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ELECTRIFYING ENERGY INTENSIVE INDUSTRIES

Assessing the EU Financial Framework for Industrial Decarbonisation

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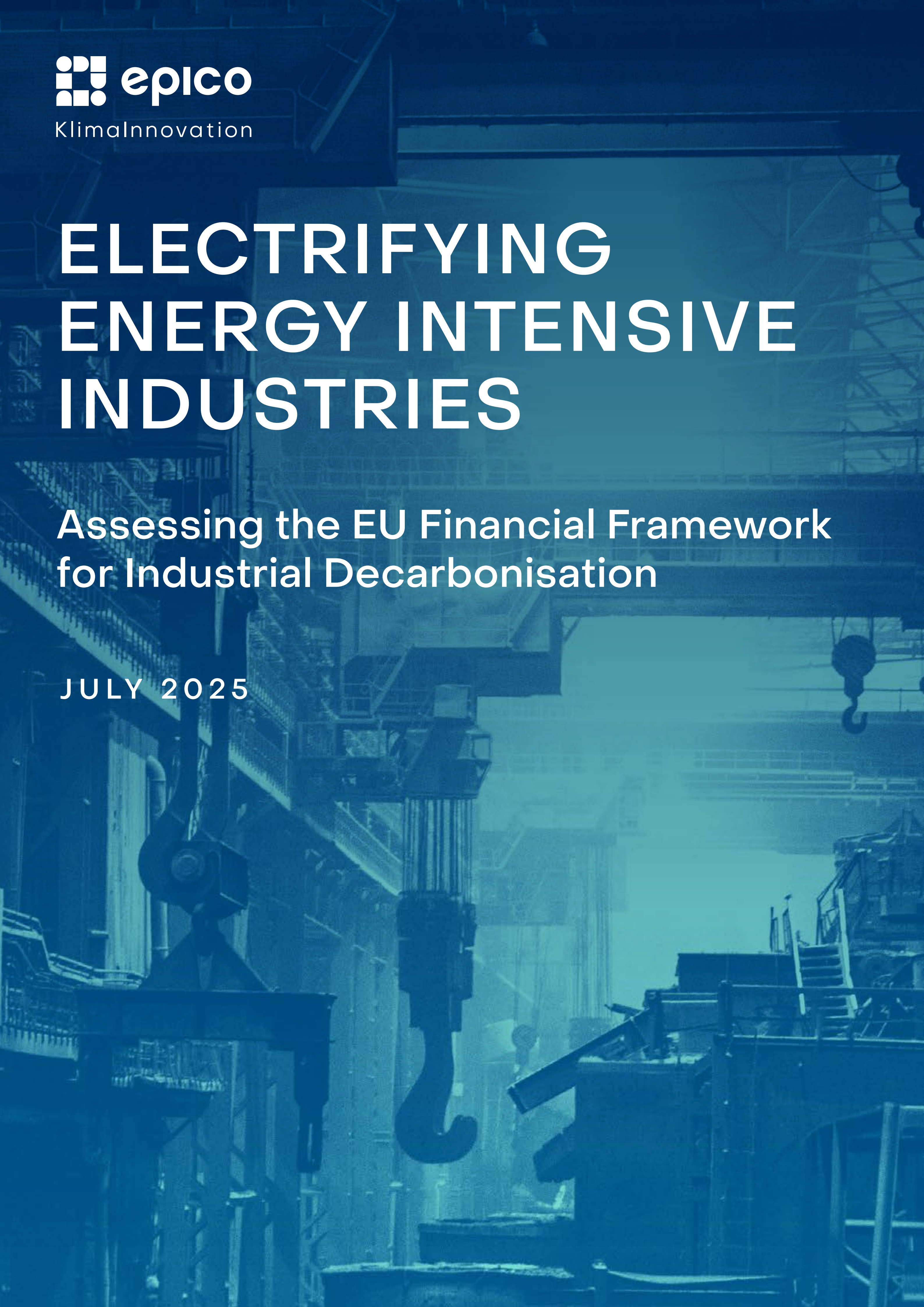

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TITLE

Electrifying Energy Intensive Industries: Assessing the EU Financial Framework for Industrial Decarbonisation

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DESCRIPTION

This brief was developed using the results of the workshop on accelerating the decarbonisation of Energy-Intensive Industries (EIIs), hosted by EPICO KlimaInnovation on 8 May 2025. Participants included representatives from Agora Energiewende, Bundesverband der Deutschen Industrie e.V. (BDI), European Chemical Industry Council (Cefic), European Cement Association (Cembureau), European Ceramic Industry Association (Cefic), Climate Strategy, Third Generation Environmentalism (E3G), European Lime Association, Union of the Electricity Industry (Eurelectric), European Steel Association (EUROFER), Future Cleantech Architects, Hydrogen Europe, International Federation of Industrial Energy Consumers (IFIEC), SSAB, and Vattenfall.

The recommendations outlined in this policy brief are those of the authors and do not represent the opinions of the workshop participants and their organisations.

DESIGN AND TYPE SETTING

Arthur Dubois. Brussels, Belgium.

ASSESSING THE EU FINANCIAL FRAMEWORK FOR INDUSTRIAL DECARBONISATION

On May 8, 2025, EPICO KlimaInnovation hosted a workshop focused on accelerating the decarbonisation of Energy-Intensive Industries (EIIs). Looking mainly at greenhouse gas emission reduction, the event focused on both direct and indirect electrification as key pathways to decarbonise EIIs. Discussions on carbon capture and storage/use (CCS/CCU) and circular economy approaches were not covered by the scope of this workshop. This brief presents outcomes from the first workshop session on EU funding for industrial decarbonisation. It highlights key challenges – limited scale, fragmentation, complexity – but also the strong added value of EU-level support. The workshop brought together stakeholders from industry, the European Commission, NGOs, and think tanks to exchange insights and explore actionable solutions for advancing the decarbonisation of the metals, chemicals, glass, cement, paper and ceramics industries, under Chatham House rules.

Discussing key levers that need financial support to enable decarbonisation of EIIs, such as energy efficiency, fuel switching, clean technologies, and how to create robust financial framework for these levers to support decarbonisation of EIIs, one participant highlighted a stark funding gap, where only one-third of the €38 billion in public funding required by 2030 to support the manufacturing of ten critical clean technologies is currently covered by the EU budget commitments. This shortfall was echoed by the Draghi report, which finds a public and private climate investment gap for boosting European competitiveness of €750 – €800 billion annually. Additional to the funding gap, participants emphasised that without standardised eligibility criteria, simplified application procedures, and consistent, long-term policy signals from instruments like the ETS, the CBAM, the 2040 climate targets, and lead market policy, the EU risks deepening fragmentation and misallocation of public and private resources. To close the implementation gap and achieve meaningful emissions reductions, the EU must align governance structures, and policy clarity under an integrated, agile and forward-looking industrial strategy.

POLICY RECOMMENDATIONS TO THE EU

1. Anchor Funding to CO_2 Intensity and Social, Environmental and Resilience Modulation

Public support mechanisms should be more closely aligned with robust CO_2[2] intensity benchmarks, moving beyond a sole reliance on project cost or funding gap logic. This would improve cost-effectiveness and ensure that aid supports genuine decarbonisation. All projects should be required to meet a minimum climate performance threshold – for example, achieving at least 40% greenhouse gas reductions or falling below relevant ETS benchmarks. At the same time, funding frameworks should recognise the strategic value of certain EIIs. Since the CISAF encourages

Member States to include additional conditions when designing State aid measures to serve social, environmental or resilience policy objectives, a modulation approach allowing a limited uplift in aid intensity (e.g. +10%) for projects in net-zero-relevant sectors that also meet regional or employment-related resilience criteria could be tested. The EU could pilot a modulation mechanism in suitable vehicles such as the Innovation Fund, REPowerEU chapters, the Just Transition Mechanism, and technical assistance platforms such as ELENA (European Local Energy Assistance) and the Advisory Hub. A resilience marker could be introduced during the initial screening, similar to the 'Do No Significant Harm' check, giving fast-track access to technical assistance or enhanced consideration in close-ranking cases. This would allow funding instruments to balance environmental ambition with the economic and social importance of industrial ecosystems.

2. Mainstream Competitive Auctioning and Blended Finance Models

Test innovative financing approaches such as competitive auctions and blended finance that combine EU and national funding to support innovative projects that need derisking to be bankable. These approaches can be offered at the EU level via the new financial toolbox of the European Competitiveness Fund, which can offer EU Financial Instruments as a Service for Member States. "As a service" models follow best practices from existing instruments, like the Innovation Fund auctions as a service and the InvestEU Member State compartment, and can simplify the set-up of blended financing mechanisms at the national level (Climate Strategy, 2025). The Commission (particularly CINEA/Innovation Fund team) should offer technical assistance and operational capacity to help Member States run climate target-compatible competitive calls. These can improve capital efficiency and drive investment in priority projects.

3. Mobilise Existing EU Funds Toward Industrial Decarbonisation

Cohesion and Structural Funds often fall short of their full climate mitigation potential (Ismeri Europa 2021). This is due in part to weak enforcement, limited alternative pipelines, political pressure at the national level, and in some cases governance challenges including lobbying and corruption (Corruption Research Centre Budapest, 2022). To address this, the role of instruments such as the Cohesion Fund, Modernisation Fund, and Structural Funds should be strengthened in supporting competitive and low-carbon industrial supply chains, particularly in energy-intensive sectors. Future EU climate-related funding should be made conditional on the timely and effective implementation of the EU's energy and climate regulatory framework, ensuring a stronger alignment between investment and policy compliance. At the same time, access to EU funds should be made more agile and collaborative, by improving the governance of EU energy and climate planning (Jacques Delors Institute, 2023). This includes developing more robust national and regional monitoring systems that track progress, enable mid-course corrections, and allow for the continuous integration of lessons learned throughout implementation. To address the low uptake of blended finance models in Cohesion Policy, Member States and regions should be incentivised to allocate part of their EU funds under shared management to EU Financial Instruments as a Service to finance industrial decarbonisation in their regions, such as contributing to the Innovation Fund auctions as a service or to the InvestEU budget guarantee via the Member State compartments. This can also help them in increasing the impact of

EU funds with higher leverage potentials and by crowding in private investments into the industrial transition.

4. Mobilise Private Investment through InvestEU

Utilise InvestEU's guarantees and the European Investment Advisory Hub's technical assistance and the Project Development Assistance (PDA) to attract private capital for decarbonisation initiatives, particularly in hard-to-abate sectors, which face the issue of not producing fundamentally new products with high scaling potential. The European Commission should work with the EIB and DG FISMA to reduce investor risk perception and unlock private capital. This includes mandating the EIB to provide technical due diligence and model deal structures that can serve as reference points for national promotional banks and commercial banks, as well as piloting standardised internal ratings for clean industrial projects. There is also a clear need for better alignment between InvestEU and instruments such as the Innovation Fund, particularly through shared pipelines or platforms focused on industrial decarbonisation. Existing tools like the Advisory Hub should be strengthened to support Member States and project developers in preparing bankable, investment-grade proposals – addressing one of the main bottlenecks in scaling EU-level blended finance.

ZOOMING IN: BIDDING INSTRUMENTS

During our workshop discussion, Carbon Contracts for Difference (CCfDs) emerged as a promising financing instrument, offering a bankable structure for funding low-carbon technologies. A Contract for Difference (CfD) is a financial agreement where two parties exchange the difference between a fixed "strike price" and the market price of an asset. A Carbon Contract for Difference (CCfD) applies this concept to carbon pricing. It guarantees a stable carbon price for low-carbon projects by covering the gap between the strike price and the actual carbon market price. If the market price is lower than the strike price, the government pays the difference; if it's higher, the project pays back the surplus. This mechanism helps make low-carbon technologies competitive, especially when fossil-based alternatives are still setting market prices. This way, government guarantee companies a fixed carbon price over a defined period, typically around 15 years. What is unique in Germany's approach is that a portion of the total CCfD value is made available upfront, before operation starts. This amount is calculated based on expected cumulative payouts from the CCfD. Their key advantage lies in their ability to help offset both the additional capital expenditures (CAPEX) and operational expenses (OPEX) associated with clean technology, energy efficiency, circular economy models and fuel switching, all necessary to decarbonise. By doing so, CCfDs can help overcome some of the economic barriers that EIIs face in transitioning to low-carbon solutions. Their market-based nature, allowing for competitive bidding for funding receivers, represents a promise for efficient public spending, acknowledged by the Commission, which announced in its Clean Industrial Deal Communication that the future Industrial Decarbonisation Bank would rely on competitive bidding for funding allocation.

Some participants emphasised that, without clear and objective criteria, CCfDs may still not be enough to make a project bankable. Ambiguity in eligibility or measurement could lead to misallocated public funds or speculative bidding, with support flowing to companies that may not need it, undermining the policy's effectiveness and legitimacy. Improvements could include a requirement to assess whether supported technologies are the most efficient and sustainable option. Projects could be evaluated against electrification benchmarks such as heat pumps, electric boilers, induction or plasma heating, based on lifecycle emissions, energy input, material intensity, and system benefits.

Additional concerns were raised about using CCfDs for hydrogen projects. Some warned that these schemes could tie up substantial public funds without ensuring project delivery. CCfDs should not support hydrogen use where mature electrification options already offer better environmental and economic performance. This concern, allocating resources without guarantees, will be explored further in the hydrogen session briefing.

Other best practices include instruments such as the U.S. Inflation Reduction Act and the EU's Connecting Europe Facility (CEF) auctions have been successful in mobilising private investment into bankable projects. The U.S. 6.3 billion Industrial Demonstrations Program, funded by the Inflation Reduction Act and the Bipartisan Infrastructure Law, targeted industrial decarbonisation in sectors such as steel, cement, and chemicals. The EU could draw lessons from its focused scope, accelerated award timelines, and willingness to fund early-stage project development prior to commercial readiness. Another good practice is the provision of earlier and more integrated support for project development phases such as feasibility and FEED studies, which in the US are often embedded in demonstration funding. The CEF-AFIF model provides support based on the number of electric vehicle chargers installed, a robust example of outcome-based funding (Dings & Sol, 2025, p.21). A similar output-driven approach could be more effective for supporting decarbonisation in heavy industry (Cleantech for Europe, E3G, Transport & Environment, Climate Strategy).

To pool national and EU resources, and lower administrative spending, CCfDs and fixed premium auctions can be offered under the new EU Industrial Decarbonisation Bank with an "as a service" compartment for Member States. This model follows best practices from existing instruments like the Innovation Fund "auctions as a service" and the InvestEU Member State compartments, which are gaining traction among Member States looking to avoid bureaucratic costs.

Key Takeaways

1. **CCfDs should shift from risk-offsets to transformation drivers.** Support should target high-impact investments that enable structural decarbonisation, not just incremental emissions reductions. This includes recognising system-wide benefits such as infrastructure synergies, supply chain anchoring and technology spillovers.

2. **Establish Clear, Verifiable Carbon Standards.** Project-level negotiations create uncertainty and delay. Emissions baselines and benchmarks must be clear, standardised, and independently verifiable. A shared EU methodology would improve bankability and reduce administrative complexity-especially in cross-border value chains. Predictability in CO_2 reference scenarios and abatement metrics is essential to attract capital.

3. **Deploy Outcome-Based, Pooled Financing Tools.** Future CCfD models should prioritise pooled, performance-based funding. Drawing from mechanisms like CEF-AFIF, outcome-based support should be tied

to actual decarbonisation per euro spent. This approach can be delivered through centralised instruments such as "auctions-as-a-service". These platforms can unlock scale, enhance cost efficiency, and ensure fair access to funding across regions.

4. **Prioritise Scalable, Efficient Technologies Only**. CCfDs must apply a technology effectiveness filter to avoid subsiding inefficient or transitional solutions. Selection criteria should assess lifecycle emissions, energy use, material inputs, and the existence of more mature or electrified alternatives. Public support should favour solutions that are not only low-carbon, but also resource-efficient and scalable, avoiding lock-in of suboptimal technologies.

ZOOMING IN: THE CLEAN INDUSTRIAL DEAL STATE AID FRAMEWORK (CISAF)

On June 25th, the Commission adopted The Clean Industrial Deal State Aid Framework (CISAF). The CISAF is intended to build on the Temporary Crisis and Transition Framework (TCTF), aiming for more standardised, user-friendly support schemes that fast-track investments in industry decarbonisation, storage, flexibility, and clean tech manufacturing and electrification. The CISAF provides a medium-term framework, providing a legal basis for Member States to subsidise clean energy and technology investments with fewer procedural hurdles. **It will run until December 31st, 2030**.

Aid can cover up to 60% of eligible costs for investments enabling the use of hydrogen or hydrogen-derived fuels. It can reach 45% for investments in renewable energy production, energy storage, flexible electrification or carbon capture equipment. Aid is capped at 35% for investments enabling the use of low carbon fuels and at 30% for other decarbonisation technologies. For the production or use of low carbon fuels the maximum is 20%. For clean technology manufacturing, aid can reach 15% in non-assisted areas, 20% in 107(3)(c) regions and 35% in 107(3)(a) regions. These maximum intensities can be increased by 20% points for small enterprises, 10% points for medium sized enterprises, 15% points for projects located in assisted areas, 15% points for cross border projects and 10% points for projects with an "innovative character". At the time of the workshop, the CISAF was not yet adopted, and the participants were discussing the draft communication by the European Commission, which was open to feedback until 25 April 2025. It set out criteria for assessing State aid measures under the Clean Industrial Deal, including compatibility conditions under Article 107(3)(c) TFEU, definitions and procedures like competitive bidding and funding-gap methods, category-specific rules for renewable energy, industrial decarbonisation, clean tech manufacturing and private investment de-risking, as well as transparency and monitoring obligations to ensure investor predictability and internal market safeguards.

The discussion put great emphasises on having a production-based aid, something the final adopted CISAF does not include, as it incentivises a project-by-project approach. Concerns around state aid being linked to political pressure instead of market competitiveness or strategic significance therefore remain.

On the other hand, a significant positive adjustment in the adopted CISAF reflects a key recommendation from the workshop: extending the timeline for industrial decarbonisation projects. The initial timeline of 36 months for having a project to be operational, was deemed unrealistic by several participants. One participant noted that small, high-TRL projects cannot deliver a 40% CO_2 reduction in only 36 months, even more for larger projects. Especially in sectors like aluminium or cement, where over 60% of emissions are process-related and emerging technologies such as CCS or alkaline Supplementary Cementitious Materials are not yet scaled. However, **in the final version, decarbonisation projects are given 60 months for the installation or equipment to be in operation**. The extended deadline is a very positive change, making more projects eligible.

Key Takeaways

1. **Shift towards output-based aid:** There was a strong call, mainly by think tanks, for reforming State aid to focus on output-based support rather than a project-by-project approach. Some participants argued that outcome-based incentives could better attract private investment and most efficiently chooses projects.

2. **Make fast-track rules the standard:** Fast-track aid approval mechanisms should become the norm rather than exceptions, supported by standardised and accessible schemes to speed up clean investment deployment.

3. **Preventing harmful subsidy races:** While support for public-private investment is essential for the green and industrial transitions, CISAF should include safeguards against subsidy races between Member States, and potential single market distortion.

4. **Need for simplification:** The framework would benefit from clearer rules and aid intensities to reduce complexity and lower administrative burdens.

5. **Support for specific principles:** Participants welcomed binding project timelines, minimum performance thresholds, claw-back mechanisms, and relocation safeguards as essential components for accountability and impact.

FURTHER DISCUSSION POINTS AND EMERGING THEMES

Beyond bidding instruments and state aid framework, other topics emerged during this session.

Another central theme was the importance of **stronger collaboration**. Several participants stressed that **there is an urgent need for coordinated action among EU institutions, Member States, and stakeholders**. It was stressed that the transition cannot succeed in silos, rather with open dialogue and strong partnerships across the entire value chain, essential to ensure both efficiency and impact. One participant highlighted the tripartite approach as a strong example of the kind of collaboration needed to coordinate decarbonisation efforts across all levels. This model was welcomed as an effective framework for aligning stakeholders at both national and EU levels on key strategic issues. The most recent Tripartite Social Summit, held on March 19, 2025, focused on boosting industrial competitiveness.

A key call was made for fair and consistent compensation for indirect carbon costs across all EU Member States and affected industries, potentially making indirect cost compensation equal at the EU level, a demand reflected in the ETS 1 consultation, which ended on 8 July.

The European Competitiveness Fund was another topic raised during the discussion. Participants called for a more integrated approach, emphasising **better alignment between EU and national resources** with a broader use of EU financial instruments as a service (FIaaS) following the model of the Innovation Fund (IF) auctions as a service and the InvestEU Member State compartment, and a **more strategic deployment of EU ETS revenues for CBAM-covered sectors, one of EII's core demands**, in line with the calls made in the Draghi report. Despite the IF potential, recent funding levels were too modest, with only €3 billion available in 2022. The European Investment Bank's shift toward providing guarantees, and the new Cleantech Guarantee Facility under the Clean Industrial Deal were welcomed, though participants emphasised the need for greater funding volume.

CONCLUSION

If the EU is committed to achieving net zero, it must step up its efforts to decarbonise Energy-Intensive Industries. Emissions need to decline, but companies must remain viable. Climate goals and industrial logic are not opposites: they must advance together. Today, many investments in energy intensive sectors lack a viable business case in Europe. Yet, these industries are needed for strategic autonomy, innovation, and spillovers that benefit other non-EU regions. A significant funding gap remains and closing it will require a more robust and sustainable financial framework, one that channels both public and private capital toward net zero. Climate performance must count, and EU funding should be tied to CO_2 benchmarks and minimum thresholds: this is how credibility is built, and resources are used efficiently. Stakeholders voiced support for a pilot mechanism that modulates support based on climate alignment and regional or employment impact. Furthermore, there was also a call to use existing EU tools more effectively, particularly Innovation Fund, InvestEU, the Just Transition Mechanism, and Financial Instruments as a Service, which can help reduce fragmentation and improve financial leverage. At last, predictable and rules-based governance remains essential to avoid subsidy races and misallocation.

ABOUT US

EPICO KlimaInnovation is an independent think tank that advances constructive, market-based, and innovation-driven climate and energy policies through clear concepts and viable, balanced solutions. We create a network that brings together key stakeholders in climate and energy policy to establish and implement a socially broad-based agenda. We provide a platform for actors from politics, business, science, and civil society to engage, consult, contribute, and advance solution-oriented approaches.

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