

9 Europe's green industrial policy

Inflation Reduction Act (IRA). The IRA prompted fears of relocation of European clean-tech industries to the US, attracted by a combination of subsidies and protectionist local-content requirements. Regardless of how reasonable these fears are, this new geoeconomic context poses two challenges for Europe.

First, Europe is already lagging Asia and the US in the global race for digital technologies. It cannot afford to give up its position in the global race for clean technologies and miss out on the industrial growth opportunities from the green transition.

Second, for overall competitiveness and growth, the European economy is heavily reliant on carbon-intensive industries, such as the automotive industry. These sectors will undergo significant restructuring in the coming years, because of the transition to clean technologies – to electric vehicles, for example. A green industrial policy is therefore needed to ensure the success of the green transition and to help maintain and strengthen the EU's socio-economic model. This is why the EU has packaged the European Green Deal as its 'growth strategy' and why it has reacted nervously to the IRA by proposing its own Net Zero Industry Act (European Commission, 2023a).

In this chapter, we: i) outline a set of principles for an effective green industrial policy in Europe; ii) provide an overview of Europe's ongoing green industrial policy measures; iii) set out recommendations to deliver a more effective green industrial policy in Europe.

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Green industrial policy is unique. Instead of solely focusing on the competitiveness of industries and companies, as is typical of tradi-

and public returns from clean markets diverge the most. A green industrial policy should be developed in coordination with the instruments used for climate policy, and with industrial policy instruments more generally. For example, carbon pricing is an important instrument in the green industrial policy toolbox, which also includes subsidies, taxes, targets, regulations, and standards.

Green technologies, often still emerging, are complex and uncertain. Future uncertainty about climate and technology scenarios underlines the importance of learning and information sharing, and thus experimentation, risk taking, self-discovery on the market and industry-research-policy collaborations to share risks, costs and information.

Clean technologies are also characterised by internalised costs or benefits for those other than the producers (Martin and Verhoeven, 2022), if only because of the variety of climate policies worldwide. This calls for a more directed approach to supporting investments in clean technologies. In addition, a clean-tech investment push is necessary to counter the lock-in of fossil fuel-based technologies and their path-dependencies.

The difficulty in profiting from green technologies, and in developing new low-carbon technologies, lies in the hidden support provided to fossil-fuel products in different forms, from the absence of a carbon price to explicit subsidies. These mechanisms can skew the market in terms of production, technology adoption and innovation (Aghion *et al*, 2016; Aghion *et al*, 2019). The case for subsidising green technologies, in this sense, is broader and stronger than the general case. Environment-directed innovation policy. Needs to select 'clean' to address the greater knowledge spillovers and lock-in problems. This still leaves the questions of whether and how to choose between 'clean' technologies, and which winners to pick (eg focusing on individual clean technologies such as batteries or hydrogen). When choosing between clean technologies, the principle of divergence between expected social and private returns, and the greatest scope for reducing clean market failures, should guide the decision-making process. Choosing between clean technologies should also take into account the impact of any choice on

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Source: Bruegel Economics (2014).

policy should include milestones and should be adapted depending on lessons learned from regular monitoring and evaluation.

Finally, coordination between the many different stakeholders, policy governance areas, instruments and projects will require strong operational governance for successful green innovation policy.

4.1 Horizon Europe

Horizon Europe is the EU's main funding programme for research and innovation⁴⁸. Its budget is €95.5 billion for 2021 to 2027, of which €5.4 billion comes from NextGenerationEU⁴⁹. Among other things, it seeks to tackle climate change and boost the competitiveness and growth of the EU. Horizon Europe also has a strong focus on green technologies. The programme defines a new partnership instrument, the Horizon Europe Missions, to catalyse cross-sectoral investments to find solutions to pressing challenges for society. In September 2020, Mission Boards proposed five Missions, of which four have a climate change/environment angle: A Climate Resilient Europe; Mission Starfish 2030: Restore our Ocean and Waters; 100 Climate-Neutral Cities by 2030 – by and for the citizens; Caring for Soil is Caring for Life.

The European Research Council (ERC)⁵⁰ was created in 2007 to fund frontier research through grants. Since its creation, it has funded more than 12,500 projects with an emphasis on early-stage researchers. The overall ERC budget from 2021 to 2027 is more than €16 billion. While ERC projects are selected for funding without thematic priorities, the research undertaken by many ERC grantees generates knowledge in support of the European Green Deal⁵¹.

The European Innovation Council (EIC)⁵² was created in 2017 to help companies grow and expand beyond European borders. It has a budget of €10.1 billion for 2021 to 2027. Money is provided to beneficiaries as grants and/or as equity investment. The EIC is split into two branches: the EIC Accelerator and the EIC Pathfinder. Although also a programme funding bottom-up proposals without thematic priorities, the EIC is

strong in the areas of clean energy, clean mobility and smart buildings⁵³.

The European Institute of Innovation and Technology (EIT)⁵⁴ was created in 2008. Its 2021 to 2027 budget is €2.9 billion from Horizon Europe.

The EIT supports the development of pan-European partnerships between companies, research labs and universities, known as EIT Innovation Communities (Knowledge and Innovation Communities – KICs), which aim to find answers to global challenges. The EIT provides grants with a varying funding rate according to the life cycle of the KICs. Five out of the eight Communities at time of writing are strongly relevant to green industrial policy: EIT Climate-KIC: Innovation for climate action, EIT InnoEnergy, EIT Manufacturing, EIT Raw Materials and EIT Urban Mobility.

4.2 Deployment

The EU Innovation Fund (IF) was established under the EU emissions trading system (ETS) for the period 2021-2030 with at least 450 million carbon allowances. Assuming a carbon price of €75 per tonne, the Fund will provide around €38 billion of support over the period. Projects supported by the fund are expected to be implemented in collaboration with industry partners, research institutions and other stakeholders. As of March 2023, 52 projects had been signed, for a total contribution by the Fund of €2.94 billion: 58 percent of projects target energy-intensive industries, 21 percent renewable energy, 17 percent energy storage and 4 percent carbon capture and storage.

Industrial Alliances are a tool to promote public-private partnerships with an increasingly leading role in regulating and directing funds towards the strategic priorities identified by the European Commission.

The aim is to maximise the job, growth and investment potential of new green technologies, and to prevent a technological dependence on

53. . . . https://eic.ec.europa.eu/news/green-deal-challenge-eic-supports-solutions-2021-12-15_en.

54. . . . <https://eit.europa.eu/>.

The European Investment Bank (EIB) has positioned itself as the EU's "climate bank" since 2019. It adopted a new energy lending policy and sustainability strategy based on three pillars: i) end of lending for fossil-fuel projects from the end of 2021; ii) focus future financing on clean energy innovation, energy efficiency and renewables; iii) unlock €1 trillion of climate and environmentally sustainable investment in the decade to 2030. In 2022, the EIB allocated around €17.5 billion to the transport

ensure the consistency of green industrial policy is missing. Instead, the EU green industrial policy strategy seems more like a scattered collection of energy, climate, innovation and social policy initiatives, rather than a coherent industrial policy framework.

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The need to tackle climate change calls for a green industrial revolution. A new policy-driven approach should be based on strong governance, on formalised collaboration with the private sector and civil society, and on development of solutions that combine public and private knowledge and capacities. To design green industrial policy, a new industrial policy perspective is helpful. It should have much broader multi-dimensional objectives and should view policymaking as a process of partnership between the public sector, the private sector and society, rather than a top-down approach of allocating funds to a few winners.

The traditional EU strategy is not sufficient to turn the green transition into an industrial opportunity. The EU faces challenges in coordinating and achieving the necessary economies of scale because of the fragmentation of tools and funding sources, and because of nationalistic industrial policies. While some elements already reflect the new industrial policy approach, such as provision of support for industrial ecosystems encompassing all players operating in a value chain, much stronger measures are required to develop an effective EU green industrial policy.

5.1 *Given the inherent complexities of both green industrial policy and the*

EU as policymaking machinery, strong governance is a prerequisite for an effective EU green industrial policy. Only a leadership that is competent, independent and accountable to clear goals and milestones, and that encourages risk-taking, can coordinate the progress of different government groups, which are each responsible for distinct parts of green industrial policy.

5.2 Re a pi g EU- e e b idie f g ee n i r a i r

While the EU should not copy the US IRA production subsidies, there

way are crucial to unleash high risk/high return ideas⁵⁵. Funding such grants could be the main purpose of the EU Sovereignty Fund proposed by the European Commission⁵⁶.

New joint borrowing may not be needed to fund such EU initiatives. As suggested by the European Commission (2023b), one option could be to re-shuffle EU budget money. Another option could be to make use of the additional grants that will be devoted to the new REPowerEU facility under the RRF, and to blend some of this money with EIB loans and guarantees⁵⁷.

Public funding can be more efficient when leveraging private investments in clean-tech public-private partnerships, with the size of the

technologies by avoiding regulatory costs associated with fragmentation, uncertainty, and bureaucracy. These include regulations that place time limits for decisions at each stage of permitting procedures, a measure that can accelerate developments in areas vital to decarbonisation, thus enlarging clean-tech markets more quickly. For example, in December 2022, EU countries agreed a temporary emergency regulation to fast-track permits for renewable energy infrastructure and grids (Council Regulation (EU) 2022/2577).

Similarly, tighter European standards can foster global competitiveness by demonstrating marketability and attracting investment into firms that comply with standards. One example, agreed by the EU in December 2022, is the introduction of stronger environmental sustainability requirements for all batteries sold in the EU⁵⁸. Another option could be to develop regulatory sandboxes – frameworks for experimentation – to push for quicker development of clean technologies and fast-tracking of the necessary certifications required for placing them on the market⁵⁹. Coordinated use of procurement can provide a larger, more integrated lead market for clean technologies. An efficient EU electricity market design could help to lower energy costs structurally, also for clean-tech manufacturers, with the related competitiveness benefits. Greater use of green public procurement would be particularly important in sectors in which public purchasers make up a large share of the market, including transport and construction (Rodríguez Quintero *et al*, 2019). By introducing sustainability requirements for clean technologies (for instance, by rewarding in tenders the use of electric cars that are produced to certain sustainability criteria, or based on certain innovation or environmental

58. European Council, “Council Regulation (EU) 2022/2577 of 14 December 2022”, 9 Dec. 2022: <https://www.europarl.europa.eu/news/en/press-room/20221205IPR60614/batteries-deal-on-new-eu-rules-for-design-production-and-waste-treatment>.

59. “Regulatory Sandboxes”, European Commission, Directorate-General for Economic and Financial Affairs (2020), <https://www.bmwk.de/Redaktion/EN/Dossier/regulatory-sandboxes.html>. European Commission, “Regulatory Sandboxes”, November 2020; Council Regulation (EU) 2020/16 N, 2020: <https://www.consilium.europa.eu/media/46822/st13026-en20.pdf>.

to European industrial alliances. The establishment in February 2023 of a large-scale skills partnership for onshore renewable energy⁶¹ was a welcome first step.

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In early 2023, the European Commission published a Green Deal Industrial Plan (European Commission, 2023a), intended to leverage the single market and improve the competitiveness of Europe's net-zero industry. Its main plank was a proposal for a Net Zero Industry Act (NZIA) that serves three main purposes.

First, it identifies the net-zero technologies deemed of strategic importance, including renewable energy technologies, batteries, electrolyzers and carbon capture and storage (CCS) technologies. Second, it defines a target for manufacturing capacity of at least 40 percent of the EU's annual deployment needs of these technologies by 2030. Third, it would establish a governance system resting on Net-Zero Strategic Projects (NZSPs) identified by EU countries, and a regulatory framework to facilitate their rapid implementation, including fast-track permitting and administrative procedures, evaluation of public procurement procedures against a 'sustainability and resilience' criteria, and a streamlined process for EU countries to grant aid to accelerate the green transition.

Yet, the design of the governance framework falls short. The NZIA would still rely on the dispersed assemblage of policy tools and initiatives, instead of delivering a systematic green industrial policy. Even more troubling is the how the proposed NZIA prioritises net-zero technology sovereignty and the pursuit of strategic autonomy over efficiency and the imperative of global decarbonisation. The US IRA is a wake-up call for the EU that a more coherent framework and public support is required for the manufacturing and deployment of clean technologies. However, rather than following the paths taken by others, the EU must

European Commission. (2023b) 'Proposal 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
