

Rebooting the European Union's Net Zero Industry Act

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Executive summary

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IN MARCH 2023, the European Commission published a legislative proposal for an EU response to the US Inflation Reduction Act: the Net Zero Industry Act (NZIA). It is an unconvincing policy proposal, both for what is in it and for what is not in it.

THE PROPOSAL HAS five problematic aspects. First, it takes a top-down approach, in which specific technologies are selected for preferential treatment. Preferable would be a technology-neutral approach open to all current and future technologies that help tackle the net-zero challenge. Second, its blanket 40 percent self-sufficiency benchmark for EU domestic cleantech manufacturing by 2030 sends a protectionist signal, is poorly defined and does not reflect the differences in EU capacity in the cleantech sector. Third, it relies on the acceleration of permitting procedures as the main policy instrument, although this is not the main obstacle to cleantech investment in the EU. Fourth, it proposes more strategic use of public procurement. While this is an objective to be supported, the specific proposals are likely to be ineffective because of the way they are designed. Fifth and not least, the NZIA would lack a governance structure that would ensure effective implementation.

IN ADDITION, the NZIA does not tackle three critical issues. It does not address investment obstacles related to failures of the single market. It does not tackle the coordination problem at the core of developing an EU green industrial policy. Finally, it does not develop an EU-level funding strategy, but rather relies on state aid, with the related risk of fragmentation.

THE EUROPEAN PARLIAMENT and EU countries in the Council of the EU should reboot the proposal and refocus its objectives, sharpening its limited instruments, improving its governance, and adding financial incentives to ensure implementation. In parallel, the EU should develop a broader green industrial policy strategy that leverages the single market in a credible manner, building a solid new governance framework and a new EU-level funding approach.



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1 Introduction

Europe's industrial policy, with its green and digital twin focus, has long emphasised resilience and "open strategic autonomy" as a policy objective. The declared aim of the European Commission's March 2020 New Industrial Strategy for Europe was to manage the green and digital transitions while avoiding external dependencies, particularly on China (European Commission, 2020). Its policy goals included securing the supply of clean technologies and critical raw materials, stepping up investment in green research, innovation, deployment and up-to-date infrastructure, creating lead markets in clean technologies and making more strategic use of single-market regulations, public-procurement rules and competition policy.

One day after the publication of the strategy, the World Health Organisation declared the COVID-19 outbreak a pandemic. That shock, with all its consequences for the emergency procurement of personal protective equipment and vaccines, challenged the strategy and led to a substantial revision in May 2021. The updated strategy emphasised strengthening the resilience of the single market in key areas including health, green and digital policy. This would be done by diversifying international partnerships, developing Europe's strategic industrial capacities and monitoring strategic dependencies (European Commission, 2021).

Additional concerns about strategic autonomy have now made Europe's quest for a green industrial policy even more pressing. The war in Ukraine has further highlighted Europe's geostrategic vulnerabilities, including fears about the possibility of China weaponising cleantech and critical raw materials exports in a similar way to what was done by Russia with gas supplies. The United States's 2022 Inflation Reduction Act (IRA) has been another wake-up call for Europe to scale-up its cleantech efforts and establish itself as a competitive, autonomous player in what are considered to be major growth sectors. The International Energy Agency estimates that the global market for key manufactured clean technologies will triple in size by 2030 (IEA, 2023).

Facing these strategic autonomy and economic competitiveness pressures, the European Commission is again seeking to revise its industrial policy proposals. This is a difficult task for at least three reasons.

First, EU countries differ in terms of industrial structure, geography, preferences for certain technologies and fiscal space. These differences influence how they think about achieving resilience and open strategic autonomy. They also imply that EU-level proposals can be divisive (and they usually are).

Second, even setting aside these differences, the question of how resilience and strategic autonomy should be defined and achieved is difficult to answer. What are the most effective and efficient policy instruments to achieve resilience? To what extent are there trade-offs with other critical policy objectives, including economic efficiency, growth and rapid decarbonisation? How far should the EU move away from a horizontal approach shaping framework conditions, such as strong competition policy and open trade, towards a vertical approach that favours specific industries and projects?

Third, the EU has limited industrial policy powers. While the European Commission leads on competition and trade policy, it has much weaker instruments to influence public investment, innovation and skills. For instance, its Horizon Europe budget for research and innovation (R&I) only covers about 7 percent of public R&I spending on cleantech by EU countries (European Commission, 2022).

Spurred by the shock of the Russian invasion, geopolitical tensions and the challenge presented by the US IRA, the European Commission in March 2023 published two important legislative proposals: for a Net Zero Industry Act (NZIA) (European Commission, 2023b) and

a Critical Raw Materials Act¹. This policy brief focuses on the NZIA². We describe and review the key elements of the proposal. We also point out obstacles to cleantech reform that the NZIA does not address, in part because these obstacles relate to single market and EU governance failures that require a broader solution. Accordingly, our policy recommendations include both a proposal to revamp the NZIA and a vision for an EU green industrial policy beyond the NZIA.

2 Key elements of the NZIA

The proposed NZIA is an industrial policy to promote cleantech manufacturing, organised in four steps.

First, it lists net-zero technologies considered to be “strategic”. These include solar photovoltaic and solar thermal, onshore wind and offshore renewables, batteries and storage, heat pumps and geothermal energy, electrolysers and fuel cells, sustainable biogas and biomethane, carbon capture and storage (CCS) and grid technologies.

Second, it would set an overall benchmark target for EU domestic manufacturing in these technologies to meet at least 40 percent of the EU’s annual deployment needs by 2030. The NZIA also proposes a target for an annual injection capacity in CO₂ storage of 50 megatonnes (Mt) CO₂ by 2030, to spur the development of CCS.

Third, it outlines a governance system based on the identification of Net-Zero Strategic Projects (NZSPs) by member states, with a minimal check by the European Commission. NZSPs must contribute to CO₂ reductions, competitiveness and security of supply, and should involve technologies close to commercialisation³. This approach represents a break with what has been done so far: support focused on earlier stages of technology development, including research, early-stage development and prototyping.

Fourth, the NZIA outlines a set of policy instruments, mostly at national level, to support the selected NZIA projects:

1. Acceleration of permitting and related administrative procedures, within time limits pre-set by the EU, including by identifying a one-stop-shop national authority in charge of these projects.
2. Coordination of private funding. The Commission estimates that meeting the headline 40 percent target by 2030 will require €92 billion in investment, with the bulk (around 80 percent) coming from the private sector, to be facilitated by a “*Net-Zero Europe Platform fostering contacts and making use of existing industry alliances*”.
3. Limited public subsidies, mainly at national level (see below). Support for NZSPs is to be prioritised in national and EU budgets. However, the NZIA proposal does not allocate new EU-level funding, and neither is such funding being allocated in parallel⁴.

1 See European Commission press release of 16 March 2023, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_1661.

2 For an assessment of the Critical Raw Materials Act see Le Mouel and Poitiers (2023).

3 TRL (technology readiness level) classifies technologies by their stage of development. NZIA targets TRL 8 indicating technologies that have been tested and ‘flight qualified’ and are ready for implementation into an existing technology.

4 An EU-level ‘Sovereignty Fund,’ which might include clean-tech support, mentioned in speeches by Commission President Ursula von der Leyen in spring 2023, has not materialised. Instead, on 20 June, the Commission proposed a repackaging of existing EU funds under a so-called Strategic Technologies for Europe Platform (STEP), introducing a “*sovereignty seal*” as an “*EU quality label for sovereignty projects*” and a “*sovereignty portal*” for accessing funding opportunities under STEP. See European Commission press release of 20 June 2023, https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_3347.

4. Public procurement procedures and auctions, which are to include “sustainability and resilience” criteria, which can be given a weight of up to 15-30 percent. At the same time, bids that propose the use of equipment for which a non-EU country of origin provides at least 65 percent of EU supply are to be disadvantaged.

The NZIA proposal also mentions other areas, including regulatory sandboxes and the skills agenda, but without implementation details. Although the Commission acknowledges skills shortages as a major barrier (an estimated shortfall of 180,000 skilled workers in hydrogen and 66,000 in solar PV in 2030, for example), the NZIA does not develop a strategy to tackle this problem, limiting itself to coordinating initiatives, such as Net Zero Industry Academies, through the Net-Zero Europe Platform.

Since EU countries are assigned the role of main provider of public funds for NZSPs, it is important to read the NZIA in parallel with the Temporary Crisis and Transition Framework (TCTF), modified by the European Commission in early March 2023 in response to the IRA (European Commission, 2023c). The TCTF outlines conditions under which the Commission will approve “*aid accelerated investments in sectors strategic for the transition towards a net-zero economy*”, defined as batteries, solar panels, wind turbines, heat pumps, electrolysers and carbon capture usage and storage, as well as the production and recycling of priority components and critical raw materials⁵. Specifically, EU countries are allowed to:

1. Provide more support to cleantech production located in disadvantaged regions, capped at a certain percentage of the investment costs and nominal amounts, depending on the location of the investment and the size of the beneficiary;
2. Grant higher percentages of the investment costs if the aid is provided via tax advantages, loans or guarantees. This implies that state aid is not limited to funding capital expenditures but that operating expenditures (OPEX) can also be covered, up to the identified funding gap. This approach is novel for Europe as it has been only rarely adopted previously, most notably in the case of cohesion regions;
3. Provide matching aid, that is, the amount of support the beneficiary could receive for an equivalent investment in the alternative location, or the amount needed to incentivise the company to locate the investment in the EU. This part is perhaps the clearest revision of the state-aid guidelines as a reaction to the IRA. This matching-aid option requires individual notification and must respect several safeguards: (i) investments must be in assisted areas, as defined in the applicable regional aid map; or (ii) cross-border investments involving projects located in at least three countries, with a significant part of the overall investment taking place in at least two assisted areas, one of which is an ‘a’ area (outermost regions or regions where the GDP *per capita* is below or equal to 75 percent of the EU average). Furthermore, the beneficiary should use state-of-the-art production technology from an environmental emissions perspective. Finally, the aid cannot trigger relocation of investment between EU members.

⁵ See https://competition-policy.ec.europa.eu/system/files/2023-03/overview_of_TCTF_section_2.8_schemes.pdf.

3 Problems with the current proposal

Taking the scope of the NZIA as given, five issues are problematic.

3.1 Technological scope is overly selective

First, the NZIA adopts a top-down approach in which policymakers seek to promote a pre-defined set of technologies, and within these, specific projects considered 'strategic' for the transition to net-zero. This can lead to two problems: policymakers may end up backing the wrong technology, and this backing may generate unnecessary and damaging costs.

While the list of NZIA technologies contains most of the major technologies currently in use or close to commercialisation, it excludes others. For example, while the proposal recognises that "*advanced technologies to produce energy from nuclear processes with minimal waste from the fuel cycle, small modular reactors, and related best-in-class fuels*" are net-zero technologies, it does not include them in the list of strategic net-zero technologies, thus preventing them from becoming NZSPs. The same is true for technologies for improving energy efficiency, early-stage technologies such as near-zero materials or direct air capture, and – obviously – technologies not yet on the public radar.

Because of the high path-dependencies in green technologies and the high degree of uncertainty intrinsic to technological innovation, industrial policy that seeks to promote a pre-defined set of green technologies can lead to inferior outcomes. It would have been better to adopt a technology-neutral approach, open to any project and technology that can contribute to lower emissions and greater competitiveness and resilience.

An additional concern applies even when the selected technology is in fact the right one. The proposed NZIA asks EU countries to promote projects based solely on their propensity to advance or commercialise that technology. However, many such projects may not need public support. In rare cases, such support could be costless (for example, if it consists of waiving a bureaucratic requirement that has no merit in the first place). Mostly, however, support involves a cost, whether in the form of public money, lighter environmental checks or a distortion of competition (tilting the playing field against projects and companies that are not selected). As a result, NZIA promotion may, in some cases, do more harm than good.

In sum, the procedure for determining NZSPs seems unlikely to properly balance the risk of government failure against the market failures it is trying to address. In the presence of technological path-dependency, it may even exacerbate market failures.

3.2 The 40 percent benchmark is problematic

Second, the NZIA adopts a 40 percent self-sufficiency benchmark for domestic manufacturing as the only relevant indicator of "*strategic autonomy*". This is problematic for several reasons.

1. It disregards the costs of promoting self-sufficiency in particular technologies, compared to the use of cheaper imports. As a result, it is unclear whether meeting such a target would accelerate or slow EU decarbonisation and whether it would in fact advance resilience, which is more closely related to the concentration of imports than their overall volumes (Welslau and Zachmann, 2023). No impact assessment, whether on cost, emissions reductions or resilience objectives, was performed to justify the 40 percent domestic manufacturing target.
2. Even if an import substitution target is viewed as necessary for achieving strategic autonomy, it is unclear why this benchmark should apply across all NZIA technologies, which differ in many ways: in terms of their current domestic manufacturing capacity (see Sgaravatti *et al*, 2023), the costs of expanding domestic manufacturing in the EU compared to alternatives, and the lead times for expanding production.
3. The extent to which the target applies to component parts of the identified net-zero technologies is also unclear. Several of these components are very important and represent a major bottleneck for domestic manufacturing in Europe.

3.3 The focus on fast-track permitting is misplaced

Third, a major focus of the proposal is the fast-tracking of permitting procedures for NZIA technologies. While improving permitting procedures is always a good idea (not only for strategic projects), its relevance as a determinant of investment in this context is not clear. Permitting times represent a significant drag on the deployment of renewable energy, CCS projects and mining projects, but not normally for the manufacturing industry. In the EU, the principal obstacles to manufacturing production and investment tend to be skills and access to funding (see EIB, 2022). Thus, it is unlikely that fast-tracking of permitting and administrative procedures will provide a significant boost to cleantech investment in Europe.

3.4 Strategic use of public procurement is irrelevant in practice

Fourth, while the NZIA emphasises more strategic use of public procurement, its actual proposals risk being irrelevant in practice. The “*sustainability and resilience*” award criteria introduced by the NZIA can be ignored if applying them results in a “disproportionate cost” for an EU country, defined as a cost gap between the domestic technology and foreign technology of more than 10 percent. Considering that European domestic manufacturing of certain clean technologies – most notably those in which Europe is lagging, like solar panels – remains considerably more expensive than in Asia, such cost gaps may be common and the NZIA criteria are unlikely to be much applied.

3.5 Governance is light

Fifth, the governance of the NZIA looks light. EU-level oversight of national decisions is envisaged to be minimal, although projects supported by member states will generally receive preferential treatment (whether financial or non-financial). European Commission monitoring is supposed to focus on whether manufacturing capacity in the EU grows in line with the 40 percent self-sufficiency target. There is no mechanism to check the selection of NZIA projects by EU countries with respect to their effectiveness in meeting climate or resilience targets, their proportionality and their impact on the level playing field. The proposal mentions the Net Zero Europe Platform as a governance tool, but its purpose seems to be the coordination of public instruments and links to private investment sources, not to ensure that the right projects are selected and that the NZIA meets its ultimate objectives at an acceptable cost.

In terms of monitoring progress and evaluating impact, the proposal mentions that an evaluation will be done by the European Commission after three years and then regularly thereafter. But it is unclear how this process will be organised and implemented, running the risk that it will be little more than a nominal exercise. And it remains unclear what will happen if the EU is not on track on certain technologies.

It is also worth mentioning that, as in the case of other recent legislative proposals, such as the March 2023 Electricity Market Design reform proposal⁶, the NZIA proposal did not pass through the usual *ex-ante* exercise done by the European Commission services to assess the likely impact of the proposal compared to alternatives. It was only followed-up by a working document discussing NZIA investment needs and funding options (European Commission, 2023a).

⁶ See European Commission press release of 14 March 2023, https://ec.europa.eu/commission/presscorner/detail/en/IP_23_1591.

4 What is missing from the NZIA

The NZIA's premise is that cleantech in the EU can and should be promoted by improving the business environment specifically for cleantech. However, cleantech investors face many of the same barriers that constrain other categories of private investment in Europe, including lack of access to finance, high energy costs, policy fragmentation and scarcity of critical skills. Addressing these barriers may be more useful, even from the narrow perspective of promoting cleantech, than giving preferential treatment to cleantech projects.

Reducing these obstacles would require much more comprehensive reforms than proposed in the NZIA. These include a more integrated European electricity market that would help to lower energy costs structurally, an EU-wide strategy to develop and improve (green) tech skills, and the creation of a banking and capital markets union to overcome Europe's highly bank-dominated and fragmented financial system and mobilise private capital for cleantech (Kleimann *et al*, 2023). Furthermore, those reforms would promote not only cleantech investment, but would foster growth and competitiveness in the EU more broadly.

The proposed NZIA is also too narrow in that it does not tackle the central problem plaguing EU green industrial policymaking: lack of coordination. Europe has a multitude of green industrial policy initiatives at EU level, adding to the multitude of policy initiatives at national and regional levels (Tagliapietra and Veugelers, 2021). These initiatives are generally not coordinated and may even conflict. Uncoordinated industrial policies fail to capitalise on EU economies and synergies scale and could undermine the level playing field across Europe. While the NZIA proposes a Net Zero Europe Platform to coordinate the preferential treatment of projects selected, this does little to address the fragmented state of cleantech industrial policymaking in the EU and risks worsening this fragmentation further.

In recent years, the EU has tried to foster an industrial policy aimed at creating European ecosystems for the manufacturing of batteries and electrolyzers, via European Alliances and related Important Projects of Common European Interest (IPCEIs). Although the IPCEIs are financed by EU countries, they require cross-border EU cooperation and their formation and selection are coordinated by the European Commission and assessed for compatibility with state aid guidelines. While it is too early to assess their effectiveness, they are designed to capitalise on EU scale and protect the single market. By focusing almost exclusively on the promotion of individual projects at national level, the NZIA takes a step in the wrong direction.

Finally, and related to the need for a consistent EU-wide industrial policy, the proposed NZIA lacks a solid EU-level funding instrument. A Strategic Technologies for Europe Platform (STEP) proposed by the EU on 20 June 2023, does not provide new fresh EU resources but rather repackages existing ones. This initiative also has a much broader scope than NZIA, covering all sorts of 'strategic technologies,' including clean, digital and biotechnologies⁷.

Public financial support for cleantech would thus need to come mainly from EU countries' regular budgets, which risks jeopardising the single market's level playing field. This risk might materialise quickly if countries with more fiscal space decide to create their own green industrial policy packages. For instance, if Germany goes ahead with a large subsidy scheme to lower electricity costs in energy-intensive industries in general, and cleantech manufacturers in particular⁸, it will likely trigger a backlash from other member states, as

⁷ See European Commission press release of 20 June 2023, https://ec.europa.eu/commission/presscorner/detail/en/ganda_23_3347.

⁸ As proposed by Germany's economy minister. See Federal Ministry of Economic Affairs and Climate Action press release of 5 May 2023, <https://www.bmwk.de/Redaktion/DE/Pressemitteilungen/2023/05/20230505-habeck-legt-arbeitspapier-zum-industriestrompreis-vor.html>.

seen after Germany's adoption of the €200 billion 'economic defence shield' to counter rising energy prices (Tagliapietra *et al*, 2022). The same goes for France's plan to adopt a "green industry bill", including generous tax credits for national cleantech manufacturers⁹.

There is a case for public subsidies, for early stage, high-risk clean technology in particular, but also for the early deployment of more mature technologies. Delivering these subsidies at EU level would avoid fragmenting the single market and better exploit the scale of the EU by harnessing EU-wide synergies, internalising knowledge spillovers and improving cost and risk sharing. The NZIA could have been an opportunity to streamline and unify EU funding tools that could be used for cleantech manufacturing, to create a new EU funding instrument if needed and to better coordinate with and between national funding tools.

5 Recommendations for NZIA 2.0 and a broader EU green industrial policy strategy

As proposed, the NZIA is unlikely to achieve its aims, while likely generating unintended costs. It also falls well short of a comprehensive green industrial policy for Europe. To promote cleantech manufacturing, two steps should be taken. First, in the legislative process, the NZIA should be rebooted, to make sure that at least some specific areas of intervention are dealt with efficiently and that the risk of unintended consequences is minimised. Second, the EU needs to move beyond the scope of the NZIA and start working on the development of a broader EU green industrial policy strategy.

5.1 Rebooting the NZIA

5.1.1 Refocus the objectives

- **Drop the 40 percent domestic manufacturing target and replace it with key performance indicators (KPIs) that capture the trend and resilience effects of cleantech investment.** The success of the NZIA should be measured on the basis of whether it can mobilise the massive private investments required to meet Europe's cleantech needs, and whether these make Europe more competitive and more resilient. Such KPIs should replace the ad-hoc 40 percent domestic manufacturing target.
- **Adopt a technology-neutral approach instead of cherry-picking specific technologies,** in order to include all technologies that today and in the future could contribute to reaching Europe's climate, competitiveness and resilience goals.

5.1.2 Sharpen the instruments

- **Make sure the NZIA delivers on its key goal of streamlining permitting.** While permitting is not necessarily the most important barrier to the development of cleantech manufacturing in Europe, it is – and will realistically remain – a useful NZIA instrument. At this point, it is important to ensure that the NZIA delivers on this item. This will not necessarily be easy, considering member states' competence in this area, but it will require stronger governance than what is currently envisaged.

⁹ See Élysée press release of 11 May 2023, <https://www.elysee.fr/emmanuel-macron/2023/05/11/accelerer-notre-reindustrialisation-le-president-presente-sa-strategie>.

- **Be bolder on strategic public procurement.** NZIA takes a first step towards more strategic utilisation of public procurement. This is good news, as public procurement has so far been a neglected instrument in the European Green Deal toolbox (Sapir *et al*, 2022). However, the 10 percent cost-gap safeguard included in the proposal (allowing the procuring authority to choose the cheaper bid, even if it has a lower sustainability score, if the cost gap exceeds 10 percent) will likely make this step irrelevant. One way of making it more effective while limiting the cost for procuring authorities might could involve: (i) linking the cost-gap safeguard threshold to the sustainability and resilience score of a bid, up to some maximum (for example, for projects that do very well on sustainability and resilience it could be as high as 30 percent); (ii) partly subsidise, using EU funds, the difference between the costs of the winning bid (taking account of the resilience and sustainability score) and the lowest-cost bid (see discussion of financial incentives below).

5.1.3 To ensure implementation, strengthen governance and offer financial incentives

To make sure these instruments are used effectively, the NZIA 2.0 requires both strong governance and the right financial incentives.

- **Strong governance is needed to address the key challenge in developing an EU green industrial policy: coordination.** Alignment of different stakeholders, policy competences and instruments must be steered to achieve the stated objectives. The NZIA proposal does not tackle this central point, referring only to the establishment of a Net-Zero Europe Platform, which seems to be conceived as a forum to share best practices rather than a real steering and coordination body. NZIA 2.0 needs to ensure that the European Commission plays a meaningful coordination role, starting with closer coordination between the main relevant Commission directorates for the NZIA: internal market, competition, energy, growth and trade. Strong governance is also required to monitor and evaluate which NZIA policy interventions work and which do not, measured against the KPI of growing private cleantech investment. This will help learn fast and adapt policymaking fast, if needed.
- **As the EU has limited tools to foster national action and steer coordination, it must be able to offer some incentives.** Limited EU resources should be used to part-pay for projects that involve pan-European collaboration. When it comes to strategic procurement, EU funds (including the EU Innovation Fund, REPowerEU or Cohesion Funds) could be used to part-fund national public procurement of innovative clean technologies, to encourage the roll-out of clean technologies at EU scale without creating excessive costs for the government entities undertaking the procurement.

5.2 Developing a broader EU green industrial policy strategy

To develop a full-fledged green industrial policy, the EU needs to leverage its greatest asset: the single market. Only a well-functioning, globally linked EU market will be able to achieve a similar scale to the domestic markets of the United States and China. Fragmented national measures will not lead to private investments in cleantech ecosystems at the scale that Europe needs to become a globally competitive, resilient, cleantech powerhouse. To achieve this, the EU needs to foster and deepen its single market for goods, services, components, energy, capital, people and ideas. Without such ‘horizontal’ policies, targeted ‘vertical’ policies (including NZIA instruments such as permitting, public procurement and skills) will not deliver results at the needed scale.

Take the example of skills. This is a major bottleneck for the development of cleantech manufacturing in Europe, more than permitting. While the EU has limited competence in this field, providing the right incentives to member states could catalyse national action.

At the same time, single market reforms require a new push, including capital markets union, electricity market design and alignment of EU cleantech regulations. To be a forceful

lever for private cleantech manufacturing investment, the single market must be open and competitive. The EU needs to preserve the power of its competition policy toolbox to avoid incumbency, protectionist and rent-seeking traps. EU trade policy should not fall into a reciprocal protectionist trap: it needs to remain open to allow the EU to import intermediate goods and natural resources that it cannot competitively produce itself, and to help keep export markets open. Most of these horizontal framework conditions have been essential for EU competitiveness in the past and are now more important than ever.

To promote a broad and strong green industrial policy, the EU needs to take a step further on governance. The EU should reinforce governance by creating a competent and empowered body, which is sufficiently politically independent – or detached from political pressures – yet accountable for its achievements with a set of clear, realistic milestones and targets. The US experience can be inspiring in this regard. After the approval of the Inflation Reduction Act, President Biden appointed John Podesta as Senior Advisor to the President for Clean Energy Innovation and Implementation and Chair of the President’s National Climate Task Force, with a mandate to oversee the implementation of the IRA’s clean energy and climate provisions. A similar move by the European Commission might make sense, to ensure top-level coordination and political steering of the overall process – which is vital for the longer-term socio-economic and political sustainability of the European Green Deal and its aim of being Europe’s new growth strategy. An EU counterpart to Podesta might also pave the way for better EU-US coordination of cleantech industrial policy, to avoid spiralling subsidy wars.

A broad and solid EU green industrial policy also requires a new EU-level funding strategy. To accompany the implementation of a broader green industrial policy, the EU will need a new funding strategy. Otherwise, public incentives to spur private investment in cleantech would come from national state aid, which would create risks of single-market fragmentation and fan political tensions between EU countries. A new EU strategy in the field should: (i) focus on supporting the development and scaling-up of pan-European public-private ecosystems; (ii) support the whole innovation cycle of cleantech in an integrated manner, from disruptive innovation to deployment at scale; (iii) prioritise areas in which market, network and transition failures are most likely and government selection failures least likely, ensuring additionality and leveraging of other (member state) public and private funding; (iv) fit within a portfolio of funding instruments, which is well balanced between top-down and bottom-up solicited projects.

To achieve these goals, the EU could consider the creation of an EU version of the US Advanced Research Projects Agency, with an emphasis on Energy and Climate (‘ARPA-EC’), aimed at fostering high-risk, early-stage development projects for new cleantech manufacturing technologies¹⁰. An EU ARPA-EC could also issue competitive tenders for new technological alternatives to critical components, products or services when there are supply concerns in existing green technologies, thus addressing the EU’s demand for resilience and autonomy by calling on the EU’s science and innovation capacity. ARPA-EC should connect to complementary funding schemes, both at national and at EU level, including the European Research Council (ERC) and European Innovation Council (EIC). The ERC and EIC should maintain their focus on supporting bottom-up ideas, thus balancing the top-down cleantech NZIA programmes.

It is important to stress that an ARPA-style approach requires more than just importing a label. To ensure the unique character of an ARPA-EC as risk-taking public funder for energy and climate, sufficient funding will be required, to allow it to take a portfolio approach and make multiple high-risk bets. Equally important is to design it properly for success, most notably, by giving autonomy and organisational flexibility, especially flexibility to recruit and

¹⁰ The Advanced Research Projects Agency–Energy (ARPA-E) programme, established shortly before the 2007-08 financial crisis, has around \$350 million in annual funding and aims, like its Defense Advanced Research Projects Agency sister, to nurture new strategic energy technologies to achieve rapid deployment of radical technologies with high market potential.

accommodate the venture-capital entrepreneur type of policy programmers and officers. Calls must have clear quantifiable goals and trackable metrics, so that policy officers can be given high levels of autonomy, together with clear mandates and accountability.

The EU could also fund the creation of support schemes designed to top-up national and other EU funding in projects that demonstrate pan-European collaboration or coordination, contributing to the creation of cleantech ecosystems at EU scale. A particular line of action to address the critical lack of skills for green investments, would be the funding of programmes to stimulate the intra- and extra- EU mobility of cleantech skills¹¹. These could be targeted specifically at fostering intra-EU mobility between upstream and downstream parts of European cleantech ecosystems.

6 Conclusion

The US Inflation Reduction Act has revived Europe's deep-seated fears of de-industrialisation and of missing out on the growth opportunities of cleantech manufacturing. Such a reaction should not be surprising: turning brown jobs into green jobs represents an essential condition for Europe to maintain and strengthen its socio-economic model – and welfare state – while meeting its decarbonisation goals. This is the fundamental reason why the EU has adopted the European Green Deal as its growth strategy. At the same time, the EU's recent experience with overreliance on Russian gas has made the security of clean-energy supply, and more generally resilience to trade disruptions, a central policy objective.

The NZIA as proposed by the European Commission is a partial and poorly designed green industrial policy that is unlikely to deliver meaningful results in relation to the triple objective of EU decarbonisation, competitiveness and resilience. The European Parliament and EU members in the Council of the EU must reboot the NZIA and make sure it both delivers on its limited scope of action and minimises the risk of unintended consequences. In parallel, the EU needs to advance a much broader and stronger green industrial policy strategy, resting on three pillars: horizontal single-market reforms, an upgraded steering and co-ordination body at the EU level, and a strong, central advanced research funding agency in the mould of ARPA. Delivering on this strategy should be a priority goal of the new EU institutional cycle from 2024.

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¹¹ For example, through dedicated NZIA Erasmus and Marie Curie fellowships, or mobility top-ups to Horizon Europe or other funded projects.

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