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Is Green Industrial Policy the Right Choice for the EU?

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Abstract

This paper critically evaluates the European Union's shift towards large-scale green industrial policies. It highlights the risks of government-directed resource allocation, such as inefficiencies, misaligned incentives, rent-seeking, and lobbying. Politicians and bureaucrats at the EU level lack the ability to identify the future industries, products, and technologies for this policy to work effectively. The EU is not designed to operate large top-down interventions successfully. There is a substantial risk that large amounts of resources will be spent on initiatives that ultimately fail. Instead, this paper emphasizes competition- and technological-neutral frameworks, emissions trading systems, and general policy incentives. The paper concludes that a decentralized, market-driven approach is more sustainable for fostering innovation.

Keywords: New industrial policy, green investments, Innovation policy, Mission-oriented policies

JEL Codes: H50, L52, O38, P16

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1. Introduction

Europe faces many challenges linked to the geopolitical realities of the 2020s. Following Russia's attack on Ukraine, Vladimir Putin pursues an increasingly aggressive foreign policy. China has emerged as a new superpower with the ambition to set the agenda for the world's future development—economically, politically, geographically, and militarily. In parallel with this development, the United States, following the election of Donald Trump as president, will continue to pursue an isolationistic and protectionist world policy.

The global context has, in many ways, contributed to the renaissance of industrial policy seen in the Western world during the 2020s. A growing number of countries support targeted policies and argue that government initiatives are essential to foster the introduction of innovations and contribute to the renewal of the economy. Mission-oriented innovation policies—large-scale government programs and centrally directed industrial policies to address well-defined societal goals—are now prominent on many governments' agendas. This idea is not only supported at the national level—the EU has also started to support active industrial policies and intends to launch large-scale projects and initiatives.

The academic discussion on industrial policy has a long history, and its popularity has shifted over time. The idea has been seriously revitalized following the contributions of London-based professor Mariana Mazzucato about the entrepreneurial state and mission-oriented innovation policy in the 2010s and 2020s. The changing geopolitical climate and the environmental challenges the world has been exposed to since her first contribution appeared in print have made her research increasingly popular.

The aim of this paper is to analyze the choice facing the EU by highlighting the problems we see with a large-scale green industrial policy and instead pointing to a better and more realistic path in our view. We argue that the political sector lacks the ability to identify the future industries, products, and technologies for this policy to work effectively. Introducing an extensive support and subsidy system may also distort incentives. The political process opens up to lobbying, and funds may end up in the pockets of special interests. Ultimately, there is a risk that large amounts of resources

will be spent on initiatives that will fail. This problem may be aggravated if support systems are set up at both national and supranational levels.

Many legal and political problems might slow down, hamper, or even prevent the EU from developing in the direction discussed here. Leaving the political and juridical difficulties aside, we will discuss the issues we see with this policy from an economic perspective.

The paper begins by discussing industrial policy and green initiatives in the EU. We then review the potential problems and dangers associated with this policy. After this, we discuss why government intervention might still be needed and conclude by pointing a way forward that is hopefully better and more realistic.

2. The EU, industrial policy, and the Green Deal

When the forerunner of today's EU, the European Coal and Steel Community, was established in 1952, it consisted of six member countries with a well-defined mission centered on cooperation between their steel and coal industries. Over the years, cooperation has deepened and broadened to include more Member States.

In the 2020s, the European Union further raised the level of ambition. The environmental challenges facing the Union also meant that many politicians often highlighted 'green' initiatives as a priority area requiring government intervention.

This development started with the COVID-19 pandemic that spread worldwide in 2020. This plague made EU policymakers fear that many sectors, especially those in the services sector requiring physical contact, would be severely affected. Many Western politicians felt that policy responses in the form of temporary large-scale national aid and subsidies were necessary. However, the EU has a general prohibition on state aid (though some exceptions are allowed) because it can distort competition between companies in different countries of the Union. Already during the 2008 financial crisis, French President Nicolas Sarkozy proposed relaxing state aid rules, but his idea was rejected.

With the COVID-19 crisis, however, policymakers acted differently. The introduction of the first so-called temporary 'crisis framework' (*Temporary Framework for State aid*

measures to support the economy in the current COVID-19 outbreak) allowed EU countries to temporarily derogate from the principle of state aid in order to support the companies and sectors most affected by the coronavirus outbreak. Some support had to be repaid, while others were business transfers. The framework was supposed to be in place until mid-2022, but it was replaced in the same year by another temporary crisis framework introduced due to Russia's war against Ukraine (*Temporary Crisis Framework for State Aid measures to support the economy following the aggression against Ukraine by Russia*). This framework allowed for continued generous support from national governments to businesses. In March 2023, when *the Ukraine Crisis Framework* was due to expire, the EU initiated a new generous exemption from state aid rules through a so-called Temporary Crisis and Transition Framework (*Temporary Crisis and Transition Framework for State Aid measures to support the economy following the aggression against Ukraine by Russia*), which was supposed to support EU countries' transition to climate-neutral economies. The framework was set to last until the end of 2025.[1]

One problem with all the state aid was the skewed distribution between countries. The Commission does not have any official and precise figures on all state aid paid out per member state, but in a policy paper (European Commission 2024), the EU showed that more than 70% of all notified state aid came from Germany and France. Commissioner Margrethe Vestager also stated in a speech in 2023 that up to 80% of all state aid goes to these countries, underscoring that state aid was unevenly distributed within the Union. A dilemma for the EU, especially for smaller EU countries, is that large and rich countries have greater opportunities to support their industries. Providing support from the EU level to avoid the distortions that national funding can create has thus become an issue high on the EU agenda in the 2020s. One idea is to scale up industrial support at the EU level while expanding its scope and targeting green investments to accelerate the transition to a sustainable economy.

Enrico Letta and Mario Draghi also discuss these ideas in two reports, highlighting the challenges and problems faced by the EU (Letta 2024; Draghi 2024). The EU's productivity growth is significantly lower than that of its competitors, and both reports

[1] See, e.g., European Court of Auditors (2024a) for a further discussion about the different frameworks.

argue that the EU risks falling behind if it cannot raise the level of investment in the EU. Private initiatives and investments are not considered sufficient, and they argue that more political initiatives are needed. EU could, here, coordinate, steer, and stimulate the level of investment at the supranational level to address the problems of nationally distorting state aid.

The EU has also already started to combine environmental and industrial policies through various European Green Deal initiatives. The European Green Deal is an umbrella term for the EU's long-term green transition policy. It includes a combination of legislation, regulation, and industrial support through direct grants and credit guarantees. The policy is challenging for the industry, not least concerning the requirement to eliminate carbon emissions. For example, in March 2023, the EU decided to ban combustion-engined vehicles (unless powered by renewable, climate-neutral fuels) by 2035. The goal is also for industries traditionally emitting large amounts of carbon dioxide, such as steel and cement production, to switch to fossil-free alternatives.

To support the business sector in achieving these environmental goals, the European Union has launched large-scale initiatives worth up to €1 trillion over ten years. Two-thirds of this will be direct grants, while one-third will be various types of cheap loans. The support will primarily go to renewable electricity production, such as offshore wind and solar power. In addition, significant targeted investments towards hydrogen are identified as a key technology. For example, 43% of the European Green Deal, €430 billion, is earmarked for hydrogen. The EU's 2020 hydrogen strategy also states that the European Union will promote the use of hydrogen for heating buildings.

Commission President Ursula von der Leyen has referred to the European Green Deal as the Union's equivalent of the moon landing. When French President Emmanuel Macron delivered a noted speech in spring 2024, he also pointed out that the Union faces significant challenges. He called for a large-scale industrial policy that prioritizes domestic industry and uses the single market to assert Europe's interests in the world. In other words, there are plenty of examples of how active industrial policy has received interest and support within the Union.

A dedicated organization, the *European* Climate*, Infrastructure and* Environment *Executive Agency* (CINEA), has also been created to coordinate and help different actors implement green initiatives.

3. Green industrial policy for the EU - a critical review

Industrial policy creates a variety of challenges. However, it may be worth emphasizing that government support and regulation may improve economic efficiency and development. Several examples of successful government initiatives at both national and EU levels exist. The technology to remove sulfur from oil using hydrogen was developed in interaction between the oil industry and the EU. EU legislation was also behind the phase-out of incandescent light bulbs and the introduction of much more energy-efficient LEDs. Fossil fuel drilling in the North Sea was successfully achieved partly due to large EU projects. There are also historical examples of how groundbreaking innovations have been developed through collaborations between the private and public sectors. Ericsson's close partnership with the Swedish telecommunications monopoly—the government agency Televerket—which led to the development of electronic switches and the first generations of mobile telephony in the 1970s and 1980s, is a noteworthy example.

While there are examples of areas where government initiatives have contributed to the development of the economy, the risks of a comprehensive green industrial policy, where the political sector directs vast amounts of resources to specific companies and solutions, may very well outweigh the potential benefits. The problem will be particularly pronounced if detailed resource allocation decisions are made on a significant scale at a supranational level—far from the entrepreneurs' experiences.

In a research anthology from 2024 (Henrekson et al. 2024), we identified several problems with large-scale interventionist industrial policy. These insights can be usefully applied to the EU's extensive environment-related initiatives. Many of the conclusions are related to each other and partly overlap. We summarize these below and provide some illustrative examples.

A common feature of many of the environmental and climate-related problems that the EU intends to address through supranational policies is that they are, in one way or another, what has come to be known as *wicked problems*. The term was introduced by Professors Horst Rittel and Marvin Webber of Berkeley, California, and refers, broadly, to issues that are complex, context-dependent, uncertain, intractable, and span multiple policy domains with different value conflicts (Rittel and Webber 1973). Environmental problems can be considered a typical case of wicked problems because they often have no definitive end solutions, are deeply interconnected with other societal issues, and are usually cut across different parts of society simultaneously.

Several examples from history show that it is difficult, if not impossible, to solve this type of complex problem in any meaningful way by allocating and directing funds "top-down" through political decisions. It is not enough to have genuinely good intentions and abundant public funds. For example, despite good intentions, political consensus, and extensive resources devoted to interventions that were considered to be scientifically sound, the large-scale and centrally managed projects to address homelessness in the United States launched in the 2010s were unsuccessful. The targets set were continually postponed and revised. The cost doubled, but the problems persisted. In the end, the cost of the government initiative amounted to more than USD 13,000 per homeless person per year, which would have been enough to rent apartments to all homeless people and thereby eliminate homelessness.

In the environmental field, the hundreds of billions spent on hydrogen projects in the EU might be another example. During the summer and fall of 2024, several of these hydrogen projects have been stopped. Despite extensive support from the EU, hydrogen projects in Örnsköldsvik and Långsele were terminated in 2024. Similarly, Danish Ørsted has shelved its hydrogen project in Jutland.

In the steel industry, LKAB postponed the development of Hybrit and hydrogen-based sponge iron in 2024. The European head of Arcelor Mittal—the world's second-largest steel producer—said in an interview in 2024 that hydrogen had become too expensive in Europe and was not a realistic option for steel production there—even though the company has received significant EU funding for its hydrogen initiative in Germany.

The doyen of evolutionary and innovation economics—Professor Richard Nelson of Columbia University in New York—argues that many major societal challenges are difficult to address effectively through the historically large-scale government initiatives often referred to in the debate—such as the Apollo and Manhattan programs (i.e., the US moon landing and nuclear weapons development). We believe the same should apply to today's environmental problems, which differ significantly from the earlier projects. These were technically well-defined and delimited, making it relatively easy to finish the projects once they had produced the required results (in terms of technical solutions).

Muldoon and Yonai (2023) argue that advocates of a state-directed mission-oriented innovation policy often assume that bureaucrats and civil servants are unselfish and have no competing interests. While it is likely that both politicians and bureaucrats are not driven solely by self-interest, it would be naïve to assume that decision-makers are entirely free of this. An important starting point in the economic theory known as *public choice* is that policymakers and bureaucrats are also driven by self-interest.

Many case studies of failed government initiatives have also shown that government actors often act out of self-interest rather than for the common good. Unfortunately, political priorities often dominate industrial policy initiatives rather than difficult technological and economic trade-offs. Politicians may decide to invest in what will attract the most attention and votes in the short term—but which may not be optimal from other perspectives. For example, spending large amounts of resources in bad times on building roads and bridges in sparsely populated areas that are not needed is a textbook example of political failure (but all regional infrastructure investments are, of course, not wrong). Many examples of politically stated promises of growth and prosperity have failed, and in retrospect, many failed initiatives appear unrealistic. Critical questions are, however, often absent when these kinds of projects are announced in the media.

Politicians often present their ideas by highlighting and emphasizing the potentially very alarming or severe consequences that could occur if no policy action is taken. In economic psychology, framing an idea in this way is known as presenting the message within a *loss frame*. Since most people, according to behavioral economics, are loss averse and want to avoid negative outcomes, voters will be more willing to accept large

and costly policy projects. The need to weigh the effectiveness and (opportunity) costs of the proposed measures can thus be downplayed. As suggested above, politicians can benefit from these large government initiatives and projects through the positive publicity that such arrangements often generate, which, e.g., can attract voters—even if it may seem a questionable use of public funds to an insider. Schnellenbach (2024) has shown that this type of argumentation method has often been used to facilitate the approval of large-scale political initiatives.

The EU's ongoing investment in hydrogen can again serve as an illustrative example. For hydrogen to be considered a green energy source, it needs to be generated from non-fossil sources and by so-called electrolysis, which involves splitting water into hydrogen and oxygen. The process is demanding and electricity-intensive. Objections to the realism of these efforts have often been met with arguments that it is necessary. The CEO of H2 Green Steel (Stegra), Henrik Henriksson, said that "the planet is burning up," and LKAB's CEO, Jan Moström, said "it must go" when confronted with the lack of realism in these initiatives by the media. These two statements illustrate how industrial policy initiatives may be justified based on a created *loss frame* where fear dominates the discourse.

A more fundamental problem with state-directed industrial policy may be that there is often a lack of relevant knowledge to make it possible to achieve the intended goal via top-down government initiatives. There are no clear pathways to a solution. Many examples of knowledge problems associated with political governance can be given. Waldron and Coyne (2024) show how difficult it is, for example, to build up the economy of developing countries and their political institutions with targeted aid without sufficient information and feedback, which can easily lead to unintended consequences. Other examples include the Brazilian government's attempt to create a thriving domestic shipbuilding industry when the domestic industry did not have the conditions to succeed. Alves (2004) shows how the industry initially flourished, but the politicians underestimated the cost of building skills and capabilities in the sector, which was too high. Attempts to rebuild an industry that had collapsed in the 1970s ultimately resulted in a costly failure.

In 2024, several previously praised green initiatives have faced significant difficulties. One of the most extensive support packages disbursed under the EU's new crisis and transition framework was targeted at Northvolt's plant in Heide, Germany. However, the Northvolt Group faced significant problems in 2024 when the planned factory in Borlänge, which would have provided thousands of jobs, was forced to close. A year earlier, the Social Democrat Karl-Petter Thorvaldsson had pointed to Borlänge, claiming that Sweden was becoming a battery superpower. In late spring 2024, it was also revealed that Northvolt in Skellefteå faced production problems and growing losses. The situation worsened further in the late summer and fall of 2024. Several significant layoffs were implemented, and the company had severe financial problems in mid-October of the same year. Debt and losses then made the situation appear unmanageable.

The example of Northvolt is taken from a partly Swedish context. Still, with future supranational initiatives at the EU level, such examples can illustrate the problems that may arise. It should also be emphasized that Northvolt is a prestigious European project that has received significant funds from the European Investment Bank (EIB).

Many policy decision-makers rarely have the information to effectively and efficiently design large-scale projects. Many problems and difficulties associated with—ever so well-intentioned—large-scale government initiatives are often only discovered after they have been attempted. Even people with a genuine desire to plan or implement initiatives that they believe will benefit society have limited knowledge and skills.

It can also be hard to cancel projects that later prove unsuccessful. Policymakers may continue to spend large sums on failed projects, hoping that additional resources will solve the problem. In economics, this phenomenon is sometimes referred to as *the sunk cost fallacy*, which simply means that it is easy to feel committed to spending more money on already failed investments. Extensive literature has shown the difficulty policymakers have in terminating projects that are performing poorly. A classic example from the political sector is the Anglo-French Concorde prestige project (supersonic airplane), where politicians continued to spend money even though the project was doomed to fail. The term *Concorde fallacy* is also used to describe the inability of politicians to terminate failed projects.

In addition to these problems, interest groups may pressure the political sector to gain various forms of (financial) advantage, known as *rent seeking*. Potent and concentrated interest groups, such as large companies, trade unions, or professional associations, can often use their networks and financial resources to influence policy—often in areas where these stakeholders have an information advantage over the political sector. These actors can then try to influence the design of, e.g., regulations, compensation schemes, and tax structures to their advantage. It may well be that responsible authorities are indirectly controlled by the regulated—rather than the other way around. Rapidly increasing allocations of resources to different areas from the political sector are likely to increase the scope and scale of rent-seeking.

The battery manufacturer Northvolt, discussed above, has received credit guarantees of tens of billions of Crowns. These funds could have ended up in other companies and other countries, but the venture capitalists behind the venture have been more proficient at influencing politics in their favor. In the market for political resource allocation, it is often contacts, lobbying, and cunning that lead to more money and not necessarily the existence of a promising business idea. Holcombe (2018) has written extensively about this problem, analyzing and illustrating what he calls political capitalism. By political capitalism, Holcombe refers to a system of private ownership of companies that make money by extracting resources from the public sector. Resources can be extracted directly through grants and credit guarantees but also through regulations and tariffs. The examples illustrated earlier are not problems linked to Sweden or Germany. Similar problems can arise anywhere in the European Union if governance and resource allocation from Brussels are increased.

If companies can obtain extensive resources by lobbying for more support measures, they have strong incentives to devote themselves to this activity. Less effort can then be spent on producing and delivering valuable goods and services to customers in a competitive market. Under such circumstances, the likelihood increases that companies and organizations will become “subsidy entrepreneurs,” i.e., actors who spend time and effort to benefit from various politically decided benefits in the form of grants and subsidies. Gustafsson et al. (2020) have shown that those companies in Sweden that systematically applied for and received grants and support from the state

tended to have lower productivity. Companies receiving 'free money' for high-risk (technical) projects may become immune to risk, which may result in significant losses for society.

OECD (2021) has also highlighted the risk that large government initiatives may be shaped by the needs of different special interests. As the political sector is rarely omniscient and much information is often local, fragmented, and dispersed across society, policy initiatives must be developed in interaction and collaboration with established stakeholders. Therefore, they will likely have a very strong influence on the (resource allocation) process. As a result, large-scale initiatives tend to favor special interests or institutional entrepreneurs, and policies may focus on areas and industries where there is ample room for lobbying and clientelism rather than on the most socially valuable projects.

However, this issue is more complex, with other aspects to consider. As mentioned in the introduction to this section, there may be good arguments for state intervention. For example, without state aid, the Airbus aircraft type would not have been developed to compete with Boeing, which would have been bad for the EU and the competition in the aircraft industry. However, using this single example as a basis for supporting an extensive expansion of public investments at the EU level is inappropriate.

Illustrative examples of failed technological public initiatives where the state believed it had the ability to "pick the winner" and tried to steer the development in a specific direction can be multiplied. For example, the EU contributed 550 million to Göteborg Energi to try to make biogas from branches and twigs. This latter project ended up costing taxpayers up to SEK 2 billion under the so-called Gobigas project. EU funds were also given to Skellefteå Kraft to build a wind farm, Blaiken Vind. A few years after its inauguration, the company was forced to write down the facility's value by SEK 500 million. In the United Kingdom, the company Britishvolt was launched and praised by former Prime Minister Boris Johnson in January 2022 as part of the country's green industrial revolution. The company received government support, but a year later, it went bankrupt. These investments would not have been made without significant public subsidies, and the resources could have been used for other purposes. Such failures will likely increase if the EU intends to scale up its active industrial policy at the Union level.

The more the political sector plans to invest, the more companies want to benefit from these resources, and the harder it will be for politicians and bureaucrats to find long-term winners (such as Airbus) among all the potential grant applicants.

When a policy decision is taken to implement a particular green initiative, it usually means that significant resources are made available to selected actors in the form of preferential loans, research and development grants, or various subsidies. The availability of these resources will influence the behavior and decisions of the actors. Many (large) companies may systematically exploit such political allocations and become less prudent in their investment decisions, which can lead to increased *moral hazard*. Moral hazard occurs when an actor has an incentive to increase its risk exposure because a large part of the risk is borne by someone else (which, in this case, often means the political sector).

All the risks taken by the management and owners of the aforementioned Northvolt, for example, have been covered by credit guarantees from the Swedish National Debt Office and various EU institutions such as the European Investment Bank. In short, a credit guarantee means that the state does not demand repayment of the loans if the borrower becomes insolvent. The risk is borne by someone other than the risk-taker, which can easily lead to companies being careless about the risks they take. The existence of targeted grants and cheap loans from a central authority can also mean that local politicians are tempted to get involved in technology with limited potential.

In several critical reports, the European Court of Auditors (2024a,b,c,d) has also discussed the aid measures used and approved by the EU. The Court finds numerous problems and systematic shortcomings in the way the money is allocated and used. They also suggest that several improvements need to be made. Based on these reports, it appears that the EU cannot accurately assess what to invest in, does not have the resources to check that the money is spent as intended, and lacks the ability to evaluate whether the investments have been beneficial (i.e., whether the benefits exceed the costs). The EU seems not ready for the comprehensive, active, green industrial policy many politicians started promoting in the mid-2020s. Advocates might argue that conditions today are inadequate, but this approach will work better over time and with increased resources. Until the problem addressed by the European Court of Auditors is

solved, it is, nevertheless, our view that the EU should be restrictive with this kind of policy.

4. The need for government interventions

One might ask why the interest in active, centralized, and selective industrial policy has increased so markedly in the 2020s, considering all the problems we highlighted above. Research and innovation policy has traditionally addressed the market failures associated with new knowledge being a public good. A public good is a good whose consumption is non-excludable and non-rivalrous, meaning that it can be enjoyed by many simultaneously and that it is difficult to prevent actors from using it. New knowledge is also characterized by having positive externalities, which means that the social benefits of new knowledge are greater than the individual benefits for those who produce the knowledge. The traditional view has been that the state should increase the supply of research and technology-oriented activities in society but not control the direction too much. Instead, the choice of technologies and investments should be left to the individual companies and industries, i.e., to the market.

Since the financial crisis of 2008, this view has been challenged by the idea of a more active state. Proponents argue that the state and the political sector need and have the ability to more directly and selectively steer the direction of investments toward what is considered the best for society. Arguments for active industrial policy have often been linked to developing economies in the past, and, according to the proponents, it has been a way for these countries to speed up the catching-up process toward the richer countries. This argument is less relevant for the EU but has been used in an Asian and Latin American context.

Other newer arguments often used by advocates of a more active and selective policy in the EU are linked to the fact that uncertainties and risks are too high for new (environmental) technologies and solutions to be developed without government support. However, transferring the risk to the political sector is not unproblematic. The danger is that the private sector takes on too much risk and that too many private actors

invest money in projects that ultimately are not viable. The problems of moral hazard, discussed in previous sections, are also imminent.

Further arguments for an active industrial policy are linked to developing self-sufficiency in key sectors that may be needed in future wars and crises. State support for agriculture rests partly on this latter argument. The changing geopolitical context of the mid-2020s has also led to the self-sufficiency argument being applied to other sectors, pointing to the value chain vulnerability built up in society following globalization and trade liberalization. The need for enhanced national or European self-sufficiency in key industries and critical areas appears increasingly desirable after the increased tensions in the world after the turn of the millennium. The EU has here launched the concept of "open strategic autonomy" as a European strategy to cope with the vulnerability that a global, liberal, and highly integrated economic system implies.

However, there are also environmental aspects linked to this issue. If the EU has higher climate ambitions than non-EU countries, this may require the EU to use so-called environmental customs duties. With these customs duties, imported goods from outside the EU are subject to tariffs corresponding to the increased cost that higher ecological requirements within the EU imply for the domestic industry. The EU has also introduced a *Carbon Border Adjustment Mechanism* (CBAM) as part of the fit-for-55 strategy.

However, the risks of a protectionist policy of this kind are not insignificant. To begin with, it may encourage lobbying from the industry, which wants to be protected from outside competition. Instead of increasing the speed of transition to a sustainable economy, it could lead to the opposite if the EU is not vigilant. Increased protectionism also risks leading to trade wars and closed borders. Our concerns align with Jarlebring (2024), who underlines the potential for policy entrepreneurs to push through their agendas and the risk of increased international tensions and trade wars. Hassler (2023) is sympathetic to the idea behind environmental cross-border fees but also raises a concern that these arrangements could be used in a way that could be considered a trade barrier.

There are other problems related to international trade between countries. China actively supports its domestic industry with various subsidies and support measures. However, this is not only true of China; the United States is also increasingly investing

public resources in supporting its industry. Behind the acronym IRA (*Inflation Reduction Act*) and a supposed desire to combat excessive inflation lies a plethora of targeted support measures for companies operating in the United States. Given that other economic actors, such as the United States and China, are increasingly adopting a business policy model that includes this active industrial policy, the EU's best response may be to do the same. Both the EU's *Temporary Crisis and Transition Framework* and the *Net-Zero Industry Act* adopted in 2023 can be seen as a response to the US's ambitions in this area, with increased state interventions and heavy spending on various forms of state aid aimed at new technologies and the green transition. The *Net-Zero Industry Act* is part of the European Green Deal and aims to facilitate the green transition within the European Union in various ways.

An alternative to imposing trade restrictions could be to use the same strategy with extensive support for domestic industry to keep jobs, skills, and production within the Union's borders. An objection to our approach is that Europe must do the same as the US and China—subsidizing the national industry—to not lose competitiveness. If the EU adopts this strategy and also directs support towards the green sector and focuses on green investments, advocates of this idea mean that we can both support the economy and facilitate the green transition.

There is extensive academic literature discussing how the EU should best respond to the changing geopolitical landscape, mentioning the same dilemma. For example, Ghauri et al. (2024) argue that the changing geopolitical conditions have made many politicians feel they must use state aid to maintain and create new jobs within the country. The massive increase in state aid around the world is seen as the biggest threat to the liberal and open world order that has been in place since World War II until the outbreak of the COVID-19 pandemic.

The risk with this strategy is, however, plentiful. It may lead to a vicious circle, where states are constantly required to outbid their counterparts to the extent of active support for the industry. The term *state-aid shopping* is sometimes used to describe this phenomenon where large companies try to extract as much aid and subsidies as possible from the political sector in different competing countries. In the end, it is likely that the largest countries will be able to offer the most money. This imbalance between

countries of various sizes distorts competition to the detriment of smaller countries. Placing public investments at the EU level could reduce this form of competition between the member states *within the* Union. However, the race to provide the most extensive support will then instead be between the largest economic blocs in the world economy. In this case, the problem has not been solved—it has only moved to another level.

It is also questionable whether the intra-European competition would be reduced if the lion's share of all public (and green) investments were made at the EU level. The EU must prioritize what it wants to invest in—the EU does not have infinite resources. As a result, different member states would probably try to convince the EU to prioritize the investments that benefit their country most.

In addition, our reasoning in section 3 suggests that these types of initiatives run a high risk of failure. Those who avoid large-scale combined environmental and industrial policy may be more competitive when the initiatives in the next phase work poorly or fail. In other words, large-scale active industrial policy appears to be a risky and poor long-term strategy. Those more restrictive in using subsidies and providing various forms of support to their domestic industry can instead focus on other parts of the economy and buy the rest of the world's subsidized products as inputs. In addition to the problems discussed by the European Court of Auditors, it seems that the entire EU infrastructure would have to be redesigned before even considering engaging in this kind of large-scale active industrial policy at the supranational level.

5. Environmental policies that work

The EU's goal of climate neutrality is a challenge for Europe. Based on the earlier arguments in this paper, we believe that a top-down driven policy will not be the solution. This strategy could lead to a swelling administration where significant resources will be spent on failed projects. Instead of lifting national state aid to the higher EU level and expanding its scope, the development should be reversed. The EU cannot know and should not decide which energy sources and technological solutions will be used in the future.

It is too difficult for politicians and bureaucrats to identify future industries, products, and technologies and steer the economy toward them through extensive support measures targeted at selected venture capitalists, companies, and government institutions. The political sector does not have the competence and ability required to implement this idea effectively. A system is needed where the political sector is not expected to spend resources on specific investments that are difficult to reverse and later may turn out to be malinvestments that generate significant losses for the state. One should strive for a competition-neutral system where politicians are not required to select future technological solutions in what might be (or not be) future industries. This conclusion also aligns with Sjöholm (2023), who states that it is highly uncertain whether the EU possesses the competence required for a comprehensive and active industrial policy to successfully steer development forward appropriately.

A global, well-functioning emissions trading system involving all nations must form the foundation for environmental problems related to climate change. Regulations and rules should be neutral, not distorting private initiatives, but environmental pollution must be priced. Many companies constantly test new products and services or try to imitate and improve existing ones. Creating an institutional framework that rewards and facilitates this process is essential. This approach lacks grandeur, and it will not be possible to say in advance exactly which final solution(s) will address the environmental problems because politicians have not chosen a specific solution to focus on.

Hence, politicians should strive to introduce a well-functioning emissions trading system that provides private economic incentives in line with the total cost of society,

taking into account the environmental effects. With such a system in place, it would be possible to reduce the need for direct government green investment support to private actors. Hassler (2023) also states that one can be more restrictive with centrally controlled public investments if and when one has a functioning emission trading system in place.

As mentioned earlier, the traditional view in economics is that knowledge generation and innovation may need policy support due to the existence of positive externalities and public goods. However, support measures should be deployed in a more general and technology-neutral way that does not distort incentives. One idea is to use various research and development tax credits instead of grants. This support system need not distort competition like targeted grants because they are not targeted at specific firms or technologies. They require less public administration and, if properly designed, need not distort companies' risk calculations. Critics would argue that targeted subsidies are needed and were necessary, for example, for Denmark to become a world leader in wind energy and Spain in solar energy. However, both these energy sources are still struggling to stand on their own feet in the mid-2020s, and it is arguable whether these are actually examples of successful investments.

Long-term investments in the underlying infrastructure are also needed to facilitate the industry's transition and willingness to invest. Europe needs to build better transmission capacity and grid infrastructure, and investors must be confident that sufficient electricity is available *when* and *where* it is needed. Other, often recurring suggestions are to shorten lead times and permitting processes (deregulation) and increase transport capacity within the Union. The scope for increased and perhaps coordinated basic research might also be an issue on the agenda. In addition, a significant political risk makes investors reluctant to make large and substantial investments. Political whims and a sudden enthusiasm for a particular solution can quickly turn into the opposite. Transparent, neutral, and long-term stable rules are needed.

Conventional environmental policies such as taxes, fees, and outright bans have worked relatively well in Europe. Greenhouse gas emissions in EU countries have decreased by 29% between 1990 and 2021. 24 out of 27 countries have seen a decrease, while the Union's GDP has increased by 62%. This reduction means that emissions per unit of GDP

have fallen in all Member States. The results are also true if you look at consumption-based emissions. These have fallen by 27% since 1990, and there has been a reduction in 22 out of 27 EU countries. Air pollution has also fallen in the EU. 25 of the 26 pollutants the EU measured from 1990–2021 have decreased. The average reduction for these is 61%, and in relation to GDP, which increased significantly over the period, the reduction is 76%.

This development gives some hope, but it is essential to underline that it has not happened by itself. Profit-maximizing companies need to economize on their resources as this ultimately reduces costs. To the extent that pollution causes environmental harm, taxes, legislation, and bans need to compensate in various ways for the failure of the market mechanism to work fully. The EU has played an important role here. EU's environmental legislation has helped to phase out toxic substances over time, and there is much to learn from the developments that have taken place over several decades.

Finally, the close-down of nuclear power plants that we have seen across the Union, such as Germany (as part of their strategy called *Energiwende*), should be mentioned. In retrospect, this strategy appears less successful, and Emblemsvåg (2024) has shown that it would have been better (both from an environmental and economic point of view) to keep or even expand nuclear power in Germany. Electricity supply and nuclear power could be issues that could be raised at the EU level. However, nuclear power is also associated with risks (for example, the risk of accidents), and we leave it to others to conduct a deeper analysis of this issue from an EU perspective.

6. Conclusions

This chapter has highlighted how industrial and environmental policies have converged in the EU. Environmental policy is no longer just about managing emissions through taxes, regulations, and prohibitions. Environmental policy is also about initiating and pushing through large-scale state-sponsored industrial investments. This idea is not unproblematic. Instead of allowing the state aid that has expanded in recent years among the member states to be lifted and continue to grow at the EU level, we propose

that the EU return to the pre-pandemic situation with a restrictive approach to state aid for specific companies, industries, and countries.

There have, of course, been examples of successful government ventures and initiatives, and we do not suggest that everything politicians are involved in is bad or will fail. The changing geopolitical environment has also strengthened the case for greater state involvement in the economy. However, we believe there are significant risks with large-scale industrial policy. As our paper has shown, allowing the political sector and its bureaucracy to expand and control the direction and development of the economy at the EU level is not without its problems—regardless of whether its proponents have good intentions and want to respond to future challenges.

Our overall assessment based on our own and others' research suggests that the EU should refrain from building up an extensive Union-level administration that tries to mandate a green transition in a specific direction. It is difficult to successfully identify where and how increased public funds should be spent and who should have access to them. As our paper shows, this may fail because it requires too much from the political sector. Knowledge, incentives, and skills at the EU level are not designed to operate this form of political capitalism successfully. Cheap loans and large grants might also lead to recklessness about the risks that a company is willing to take. We see how companies are set up to apply for funds, which leads to distorted and unfair competition. Moreover, large industrial subsidies are rarely technology-neutral. If a specific company with a distinct technology receives billions in targeted subsidies, this money will crowd out other technological developments.

An alternative way forward is to focus on legislation and getting a well-functioning and comprehensive emissions trading system in place. Traditional environmental policy, with outright bans and phase-outs of environment-related toxins combined with a price on pollution, is a conventional path well worth building on and adapting to the future. Such policies have served the EU relatively well in recent decades. For example, as mentioned earlier in this paper, 25 of the 26 air pollutants measured by the EU from 1990-2021 have decreased. Several of these pollutants, such as lead and sulfur dioxide, have fallen by more than 90%. This decline has been achieved through a combination of legislation and technological developments. Policymakers have often led the way but

have also acted in harmony with industry, which has managed to keep up and develop cost-effective alternative solutions.

If additional incentives are needed to speed up development, general deductions should be used as much as possible instead of targeted grants. Grants are rarely technology-neutral. They are also subject to administrative costs that large companies can usually only afford and are therefore incompatible with free and open competition. Specific deductions for various forms of development work on environmental improvement technologies are a way forward that is more compatible with both technology neutrality and competition neutrality.

The choice and shaping of sectors, industries, products, and technological solutions through exploration, experimentation, and selection should, as far as possible, be left to the individual private producers and consumers in the market. Potential solutions must be allowed to compete in a free market with a technology-neutral regulatory framework without favoritism via political actors and interventions. In our view, the geopolitical and environmental challenges facing the EU have, with few exceptions, not changed this conclusion.

References

Alves, A. C. (2024). “The Cost of Missions: Lessons from Brazilian Shipbuilding.” In M. Henrekson, C. Sandström, & M. Stenkula (Eds.), *Moonshots and the New Industrial Policy: Questioning the Mission Economy* (pp. 169–189). Cham: Springer.

Draghi, M. (2024). *The Future of European Competitiveness: A Competitiveness Strategy for Europe*. Brussels: European Commission.

Emblemsvåg, J. (2024). “What if Germany had Invested in Nuclear Power? A Comparison Between the German Energy Policy the Last 20 Years and an Alternative Policy of Investing in Nuclear Power.” *International Journal of Sustainable Energy*, *43*(1), Article 2355642.

European Commission (2024). *The Use of Crisis State Aid Measures in Response to The Russian Invasion of Ukraine (Until End-June 2023)*. Brussels: EU.

European Court of Auditors (2024a). *Absorption of Funds from the Recovery and Resilience Facility.* Special Report 13. Luxembourg: EU.

European Court of Auditors (2024b). *Green Transition*. Special Report 14. Luxembourg: EU.

European Court of Auditors (2024c). *State Aid in Times of Crisis*. Special Report 21. Luxembourg: EU.

European Court of Auditors (2024d). *Double Funding from the EU Budget*. Special Report 22. Luxembourg: EU.

Ghauri, P. N., Oxelheim, L., & Randøy, T. (2024). “The Changed Geopolitical Map: Implications for International Business Policy in a Sustainable Finance Perspective.” In P. Gugler & A. Tavares-Lehmann (Eds.), *Handbook of International Business Policy* (pp. 170–189). Cheltenham, UK and Northampton, MA: Edward Elgar Publishing.

Gustafsson, A., Gustavsson Tingvall, P., & Halvarsson, D. (2020). “Subsidy Entrepreneurs: An Inquiry into Firms Seeking Public Grants.” *Journal of Industry, Competition and Trade*, *20*(3), 439–478.

Hassler, J. (2023). *46 förslag för klimatomställningen i ljuset av Fit-For-55*, Stockholm: Regeringskansliet

Henrekson, M., Sandström, C., & Stenkula, M. (Eds.) (2024). *Moonshots and the New Industrial Policy – Questioning the Mission Economy*. Cham: Springer. doi.org/10.1007/978-3-031-49196-2

Holcombe, R. (2018). *Political Capitalism: How Political Influence is Made and Maintained*. Cambridge, MA: Cambridge University Press.

Jarlebring, J. (2024). “Betydelsen av EU:s marknadsmakt i en geopolitisk värld.” In B. Lundqvist, A. Michalski, & L. Oxelheim (Eds.) (2025). *Den nya geopolitiska kartan och EU:s vägval* (pp. 33–59). Stockholm: Santérus Förlag

Letta, E. (2024). *Much More Than a Market. Speed, Security, Solidarity. Empowering the Single Market to Deliver a Sustainable Future and Prosperity for All EU Citizens*. Brussels: European Commission.

Lundqvist, B., Michalski, A., & Oxelheim, L. (Eds.) (2025). *Den nya geopolitiska kartan och EU:s vägval*. Stockholm: Santérus Förlag

Muldoon, J., & Yonai, D. K. (2023). "A Wrong but Seductive Idea: Public Choice and the Entrepreneurial State." *Journal of the International Council for Small Business*, *4*(4), 351–361.

OECD (2021). "The Design and Implementation of Mission-oriented Innovation Policies: A New Systemic Policy Approach to Address Societal Challenges." OECD Science, Technology and Industry Policy Papers, No. 100. Paris: OECD.

Rittel, H. & Webber, M. (1973). "Dilemma in a General Theory of Planning." *Policy Sciences*, *4*(2), 155–169.

Schnellenbach, J. (2024). "A Behavioral Economy Perspective on the Entrepreneurial State and Mission-oriented Innovation Policy." In M. Henrekson, C. Sandström, & M. Stenkula (Eds.), *Moonshots and the New Industrial Policy: Questioning the Mission Economy* (pp. 61–76). Cham: Springer.

Sjöholm, F. (2023). "Gränsernas återkomst i världsekonomin: Ett EU-perspektiv." In A. B. Engelbrekt, A. Michalski, & L. Oxelheim (Eds.), *EU:s inre och yttre gränser i en konfliktfylld värld* (pp. 57–80). Stockholm: Santérus Förlag.

Waldron, K. & Coyne, C. J. (2024). "You Can't Develop What You Don't Know: The Realities and Limitations of Foreign Aid Missions." In M. Henrekson, C. Sandström, & M. Stenkula (Eds.), *Moonshots and the New Industrial Policy: Questioning the Mission Economy* (pp. 191–212). Cham: Springer.

Wennberg, K. & Sandström, C. (Eds.) (2022). *Questioning the Entrepreneurial State: Status quo, Pitfalls, and the Need for Credible Innovation Policy*. Cham: Springer.