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CLEANTECH



The sharpest tool in the box: how to strengthen the EU Innovation Fund for climate, competitiveness and security

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



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

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EXECUTIVE SUMMARY

The EU Innovation Fund is Europe’s largest fund for climate innovation. It has a key role to play in European climate action, energy security and technological leadership. To unleash the full potential of European cleantech, greater public support is needed to help more companies and projects cross the so-called “valleys of death” that are inherent to cleantech innovation and scale-up.

In this endeavour, relying solely on national public funds would create two risks. In countries where governments do not rise to the financing challenge, innovators will fail or flee. Conversely, governments with the fiscal means to spend big on cleantech may create a harmful subsidy race among EU member states, undermining EU solidarity and the integrity of the EU Single Market.

A European funding solution is required. To quickly bridge the cleantech investment gap, increasing the EU Innovation Fund funding, reforming its assessment process and expanding its focus to also include cleantech manufacturing are now urgently needed.

As climate impacts worsen, bringing innovative cleantech solutions to market and deploying mature technologies are urgent to avoid a climate disaster. Building up cleantech is also crucial in facing other challenges important for the EU today: guaranteeing energy security in the face of geopolitical instability, strengthening the EU’s competitiveness in the global cleantech race, and ensuring that the continent’s workers and regions reap the benefits of green industrialisation. These pose overlapping challenges for policymakers, who must support both the manufacturing and deployment of existing tech, as well as the development of the cutting edge.

On the ground, cleantech innovators and developers face their own hurdles to realise their project. They need adequate land for the development of a factory, with dependable access to necessary raw materials and components, as well as a skilled workforce and vibrant research ecosystem. They must be confident that they will be able to get a permit under the local regulatory

regime. Perhaps most importantly, the correct market conditions and incentives must be in place to ensure that, once production starts, they will be able to sell what they make.

This paper focuses on a final challenge - European cleantech needs more funding, both public and private. Cleantech innovators in Europe face two funding “valleys of death”, stages in the growth of their business where a lack of available finance makes it difficult to bring their product to market. Public support has an important role to play, so that these valleys can be crossed and these new cleantech industries can deliver the decarbonisation, competitiveness, and jobs that they promise.

As the US, Japanese and Chinese governments (among others) put hundreds of billions of public money on the table, European governments are seeking their own solutions at home. However, this EU challenge demands an EU response. An over reliance on national state aid would lead to major inefficiencies, distort the single market, and precipitate a subsidy race that advantages wealthy member states over others with less fiscal space. An EU long-term cleantech investment plan is required, which makes coordinated use of EU funds and benefits all member states.

Landing such an ambitious investment plan will not be politically easy. The EU should therefore look to the financial instruments it already has, to quickly mobilise as much funds as possible to develop and scale cleantech.

For this purpose, the Innovation Fund must be more closely considered: with its focus on climate innovation and whole-of-Europe scope, it can be a powerful tool for European climate action. It already has awarded €3.6bn in 2023, and is likely to grow, as we estimate it to be able to disburse €82.2bn in the years 2025-2030, reaching a high of €27.1bn in 2030 alone (*see Section 6*).

This paper proposes five ways in which its impact can be improved:

- **Further increase the size of the Innovation Fund**, especially in the coming years, through an allocation of member state ETS or other revenues, to ensure it is of an adequate size to bridge the widening investment gap and ensure

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cross-Europe support for cleantech. An increase of €22bn between 2025-2029 would ensure the Innovation Fund can respond to the needs of European cleantech;

- **Introduce a new process for “cleantech manufacturing calls”**, which would be explicitly targeted at building up European manufacturing capacity, supporting the bloc’s competitiveness and energy security while delivering quality jobs;
- **Reform the application and assessment process** to better support cleantech innovators, SMEs and start-ups, by making all Innovation Fund calls “always open”;

- **CINEA (the body which manages the Innovation Fund)** should be better-resourced and staffed by more agents, to support its effective functioning as the scope of the Innovation Fund widens;

- **As the EU elections approach**, use the reform of the Innovation Fund as the launch pad for a broader and more ambitious Cleantech Investment Plan.

Bridging the cleantech financing gap is one of the key challenges in the EU’s progress towards net-zero. The Innovation Fund has an important role to play in financing the transition, and delivering decarbonisation, energy security and competitiveness for the EU.

1. The EU Innovation Fund

The EU Innovation Fund is an EU-level fund originally made to support the commercial demonstration¹ of green innovation projects. Unlike many EU funds, which are funded by the EU budget, the Innovation Fund is funded by an allocation of EU carbon allowances under the EU's Emissions Trading System (ETS), which are then auctioned on Europe's carbon market to raise capital for the Fund. It is one of the largest sources of EU public finance for cleantech (see section 5 for a fuller exploration of where the Fund sits in the landscape of EU financial instruments).

The Innovation Fund disburses grants through regular calls for projects, and will soon begin running auctions of fixed premiums for hydrogen projects (the "Hydrogen Bank"). Since the price of carbon in the ETS fluctuates, the euro value of the Fund can increase or decrease over this operating period. The official European Commission estimate sits at €40 billion² (based on an estimated carbon price of €75/t) - although,

as Section 6 of this paper demonstrates, this figure is likely to be significantly larger (an estimated €82 billion between 2025-2030) in the light of carbon price forecasts.

The Innovation Fund emerged from the NER300 program, an earlier experiment at ETS-funded EU support for climate innovation, launched in 2010. According to the European Court of Auditors³ NER300 failed on its own terms, with several design issues and many funded projects ultimately closing down, and only €1.4 billion of its €2.1 billion budget disbursed.

The Innovation Fund builds from the lessons learned from NER300 and has been more successful in its initial calls⁴. However, the design and use of the Fund should be re-examined, considering the role it can play in Europe's efforts at climate action in the years to come.

2. The role of cleantech in EU climate action

To mitigate climate change, behavioural, economic, social, and technological changes at scale are required⁵. Developing, demonstrating, and deploying cleantech⁶ plays a crucial role in this.

Many of the technologies needed to deliver these emissions reductions are already on the market (e.g., *heat pumps*). Achieving the EU's medium-term goal of 55% emissions reduction by 2030 will depend largely on deploying these technologies at scale, requiring not only demand-side (e.g., *internalising the cost of pollution in the*

end-user price for gas heating), but also supply-side policies for a greatly expanded manufacturing base (e.g., *the Net Zero Industry Act*⁸). However, simply building up manufacturing for cleantech that is on the market today will not be sufficient to reach net zero by 2050 and mitigate some of the worst potential consequences of climate change. Doing so requires the development of innovative technologies that still require research and development, first of a kind demonstration, and commercial scale-up (e.g., *high temperature heat pumps for industrial heat*).

1. Commercial demonstration refers to an intermediate stage in the development of a technology from research idea to fully mature product with good market acceptance. The IEA illustrates this process with use of its 11 Technology Readiness Levels (TRL). This paper will make use of the TRL structure throughout to discuss different stages of the innovation process. At the demonstration phase, a product is tested in a real world environment, before it is made commercially available. For a fuller explanation of the TRL system, refer to pages 5-6 of [Bachelet, Pellerin-Carlin 2021](#).

2. European Commission, [What is the Innovation Fund?](#), 2023

3. European Court of Auditors (ECA), [Demonstrating carbon capture and storage and innovative renewables at commercial scale in the EU: intended progress not achieved in the past decade](#), 2018

4. European Commission, DG CLIMA, [Innovation fund progress report](#), 2022

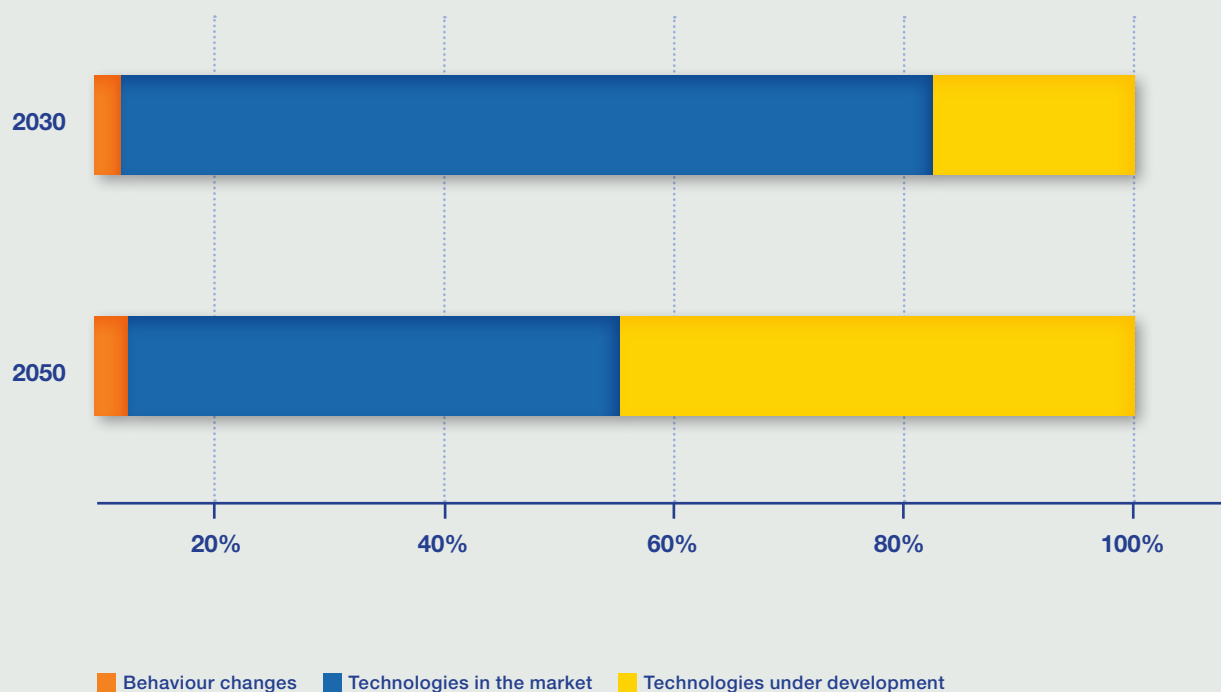
5. IPCC, [AR6 Synthesis Report - Summary for Policymakers](#), 2023

6. Defined as "technology that makes it possible to reduce or avoid harm to the environment, for example technology related to recycling, renewable energy, or methods of transport that do not cause pollution" ([Cambridge Dictionary](#), 2023)

7. International Energy Agency (IEA), [Energy Technology Perspectives 2023](#), 2023

8. Humphreys, Pellerin-Carlin, I4CE, [The Net-Zero Industry Act: Designing Europe's launchpad for a cleantech investment plan](#), 2023

FIGURE 1: ANNUAL CO₂ EMISSIONS SAVINGS IN THE INTERNATIONAL ENERGY AGENCY'S NET ZERO PATHWAY, RELATIVE TO 2020



Source: (IEA 2021)⁹

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Policymakers face a dual challenge. First, attention must be given to building up manufacturing capacity as soon as possible, and using policy support to ensure that the producers of mature cleantech solutions can scale in the short time required to support decarbonisation up to and beyond 2030. Secondly, support must be provided to cleantech innovators, whose cutting-edge technologies need to be developed and brought to market, allowing for the technology mix that can make climate neutrality a reality. Both pose a significant financing challenge, which this paper will explore in detail in section 4.

Supporting climate innovation represents an opportunity for Europe to maximise its impact on global climate action. While Europe accounts for less than 8% of global emissions¹⁰, its world-class research and innovation architecture and large economy means it can have a large impact on developing and deploying cleantech. If these innovations are successful and useful, Europe can make a tangible contribution to the world's, not only its own, decarbonisation¹¹.

9. IEA, [Net Zero by 2050: A roadmap for the global energy sector](#), 2021

10. European Environment Agency (EEA), [EU greenhouse gas emissions kept decreasing in 2018, largest reductions in energy sector](#), 2020

11. Pellerin-Carlin et al., Jacques Delors Institute, [Making the energy transition a European success](#), 2017

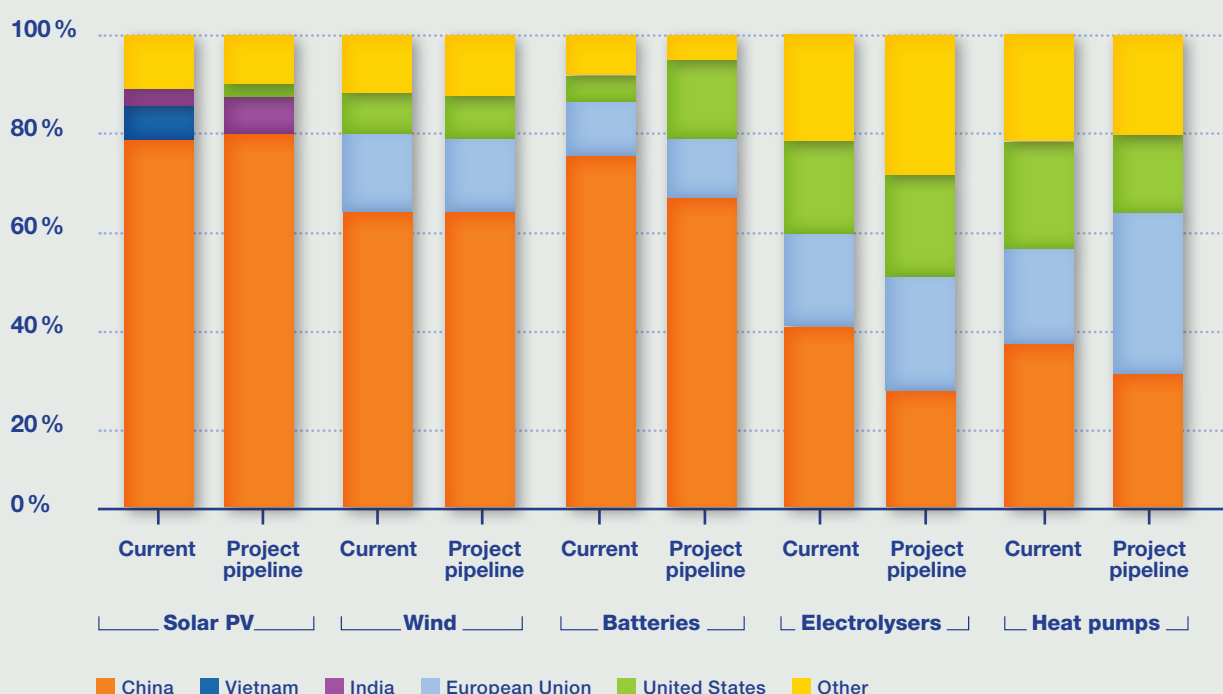
3. Geopolitics, competition and jobs: looking beyond climate

Beyond climate action, policymakers must grapple with how cleantech policy intersects with questions of energy, economic and national security.

Russia's war on Ukraine and US-China tensions have made clear the fragility of the geopolitical assumptions on

which Europe based decades of foreign policy. In the case of cleantech manufacturing, China plays a nearly hegemonic role (see *Figure 2*).

FIGURE 2: CURRENT AND PROJECTED GEOGRAPHIC CONCENTRATION FOR MANUFACTURING OPERATIONS FOR KEY CLEAN TECHNOLOGIES



Source: (IEA 2023)¹²

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If EU-China relations were to deteriorate, China's cleantech dominance could be used as leverage in diplomatic crises. With the Inflation Reduction Act (IRA), the US now has an investment plan to mitigate this geopolitical risk¹³, while the EU lacks anything similar.

Yet the recent ramp up in government support across the globe for cleantech manufacturing is not only spurred on by

geopolitical concerns, but also by an interest in securing a strong position in a global cleantech market that is likely to reach \$650bn per year in 2030¹⁴.

This cleantech competition poses a risk to the EU, whose strong position in the global cleantech market (representing, for example, 34% of global wind turbine superassembly¹⁵ and 40% of global heat pump manufacturing¹⁶), is being shaken

12. IEA, *The state of clean technology manufacturing*, 2023

13. Pellerin-Carlin, I4CE, *Think house, not brick: Building an EU Cleantech Investment Plan to match the US Inflation Reduction Act*, 2023

14. IEA, *Energy Technology Perspectives 2023*, 2023

15. The final stage of the manufacturing process.

16. European Commission, *Commission Staff Working Document: for a Regulation of the European Parliament and of the Council on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem (Net Zero Industry Act)*, 2023

by the drastic policy changes of other nations¹⁷. The most notable of these recent moves, which has come to dominate the debate within Brussels and (to a lesser extent) member state capitals, is the US IRA, which poses a competitiveness challenge to many EU cleantech sectors¹⁸.

While the IRA has grabbed recent headlines, the most significant competitiveness threat for EU cleantech is China. China is forecast by the IEA to represent 65% of global cleantech manufacturing output by 2030¹⁹. Projected domestic demand will only absorb a portion of this supply, and more than two thirds of this output would likely make its way to export markets. It will compete with European producers, and in particular export industries such as wind²⁰, and heat pumps²¹.

If the EU were to fall behind in the cleantech race, it would also miss out on the jobs benefits and tax revenues that a

vibrant cleantech manufacturing base provides. In the US, the IRA's ambitious support to green factories has already created over 60,000 jobs within the first year of operation²², with that impact only expected to increase. As for Europe, the European Commission²³ foresees an increase of 350,000 EU jobs between now and 2030 by building up manufacturing in five key cleantech industries²⁴.

In this light, cleantech policy takes on a fresh urgency. Supporting manufacturing will shield the EU from supply shocks arising from geopolitical instability, strengthen Europe's weakening cleantech competitiveness and deliver quality jobs for citizens during a once-in-a-generation economic transformation. Public support for cleantech needs to be designed with this in mind - we see the first indications of this in the EU's proposed Net Zero Industry Act (NZIA) and the Strategic Technologies for Europe Platform (STEP).

4. European climate action needs much more funding

Building up EU cleantech, and thus facing the challenges outlined above, requires significant public and private investment, and innovators seeking to bring a technology to market face significant hurdles. While there is strong European public support at the early research stage, and a growing cleantech venture capital market²⁵, cleantech start-ups nonetheless face two distinct funding "valleys of death" - funding gaps which can slow or halt the growth of a business.

The first "valley of death" comes as a product or service has left the lab and the team has produced a working prototype. At this stage, a start-up will seek to launch a pre-commercial demonstration (or pilot) project, to prove the viability and future market acceptance of the technology. At this stage, start-ups face their first valley of death, as public funding for research no longer applies²⁶. Start-ups will look for seed funding²⁷, yet private capital is wary of taking a risk on an as-yet unproven technology.

If a start-up nonetheless succeeds in commercially demonstrating their technology, supported either by private seed and series A funding or public support (such as from the Innovation Fund) or a mix of the two, **they will later face another valley of death as they attempt to grow their operations.** For a cleantech start-up to scale sufficiently to reach the mass market, they need regular injections of fresh capital. These investment needs are even greater for cleantech hardware companies, which need to purchase and build innovative, and often expensive, equipment and operating premises. Such hardware start-ups also come with higher operational risks than, for example, a new digital app²⁸. All of this means that venture capital funds and other private investors are unlikely to want to invest sufficiently to help these companies grow quickly, which can slow or even ruin their chance to reach the mass market - and from there meaningfully contribute to EU climate action and economic competitiveness.

17. Pellerin-Carlin, I4CE, [Think house, not brick: Building an EU Cleantech Investment Plan to match the US Inflation Reduction Act](#), 2023

18. Jansen, Jäger, Redeker, Jacques Delors Centre, [For climate, profits, or resilience? Why, where and how the EU should respond to the Inflation Reduction Act](#), 2023

19. This figure relates to what the IEA calls "key clean energy technologies" - solar PV, wind, batteries, hydrogen electrolyzers and heat pumps.

20. Springford, Tordoir, Centre for European Reform (CER), [Europe can withstand American and Chinese subsidies for green tech](#), 2023

21. Kuokkanen et al., [European Commission, European Climate Neutral Industry Competitiveness Scoreboard \(CINDECS\) - Annual Report 2021, 2022](#)

22. Conness, [IRA and CHIPS Investment Dashboard](#), 2023

23. European Commission, [Commission Staff Working Document: for a Regulation of the European Parliament and of the Council on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem \(Net Zero Industry Act\)](#), 2023

24. Wind, Heat Pumps, Electrolysers, Batteries, Solar PV

25. [Cleantech for Europe, Cleantech annual briefing 2022](#), 2023

26. Sweatman, Climate Strategy & Partners, [Summary Report of Expert Consultations for Finance for Innovation: Towards the ETS Innovation Fund](#), 2017

27. [Initial private investment for early stage cleantech startups to develop and deploy their product](#).

28. Tech for Net Zero Allianz, [Impuls 1: Finanzierung von Climate Tech Start-ups](#), 2023

If Europe is to both build-up cleantech manufacturing for mature technologies as well as bring to market those technologies that will be the green industries of the 2030s and beyond, it is urgent that these hurdles be overcome. To achieve this at the pace required, public finance will need to play a significant role, whether in the form of direct infrastructure investment or co-financing, private-public partnerships, or the use of instruments such as guarantees. According to the ECB, the public share of green investment (in all affected sectors, not only cleantech) will need to amount to 45% of the total²⁹.

While figures on the climate investment gap vary, official EU institutional projections estimate an economy-wide investment need (including but not limited to cleantech) of c.€360 billion³⁰ per year if Europe is to meet its 2030 decarbonisation target³¹. When looking at the investment needs pertinent to this paper, the Commission, in its working document³² on the proposed Net Zero Industry Act (NZIA), estimates an investment need of €92 billion total for the period between 2023 and 2030, with public funding requirements of at least €16-18 billion³³. This estimate concerns building up manufacturing for five key cleantech sectors³⁴ which will be crucial to delivering the 2030 decarbonisation target. Supporting the bringing

to market of the innovative technologies which will help guide Europe to net-zero by 2050 will require further investment, although much of that will need to be dispensed after 2030.

As the Commission's working paper makes explicit, the current EU budget and suite of programs, with its limited scope and focus on the early stage of technological development, is not adequate to support the build-up of cleantech manufacturing and therefore strengthen Europe in facing its climate, geopolitical, social, and economic challenges. In the absence of EU funds, there is increasingly a tendency for policymakers in Brussels and national capitals to look to national budgets to pick up the slack - as demonstrated by the further relaxing of state aid restrictions under this year's Temporary Crisis and Transition Framework (TCTF), as well as the introduction of and increased focus on Important Projects of Common European Interest (IPCEIs)³⁵. Yet such a reliance on state aid poses risks, with large states such as France and Germany able to use both their economic weight, fiscal position and political clout within the bloc to push ahead of other member states. A European approach, with EU-level funding, can limit these risks - but will require a broader consensus of member states to progress.

29. European Central Bank (ECB), [The climate change challenge and fiscal instruments and policies in the EU, 2023](#)

30. The Commission's latest [2023 Strategic Foresight Report](#) gives a higher figure of €620bn annually, however, the methodology behind this figure is unclear.

31. European Investment Bank (EIB), [Investment Report 2022/2023: Key findings, 2023](#)

32. European Commission, [Commission Staff Working Document: Investment needs assessment and funding availabilities to strengthen EU's Net-Zero technology manufacturing capacity, 2023](#)

33. This estimate does not include operational expenditure (OPEX) support needs. A more complete estimate would likely therefore be higher.

34. Wind, Solar PV, Heat Pumps, Batteries and Electrolysers.

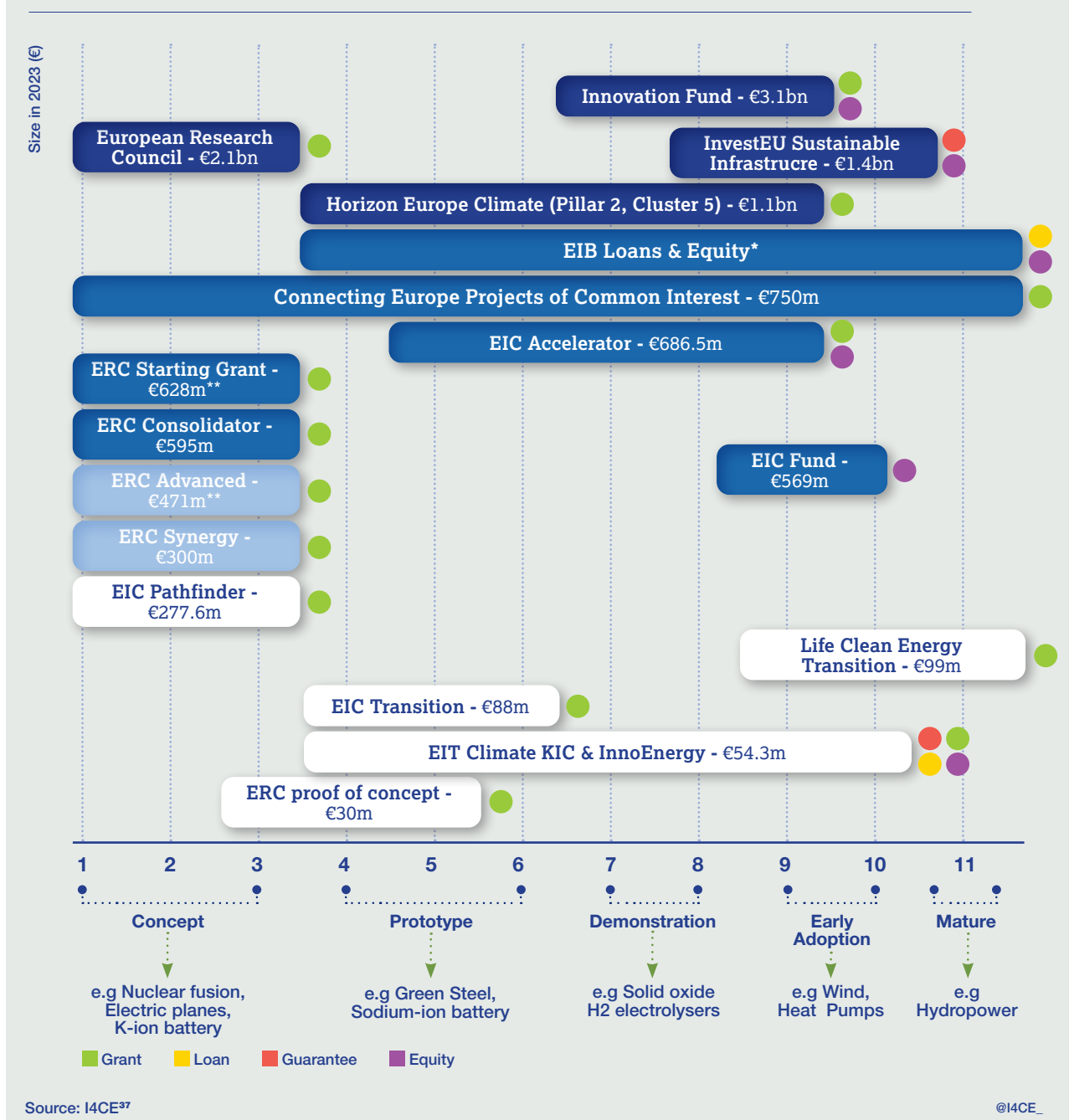
35. Eisl, Jacques Delors Institute, [EU industrial policy in the making, 2022](#)

5. What are the options for a joint EU funding approach?

When policymakers look for a European solution to the question of cleantech funding, it is important to be aware of the options already available to them. Figure 3 outlines the range of funds at EU level that are available to support

cleantech at different stages of technological development. The further analysis of this paper will be focusing particularly on the more advanced part of a technology's development cycle, TRL 7 and above³⁶.

FIGURE 3: THE EU CLEANTECH FINANCING LANDSCAPE (WITH REFERENCE TO IEA TECHNOLOGY READINESS LEVELS)



36. TRLs 7-11 includes technologies that are at the first of a kind and commercial demonstration stage, as well as early market adoption and full maturity. For a full explanation of the TRL system, please refer to pages 5-6 of [Bachelet, Pellerin-Carlin 2021](#).

37. *Refers to a large range of EIB financial instruments, including venture debt, investments in and intermediated loans to SMEs and mid-cap funds. **2022 figure

This wide range of funds are not well suited, individually, or collectively, to support cleantech manufacturing, in support of the EU's decarbonisation, energy security and competitiveness. Only a minority of these funds can offer more than €1bn per year, and many are focused on the early stages of technological development that are concerned with research and innovation. A few instruments (the Innovation Fund, InvestEU and the EIB venture debt instrument) are of sufficient size and focus to support the scaling up and build-out of manufacturing capacity in the coming years. However, supporting cleantech manufacturing requires funding both the capital and operational expenditures (CAPEX and OPEX) of projects, and most EU funds (including InvestEU and Horizon) are not able to fund OPEX.

Faced with this shortfall, the option to develop new funds to support EU cleantech should be raised. As part of its Green Deal Industrial Plan announced this year, the Commission proposed a Sovereignty Fund, which would have the goal of supporting those member states not able to exploit state aid relaxation to build up their own green industries, therefore guarding against distortion of the single market. What has since materialised however, the Strategic Technologies for Europe Platform (STEP), falls well short of this ambition. The reshuffling of existing money and allocation of only €10bn to existing mechanisms to support competitiveness (€5bn of which will be

allocated to the Innovation Fund) will not go nearly far enough to support green industrialisation.

One more ambitious approach would be a European cleantech investment fund, most likely funded through further joint borrowing in the manner of Next Generation EU. However, given that time is short (investment decisions on cleantech manufacturing projects needs to be taken within the next 5-7 years to keep Europe on track for its decarbonisation goals³⁸), the political hurdles to achieving this outcome means that it should not be the sole focus of those aiming to unlock cleantech investment. Member State opposition to the Sovereignty Fund³⁹ gives a sense of the substantial pushback any such proposal would almost certainly face from the so-called “frugal” countries (Austria, Netherlands, Denmark, Sweden, among others) who often oppose increases to the EU budget.

Common debt is not the only option for such a fund. New taxes at EU or national level, a redirection of ETS revenues or existing EU budget lines could all fulfil the same role - but these options would face some political opposition. If such a fund is to be realised, it will likely only be possible once a new Commission has taken office, following the June 2024 EU elections, and begun the debate around the next EU budget (which will run from 2028-2035). Therefore, Europe needs to find an effective funding solution to bridge that gap.

6. The Innovation Fund is the best tool available

With the need to fund cleantech research, development, and manufacturing as soon as possible, it is logical for policymakers to turn to the instruments that they already have, to avoid long legislative and political fights that will only delay EU action. As the largest single fund for this purpose that the EU has at its disposal, the Innovation Fund should be reconsidered.

The Innovation Fund has multiple attributes which make it a good place to start when trying to solve the cleantech finance challenge. Firstly, its **focus on climate innovation** means that an explicit targeting of cleantech innovation and manufacturing would not require a reorientation

of the fund, but rather a redefinition of its already-existing scope and a redesign of parts of its functioning. Secondly, it **covers projects across the whole of the EU**, meaning it is well-placed to counteract the distortive effects of an overreliance on state aid. Finally, the **Innovation Fund is large (it will award more than €3.6bn in 2023) and is only set to grow larger**. Figure 4 shows a projection of the size the Innovation Fund is likely to reach. With a predicted size between 2025-2030 of €82.2bn, the Fund, if correctly targeted, would be able to cover the €18bn of cleantech investment required to realise the NZIA goals - and indeed enough to finance a far more ambitious EU cleantech strategy.

38. IEA, [Energy Technology Perspectives 2023](#), 2023

39. A European Sovereignty Fund was presented in February 2023 by President Von der Leyen as the funding arm of the EU's Green Deal Industrial Plan. Following member state opposition, the original ambition was lowered, resulting in the Strategic Technologies for Europe Platform (STEP), which is not a new fund, but rather leverages existing financial instruments into not only cleantech, but also deeptech and biotech.

FIGURE 4: PROJECTED SIZE OF THE EU INNOVATION FUND 2025-2030 (€BN)

INNOVATION FUND FORECAST	2025	2026	2027	2028	2029	2030	2025-2030
> ALLOWANCES IN FUND (M)	44	61	68	81	115	184	
> PROJECTED ETS PRICE (€/T)	105.75	118.53	112.07	123.57	131.68	147.22	
> REPOWEREU (€BN)	3	3	0	0	0	0	
> STEP (€BN)*	1.13	1.15	2.2	0	0	0	
> TOTAL (€BN)	8.8	11.4	9.8	10	15.1	27.1	82.2

Source: I4CE⁴⁰

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> This was calculated using a projection of allowances in the Innovation Fund from the ClimAct ETS Model V5⁴¹. The projection of the future ETS price is a publicly available BloombergNEF projection from November 2022⁴². The RePowerEU contribution is an estimation based on an equal distribution of €12bn equivalent of EU allowances between 2023-2026. This annual distribution is still under discussion and so likely to change. Finally, the STEP contribution is based on the Commission legislative proposal⁴³, which will enter Trilogues between the EU institutions this year. Therefore, these figures too may be subject to change.

40. *STEP figures are taken from the proposal of the Commission, and therefore subject to negotiation and change.

41. Climact, [ETS Model V5](#), 2023

42. Pahle et al., [The EU-ETS price through 2030 and beyond: A closer look at drivers, models and assumptions](#), 2022

43. European Commission, [Proposal for a regulation of the European Parliament and Council establishing the Strategic Technologies for Europe Platform \('STEP'\) and amending Directive 2003/87/EC, Regulations \(EU\) 2021/1058, \(EU\) 2021/1056, \(EU\) 2021/1057, \(EU\) No 1303/2013, \(EU\) No 223/2014, \(EU\) 2021/1060, \(EU\) 2021/523, \(EU\) 2021/695, \(EU\) 2021/697 and \(EU\) 2021/241](#), 2023

7. Three Innovation Fund shortcomings need to be addressed

However, as currently designed the Innovation Fund has some drawbacks that need to be addressed to ensure it can realise its full potential.

The Innovation Fund may remain too small in the short term

As shown in Figure 4, the Innovation Fund is set to grow greatly in size as the carbon price rises and ETS free allowances are phased out⁴⁴. However, the need for climate action is urgent, investment decisions on cleantech manufacturing need to be made quickly, and new innovations will have to be brought to market at an unprecedented pace⁴⁵. The climate investment gap needs to be closed immediately for the EU to align with its decarbonisation pathway⁴⁶. The boost offered by STEP to the Innovation Fund shows there is an understanding of this need, but the proposal is not sufficiently ambitious⁴⁷.

The scope and assessment criteria of the Innovation Fund are not

The Innovation Fund is currently focused on the demonstration of innovative green projects, meaning the construction of first of a kind projects in Europe. As explained in section 4, cleantech projects face a double valley of death in terms of funding shortfalls, the second of which comes after this demonstration stage. Cleantech projects need support in scaling up their manufacturing operations beyond demonstration, to ensure they can operate at scale as quickly as possible and deliver decarbonisation, competitiveness, and energy security co-benefits. With its current scope, the Innovation Fund will not provide sufficient support.

The current procedure by which projects are assessed compounds this issue. The procedure examines five broad criteria: degree of innovation, absolute greenhouse gas (GHG) emission avoidance, project maturity, scalability, and cost efficiency. If a project does not pass in terms of degree of innovation, then the other four criteria are not assessed, and the application is shelved. This makes harnessing the Innovation Fund as a tool to scale up manufacturing of more mature technologies difficult, as the primacy of the innovation criterion would clearly disadvantage projects for technologies of TRL 9 and above.

The Innovation Fund assessment is hard to access for innovators

The design issues with the Innovation Fund not only concern the challenges of using this funding to build up cleantech manufacturing, but also the innovative cleantech projects which are earlier in the technological development cycle. Cleantech innovators, who are often at the helm of small start-ups, can find it more difficult than established incumbents to access Innovation Fund financing. This partly stems from the complexity of the application process itself. SMEs and start-ups, who have less resources to hire legal professionals to parse what can be at times an obtuse application process, are disadvantaged vis-à-vis larger incumbents when applying. The timeline of calls for proposals also poses an issue, as less-resourced innovators struggle to submit quality applications in the short window of time available and cannot always request funds at the time which makes most business sense.

Furthermore, the importance of project maturity (how well-prepared a company is to face the risks associated with the project) in the assessment criteria further biases the process against cleantech innovators, whose smaller organisational size means they do not have the same internal infrastructure in place as more established incumbents competing for the award. To make matters more difficult, applicant companies are also expected to submit profit and loss accounts and a balance sheet for the previous two financial years⁴⁸, which again biases the assessment away from start-ups, who will likely still be far from profitable at the time of application.

The Commission has recently attempted to address these shortcomings with changes to the Innovation Fund. As part of the RePowerEU plan, a new window of €0.7bn has been introduced in the third large scale call for innovative electrification and hydrogen applications in industry and innovative cleantech manufacturing, as well as introducing a separate mid-sized call for pilot projects. The assessment process has been amended to include a 2-stage system, with an initial assessment followed by the assessment of other criteria, to make the application more user-friendly⁴⁹. Finally, the Innovation Fund has also incorporated the use of auctions of fixed premiums for renewable hydrogen projects (the “Hydrogen Bank”), to make funded projects more attractive to investors.

44. Pellerin-Carlin, Vangenchten, et al. [No more free lunch. Ending free allowances in the EU ETS to the benefit of innovation](#), 2022

45. IEA, [Energy Technology Perspectives 2023](#), 2023

46. European Climate Neutrality Observatory (ECNO), [Finance](#), 2023

47. Cleantech for Europe, [Press Briefing Sovereignty Fund – A STEP in the wrong direction?](#), 2023

48. European Commission, [Call for proposals: Innovation Fund Large-scale Projects](#), 2021

49. European Commission, [Call for proposals: Innovation Fund Large-scale Projects](#), 2021

8. Making the Innovation Fund fit for the cleantech challenge

The Innovation Fund has already begun to be used, in a very limited way, to scale some cleantech manufacturing⁴⁰. However, its limitations in its current size, scope, and assessment criteria for both small and large projects are holding it back from being the key tool in funding European cleantech. For the Innovation Fund to deliver its full potential as the main EU-wide financing tool to make Europe the home of cleantech, this paper argues that EU policymakers should increase the amount of money allocated to the Innovation Fund, create a specific cleantech manufacturing call, and reform the Innovation Fund selection process to make it more accessible to innovators.

A larger Innovation Fund now: Member State revenues to bridge the cleantech funding gap

As this paper demonstrates, the Innovation Fund is set to grow far larger between now and the end of this decade. Yet much of this growth will take place in the latter half of this decade. In order to have the most impact on climate change mitigation, Europe's energy security and cleantech competitiveness, the size of the Innovation Fund needs to be expanded also in the short term.

A clear route to doing so would be the use of member state ETS revenues to supplement the size of the Innovation Fund. This could be done through an injection of member state national revenues into the Fund, or through the allocation of a portion of national ETS allowances into the Fund. The size of this contribution would have to be decided at a political level, but could be significant - at 2021 levels, a 10% contribution would amount to an extra €2.5bn per year for the Innovation Fund, with that amount trending upwards⁵¹.

As the lack of funding is particularly acute in the short term, the EU and member states should explore a range of further options to bridge the financing gap. One of the most impactful of these would be for the EU to borrow €22bn to increase the Innovation Fund funding for the period 2025-2029, with two thirds of that money being

invested in 2027 and 2028, to compensate for the phase-out of RePowerEU and STEP⁵². These EU loans could be repaid by future ETS revenues which we can expect to increase throughout the decade 2030-2040.

However, in the current political and economic climate, such a further demand at European level for member state capital or common borrowing can be expected to be met with resistance. One avenue of overcoming this barrier to expansion of the Innovation Fund would be to build off a proposal made in relation to the Hydrogen Bank⁵³ and implement a two-stage process for allocation of Innovation Fund grants. The first stage would continue as before, with a Europe-wide call for projects, funded by the EUAs auctioned by the Innovation Fund. A second stage would be introduced, in which projects which passed assessment but for which no further EU-level funding is available would be eligible to grants funded by their home member state's contribution to the fund. This would expand the number of projects funded under the Innovation Fund's assessment criteria, while ensuring a sense of national ownership of projects.

Running the cleantech race: introducing a "Cleantech Manufacturing Call"

As outlined in the previous section, the current scope and assessment methodology of the Innovation Fund, with its overall focus on demonstration projects, is currently too limited to address the overlapping challenges Europe faces. This scope should be widened to include manufacturing capacities in strategic cleantech sectors.

To do so, the Innovation Fund should use a portion of its resources to launch a new funding call - the "cleantech manufacturing call"⁵⁴, which would be targeted at scaling up manufacturing for technologies which have already been demonstrated and need to come to market at speed. The resources dedicated to this call could be used to support grants or, given the more mature status of the technologies targeted, financial instruments such as carbon contracts for difference or fixed premiums.

50. An overview of those projects can be found here under "clean tech manufacturing" (European Commission, [Projects selected for grant preparation](#), 2023).

51. EEA, [Use of auctioning revenues generated under the EU Emissions Trading System](#), 2023

52. These funds could be spread throughout the 2025-2029 period to ensure a gradual and predictable increase of the size of the Innovation Fund. Working from our estimate in Figure 4, the €22bn could be disbursed as €1.2bn in 2025, €1.6bn in 2026, €6.2bn in 2027, €8bn in 2028, €5bn in 2029. This would leave the size of the Innovation Fund, following our forecast, in the years 2025-2030 as €10bn, €13bn, €16bn, €18bn, €20.1bn, and €27.1bn respectively. These figures, as well as the agreed size of the borrowed funds would likely be subject to change due to fluctuations in the ETS price, fresh assessments of EU cleantech public investment needs, a future political compromise and other relevant factors.

53. European Commission, [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions on the European Hydrogen Bank](#), 2023.

54. This proposal builds on progress the Innovation Fund has already made. Under RePowerEU, this year's third large-scale call included a window of €0.7bn for cleantech manufacturing. In addition, the European parliament has proposed transforming the Innovation Fund into the Climate Investment Fund, with a mandate to also support mo technologies crucial to the EU's decarbonisation.

The launch of this call would also offer an opportunity to innovate on the assessment criteria which is used to determine which projects receive funding. Given the different scope of this call, significantly less weight and primacy should be placed on the innovativeness of the technology. The GHG emissions avoidance part of the assessment should account for the emissions reduction that the product will deliver as well as emissions avoided by the production process (as is currently the case with the assessment of renewable energy and storage projects⁵⁵). A new bonus point could also be included for projects which are assessed to enhance the EU's security of supply and energy security.

This call would align with the aims of the Green Deal Industrial Plan and the NZIA, and projects which are assessed under NZIA as Net Zero Strategic Projects could be given preferential access (provided that the final text of NZIA retains a scope focused on cleantech). Finally, this call would be a space for investor concerns to be better integrated into the assessment, with questions of profitability and credibility of business assumptions better incorporated to crowd-in more private capital at this crucial scale-up stage.

It is important, however, that the proposed call retains a definition of cleantech manufacturing which is targeted and limited. Overly expanding the scope would overstretch the Fund and limit its impact at addressing the challenges laid out in this paper.

A more accessible Innovation Fund: Reforming the application process to support innovators

Changes to the Innovation Fund should not only support the build-up of cleantech manufacturing, but ensure it be as effective as possible at supporting the next generation of innovations. Cleantech innovators, SMEs and start-ups face several barriers to entry when it comes to applying for Innovation Fund financing - one of the principal of these is the application process and the timeline of annual calls.

As a solution, the Commission should explore how to reform this assessment process. One of the most impactful changes would be a shift from time bound calls for proposals to “always open” funding windows⁵⁶. This continuous application process, which conforms more to the private sector standard, would mean that innovators can both prepare quality applications and time applications for the most impact on the continued growth of their business, while ensuring that the Innovation Fund can support

the crucial cleantech projects Europe needs as quickly as possible.

An “always open” approach to allocating funding (as well as the introduction of a new cleantech manufacturing call, or indeed the expected increase in applications as the Innovation Fund grows in size) demands that the European Climate, Infrastructure and Environment Executive Agency (CINEA), the body which manages the Innovation Fund, is better-resourced and staffed by more agents, to allow for timely and smooth assessments, awards and disbursement of funds.

The Innovation Fund as cornerstone to an EU Cleantech Investment Plan

Although the Innovation Fund has the capacity to be the cornerstone of Europe's cleantech public support, to truly face the scale of the challenges facing the EU, it cannot be the only tool in the toolbox. Other financial instruments (such as EIB loans, guarantees and venture debt, or equity from the European Innovation Council) should be boosted and targeted towards building up cleantech across the continent.

As Europe gears up for the European parliamentary elections in June 2024, there is an opportunity for the EU institutions and member states to think big when it comes to cleantech - to think how the EU could adapt its means to its ambitions. Policymakers should consider a European Cleantech Investment Plan, which could provide the scale of financing necessary to bridge the cleantech investment gap, as well as the clarity and a long-term perspective which will give investors confidence to back European cleantech.

55. European Commission, [Call for proposals - Annex C: Methodology for calculation of GHG emission avoidance](#), 2021

56. This was proposed during the first expert consultation on the design of the Innovation Fund (Sweatman, Climate Strategy & Partners, [Summary Report of Expert Consultations for Finance for Innovation: Towards the ETS Innovation Fund](#), 2017)

CONCLUSION

Cleantech and climate innovation is a key component of EU climate action, and developing, manufacturing, and deploying it at scale should be a priority if the EU is to remain on track with its climate goals. Beyond climate change, geopolitical instability and economic competitiveness add new impetus to the need to support cleantech.

To fully play its vital role, European cleantech needs much more funding, both from the private and public sectors. Public investment is critical to ensure cleantech success, as China, Japan and the USA acknowledged and acted upon with their recent massive public investment programmes. To support a truly European transition, it is essential that as much public money as possible come from the EU level. The alternative is a fragmented national response that will see a handful of wealthy EU member states outspending all others, creating a subsidy race that will lead to inefficient investments and threaten the integrity of the EU single market. Meanwhile, European cleantech leaders based in countries where governments are unwilling or unable to sufficiently support them will face serious funding shortfalls, and either fail or move their operations to the US or another competitor.

However, political appetite for a genuine EU response is limited by some member states' hesitancy to increase their contributions to the EU budget. Policymakers should therefore first turn to existing funds and financial instruments to help boost cleantech investment as quickly as possible. The Innovation Fund will be one of the principal tools in the EU's toolbox - but several issues of design and scope limit its effectiveness at supporting cleantech manufacturing and innovative start-ups.

To maximise the impact of the Innovation Fund, its size should be increased as soon as possible; a "cleantech manufacturing call" should be introduced, targeted at the needs of a Europe facing overlapping threats and crises; and the assessment process should be reformed to better support the smaller cleantech innovators who will be crucial to delivering Europe's decarbonisation up to 2050 and beyond.

Finally, as the EU elections of June 2024 approach, policymakers will need to consider how the Innovation Fund, the EU budget and other financial instruments can work in concert and benefit from more visibility, staff and funding. The debate should bring to the fore the cleantech component of a wider European Climate Investment Plan, to ensure EU, national and private investments turn the Green Deal objectives into tangible realities for businesses, workers, and families⁵⁷.

57. Pellerin-Carlin, I4CE, [Think house, not brick: Building an EU Cleantech Investment Plan to match the US Inflation Reduction Act](#), 2023

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