should square with the concept of technology neutrality. Here, it is useful to distinguish between technology openness, which relates to a regulatory environment that does not discriminate between technologies, and technology neutrality, which relates to the neutral design of individual interventions (Agora Verkehrswende 2020). By including the widest possible scope of technology sectors in the analysis of the prioritisation methodology, and assessing them against common indicators, the proposal here aligns with technology openness, while still functioning as a valuable decision-support tool. The degree of technology neutrality of resulting interventions remains a decision for Member States, facilitated by the CCT. Both IPCEIs and individual state aid cases give examples for how those interventions can target specific sectors that governments consider strategic (European Commission 2025b; 2024a; 2024b; 2023b).

3. SUMMARY OF RECOMMENDATIONS FOR THE COMPETITIVENESS COORDINATION TOOL

The Competitiveness Coordination Tool comes at a crucial moment for EU industrial policy. Europe's competitiveness, security, and climate goals all require a more coherent approach to identifying and supporting its most strategic sectors. Existing coordination frameworks offer useful precedents, but industrial policy remains fragmented, and previous attempts at prioritisation have often been weakened by political pressures or unclear implementation.

The CCT provides an opportunity to strengthen how Europe makes and acts on strategic choices – through clear criteria, transparent analysis, and sound governance. To provide the necessary prioritisation and coordination for EU industrial policy, the CCT should:

- **Be established as a Commission-managed governance framework** for EU industrial policymaking, led by a Project Group for Sustainable Competitiveness at the highest levels of the European Commission.
- **Operate through an annual coordination cycle**, inspired by the European Semester, that combines independent analysis, political debate, and implementation.
- **Involve Member States through the Competitiveness Council (COMPET)** to endorse priorities and decide on joint actions, while **the European Parliament** should ensure that EU support and funding instruments are designed effectively and reflect these priorities.
- **Include industry, expert, and civil society representatives** at every stage of the process to ensure legitimacy, transparency, and accountability.
- **Apply a transparent, evidence-based methodology for prioritisation**, taking into account competitiveness, strategic importance, and decarbonisation factors, supported by expert judgement. The design and conduct of the assessment should remain technical and depoliticised, while its interpretation and implementation should be the subject of Council debate.
- **Focus on sectoral prioritisation, not project-level selection**, to align EU and, over time, national efforts around shared objectives and consolidate existing coordination platforms under one coherent framework.
- **Promote voluntary joint actions and "coalitions of the willing"** rather than rigid national plans or enforcement mechanisms, creating a structure for coordinated initiatives aligned with EU goals.
- **Inform the work programme and funding priorities of the European Competitiveness Fund**, as well as related EU trade, regulatory, and funding initiatives.
- **Ensure transparency and clarity in governance**, with public reporting on the CCT's activities, decisions, and outcomes, to build trust and public support around Europe's competitiveness agenda.

If designed along these lines, the Competitiveness Coordination Tool can provide the foundation for a more strategic and coherent EU industrial policy – one that directs limited resources where they have the greatest impact, supports Europe's long-term industrial strengths, and integrates competitiveness with climate and security objectives.

ANNEX. ASSESSMENT OF CLEANTECH SECTORS AGAINST INDICATORS

Annex 1. Wind Energy

Indicator	Score (0-1)	Evidence	Source	Notes/uncertainty
1. Research & Innovation	1	The EU leads public R&I investment in the OECD, and is the global leader in Private R&I investment.	(CETO 2024e)	
2. Technological Capability	0.75	Placement on "EU Technological Capability (Normalised)" in *EU competitiveness in net-zero technologies: Insights from patents and economic complexity*.	(Albora *et al.* 2025)	
3. Industrial Ecosystem & Bankability	0.75	EU OEMs have dominated the sector over the past decade but this position has slipped vs China. Recent slowdown in deployment investments, but strong continued investments in manufacturing suggest continued bankability.	(Calipel *et al.* 2025; CETO 2024e)	
4. Trade Position	0.75	The EU retains a consistent trade surplus, although is being challenged by China.	(Bruegel 2025)	
5. Climate Contribution (Mitigation)	1	Wind accounted for 20% of Europe's electricity in 2024 and is central to EU decarbonisation plans.	(Reuters 2025)	
6. Supply Dependence & Concentration	0.75	China has a strong position in key components such as gearboxes, generators, power converters and castings, as well as 90% of permanent magnet manufacturing.	(Patey and Tsang 2025)	
7. Domestic Substitutability (Inversely Scored)	0.25	A strong manufacturing base at home indicates resilience to supply shocks, while efforts are being made to create European alternatives to permanent magnets.	(Reuters 2024; CETO 2024e)	Without clear analysis available of how the industry would fare in supply shock, this is an inference from available information.
8. Climate Contribution (Adaptation)	0	Wind Energy is primarily a climate mitigation technology.	X	Based on authors' own judgement.
9. Critical Infrastructure Role	0.75	With an increasing importance in the EU's energy mix, any disruption of wind power supply could disrupt energy infrastructures, although alternatives would be available.	(Patey and Tsang 2025)	
10. Dual-Use & Security Sensitivity	0.5	While not a dual-use technology, components in the value chain (electric motors, permanent magnets) overlap with the modern defence industry, and wind energy contributes to energy security.	(Bond *et al.* 2025; Smith 2025)	

Average Competitiveness (Indicators 1-5): 0.85

Average Strategic Importance (Indicators 6-10): 0.45

Quadrant placement: Competitive Opportunities (borderline Critical Leaders)

Annex 2. Heat Pumps

Indicator	Score (0-1)	Evidence	Source	Notes/uncertainty
1. Research & Innovation	0.75	Of OECD countries, the EU spends the second-most on public R&I behind Japan, and on private R&I is second to China.	(CETO 2024b)	
2. Technological Capability	0.5	Placement on "EU Technological Capability (Normalised)" in *EU competitiveness in net-zero technologies: Insights from patents and economic complexity*.	(Albora *et al.* 2025)	
3. Industrial Ecosystem & Bankability	0.5	Between 60% and 73% of heat pumps installed in Europe are made in the EU, with a large manufacturing base. Trends show a growing value chain in production value and employment. However, EU manufacturers are largely assemblers with the rest of the supply chain abroad, demand has slowed in 2023 and investments declined, indicating weakening bankability.	(CETO 2024b; Calipel *et al.* 2025)	
4. Trade Position	0.5	The EU's trade surplus became a deficit in 2020. While exports increased again in 2023, the deficit remains. Nonetheless, behind China, the largest exporters in the world are European.	(CETO 2024b; Bruegel 2025)	
5. Climate Contribution (Mitigation)	1	Heat Pumps are key to the EU's decarbonisation objective.	(CETO 2024b)	
6. Supply Dependence & Concentration	0.75	While the EU has a strong manufacturing base, there are strong dependencies on imports for components such as compressors. However, supply is more diversified, with China, Japan and the US all exporting to the EU. Heat pumps are also vulnerable to disruptions in permanent magnets and semi-conductors.	(CETO 2024b)	
7. Domestic Substitutability (Inversely Scored)	0.25	Some components are partly produced in Europe such as pumps, fans, heat exchangers and electric motors – meaning that much of the value chain could be scaled domestically if needed. Efforts are being made to create European alternatives to permanent magnets.	(CETO 2024b)	
8. Climate Contribution (Adaptation)	0.75	Reversible heat pumps will play an important role in space cooling in an EU facing the impacts of extreme heat.	(CETO 2024b)	
9.Critical Infrastructure Role	0.5	Large heat pumps, in combination with storage, have a role to play in grid balancing.	(CETO 2024b)	
10.Dual-Use & Security Sensitivity	0.25	Heat pumps are a largely civilian technology with little clear dual-use potential. However, components in the value chain (electric motors, permanent magnets) overlap with the modern defence industry.	(Bond *et al.* 2025; Smith 2025)	

Average Competitiveness (Indicators 1-5): 0.65

Average Strategic Importance (Indicators 6-10): 0.5

Quadrant placement: On the boundary between Competitive Opportunities and Critical Leaders

Annex 3. Hydrogen

Indicator	Score (0-1)	Evidence	Source	Notes/uncertainty
1. Research & Innovation	0.75	Public funding, particularly at EU level, is broad, with the Hydrogen Joint Undertaking, Hydrogen Bank and IPCEIs. Germany is a global leader in public and private investment.	(CETO 2024d)	
2. Technological Capability	0.25	Placement on "EU Technological Capability (Normalised)" *in EU competitiveness in net-zero technologies: Insights from patents and economic complexity*	(Albora *et al.* 2025)	
3. Industrial Ecosystem & Bankability	0.25	EU manufacturing capacity is growing but underutilised. Higher than anticipated costs and lack of offtake serious blockers to bankability.	(CETO 2024d)	
4. Trade Position	0.25	The EU represents at least 25% of global manufacturing capacity. While the bloc has a trade surplus, the cale of international trade is overall negligible, so the sector is not an export opportunity.	(CETO 2024d; Bruegel 2025)	
5. Climate Contribution (Mitigation)	0.75	Hydrogen is a key decarbonisation pathway for hard to abate sectors. However, recent calls for a "reality check" of the role of the technology in the EU's strategy have caused its role to be questioned.	(CETO 2024d; European Court of Auditors 2024)	
6. Supply Dependence & Concentration	0.5	High dependence on import for critical minerals, and components (membranes, catalysts), with China dominant.	(CETO 2024d)	
7. Domestic Substitutability (Inversely Scored)	0.5	The EU's existing and well supported hydrogen infrastructure is already underutilised, with trade being negligible, indicating that disruptions to supply could be well managed. However, a dependence on some critical raw materials (such as Iridium for PEM electrolysers) poses a risk.	(CETO 2024d)	
8. Climate Contribution (Adaptation)	0	Hydrogen is primarily a climate mitigation technology.	X	Based on authors' own judgement.
9. Critical Infrastructure Role	0	Hydrogen is still at an early stage of integration to infrastructures, with disruption not having appreciable knock on effects.	(CETO 2024d)	
10. Dual-Use & Security Sensitivity	0	No direct dual-use applications, or indirect energy security considerations at present.	X	Based on authors' own judgement.

Average Competitiveness (Indicators 1-5): 0.45

Average Resilience (Indicators 6-10): 0.2

Quadrant placement: Limited Priority Areas (borderline Competitive Opportunities)

Annex 4. Solar PV

Indicator	Score (0-1)	Evidence (short quote or datapoint)	Source	Notes/uncertainty
1. Research & Innovation	0	Public investment in Solar R&I peaked between 2011 and 2013, and have since declined, with the share of global private investments declining sharply over the same period.	(CETO 2024c)	
2. Technological Capability	0.5	Placement on "EU Technological Capability (Normalised)" *in EU competitiveness in net-zero technologies: Insights from patents and economic complexity*	(Albora *et al.* 2025)	
3. Industrial Ecosystem & Bankability	0	EU manufacturing capacity is small and underutilised, although manufacturing announcements for fresh capacity have been made. Deployment is remains strong although a sudden drop in 2024, as well as weak cost competitiveness with China, means that the bankability of EU PV is questionable.	(Solar Power Europe 2024; CETO 2024c; Bruegel 2025)	
4. Trade Position	0.25	The EU has run a consistent and growing trade deficit in Solar power since at least 2015. This has reduced in 2024/5, but this may be reflective of weakening domestic demand.	(Solar Power Europe 2024; Bruegel 2025)	
5. Climate Contribution (Mitigation)	1	The share of solar in the EU's electricity mix increased from 2.9% in 2013 to 9.2% in 2023. With unit costs falling and efficiency improving, solar is perhaps the pivotal climate technology for EU decarbonisation.	(CETO 2024c)	
6. Supply Dependence & Concentration	1	The EU remains highly import dependent for components and finished units. China dominates the value chain.	(CETO 2024c)	
7. Domestic Substitutability (Inversely Scored)	1	While the EU has capacity to supply polysilicon and some components, over 90% of key components (wafers/cells) are dependent on imports.	(CETO 2024c)	
8. Climate Contribution (Adaptation)	0	Solar is primarily a climate mitigation technology.	X	Based on authors' own judgement.
9. Critical Infrastructure Role	0.75	The rapidly growing share of the EU's energy mix means that supply disruptions could have knock on effects for the energy system.	(CETO 2024c)	
10. Dual-Use & Security Sensitivity	0.5	While not a dual-use technology, both final modules and components in the value chain overlap with critical defence, digital and space industries, and solar energy contributes to energy security.	(Bond *et al.* 2025; Smith 2025)	

Average Competitiveness (Indicators 1-5): 0.35

Average Strategic Importance (Indicators 6-10): 0.65

Quadrant placement: Vulnerabilities

Annex 5. Batteries

Indicator	Score (0-1)	Evidence (short quote or datapoint)	Source	Notes/uncertainty
1. Research & Innovation	0.5	EU public R&I investments have increased significantly from 2019 (€50-70m) to 2022 (€300m), higher than the US, although private investments have decreased. Chinese private investment remains stronger than that of Europe, and data for public investment for comparison is unavailable. However, China is the global centre for new battery technologies, such as solid-state batteries.	(CETO 2024a; IEA 2025b)	
2. Technological Capability	0	Placement on "EU Technological Capability (Normalised)" *in EU competitiveness in net-zero technologies: Insights from patents and economic complexity*	(Albora *et al.* 2025)	
3. Industrial Ecosystem & Bankability	0.75	Despite some high-profile failures, and intense competition on price from China, the EU battery manufacturing sector continues to grow at pace and attract investment (although much of this is Chinese FDI, raising some questions around the bankability of EU projects). €13bn were invested in manufacturing in 2023, although that is expected to have reduced slightly to €11bn in 2024. Battery makers are well integrated into the EU's automotive industry. Where the sector struggles is in the skills base to staff expansions, although the workforce is expected to grow to 0.3m (up from 90,000) by 2030.	(Calipel et al. 2025; CETO 2024a)	
4. Trade Position	0	The EU's trade deficit has grown significantly since 2021, and producers struggle to compete on price and quality with Chinese manufacturers.	(Bruegel 2025; CETO 2024a)	
5. Climate Contribution (Mitigation)	1	Batteries are a crucial technology for the decarbonisation of transport and as storage solutions for decarbonised energy systems.	(CETO 2024a)	
6. Supply Dependence & Concentration	1	China dominates the battery value chain, and EU producers are heavily dependent for both processed materials and components.	(CETO 2024a)	
7. Domestic Substitutability (Inversely Scored)	0.75	Recycling is at an early stage, and often recovered elements such as black mass need to be sold back to Asian refining operations. Critical raw materials are not easily substituted domestically, despite increased efforts.	(CETO 2024a)	
8. Climate Contribution (Adaptation)	0.5	Battery storage has a role to play in grid balancing.	(CETO 2024a)	
9. Critical Infrastructure Role	0.75	Batteries are increasingly foundational to transport and power infrastructure, especially as the EU continues to decarbonise.	(CETO 2024a)	
10. Dual-Use & Security Sensitivity	1	Batteries have high crossover with military infrastructure such as drones for defence purposes. A high dependence on China, a strategic rival, is a geopolitical risk.	(Bond *et al.* 2025; Smith 2025)	

Average Competitiveness (Indicators 1-5): 0.45

Average Strategic Importance (Indicators 6-10): 0.8

Quadrant placement: Vulnerabilities (borderline Critical Leaders)

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