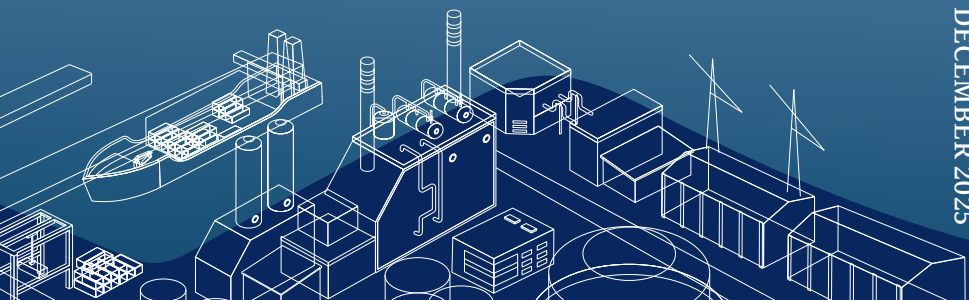
INSTITUT Montaigne

Dunkirk

A Testing Ground for European Industrial Renewal



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REPORT - December 2025

Dunkirk

A Testing Ground for European Industrial Renewal

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Foreword

Over the past three years, approximately four billion euros of French and European public funds have been allocated to the industrial renewal of Dunkirk. The stated objective is clear: make Dunkirk a testing ground for European industrial renewal, one in service of the environmental transition, green technologies, and regional competitiveness.

This monograph on Dunkirk and its surroundings seeks to provide a first progress report of this ambition. It allows us to both examine how local, national, and European public policies have been coordinated to support such a project and to draw key lessons.

The first lesson concerns the concentration of resources on a single territory and their synergies: land, infrastructure, procedures, and taxation. Everything must contribute to the speed of execution and the coherence of the project, both at the industrial level and in social and political terms. The second focuses on conditions of competitiveness: low-cost energy, risk management sufficiently anticipated upstream and administrative promptness—whether in proposing investments, issuing permits, or connecting networks. The third concerns governance, local, of course, but above all European, so that on-the-ground efforts are not undermined by the overarching principles of free trade and to ensure economic security strategies fully justify hard-won public investments.

Dunkirk has become the symbol of a proactive approach needed for European industrial renewal. It is a gamble that has not yet been won and illustrates the difficulty of reconciling, on the one hand, French competitiveness, European governance, and global aggressiveness, and, on the other, of sustainably investing in decarbonized sectors that remain too immature within an economic and political context that lacks long-term clarity.

Marie-Pierre de Bailliencourt,
Institut Montaigne's Managing Director

Executive summary

The European economy is stalling, its industrial power is faltering, its international influence is being called into question, and its environmental transition agenda is being challenged. Against this backdrop, this in-depth study of a region at the intersection of all these challenges offers valuable insights for rethinking public policy.

1. DUNKIRK, A FLAGSHIP PROJECT FOR ECOLOGICAL AND INDUSTRIAL TRANSFORMATION AT THE INTERSECTION OF LOCAL, NATIONAL, AND EUROPEAN SCALES

Today, Dunkirk is at the forefront of industrial revitalization efforts in France and, more broadly, in Europe. Two emblematic dynamics are at work: on the one hand, the decarbonization and transformation of traditional heavy industries, and on the other, the establishment of new industrial sites around the construction of a battery value chain. The energy transition and reindustrialization of France and Europe are unfolding through these dynamics, thus reducing the external dependencies that constrain our strategic room for maneuver.

ArcelorMittal and Aluminium Dunkerque (which together employ 4,000 people across the territory) have invested roughly €4 billion in the decarbonization of their local sites while benefiting from nearly €1 billion in public aid. These sites alone account for 40 percent of national steel production and two-thirds of aluminum production;[1] they also generate more than 15 percent of industrial carbon emissions in France. At the same time, connected to northern France's historic automotive industry ecosystem, Dunkirk is now at the heart of ambitions to develop a "Battery Valley." Four projects are currently under development in the region:

[1] *Two-thirds of primary aluminum production and one-third of total production (including recycled aluminum).*

- Upstream in the value chain, Orano and XTC are planning together to set up two factories to produce battery components and assemble battery cells.

- These factories are intended to supply, in particular, two gigafactories (battery production and assembly) that are currently under development: one by Verkor, which plans to produce 16 GWh of lithium-ion cells per year starting in 2026, and one by ProLogium, which aims to produce 48 GWh of solid-state batteries. Together, the gigafactories should be able to equip nearly one million cars per year.

- Conceived from the outset in connection with the installation of the gigafactories, the Suez project completes the value chain with downstream activities as part of a circular economy approach. It plans to set up a battery dismantling plant intended to process 200,000 batteries per year; a second recycling plant could also be built on site. In addition, Orano/XTC is also planning a battery recycling plant.

These projects are at very different stages. The Verkor plant is almost complete, while construction on the ProLogium and Orano plants is not expected to begin until 2026. The launch of the Suez site, meanwhile, has been postponed until after 2025. In total, these investments in the battery sector in Dunkirk are expected to exceed €9 billion, of which approximately €3 billion is financed by public aid (regional, national, and European). They are expected to create at least 5,000 direct jobs.

These companies all agree on their reasons for choosing Dunkirk: the availability of serviced land, abundant access to carbon-free electricity, a region situated at the intersection of European industry and rich in logistics infrastructure, the crucial involvement of the local authorities, and support from the public authorities at the national level (including financial support). This last point emerged in all interviews with local

stakeholders conducted during the preparation of this report: Dunkirk's industrial dynamic benefits from the support of all public stakeholders working together, backed by local public opinion that is supportive of industry, which is perceived as an integral part of the local identity.

However, Dunkirk still faces many challenges and risks in pursuing its renewed industrial ambitions. Energy prices are a major concern for all projects. International competition distorted by state capitalism in China, which heavily subsidizes its green energy sector, is a threat that could worsen in the absence of a political response commensurate with the stakes. Sustainable access to a skilled workforce is a constant challenge, and all stakeholders in Dunkirk's transformation believe that an adjustment to public policies is needed to achieve this. Changes to the European carbon market regulatory framework are a source of both concern—regarding the disappearance of free emissions allowances—and hope, regarding validation of decarbonization efforts. At the same time, the emergence of a European demand-based policy, through sustainability criteria or European preferences in public procurement, could be an important determinant of Dunkirk's success. However, this option is currently only at a preliminary stage of debate and design, in contrast to China, which is making full use of it to provide its national players the scale they require to conquer international markets. Added to these are ongoing difficulties, notably the slow pace of administrative procedures, particularly for environmental issues, as well as cumbersome and complex applications to access essential French and European public funding to support these projects.

2. THE IMPORTANCE OF CONCENTRATING NATIONAL AND EUROPEAN INDUSTRIAL POLICY RESOURCES IN SPECIFIC AREAS

Between the creation of a Battery Valley and the decarbonization of its historic heavy industries, Dunkirk is at the forefront of next-generation industrial development. The convergence of these political ambitions and the multiple forms of support that accompany them—in a region that has, in many ways, been devastated by the deindustrialization of recent decades—make it an exceptional testing ground for the industrial changes that are currently underway. The lessons that can be learned here resonate strongly with local, national, and European public policymakers alike.

Several of the strengths of the Dunkirk industrial area mentioned above are prerequisites for the success of French and European industrial ambitions. The Dunkirk case study also highlights a factor that is essential if reindustrialization efforts are to succeed: the importance of concentrating resources in one geographical area, i.e., a cluster-based approach. Dunkirk's industrial dynamism is thus based on local political will in line with national and European levels. It is reflected, among other things, in land-use planning and appropriate project support and employment policies. Such policies respond to a specific context and would lose their effectiveness if generalized.

In a particularly competitive and increasingly globalized industrial economy, such a proactive approach requires alignment among industrial, political, and administrative actors. Beyond individual, partisan, institutional, and corporatist interests, the willingness to "work together" is a marker not only of this shared strategic ambition but also of the day-to-day operational commitment to supporting projects that contribute to it. Synergies between different projects are a key factor in their respective successes.

The mass effect (the cumulative impact achieved by concentrating multiple related projects and policies in one region) plays a role in ensuring consistency between the various public policies related to reindustrialization. This enables the region to put to good use its expertise and assets to serve certain industrial sectors and support their success: training programs tailored to industry needs; services to address the shortcomings of the workforce; administrative services acquainted with industrial issues; supporting the long-term development of industries through the establishment of nearby research centers, etc.

The fact that a shared vision in an environment of strong trust is a determining factor for success makes the case for an industrial policy vision refocused on regional and sectoral clusters—in contrast to the dominant European approach, which favors equalization between regions and tends to spread resources too thinly.

3. THE SUCCESS OF DUNKIRK? A TIPPING POINT

There are several urgent reasons why a renewal of industrial policy in Europe is necessary. The first is the need to advance our economies' environmental transition in the face of climate change. Second, we need to reduce our external dependencies in the context of increasingly brutal globalization. Finally, we need to bring our economic decline and territorial disintegration to a halt. On the initiative of France and Germany, Europeans started to make this industrial policy shift shortly before the COVID-19 pandemic, with the Green Deal and then the Clean Industrial Deal spearheading these new ambitions.

The revival of European industrial willpower—which was already fragile—has been hit by a series of shocks of exceptional magnitude. The sharp reduction in the availability of Russian gas has permanently driven up the price of energy in Europe compared to the rest of the

world. The U.S.' aggressive approach to trade, via massive subsidies to green industries under Joe Biden and customs barriers under Donald Trump, has severely affected European prospects in its main export market. Finally, the rapid emergence of a world-class industrial base in China in a number of industries, coupled with massive subsidies and overcapacity, challenges industrial production around the world, particularly in Europe.

Despite a genuine but belated commitment, industrial policies in France and Europe still risk failing to deliver the expected returns on investment. In Dunkirk, more than €4 billion in public investment is already at stake—to say nothing of the indirect exposure and economic and social damage of potential failures.

If these efforts to bring about an industrial revitalization in Dunkirk were to fail, despite the many advantages mentioned above, the consequences for both France and Europe would be heavy. The credibility of our entire industrial capacity would be called into question and, even more so, our ability to withstand the fierce industrial competition brought by the new phase of globalization. Our ambitions for strategic autonomy would also be severely affected. More generally, public support for a decarbonization agenda, which cannot be achieved simply by closing down our industries, would undoubtedly be weakened. Dunkirk invites us—and at the same time obliges us—to identify room for maneuver at the national and European levels to further accelerate the path to reindustrialization.

At the national level, it is important to take action in the following four priority areas:

- Clarifying energy policy, particularly with regard to the role of French energy players.
- Strengthening skills in industrial professions, which must also be developed and coordinated with existing regional clusters.

- Simplifying and introducing more flexibility in our regulatory framework by shortening implementation and certification timelines or even considering location-specific policies and supports to help areas with concentrated industries and important strategic projects thrive.
- Reducing production taxes, which remain a specifically French burden on the national production.

At the European level, it is important to take action in the following areas:

- Ensure a reduction in the energy price differential for manufacturers compared to other major regions of the world. The recently established flexibility in terms of direct support for energy-intensive industries and decarbonization projects must be further exploited and, above all, financed.
- Concentrate financial support: Underinvestment by the public and private sectors (compared with our non-European competitors, particularly China) and the fragmentation of national and European financing instruments lead to a sub-optimal dispersion of efforts, while their cumbersome nature adds constraints, delays, and complexities that are out of step with the pace of global developments. The obvious response to this is to move to a new approach that concentrates public efforts and support in targeted regions.
- Existing European policies must be adapted to the new industrial objectives. Far from being limited to the targeted easing of state aid rules, competition policy must go beyond just the European market and focus more actively on global competitors. At the same time, trade policy, along with establishing preferential treatment for European producers in public procurement and publicly funded projects, must help stabilize market prospects across Europe for critical industrial sectors.

Recommendations

Recommendation 1

Establish priority areas for industrial recovery based on access to land, support for infrastructure construction, tax exemptions, and bureaucratic relief.

Building on the French "Territoires d'industrie" *(Industrial Territories)* initiative, a public policy launched in 2018 and renewed in 2023, that certified 183 French territories, this report recommends, in order to go further, faster, and with greater impact, **entrusting the prime minister's office with identifying a dozen of these priority areas in mainland France and its overseas territories on which to focus efforts and develop special administrative and tax regimes**.

In close cooperation with the Ministry of Industry and drawing on local authorities' knowledge of industrial ecosystems, **a strong signal should be sent to local stakeholders about the priority given to value creation and industrial job creation** and about its commitment to **accelerating the upgrading of the necessary infrastructure and simplifying the administrative and regulatory implementation of projects**.

The establishment of priority areas for industrial recovery would be based on spontaneous local industrialization initiatives and support them retrospectively through tax and bureaucratic relief or relevant *ad hoc* measures.

To this end, it is necessary to think on a European scale—on the one hand, convincing the European Commission and other Member States of the relevance of this type of territorial concentration and, on the

other hand, being able to rely on robust supply chains within the European market. Indeed, an integrated approach at the continental level would secure such an organization in the long term by strengthening industrial complementarities and market synergies.

Recommendation 2

Promote a project-based organizational model for the end-to-end administrative assistance of industrial projects and related local infrastructure and development plans.

In Dunkirk, coordination between the Port *(Grand Port Maritime de Dunkerque)* and RTE *(Electricity Transport Network)* with the Urban Community of Dunkirk (CUD), supported by the sub-prefect, enabled them to play a structuring role in land planning ahead of the implementation of various industrial projects, by anticipating needs and coordinating actions ahead. This success argues for the widespread adoption of these best practices at the national level.

It is therefore necessary to take the following actions:

- Align the region's assets with the essential needs for the success of the projects in terms of infrastructure, training, and service support.
- **Identify, in each priority area, the players necessary for its success**. Local specificities are essential to defining the strategy, and industrial and administrative players must be able to align themselves under the leadership of an industrial champion.
- Enable manufacturers to bring their R&D closer to production areas by facilitating the financing and pooling of regional multi-sector laboratories and test benches. In the case of Dunkirk, such an approach could be led by the Dunkirk Campus of the Université Littoral Côte d'Opale.

- In line with a "clustering" approach, prioritize rapid connections to the electricity grid for sites to be industrialized and develop large-scale energy storage capacities there.
- Encourage all local stakeholders to submit **a list of recommendations for administrative and regulatory simplification** to the State via the prefecture in order to accelerate the development of identified industrial projects. The **prefecture can play a major role in identifying the key conditions for success** and coordinating closely with the stakeholders involved in territorial decentralization, particularly the regions and Chambers of Commerce and Industry.

Recommendation 3

Create a specific tax regime for these industrial clusters, especially by reducing production taxes.

Our study of industrial revitalization projects in Dunkirk highlights the priority importance of stabilizing corporate taxation and continuing to reduce production taxes. Despite the efforts begun in 2017, France remains at a disadvantage compared to its European partners.

Industries, due to their large land holdings, are particularly affected by property tax, and a reduction or exemption from this tax would encourage them to set up in the region. Beyond the immediate financial effect, measures targeting skilled and expert salaries could improve the region's ability to attract talent with competitive salaries: An exemption from employer contributions on these salaries would help break out of the low-wage trap, motivate skills training, and attract new talent. Other tax levers, such as a reduction or elimination of the C3S (corporate social solidarity contribution), are also avenues to explore to strengthen the establishment and development of industrial clusters.

Recommendation 4

Guarantee long-term access to secure, carbon-free, and competitive energy.

Access to affordable and stable electricity is the primary concern for industrial companies in the Dunkirk area. In this context, and within the framework of the European market, it is necessary to take the following steps:

- **In France, clarify the government's strategic objectives and priorities in terms of energy policy**—which should be addressed by the draft Multi-Year Energy Program (PPE 3), due to be published this year. It is necessary to clarify the role and objectives of EDF, between profitability and priority for industrial development, which must concretely lead to an increase in nuclear production allocation contracts (CAPN) between EDF and "highly electro-intensive" industries.
- **In Europe, encourage futures markets to reduce dependence on short-term markets, thereby guaranteeing stable and competitive electricity prices for manufacturers**, in particular through long-term contracts such as Power Purchase Agreements (PPAs) or Contracts for Difference (CfDs).
- **In the medium term, reduce the share of fossil fuels in the electricity mix in order to better control electricity prices**. This would require the following actions:
  - Continuing efforts to shift a significant portion of energy use to electricity to replace fossil fuels.
  - Supporting the revival of new nuclear reactor construction in France (which will only be able to meet additional demand in fifteen to twenty years' time).
  - Supplement this plan with a policy focused on faster development of renewable energies.

- **Take advantage of the political structuring around clusters to keep pace with the growth in demand for carbon-free electricity**. When this demand exceeds the available nuclear supply, respond to it with the simultaneous deployment of renewable capacities.
- In conjunction with this accelerated development of renewable energies (intermittent and decentralized), accelerate and amplify investments in networks and energy interconnections at the European level to facilitate grid balancing, increase flexibility, and make consumption more predictable. This also includes the issue of storage in industrial clusters. These clusters encourage the establishment of carbon-free industries, thereby creating demand. It is also necessary to anticipate future energy storage needs and install large-scale storage infrastructure.

Recommendation 5

In order to create the conditions for a project-based approach, the government must implement a state-backed risk guarantee system, for example by instructing Coface (Compagnie française d'assurance pour le commerce extérieur, a major trade credit insurance company) or an equivalent body to pay particular attention to this.

In Dunkirk, several decarbonization projects using new technologies are struggling to get off the ground or have been abandoned. This is particularly the case for the Heat Highway and other projects involving waste heat recovery, hydrogen, and carbon use and storage. There are two reasons for this: the lack of risk-taking by project stakeholders faced with economic uncertainty and insufficient guarantees and support mechanisms.

Recommendation 6

Strengthen the adaptation of training systems to the objectives of reindustrialization.

In the collective imagination, industry remains associated with arduous work. Reindustrialization requires a change in these perceptions through communication and education aimed at specific target audiences (young people, women, etc.). Again, in line with the cluster approach, these educational initiatives should be organized at the local level, in conjunction with the industries in each region, with a view to aligning the region's resources and assets with the needs of its industry. In Dunkirk, for example, this has resulted in the organization of open days at factories, collaborations between industries and schools, trade shows for the general public, etc. At the national level, the need to retrain the workforce requires strengthening the attractiveness of scientific and technical training in early education, in a manner adapted to the new needs of industry, and encouraging lifelong learning in these fields. This is a key element of a genuine industrial policy strategy, giving French and European citizens the skills they need to achieve their ambitions. Reindustrialization must go hand in hand with greater social inclusion through opportunities for education, lifelong learning, and well-paid, high-quality jobs. Regional industrial clusters have an essential role to play in implementing this policy.

Recommendation 7

Work towards better alignment of European competition and territorial cohesion policies with industrial policy objectives.

The European Union tends to favor economic harmonization among its Member States, a choice guided by the legitimate requirement of fairness but which results in a territorial cohesion policy that spreads resources too thinly at the expense of effectiveness. It thus steers its policies with a view to catching up on development delays in certain regions rather than reorienting them toward strategic industrial projects capable of mitigating its economic fragilities and dependencies. This involves, in particular, reorienting the ERDF, the European Regional Development Fund (€9.1 billion for France in the 2021–2027 budget), toward industrial projects in territorial clusters. The case of Dunkirk shows the importance of aligning territorial cohesion policy with industrial policy objectives, an alignment that also applies to competition policy.

Indeed, **the difficulties encountered by several actors and businesses in the Dunkirk area highlight the need to broaden the scope of exemptions from European competition law for IPCEIs**. It is not only necessary to clarify the objectives that allow for exemptions. There is also an urgent need to introduce a more permissive interpretation of the types of projects that can benefit from exemptions. **Projects that can reduce proven European dependence or promote the resilience of critical value chains should be assured of their eligibility for exemptions from the IPCEI state aid regime, which is currently limited by an innovation criterion**. This IPCEI framework must be mobilized in favor of these territorialized industrial clusters. In the same vein, the expansion of aid authorizations provided for in the new European Clean Industry State Aid Framework (CISAF) would benefit from incorporating a territorial approach. In addition, competition law should be amended

so as not to hinder the emergence of European champions in sectors where critical mass is achieved on a continental scale.

Recommendation 8

Beyond the Industrial Accelerator Act (IAA), create an "investment shock" for European industry through dedicated labels and tax incentives.

The Dunkirk study demonstrates the relevance of the conclusion of the 2024 Draghi Report on the need for an investment shock in Europe, which is the only way to overcome the asymmetries with China and the United States. The instruments for European reindustrialization are undergoing a complete overhaul at the level of the Commission and the Member States: European preference in public procurement, reflection on the development of the Capital markets Union, preparation of a second Chips Act, refocusing of the European budgetary framework on industrial issues, etc.

In the wake of the adoption of the Clean Industrial Deal in early 2025, new tools are being developed to this end. The Industrial Accelerator Act (IAA), scheduled for adoption early next year, aims to stimulate demand by introducing low-carbon criteria into public procurement for heavy industry decarbonization and green industry projects. European local content criteria are also being considered, which is highly desirable in order to stimulate demand and promote clusters. Measures to support Member States in planning and implementing environments conducive to industrial clusters are planned but with the main objective of maximizing the effectiveness of the transition. This should be an important step in the European institutions' recognition of the need to act by concentrating support geographically in the areas best placed to strengthen Europe's industrial competitiveness and resilience.

However, it is necessary to go further. While waiting for agreements on the European capital markets union, which are still uncertain, a few immediate measures can be considered:

- Place European resilience and competitiveness criteria at the heart of European industry support mechanisms, similar to the approach currently being taken with regard to the criterion of industrial projects' usefulness to the energy transition.
- Establish an EU tax refund system—a cash rebate system that reimburses businesses after they have made investments, similar to tax credits but within the framework of EU subsidies.
- Create a "resilience" label for priority projects, potentially backed by preferential treatment, in addition to the "low carbon" label currently in preparation.
- Encourage the convergence of existing national and European financing instruments through a reform of the IPCEI, with a view to simplifying procedures, broadening eligibility criteria based on resilience and competitiveness, and allocating European budgetary resources to support national state aid.

Recommendation 9

In the face of international competition, better adapt European trade policy to industrial and resilience imperatives by mobilizing economic security instruments in a strategic and coordinated manner.

European industries, and in particular industrial ecosystems such as Dunkirk, are bearing the brunt of global trade dynamics: massive distortions of free competition, expansion of Chinese capacity in strategic segments of value chains (particularly batteries), US policy aimed at imposing asymmetric agreements, increasing acts of economic

coercion, tensions over critical supplies, and persistent weakness in European domestic demand.

These trends are creating major uncertainty about the viability of industrial projects, given distorted international competition and a multilateral framework that is losing its regulatory capacity. The French government must focus its political action within the EU on three areas:

- **Mobilize European trade defense instruments in a more coordinated and strategic manner**. Existing instruments (anti-subsidy, anti-dumping, safeguard measures) are currently used sporadically and on an ad hoc basis. They must be deployed in the service of a coherent strategic agenda for the protection of European industry, in a methodical manner and with a carefully considered timing so that the sequence of procedures has maximum impact. To achieve this objective, it is necessary to speed up the procedures for initiating trade defense instruments by strengthening the European Commission's investigative capabilities.

- Mobilize targeted economic diplomacy to secure critical supplies. The new European trade policy instrument (Clean Trade and Investment Partnerships) is a promising tool that is currently being tested in negotiations with South Africa. It can be used to conclude simplified agreements focused on critical materials, resilience issues, and Europe's industrial interests. They should be used to build structural industrial partnerships (co-investment, co-processing, value sharing) in order to anchor capacities in Europe and with partner countries willing to play by balanced rules on a long-term basis.

- Adopt a coalition trade policy by deepening agreements with economies willing to commit to resilience and industrial competitiveness interests, particularly around the alignment of public procurement criteria. The French presidency of the G7 offers an

opportunity to push this agenda in 2026 within a framework that could be extended by a multilateral initiative led by the EU.

- Making the Carbon Border Adjustment Mechanism (CBAM) and ETS true guarantors of our industrial sovereignty. The ETS system, combined with the CBAM, must become a tool for competitive fairness rather than a factor weakening energy-intensive industries.
  - Gradually extend the CBAM to intermediate and finished products in order to prevent circumvention and protect the entire European value chain.
  - Combine the European target of a 90 percent reduction in emissions by 2040 with a pooled financing mechanism, enabling strategic industrial sites to make the necessary decarbonization investments.
  - Recycle CBAM and ETS revenues according to three priorities:
  - Targeted compensation for exposed industries.
  - Financing industrial transformation and decarbonization projects on European soil.
  - Decarbonization partnerships with countries that supply critical resources, in order to secure supplies while supporting their transition, in a spirit of strategic reciprocity.

Recommendation 10

Ensure that the Commissioner for Prosperity and Industrial Strategy promotes a coherent policy among Member States, industry, and the general public.

Despite numerous national and European initiatives in the field of industrial policy, there is currently no overall vision or strategy that takes into account the reality and potential of Europe's territories. While sectoral plans are multiplying (semiconductors, hydrogen,

cleantech, etc.), governance is struggling to develop an overall strategy with a territorial dimension. A clear mandate from the heads of national and European institutions to agree on a few priorities is undoubtedly necessary, particularly to coordinate the various public policy silos that such an ambition must mobilize. This approach has been successful in overcoming the euro crisis and could represent, with regard to industrial ambition, a necessary step toward political convergence at the relevant level.

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Authors

Thierry Chopin

Thierry Chopin is a Senior Fellow at Institut Montaigne. A specialist in European Affairs, he holds a PhD in Political Science from the EHESS. After teaching for several years at Sciences Po, the Corps des Mines, and more recently at École Polytechnique, Thierry is now a consultant on European Affairs and a Visiting Professor at Sorbonne University as well as at the College of Europe in Bruges.

He chaired the Reflection and Proposal Committee for the French Presidency of the Council of the European Union, whose report, submitted to Clément Beaune, then Secretary of State for European Affairs, was published under the title *Une Europe pour aujourd'hui et pour demain. Souveraineté, solidarités, identité commune* (La Documentation française, 2022). He is the author of numerous books and articles on the European Union.

François Chimits

François Chimits is Head of Europe Program at Institut Montaigne. He specializes in economic security issues, EU trade policy and the EU-US-China triangle.

After a master's degree in development economics from Paris Dauphine, François began his career working for the French Ministry of Economy and Finance, first in Singapore, then for two years in Beijing, and finally in Paris, working on French and EU trade policy issues. He then returned to China-related affairs, spending four years with the Mercator Institute for China Studies (MERICS) economics team, first in Berlin and then helping to open a Brussels branch. He has also spent time as a research associate at Centre for Research and Expertise on the World Economy (CEPII) and led the Chinese economy module at Sciences Po Paris from 2019 to 2024.

Énora Morin

Énora Morin has been a Project Officer in Institut Montaigne's Europe program since September 2024. Her research focuses primarily on the EU's economic security agenda and industrial policies. She also coordinates activities, events and publications in the Europe program.

After a literary preparatory class, Énora completed an MA in History of International Relations at Paris 1 Panthéon Sorbonne University. She then went on to study in Sweden where she graduated with an MA in International and European Relations from Linköping University.

Introduction

The city of Dunkirk in northern France hopes to achieve an industrial renaissance by focusing on carbon-free energy and electric battery production, thus becoming a "model for twenty-first-century industry." Various public policies have played an important role by directly supporting these goals. This study analyzes these industrial transformation initiatives with a view to identifying both the factors for success and the obstacles that need to be overcome. Ultimately, the study aims to enhance the effectiveness of regional industrial revival policies in Europe and their concrete applications in France.

This renaissance cannot be taken for granted. The Dunkirk industrial basin serves as a stark illustration of the cumulative effects of deindustrialization in France. In recent decades, the region has witnessed the closure of several major industrial sites, a proliferation of mass layoffs, and persistent unemployment (at 8.2 percent in 2024). The decline in productive investment has fueled a vicious circle of economic devitalization and weakening local growth and employment dynamics. However, Dunkirk should not be seen just as a symbol of industrial crisis—it is also a model of resilience, having rebuilt its industrial ecosystem several times in the wake of shocks.

Dunkirk aims to put itself on the global electric battery map while successfully completing its transition to decarbonization. The strategic importance of this industrial renaissance is clear given the heavy legacy it addresses: Dunkirk's industrial complex is responsible for more than 20 percent of France's industrial CO_2 emissions. This reality places Dunkirk at the heart of national issues of reindustrialization, decarbonization, and social and regional cohesion. Given these stakes, the city is now at a decisive turning point for the success or failure of this ambition. Which factors are likely to contribute to the successes of Dunkirk's reindustrialization, and which are likely to prove obstacles? What are the roles and responsibilities of public and private actors?

Beyond its local, regional, and national dimensions, Dunkirk must also be understood in its European and international context. The projects developed there embody the industrial consequences of the Green Deal, which was at the heart of the agenda of the first von der Leyen Commission, which focused on the challenges of decarbonization and the creation of an industrial value chain in the field of green technologies, particularly batteries. These projects are equally relevant to the priorities of competitiveness and growth at the heart of her Commission's second term.

The projects underway in Dunkirk highlight several challenges for any industrial policy in Europe: the issue of energy prices—a key issue for competitiveness; the issue of access to financing at scale; and the adaptation of competition and trade policy to new national and European industrial objectives. Internationally, Dunkirk's growth model is threatened both by the trade war launched by the Trump administration and by unfair competition and production surpluses from China, which pose an existential threat to European industry. Dunkirk can therefore be seen as a laboratory and a testing ground for industrial change; it is both the place where the slight upturn in competitiveness observed in France since 2017 has become tangible and the point where the most recent challenges are concentrated.

Dunkirk offers a chance to evaluate the effectiveness of an industrial policy centered on local clusters, as opposed to conventional approaches favoring the harmonization of economic development policies across European regions.

It is at the intersection of the local, regional, national, and international scales that the tipping point for reindustrialization projects can be observed, with Dunkirk serving as a prime example. In a country that has experienced extreme deindustrialization over the past half-century—more so than many of its peers among EU Member States—the lessons to be learned here are critical. Taking a perspective that

accounts for local, regional, national, and international scales, this study aims to achieve the following objectives:

1) To present the industrial projects that currently underpin the reindustrialization strategy around the "Battery Valley" project and the decarbonization of traditional heavy industries underway in Dunkirk.

2) To identify assets and success factors specific to the Dunkirk region that are conducive to decarbonization projects and to establishing new industrial value chains, particularly in the green technology and battery sectors, as well as the obstacles, constraints, and risk factors that could undermine these dynamics in a national, European, and international geopolitical and economic context marked by considerable uncertainty.

3) To propose recommendations at the French and European levels to overcome these risk factors and ensure the success of these reindustrialization projects.

These analyses will be presented with constant attention to contextualizing the relevant public policies and ensuring coherence among them, as well as the political and institutional conditions for their implementation at the national and European levels. Finally, in addition to using secondary sources (reports, specialized press, think tank studies, official statements), this study draws on more than fifty interviews with private actors—many of them industrial firms—and public actors at the various levels concerned: local, regional, national, and European.[2]

[2] *The list of people interviewed is included at the end of this study.*

1 Decarbonization and the Battery Valley: Where Does Dunkirk Stand?

1.1. "DUNKIRK": A FLAGSHIP PROJECT FOR ECOLOGICAL AND INDUSTRIAL TRANSFORMATION AT THE INTERSECTION OF LOCAL, NATIONAL, AND EUROPEAN LEVELS

a. Dunkirk, an emblematic area caught between vulnerability, resilience, and hope for our industries

For more than fifty years, France has been undergoing a profound process of deindustrialization[3]—one that European countries such as Germany and Italy have also experienced, albeit to a lesser extent—leaving France in a particularly vulnerable position, an assessment shared by many observers.[4]

Industry's share of France's gross domestic product (GDP) has halved over the past fifty years. Now less than 10 percent,[5] it is well below the European average (20.5 percent)[6] and below countries with,

[3] *It is necessary to recall here the distinction between industry and the manufacturing industry, which is the primary focus of this study. The more general term "industry" is understood here —in accordance with the Insee definition and the French classification of economic activities— as an "economic activity combining factors of production to produce material goods for the market." The manufacturing industry, which is a subset of industry, refers to the transformation of goods and encompasses the main industries discussed in this study: metallurgy and electric battery production.*

[4] *Louis Gallois, Pacte pour la compétitivité de l'industrie française [Pact for the competitiveness of French industry], report to the Prime Minister (Paris: La Documentation française, 2012), https://www.vie-publique.fr/rapport/32798-pacte-pour-la-competitivite-de-industrie-francaise; Nicolas Dufourcq, La désindustrialisation de la France, 1995–2015 [The deindustrialization of France, 1995–2015] (Paris: Odile Jacob, 2022); Olivier Lluansi, Réindustrialiser: le défi d'une génération. Cohésion, souveraineté, territoires, décarbonation: les solutions existent! [Reindustrializing: The challenge of a generation. Cohesion, sovereignty, territories, decarbonization: Solutions exist!] (Paris: Les Déviations, 2024).*

[5] *Lluansi, Réindustrialiser [Reindustrializing].*

[6] *Eurostat, "National Accounts and GDP," Statistics Explained, accessed October 2, 2025, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=National_accounts_and_GDP#Labour_productivity.*

nonetheless, comparable economies such as Germany, where industry still represents 20 percent of GDP.[7] This deindustrialization has had a very strong economic, social, and regional impact: Over the past fifty years, France's industry has lost 2.2 million employees.

Figure 1 • Share of manufacturing as a percentage of GDP in France

Source: National Assembly, Economic Affairs Committee.

[7] *Statistisches Bundesamt (Destatis), "Industry, Manufacturing," German Federal Statistical Office, accessed November 10, 2025, https://www.destatis.de/EN/Themes/Economic-Sectors-Enterprises/Industry-Manufacturing/_node.html.*

The Dunkirk industrial basin illustrates with particular clarity the cumulative effects of deindustrialization. In recent decades, the region has seen the closure of several major industrial sites, numerous mass layoffs, and a persistent rise in unemployment. The Total refinery closed in 2009, as did some of the blast furnaces following the 2008 crisis. The decline in productive investment has fueled a vicious circle of economic devitalization, weakening local growth and employment dynamics. Unemployment rose to 12.5 percent in 2014[8] before stabilizing at 8.2 percent in 2024, partly due to the loss of a quarter of industrial jobs in the territory between 2008 and 2021.[9]

The current beginnings of its industrial revival are linked not only to the realization of the need to reindustrialize the country but also to the imperative ecological transformation. The territory alone accounts for more than 20 percent of France's industrial CO_2 emissions.[10] This assessment places Dunkirk at the heart of national issues of decarbonization, reindustrialization, and social and territorial cohesion.

[8] *Data from the Urban Community of Dunkirk.*

[9] *Agence Nationale de la Cohésion des Territoires (ANCT) and Insee (National Institute of Statistics and Economic Studies), "Territoires d'Industrie: Key Indicators, Dunkirk—Flanders" [Industrial territories: Key indicators, Dunkirk—Flanders], November 2024, https://anct.gouv.fr/programmes-dispositifs/territoires-d-industrie.*

[10] *Dunkerque l'Énergie Créative, "Un territoire incontournable de la transition [An essential territory in the transition]," accessed September 30, 2025, https://dunkerquelenergiecreative.fr/choisir-dunkerque/rejoindre-economie-forte/territoire-transition.*

b. Dunkirk: A local, national, and European testing ground for ongoing ecological and industrial transformations

Faced with this triple economic, social, and environmental emergency, an original initiative emerged in Dunkirk in 2016–2017. The mobilization for the decarbonization of Dunkirk's industry was initiated by the industrial players themselves rather than being a "top-down" effort. Dunkirk's electricity-intensive industries, which consume large amounts of energy, played a particularly important role in raising awareness of the urgent need to transform industrial and energy models and in addressing competitiveness issues related to energy costs and decarbonization. These industrial players first came together in the form of the *Collectif CO_2 industries territoire* (CO_2 Industries Territory Collective) to consider the decarbonization objectives to be pursued across the territory. In this sense, Dunkirk is a laboratory for environmental transition and "territorial industrial ecology" with a view to decarbonizing traditional heavy industries (aluminum and steel in particular), with several objectives set to be pursued on the basis of a "division of labor" between electro-intensive industries:[11] electrification (Aluminum Dunkerque); hydrogen (ArcelorMittal); development of CO_2 capture and transport technologies; recovery of waste heat and the building of heating networks. The objective was twofold: to alert the public authorities to the critical situation facing the local industrial fabric and to take concrete action to retrain employees affected by restructuring.

The industrial firms quickly gained the support of the prefecture and, from 2018–19, the mayor of Dunkirk and president of the CUD,[12] Patrice Vergriete, who had also launched comprehensive local employment

[11] *A company is considered electricity-intensive if it consumed more than 2.5 kWh of electricity per euro of added value in at least one of the previous two years and if it carries out an industrial activity in a sector exposed to strong international competition (trade with third countries exceeding 4 percent according to European criteria).*

[12] *CUD: Communauté Urbaine de Dunkerque (Urban Community of Dunkirk), an intercommunal authority grouping seventeen communes in the Dunkirk area.*

consultations in 2014. In 2018, the industrial firms obtained the formal support of the CUD and the regional presidency with the creation of the Rev3 initiative.[13] It is actively supported by the *Grand Port Maritime de Dunkerque* (Port of Dunkirk Authority),[14] the local branch of MEDEF,[15] and the Chamber of Commerce and Industry (CCI), as well as by the region's economic agencies—notably Nord France Invest,[16] which is recognized as particularly effective by the local industries. This momentum has made it possible to unite the industrial ecosystem around a common strategy. The industrialists published an initial manifesto and organized the first European Low Carbon, Industries and Territories Meetings in 2019.[17] These meetings aimed to publicize their projects and mobilize financial support for decarbonization, which requires significant investment. The movement was then reinforced by the COVID crisis and the energy crisis in the winter of 2022–2023, which further highlighted the sovereignty issues posed by the country's industrial dependencies. This horizontal governance, which is more open and collaborative than in other regions, encourages the emergence of industrial ecosystems supported by public authorities that are proactive at the local, regional, and national levels.

[13] *Rev3 (Third Industrial Revolution) is a collective initiative launched by the Hauts-de-France Region and the Regional Chamber of Commerce and Industry to accelerate the territory's energy, technological, and societal transition. It aims to make Hauts-de-France a more sustainable and inclusive region by mobilizing businesses, local authorities, citizens, and research stakeholders around five major ambitions: developing new energy sectors, territorial anchoring, training and research, citizen initiatives, and integrating the energy and ecological transition into all regional policies. This dynamic, initiated nearly ten years ago, is based on concrete mechanisms and pilot projects to meet the challenges of decarbonization and innovation in the region. See: https://rev3.hautsdefrance.fr/rev3-economie-durable-connectee.*

[14] *Hereinafter referred to as GPMD. Dunkerque-Port is under the supervision of the Ministry Delegate to the Ministry of Ecological Transition and Territorial Cohesion, responsible for Transport. See: https://www.dunkerque-port.fr/en/about-us/our-organization.*

[15] *MEDEF refers to the Mouvement des Entreprises de France (Movement of French Enterprises), France's largest employer federation, equivalent to the U.S. Chamber of Commerce or the UK's CBI.*

[16] *Nord France Invest is the economic development agency for the Hauts-de-France region.*

[17] *ÉcosystèmeD. (2025). European Low Carbon Industries and territories meetings 2025 – 7th edition, October 2–3, Dunkirk [Program]. Communauté urbaine de Dunkerque, CCI Hauts-de-France, CCI Littoral Hauts-de-France, Rev3, Région Hauts-de-France, Dunkerque-Port, ADEME, World Economic Forum. https://dunkerquelenergiecreative.fr/en/events/redit-2025/, (accessed on 14 November 2025).*

In addition, a logic of resource-sharing between companies has developed, promoting economies of scale, shared innovation, and the territorial anchoring of projects.

One example is Air Liquide's decarbonization project, launched in 2020, which is being carried out in close collaboration with several industries pursuing the same agenda. The "umbrella" project Cap Décarbonation brings together Air Liquide and two other industrial firms in the region, Eqiom (K6 project) and Lhoist (CalCC project), producers of cement and lime, respectively, who are decarbonizing their industrial processes by capturing CO_2 from factory chimneys. These two twin projects have been integrated into the "d'Artagnan project" for CO_2 infrastructure, with CO_2 being transported via pipeline to the Dunkirk LNG terminal. It is then shipped across the North Sea to a storage area in Norway (Northern Lights). The goal is to capture 1.5 million tons of CO_2 per year (out of the sixteen million tons produced by Greater Dunkirk) by 2028. ArcelorMittal is also participating in the project and plans to connect to the pipeline during a second phase. This connection should enable the transport of an additional five to six million tons of CO_2 per year (equivalent to more than 5 percent of French industrial emissions in 2024). From the outset, these three projects were designed to be complementary, as evidenced by the construction of a terminal with a capacity of up to five million tons per year. However, since ArcelorMittal's scaling back of initial commitments, the terminal's use would remain limited for the time being, also highlighting the risks of interconnected projects based on anticipated participation.

"Dunkirk" highlights the importance of local political will to adapt the Dunkirk territory based on local industrial development planning that is virtually unique in France, with very significant implications in terms of employment: 20,000 direct new jobs created in industry, construction, logistics, and major commercial projects by 2035 (12,000 by 2029), along with 8,000 indirect jobs created in the territory by 2029 (education, medical professions, retail, new services, crafts, personal services,

entrepreneurship, etc.), according to estimates by the Dunkirk Urban Community. This dynamic has also led to a strong strategic reflection on the spatial planning of this territory—issues of housing, transportation, water management, attractiveness, employment, and training—which will become denser as a result of these new jobs.

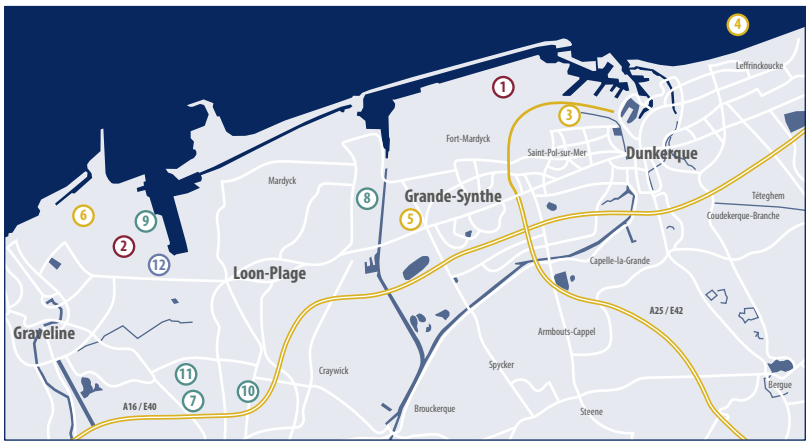
The case of Dunkirk illustrates the importance of territorial cooperation dynamics in industrial and ecological transitions. The synergies between industrial firms, the state (prefecture, sub-prefecture, regional state agencies), local authorities, and institutional economic actors (CCI, MEDEF) are a strategic lever for developing the territory's attractiveness for new industrial investment while promoting social inclusion, cohesion, and territorial development. Dunkirk is thus a flagship project for ecological and industrial transformation, and in reality a testing ground for the industrial changes currently underway.

Finally, Dunkirk has a strong European dimension. This project embodies the industrial consequences of the Green Deal,[18] with the creation of an industrial value chain in the context of international competition in the field of green technologies, particularly batteries. Funding has been provided by both the Commission and the European Investment Bank. At the same time, this project also embodies the difficulties of implementing this agenda and the promises of the Green Deal, as the proposed growth model faces challenges from both fierce competition from Chinese companies and American protectionism.

[18] *European Commission, "The European Green Deal: Striving to Be the First Climate-Neutral Continent," https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en.*

1.2. INDUSTRIAL PROJECTS IN THE DUNKIRK AREA

Figure 2 • Map showing the location of the projects



Decarbonization Projects

1. **ArcelorMittal Dunkirk** (2025-2030), production of low-carbon steel based (DRI, HMR, DMX…): €1.8 billion.
2. **Aluminium Dunkerque** (2025-2030), construction of a second foundry line (2025, 8 jobs), carbon capture (2030, 100 jobs), €260 million.

Energy Projects

3. **Heat Highway** (2027), creation of a 20km industrial heating network: €250 million.
4. **Offshore Wind Farm • RTE** (2028), offshore wind farm: 600 MW, 50 jobs, €1.45 billion.
5. **RTE** (2029), development of an electricity network: 400,000 volts for the decarbonization of Dunkirk Territory: €270 million.
6. **EDF Graveline** (2026-2039), construction of 2 EPR2 reactors: €17 billion, 1,000 jobs.

Electromobility Projects

7. **Verkor** (2025), production of low-carbon batteries: 1,200 jobs, €3 billion.
8. **Suez** (2025), recycling of lithium-ion electric batteries: 200 jobs, €300 million.
9. **Orano - XTC New Energy** (2026), production of parts for electric-vehicle batteries (CAM, PCAM): €1.5 billion, 1,300 jobs.
10. **ProLogium** (2027), lithium ceramic electric battery production : 3,000 jobs by 2030, €5.2 billion.
11. **Enchem** (2027), electricity production for batteries, €57 million, 100 jobs.

Other Projects

12. **SNF Flocryl** (2024), polymer production for water treatment and monomers for paper treatment: €240 million, 180 jobs.

a. Dunkirk: A region seizing national and European opportunities

Reflecting the dynamism of local stakeholders in the city and the territory, Dunkirk has been selected for several French and European support programs and initiatives which, by putting the city in the spotlight, allow it to seize numerous opportunities and foster a favorable environment for investment.

Dunkirk was one of 100 cities in EU Member States selected as part of the Horizon Europe program's "Climate-Neutral and Smart Cities" mission, beginning in 2022.[19] The aim is to achieve carbon neutrality by 2030 in these pilot cities (which are expected to lead the way for all European cities). To this end, and as part of a "Climate City Contract," the EU is providing Dunkirk with logistic, financial, and legal support. Symbolizing the city's political commitment, this program includes an action plan to achieve climate neutrality, coordinated with financing plans.

In 2023, Dunkirk also became the first "low-carbon industrial zone" (ZIBaC[20]) in France after responding to a call for projects from ADEME (French Agency for Ecological Transition) with the Dkarbonation project (led by ÉcosystèmeD, the local public interest group, linked to the local decarbonization movement). This scheme, created as part of a France 2030 plan, enables selected territories to benefit from specific support and assistance from the state in the development of decarbonization projects. In Dunkirk, this support includes an €11.8 million grant for engineering and feasibility studies and infrastructure needs for decarbonization (EPR2, wind farm, district heating network, hydrogen, etc.). In Dunkirk, the ZIBaC project acts as a "structuring pillar of the territorial strategy" by encouraging "the interconnection of companies and the sharing of processes," according to one of the stakeholders interviewed.

[19] The European Union's main research and innovation funding program for the period 2021–2027, aimed at strengthening Europe's scientific, technological, and industrial competitiveness.
[20] ZIBaC = Zones Industrielles Bas Carbone.

Dunkirk was also awarded the Territoire d'industrie label in 2019 (renewed in 2023 as part of phase II of the program), a government initiative that identifies territories throughout France in order to facilitate industrial revitalization. Local stakeholders in the selected territories are given "free rein to develop their industrial recovery strategy," based on close collaboration between public authorities and local industrial firms. The government then provides technical and financial support for these plans.[21]

b. Decarbonization of traditional heavy industries

The convergence between political will and the interests of economic actors has made numerous initiatives around decarbonization issues possible. The most high-profile example of this virtuous circle is the development of the "Battery Valley," an ambitious project to create industrial value in the Dunkirk territory, which should not overshadow the significant efforts also being made in older industries.

Traditional heavy industries are at the forefront of decarbonization. As the primary initiators of local momentum and the main emitters, each is developing its own decarbonization projects, while still allowing for synergies.

ArcelorMittal, a long-established company in the local industrial ecosystem that has been present since 1963 and is the largest employer in Dunkirk with 3,200 employees, is the leading European steel producer and the largest CO_2 emitter in France in 2024.[22] The company, head-

[21] *For more details on this program, see Sénat, Commission des affaires économiques, Rapport d'information n° 217 (2024–2025), relatif au programme Territoires d'industrie [Information report no. 217 (2024–2025), concerning the Industrial Territories program], by Martine Berthet, Rémi Cardon, and Anne-Catherine Loisier, December 18, 2024, https://www.senat.fr/rap/r24-217/r24-2174.html.*

[22] *Aurélie Brunstein, Axèle Gibert, and Margaux Morel, "50 sites industriels français les plus émetteurs de CO_2: Qui s'engage, qui bloque?" [50 French industrial sites with the highest CO_2 emissions: Who is committed, who is blocking?], Réseau Action Climat and France Nature Environnement, July 28, 2024, https://reseauactionclimat.org/publications/50-sites-industriels-francais-les-plus-emetteurs-de-co2-qui-sengage-qui-bloque.*

quartered in Luxembourg, has several plants in France—in Dunkirk and Mardyck, as well as in Moselle, Loire-Atlantique, and Fos-sur-Mer (close to Marseille). It mainly produces flat steel, primarily for the automotive and other industrial sectors, hence its importance in Dunkirk's industrial ecosystem. Its site, one of the largest along with that of Fos-sur-Mer, straddles the municipalities of Dunkirk and Grande-Synthe, covering an area of 450 hectares. Its annual production capacity is 6.8 million tons of steel, representing 40 percent of French production and nearly 5 percent of EU production.

However, the production process, which is based on the reduction (extracting the oxygen present in iron in its natural state in the form of iron oxide) and smelting of iron ore in blast furnaces (three at the Dunkirk site) using coke and coal, is extremely polluting, and emits twelve million tons of CO_2 per year at full capacity, making the Dunkirk plant one of the most polluting facilities in France, accounting for 15 percent of national industrial emissions, or 1.8 tons of CO_2 per ton of steel produced (in line with the European average and substantially lower than most non-European producers).[23]

ArcelorMittal's decarbonization strategy initially aimed to achieve carbon neutrality by 2050. From 2022, it included a specific decarbonization plan for the Dunkirk and Fos-sur-Mer sites. The goal was to reduce emissions at both sites by nearly 40 percent by 2030 through the production of "green steel," based on two successive processes:

- Replacing coal-fired blast furnaces with electric arc furnaces (EAFs), which emit less CO_2 and are powered by carbon-free electricity, to melt pre-reduced iron ore and scrap steel.
- Alongside EAFs (Electric Arc Furnaces), adding a direct reduced iron (DRI) unit, which was intended to eventually run on hydrogen after a transitional phase using natural gas; the DRI process reduces iron

[23] *Koolen, D. and Vidovic, D., Greenhouse Gas Intensities of the EU Steel Industry and Its Trading Partners (Luxembourg: Publications Office of the European Union, 2022).*

ore without coal, thereby emitting less CO_2. The pre-reduced iron could then be used directly in electric furnaces to make steel. Initially, ArcelorMittal aimed to use imported DRI (produced by ArcelorMittal abroad or purchased directly on the market), but the goal was to produce DRI on site once the technology was more mature and cost-effective in Europe.

For this project, with an initial investment of more than €1.8 billion, ArcelorMittal signed an €850 million aid contract with the French government as part of France 2030. The European Commission approved this state aid in July 2023. However, citing difficulties linked to the slowdown in the European steel market and competition from outside Europe (linked to global production overcapacity, particularly in China), ArcelorMittal suspended the initial plan at the end of 2024. After the EU adopted a Steel Plan, the initial ambition was finally partially relaunched in May 2025 with the confirmation of the intention to build a first electric furnace, representing an investment of €1.2 billion. However, the construction of a second furnace and the DRI unit remain indefinitely postponed.

Significant work has been carried out with the public authorities not only to decarbonize Arcelor but also to support the steel industry in the face of the difficulties encountered by the sector. The French authorities worked with companies to draw up the Steel and Metals Action Plan in Brussels.[24] Its adoption was a determining factor in maintaining ArcelorMittal's decarbonization project. In terms of trade policy, industries are seeing a growing awareness in Brussels. Faced with significant global overcapacity, particularly due to China's enormous capacity, trade defense measures were adopted in 2018, including anti-dumping and safeguard measures. In the wake of the Steel and Metals Action Plan, and

[24] *In response to the crisis facing the steel sector, the Steel and Metals Action Plan published by the Commission in May 2025 implements specific measures to strengthen its competitiveness and ensure the sustainability of this industry in Europe. The measures include easier access to energy, the implementation of the Carbon Border Adjustment Mechanism (CBAM), strengthened safeguard measures, the introduction of resilience and sustainability criteria in public procurement, measures to preserve jobs, and the promotion of circularity.*

after years of heated discussions with the Commission, the sector has seen Brussels propose ambitious restrictions on steel imports, which still need to be approved by the European Parliament and Member States.

Although ArcelorMittal has expressed its intention to build its first electric furnace, the company and the success of the project remain at risk given the complex situation facing the steel industry in Europe. The industry is still facing global steel overproduction, compounded by US tariff increases that are having a significant impact on the world market. In this context, with demand for flat steel declining in Europe and France since 2018, the continent is facing a redirection of Indian and Chinese exports following the tariff measures imposed by the second Trump administration. Europe is also disadvantaged by the price and certain spillover effects of the European carbon market (purchase of quotas, lack of export competitiveness, strategies to circumvent the carbon border adjustment mechanism (CBAM) for Chinese products, and "resource shuffling"[25] by Asian countries in particular). The company had specified that confirmation of the investment and construction of the electric furnace would depend on the implementation of the Steel Plan, in particular through trade defense and a properly designed CBAM, particularly with regard to export competitiveness issues.

Aluminium Dunkerque is one of the largest primary aluminum smelters in Europe.[26] Its sole site, located in Loon-Plage, covering an area of 65 hectares of the Grand Port Maritime, is the fifteenth-largest

[25] *"'Resource shuffling' refers to the reallocation of exports from third-country producers of their most decarbonized goods to the EU in order to limit the cost of the CBAM financial adjustment." —Direction générale des Entreprises, "Sommet européen pour une stratégie européenne autour de l'industrie de l'acier" [European summit for a European strategy on the steel industry], Ministry for the Economy, Finance, and Industrial and Digital Sovereignty, February 25, 2025, https://www.entreprises.gouv.fr/la-dge/actualites/sommet-europeen-pour-une-strategie-europeenne-autour-de-lindustrie-de-lacier.*

[26] *Bastien Bonnefous, "À Dunkerque, à la plus grande fonderie d'Europe, l'aluminium doit prendre le virage de la transition énergétique" [In Dunkirk, at Europe's largest smelter, aluminum must embrace the energy transition], Le Monde, March 22, 2024, https://www.lemonde.fr/economie/article/2024/03/22/a-dunkerque-la-decarbonation-sous-contraintes-de-l-aluminium_6223362_3234.html.*

national CO_2 emitter with 0.5 million tons per year.[27] The plant produces 300,000 tons of aluminum per year in the form of plates and ingots. It employs approximately 780 people. The company is also the largest consumer of electricity in France (4 TWh per year), hence the importance of its location near the Gravelines nuclear power plant.

Aluminium Dunkerque was one of the first industrial firms in the Dunkirk territory to initiate a process of decarbonizing its production. In 2017, as part of a joint initiative with other heavy industries (ArcelorMittal, Versalis, Engie, etc.) supported by MEDEF and the CCI, the company decided to take measures to promote decarbonization as part of the "lowCAL" project, which is based on a three-phase development plan:

- Reduce emissions by 5 percent in 2025 through the use of recycled aluminum and continued efforts in energy conservation and optimization of energy performance. According to the company's estimates, this target should be met or even exceeded by the end of the year.
- Reduce emissions by 30 percent by 2030, in particular through the development of carbon capture and storage technology. Aluminium Dunkerque's emissions are linked to the electrolysis processes in which the anodes in the tanks burn and emit CO_2. Capturing some of the CO_2 emissions from this combustion would reduce their impact, but as CO_2 is highly diluted in the emissions, the capture process still needs to be developed.
- Reduce emissions by 70 percent by 2050 by improving the electrolysis process to emit less CO_2 during aluminum production. This involves developing a truly new technology based on the use of inert anodes. However, this technology still needs to be developed before it can be used on a large scale (development is underway at Aluminium Dunkerque's former owner, Rio Tinto).

[27] *Brunstein, Gibert, and Morel, 50 sites industriels français les plus émetteurs de CO_2 [The 50 French industrial sites with the highest CO_2 emissions].*

As part of this decarbonization project, which depends on technological advances for success, Aluminium Dunkerque also started operating an eighth smelting furnace dedicated to recycling in May 2025. This reduces the carbon intensity of production. Recycled aluminum consumes only 5 percent of the energy required to produce primary aluminum. In response to increasing demand and as part of a circular economy approach, this helps to limit imports, which have a much higher carbon footprint. In concrete terms, this new furnace makes it possible to introduce and recycle 7,000 tons of external aluminum per year and avoid exporting internal waste. The production of low-carbon aluminum from this recycled aluminum is expected to reach 20,000 tons per year, contributing to the development of a new industry. In terms of emissions, recycling at this site avoids the emission of 25,000 tons of CO_2 per year, or 8.3 percent of the company's annual emissions.

The project requires €300 million in financing for phases 1 and 2 (over five years), and more than €2.5 billion for phase 3. To finance these investments, the company has mainly mobilized its own funds and could, if necessary, activate bank credit options or other external financing. In November 2023, Aluminium Dunkerque also signed an Ecological Transition contract with the French government.[28] Under this agreement, in exchange for commitments to decarbonize its activities, Aluminium Dunkerque will receive initial funding of €1 million over three years to develop a carbon capture prototype. The company has invested €13 million in the construction of its eighth recycled aluminum production furnace, partly financed by France 2030 funds.

Beyond the financing provided, the company also highlights the creation of an environment conducive to decarbonization by the public authorities: Hauts-de-France is part of the European Commission's Just

[28] *Ministère de l'Économie, des Finances et de la Souveraineté industrielle et numérique, Contrat de transition écologique – Aluminium Dunkerque [Ecological transition contract—Aluminium Dunkerque], November 2023, https://www.entreprises.gouv.fr/files/files/Priorites-et-actions/Transition-ecologique/contrat-aluminium-dunkerque-signe.pdf.*

Transition initiative and therefore benefits from related financing (see p. 98), and the national policies developed in recent years in favor of reindustrialization (France 2030, post-COVID recovery fund) have contributed to the company's confident commitment to the decarbonization process. However, while the public authorities are striving to meet their commitments, the industrial firm has sometimes been confronted with contradictory information coming from different sources, due to a lack of communication between the various government departments (the DGE, Direction Générale des Entreprises [Directorate General for Enterprises], and Treasury) and each one focusing on its own area of action.

Despite this public support, the company still faces certain risks. While the issue of electricity prices was partially resolved with the signing in July 2025 of a long-term contract with EDF covering part of its needs, the question of the impact of the carbon market remains. At present, Aluminium Dunkerque benefits from an indirect CO_2 cost compensation system, a mechanism that allows the company to offset its CO_2 costs through its electricity purchases. However, the continuation of this system is highly uncertain. The mechanism is authorized by the European Commission but is not applied by all Member States. It is subject to review every five years, with the next review due in 2025. The French government, for its part, decides each year whether or not to continue applying it. The financial amount involved remains significant. In addition, like ArcelorMittal, the company is also facing the spillover effects of the CBAM, i.e., the reduction of its exemptions with regard to the European carbon price (see p. 168). Finally, decarbonization itself carries risks, as it relies on a number of technological gambles.

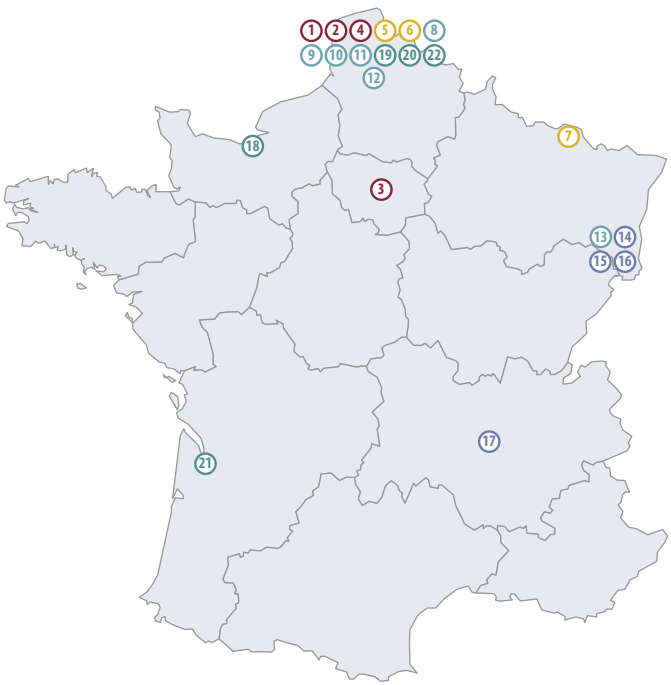
Compared to other decarbonization projects in France, including those of three other companies in the top-ten most polluting industries in France, the costs of the ArcelorMittal and Aluminium Dunkerque decarbonization projects are much higher: the Naphtachimie project (which

has also signed an ecological transition contract with the government) amounts to €200 million, Lafarge's to €260 million, and Calcia's to €350 million.

Once momentum was underway, other local manufacturers (Versalis, Lhoist, etc.) embarked on decarbonization projects, as did energy suppliers such as Air Liquide, which are partnering with local industrial firms for their decarbonization. The Cap Décarbonation initiative brings together three projects: two CO_2 capture projects–K6, in partnership with cement manufacturer Eqiom, and CalCC, with lime producer Lhoist–both financed by the European Innovation Fund to the tune of €150 million (Eqiom) and €125 million (CalCC); and, as integrated components with the d'Artagnan project, which is developing CO_2 transport and storage (in partnership with Norway's Northern Lights).

c. The desire to create new carbon-free value chains: The "Battery Valley" and gigafactories

Figure 3 • Main projects in the battery sector in France[29]



[29] *Xerfi, Le Marché des batteries à l'horizon 2030: Assurer l'avenir de la filière européenne des batteries: un défi industriel et stratégique [The battery market by 2030: Ensuring the future of the European battery industry: An industrial and strategic challenge], Precepta Insights collection (Paris: Xerfi, September 15, 2025), https://www.xerfi.com/presentationetude/Le-marche-du-stockage-embarque-et-des-batteries_MTR18.*

Battery Recycling

1. **Battri** (2025), recycling of batteries with production of black mass, capacity of 15,000 to 35,000 t/year.
2. **Hydrovolt** (end of 2025), recycling of batteries with production of black mass, 3,000 m^2 plant.
3. **Derichebourg** (early 2027), recycling of batteries with production of black mass, capacity of 20,000 t/year.
4. **Suez** (2025), recycling of lithium-ion electric vehicle batteries, capacity of 70,000 t/year, €300 million.

Black Mass Processing

5. **Orano** (target 2031), pre-treatment of 10,000 t of batteries and refining of 15,000 t/year of black mass.
6. **Mecaware** (target 2029), 8,000 t/year of recycled metals from black mass.
7. **Veolia** (operational), processing of 7,000 t/year of black mass.

Gigafactories

8. **ACC** (operational), 40 GWh targeted capacity.
9. **AESC** (operational), 30 GWh targeted capacity.
10. **Verkor** (under construction), 70 GWh targeted capacity.
11. **ProLogium** (2028), 44 GWh targeted capacity.
12. **Tiamat** (planned), 5 GWh targeted capacity.
13. **Blue solution** (planned), 25 GWh targeted capacity.

Lithium Extraction and Refining

14. **Viridian** (target 2027), 28,500 t/year of lithium hydroxide.
15. **Eramet** (target 2027–2030), extraction of 10,000 t/year of lithium carbonate.
16. **Averne Group** (target 2031), production of 27,000 t/year of lithium carbonate.
17. **Imerys** (target 2030), €1.8 billion investment, 34,000 t/year of lithium hydroxide.

Battery Materials and Components

18. **Sibanye-Stillwater** (2028), production of pCAM, 15 kt/year capacity.
19. **Alteo Alumnia / W-scope** (planned), production of battery separators.
20. **Orano / XTC** (2028/2031), production of CAM (80 kt/year for CAM and pCAM).
21. **Emme** (target 2028), €530 million investment, nickel and cobalt sulfates for 500,000 cars/year.
22. **Axens / MNEM** (target 2028), €500 million investment, 28,000 t of high-nickel cathode materials (CAM).

Source: National Assembly, Commission for Economic Affairs.

Alongside the decarbonization of traditional heavy industries, Dunkirk is also building its reindustrialization by developing new decarbonized value chains. A Battery Valley is gradually developing, backed by numerous local assets (available land and access to decarbonized electricity in particular; see part 2). This is part of a broader regional initiative, where the automotive industry has long been present with Renault, Stellantis, and Toyota spread across seven construction sites in the

Hauts-de-France region, as well as other recent battery gigafactories: Envision AESC in Douai and ACC (Automotive Cells Company) in Douvrin.

In Douai (110 km from Dunkirk), Renault has had a battery factory built by AESC, a subsidiary of the Sino-Japanese group Envision, which was inaugurated in June 2025. The factory will supply some of the batteries for electric cars manufactured by Renault. The territory, along with other public institutions, contributed €60 million in funding. Similar funding was granted to Verkor and ACC (Automotive Cells Company) with a view to building a regional value chain. The ACC plant, a joint venture between TotalEnergies, Stellantis, and Mercedes-Benz, is the first battery gigafactory to be built in France. Inaugurated in 2023, it also received significant support from regional and national public authorities as part of the first battery IPCEI,[30] as well as from the EU.

The **Verkor** project was the first to be launched in Dunkirk. The company was founded in Grenoble in July 2020. From the outset, its strategy has been European. It began within the framework of EIT InnoEnergy,[31] where Benoit Lemaignan, co-founder and CEO of Verkor, worked—a Horizon Europe program dedicated to developing the renewable energy sector and supporting innovation in eight thematic areas, including new energies for transport and mobility. Since its creation, Verkor has benefited from the support of the EIT, which is a shareholder in the company and provides it with financial support of nearly €4 million. The EIT's support also translates into the contribution of industrial partners who help to secure and lend credibility to the launch of the project.

[30] *As important projects of common European interest, IPCEIs allow for derogations from European competition law and aim to boost continental production in sectors considered strategic, such as electric batteries, hydrogen, semiconductors, and critical raw materials.*

[31] *EIT InnoEnergy: a Knowledge and Innovation Community (KIC) created by the European Institute of Innovation and Technology (EIT) as part of Horizon Europe.*

The aim is to produce low-carbon batteries to meet the needs of a market that was considered emerging in Europe at the time, even though its development has lagged behind, particularly in comparison with China. Nevertheless, the specific features of the project lie in the construction of a very large-scale production plant: a "gigafactory" for low-carbon, high-performance battery cells, capable of equipping up to 300,000 vehicles per year. Verkor aims to produce 16 GWh of lithium-ion cells from 2026, rising to 70 GWh in 2035.

Since its creation in July 2020, the company has focused on finding a site and conducting feasibility studies. Verkor is recruiting a team of experts capable of carrying out the project in its various dimensions—for example, experience in finding available land for large-scale factories was a priority target at this stage. From the outset, the company adopted an ambitious human resources strategy, recruiting international talent. By the end of 2024, 300 people of forty-eight different nationalities had already been recruited, and the company is expected to create 1,200 direct jobs.

Forty possible sites in Europe (in Germany, Italy, etc.) were studied for the location of the plant. A decision was quickly made in favor of France. The decisive factor was nuclear power, which provides carbon-free energy. The final decision had to be made between Dunkirk, Le Havre, and Châteauroux. At this stage, the anticipation of turnkey land development in Dunkirk was decisive: access to 100 hectares of land with the possibility of expansion, industrialization possible as early as 2025, and connection to RTE,[32] anticipated by the port. Added to this, of course, were financial criteria (tens of millions in funding from the territory and the community of municipalities) and the region's decarbonization ambitions. One of the only drawbacks is its location in an area that is still largely undeveloped. In theory, this choice allows the factory to carry out a large-scale construction project without disturbing the neighborhood

[32] *Electricity transmission network.*

and to allow it to consider possible future expansions. However, the site remains difficult to access and lacks services in the immediate vicinity, particularly for its employees. Recognizing the strategic importance of the project, the local authorities quickly gave Verkor their political and administrative support to establish its factory. Thanks to the cooperation and mobilization of the town hall, the territory, the sub-prefecture, the port, and the DREAL,[33] environmental authorizations and building permits were obtained in less than six months. The project was officially announced in February 2022 by Xavier Bertrand, president of the territory, and Emmanuel Macron, president of the Republic.

The factory, located in the Bourbourg area, covers 80 hectares. The first production lines are operating at satisfactory production and quality levels, particularly the production of modules. The cell section is currently being started up and mass production is expected to begin in 2026. This schedule makes Verkor the most advanced electric battery project in Dunkirk.

In terms of financing, Verkor has successfully raised more than €3 billion in funding over four years. For a country like France, this is a notable success. The achievement of such large-scale fundraising within such a short timeframe can be explained in particular by the successive commitment of multiple players, often encouraged in their investments by previous commitments. The commercial partnership with Renault was signed in 2023, following negotiations that began in 2021. It was not easy to secure, as it is the largest offtake contract ever signed by the group. Renault has

[33] *Les Directions Régionales de l'Environnement, de l'Aménagement et du Logement (The Regional Directorates for Environment, Planning, and Housing, DREAL) are decentralized departments of the ministries responsible for regional planning, ecological transition, and energy, under the authority of the regional prefect and departmental prefects. In conjunction with other government departments and in partnership with local authorities, professionals, industrial firms, and associations, they adapt major national policies to the specific characteristics of each region. They are involved in a wide range of issues, including energy, housing, transportation, preservation of natural environments, and risk prevention. They thus embody the regional presence of the ministries. They are responsible for a significant number of administrative procedures, from environmental impact assessments to the issuance of transport licenses and public consultations.*

committed to purchasing 12 GWh of batteries per year for ten years, representing 75 percent of Verkor's planned production. This represents a decisive step in Verkor's growth. This very solid contract, which notably commits Renault to financial compensation in the event of noncompliance with its commitments, has reassured Verkor's other financiers and created positive momentum (see below). These funds were initially used to finance the innovation center and a pilot plant in Grenoble (the Verkor Innovation Center), followed by the Dunkirk gigafactory.

Renault's commitment thus played a key role in the decision by the Banque des Territoires, the French public investment bank for local and regional development, to finance a bridge loan of around €150 million, followed by a subordinated loan of €150 million, even though Verkor had not yet obtained the necessary fundraising or administrative authorizations. The subordinated loan benefits from coverage by the CUD, which guarantees this debt up to 50%. This coverage notably explains the size of the financing from the Caisse de dépôts, whose amount is double the €75 million previously allocated for AESC. Following this initial financing, Verkor also obtained financing from the Hauts-de-France region and the Dunkirk Urban Community, amounting to €60 million and €30 million, respectively. Although these amounts are small in relation to the total investment, they nevertheless constituted a real mark of commitment for the private investments that followed as part of a fundraising campaign. In terms of public funding, Verkor has mainly benefited from €569 million in funding under France 2030, which was approved by the European Commission as state aid in October 2023.

Finally, the company also raised private funds, partly guaranteed by French and European public support. The European Investment Bank (EIB) and eighteen other public and commercial banks specifically financed the gigafactory project through a non-recourse financing mechanism (project financing), which means that the EIB will be repaid from part of the gigafactory's revenues. Previously, the EIB had granted initial financing of €49 million to fund the Verkor Innovation Center (the

research center), covered by an InvestEU mandate from the European Commission for the deployment of innovative technologies. The Public Investment Bank (Bpifrance) is providing a guarantee to the sixteen commercial banks involved in the project,[34] with a senior green loan of €1 billion backed by the BPI's GPS guarantee to limit a risk already diluted by the number of banks involved in the project (the BPI guarantees coverage of around €280 million).

Within Verkor, five jobs are dedicated to managing this financing, an investment in human resources that is essential to securing partnerships with project supporters.

Public support for the project also took the form of immediate and coordinated mobilization of all local public actors following the president of the Republic's announcement of the decision to locate the facility in Dunkirk. In particular, the sub-prefect created a monitoring committee bringing together all the stakeholders involved in the project (see below). Relations with the European public authorities, although indirect via the DGE in Bercy, were more complex and took longer, particularly for the integration of the first battery IPCEI,[35] which ultimately did not materialize.

Beyond the difficulties of the IPCEI process, the broader lessons of which are analyzed below, the Verkor experience highlights the complexity and slow pace of obtaining French public funding. At present, four years after the first discussions between the DGE and Verkor began in July 2021, although the first two payments were received in December 2023 and the second half of 2024, the company is still waiting for the rest of the funding it was granted. There have been delays in the initial payment dates, which can be explained by the implementation of

[34] *Meridiam, Renault Group, EQT Ventures, EIT InnoEnergy, and Sibanye-Stillwater, SPI investment fund, Crédit Agricole Assurances, Fonds Stratégique de Participation (FSP), CMA CGM (PULSE), and Airbridge Investments.*

[35] *IPCEI: Important Projects of Common European Interest.*

an expense reporting system, as well as accounting reasons. Although Verkor has benefited from a significant amount of funding, barriers to access remain a limiting factor for companies that began as start-ups and are still struggling to finance their CAPEX and ramp-up costs—despite the various European and French subsidy instruments available European and French subsidy instruments (see p. 88).

The second production plant project is even more ambitious. **ProLogium**, a Taiwanese energy innovation company founded by Vincent Yang in 2006, aims to be the first to mass-produce solid-state batteries, known as lithium ceramic batteries, or LCBs. ProLogium is thus seeking to conquer a rapidly developing market. The company, whose technologies originated in the production of micro-batteries for the telecommunications and space sectors, is innovating by moving into the automotive sector. Its first gigafactory was built in January 2024 in Taiwan, generating 0.5 to 2 GWh per year—enough to equip 14,000 vehicles but also to ship hundreds of thousands of samples for testing with European car manufacturers and equipment suppliers.

ProLogium's ambition in Dunkirk is to build its first gigafactory outside Taiwan, with an annual capacity of 44 GWh, which would enable it to equip between 500,000 and 700,000 vehicles per year. The aim is to meet the demand of the European battery market. The factory is expected to cover 130 to 180 hectares straddling the municipalities of Craywick and Bourbourg, in the SGI2 port area of Dunkirk. In addition to the production plant, the project also includes the construction in May 2024 of its R&D center in France, located in Paris-Saclay, which is dedicated to research into advanced materials.

ProLogium's choice of Dunkirk is explained by its access to competitive, low-carbon electricity and a large, already equipped site. Support from public authorities was also a decisive factor (see below), particularly in the choice of France. The parties involved highlight the role of Business France (both in Taiwan and France).

The project was officially announced by Emmanuel Macron at the Choose France summit in May 2023. Public consultation and ongoing consultation took place in the fall and were finalized in October 2024. In December of the same year, the company obtained a building permit and an environmental permit from the prefecture. At present, however, the factory has yet to be built (construction has been postponed to the first quarter of 2026, with industrial production scheduled to start in 2028), and the batteries have yet to be developed. ProLogium has postponed its project by one year, deciding to reorient the gigafactory project to develop fourth-generation batteries, which are more innovative than previous generations of batteries, in order to remain competitive. The project's unique feature—but also its challenge—is to produce fourth-generation solid-state batteries with inorganic electrolytes that address some of the current barriers to purchasing electric vehicles (faster charging, better range, improved safety, and higher recyclability). Indeed, while ProLogium is betting on a 200 GWh mass-market battery market in Europe in 2030 and thus aims to cover almost a quarter of European demand, this market is still struggling to emerge due to consumer reluctance to switch to electric vehicles (see below p. 98). In terms of jobs, ProLogium is expected to create nearly 3,000 direct jobs. For the time being, ProLogium has only recruited fifteen employees in France. ProLogium is, therefore, betting on the future.

In terms of financing, ProLogium was quick to benefit from strong government support under Choose France 2023, with Bpifrance providing €1.5 billion in state aid, approved by the European Commission in August 2023. Totaling €5.2 billion, the project is financed, in addition to the public subsidy, by fundraising by the company, which plans to go public, and bank loans. Public funds are released in tranches by BPI, on the advice of the DGE, based on ProLogium's progress on contractual milestones.

Beyond financial support—and much like Verkor—ProLogium notes the very strong mobilization and support of the public authorities for

the project, starting in January 2023. The building permit and environmental authorizations were obtained in record time in December 2024.

The support provided by the public authorities also proved to be a decisive factor in ProLogium's decision to locate in France. With the help of a specialist agency, ProLogium initially identified and audited eighty-nine sites covering thirteen countries or states in the United States and Europe. The selection was quickly narrowed down to five countries in Europe and three key sites: Germany (Emden), the Netherlands (Eemshaven), and France (Dunkirk).

The United States was also considered because it could have provided significant financial support under the Inflation Reduction Act (IRA)[36] but was ultimately quickly ruled out. This was because the IRA framework was not suited to ProLogium's model as a unicorn company that needed support to get the project off the ground (financial aid under the IRA would only have been delivered once the first batteries had been produced). The United States was also ruled out because of its lower level of public support in terms of land use planning. Despite the number of sites available, none were serviced, which would have required very costly development work to be carried out by the company itself in terms of deforestation, connection to electricity, construction of road access, etc.—without the support of the local public authorities. It was, therefore, quickly established that, unlike Europe, the United States did not offer the right framework for the project.

The choice quickly fell on Europe, then on France and the port site of Dunkirk, which met all of ProLogium's selection criteria: availability of turnkey land dedicated to industrial activity, abundant low-carbon energy at the best price, regulatory stability with low exchange-rate

[36] *Énora Morin and Georgina Wright, Compétitivité européenne : quels enseignements tirer de l'IRA? [European competitiveness: What lessons can be learned from the IRA?], Institut Montaigne, March 2025, https://www.institutmontaigne.org/publications/competitivite-europeenne-quels-enseignements-tirer-de-lira.*

risk, a talent pool and population with an industrial culture, and support from the French government, both nationally in terms of financing and locally in terms of administration. Other European countries also offered government support, but there were other limitations that argued in favor of setting up in Dunkirk: land that was not directly usable in the Netherlands and Germany, serviced land in Poland but less government aid, the risk of setting up outside the euro zone in Great Britain and additional transport costs, etc.

In comparison, France stood out for its public support for the project, directly monitored at the ministerial level by Bercy, with involvement from the Élysée Palace, and a strong shared political will, reflected in the alignment of the various administrative levels (presidential, ministerial, regional, and local) despite political differences. Locally, the port of Dunkirk responded very favorably to the economic, fiscal, and social criteria established by the project. The support provided by the CUD in terms of development (housing, attractiveness, environment, etc.) also reassured ProLogium about this location. Finally, the project was facilitated by the participation as co-project manager of RTE, which is familiar with the implementation of many other large electricity-intensive industrial projects in the region. The relationship with the European public authorities was managed more indirectly, through the DGE. To oversee the state aid approval process and receive assistance with the administrative procedures, ProLogium called on a dedicated consulting firm to study the possible regulatory frameworks: integration into the IPCEI was not successful, particularly given the complexity of the process, and it was decided to validate the state aid within the framework of an RDI framework,[37] particularly as this was in line with ProLogium's plan to not only produce batteries on a large scale but also develop innovations and pursue research activities.

[37] *European Commission, "Cadre concernant les aides d'État à la recherche, au développement et à l'innovation (RDI framework)" [Framework for State aid for research and development and innovation], summary, EUR-Lex, https://eur-lex.europa.eu/FR/legal-content/summary/state-aid-framework-for-research-and-development-and-innovation-rdi-framework.html.*

For ProLogium, a Taiwanese company making its first investment outside Asia, there was obviously a constant discovery of the intertwining of French and European law and the French regulatory framework (environmental legislation, prior public consultation, etc.). Although there was a degree of culture shock, the company was understanding of these measures, which were implemented without any particular difficulties.

Beyond the risk factors mentioned above regarding the technological gamble on solid-state batteries, the future of European demand for batteries, and the recruitment of talent, ProLogium highlights the bureaucratic complexity of Europe and France. The validation of state aid required the submission of files exceeding several hundred pages to both DG Comp and DG Trade, again via the DGE.[38] Although a "Team France dynamic" (alignment of the various public players) was set in motion as soon as the financing decision was taken, European procedures remain slower and more complex, particularly for foreign investors, including with regard to eligibility criteria for financing opportunities (see p. 88).

Two other projects complement this battery value chain, both upstream and downstream.

The **Orano/XTC** project contributes to the "upstream" battery production process, with two component production plants. Since 2022, Orano's partnership with the Chinese company XTC—a leader in the supply of materials for electric vehicles—has taken the form of two joint ventures (finalized in December 2024), enabling the transfer of technology and expertise from China to France. Specifically, this technology transfer is carried out from XTC to the joint ventures only, which is the only way Orano can use it. The transfer covers the factory processes

[38] *That is, ProLogium needed to file this documentation with two directorates of the European Commission, DG Comp (Directorate-General for Competition) and DG Trade (Directorate-General for Trade) via the French DGE: Direction générale des Entreprises, or Directorate General for Enterprise.*

—cathode active material (CAM) and precursor cathode active material (PCAM)—and the parameters for producing the products that will be sold by the joint ventures. While the transfer can only be used through the joint ventures, either partner may independently decide to develop an additional CAM or PCAM activity in Europe through the joint venture, regardless of whether the other partner participates. Orano is also contributing to the "downstream" part, with a third battery and production scrap recycling plant, but its construction has been delayed following the withdrawal of Stellantis from the initial partnership.

Specifically, the project involves the construction of a Neomat PCAM plant to produce cathode precursors and a plant to produce cathode active materials (Neomat CAM) at a rate of 80,000 tons per year. The two plants operate in true synergy, with the first PCAM plant supplying material to the CAM plant. These two components are essential for the manufacture of battery cells and should enable the production of a total of 64 GWh of batteries, which is equivalent to supplying 700,000 to 1 million cars per year. The two companies, which share ownership and governance, hold roughly equal shares in each plant: Orano owns 51 percent and XTC New Energy 49 percent of the PCAM plant, while the ratio is reversed for the CAM plant (XTC New Energy 51 percent, Orano 49 percent).

The factory site, located in Loon-Plage, covers approximately 50 hectares. The availability and characteristics of this site were key criteria in Orano's decision to locate there, thanks to its "turnkey" delivery following the mobilization and foresight of the GPMD: immediate access to electricity and water and proximity to logistics infrastructure. Beyond the availability of the land, Orano, which had selected three other potential sites in the Grand Est and Normandy regions, chose Dunkirk in particular thanks to the significant mobilization of the Hauts-de-France Regional Council and local economic agencies, whose quality of support for the establishment process was noted by all stakeholders. While access to turnkey land was already a major advantage for Dunkirk, the

welcome and dynamism of local stakeholders were decisive factors, particularly in terms of effectively managing environmental compensation procedures (measures to "avoid, compensate, reduce" and zero net artificialization).

At present, construction of the plants has not yet begun, and public consultations have been ongoing since 2024. A public inquiry was held in July and August 2025 concerning the CAM plant, following consultations that took place in 2024.[39] Construction of this first plant is scheduled to begin in early 2026, once the prefectural decree has been obtained, the relocation of protected species and land clearing have been completed, and authorization to start construction has been granted by the governing bodies of XTC and Orano, with production expected to begin in 2028. The PCAM plant is expected to be built starting in 2027, with production beginning in 2031.[40]

The overall budget for the two projects is €1.5 billion, financed by loans, company capital, and public funding. The project has benefited from the CI3V fund,[41] enabling the DGE to provide partial coverage of the capital investment, under the European Temporary Crisis and Transition Framework (TCTF),[42] which authorizes the coverage of capital subsidies in certain sectors, particularly the battery sector. The TCTF, a European

[39] *Orano and XTC New Energy, "Synthèse du projet Neomat CAM – enquête publique du 7 juillet au 8 août 2025" [Summary of the Neomat CAM project – public inquiry from July 7 to August 8, 2025], https://www.orano.group/concertation-orano-xtcnewenergy/fr/enquete-publique.*

[40] *Orano and XTC New Energy, "Synthèse du projet Neomat CAM" [Summary of the Neomat CAM project].*

[41] *The CI3V (Interministerial Committee for the Establishment of Green Industrial Sites) is a national strategic steering mechanism aimed at accelerating and securing industrial projects with a high ecological impact.*

[42] *On March 23, 2022, the European Commission adopted a temporary crisis framework to enable Member States to support the economy in the context of Russia's invasion of Ukraine. This temporary framework complements the existing state aid toolbox, which already offers Member States many other possibilities, such as measures to compensate companies for damage suffered directly as a result of exceptional circumstances, as well as the measures described in the Commission's communications on the evolution of the energy market (European Commission, "REPowerEU: Joint European Action for More Affordable, Secure and Sustainable Energy," last modified 2022, https://commission.europa.eu/topics/energy/repowereu_en). The Temporary Crisis Framework was replaced in 2023 by the Temporary Crisis and Transition Framework (TCTF).*

Union mechanism established by the Commission in 2023 to authorize, in exceptional circumstances and for two years, certain forms of state aid compatible with the internal market, allows state aid to cover 20 to 25 percent of investment expenditure, up to a ceiling of €200 million. Designed to be exceptional and temporary in response to the energy shock, the program has been extended until 2030 under the Clean Industrial Deal State Aid Framework (CISAF). The project has also benefited from a strategic project guarantee from Bpifrance and won an Innovation Fund call for projects in early November 2025 (the amount has not yet been disclosed), wich will be used to partially finance the recycling and PCAM plants. Local subsidies were limited by the TCTF ceiling, but Orano will still be able to benefit from training grants, and the GPMD has also financed road access to the site, to the tune of €3 million.

Orano's experience with public support schemes for industrial projects is similar to that of ProLogium. Orano highlights the involvement of regional public authorities. Local authorities also played a central role. The Hauts-de-France region, the Dunkirk Urban Community, and the municipalities of Gravelines and Loon-Plage facilitated the establishment of the project, in particular by assisting with the search for land, for which the port's forward planning was decisive. State services, in this case the DREAL and the sub-prefecture, provided very useful assistance with administrative procedures, although the complexity of these procedures is also noted (see p. 75). In the process of accessing public funding, the DGE acted as a "facilitator" by positioning itself as an intermediary with European institutions. At the European level, Orano initially mobilized the IPCEI framework, which ultimately proved too complex, before turning to the Innovation Fund, which was perceived as better structured to meet the needs of innovative companies, complemented by the TCTF framework.

Although Orano benefited from assistance with the establishment of its facility, several impediments were identified throughout the process, in particular the administrative procedures, which are overly sequential and

not sufficiently parallelized. Environmental compensation procedures were found to be particularly complex (see p. 77), especially for a foreign investor. This also results in high entry costs for industrial firms (in terms of resources committed, such as the use of an external consulting firm), despite the assistance provided by local authorities. With regard to financing mechanisms, Orano highlights the complexity of certain European mechanisms, such as the IPCEI (see above). Finally, changes in market conditions will also determine the success or failure of the project. These depend in part on the regulatory conditions (in addition to the financing conditions already secured) in terms of subsidies for electric vehicles, incentives and regulations associated with production in Europe, recycling requirements in Europe, etc. For Orano, the question of the third plant also arises, the launch of which will depend on market conditions, the selection of a potential partner, and the project's final scope.

The last project concerns the downstream segment of the battery value chain. Initiated in 2018 in Eramet's R&D laboratory, the ReLieVe project ("Recycling of Li-ion batteries for electric vehicles") was originally driven by Eramet and **Suez**. The initial project combined Eramet's know-how in recycling battery metals contained in "black mass"[43] with Suez's experience in the collection, sorting, preparation, dismantling, and recycling of battery waste, stemming in particular from its hydrometallurgical know-how.

Following Eramet's withdrawal from this project at the end of 2024, only Suez's battery dismantling plant is still moving forward. It is calibrated to meet European rules imposing thresholds for the recovery of production materials in batteries placed on the European market from 2027 onwards.[44] Above all, the Dunkirk project has been designed from the outset with the establishment of gigafactories in mind and as part of

[43] *Black mass is the dark powder produced by grinding used batteries, which is rich in critical metals (lithium, nickel, cobalt, manganese).*

[44] *Official Journal of the European Union, "Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 Concerning Batteries and Waste Batteries, Amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and Repealing Directive 2006/66/EC," L 191/1 (28 July 2023), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R1542.*

a circular economy approach within a local ecosystem: The aim is to contribute to a closed-loop system by recycling battery components that can then be used to supply factory production.

Beyond the proximity of the battery factories, and although Suez had considered locating this factory near car manufacturers, it was once again the mobilization of local stakeholders that was decisive in persuading the company to set up in northern France, illustrated by their responsiveness in assisting with the necessary procedures ("It really makes you want to go there").

Although the project has been delayed (production was initially scheduled to start in 2025), and Suez is still looking for a new partner, the company is maintaining its commitment to the upstream battery dismantling and recycling project, thus completing the local value chain. The ambition is to process 200,000 batteries per year, or 70,000 tons of waste.

In terms of financing, the project has received support from the EU Innovation Fund (€67 million) and BPI (€13 million). As early as its pilot phase in 2020, the project received €3 million in funding from EIT Raw Materials, a knowledge and innovation community of the EU that supports innovation projects in the field of critical materials.

Once again, support from local authorities was a defining aspect of the project. The initial intention to set up near a port and, above all, other battery projects under development, was only reinforced by the enthusiasm shown by local authorities, whose simple communication, responsiveness, and significant support system, whether from the CUD or the GPMD, are praised by the company. The same is true of the sub-prefects, with whom the company was in constant contact. The project is currently on hold, although the battery metal recycling part remains on the agenda. Beyond the main challenge of finding a new partner, Suez is facing a lack of public funding to develop battery waste collection, particularly at the European level.

2 Strengths, Obstacles, and Risks

2.1. A REGION WITH MANY STRENGTHS

a. Dunkirk, gateway to France and the Rhineland Europe, with first-rate infrastructure and logistic advantages

The Dunkirk region is located at the crossroads of major transport routes between France and the Rhine River basin, giving it a strategic position on a European scale.

The region has a dense, multimodal logistics hub (Dunkirk is France's leading multimodal port), with deep-water port infrastructure, an LNG import and regasification terminal, and a combined transport terminal (Terminal des Flandres) providing direct connections between the road (A16, E40), rail (the port has its own internal rail network connected to the national and cross-Channel networks) and river networks. Dunkirk is the leading river port in the Hauts-de-France region, handling three million tons of freight per year and providing links to both Rhineland Europe and the Paris basin. Moreover, the construction of the Seine-Nord Europe canal will strengthen links with Belgium and the Netherlands, connecting the ports of Le Havre, Rouen, and the Paris region to Dunkirk and Lille, and extending onwards through Belgium to the Netherlands as far as Amsterdam. These interconnections between five seaports and sixty inland ports[45] (for France and Belgium) are expected to enable 150 million tons of goods to be transported by 2035 through the Seine-Scheldt network.[46]

[45] *Seine-Escaut, "Le Réseau Seine-Escaut [The Seine-Escaut network]," Seine-Scheldt, https://seine-scheldt.eu/le-reseau/, accessed September 4, 2025.*

[46] *Seine-Escaut European Economic Interest Grouping, Un investissement d'avenir pour les territoires européens [An investment in the future for European territories], Seine-Scheldt, https://web.archive.org/web/20240803235230/https://seine-scheldt.eu/app/uploads/2022/06/GEIE_SE-220519-_3-volets_FR_EXE_PAP.pdf.*

These assets make the region a natural gateway for raw material flows and a high-performing export platform for processed products, including those destined for the industrial heartland of Europe. In the case of batteries, this location is particularly strategic: The transport of batteries requires strict safety and packaging standards, with UN certification, in particular to mitigate the risks of thermal runaway. Consequently, transportation costs are high, hence the advantage of Dunkirk's location, which allows for rapid delivery to European automotive industry stakeholders located in the rest of northern France, as well as in Rhineland Europe and the Nordic countries via the North Sea.

b. Privileged access to energy, but at a cost that hinders European industrial competitiveness

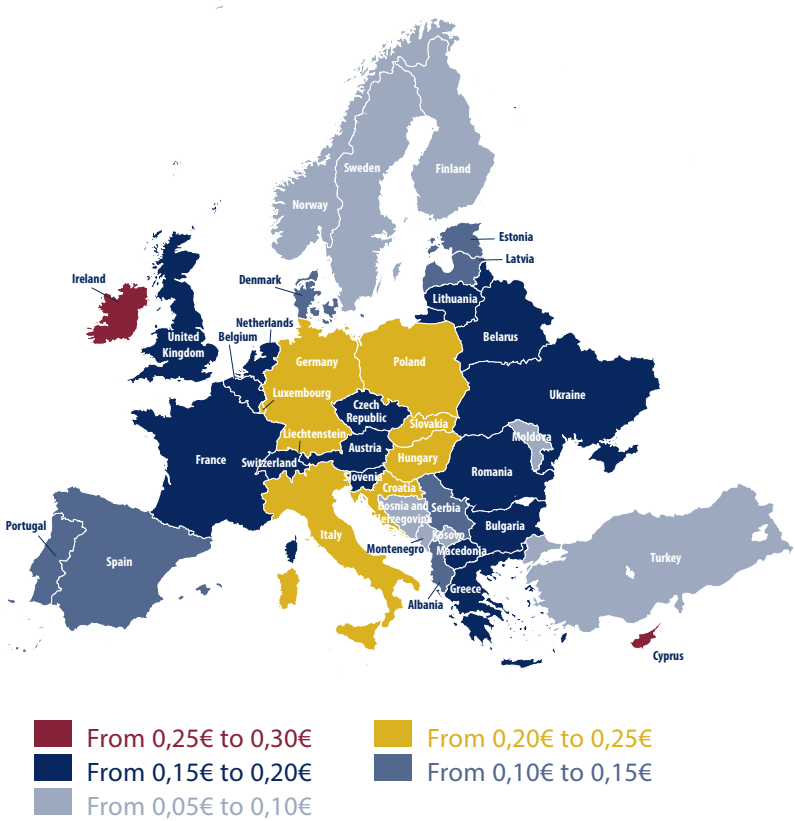
In terms of energy, the availability of carbon-free electricity is a decisive advantage in the context of energy and industrial transition, where decarbonization relies on the electrification of end-uses. This is all the more decisive for energy-intensive industries. Thus, the availability of high-capacity and varied energy infrastructure has been decisive: for example, the Gravelines power plant located 20 km away, which has a capacity of 5,400 MW and whose production capacity is set to increase (an additional 3,340 MW) with the construction of a new EPR2 reactor by 2038/39, while the plant already supplies 74 percent of the electricity in the Hauts-de-France region. In addition, there are several renewable energy production projects, including the construction of an offshore wind farm in 2028 and the development of a renewable, low-carbon hydrogen value chain based on several initiatives. Competitive access to raw materials via the port completes this ecosystem.

Nevertheless, one of the obstacles for European industry is the energy cost differential compared to its non-European competitors, which has been exacerbated by the consequences of the energy crisis and Russia's invasion of Ukraine.

While at the intra-European level, the price of electricity is lower in France compared to several of its partners in other Member States (see Figure 4a), European companies pay two to three times more for their electricity than their American and Chinese counterparts (see Figure 4b), as well as Canadian and Australian counterparts. Gas prices in Europe are also around four to five times higher than in these regions. Although the significant increase in this gap since 2022 has stabilized slightly, a return to pre-2022 levels is not expected in the medium term under current policies. According to RTE projections[47] based on various possible scenarios—a favorable macroeconomic scenario and a scenario of "thwarted globalization"—electricity prices are expected to increase in all cases by 2035 (full system cost of €75/MWh to €90/MWh depending on the scenarios in France). Gas prices in Europe, meanwhile, could fall until 2030 in the favorable scenario, but would remain well above pre-crisis levels (€15/MWh before the crisis and €25/MWh in 2030). Furthermore, in a "thwarted globalization" scenario, gas prices would continue to rise until 2030 (€40/MWh) and would only fall after that date.

[47] *Réseau de Transport d'Électricité (RTE), Bilan prévisionnel 2023 – Synthèse [2023 Forecasting Report – Summary], 2023, https://assets.rte-france.com/prod/public/2023-09/Bilan-previsionnel-2023-synthese.pdf; Réseau de Transport d'Électricité (RTE), Bilan prévisionnel 2023, Chapitre 9: "Économie du système électrique," [2023 Forecasting Report, Chapter 9: Electricity System Economics], 2024, 10, 31–32, https://assets.rte-france.com/analyse-et-donnees/2024-07/Bilan%20previsionnel%202023%20Chapitre%209%20Economie%20systeme%20electrique.pdf.*

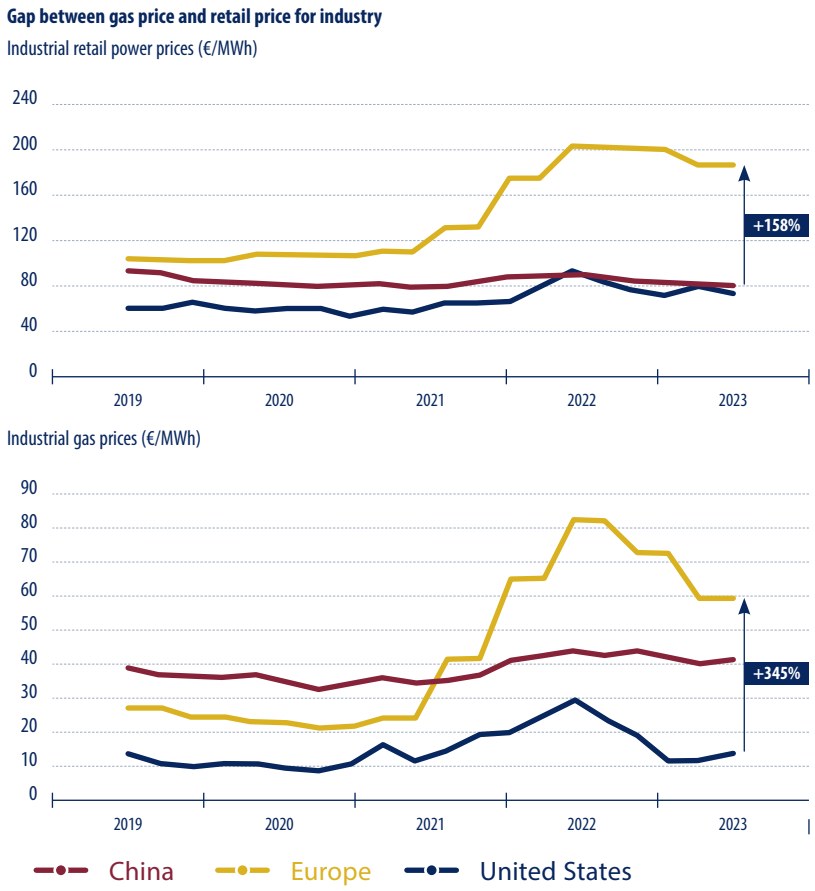
Figure 4a • Electricity prices in Europe[48]



Source: Eurostat, (2024).

[48] *Source: Eurostat, "Electricity Prices for Non-Household Consumers, Second Half 2024," accessed September 4, 2025, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:F6Electricity_prices_for_non-household_consumers,_second_half_2024_.png.*

Figure 4b • Comparison of gas and retail electricity prices for industry in Europe, the United States, and China[49]



Source: European Commission, Eurostat (EU), EIA (United States) et CEIC (China), 2024.

[49] *European Commission, The Future of European Competitiveness: In-depth Analysis and Recommendations. Part B, European Commission, September 2024, 5, https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en?filename=The%20future%20of%20European%20competitiveness_%20In-depth%20analysis%20and%20recommendations_0.pdf.*

This energy cost premium is a major competitive disadvantage, made all the more problematic by the fact that it affects precisely those sectors that are most strategic for the climate transition, such as steel, aluminum, chemicals, and battery production.

There are several reasons for this situation. At the European level, the electricity market remains structured around a pricing system—considered the most rational from an economic standpoint—that does not allow the stable costs of carbon-free energies (nuclear, renewables) to be decoupled from the volatility of fossil fuel prices, particularly gas (see p. 129, box on the European electricity market). Furthermore, insufficient investment in low-carbon infrastructure and dependence on external resources are widening the gap with other economic zones.

These high energy prices are holding back certain essential industrial projects, with significant knock-on effects. In the case of the Dunkirk region, this is true, for example, of hydrogen decarbonization projects, which are profitable only if the cost of hydrogen is competitive, which is only possible with very low-cost electricity (around €15/kWh). Industrial players are also calling for visibility on electricity prices, without which it is impossible to plan long-term investments, particularly those related to decarbonization.

The situation is all the more concerning in France as the planned end of ARENH (Accès Régulé à l'Électricité Nucléaire Historique, Regulated Access to Historic Nuclear Electricity) by the end of 2025[50] creates a policy void for which no clear replacement solution has been found to date. In this context, it is essential that the government clarify EDF's strategic objectives (see section 3). At the European level, clarification

[50] *Thomas Reverdy, "Fin de l'ARENH: comment l'électricité nucléaire française a basculé dans le marché" [The end of ARENH: How French nuclear electricity shifted to the market], The Conversation, April 15, 2025, https://theconversation.com/fin-de-larenh-comment-lelectricite-nucleaire-francaise-a-bascule-dans-le-marche-253145.*

is also expected regarding the future of the carbon market (see p. 166, box on the European carbon market). As free emission allowances disappear—a process that will begin in 2026 and end in 2034—and are replaced by the carbon border adjustment mechanism (CBAM), European and French industrial firms risk seeing their input costs rise without an offsetting mechanism. The pressure this could put on their competitiveness, particularly in exports and downstream in value chains, could hamper their greening efforts.

2.2. AVAILABLE LAND AND A STRATEGY OF ANTICIPATION AND PREPARATION OF "TURNKEY PLATFORMS" TO FACILITATE THE ARRIVAL OF INDUSTRIAL FIRMS

a. "The mother of all battles": Ideally located, available, and developed land

Dunkirk's geographical location, combined with a significant land reserve (7,000 hectares in the port, of which 3,000 have remained vacant and undeveloped since the 1970s), makes it possible to offer "turnkey platforms" that are particularly attractive to industrial project developers.

The *Grand Port Maritime de Dunkerque* has played and continues to play a central role in this strategy, anticipating, preparing, and developing turnkey or tailor-made platforms that are ready to accommodate new industrial projects. Given the short "time to market" for companies (often less than three years), i.e., the period between the siting decision and the launch of a product on the market, the preparation of the land becomes crucial. The more procedures that need to be completed, the longer it inevitably takes for the project to materialize. Hence the importance of anticipation and preparation by the port, which can really make a difference compared to other industrial areas. This this principle of anticipation was formally enshrined by the port in its strategic plan

in 2008, during the port reform[51] that made the port of Dunkirk a public state institution. This means that the port is under the supervision of the ministries responsible for transport and the economy but at the same time enjoys broader prerogatives, in particular the status of land developer and full ownership rights over the port area.

This land development process began in the years 2010–2015, with the aim of transforming "low-cost" land into "premium" land. Most of the 3,000 hectares of available land had been either leased to farmers or remained in the form of wasteland where biodiversity developed. The planning operation therefore involved numerous stages: selection of a specific dedicated perimeter where the port proactively carries out preventive archaeological and fauna and flora studies (carrying out an inventory over four seasons), as well as earthworks. This initial two-to-three-year process allows for administrative authorizations to be secured in advance. The port is also working on developing the land and connecting it to transport and electricity networks, arranging in advance with RTE for investment in a high-voltage station near the serviced land, enabling it to be connected to the rest of the network. This is a key anticipatory measure, as this type of installation requires a minimum of two years to become operational.

This connection was a decisive factor in Verkor's siting decision. All these proactive measures have enabled the rapid installation of battery factories. One stakeholder sums up the current situation, with much of the land already allocated: "We're fighting to come to Dunkirk." In the case of projects such as Orano-XTC, it is also the combination of available, ready-to-use land, coordinated institutional guidance, and a national framework conducive to reindustrialization that has made it possible to attract international investment.

[51] *République française, LOI n° 2008-660 du 4 juillet 2008 portant réforme portuaire [Law no. 2008-660 of July 4, 2008 on port reform], Journal officiel de la République française, July 5, 2008, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000019122891.*

It should be noted that such measures were possible because the GPMD, as a national port, enjoys a special status as a land developer, allowing it to install electrical substations upstream of industrial projects. This special authority is complemented by that of RTE, which has also invested specific resources in Dunkirk, as it is classified as a priority 1 industrial zone (along with Fos and Le Havre). These industrial zones, specifically identified as having potential for growth, are authorized to build infrastructure in advance, even before industrial projects are confirmed. RTE has therefore committed to investing €1.5 billion in connecting the network, which will be delivered in 2029, regardless of whether the industrial projects materialize. The P1 zones, which effectively allow for risk-taking, correspond to an objective of building shared network structures, which is in line with the planning methods for major investments. Given the risks inherent in this forward-looking strategy, Dunkirk already met many of the distinguishing criteria (beyond land, political alignment, skills, electricity, a highly integrated regional industrial ecosystem, initial projects, and a ripple effect—see below).

The selection of Dunkirk as a ZIBaC (Low-Carbon Industrial Zone) in 2023 illustrates this proactive approach:[52] Dunkirk provides a very good example of a deliberate industrial and territorial planning policy supported by the national government and backed by public investment in network infrastructure.[53]

[52] *In 2023, Dunkirk was selected as one of France's Low-Carbon Industrial Zones (ZIBaC) through the D-Karbonation project, led by the public interest group GIP Euraénergie; this initiative is supported by a €13.6 million grant from the French Agency for Ecological Transition (ADEME). The ZIBaC designation serves to bring all stakeholders to the table.*

[53] *The question arises as to whether this approach could be extended to other EU Member States so that network planning can be anticipated in all member countries—but this does not fall within the EU's remit; the national TSOs (transmission system operators) of the Member States could carry out in-depth forward planning (as RTE has done) with the European Commission, which would act not as a decision-maker but as a facilitator.*

b. The environmental framework: Between necessary ambition and procedural delays

While Dunkirk stands out for its availability of land, the issue of environmental protection remains a major challenge in access to industrial sites. Reindustrialization cannot be achieved at the expense of environmental protection or public health. However, the current regulatory framework sometimes tends to slow down projects that, in fact, contribute to these objectives through their contribution to decarbonization. Numerous procedures sometimes significantly lengthen the implementation timeframes for industrial projects.

Environmental studies and flora and fauna assessments must be carried out, which can take up to a year. Once these have been completed, strict ecological compensation measures must be fully implemented as part of the "avoid, reduce, compensate" (ERC) sequence.[54] However, there is no national standard defining these compensation measures. This means that manufacturers have to use private environmental consulting firms, incurring additional costs, before the measures can be validated by the DDTM.[55] This regulatory framework is a barrier to reindustrialization, as it lacks clarity for potential foreign investors. In addition, implementation times can be significantly longer in France than in other European countries (see Figure 5 below).

[54] *The "Avoid, Reduce, Compensate" (ERC) mechanism is a regulatory approach that requires, when designing and implementing projects likely to have an impact on the environment, first to avoid these impacts, then to reduce them if they cannot be completely avoided, and finally, as a last resort, to compensate for any remaining residual effects.*

[55] *The DDTM (Direction Départementale des Territoires et de la Mer, Departmental Directorate for Territories and the Sea) has as its main mission the promotion of sustainable development and balanced land use planning in both urban and rural areas. Under the direction of the prefect of the department, it is particularly involved in the fields of agriculture, the environment, urban planning, risk prevention, road safety, maritime affairs, and coastal management.*

Figure 5 • Comparison of theoretical and actual implementation times in France and other EU Member States

Source: Laurent Guillot, Simplifier et accélérer les implantations d'activités économiques en France [Simplifying and accelerating the establishment of economic activities in France], Government of France, March 17, 2022, https://www.economie.gouv.fr/smplifier-accelerer-implantations-activites-economiques-rapport-guillot.

Furthermore, the desire to combat land take[56] sometimes conflicts with the need for quickly available serviced land. Procedures are faster in other European countries than in France (part 3).

[56] *Under the Climate and Resilience Law adopted in August 2021, France has committed to achieving zero net land take (zéro artificialisation nette, ZAN) by 2050. This commitment is accompanied by an intermediate target: to halve the rate of conversion of natural, agricultural, and forest areas between 2021 and 2031 compared to the previous decade (2011–2021). The ZAN law of July 20, 2023, reinforced support for local elected officials to facilitate the implementation of measures to combat land artificialization and respond to the difficulties encountered in the field.*

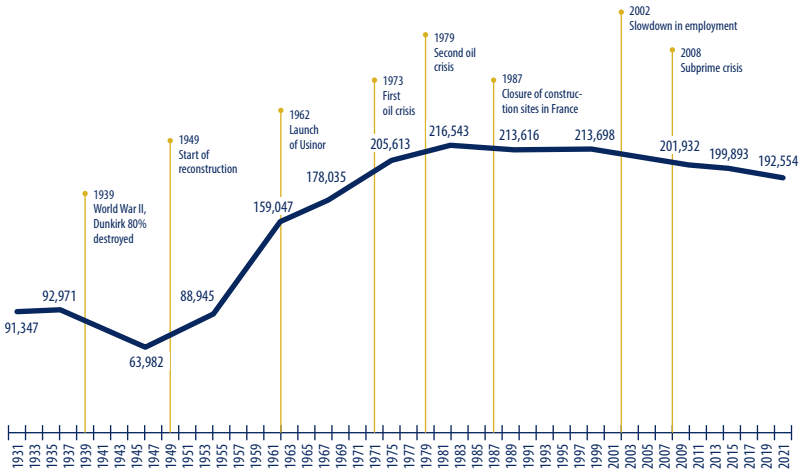
This is not a question of calling environmental standards into question but rather of rethinking their implementation so that they do not become obstacles to the transition they are supposed to support. The question could therefore be asked as to whether the government could speed up the release of certain brownfield sites, simplify certain procedures (see part 3), and better align the various objectives of environmental and biodiversity protection policy with those of industrial policy. A public debate on how to respond to the tensions between these different requirements is undoubtedly needed.

2.3. THE MAJOR ADVANTAGE OF A LOCAL POPULATION WITH A STRONG INDUSTRIAL CULTURE

a. A population resilient to shocks

The Dunkirk region's history is marked by a succession of shocks, often of exceptional magnitude. From world wars to successive waves of deindustrialization in the twentieth century (closures of shipyards and steel mills, massive job losses), the local economic fabric has been confronted with profound traumas. The port was created in April 1966, but the first setback came with the oil crises of the 1970s, followed by a second shock with the closure of the shipyards in 1987.

Figure 6 • Population growth in the urban community of Dunkirk between 1931 and 2021



Source: Dunkirk Urban Community.

Several attempts were made to revitalize the area in the late 1980s and 1990s, including government intervention: the establishment of Péchiney and the allocation of part of Gravelines' nuclear production to supply the company, a strategy of large-scale industrial development, and significant public funding. Dunkirk suffered again in 2008 following the subprime crisis, but the first signs of recovery began to appear in the early 2010s (with the construction of a methane terminal and the submission of two development plans for business parks, including an initial 300-hectare site), a dynamic that has been building since 2015.

These disruptions had a heavy human and social cost in a small area, leaving lasting traces in the collective memory. However, this memory is also one of resilience. Far from turning in on itself, the region has cultivated a kind of "spirit of resilience," an ability to look to the future

without denying the wounds of the past. This atypical positioning is a strategic lever in the region's industrial revival.

This industrial past remains a structuring frame of reference. It fuels a technical and professional culture that is still vibrant today, fostered by the long-standing geographical presence of traditional heavy industries. The availability of a skilled workforce and a population historically acculturated to industrial issues is a differentiating factor for investors.

b. Greater social acceptance of industry than elsewhere…

In a national context where the acceptance of industrial projects is often hampered by local opposition,[57] this memory and the industrial culture that stems from it promote social acceptance of industry. It also provides a significant pool of skills, even if the attractiveness of industrial jobs remains a persistent challenge (see section 3).

According to local stakeholders, the Dunkirk region stands out for its generally favorable attitude toward the establishment of industrial sites, including those classified as Seveso[58] or IED.[59] This acceptance can be explained both by historical familiarity with industrial culture (detailed knowledge of heavy industry among many people) and the associated risks. For example, the establishment of Seveso sites does

[57] *See, for example, the current controversy surrounding the high-voltage power line project for the Fos-sur-Mer industrial zone.*

[58] *The European Seveso Directive, adopted in 1982 and strengthened in 1996 and 2012, provides a framework for the prevention of major risks associated with industrial facilities handling hazardous substances. It distinguishes between two levels of risk (high threshold and low threshold) and imposes strict measures on operators in terms of prevention, public information, and accident management. The latest version (Seveso 3) adapts the regulations to the new classifications of chemicals and increases transparency and citizen participation.*

[59] *The European Industrial Emissions Directive, also known as the "IED" directive, aims to save resources and reduce pollution from major industrial sources by implementing the best available techniques at an economically acceptable cost (BAT). This directive requires a comprehensive approach to the environment.*

not provoke any strong opposition or fears. In the opinion of several stakeholders, there is a genuine industrial culture, including in comparison with other regions, such as Calais, which rejected several projects that ultimately went ahead in Dunkirk. Above all, in Dunkirk, the population "sees a direct benefit" in industrialization in terms of outcomes such as job creation, the mobilization of local businesses, and opportunities for their children. The issue of local employment is indeed considered one of the main drivers of project acceptability. Added to this is a shared understanding of the economic and social issues at stake (employment and territorial cohesion), as well as the sovereignty issues linked to industrial production.

This specificity translates into less conflict in public consultations and a pragmatic anticipation of regulatory constraints (see above). In a context of strategic reindustrialization, this social acceptability constitutes an important competitive advantage that facilitates the implementation of projects.

Specifically, the discussions organized by the National Commission for Public Debates (CNDP)[60] took place in a calm atmosphere and, reflecting social acceptability, the industries encountered no real opposition, only questions about industrial projects and activities. Beyond this curiosity and interest, the debates also focused on concerns related to land use issues (housing, water management, jobs, etc.). Overall, these public debates were used as a lever for new industries, both to learn about the area themselves and to make themselves known to its inhabitants, particularly in the case of foreign companies. These commissions also

[60] *La Commission nationale du débat public (CNPD) is the independent authority responsible for guaranteeing the right of everyone living in France to information and participation in projects or policies that have an impact on the environment. This right is enshrined in Article 7 of the Environmental Charter. The CNDP must be consulted on major projects. It is consulted voluntarily on projects with a lesser impact. Its scope covers projects that have an impact on the environment: energy and climate, transport and mobility, industrial facilities, facilities (scientific, sporting, tourist, or cultural), waste, and the circular economy. See: Commission nationale du débat public, "CNDP – une entité indépendante" [CNDP—an independent entity], last modified April 24, 2025, https://www.debatpublic.fr/cndp-une-entite-independante-671.*

enabled them to improve their projects accordingly and are therefore considered useful.

c. …but a need to further strengthen training and employment policies

The reindustrialization of the Dunkirk region, symbolized by the decarbonization of traditional heavy industries, the installation of battery gigafactories, and the rise of the green economy, could generate up to 20,000 direct jobs by 2035, according to estimates by the Dunkirk Urban Community, including 6,000 in the electromobility sector. Induced employment, meanwhile, is expected to reach 10,000 new jobs in 2029. Such a profound transformation involves responding to a twofold challenge: attracting talent on the one hand and managing the social and professional changes in the urban fabric on the other.

In this region, which has a strong industrial history and culture, the paradox is striking: The trend in salaried employment in the manufacturing industry is less favorable than in the rest of the country (see Figure 6), with part of the population remaining distant from the labor market or insufficiently trained for industrial jobs.

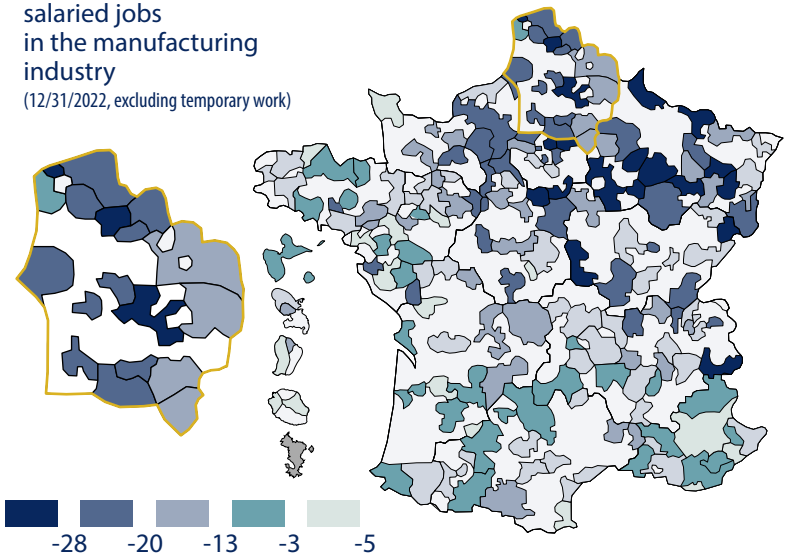
Figure 7 • Changes in salaried employment in the manufacturing industry in France and Dunkirk (2008-2021)

→ Changes in salaried employment in the manufacturing industry between 2008 and 2021

-27% Dunkerque-Flanders Industrial Territory

-14% Industrial regions of France (Outside Mayotte)

19,420
salaried jobs
in the manufacturing
industry
(12/31/2022, excluding temporary work)



Source: Insee, "Territoires d'Industrie" [Industrial territories].

Employment policy, coordinated by a dedicated department within the CUD, has been a major focus from the outset in connection with the reindustrialization project, with an emphasis on local employment. Starting in 2019, studies were conducted to examine the deficiencies

and the state of the local job market, particularly the low number of people completing initial technical training. Subsequently, a regional policy was launched that was tailored to the needs and population already present locally. In concrete terms, this involved working with all the relevant stakeholders (the local education authority, employment centers, etc.) to mobilize multiple levers:

- Information on easily accessible training opportunities (brochures on training opportunities distributed in schools, online, at local forums)—a policy that may seem obvious but did not exist before.
- Career Guidance: The local authority worked directly with the Ministry of Education and the business community, in particular by creating physical meeting places for students to meet representatives of industry in the city's neighborhoods, dedicated venues such as the Palais de l'Univers et des Sciences, career forums, etc.
- Higher education: Working with universities to ensure that programs are aligned with the challenges facing the Dunkirk region—even though the local authority is faced with the difficulty of revitalizing the local university, given the strong pull of the Lille metropolitan area.
- Career change: Working with local agencies specializing in career transition (such as Transitions Pro) on both collective (targeting an entire profession) and individual retraining.

However, part of the working population remains distant from the labor market (Dunkirk had an 8.2 percent unemployment rate in 2024) or has little training in industrial trades. Despite the majority of the population being acculturated to industry—and although this is much less the case than in the rest of France—part of the local population still has a negative image of industry, which partly explains this mismatch.

Although Dunkirk faces this problem to a lesser extent than other French regions, there is nevertheless a real human resources problem in the industry, which lacks not only skilled workers (e.g., welders for

EPR maintenance) but also engineers (see p. 139).[61] In addition, France is struggling to attract industrial "talent," largely due to the mismatch between the salary levels offered in France and international and European competition. This loss of attractiveness of the French model has resulted in a brain drain. In some regions, France is paradoxically recruiting skilled personnel from abroad to meet the local shortage of human resources.

Meeting this challenge requires the coordinated mobilization of all stakeholders in training and employment, including France Travail, local authorities, higher education, vocational training, businesses, and social partners. The aim is to develop a strategy for anticipating skills needs, adapting initial and continuing training, and supporting geographical and social mobility (in terms of salaries, living environment, public transport, compensation, mobility or relocation assistance, etc.).

d. The essential link between industrial development and regional planning: A challenge for attractiveness

As mentioned above, the issue of human resources is inseparable from reindustrialization. Similarly, broader issues relating to regional planning and attractiveness are also inseparable from human resources and, therefore, from reindustrialization.

[61] *Institut Montaigne, Métiers de l'ingénieur : démultiplier nos ambitions [Engineering professions: Multiplying our ambitions] (Paris: Institut Montaigne, 2025), https://www.institutmontaigne.org/publications/metiers-de-lingenieur-demultiplier-nos-ambitions.*

The issue of transportation

Transport and mobility are crucial issues for attracting and mobilizing the workforce, particularly in villages far from industrial sites, for which innovative solutions can sometimes be considered. Dunkirk has made commitments in this area, becoming the first local authority to offer a free transport network. Local transport policy provides for the creation of factories without parking lots, with the development of shuttles to transport employees from park-and-ride facilities or from the train station to industrial areas that are sometimes located far from the city center (such as Verkor). These initiatives are part of a transport policy designed in line with the imperatives of ecological transition and industrial change. Reducing congestion in saturated areas and on busy roads in favor of "soft" mobility also contributes to the attractiveness of the region. It is essential that these issues be taken into account in industrial strategic planning.

The challenge of housing

In addition to the issue of transport, there is also the issue of housing. In the case of Dunkirk, with the prospect of 20,000 new jobs being created, while some of the workforce can be recruited locally, the city must be prepared to welcome new residents, including those from abroad. This requires forward planning by the public authorities. In Dunkirk, which already has a housing shortage, particularly in the social housing sector, the construction of 12,000 homes is already planned over ten years, corresponding to a threefold increase in the number of homes currently built each year. All types of housing (social, luxury, first-time buyers, etc.) are planned in order to encourage the establishment of all types of professions and populations (including tourism, for example). This policy itself intersects with other issues such as recruitment in the construction industry.

The challenge of services

In Dunkirk, the local authority is working hard on the issue of services, particularly health, through subsidy mechanisms for young doctors, the opening of medical centers, and education. However, the effects will only be visible in several years' time, highlighting the need for anticipation and the importance of combining the revitalization of the region through industry with the implementation of a genuine regional development and services policy. Thus, with regard to employment, skills, and human resources, the question of a strategic vision on the part of the state concerning the social and human aspects of reindustrialization, and what currently falls within the public sector (education, higher education, healthcare, and to a lesser extent, childcare), is raised with particular urgency.

These issues are linked to another aspect of the impact that reindustrialization has on the labor market: the use of skilled and experienced foreign labor, which is a guarantee of the rise of new industries and a catalyst for the social transformation of regions.

In order to provide day-to-day support to these non-native speakers of French, who are demanding and accustomed to a high level of service, structural difficulties arise that are undoubtedly common to employment areas undergoing reindustrialization. In this regard, three major issues are often addressed too late and suffer from a lack of anticipation by both the public and private sectors at both the local and national levels: anticipating the need to strengthen healthcare provision, particularly general medicine (deindustrialized areas are often "medical deserts"); the creation of a renewed supply in the regions to develop childcare options—a sector facing a lack of attractiveness of professions and training and a lack of solutions for atypical working hours corresponding to jobs in industry, which is also a key issue for the feminization of recruitment in industry; and the need to offer bilingual or even international schooling for families.

e. "Dunkirk: The place to be"—the tension between reindustrialization and territorial cohesion

In the opinion of some of our interlocutors, one specific risk should be highlighted: that of unbalanced reindustrialization, concentrated in a few key areas at the expense of others. The dynamism of the Dunkirk region, if not accompanied by a coherent development strategy, could produce a territorial suction effect by "siphoning off" human resources and investment from neighboring areas (Calais, Saint-Omer, Boulogne). Paradoxically, this phenomenon could reinforce industrial divisions, effectively creating increased deindustrialization in the rest of the region due to reindustrialization in Dunkirk, thereby exacerbating the social and territorial divisions it was supposed to help reduce.

Public authorities must therefore anticipate responses to such tensions and their impact on territorial cohesion and development. Public actors are aware of this and want to avoid this scenario by anticipating and arbitrating these dynamics and ensuring the diversification of other industries, as well as maintaining strong social and territorial cohesion, in particular by ensuring that all citizens are involved in the transition, without pitting different economic sectors against each other and avoiding "creating losers of the transition." This means, for example, enabling industrial development while promoting local agriculture and complying with environmental legislation and regulations.

2.4. ACCESS TO CAPITAL: "THERE'S A ZERO MISSING!":[62] FINANCIAL OBSTACLES

As mentioned above in the presentation of the Dunkirk projects, access to financing is one of the major concerns for manufacturers decarbonizing or setting up in Dunkirk. This concern is widely shared at the French and European levels.

Although Europe and its Member States have increased the number of aid and support mechanisms for industrial transition and industry in recent years, their effectiveness remains hampered by significant fragmentation and atomization between the various national and European financing instruments, administrative complexity that can be discouraging when it comes to accessing and mobilizing them, and insufficiently integrated governance. Many manufacturers struggle to mobilize available public funding—whether from the ERDF[63] or other European funds such as the Innovation Fund—due to a lack of sufficient internal resources or visibility of the various funding channels. The difficulties involved in putting together funding applications are often a deterrent. It would therefore be necessary to strengthen the structure and simplify access to the various sources of public funding, for example through a "one-stop-shop" approach involving integrated governance and joint engineering.

[62] *One of the people interviewed provided a very concrete example illustrating this clear difference in financing between China and Europe: During negotiations for a possible joint venture between a gigafactory and a Chinese partner, when the European gigafactory offered to finance 10 percent of the CAPEX, the Chinese negotiators' reaction was: "There's a zero missing"!*

[63] *Created in 1975, the ERDF (European Regional Development Fund) is one of the main funding programs for European economic, social, and territorial cohesion policy. It aims to strengthen competitiveness and cohesion between European regions through investments in economic development, innovation, transition, etc. ERDF programs are allocated by region, whose authorities are therefore responsible for allocating them to projects.*

This situation is all the more problematic given that industrial decarbonization projects are, by their very nature, very capital-intensive, while most companies in the sector, which are often relatively young, have limited financial resources. According to studies by the SGPE (Secrétariat Général à la Planification Ecologique, the General Secretariat for Ecological Planning), of all industrial transformation projects aimed at reducing greenhouse gases, only a quarter of companies have the necessary financial capacity, and a third of projects are associated with companies that do not have the economic capacity to finance them. However, funding for decarbonization remains below investment needs.[64]

At the same time, Europe continues to lose ground to powers such as the United States and China. On the other side of the Atlantic, the end of the IRA and its massive, predictable, and rapid support for green industries has been replaced by a policy of deregulation and low energy prices across the board. The People's Republic of China has developed an entire political economy geared toward supporting its industries, which Xi Jinping's techno-nationalism has only reinforced.

In France, the signals being sent are worrying: The finance law passed for 2025 has led to a reduction in the funds allocated to industrial policy. Furthermore, at the European level, the Draghi report, submitted to the Commission in September 2024, highlighted this asymmetry and warned of its effects in terms of Europe's loss of competitiveness. One year after its publication, the observations made by the former president of the ECB have not yet led to any substantial efforts to address these disparities in financing and energy costs. Despite the consensus on the findings, the apathy is largely due to disagreements between Member States on the issue of financing, particularly with regard to public investment. Added to this is uncertainty about the future of the

[64] *Logan Gourmand, "Quels besoins d'investissements pour les objectifs français de décarbonation en 2030? [What investment needs are required to meet France's decarbonization targets for 2030?]," Document de travail de la Direction générale du Trésor, no. 2024/2 (April 2024), https://www.tresor.economie.gouv.fr/Articles/9e631895-bbef-4e9e-8cb6-9c1090986cd9/files/50ee53e8-9451-4077-9476-f81dd8dc1f0d.*

Green Deal,[65] which has been repeatedly attacked by the far right but also criticized by certain European capitals and sections of the right. The resulting regulatory instability is likely to affect investment in green industries in Europe.

In this context, several manufacturers interviewed emphasized the uncertainty surrounding their future investments. These concerns reflect a simple but worrying reality that was expressed by several of our interviewees: "As things stand, it is more expensive to decarbonize than to do nothing!" Even combined national and European aid for certain decarbonization projects is not enough to make them economically viable.

For example, in the case of Lhoist, the cost of decarbonization (from capture to storage) is estimated at €330–350 per ton of CO_2 and reduced to around €260 per ton after European support through subsidies. However, it remains largely unprofitable compared to the ETS price, which currently stands at only around €65–68 per ton of CO_2. In addition, the cost of decarbonization is sometimes compounded by the "first runner" cost, i.e., the unforeseen costs associated with the use of new technical solutions. While the cost of CO_2 capture was estimated at €110 per ton and the cost of logistics and storage at €50 per ton at the start of Lhoist's decarbonization project, it has now risen to €150 and over €150, respectively. The cost of financing infrastructure, built for the first time, must also be taken into account, even if shared between several industries.

While several mechanisms exist at the European level to support industrial development, these are not considered comparable to those put in place by non-European competitors in their decarbonization efforts. The Chinese government, for example, directly finances CAPEX through

[65] *Virginie Malingre, "Décrochage économique de l'Europe: le Pacte vert sous le feu des attaques" [Europe's economic decline: The Green Deal under fire], Le Monde, January 29, 2025, https://www.lemonde.fr/economie/article/2025/01/29/decrochage-economique-de-l-europe-le-pacte-vert-sous-le-feu-des-attaques_6521139_3234.html.*

mechanisms such as repayable advances in the form of tax credits or subsidies, which are then converted into debts to the state. Furthermore, according to some of the manufacturers surveyed, European funding frameworks are considered well designed in terms of supporting research and development but less effective for financing OPEX and scaling up businesses. In fact, most European financing instruments apply mainly to CAPEX (although OPEX financing is possible in certain specific cases—state aid, unprofitable InnoFund projects), unlike the US IRA, for example.[66] The Draghi report itself recommends extending possible support to OPEX expenditure, especially since for many green technologies that are not yet mature, operating and running costs are still often poorly defined and frequently higher than those of traditional technologies.[67]

Some European funding is sometimes not suited to the specific situations of companies. For example, the EIB made the provision of purchase orders from automotive customers for gigafactories a condition of financing, even though these did not yet exist. In some cases, such as Verkor, it was nevertheless possible to obtain this financing from the EIB because the company had managed to agree on an offtake contract with Renault, enabling it to demonstrate orders to the EIB before the gigafactory was even built. However, not all gigafactories are able to obtain such contracts, which limits their financing options. The very strict rules on the type of materials eligible for financial aid, which exclude black mass intermediary material in particular,[68] limit the support available to battery recycling plants.

[66] *Mario Draghi, The Future of European Competitiveness: In-depth Analysis and Recommendations, Part B (Brussels: European Commission, 2024), 125, https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en?filename=The+future+of+European+competitiveness_+In-depth+analysis+and+recommendations_0.pdf.*

[67] *Draghi, The Future of European Competitiveness, Part B, 125.*

[68] *In battery recycling, black mass refers to the material obtained once the metals contained in the batteries have been reduced to powder. Hydrometallurgy is then used to recover these metals from the black mass for reuse in the production of new batteries.*

Faced with the development of new technologies, uncertain profitability, and customers unwilling to pay a premium for a low-carbon product, companies are calling for more robust support mechanisms.

However, a distinction must be made between the following types of industries:

- New industries, which are not profitable in the short or medium term given the industrial and technological processes still needed to mature, as well as the market and mass effects. In economic theory, these protections must be accompanied by temporary barriers when facing more advanced foreign production.[69] On the other hand, these industries can prove extremely profitable in the long term. This profile justifies intervention in innovative projects *(first of a kind)*, which is precisely what the European framework allows. In some cases, on the contrary, it may seem difficult to envisage subsidizing large-scale projects on an ongoing basis, potentially at a loss.
- Traditional heavy industries: In this case, part of the decarbonization process is profitable in the long term when it involves industrial and energy optimization in particular (lower material and energy consumption), but part of it is unprofitable in the short term with the increase in the price of carbon and profitable in the long term once decarbonization has been achieved. However, this is compounded by a decline in the competitiveness of decarbonized production, linked to the exogenous factor of the carbon market, which may lead to the relocation of part of production to other production sites outside Europe. In this case, it would not be a question of subsidizing unprofitable industries, but of subsidizing common goods (in this case, decarbonization and the fight against climate change).[70] From this point of view, the European Commission's

[69] *Marc J. Melitz, "When and How Should Infant Industries Be Protected?" Journal of International Economics 66, no. 1 (2005): 177–196, https://doi.org/10.1016/j.jinteco.2004.07.001.*

[70] *Kalin Anev Janse, Roel Beetsma, Marco Buti, Klaus Regling, and Niels Thygesen, "European Public Goods: The Time for Action Is Now," Bruegel, January 15, 2025, https://www.bruegel.org/analysis/european-public-goods-time-action-now.*

announcement of a future Decarbonization Bank,[71] with €100 billion in funding, is a step in the right direction.

Furthermore, economic security objectives and strategic autonomy issues may justify policies that go beyond the mere threshold of profitability, especially when other international players are providing massive support to their strategic sectors, such as economic security or national security issues. Mechanisms should therefore be established to distribute efforts in a sustainable and bearable manner in order to make them sustainable.

2.5. GOVERNANCE AT DIFFERENT LEVELS: "TRUST, A KEY FACTOR"

a. A collective organization serving a common strategy

The region has a clear strategic ambition, structured around three major vertical value chains: batteries, steel and aluminum decarbonization, and green hydrogen. This ambition is driven by a particularly committed local political momentum, which stands out for its intensity and continuity, far beyond what is seen in other regions. It is based on effective alignment between the national, regional, and local levels, in a project-based mode approach in which the state plays a facilitating role. The prefecture and sub-prefecture provide ongoing support to manufacturers, facilitating their establishment and removing administrative barriers in a consistent and systematic manner for each project, despite successive generations of public actors (work perceived as a "marathon with baton changes").

[71] *European Commission, "The Clean Industrial Deal: A Joint Roadmap for Competitiveness and Decarbonisation," COM(2025) 85 final, February 26, 2025, https://commission.europa.eu/topics/eu-competitiveness/clean-industrial-deal_en. This Bank is still at the Commission proposal stage and must still be approved by Parliament and then the Council before it can be launched.*

In concrete terms, this project mode consists of regularly bringing together all the relevant state and local government departments (SDIS,[72] SNCF,[73] DREAL,[74] DTTM,[75] CDC Biodiversité,[76] CUD,[77] Regional Council, etc.) for an industrial project, in order to centralize information and decision-making in a spirit of seamless coordination. This means handling industrial projects from the outset, then at each stage (access to land, environmental authorizations, CSRPN,[78] permits, recruitment), until "the last apprentice is hired." The installation process is thus drastically simplified and accelerated.

This support is structured around several distinct steering committees bringing together the stakeholders mentioned above, enabling rapid and detailed handling of specific issues (housing, mobility, regional attractiveness, employment and training, industrial water). This work can be spread over two to three years on a continuous basis. First implemented to support the establishment of Verkor, this highly effective approach was then replicated for other gigafactories and local industrial projects. Reflecting the intense activity in the Dunkirk area compared to other regions, the sub-prefect has to monitor a dozen such projects each year, compared to one or two for his counterparts in other areas.

[72] *SDIS ("Service Départemental d'Incendie et de Secours", Departmental Fire and Rescue Service).*

[73] *"Société Nationale des Chemins de Fer", the French national railway company.*

[74] *The Regional Directorates for Environment, Planning, and Housing.*

[75] *The Departmental Directorate for Territories and the Sea (DDTM) is an interministerial departmental directorate (DDI) under the authority of the Prefect, serving the sustainable development of territories in all its dimensions.*

[76] *Created in 2008 by Caisse des Dépôts (a French public-sector financial institution), CDC Biodiversité is a subsidiary of the CDC Group whose main mission is to reconcile biodiversity and economic development in the public interest.*

[77] *The Urban Community of Dunkirk (CUD) is the first voluntary urban community in France. It was created by decree on October 21, 1968. It works to develop the urban area and improve the well-being of its inhabitants. The urban area now comprises seventeen municipalities and three associated municipalities, covering part of Maritime Flanders and the entire coastline of the Nord department. Its three main missions are: organizing major public services, promoting the region, and ensuring territorial cohesion.*

[78] *CSRPN: Conseil Scientifique Régional du Patrimoine Naturel (Regional Scientific Council for Natural Heritage).*

This system reflects a genuine public authority approach, with not only government departments but also all public and semi-public bodies organizing themselves in such a way as to streamline the administrative burdens of industrial project development as much as possible. This climate of cooperation is reinforced by the ease of dialogue between the various players in the region: industrial firms, public authorities, local authorities, chambers of commerce and industry, trade associations, competitiveness clusters, etc. This "cooperative" culture facilitates the implementation of public–private synergies and fosters exemplary governance, both formal and informal. The high level of trust between stakeholders is a key factor in this success: Decisions are made more quickly and bottlenecks are less frequent. There is also genuine political cohesion, even between stakeholders with different political leanings, who put their differences aside to pursue common goals for the region.

Nevertheless, according to some of our interviewees, limitations remain, notably the persistence of a silo mentality between administrations, which sometimes hinders the effectiveness of collective action. The regional (DREAL, DREETS), national (ADEME),[79] and ministerial levels are not always perfectly aligned, with each advancing according to its own internal rationale. This project-based mode, while owing much to the local actors implementing it in Dunkirk, is applied throughout the region. While other successes are worth mentioning (such as the AESC and ACC factories), Dunkirk stands out because of the aforementioned advantages, and in particular the availability of land around a structuring and highly autonomous actor such as the GPMD.

[79] *ADEME ("Agence de la transition écologique") is the French Agency for Ecological Transition and is under the direct supervision of the Ministries of Ecological and Solidarity Transition and Higher Education, Research, and Innovation.*

b. A "willingness to work together" helps to align the various political and administrative players at different levels

At the European level, the Hauts-de-France region has been recognized as an eligible territory benefiting from the European Just Transition Fund for the 2021–2027 financial period.[80] The region thus benefits from a specific budget of €228 million, which it can allocate at its discretion to support decarbonization projects. Hauts-de-France has equipped itself with effective distribution tools (Rev3, competitiveness clusters, etc.).

At the national level, major investment plans—France Relance[81] (€100 billion) and France 2030[82] (€54 billion, reduced to €30 billion)—have strongly supported industrial projects, including in Dunkirk. Funding is targeted in particular at reindustrialization and the decarbonization of processes. Bpifrance and Caisse des Dépôts (via Banque des Territoires) play a key role in helping innovative companies to set up and in structuring the industrial value chains of the future.

[80] *The Just Transition Fund is a European cohesion policy tool set up by the first von der Leyen Commission. It aims to support regions in their energy and industrial transition towards carbon neutrality by mitigating the resulting socioeconomic consequences in order to achieve the objectives of the Green Deal and the Paris Agreement. In concrete terms, the JTF supports projects that contribute to the achievement of the climate neutrality objective and require significant development (new products, services, etc.).*

[81] *France Relance is the economic recovery plan launched by the French government in September 2020 after the COVID-19 crisis to quickly stimulate the economy and achieve concrete progress in terms of decarbonization, reindustrialization, and skills development throughout the country. Focusing on three major areas—ecological transition, competitiveness, and cohesion—this plan receives financial support from the European Union amounting to approximately €40 billion out of a total of €100 billion.*

[82] *The "France 2030" plan, launched in 2022 with €54 billion deployed over five years, aims to develop industrial competitiveness and future technologies, with half of the funding earmarked for emerging and innovative players (tech start-ups, industrial SMEs, etc.) and half for decarbonization initiatives. It has ten objectives to "better understand, live better and produce better" by 2030, including the production of two million electric and hybrid vehicles in France and a 35 percent reduction in greenhouse gas emissions.*

Finally, it should be noted that the quality of relations with public authorities is regularly praised. Once investment decisions have been taken at the highest level of government, the system is put in place and operates efficiently across all successive administrative levels. The French model of centralization is a real asset here. Unlike other European countries, where the federal level is weaker than the local and regional levels, in France the central government has the legal, human, and institutional resources to support projects from the ground up, through all administrative levels, right up to the EU. These advantages of the French centralized model are more readily apparent in large-scale investments, which are prevalent in our study.

However, a persistent gap between political awareness and the relative slowness of decision-making is a point of concern. The pace of public responses is struggling to keep up with that of international competition. In addition, the energy cost differential between Europe and other regions of the world has grown faster than corrective measures, in the context—admittedly exceptional—of weaning off Russian gas.

Nevertheless, despite the benefits of centralization in the alignment of public actors, particularly through the role of the prefectural authority (see p. 96), this system is not without a number of limitations, notably linked to the existence of sometimes divergent cultures and interests. For example, the fact that the management of government services is shared between the Ministry of Ecology (responsible for authorization procedures) and the Ministry of Industry (responsible for defining national economic attractiveness objectives) can hinder support for industrial projects. Furthermore, the role of certain agencies—often partially autonomous from the state structure—remains difficult for some industrial firms to understand given the distribution of tasks among the various administrations. In addition, projects can be hampered by a lack of industrial culture among certain officials who are unfamiliar with industrial realities.

The Battery Valley: A Battle Still to be Fought

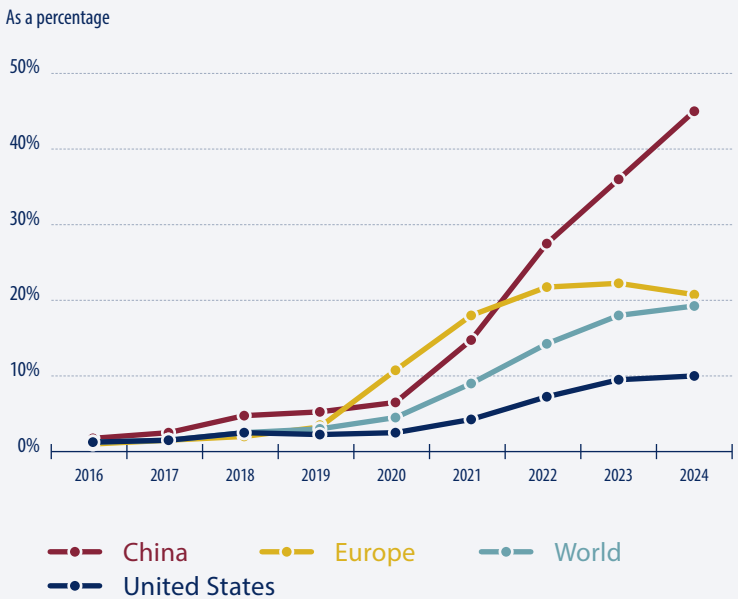
The success of Dunkirk's reindustrialization depends largely on that of its "Battery Valley." Unfortunately, there is still a great deal of uncertainty surrounding the latter. The cautionary tale of Northvolt in Sweden remains fresh in people's minds: The company grew too quickly due to excessive ambition, while the new technical processes were not fully mastered, and the factory encountered financial and logistic difficulties. Although this failure was mainly due to specific economic circumstances, some projects in Dunkirk have been put on hold.

Eramet, which had planned to develop a recycling plant (separating and refining metals contained in batteries) to supply gigafactories with PCAM and CAM, ultimately suspended its project on the Dunkirk site. The disappointing performance of the electric car market in Europe weighed heavily on the decision (see Figure 8).[83] But above all, Eramet found that the downstream processing chain was not sufficiently developed: The precursors were not present on site, limiting full industrial integration, which is crucial for competitiveness. As the mining industry in New Caledonia also shows, focusing on a single link in the chain without considering the sector as a whole is a mistake. The entire value chain cannot be located in Dunkirk, but a large part of it can. To act on the entire chain, it is necessary to rely on highly concentrated territorial clusters, such as Dunkirk, while having

[83] *Eramet planned to recycle NMC batteries when gigafactories finally stopped investing in these lines to turn to LFP lines, a value chain considered still too underdeveloped in Europe, and an extension of battery life, which was estimated at eight to ten years three years ago when the project was designed but now have a life expectancy of fifteen years, effectively reducing the amount of material to be recycled. Faced with such uncertainty, and given the scale of the investment involved, the company chose to act prudently and decided to abandon the project.*

a better-integrated European market capable of offering viable supply options and creating demand on a scale that makes the entire sector viable and competitive.

Figure 8 • Share of EV sales in total car sales (2016-2024)



Source: Marie Jugé, Ugnė Keliauskaitė, Kate Larsen, Charlotte McClintock, Ben McWilliams, Hannah Pitt, Simone Tagliapietra, Harold Tavarez, and Cecilia Trasi, "Transatlantic Clean Investment Monitor 3: Battery Manufacturing," Bruegel, March 6, 2025, https://www.bruegel.org/analysis/transatlantic-clean-investment-monitor-3-battery-manufacturing.

Not only is the market facing competition from China—although this is a positive factor in accelerating the electrification of the fleet—but demand for electric vehicles in Europe is struggling to take off. The "mental shift among citizens has not taken place yet," according to one of the people interviewed. However, there are many disparities among Member States, with some, such as Denmark and the Netherlands, already exceeding European targets.[84] Indeed, for many car drivers, the purchase price of a new electric car remains a significant obstacle, as they are more expensive than combustion engine cars.[85] This price factor also discourages the purchase of electric vehicles in terms of their resale value, as rapid technological development accelerates their obsolescence on the used car market and thus reduces their residual value.[86] Furthermore, despite the many advances that have been made, electric cars are still perceived by the general public in France as being restrictive (in terms of charging, etc.).

[84] *Sophie Fay, "Voitures électriques: deux études confirment qu'elles polluent beaucoup moins que les véhicules thermiques" [Electric cars: Two studies confirm that they pollute much less than combustion engine vehicles], Le Monde, July 20, 2025, https://www.lemonde.fr/economie/article/2025/07/20/voitures-electriques-deux-etudes-confirment-qu-elles-polluent-beaucoup-moins-que-les-vehicules-thermiques_6622330_3234.html; Pascal Canfin, "Analyse du déploiement de la mobilité électrique" [Analysis of the deployment of electric mobility], LinkedIn, September 3, 2025, https://www.linkedin.com/posts/pascal-canfin_analyse-du-d%C3%A9ploiement-de-la-mobilit%C3%A9-%C3%A9lectrique-activity-7352680482049822721-zVPe.*

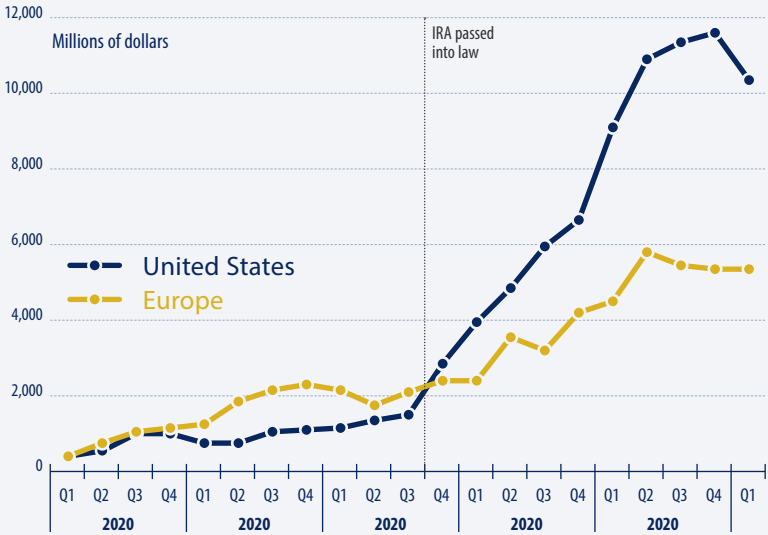
[85] *France, Direction interministérielle de la transformation publique, Encourager l'adoption des véhicules électriques: L'éclairage des sciences comportementales [Encouraging the Adoption of Electric Vehicles: Insights from Behavioral Sciences], January 2025, https://www.modernisation.gouv.fr/files/2025-03/Note%20v%C3%A9hicules%20%C3%A9lectriques.pdf.*

[86] *Aurélien Fleurot, "Pourquoi les Prix des Voitures Électriques d'Occasion S'effondrent" [Why used electric car prices are collapsing], Europe 1, October 3, 2024, https://www.europe1.fr/economie/exclu-europe-1-automobile-la-valeur-des-voitures-electriques-doccasion-chute-en-un-an-4270770.*

Beyond this commercial risk linked to demand, factories face an industrial risk inherent in this type of project, and some also face a technological risk: ProLogium, for example, is taking a real technical gamble with the launch of a large-scale solid-state battery factory, as this is still a very recent technological innovation. However, in the case of disruptive innovations, this risk-taking for the development of decarbonization technologies may be justified by new technologies that will enable industrial activities to be maintained in Europe, which is a legitimate strategic and even social public policy objective.

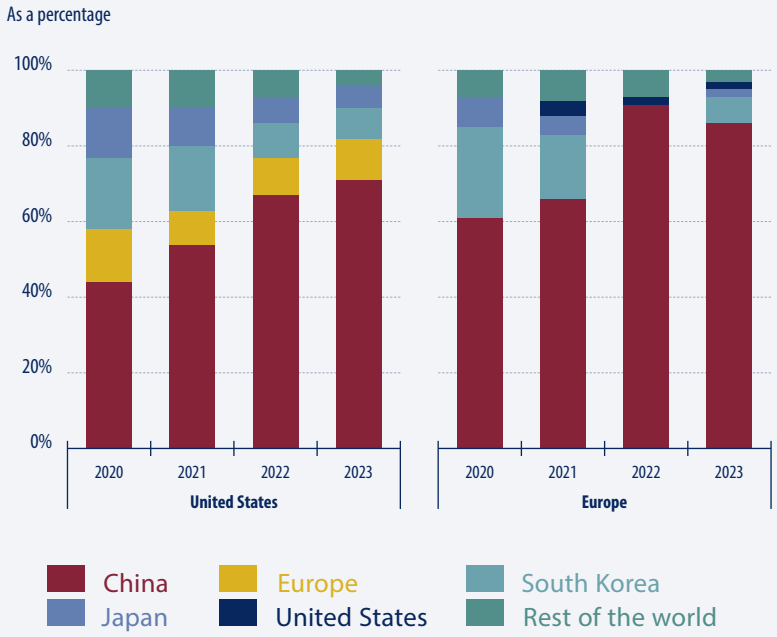
This slowdown is weighing on investment, which is also affected by competition from Chinese producers. Europe imports a large proportion of its batteries from China at low cost, and despite the massive subsidies detailed in the Commission's investigation into electric vehicles, they are still not subject to specific protection measures. Their role as an input, and therefore in the export competitiveness of electric vehicles produced in Europe, complicates the equation, especially as the majority of European manufacturers are forming alliances with Chinese producers.

Figure 9 • Quartely real investments in the battery manufacturing supply chain in Europe and the United States



Source: Marie Jugé, Ugnė Keliauskaitė, Kate Larsen, Ben McWilliams, Shweta Movalia, Hannah Pitt, Alfredo Rivera, Simone Tagliapietra, Harold Tavarez, and Cecilia Trasi, "Transatlantic Clean Investment Monitor 4: Electric Vehicles," Bruegel, June 5, 2025, https://www.bruegel.org/analysis/transatlantic-clean-investment-monitor-4-electric-vehicles.

Figure 10 • Share of imports of lithium-ion battery cells and modules by country of origin of batteries (Europe and United States, 2020-2023)



Source: Jugé et al., "Transatlantic Clean Investment Monitor 3: Battery Manufacturing."

Analysis of the strengths and weaknesses of industrial projects in Dunkirk confirms the diagnosis made at the national level in recent reports. These reports converge in identifying the main obstacles to reindustrialization in France, whether in terms of human resources, financing, or the scarcity of available land.[87] Certain needs have been quantified with a view to understanding different possible reindustrialization trajectories in France by 2035 (see Table 1).[88]

Reindustrializing France in the context of ecological and energy transition requires removing the structural barriers identified and offering manufacturers a favorable, clear, and stable outlook, particularly with regard to energy prices, financing issues, skills challenges, regulatory issues, and protection of the domestic market. This must lead to the articulation and contextualization of these various public policy issues within the framework of a coherent strategy at the different levels of public authority concerned, not only at the national level but also at the European level.

[87] *See in particular: Olivier Lluansi, Réindustrialiser [Reindustrialize]; Cour des comptes, "10 ans de politiques publiques en faveur de l'industrie: un bilan encore fragile" [10 years of public policy in favor of industry: Results still fragile], communication to the Finance Committee of the National Assembly, November 28, 2024, https://www.ccomptes.fr/sites/default/files/2025-02/20241128-press-release-10-years-of-public-policies-for-industry.pdf; Laurent Guillot, Simplifier et accélérer les implantations d'activités économiques en France [Simplifying and accelerating the establishment of economic activities in France], Government of France, March 17, 2022, https://www.economie.gouv.fr/simplifier-accelerer-implantations-activites-economiques-rapport-guillot.*

[88] *Grégory Claeys, Ruben Fotso, Maxime Gérardin, Coline Bouvart, Nassim Zbalah, and François Belle-Larant, "Reindustrialising France by 2035: Needs, Constraints and Potential Effects," working paper, France Stratégie, July 12, 2024, https://www.strategie-plan.gouv.fr/en/publications/reindustrialising-france-2035-needs-constraints-and-potential-effects-0; Institut Montaigne, Métiers de l'ingénieur [Engineering professions].*

3 Lessons and Recommendations at the French and EU Levels

Having identified the strengths and weaknesses of the industrial ecosystem in the Dunkirk area, the next step is to analyze, from an operational perspective, the conditions for success that need to be met to ensure the sustainability of projects and to draw useful lessons for the design of more effective industrial policies at the national and European levels. An in-depth study of the construction of the Battery Valley and heavy industry decarbonization initiatives thus makes it possible to identify concrete ways to strengthen the effectiveness of public action by optimally coordinating the local, national, and European levels.

3.1. THINKING IN TERMS OF CLUSTERS

In the previous section, we saw that the intertwining of diverse issues clearly shows that large-scale reindustrialization can only be achieved through a combination of public policies. This diversity of instruments to be mobilized and coordinated calls for a concentration of industrial investment in the form of clusters, which are the only way to achieve the necessary critical mass. Although the battery cluster in Dunkirk was not conceived as such from the outset—the installation of Verkor in Dunkirk was encouraged by the public authorities because the ACC and Envision factories already existed about 100 kilometers away—it was the installation of the first factories that contributed to the arrival of the rest of the value chain. Throughout this report, it becomes clear that the sustainability—and, above all, the success—of projects depend on this mass effect within a cluster approach.

Working in clusters also makes it possible to establish industries in locations where energy—preferably carbon-free—is available nearby and to benefit collectively from existing infrastructure or infrastructure to be built in coordination. Working in clusters makes it possible to orient the region toward promoting its expertise and assets in order to ensure the success of its industrial projects by not only offering training in line with the needs of industry and developing services to meet the needs of the workforce but also enabling the long-term development of industry through the establishment of research centers nearby. Furthermore, working in a cluster, particularly when it comes to developing new and often costly technologies, allows for partnerships to be formed to limit logistics costs by pooling them, as in the joint project between Lhoist and Eqiom in collaboration with Air Liquide.

However, as things stand, little R&D is carried out directly in the Hauts-de-France region—and in French regions in general, outside of major technology hubs such as Grenoble—as laboratories are often attached to company headquarters, which are mostly located in the Paris region.

This is the case for ProLogium, whose laboratory, located on the Paris-Saclay plateau, is tasked with continuously fueling innovation for its Dunkirk gigafactory. The company initially wanted to set up the laboratory near the gigafactory, but the logistic conditions and technical capabilities to accommodate it were not in place, and several decisive criteria weighed in favor of the Paris region (the presence of researchers, lower costs, faster operational readiness, etc.). However, while industry players consider it essential for R&D to be carried out on site, maintaining local R&D depends on the region's ability to attract or train a qualified workforce, which is not necessarily available locally.

"Territoire d'industries" (Industrial Regions), a First Milestone in Targeting Our Industrial Efforts

Currently, the French public authorities have a program that allows them to select a region and grant it both greater governance and planning powers on industrial issues and subsidies in this regard. This program, Territoires d'industries, launched in 2018, aims to use a local and territorialized approach to support the hoped-for reindustrialization dynamic, without any specific sectoral dimension.

An interministerial steering committee under the aegis of the prime minister selects the territories and plans proposed by local actors and monitors their implementation and the support provided by the state. This committee brings together the Ministry of Industry and the Ministry of Territorial Cohesion, state agencies (ADEME, Business France), as well as representatives from the sector (France Industrie), public financiers (Bpifrance, Banque des Territoires, Caisse des Dépôts et Consignations), and France Travail. This committee is also responsible for identifying and supporting local authorities on strategic issues, which currently include ecological transition, innovation, skills development and attractiveness, and the mobilization of industrial land. The program also includes an important component relating to the local governance of each industrial territory. A regional steering committee must be set up, bringing together the regional prefect, representatives of local authorities, industrial players, and local public actors. It is chaired by the president of the regional council. This committee defines a Localized Action Plan and monitors its implementation while facilitating coordination between the public actors involved.

In concrete terms, to support these action plans, the program provides the following:

- **Support for local coordination:** Co-financing of project manager and regional coordinator positions to ensure operational coordination and coordinate the network of elected officials, manufacturers, and stakeholders involved in regional reindustrialization (representing €6.7 million mobilized in 2023 and 2024).
- **Engineering resources:** This enables regions to call on design offices for support in the design and implementation of complex projects.
- **Financial support for productive investments:** Except for specific aid via the Green Climate Fund to finance companies' green investment projects (€63 million in 2024), the program consists of supporting and concentrating other national and local public funding. It is therefore difficult to assign a public support amount to the program, especially in the absence of formal evaluation and monitoring.[89] The Court of Auditors reports that public authorities have committed €1.8 billion has to support the development of these Industrial Territories from 2018 to 2023, to which must be added the autonomous contributions of local public actors.[90] The second phase of the project, which began in 2024, provided for an increase in dedicated funding, in particular for the financing of project managers in all territories and a strengthening of the services

[89] *Martine Berthet, Rémi Cardon, and Anne-Catherine Loisier, Rapport d'Information Fait au Nom de la Commission des Affaires Économiques Relatif au Programme Territoires d'Industrie [Information report prepared on behalf of the Economic Affairs Committee on the Industrial Territories program], rapport d'information no. 217, session ordinaire de 2024-2025 (Paris: Sénat, December 18, 2024), https://www.senat.fr/rap/r24-217/r24-2171.pdf.*

[90] *Cour des comptes, Le Programme « Territoires d'Industrie » 2018–2023 [The "Industrial Territories" program 2018–2023: Evaluation], November 2024), https://www.ccomptes.fr/sites/default/files/2024-11/20241121-Programme-Territoires-d-industrie.pdf.*

"offered" under the program. The Green Climate Fund of the France "Relance" plan also allocates €63 million to the program.

- **"Turnkey industrial sites":** Fifty-five industrial sites labeled "turnkey," representing nearly 3,000 hectares and benefiting from enhanced promotion by the ANCT (National Agency for Regional Cohesion).[91]

By the end of 2024, 183 territories, generally defined at the level of communities of municipalities or inter-municipal groups, had been selected. These territories represented more than 60 percent of national industrial added value and nearly half of all EPCIs (Établissements Publics de Coopération Intercommunale, French inter-municipal authorities) and the national population. These figures may raise questions about the targeting and concentration of the support that the program was supposed to provide. In addition, a report produced by the Court of Auditors focusing mainly on the first phase of the program (2018–2023) highlights, on the one hand, the "cannibalization" of the program by the COVID recovery plan, which is more focused on economic than industrial recovery, and the weakness of the assessment of its impact on the ground.[92] On the other hand, the report notes a slight trend toward the concentration of public funding for industry in these territories. While the effects in terms of industrial employment are unclear, there has been a slight improvement in the dynamics of industrial value added in these territories compared to the rest of the country.[93]

[91] *National Agency for Territorial Cohesion.*
[92] *National Agency for Territorial Cohesion.*
[93] *Samuel-Frédéric Servière, "Les Territoires d'Industrie: Un Exemple de Non Évaluation" [Industrial territories: An example of non-evaluation], IFRAP, November 25, 2024, https://www.ifrap.org/budget-et-fiscalite/les-territoires-dindustrie-un-exemple-de-non-evaluation.*

> While the program's geographical coverage is impressive, and its contributions to governance are very interesting, it remains fairly marginal in financial terms compared to the €200 billion or so in aid to industry provided by public authorities over the last decade in France.[94]

There are, therefore, many arguments in favor of setting up clusters as priority areas for industrial recovery. In addition to the concentration of investment and resources mentioned above, the establishment of industrial clusters should also facilitate the construction of infrastructure and be accompanied by tax exemptions and administrative simplification, particularly with regard to easier access to land (see below). While it is certainly strategic to focus on these clusters and sectoral specialization, the development of other industries in the region should not be abandoned. Ensuring the sustainability of the local economic model also requires diversifying activities to limit risks and reduce dependence on a single sector (batteries). Market failures and downturns have punctuated industrial history. Dunkirk therefore plans to develop a new sector around data centers, in addition to maintaining other preexisting industrial activities (e.g., agri-food with the establishment of the Clarebout potatoes factory).

[94] *Cour des comptes, 10 Ans de Politiques Publiques en Faveur de l'Industrie: Des Résultats Encore Fragiles [10 years of public policy in favor of industry: Results still fragile], November 28, 2024, https://www.ccomptes.fr/fr/publications/10-ans-de-politiques-publiques-en-faveur-de-lindustrie-des-resultats-encore-fragiles.*

3.2 THE CHALLENGE OF REGULATION AND LAND

As explained above, one of the first conditions for ensuring the development of clusters is the availability of land. However, the exchanges conducted as part of this study highlight that one of the obstacles to reindustrialization is the "the procedural and temporal burden required to implement the necessary regulations for the establishment of industrial activities." These are governed by the law on classified facilities for environmental protection (ICPE).[95] In addition to this specific framework, there are numerous European and French regulatory dimensions, which we will discuss in more detail in this section.

Since 2017, however, numerous measures have already been suggested to simplify procedures and speed up implementation times,[96] such as the identification of turnkey areas.[97] However, as Laurent Guillot's recent report[98] showed, there is still a gap between actual and theoretical timeframes (over eight months for authorization, over four months for registration). This can be explained not only by additional document requests and the accumulation of coordination delays between the various stages of the procedure but also, beyond the administrative procedures, by the completion of the fauna and flora inventories required by law.

[95] *ICPE (Installations Classées pour la Protection de l'Environnement, or Classified Installations for Environmental Protection) refers to any industrial or agricultural installation that may present risks or cause pollution or nuisance to health, public safety, or the environment. These installations are subject to specific regulations aimed at preventing accidental risks (fire, explosion, pollution, etc.) and protecting the environment, biodiversity, and public health.*

[96] *Guillaume Kasbarian, "5 Chantiers pour Simplifier et Accélérer les Installations Industrielles" [Five projects to simplify and accelerate industrial installations], Government of France, September 23, 2019, https://www.info.gouv.fr/rapport/11158-rapport-5-chantiers-pour-simplifier-et-accelerer-les-installations-industrielles.*

[97] *Agence nationale de la cohésion des territoires and direction générale des Entreprises, "Les Sites Clés en Main – France 2030" [Turnkey sites – France 2030], dataset, Government of France, accessed August 5, 2025, https://www.data.gouv.fr/datasets/les-sites-cles-en-main-france-2030.*

[98] *Guillot, "Simplifier et Accélérer les Implantations d'Activités Économiques en France" [Simplifying and accelerating the establishment of economic activities in France].*

Beyond international comparisons, particularly with the United States and China, intra-European comparisons show that the time required for prefectural review and authorization is often longer in France than in neighboring European countries. The complexity and technical nature of the authorization process—carrying out assessments in conjunction with specialized government agencies on the impacts on water and air, including environmental impact assessments (EIAs), noise and biodiversity, hazardous waste management, industrial risk-prevention measures—require companies to access funding provided by public authorities, which is certainly perceived as restrictive but indispensable. However, this means that it takes an average of six months in Germany (the environmental authority in Germany is independent, whereas in France authorizations go through several levels of procedures) compared to ten to twelve months in France, unless there is exceptional support from government departments and local elected officials. This was the case for Dunkirk, once the application had been submitted (after nine months of upstream preparation);[99] permits were granted with a delay of seven months for Verkor and ProLogium. Furthermore, these processes are made all the easier by the fact that these are large-scale projects heavily supported by the state. In general, large industrial companies have more resources than SMEs and find it easier to complete this process.

The "Loi industries vertes" (Green Industries Law)—enacted in 2023 and implemented in July 2024—proposes new simplification and acceleration tools that will reduce the procedure from twelve to seven months, but it is too early to assess its actual effectiveness. Additional avenues for strengthening the effectiveness of the implementation of these regulations are well known.[100] The Dunkirk case study supports some of these avenues:

[99] *Kasbarian, G. . 5 chantiers pour simplifier et accélérer les installations industrielles [Five initiatives to simplify and accelerate industrial establishments]. Mission pour le Premier ministre. (2019, September 23), https://www.info.gouv.fr/upload/media/default/0001/01/2019_09_rapport_kasbarian.pdf.*

[100] *Guillot, "Simplifier et Accélérer les Implantations d'Activités Économiques en France" [Simplifying and accelerating the establishment of economic activities in France].*

- Identifying land available for industrial development. In Dunkirk, this identification is carried out by the GPMD and the Communauté Urbaine, enabling them to anticipate land development in order to facilitate the establishment of industrial companies. This anticipation should be replicated at the national level, in an operation to identify potential land on which to build clusters.

- Systematizing and generalizing best management practices in project-based mode around strong synergies between the state, local authorities, and industrial players themselves; the example of Dunkirk highlights the "facilitating" role of the prefecture and sub-prefecture. At the national level, it would be necessary to identify the players needed to ensure the attractiveness of priority industrial areas.

- In this regard, the "upstream phase,"[101] trialed in Dunkirk with Verkor and then replicated for the installation of ProLogium, with coordinated work between the DREAL and the sub-prefecture, made it possible to speed up procedures and reduce delays; it would be appropriate to consider rolling out this model more widely, although this would require a significant mobilization of government departments. As the management of government departments is shared between the French Ministry of Ecological Transition (responsible for authorization procedures) and the Ministry of Industry (responsible for defining national economic attractiveness objectives), it would be useful to promote the development of a common culture based on trust and a shared desire to support industrial project leaders.

[101] *This upstream phase practice, described in the Guillot report, is largely inspired by the practices implemented in Dunkirk. It consists of starting to work with manufacturers and design offices on the construction of files very early on in the project. It lasts nine months and allows other procedures, such as consultations, to be carried out in parallel. Specifically, it involves regular meetings chaired by the prefect and attended by a steering committee.*

- Similarly, at the European level, the revision of the Projects Directive could contribute to a useful simplification of the regulatory framework.[102] Directive 2011/92/EU on the assessment of the effects of certain projects on the environment (EIA), known as the "Projects Directive," aims to ensure that the environmental impact of projects, particularly industrial projects, is taken into account and assessed before they are approved by the authorities. It specifies the preliminary assessment process with a very precise methodology (assessment in terms of human health, biodiversity, soil, water, etc.) that must be carried out. Despite an initial simplification effort in 2014, the directive has made action in the field more complex. It requires an assessment to be carried out not only for the factory project itself but also for associated projects (e.g., transport serving the factory site). However, this means that the scope of projects must be precisely defined before construction even begins. In addition, the increasing number of stakeholders involved and the synchronization of fauna and flora inventories lengthen the procedures. Without compromising environmental requirements, a revision of the directive could be considered, notably providing for the inclusion of deadlines. In addition, anticipating the de-risking of land by public authorities must be a focus for progress.

- The revision of the "Avoid, Reduce, Compensate" mechanism,[103] which requires, after an environmental study and when necessary, compensation for damage to biodiversity prior to the start of projects. However, finding compensation land can take several months or even years (even though the ECJ recognizes that the restoration

[102] *European Union, Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the Assessment of the Effects of Certain Public and Private Projects on the Environment, Official Journal of the European Union L 26 (January 28, 2012): 1-21, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011L0092.*

[103] *Ministère de la Transition écologique, "« Éviter, Réduire, Compenser » (ERC) : En Quoi Consiste Cette Démarche ?" [Avoid, reduce, compensate (ERC): What this approach involves], Notre-environnement.gouv.fr, accessed September 4, 2025, https://www.notre-environnement.gouv.fr/themes/evaluation/article/eviter-reduire-compenser-erc-en-quoi-consiste-cette-demarche.*

of biodiversity is a long-term process), delaying the start of projects. One possible solution would be to maintain this compensation requirement, but on an ex post basis, at least in certain specific industrial areas. In practice, compensation is already often implemented in the form of contractual mechanisms that allow local and biological realities to be taken into account.

- In order to accelerate the development of industrial projects, regulatory issues should be simplified by identifying bottlenecks with local stakeholders. Local stakeholders could submit a list of recommendations for administrative and regulatory simplification to the state via the local authority in order to accelerate the development of identified industrial projects.

Furthermore, reindustrialization requires easier access to land, yet current needs remain largely unmet (see section 2). This issue is exacerbated by complex interactions with environmental and biodiversity protection requirements. Indeed, land is set to become increasingly scarce as part of the implementation of the Zero Net Artificialization (ZAN) objective set by the Climate and Resilience Law.[104]

The hearings held highlight the question of the extent to which these regulations could be relaxed for industrial areas, in particular by granting a presumption of overriding public interest (RIIPM).[105] In other words, the targeted relaxing of regulations could be considered in this context,

[104] *The ZAN reform sets a requirement to reduce land artificialization by 50 percent over the period 2021–2031 compared to the previous decade, and to achieve net artificialization of 0 by 2050. Article 191 of Law No. 2021-1104 of August 22, 2021 on combating climate change and strengthening resilience to its effects, known as the "Climate and Resilience Law."*

[105] *RIIPM: Raison Impérative d'Intérêt Public Majeur (Imperative reasons of overriding public interest). This presumption is already provided for renewable energy projects in the APER law of 2023; in addition, the "project of major national interest" (Projet d'Intérêt National Majeur, PINM) created by the "Green Industry" law facilitates the early recognition of an imperative reason of major public interest, and the "Simplification" bill currently under discussion in the French Parliament aims to generalize the granting of an RIIPM as soon as it is declared to be in the public interest.*

for example in the reindustrialization clusters mentioned above and in industrial port areas (such as Le Havre/Tancarville), where land initially intended for industry is now classified as biodiversity reserves, slowing down any development projects.

The measures in question are enshrined not only in the Environment Code but also in European law (the Habitats Directive). Introducing such exemptions could therefore also add legal uncertainty. Furthermore, such an exemption would amount to abandoning the legitimate objective of environmental preservation. Such a precedent could lead to increased political pressure to go beyond industry alone.

This study does not seek to resolve this complex and politically divisive issue. Nevertheless, the Dunkirk case study highlights ways in which it is possible to develop the capacity to offer industrial project developers productive land that is immediately or at least rapidly available. As detailed above, the structuring role of local actors such as the Great Maritime Port of Dunkirk (see section 2), a true developer of "turnkey" industrial zones, shows the importance of advance planning at the regional level, carried out as close as possible to the ground by an accountable, agile actor with broad skills. This approach could serve as a model in other areas with high potential.

One solution could therefore be to replicate this forward-thinking model on a larger scale, with a sectoral dimension, in the form of regional planning managed by public developers around clusters, selecting specific sectors where industrial development would be encouraged through appropriate forward planning. For example, in an area dedicated to chemicals, specific regulations (discharges, water supply) would be streamlined by concentrating resources to anticipate and address constraints, contributing to the benefits of a cluster approach.

Recommendation 1

Establishing priority areas for industrial recovery based on access to land, support for infrastructure construction, tax exemptions, and bureaucratic relief.

As an extension of the "Territoires d'industrie" initiative, a public policy launched in 2018 and renewed in 2023, that certified 183 French territories, and in order to go further, faster, and be more impactful, this report recommends **entrusting the prime minister's office with identifying a dozen of these priority areas in mainland France and its overseas territories on which to focus efforts and develop special administrative and tax regimes**.

In close cooperation with the Ministry of Industry and drawing on local authorities' knowledge of industrial ecosystems, **a strong signal should be sent to local stakeholders about the priority given to value creation and industrial job creation** and about its commitment to **accelerating the upgrading of the necessary infrastructure** and **simplifying the administrative and regulatory implementation of projects**.

The establishment of priority areas for industrial recovery would be based on spontaneous local industrialization initiatives and support them *retrospectively* through tax and bureaucratic relief or relevant *ad hoc* measures.

To this end, it is necessary to think on a European scale—on the one hand, convincing the European Commission and other Member States of the relevance of this type of territorial concentration and, on the other hand, being able to rely on robust supply chains within the European market. Indeed, an integrated approach at the continental level would secure such an organization in the long term by strengthening industrial complementarities and market synergies.

Recommendation 2

Promote a project-based organizational model for the end-to-end administrative assistance of industrial projects and related local infrastructure and development plans.

In Dunkirk, coordination between the Great Maritime Port and RTE with the CUD, supported by the sub-prefect, enabled them to play a structuring role in land planning ahead of the implementation by anticipating needs and coordinating actions ahead of various industrial projects. This success argues for the widespread adoption of these best practices at the national level.

It is therefore necessary to take the following actions:

- Align the region's assets with the requirements for the success of the projects in terms of infrastructure, training, and service support.
- **Identify, in each priority area, the players necessary for its success**. Local specificities are essential to defining the strategy, and industrial and administrative players must be able to align themselves under the leadership of an industrial champion.
- Enable manufacturers to bring their R&D closer to production areas by facilitating the financing and pooling of regional multi-sector laboratories and test benches. In the case of Dunkirk, such an approach could be led by the Dunkirk Campus of the Université Littoral Côte d'Opale.
- In line with a "clustering" approach, prioritize rapid connections to the electricity grid for sites to be industrialized and develop large-scale energy storage capacities there.
- Encourage all local stakeholders to submit **a list of recommendations for administrative and regulatory simplification** to the state via the prefecture in order to accelerate the development of identified industrial projects. The **prefecture can play a major role in identifying the key conditions for success** and coordinating

closely with the stakeholders involved in territorial decentralization, particularly the regions and Chambers of Commerce and Industry.

Linked to these issues of land, environmental protection, and administrative simplification is the question of sustainable access to water. Although not mentioned by manufacturers as a criterion for installation in Dunkirk, access to sufficient quantities of water is increasingly a factor influencing investment choices.[106] In the future, the region's ability to provide water will become a key factor in its attractiveness. This issue is particularly relevant to the battery sector, whose chemical production processes generate large amounts of saline waste and dissolved metals, raising the acute issue of water purification.

3.3. DEBT, TAX PRESSURE, POLITICAL INSTABILITY

The political and fiscal environment in France remains marked by significant instability, which is holding back investment.

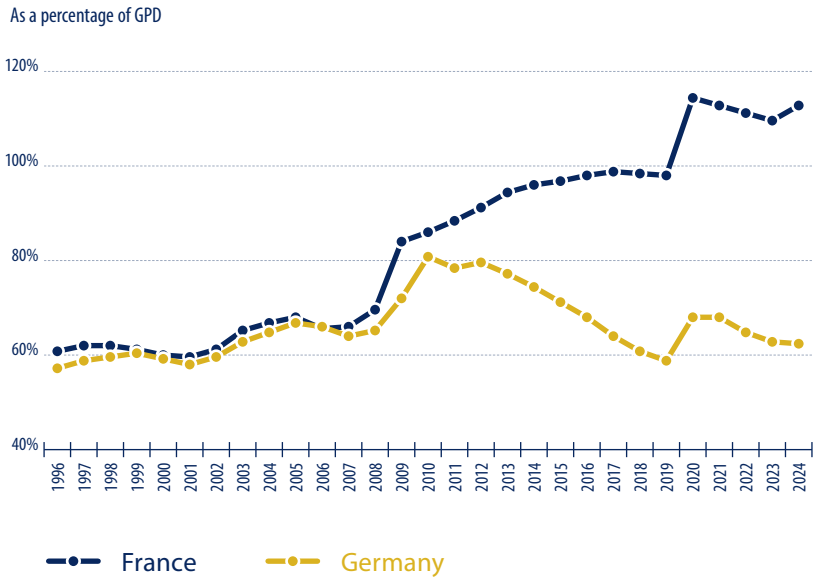
For over a year, the fragmentation of the political landscape and the polarization of public debate have plunged France into indecision, the economic and social costs of which could be very significant. With no direction or sustainable budget, the French economy is already paying the price for political instability and uncertainty. Activity indicators and the latest surveys show that companies are reluctant to invest, manufacturing activity is declining,[107] and employment has begun to contract. The deterioration of public finances and the budgetary impasse are driving up borrowing costs, particularly in comparison with Germany.

[106] *INRAE, "Explore2, LIFE Eau&Climat: Des Clés pour l'Adaptation de la Gestion de l'Eau" [Explore2, LIFE Water&Climate: Keys to adapting water management], June 28, 2024, https://www.inrae.fr/actualites/explore2-life-eauclimat-cles-ladaptation-gestion-leau.*

[107] *Insee, "En Mai 2025, la Production Manufacturière Baisse de 1,0%" [In May 2025, manufacturing output fell by 1.0 percent], Informations Rapides no. 171, Indice de la production industrielle (IPI) (July 4, 2025), https://www.insee.fr/fr/statistiques/8605040.*

Although Germany has also been caught in a similar vicious circle in recent years, it seems that our neighboring partner's new coalition is determined to invest heavily domestically. Germany's budgetary margins permit this, as shown by the massive investment plan proposed by the new chancellor and voted by the Bundestag on March 18, 2025.[108]

Figure 11 • Change in public debt in Germany and France (1996 - 2024)



Source: François Ecalle, "Les Finances Publiques en France et en Allemagne de 1996 à 2023" [Public finances in France and Germany from 1996 to 2023], FIPECO, July 16, 2024, https://fipeco.fr/pdf/Fipu%20France%20Germany%202024.pdf, accessed on 4 September 2025.

[108] *"En Allemagne, les Députés Adoptent un Plan d'Investissements Historique pour Réarmer le Pays" [In Germany, MPs adopt historic investment plan to rearm the country], Le Monde, March 18, 2025, https://www.lemonde.fr/international/article/2025/03/18/en-allemagne-les-deputes-adoptent-le-plan-d-investissements-historique-pour-rearmer-le-pays_6583317_3210.html.*

In France, beyond political paralysis, public debt and the structural public deficit, regulatory instability and poor medium-term visibility on fiscal policies add to the uncertainty, creating a climate that is not conducive to investment decisions. With regard to the fiscal issue more specifically, production taxes should be lowered. Despite a €5.6 billion reduction in these taxes since 2017, France remains at a disadvantage compared to its European partners: Production taxes account for 3.8 percent of GDP (2023) compared to just over 2.5 percent on average in twelve other EU Member States.[109]

Recommendation 3

Create a specific tax regime for these industrial clusters, especially by reducing production taxes.

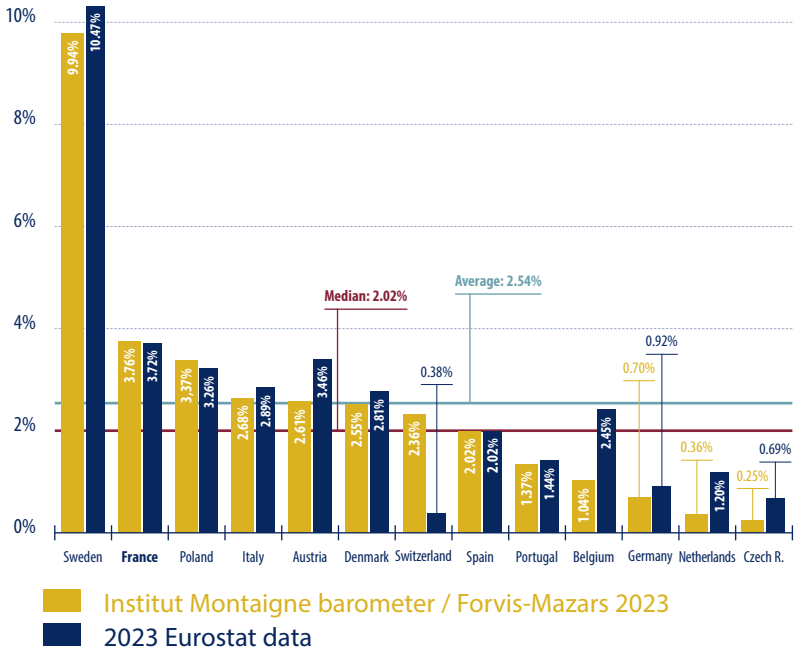
Our study of industrial revitalization projects in Dunkirk highlights the priority importance of stabilizing corporate taxation and continuing to reduce production taxes. Despite the efforts begun in 2017, France remains at a disadvantage compared to its European partners.

Industries, due to their large land holdings, are particularly affected by property tax, and a reduction or exemption from this tax would encourage them to set up in the region. Beyond the immediate financial effect, measures targeting skilled and expert salaries could improve the region's ability to attract talent with competitive salaries: An exemption

[109] *Lisa Darbois, Nicolas Laine, and Raphaël Tavanti, European Production Tax Barometer 2025 (Paris: Institut Montaigne, March 2025), https://www.institutmontaigne.org/en/publications/european-production-tax-barometer-2025. Regarding the need to stabilize corporate taxation and continue reducing production taxes, see the recent report by the Council on Compulsory Levies (an independent body attached to the Court of Auditors): Conseil des prélèvements obligatoires, Tracer un Cadre Fiscal et Social Pluriannuel pour l'Industrie Française [Establishing a multi-year fiscal and social framework for French industry], September 22, 2025, https://www.ccomptes.fr/fr/publications/tracer-un-cadre-fiscal-et-social-pluriannuel-pour-lindustrie-francaise.*

from employer contributions on these salaries would help break out of the low-wage trap, motivate skills training, and attract new talent. Other tax levers, such as a reduction or elimination of the C3S (corporate social solidarity contribution), are also avenues to explore to strengthen the establishment and development of industrial clusters.

Figure 12 • Share of Production Taxes Relative to GDP by Country (2023)



Source: Institut Montaigne – Forvis-Mazars – Eurostat data.

3.4. THE NEED FOR ABUNDANT, CARBON-FREE, COMPETITIVE, AND SECURE ENERGY

a. The strategic challenge of energy prices

Defensive instruments and offensive strategy

The planned end of ARENH (Regulated Access to Historic Nuclear Electricity) at the end of 2025[110] marks a turning point for French energy policy.

This mechanism guaranteed a certain degree of price visibility for part of the volume consumed in France (100 TWh, or ¼ of French nuclear production). The Energy Regulatory Commission set a regulated electricity tariff of €42/MWh, providing visibility for industrial firms. This specific tariff is coupled with targeted measures for energy-intensive users, thanks to the "energy price toolbox," which allows for highly specific actions: tariff reductions for interruptible service, demand response contracts (interruptibility or load shedding)—where in cases it is necessary to ensure grid stability (following local demand peaks, for example) industrial users can receive compensation in exchange for a temporary shutdown to help balance the grid—or tax abatements.

In a context marked by uncertainty around energy costs, exacerbated by the phasing out of ARENH at the end of 2025, the ability to guarantee a stable and competitive price is becoming a strategic imperative, particularly for energy-intensive industries whose activities are high electricity-intensive. The manufacturers surveyed in this study thus express

[110] *ARENH: Accès Régulé à l'Électricité Nucléaire Historique (Regulated Access to Historic Nuclear Electricity). For more on the history of this mechanism, see Thomas Reverdy, "Fin de l'ARENH : Comment l'Électricité Nucléaire Française a Basculé dans le Marché" [End of ARENH: How French nuclear power shifted to the market], The Conversation, April 15, 2025, https://theconversation.com/fin-de-larenh-comment-lelectricite-nucleaire-francaise-a-bascule-dans-le-marche-253145.*

a growing desire to secure their supplies through long-term contracts concluded directly with electricity producers.[111] For electricity-intensive industries, one solution is to rely on EDF's nuclear power plants through specific "over-the-counter" contracts (known as nuclear power allocation contracts or "CAPN"),[112] which allow manufacturers to partner with EDF as a producer and thus benefit from a preferential long-term tariff over several years (ten to fifteen years). In return, manufacturers also share the risk with the producer (in France, Électricité de France, EDF), which means they need to have a strong balance sheet, limiting access to the scheme to the largest companies.

However, this scheme remains marginal in terms of implementation, even though Aluminium Dunkerque signed its first ten-year CAPN with EDF a few months ago (May 2025). CAPNs remain subject to risks, particularly in relation to European competition rules: The Commission (following complaints from other Member States, EDF's competitors, or competitors of the contract beneficiaries) could rule that these schemes constitute disguised state aid.

For non-electro-intensive companies, the approach currently favored by the French government for early 2026 (when the ARENH will end) is based on the Universal Nuclear Contribution or VNU (Versement Nucléaire Universel). Although the mechanism has not yet been finalized, it essentially involves setting a price cap above which EDF's revenues are to be collected by the state and then redistributed to consumers—although the precise terms of this redistribution remain undefined, creating significant uncertainty.[113]

[111] These are known as "Corporate PPAs."

[112] CAPN: Contrats d'Allocation de Production Nucléaire (nuclear production allocation contracts).

[113] EDF, "De l'ARENH au Versement Nucléaire Universel: Les Clés pour Tout Comprendre" [From ARENH to Universal Nuclear Payment: The keys to understanding it all], Le Mag Entreprises, accessed October 2, 2025, https://www.edf.fr/entreprises/le-mag/le-mag-entreprises/decryptage-du-marche-de-l-energie/de-l-arenh-au-versement-nucleaire-universel-les-cles-pour-tout-comprendre.

In addition to these serious economic uncertainties, which are not entirely insurmountable, there are more worrying structural uncertainties. Indeed, in general, there is still a lack of clarity regarding the state's energy policy objectives, particularly with regard to the 2025–2035 Multi-Year Energy Program, the "PPE,"[114] contributing to instability in the decision-making framework.

However, there is broad consensus on the need to shift a significant portion of energy use to electricity in order to replace fossil fuels (oil, gas, and coal),[115] on which 60 percent of final energy consumption in France still depends. In this regard, while the resumption of construction of new nuclear reactors is necessary, it will not lead to additional nuclear electricity production for at least fifteen to twenty years, which is the time it takes to commission new power plants. Even if the operating life of the current nuclear fleet is extended to its maximum, it will not be sufficient to meet the demand for carbon-free electricity over the next ten to fifteen years if the electrification strategy is successful. It is therefore necessary to supplement this plan with a policy focused on faster development of renewable energies in France, coupled with a policy to manage electricity demand. The rapid development of renewable energies worldwide—more than 85 percent of new electricity generation capacity installed in 2024[116]—can be explained by the fact that it is cheaper to produce electricity from renewable energies than from fossil fuels, even before any public subsidies are taken into account.[117] China is leading the way here, accounting for more than 50 percent of global

[114] *Programmation Pluriannuelle de l'Énergie (Multi annual energy Plan).*

[115] *See: Ministère de la Transition écologique et de la Cohésion des territoires, "Stratégie Nationale Bas-Carbone (SNBC)" [National Low-Carbon Strategy (SNBC)], accessed October 2, 2025, https://www.ecologie.gouv.fr/politiques-publiques/strategie-nationale-bas-carbone-snbc.*

[116] *International Renewable Energy Agency (IRENA), Renewable Capacity Statistics 2025, March 26, 2025, https://www.irena.org/Publications/2025/Mar/Renewable-capacity-statistics-2025.*

[117] *ADEME, Évolution des Coûts des Énergies Renouvelables et de Récupération entre 2012 et 2022 [Changes in the costs of renewable and recovered energy between 2012 and 2022], synthèse d'expertise, édition 2024 (Angers: ADEME, January 2025), https://librairie.ademe.fr/societe-et-politiques-publiques/7941-evolution-des-couts-des-energies-renouvelables-et-de-recuperation-entre-2012-et-2022-synthese-9791029724978.html.*

investment and new capacity, and making these investments with a view to support its industry and reduce its strategic dependencies.[118]

However, France currently lacks a clear vision of the energy policy needed for a serious strategy to reindustrialize the country. The stark opposition between nuclear and renewable energy, which has become entrenched in France for essentially political and dogmatic reasons and has marked recent debates in the National Assembly, is a clear symptom of this. The June 2025 vote in the National Assembly on the moratorium on new wind and solar projects, during the discussion of the proposed energy programming law, sent a negative signal to industry, a move whose negative effect on investor confidence was not undone by the rejection of the final text the following week.

If the bill had been adopted, it would have led to a halt in the development of renewable energies, and thus to the abandonment of the massive shift to electricity for transportation, heating, and industry, which is nevertheless a necessity[119] for not only the competitiveness of the French economy but also the nation's energy security. This is all the more true in a situation of high volatility in fossil fuel prices and exacerbated trade wars.[120] It would also have meant abandoning carbon

[118] *Ember, "China Accounted for More Than Half of the Global Increase in Wind and Solar Power in 2024," accessed November 11, 2025, https://ember-energy.org/countries-and-regions/china. China uses an instrument called Feed-in-Tariff (FiT) to support the massive installation of renewables (similar to what Germany or Japan have done). The system guarantees a fixed price to renewable energy suppliers from the moment the energy is produced and injected into the grid. It will be replaced in 2026 by a new system based on the market price signal. The end of this FiT instrument explains why China has broken all installation records this year, with companies rushing to install capacity before the end of the system.*

[119] *Although France is fortunate to have completely carbon-free electricity (thanks to nuclear power and renewables), this only accounts for 25 percent of the energy mix.*

[120] *The scenarios proposed by RTE (Réseau de Transport d'Électricité) to achieve carbon neutrality involve even greater electrification of the French economy, with a significant share of renewable energies alongside nuclear energy. Réseau de Transport d'Électricité, Futurs Énergétiques 2050: Les Scénarios de Mix de Production à l'Étude permettant d'Atteindre la Neutralité Carbone à l'Horizon 2050 [Energy futures 2050: production mix scenarios under consideration to achieve carbon neutrality by 2050], February 16, 2022, https://www.rte-france.com/analyses-tendances-et-prospectives/bilan-previsionnel-2050-futurs-energetiques.*

neutrality in a context of accelerating climate change. Finally, it would have put France on the path to abandoning its efforts to reduce its energy dependence on the Gulf petro-monarchies, the United States, and Russia—a dependence that contributes to widening our trade deficit. With this in mind, we must ensure that the growth in demand for clean electricity, driven by electrification, is met with a corresponding increase in new generation capacity.

Added to this lack of vision is the delicate question of EDF's status, which has suffered for too long from the ambiguity of its status—halfway between a direct public service provider and a state-owned enterprise operating with a commercial mandate. Working to build a public energy service outside of market logic or encouraging a company to serve the public interest in exchange for fair compensation are two very different strategies. At the European level, with France's agreement, it is very clear that the second option has been chosen and that it underpins the entire applicable legal framework. Choosing to ignore this would not be without consequences and is already exposing France to tensions and disputes with the European institutions.

A European electricity market in need of reform to improve visibility and facilitate competitive pricing for industry

At the European level, as the EU has stepped up its efforts in the area of ecological transition, the energy issue is more than ever a key factor affecting industrial competitiveness. In a context marked by geopolitical tensions, access to affordable, secure, and carbon-free energy is a prerequisite for the success of the continent's industrial ambitions—and the experience of Dunkirk shows how essential the European dimension is to this endeavor.

The energy crisis of 2022 highlighted major difficulties related to the European electricity market. The current system for setting electricity prices in Europe most often (but not always in France) involves indexing them to the price of gas (see the box below on how the European electricity market works), exposing industrial consumers to the high volatility of this energy source and fossil fuels in general. This instability, combined with a lack of long-term price visibility and structurally higher costs, limit companies' ability to plan their investments, weakening the attractiveness of Europe for energy-intensive industrial projects.

Although the Iberian mechanism is sometimes considered in French public debate as an advantageous solution, it should be emphasized from the outset that this is an exception (used during the energy crisis of 2022–23) and cannot be taken as a model. Spain and Portugal operate independently from the rest of the European electricity grid, with very few interconnections between the peninsula and the rest of the continent. With their own grid balancing mechanisms, they were able to cap gas prices for their own electricity production during the crisis, thereby lowering prices for consumers. The measure was subsidized by the state, partly through a tax on certain electricity consumers. In addition, it should be noted that, with regard to interconnections, Spain and Portugal are campaigning for networks that are more connected to the rest of Europe (cf. the major blackout in April 2025[121]). Furthermore, even on the peninsula, the activation of this mechanism was only temporary, in response to the crisis. Making the mechanism permanent would have an unsustainable impact on consumer costs and the wider economy.

The situation is different for other Member States, including France, which is strongly interconnected to its neighbors, primarily Germany.

[121] *Sánchez León, J. G., Spain-Portugal blackouts: what actually happened, and what can Iberia and Europe learn from it ? The Conversation. https://theconversation.com/spain-portugal-blackouts-what-actually-happened-and-what-can-iberia-and-europe-learn-from-it-255666, (accessed 14 November 2025) (May 2, 2025).*

This allows us to export our surpluses or, conversely, to import when necessary, as was the case during the 2022 energy crisis, when nearly half of France's nuclear power plants were unavailable. This gain in flexibility, however, means that French electricity prices are directly exposed to supply and demand conditions in neighboring markets. The existence of interconnections that are vital to the stability of the French grid also means that abandoning the integrated market pricing system to set purely national prices would be very costly.

The European Electricity Market

Electricity production in Europe is based on the principle of balancing the various national grids, which are interconnected at the European level. Electricity is generated in real time to meet the total demand in each national market, according to the **merit order principle:** in order to guarantee the lowest possible price, the least expensive means of production (renewables, hydroelectricity) are dispatched first, followed gradually by other production technologies, until the **last production unit needed to meet demand is used**. The final price in each market is determined by this last technology (commonly referred to as **the "marginal plant"**)—in countries in Western Europe, this is most often gas, due to its high dispatchability. This **marginal pricing** logic results from the traditional functioning of a competitive market subject to the specific constraints of grid balancing and the difficulty of storing electricity. This system encourages production at the lowest possible cost but leads to significant price volatility, which is exacerbated by exogenous shocks. The energy crisis has highlighted the vulnerability of this model: The explosion in costs has weakened the industry while reigniting debates

about the relevance of an integrated market. However, the latter is essential in that it allows for greater flexibility through real-time management of imbalances thanks to interconnections, from which France benefits greatly. To respond to this price volatility, which is explained by the **short-term nature of the market**, with prices determined by daily electricity exchanges, efforts are increasingly being made to develop the **long-term market**, based on contracts between producers and consumers that guarantee fixed prices, independent of daily exchange fluctuations. There are currently two types of contracts: **Contracts for Difference** between electricity producers and the government, whereby the government maintains prices within a predefined range, and **Power Purchase Agreements**, between producers and industrial consumers, which include a partially fixed price for long-term supply. These mechanisms are intended to offer greater visibility to producers and better predictability for industrial consumers. In France, an alternative is currently being explored between EDF and so-called "electro-intensive" consumers with nuclear production allocation contracts "CAPN." However, these alternatives face legal obstacles: EDF, the dominant player, is constrained by competition rules and state aid regulations, which limit the implementation of differentiated or attractive prices. While state aid law does not appear to be an insurmountable obstacle, particularly given the industrial realities of which the European Commission is aware, as demonstrated by the recent Clean Industrial Deal, which somewhat relaxes the rules and procedures, the constraints associated with EDF's dominant position are not likely to change in the near future.

Several avenues need to be explored to promote long-term visibility in the European electricity market, which, despite its limitations, remains the most efficient in terms of resource allocation. While CISAF,[122] which came into force in June 2025, is a step in the right direction, the main issue today is governance and the rapid and effective implementation of these measures. Therefore, we recommend that the following measures be explored:

- Promoting long-term contracting to reduce dependence on volatile short-term spot markets. This would enable manufacturers to secure fixed-price supply contracts over several years, reducing their exposure to daily market fluctuations. The development of Power Purchase Agreements (PPAs), allowing direct contracting between producers and manufacturers on the basis of preestablished prices and volumes, could contribute to this. Other manufacturers may prefer Contracts for Difference (CfDs), which offer greater flexibility and may therefore be preferred by smaller players over PPAs.

- In the medium term, ideally, decarbonization should help shift electricity production toward clean, secure, and inexpensive energy sources (renewables, nuclear) in order to reduce the role played by fossil fuels (particularly gas) in setting electricity prices; this implies supporting investments in an energy mix that reflects this shift. However, not only is there lack of controllability of renewable energies but also operational inflexibility of nuclear power. Nuclear plants are designed for baseload generation and have slow ramp-up and ramp-down times, making them ill-suited for following rapid changes in demand or intermittent renewable output. This limits the possibility of doing without gas andfossil fuels, whose use in France is already low compared to other Member States, and in the absence of large low-cost storage capacity available within a reasonable time frame (batteries, hydrogen, hydro).

[122] *CISAF: Clean Industrial Deal State Aid Framework.*

- Develop storage capacities, with clusters themselves being highly relevant locations for deploying large-scale storage.
- It would be appropriate to develop significant investments in the network in order to facilitate grid balancing by enabling greater flexibility in both generation and consumption (i.e., "smart grids").[123] ,[124]
- Prioritize industrial clusters to promote rapid connections to the electricity grid.
- It would be necessary to produce a Draghi-style report on the issue of energy networks and interconnections at the European level.

Recommendation 4

Guarantee long-term access to secure, carbon-free, and competitive energy.

Access to affordable and stable electricity is the primary concern for industrial companies in the Dunkirk area. In this context, and within the framework of the European market, it is necessary to take the following steps:

[123] *See the CRE's studies and recommendations on the subject: Commission de régulation de l'énergie (CRE), "Présentation des Réseaux Intelligents" [Presentation on smart grids], accessed September 3, 2025, https://www.cre.fr/electricite/reseaux-delectricite/presentation-des-reseaux-intelligents.html. Voices are sometimes heard saying that these investments, which are supposedly only for the benefit of renewable energies, are unnecessary and that it would be possible to rely solely on nuclear power. Without getting into this heated debate here, let us at least note that this is not the opinion of the regulator, which we believe to be the most objective opinion on the subject.*

[124] *On this subject, see Maxence Cordiez and Pauline Jérémie, "L'Europe de l'Énergie à l'Heure du Pragmatisme : Comment Accélérer les Déploiements Capacitaires ?" [Europe's energy at a time of pragmatism: how to accelerate capacity deployment?], Institut Montaigne, February 2025, https://www.institutmontaigne.org/publications/leurope-de-lenergie-lheure-du-pragmatisme.*

- **In France, clarify the government's strategic objectives and priorities in terms of energy policy**—which should be addressed by the draft Multi-Year Energy Program (PPE 3), due to be published this year. It is necessary to clarify the role and objectives of EDF, between profitability and priority for industrial development, which must concretely lead to an increase in nuclear production allocation contracts (CAPN) between EDF and "highly electro-intensive" industries.

- **In Europe, encourage futures markets to reduce dependence on short-term markets, thereby guaranteeing stable and competitive electricity prices for manufacturers**, in particular through long-term contracts such as Power Purchase Agreements (PPAs) or Contracts for Difference (CfDs).

- **In the medium term, reduce the share of fossil fuels in the electricity mix in order to better control electricity prices**. This would require the following actions:
  - Continuing efforts to shift a significant portion of energy use to electricity to replace fossil fuels.
  - Supporting the revival of new nuclear reactor construction in France (which will only be able to meet additional demand in fifteen to twenty years' time).
  - Supplement this plan with a policy focused on faster development of renewable energies.
  - **Take advantage of the political structuring around clusters to keep pace with the growth in demand for carbon-free electricity**. When this demand exceeds the available nuclear supply, respond to it with the simultaneous deployment of renewable capacities.
  - In conjunction with this accelerated development of renewable energies (intermittent and decentralized), accelerate and amplify investments in networks and energy interconnections at the European level to facilitate grid balancing, increase flexibility, and make consumption more predictable. This also includes the issue

of storage in industrial clusters. These clusters encourage the establishment of carbon-free industries, thereby creating demand. It is also necessary to anticipate future energy storage needs and install large-scale storage infrastructure.

b. Waste heat, hydrogen, carbon capture: Alternatives to be encouraged

In Dunkirk, several decarbonization projects using new energy technologies are struggling to get off the ground or have been abandoned. This is particularly true of the Heat Highway and other projects involving waste heat recovery, hydrogen, and carbon use and storage. There are two reasons for this: the reluctance of project stakeholders to take risks in the face of economic uncertainty and insufficient guarantees and support mechanisms.

Beyond the electrification of industrial processes, which is essential for decarbonization, competitiveness, and energy sovereignty, the development of alternative energies such as hydrogen is an promising lever. Another important lever is capitalizing on the reuse of energy that has already been produced, in this case by recovering waste heat from industrial processes, i.e., heat lost during industrial processes that could be reused. Several projects have been launched in Dunkirk, but their implementation remains difficult. The Heat Highway project has been delayed several times, and a similar project had to be abandoned. Supported in particular by Engie as a potential operator-distributor, it involves recovering the waste heat emitted by an industrial producer, then transporting it via a network, enabling it to be redistributed in the form of an industrial service to another consumer company. However, its economic model reached an impasse: The heat producer could not guarantee a continuous supply that would always meet consumer demand, the consumer could not guarantee stable demand without security of supply, and the operator responsible for the installation could not recoup its investment

without minimum guarantees of consumption and production. In the absence of adequate guarantees and a willingness on all sides to take risks, the project was ultimately abandoned. Despite attempts by local authorities to create security mechanisms, their financial and regulatory leeway proved too limited to compensate for market failures.

However, heating networks and the use of locally produced heat are a real strategic lever that should be further mobilized for decarbonization. As things stand, out of around one hundred sites emitting waste heat in France, only 1 percent of this heat is recovered. There is, therefore, real potential for the development of a new carbon-free energy value chain. The failure of the Dunkirk project is representative of the difficulty in France of implementing industrial projects in local communities, which, beyond the lack of guarantees from the state, can be explained by the fear of risk on the part of certain manufacturers, which is undoubtedly multifactorial, but partly due to the lack of effective de-risking instruments, as well as relative skepticism about the reality of the measures in place (such as the end of free allowances on ETS1).[125] One solution could be for the government to provide guarantees, justified by the fact that these decarbonization projects are in the public interest. The government would commit to guaranteeing either the supply of heat or financial compensation in the event of non-consumption. This mechanism would enable manufacturers to bear the cost of the installations while being assured that they will be able to recoup their investments.

[125] *For the various measures available, see Maxence Cordiez & Pierre Jérémie. L'Europe de l'énergie à l'heure du pragmatisme : quel nouveau cadre pour atteindre la neutralité carbone ? [Europe's energy at a time of pragmatism: what new framework to reach carbon neutrality?]. (2025, February) Institut Montaigne. https://www.institutmontaigne.org/ressources/pdfs/publications/leurope-de-lenergie-a-lheure-du-pragmatisme-quel-nouveau-cadre-pour-atteindre-la%20neutralite-carbone-note-2.pdf.*

An alternative could be to transpose the SAF fund model,[126] used for geothermal energy and supported by the Caisse des Dépôts and ADEME, to industrial waste heat or hydrogen projects. Guarantee and investment decisions (shared between the state and manufacturers) would be taken following an individual review of each project by a committee of technical experts. The guarantee could take the form of a dual financing fund: an initial state fund covering the initial investment risk, followed by a fund financed by operators, guaranteeing against a potential deterioration in returns. It would be financed in particular by a tax on part of their CAPEX.

These public guarantee proposals have already been submitted to the public authorities, which remain cautious about the idea, as does the banking sector. The difficulty in mobilizing public authorities can be explained not only by France's budgetary situation but also by the political difficulty in mobilizing budgets (insurance funds) for non-immediate use. In addition, the reuse of waste heat is based on voluntary participation by industrial firms. There is currently no regulatory or fiscal incentive to do so. However, a genuine commitment from the public authorities in this direction, coupled with insurance support, could prove decisive in the development of the sector, following the model of the development of geothermal energy in France, which is currently the leading geothermal sector in Europe thanks to the distinctive methods used.

Beyond waste heat alone, other projects have been developed in Dunkirk: hydrogen, CCUS127 (carbon capture, utilization, and storage), etc., but they face the same issue of responsibility and risk sharing

[126] *The "geothermal guarantee fund," set up in France in the 1980s and managed by the Société d'Assurances Mutuelles des Collectivités Locales (SAF), aims to pool the geological risk associated with the exploration and exploitation of deep geothermal energy. This scheme, supported by ADEME, provides compensation to project developers in the event of drilling failure or subsequent degradation of the resource.*

[127] *CCUS (Carbon Capture, Utilization and Storage) is a set of technologies that capture carbon dioxide (CO_2) emitted by industrial activities, transport it, and then either store it permanently in suitable geological formations or reuse it as a resource to manufacture other products.*

between energy producers and consumers. However, it is all the more difficult to commit to these projects as they involve novel business models that require the creation of a CO2 market that does not exist yet at the European or national level and that would support the creation of connections between industrial sites. The ETS1 reform is moving in this direction with the end of free allowances, but the regulatory framework has not yet been finalized.

The model of state guarantees mentioned above in the case of waste heat could thus be extended to several industries, with administrative support from Coface.

Recommendation 5

In order to create the conditions for a project-based approach, the government must implement a state-backed risk guarantee system, for example by instructing Coface (Compagnie française d'assurance pour le commerce extérieur, a major trade credit insurance company) or an equivalent body to pay particular attention to this.

In Dunkirk, several decarbonization projects using new technologies are struggling to get off the ground or have been abandoned. This is particularly the case for the Heat Highway and other projects involving waste heat recovery, hydrogen, and carbon use and storage. There are two reasons for this: the lack of risk-taking by project stakeholders in the face of economic uncertainty and insufficient guarantees and support mechanisms.

3.5. STRENGTHENING THE ADAPTATION OF TRAINING SYSTEMS TO THE OBJECTIVES OF REINDUSTRIALIZATION

a. The key challenge of human capital and training

The Dunkirk reindustrialization project plans to create 12,000 direct jobs and 8,000 indirect jobs by 2029 (then 20,000 direct jobs by 2035), mostly in industrial occupations. Recruiting individuals with the right profile to fill these positions is a major challenge.

The creation in 2021 of an employment and attractiveness department within the urban community reflects a particular concern to address recruitment and training issues, as the Dunkirk region is facing this key national challenge.

France as a whole lacks engineers (see part 2), as well as technicians and skilled industrial workers.[128] Human capital is a key driver of competitiveness and training to serve the needs of reindustrialization. However, the latest OECD PISA rankings show that France ranks twenty-third in mathematics and twenty-sixth in science out of the eighty-five countries participating.[129] It is therefore necessary to develop a long-term strategy to meet demand. Given the urgency of the situation, it seems essential to continue with short-term palliative measures. In the opinion of several people interviewed for this study, an important lever for action is to focus on retraining, taking advantage of transferable skills (from other sectors of activity) for the industrial sector. This lever would also make it possible to take into account the challenges of the feminization of the workforce.

[128] *Institut Montaigne, Métiers de l'ingénieur [Engineering professions].*

[129] *Organisation for Economic Co-operation and Development (OECD), PISA 2022 Results (Volume I): The State of Learning and Equity in Education, December 5, 2023, https://doi.org/10.1787/53f23881-en.*

Furthermore, it is now well known that France is training too few engineers and technicians, while demand continues to grow due to the ecological and energy transition, as well as digitalization. Assuming a "moderate" reindustrialization trajectory, it has been calculated that 100,000 additional engineering and technician positions per year will be needed.[130]

Table #1 • Evolution of the need for engineers and technicians in France between now and 2035

	Accelerated reindus-trialisation scenario	Moderate reindus-trialisation scenario	Industrial stagnation scenario	Industrial recession scenario
Engineers and Masters				
Reindustrialisation *	224,000	104,000	32,000	25,000
Digital **	400,000	300,000	200,000	100,000
Ecological transition outside industry/digital ***	100,000	80,000	60,000	40,000
Total (net job creation between 2022 and 2035)	724,000	484,000	292,000	165,000
Annualised total	**55,692**	**37,231**	**22,462**	**12,692**
Technicians				
Reindustrialisation *	338,000	130,000	5,000	-7,000
Digital **	800,000	600,000	400,000	200,000
Ecological transition outside industry/ digital ***	200,000	160,000	120,000	80,000
Total (net job creation between 2022 and 2035)	1,338,000	760,000	525,000	273,000
Annualised total	**102,923**	**58,462**	**40,385**	**21,000**
Total engineers + technicians (net job creation between 2022 and 2035)	2,062,000	1,244,000	817,000	438,000
Annualised total engineers + technicians	**158,615**	**95,692**	**62,847**	**33,692**

*Sources: * France stratégie, ** Institut Montaigne, *** Working group estimate.*

[130] *Institut Montaigne, Métiers de l'ingénieur [Engineering professions].*

Adapting an initial training system requires a strategy that should focus on the following areas in particular:[131]

- Restoring the appeal of and rehabilitating scientific culture in primary and secondary education.
- Strengthening information and guidance for students to encourage them to pursue technical and scientific training and careers; this involves not only providing information about training and careers but also by providing role models, given the importance of role model effects.
- Strengthening the diversity of the talent pool being trained in scientific professions, particularly among young women and young people from modest backgrounds; several approaches could be explored: quotas in master's programs, mentoring programs, targeted scholarships, etc.[132]
- In the wake of the 2017 apprenticeship reform, continue to implement the "Lycées pro" plan (2023) a government reform that aims to modernize vocational high schools, enhance their perceived value, attract more students, and better link them to the labor market.
- Support training in engineering and technical professions in the regions by creating local training programs developed jointly by industrial players, public authorities, and local training providers. For example, certain engineering schools (such as IMT Nord Europe) have created campuses in Dunkirk (at the heart of ÉcosystèmeD, dedicated to research and innovation activities as well as energy-related training) that benefit from their proximity to existing and emerging industries. This is in line with the logic of building an industrial cluster where training for industrial professions, R&D, and industries are located in the same area, creating a truly comprehensive strategy that enables efficiency gains.

[131] *Institut Montaigne, Métiers de l'ingénieur [Engineering professions].*

[132] *Some of these ideas are inspired by the work of Xavier Jaravel; see in particular Xavier Jaravel, Marie Curie Habite dans le Morbihan: Démocratiser l'Innovation, La République des idées (Paris: Seuil, November 2023), chap. 5–6.*

b. The attractiveness of industrial professions: A key educational challenge

In addition to—and central to—strengthening the initial training system, it is also important to emphasize the challenges related to pedagogy and communication.[133] Indeed, even in the Dunkirk region, according to the local stakeholders interviewed, there is no guarantee of spontaneous interest in industrial training and careers. These still suffer from an image of an aging sector, despite the industrial heritage and culture deeply rooted in this region. This problem is even more acute in other regions.

It is therefore essential to deconstruct stereotypes (breaking down the image of industrial life found in novels such as Zola's *Germinal*), promote career paths in industry, and highlight the often more advantageous salary conditions compared to other sectors, such as retail, for example. In Dunkirk, local initiatives such as *Fabulous Factory, Viva Fabrica*, and partnerships with universities and engineering schools demonstrate a real effort to promote industrial careers, particularly among young people. Alongside the strengthening of initial and continuing training in science and technology, a key factor in the upskilling of workers throughout their professional lives, this type of initiative should be systematized throughout the country, with targeted discovery activities aimed not only at young people, as in Dunkirk, but also at specific audiences such as women, people entering the labor market, seniors, and people with disabilities. These initiatives can be reinforced with social integration clauses in company contracts.

Training is therefore a major challenge. The need to retrain the workforce requires strengthening initial education and training systems and encouraging lifelong learning throughout working life: This is a key element of a genuine industrial policy strategy, giving French

[133] *See Lluansi, Réindustrialiser [Reindustrialize], pp. 88 and following.*

and European citizens the skills they need. This will enable reindustrialization to go hand in hand with greater social inclusion through opportunities for education, lifelong learning, and well-paid, high-quality jobs. Training is therefore a key lever for ensuring the competitiveness of the French economy, France's strategic autonomy, and social and territorial cohesion. Beyond that, given the constraints mentioned at the domestic level, the issue of labor immigration should be raised, although unfortunately the format of this study does not allow for a more detailed discussion of this point.

Recommendation 6

Strengthen the adaptation of training systems to the objectives of reindustrialization.

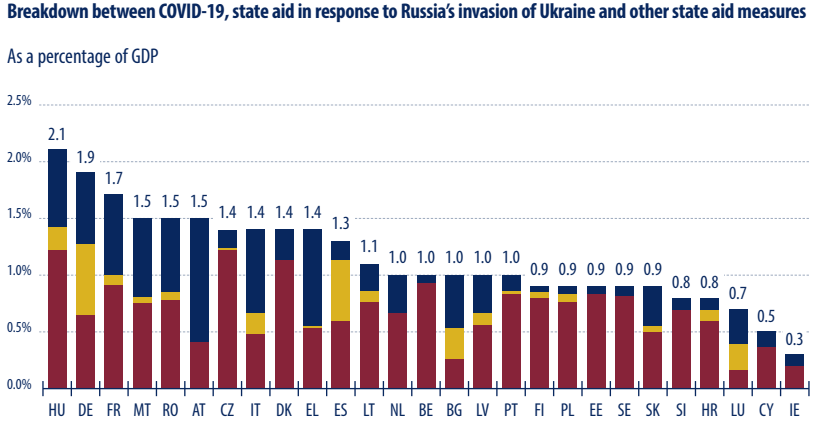
In the collective imagination, industry remains associated with difficult jobs. Reindustrialization requires a change in these perceptions through communication and education aimed at specific target audiences (young people, women, etc.). Again, in line with the cluster approach, these educational initiatives should be organized at the local level, in conjunction with the industries in each region, with a view to aligning the region's resources and assets with the needs of its industry. In Dunkirk, for example, this has resulted in the organization of open days at factories, collaborations between industries and schools, trade shows for the general public, etc. At the national level, the need to retrain the workforce requires strengthening the attractiveness of scientific and technical training in initial education, in a manner adapted to the new needs of industry, and encouraging lifelong learning in these fields. This is a key element of a genuine industrial policy strategy, giving French and European citizens the skills they need to achieve their ambitions. Reindustrialization must go hand in hand with greater social inclusion through opportunities for education, lifelong learning, and well-paid,

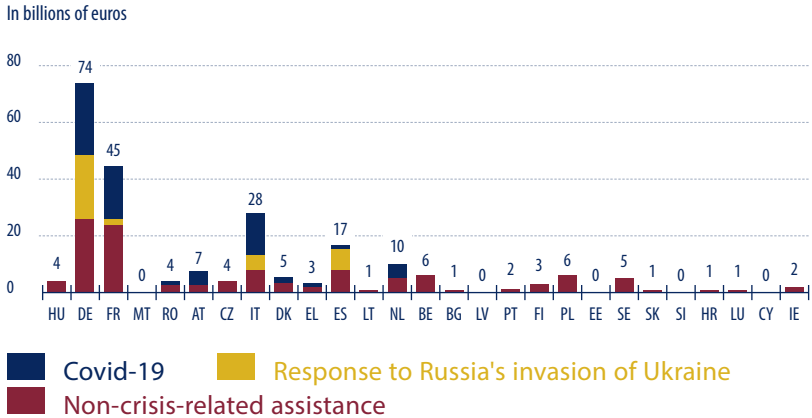
high-quality jobs. Regional industrial clusters have an essential role to play in implementing this policy.

3.6. ADAPTING COMPETITION POLICY TO INDUSTRIAL POLICY OBJECTIVES: RETHINKING THE IPCEI SYSTEM TO FOSTER THE CREATION OF INDUSTRIAL CLUSTERS IN EUROPE

European control of state aid, defined as any selective advantage granted to a company by the state and through state resources that affects competition and trade between Member States, has the potential to affect support mechanisms for decarbonization, reindustrialization, and the development of new sources of electricity. The existence of this control regime can be explained historically by a desire to avoid subsidy or protectionist spirals between Member States within the internal market.

Figure 14 • Total state aid expenditure by Member State.





Source: Mario Draghi, The Future of European Competitiveness, part A, A Competitiveness Strategy for Europe, European Commission, September 9, 2024, 16, https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4c-f152a8232961_en?filename=A+competitiveness+strategy+for+Europe+-+September+2024.pdf.

One of the recurring demands from manufacturers is for the acceleration and expansion of state aid authorizations. The Clean Industrial Deal and the draft Clean Industrial Deal State Aid Framework (CISAF)[134] are precisely in line with this. Based on previous experience, the aim is to propose simpler standard forms with less information required in order to standardize and normalize the authorization process and ultimately speed up the processing of applications.

[134] *The Clean Industrial Deal State Aid Framework (CISAF) supports the transition to clean energy and technologies and will apply until the end of 2030. It replaces the Temporary Crisis and Transition Framework (TCTF), in force since 2022, and aims to provide long-term predictability for businesses and governments while accelerating and simplifying the approval of projects contributing to the EU's climate goals. It enables faster support for the deployment of renewable energies, cost reductions for energy-intensive industries, industrial modernization, and the production of green technologies, while paying particular attention to disadvantaged regions. This mechanism is part of the Clean Industry Pact, which aims to maintain European competitiveness while decarbonizing industry.*

This is a step in the right direction; the CISAF came into force on June 25, 2025. Although the first decisions based on these new forms were made in the summer of 2025,[135] it will probably be 2026 before it is possible to assess the results of this reform.

With regard to the development of industrial policy instruments proper, the establishment of "important projects of common European interest" (IPCEIs)[136] was one of the first manifestations of the recognition that reinvestment in industrial policy was essential. This mechanism, which can benefit from derogations from the EU state aid framework, allows Member States to invest in the direct financing of industrial capacity, subject to certain conditions and monitoring by the Commission. Made possible in 2014, the addition of the strategic autonomy objective from 2022 onwards has facilitated the mobilization of this instrument for the purposes of resilience and reducing European dependencies. Since the first industrial project was approved in 2018, eight others have been approved, with aid amounting to more than €30 billion. In 2019 and 2021, the EU approved two IPCEIs aimed at supporting the development of a globally competitive battery value chain in Europe, financing R&D, innovation, and industrial deployment. France is involved in both and even coordinated the first, which contributed to the financing of the ACC gigafactory in Douvrin.

According to the manufacturers surveyed, the IPCEIs are a useful tool but too complex. The selection criteria,[137] which require the preparation

[135] *Représentation de la Commission européenne en France, "La Commission Approuve un Régime d'Aides d'État Français de 11 Milliards d'Euros Destiné à Soutenir l'Énergie Éolienne Offshore" [Commission approves €11 billion French state aid scheme to support offshore wind energy], August 5, 2025, https://france.representation.ec.europa.eu/informations/la-commission-approuve-un-regime-daides-detat-francais-de-11-milliards-deuros-destine-soutenir-2025-08-05_fr.*

[136] *IPCEIs allow for derogations from European competition law and aim to boost continental production in sectors considered strategic, such as electric batteries, hydrogen, semiconductors, and critical raw materials.*

[137] *Joint European Forum for IPCEI (JEF-IPCEI), Participating in an Important Project of Common European Interest: Technical Guidance on Conditions and Process, https://competition-policy.ec.europa.eu/document/download/279cbfaf-49b1-4b90-b8f7-89d1f4a21eb3_en?filename=JEF_IPCEI_technical-guidance-calls.pdf.*

of very lengthy justification files (several hundred pages), are considered too restrictive. The inclusion of a project in an IPCEI requires agreement between all the Member States involved and significant intra-European cooperation, which can sometimes be difficult when it comes to setting up new projects with new partners. The procedure was therefore considered "a bureaucratic nightmare" by one of the people interviewed for this report. Above all, the innovation criteria required for inclusion in the IPCEI are considered too high and sometimes difficult to justify. These criteria become counterproductive when competing countries, such as China, are already deploying technologies that do not meet the EU's high innovation threshold.

Given this complexity, some manufacturers believe that the effort involved in the procedure does not justify the investment, to the point that some of the manufacturers interviewed for this report consider the subsidies to be "a net negative." In Dunkirk, for example, three battery manufacturers, each of which had considered joining the first IPCEI battery program, ultimately decided against it and turned to other industrial initiatives (RDI support for Verkor and ProLogium, following the recommendation of the Commission, which did not wish to reopen the first IPCEI batteries program; TCTF framework at the French level and Innovation Fund application at the European level for Orano).

The French public authorities confirm this testimony from industry players on the complexity of IPCEIs and also deplore the slow pace of implementation. It can sometimes take more than two years between the submission of a project and the Commission's approval of state aid. Procedures are also slowed down by obstacles that are sometimes more circumstantial, such as the disconnect in perspective and terminology between DG Comp lawyers and economic project leaders, which creates a lack of understanding.

In light of the above, the following measures should therefore be taken:

- Extend the scope of exemptions for IPCEIs under European competition law.
- Simplify IPCEIs to make them easier to mobilize, in particular by revising the selection criteria to broaden their scope beyond disruptive or "first-of-a-kind" projects to include "non-innovative" but strategic projects (e.g., relocation of drug manufacturing plants). These include, for example, projects that are capable of reducing proven European dependencies or promoting the resilience of our societies.

This would make it a more effective tool for increasing investment in strategic areas—not necessarily the most innovative ones—that are of common European interest.

Furthermore, beyond the instrument and its functioning, despite their usefulness, the IPCEIs paradoxically illustrate the fact that there is no real European industrial policy: One must turn to the compatibility criteria of state aid control to find the (restrictive) definition of what the Union considers industrially important at the European level.

This lack of integration is also evident in energy policy and, more specifically, in the diversity of national energy mixes. Each Member State remains free, under Article 194(2) of the TFEU,[138] to choose its preferred mode(s) of energy production. This contrasts with the search for a "common European interest" and constitutes a significant limitation to any large-scale European industrial strategy on this major issue, given the politically sensitive nature of the subject. These deeply national approaches also highlight the differences in industrial strategies between Member States, underlining that one of the essential elements

[138] *Consolidated Version of the Treaty on the Functioning of the European Union, art. 194, 2016 O.J. (C 202) 134, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:12016E194.*

of the Founding Fathers' vision has not been achieved:[139] the ability to develop a coherent industrial and investment policy based on our common interests rather than just national industrial policies designed for national markets to the detriment of the proper functioning of the single market, which is now in competition with markets outside Europe.

In the current context of heightened competition from outside Europe, a genuine common European strategy in the industrial field requires the adaptation of existing European policies.[140] EU competition policy must go beyond its domestic dimension, at the level of the single market, and for sectors that lend themselves to it, to be conceived on a global scale. In line with the commitments of the second von der Leyen Commission, the approval of European mergers should take better account of the realities of international competition in sectors that are strategic for the EU. Competition policy must also be designed in line with the Union's industrial objectives, both in its application to European players and in its treatment of the effects of external actions on the single market. The single market is certainly a consumer market, but it is also a producer market!

In line with this logic of extending the scope of our competition policy, we can only welcome the entry into force in July 2023 of Regulation 2022/2560 on the control of foreign subsidies[141] received by companies

[139] *The Schuman Declaration of May 9, 1950, was ambitious in terms of industrial policy for coal and steel; so too was the 1951 ECSC Treaty, which concerned coal, the primary source of energy at the time, and was inspired by Jean Monnet's experience with the Plan (see Articles 46 and 54) and also the Euratom Treaty of 1957, which concerned atomic energy, a source of energy considered very promising at the time, but the treaty was not implemented due to the reluctance of General de Gaulle and the success of oil. On the subject of energy, particularly from a historical perspective, see Laurent Warlouzet, Europe contre Europe. Entre liberté, solidarité et puissance [Europe against Europe: Between liberty, solidarity, and power] (Paris: CNRS Éditions, 2022), 212–214.*

[140] *See Thierry Chopin, ed., Une Europe pour Aujourd'hui et pour Demain: Souveraineté, Solidarités et Identité Commune [A Europe for today and tomorrow: Sovereignty, solidarity and common identity] (Paris: La documentation française, 2022), 126–37.*

[141] *Regulation (EU) 2022/2560 of the European Parliament and of the Council of 14 December 2022 on Foreign Subsidies Distorting the Internal Market, 2023 O.J. (L 328) 1, https://eur-lex.europa.eu/FR/legal-content/summary/foreign-subsidies-regulation.html?fromSummary=08.*

operating in the single market. This new mechanism can be seen as an extension of state aid law outside the EU, incorporating subsidies from third countries and distortions of competition. It is therefore a step forward in principle but one that remains limited by an additional degree of complexity for European companies when they receive subsidies from third countries: the mechanism would benefit from being adapted to rely less on mandatory notifications and more on investigations into the most problematic cases.

Recommendation 7

Work towards better alignment of European competition and territorial cohesion policies with industrial policy objectives.

The European Union tends to favor economic harmonization among its Member States, a choice guided by the legitimate requirement of fairness but which results in a territorial cohesion policy that spreads resources too thinly at the expense of effectiveness. It thus steers its policies with a view to catching up on development delays in certain regions rather than reorienting them toward strategic industrial projects capable of mitigating its economic fragilities and dependencies. This involves, in particular, reorienting the ERDF, the European Regional Development Fund (€9.1 billion for France in the 2021–2027 budget), toward industrial projects in territorial clusters. The case of Dunkirk shows the importance of aligning territorial cohesion policy with industrial policy objectives, an alignment that also applies to competition policy.

Indeed, **the difficulties encountered by several players and companies in the Dunkirk area highlight the need to broaden the scope of exemptions from European competition law for IPCEIs**. It is not only

necessary to clarify the objectives that allow for exemptions. There is also an urgent need to introduce a more permissive interpretation of the types of projects that can benefit from exemptions. **Projects that can reduce proven European dependence or promote the resilience of critical value chains should be assured of their eligibility for exemptions from the IPCEI state aid regime, which is currently limited by an innovation criterion**. This IPCEI framework must be mobilized in favor of these territorialized industrial clusters. In the same vein, the expansion of aid authorizations provided for in the new European Clean Industry State Aid Framework (CISAF) would benefit from incorporating a territorial approach. In addition, competition law should be amended so as not to hinder the emergence of European champions in sectors where critical mass is achieved on a continental scale.

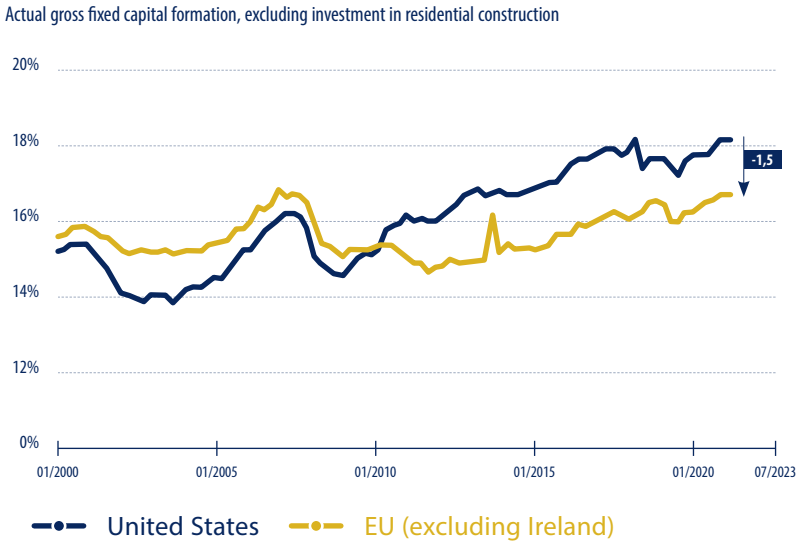
3.7. INVESTING AT SCALE: THE CHALLENGE OF FINANCING

Another challenge to be addressed at the European level is the change in the scale of industrial investment.

The hearings conducted as part of this study, with both private and public stakeholders, largely agree on the need to strengthen public investment and encourage private investment. "Now is the time to invest heavily in preparing for the future!" This is essential in order to remain competitive with rivals whose industrial ambitions are based on considerable investment. Although public investment is significant in Europe, it remains lower than in the US and China.

The Draghi report highlighted the asymmetry between the United States and the European Union in particular in terms of investment.

Figure 14 • Productive investment in Europe and in the United States (2000-2023)



Source: Source: Draghi, M. (2024). The future of European competitiveness (p. 28, Part A) [Report]. European Commission, https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4c-f152a8232961_en, accessed on 4 September 2025.

With regard to the battery sector specifically, investment in 2020 was broadly similar in Europe and the United States. From 2022 onwards, with the adoption of the Inflation Reduction Act (IRA), massive subsidies were introduced for the production of batteries and electric vehicles, accompanied by domestic content requirements. Since then, investment in the United States has exceeded that in Europe.[142]

[142] *Marie Jugé, Ugnė Keliauskaitė, Kate Larsen, Charlotte McClintock, Ben McWilliams, Hannah Pitt, Simone Tagliapietra, Harold Tavarez, and Cecilia Trasi, "Transatlantic Clean Investment Monitor 3: Battery Manufacturing," Bruegel, March 6, 2025, https://www.bruegel.org/analysis/transatlantic-clean-investment-monitor-3-battery-manufacturing.*

Above all, the comparison with China is instructive. China invested $676 billion in the energy transition in 2024, while Europe invested half that amount.[143]

Although the EU provides significant funding for R&D, it lags worryingly behind its competitors in terms of industrializing innovation. This gap must be closed. The difference with China (where battery companies such as CATL receive several hundred million USD per year)[144] and with the United States (e.g., the IRA and Tesla, which was able to spend several billion with the support of the US government to successfully scale up) is very significant. This growing imbalance can only be addressed at the European level. If this transition from innovation to industrialization is not jointly supported by public and private actors in the coming years, reindustrialization will not succeed.

It is also necessary to support both supply and demand. In recent times, Europe has tended to opt for a supply-side policy, albeit a cautious one. The Clean Industrial Deal (CID), in addition to strengthening this support, marks a paradigm shift as it provides for a demand support mechanism, particularly for the automotive sector.[145] In the opinion of the stakeholders interviewed, the CID is moving in the right direction, and this paradigm shift is notable but not yet fully realized. Beyond supply support, strategic sectors—which have been underinvested in—need

[143] *As Mario Draghi pointed out, "En 2019, la Chine a dépensé environ trois fois plus pour la politique industrielle que l'Allemagne ou la France en termes de pourcentage du PIB. En dollars ajustés à la parité de pouvoir d'achat, elle a dépensé environ dix fois plus que ces deux pays réunis" [In 2019, China spent about three times more on industrial policy than Germany or France as a percentage of GDP. In purchasing power parity-adjusted dollars, it spent about ten times more than those two countries combined] – Mario Draghi, "Une Stratégie Industrielle pour l'Europe" [An industrial strategy for Europe], speech delivered at the Monastery of San Jerónimo de Yuste on receipt of the European Charles V Prize, Le Grand Continent, June 14, 2024, https://legrandcontinent.eu/fr/2024/06/14/mario-draghi-une-strategie-industrielle-pour-leurope.*

[144] *Scott Kennedy, "The Chinese EV Dilemma: Subsidized Yet Striking," Trustee China Hand (blog), Center for Strategic and International Studies, June 20, 2024, https://www.csis.org/blogs/trustee-china-hand/chinese-ev-dilemma-subsidized-yet-striking.*

[145] *European Commission, Industrial Action Plan for the Automotive Sector, COM(2025) 95 final (Brussels: European Commission, March 5, 2025), https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52025DC0095.*

a coordinated approach (in the absence of a centralized approach) to demand, particularly with regard to public procurement through the definition of local content requirements for certain goods produced in the EU. On this subject, it is necessary to accelerate the implementation of the European Commission's proposal to introduce the idea of a preference for green technologies and "Made in Europe" materials in public procurement in certain strategic sectors.[146]

The Industrial Accelerator Act, which is expected to be published at the end of 2025, is also moving in the right direction in terms of creating demand by including low-carbon criteria and also moving toward European local content criteria for public procurement. More broadly, the EU should encourage investment and production in green industries in Europe, including by foreign companies. These companies can bring technology transfers and know-how that is not available in Europe, with a view to "Made-in-Europe" rather than "Made-by-Europe" production.[147]

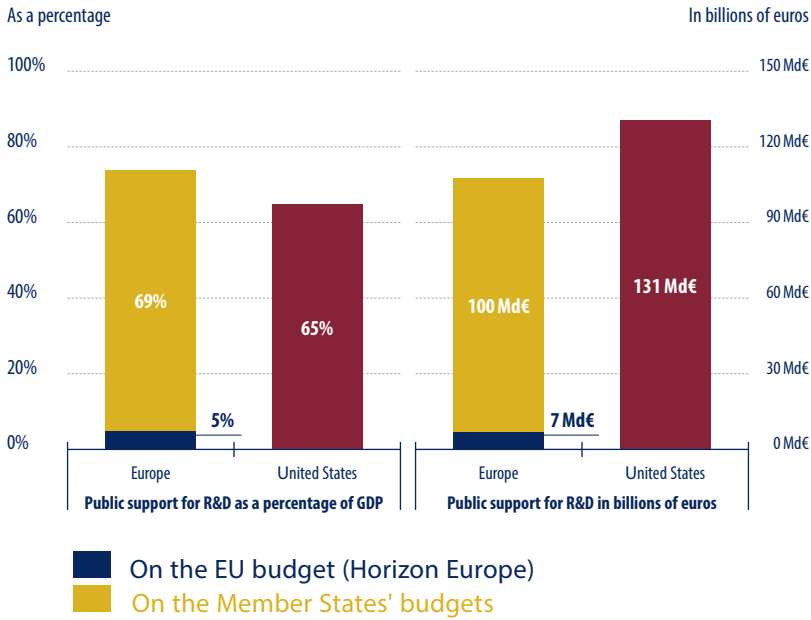
In the United States, there is a federal budget, and public investment is directed toward federal priorities. In Europe, funding instruments are fragmented between the EU and Member States, with little coordination between them, compounded by lengthy decision-making on projects of common interest. The overlapping of different levels of regulation, which are often misaligned and sometimes even inconsistent, also weighs on these investments and, more generally, on the continent's competitiveness.[148]

[146] *Joseph Dellatte, Cleantech: Reducing Europe's Strategic Dependence on China, Institut Montaigne, July 2025), https://www.institutmontaigne.org/en/publications/cleantech-reducing-europes-strategic-dependence-china.*

[147] *Morin and Wright, Lessons from the IRA.*

[148] *Regarding energy policy, see Maxence Cordiez and Pauline Jérémie, "Transition Énergétique: Il Faut Simplifier le Cadre Réglementaire" [Energy transition: the regulatory framework must be simplified], Les Échos, April 3, 2025, https://www.lesechos.fr/idees-debats/cercle/transition-energetique-il-faut-simplifier-le-cadre-reglementaire-2157877.*

Figure 15 • Sources of R&D funding at UE and state level in the EU and at federal level in the United States in 2021



Source: Draghi, M. (2024). The future of European competitiveness (p. 29, Part A) [Report]. European Commission, https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4c-f152a8232961_en, accessed on 4 September 2025.

In addition, the organization of public support is less effective in Europe. The simplicity of implementation, predictability, and national preference of IRA subsidies have been widely praised by the energy sector in the United States.[149] In China, the role of the state as planner and the massive subsidies largely reserved for domestic players have enabled

[149] *Morin and Wright, Lessons from the IRA.*

phenomenal development, which is certainly not without concerns about overcapacity, profitability, and imbalances in international markets. While in the United States, Donald Trump's return to the White House has led to a de facto suspension of the IRA, the consequences for the energy sector, which are certainly dire, have yet to be assessed.

In Europe, there is room for improvement in the implementation of our policies to support the energy sector. The first area for improvement is the definition of clear, credible, and stable priorities. The second is the streamlining and simplification of regulations (a key priority on the new Commission's competitiveness agenda).[150] Better coordination and concentration of our multiple national and European financing instruments is essential. Without this, there is a risk that our meager common resources will be wasted in a piecemeal approach involving multiple national and European financing instruments. If Europe's industrial ambition in certain sectors deemed strategic in a more threatening world does indeed become the priority that certain political discourses suggest, more public resources will also have to be devoted to it. In this regard, it is regrettable that the issue of joint financing through joint public debt or the creation of new own resources is automatically ruled out because it is too politically sensitive for some of our partners. This does not prevent the growing importance of funding for innovation and development in these sectors in the EU's next multiannual financial framework, which is currently being negotiated.

[150] *The simplification agenda and the Omnibus project are welcome developments, given that such a review of European regulatory policies is a useful exercise if it strengthens the competitiveness of European companies without leading to excessive deregulation. Nevertheless, it is important to emphasize that regulatory simplification cannot come solely from the European level but must also come from the national level (where a simplification process is also underway, albeit less directly focused on industrial issues). Indeed, European regulation can be a source of simplification when it replaces national rules; in doing so, it becomes not only a source of simplification but also of unification and harmonization of the single market. See on this point, Alfred Kammer, "Europe's Choice: Policies for Growth and Resilience," speech, International Monetary Fund, European Department, December 16, 2024, https://www.imf.org/en/News/Articles/2024/12/15/sp121624-europes-choice-policies-for-growth-and-resilience.*

More substantial funding could be used to fill certain structural gaps in the European economy with strong geostrategic implications. European countries' dependence on critical materials,[151] which are necessary for the deployment of green technologies such as electric batteries, is a priority at a time of increasing "weaponization" of these supply chains. Diversifying supplies, which requires a degree of relocation to Europe given the current concentration in China, is one response. There is growing consensus on these objectives in Europe, and they are the subject of public policies currently being implemented at the European and national levels. Nevertheless, our budgetary room for maneuver remains limited, both in certain Member States (notably France) and at the EU level—due to the limited size of the European budget—while the financing needs of these critical sectors are enormous.[152]

Furthermore, it is also in this context that the question arises of how to mobilize European financial savings. These savings are abundant: the EU generates a significant savings surplus representing around 4 percent of GDP, or €435 billion per year, while current and future investment needs are substantial (innovation, demographic transition, ecological and energy transition, digital transition, industrial policy, defense, etc.). The recent decision to create a Finance Europe label,[153] taken by only seven EU Member States with the aim of directing these savings toward greater investment in the European economy, therefore seems to be a

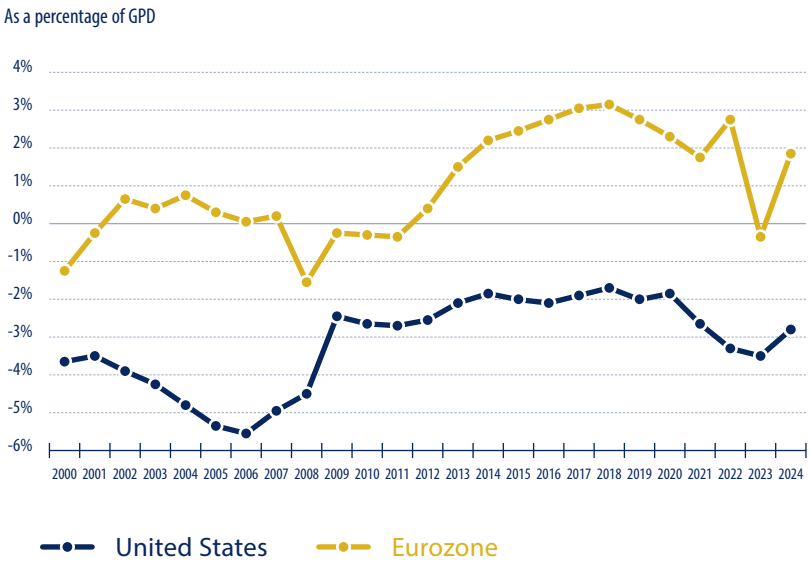
[151] *See Philippe Varin's report on securing the supply of mineral raw materials to industry: Philippe Varin, Rapport sur la Sécurisation de l'Approvisionnement de l'Industrie en Matières Premières Minérales [Report on securing the supply of mineral raw materials to industry], Ministère de la Transition Écologique et Ministère de l'Industrie, January 2022, https://www.academie-technologies.fr/wp-content/uploads/2022/06/ST22-02-13-avril.pdf.*

[152] *These investment needs were estimated a year ago at 5 percent of the EU's GDP, or up to €800 billion per year, to which it is now necessary to add the new needs related to the rearmament of the EU; see report Draghi, Report on European Competitiveness, Part A; Mario Draghi, keynote speech at High-Level Conference on EU Competitiveness, Brussels, September 16, 2025, https://commission.europa.eu/topics/eu-competitiveness/draghi-report/one-year-after_en, quoted statement "The ECB now puts annual investment requirements for 2025–31 at nearly €1,200 billion, up from €800 billion a year ago."*

[153] *Ministère de l'Économie, des Finances et de la Souveraineté Industrielle et Numérique, "Financer l'Économie Européenne avec le Label Européen « Finance Europe »" [Financing the European economy with the European "Finance Europe" label], June 6, 2025, https://www.economie.gouv.fr/actualites/financer-leconomie-europeenne-avec-le-label-europeen-finance-europe.*

step in the right direction.[154] The scale of the needs mentioned above would require stronger incentives if we are to hope for a reversal of the trend that is commensurate with the challenges.

Figure 16 • Current balance (2000 - 2024)



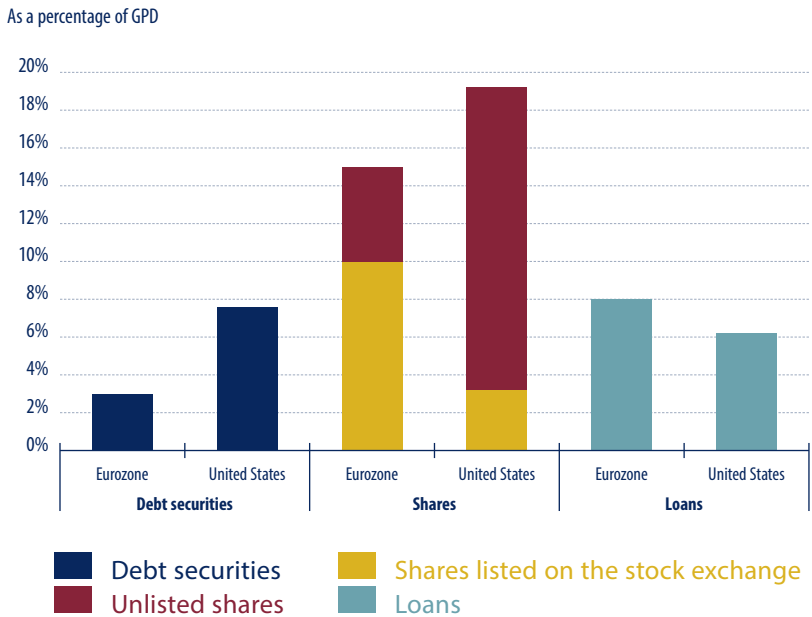
Source: L'éco à venir, (2024). L'Éco à Venir, "Europe Has 'Economic Weapons' That Are Just Waiting to Be Activated," 2024, https://lecoavenir.fr/.

However, Europe remains well below its potential in terms of financial power. Equity financing represents 84 percent of GDP in the eurozone, compared with 173 percent in the United States. European venture capital funds remain significantly smaller than their US counterparts.

[154] *The Member States currently involved in this initiative are: Germany, Spain, Estonia, France, Luxembourg, the Netherlands, and Portugal.*

Financing also remains highly national, as reflected in the major national banks, which are not very "pan-EU" in nature.

Figure 17 • Source of external financing of nonfinancial corporations in the euro area and the United States (2022, percentage of GDP)



Source: L'Éco à Venir, "Europe Has 'Economic Weapons' That Are Just Waiting to Be Activated," 2024, https://lecoavenir.fr/; European Commission, "La Commission Dévoile la Stratégie de l'Union de l'Épargne et de l'Investissement" [Commission unveils Union of Savings and Investment strategy], press release, March 19, 2025, https://ec.europa.eu/commission/presscorner/detail/en/ip_25_802.

The insufficient integration of European financial markets also poses a key problem for investment: a lack of depth in the financial resources that can be mobilized and a lack of diversity among players. Progress

on the Capital Markets Union and the strategy for a Savings and Investment Union—presented in March 2025 by the European Commission—would therefore make it possible to take the following measures:

- Ensure a European "level playing field" on the financial front equivalent to that of other major economies.
- Stabilize sources of financing through better risk sharing.
- Improve the allocation of resources—pension funding, for example—to national and European productive tools in order to meet our needs: investment in the ecological and energy transitions, digitalization, defense, etc.

While the findings and avenues for action are now well established, the reforms are stumbling over several issues, particularly political and regulatory considerations such as the lack of consensus on the path to achieving a capital markets union—and in particular the political and economic efforts required to do so—and the significant differences in our financial frameworks and practices between the twenty-seven Member States.

However, it is necessary to go further. While awaiting agreements on the union of European capital markets, which are still uncertain, a few immediate measures can be considered, such as the following:

- Placing resilience and competitiveness criteria at the heart of European industry support mechanisms, similar to the approach currently being taken with regard to the usefulness of industrial projects for the energy transition.
- Establishing an EU tax refund system—a cash rebate system that reimburses companies after they have made investments, similar to tax credits but within the framework of EU subsidies.
- Creating a "resilience" label for priority projects, potentially backed by preferential treatment, in addition to the "low carbon" label currently in preparation.

- Combining existing national and European financing instruments through a reform of the IPCEI, with a view to simplifying procedures, broadening eligibility criteria based on resilience and competitiveness, and allocating European budgetary resources to support national state aid.

Furthermore, the EU regulatory framework is still too favorable to lower-risk investments. In addition, promoting financing by developing venture capital markets (which are highly developed in the United States) at the European level is hampered by a lack of financial culture and a strong aversion to risk in Europe—undoubtedly one of the most significant problems!

Recommendation 8

Beyond the Industrial Accelerator Act (IAA), create an "investment shock" for European industry through dedicated labels and tax incentives.

The Dunkirk study demonstrates the relevance of the conclusion of the 2024 Draghi Report on the need for an investment shock in Europe, which is the only way to overcome the asymmetries with China and the United States. The instruments for European reindustrialization are undergoing a complete overhaul at the level of the Commission and the Member States: European preference in public procurement, reflection on the development of a single capital market, preparation of a second Chips Act, refocusing of the European budgetary framework on industrial issues, etc.

In the wake of the adoption of the Clean Industrial Deal in early 2025, new tools are being developed to this end. The Industrial Accelerator Act (IAA), scheduled for adoption early next year, aims to stimulate

demand by introducing low-carbon criteria into public procurement for heavy industry decarbonization and green industry projects. European local content criteria are also being considered, which is highly desirable in order to stimulate demand and promote clusters. Measures to support Member States in planning and implementing environments conducive to industrial clusters are planned but with the main objective of maximizing the effectiveness of the transition. This should be an important step in the European institutions' recognition of the need to act by concentrating support geographically in the areas best placed to strengthen Europe's industrial competitiveness and resilience.

However, it is necessary to go further. While waiting for agreements on the European capital markets union, which are still uncertain, a few immediate measures can be considered:

- Placing European resilience and competitiveness criteria at the heart of European industry support mechanisms, similar to the approach currently being taken with regard to the criterion of industrial projects' usefulness to the energy transition.
- Establishing an EU tax refund system—a cash rebate system that reimburses companies after they have made investments, similar to tax credits but within the framework of EU subsidies.
- Creating a "resilience" label for priority projects, potentially backed by preferential treatment, in addition to the "low carbon" label currently in preparation.
- Encouraging the convergence of existing national and European financing instruments through a reform of the IPCEI, with a view to simplifying procedures, broadening eligibility criteria based on resilience and competitiveness, and allocating European budgetary resources to support national state aid.

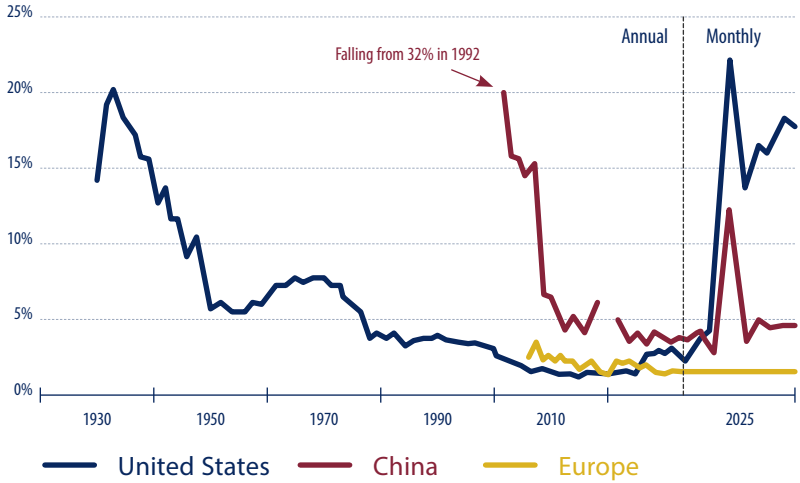
3.8. FAIR TREATMENT IN THE FACE OF INTERNATIONAL COMPETITION MUST BE STRENGTHENED AND MADE STRATEGIC

a. Adapting trade policy

The trade wars triggered by Donald Trump since his return to the White House will have a major impact on the European economy and manufacturers. The undoubtedly lasting increase in US customs duties on European products will undermine the competitiveness of many European champions in their largest export market. Furthermore, this will have the effect of redirecting Chinese overproduction exports to the EU,[155] when Chinese imports already benefit from massive state subsidies to their industries. The resulting distortion of competition threatens to destroy European industries, particularly the clean technology and automotive sectors, and thus exacerbate our strategic dependence on a player accustomed to economic coercion and whose international agenda is often at odds with European interests.

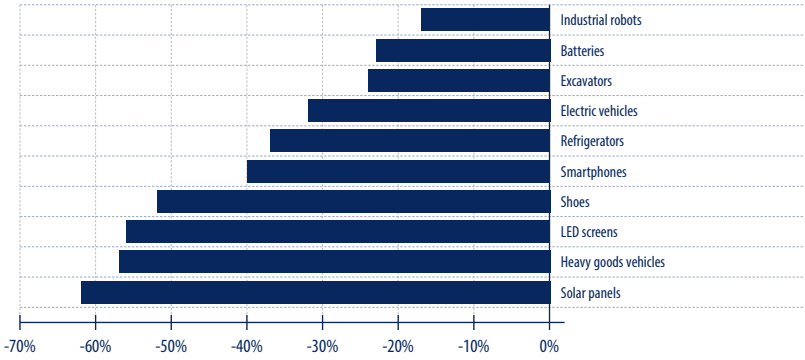
[155] *China's trade surplus with the EU could increase by nearly 20 percent as a result of this diversion alone, according to: Lukas Boeckelmann, Lorenz Emter, Vanessa Gunnella, Karin Klieber, and Tajda Spital, "China-US Trade Tensions Could Bring More Chinese Exports to the Euro Area and Reduce Inflation," The ECB Blog, July 30, 2025, https://www.ecb.europa.eu/press/blog/date/2025/html/ecb.blog20250730~833a22650e.en.html.*

Figure 18 • US effective tariff rate is now far above others (China and US)



Source: World Bank, (WTIS), PIIE, and WTO-IMF Tariff Tracker.

Figure 19 • Price comparison between Chinese products and their main competitors (as a percentage)



Source: CPB, Goldman Sachs Global Investment Research.

Faced with such threats, which naturally affect industrial projects in Dunkirk—not only those related to the Battery Valley but also those aimed at decarbonizing traditional heavy industries—it is necessary to implement and use the existing trade defense instruments that the EU has strived to improve, refine, and put in place in recent years. Faced with the combined challenge of its renewed industrial ambitions, Chinese overcapacity, and US protectionism, the EU will undoubtedly need to build on this momentum to safeguard the smooth functioning of its single market, in particular by taking the following steps:

- Strengthen the human resources allocated to its trade defense instruments (anti-subsidy measures, anti-dumping measures, safeguard measures);
- Establish more assertive coordination of the mobilization of these tools with its industrial and resilience objectives;
- Go even further in speeding up and streamlining the mobilization of these tools, particularly in the face of Chinese distortions affecting the global balance in certain sectors.

In short, the aim is to mobilize existing European trade defense instruments strategically as part of a systematic agenda. Such an agenda must include consideration of the timing of the initiation of these procedures in order to maximize their impact in favor of European production.

Beyond defensive measures, the EU's industrial ambitions will also depend on its economic diplomacy, which must be focused on securing critical supplies, specifically by securing partners and markets. Europe must coordinate trade agreements and FDI with resource-rich countries, build up stocks in certain critical areas, and create industrial partnerships to secure the supply chain for key technologies.

The new European trade policy instrument announced by the Commission, Clean Trade and Investment Partnerships, is a step in the right direction, although it still needs to be specified and fleshed out. It

should enable the conclusion of simplified agreements focused on critical materials, resilience issues, targeted financing, and Europe's industrial interests. These agreements should be used to build structural industrial partnerships (co-investment, co-processing, value sharing) in order to anchor capacities in Europe and with partner countries willing to play by balanced rules on a long-term basis.

Ideally, these partners would share a common vision of the rules governing trade in line with the WTO+ framework developed in the EU's third-generation trade agreements, as has been done with Japan, Canada, Vietnam, and South Korea. In a more threatening world, however, it will probably also be necessary to consider certain concessions in relation to this framework in order to secure new trade agreements and thus maintain a certain stability in our market access and the rules governing our international trade.

These efforts should be complemented by a coalition trade policy that deepens agreements with economies willing to commit to resilience and industrial competitiveness interests, particularly around the alignment of public procurement criteria. The French presidency of the G7 offers an opportunity to push this agenda in 2026 within a framework that could be extended by a plurilateral initiative spearheaded by the EU.

b. Avoiding side effects within the carbon market

The Emissions Trading System (ETS) is a central instrument of the European climate strategy (see box). However, the functioning of the carbon market raises several major difficulties. The volatility of carbon allowance prices creates significant uncertainty for manufacturers and a lack of confidence in the steady growth of the price per ton of CO_2, as it can vary significantly over a few years, also responding to political

uncertainties, making decarbonization strategies difficult to predict. In addition, the gradual reduction of free allowances from 2026 (see box below), with a view to their elimination in 2034, will significantly increase the costs for manufacturers that emit the most CO_2 and are most exposed to international competition. This situation has led to the introduction of a carbon border adjustment mechanism (CBAM) to combat carbon leakage. Its effectiveness remains imperfect and will vary from sector to sector. The main challenge is that the CBAM, like other compensation mechanisms, may not offer a sustainable solution to the problem of the competitiveness of European products on external markets.

The European Carbon Market and the Carbon Border Adjustment Mechanism

The European carbon quota system (ETS)

The European carbon market, established in 2005 to meet decarbonization targets through a market mechanism, is based on a **cap-and-trade** system that allows each company to emit a certain amount of carbon. Total emissions are determined each year by Member States and the European Commission on the basis of a gradual reduction trajectory, then broken down by sector according to historical emissions. The system thus encourages decarbonization by allowing companies that do not use all their allowances to sell them to those that exceed them, thereby incurring a financial penalty. Until now, most of the emission allowances were allocated free of charge to sectors, particularly those most exposed to international trade, in order to familiarize stakeholders with this innovative system while preventing the risks of production and carbon leakage. The share of free allowances has gradually decreased since

2013. Initially, the ETS saw very low prices, sometimes zero for a ton of carbon, due to the overabundance of allowances on the market, and therefore ultimately a very weak incentive for decarbonization for several years. This problem was only resolved at the margins of the third phase of the ETS (2013–2021), which aims to gradually reduce the number of free allowances allocated and introduce an auction system for the purchase of emission rights, thereby encouraging decarbonization to limit costs. The average price then jumped from around €10 per ton of CO_2 at the start of the phase to €30 at the end, then to €70 between 2021 and 2024.

The end of free allowances, which is essential for the system to provide a real incentive for industries to decarbonize, nevertheless creates many difficulties for manufacturers: While the price of carbon was not only almost zero but also stable in the previous phase, the reduction in available allowances is leading to volatility—and above all an increase—in carbon prices at a time when the implementation of decarbonization projects requires long-term investments, which increases the financial burden on manufacturers. Two solutions have therefore been put in place: The revenues generated by the auctioning mechanism are recovered by the public authorities, which reinvest the money directly in decarbonization projects (notably via the European Innovation Fund), and the adoption of Carbon Contracts for Difference (CCFD), a mechanism whereby, the state guarantees an industrial firm a fixed carbon price over a given period, paying them the difference if the market price of carbon is too low, or recovering the surplus if this price exceeds the agreed threshold, thus providing them with a certain degree of price visibility.

Carbon Border Adjustment Mechanism (CBAM)

The disadvantage of any polluter-pays pricing system such as an ETS is that it does not cover the international competition faced by certain sectors. Indeed, if the price of carbon increases during production, industries cannot always pass this on in their selling prices due to the risk of losing competitiveness with non-European producers who are not affected by a comparable instrument (ETS, carbon tax, regulation). The CBAM was adopted with the aim of preventing production and carbon leakage due to this differential in carbon cost internalization, mirroring the gradual reduction in free allowances. In place on a "dry run" basis since 2023, the CBAM will integrate the price signal for imports into the internal market from 2026, i.e., charging the carbon price to importers of products covered by the ETS. This provision has been fairly well received by manufacturers in energy-intensive sectors, who are often located upstream in industrial chains and exposed to international competition subject to low or even zero carbon prices in their production markets. However, the CBAM does not cover exports, which were previously partially offset by a system of specific free allowances. While non-European production should be subject to a price signal equivalent to that of European companies when it enters the European market, theoretically guaranteeing a level playing field, exports from the European market to third countries are less competitive because they compete with non-European production that is not subject to the carbon market system. Several solutions are being considered to address this obstacle and any side effects (see below). The other major difficulty posed by the CBAM is the treatment of downstream sectors. Their inputs are becoming more expensive as a result of this greater consideration of the cost of carbon in Europe, which is also detrimental to their competitiveness vis-à-vis production in areas that are less ambitious in this regard.

In the opinion of most of those interviewed for this study, while the CBAM is a step forward in that it should, in the long term, resolve the competitiveness gap between the EU and the rest of the world on the European market,[156] it nevertheless poses a number of practical problems linked to its complex implementation and a number of limitations. Currently, it mainly covers only certain raw materials (steel, cement, aluminum, etc.), and not downstream products. It does not address the issue of European exports. Finally, calculating the carbon content of imported products involves a heavy administrative burden.

In response to these various problems, a first wave of simplifications to the mechanism was approved in October 2025 to restrict its scope to the most carbon-intensive imports and reduce the administrative burden. Several areas for improvement can still be put forward as follows:[157]

- Gradually extend the scope of the CBAM to intermediate and finished products in order to not only protect downstream European industries but also generate revenue that can be used to finance compensation mechanisms or be reinvested in the transition by supporting decarbonization projects (see below).
- Combine the 90 percent CO_2-emissions-reduction target for 2040, presented by the Commission in July 2025, with a financing mechanism that allows for the partial pooling of the investments needed for this decarbonization.
- In a context where national budgetary margins are severely constrained and where the prospect of a new European recovery plan (such as the NGEU[158] in the context of the health crisis) is politically

[156] *The Carbon Border Adjustment Mechanism (CBAM) was designed to restore fair competition between European producers, who are subject to some of the highest carbon prices in the world, and their competitors operating in countries where CO_2 emissions are taxed lightly or not at all.*

[157] *For more details on this point, see Joseph Dellatte, Forging a Post-Carbon Industry: Insights from Asia, Institut Montaigne, October 2024, https://www.institutmontaigne.org/en/publications/forging-post-carbon-industry-insights-asia.*

[158] *The NextGenerationEU (NGEU) plan is a temporary recovery instrument set up by the European Union in 2020 to support economic recovery after the COVID-19 pandemic, with a budget of €807 billion to finance the ecological transition, digital transformation, and strengthen the resilience of European economies.*

difficult, a credible alternative would be to activate future revenues from the European carbon market (EU ETS) as a form of pre-financing. This would involve recycling CBAM and ETS revenues according to three priorities:

- Targeted compensation for exposed industries;
- Financing industrial transformation and decarbonization projects on European soil;
- Decarbonization partnerships with countries that supply critical resources, in order to secure supplies while supporting their transition, based on a logic of strategic reciprocity.

Recommendation 9

In the face of international competition, better adapt European trade policy to industrial and resilience imperatives by mobilizing economic security instruments in a strategic and coordinated manner.

European industries, and in particular industrial ecosystems such as Dunkirk, are bearing the brunt of global trade dynamics: massive distortions of free competition, expansion of Chinese capacity in strategic segments of value chains (particularly batteries), US policy aimed at imposing asymmetric agreements, increasing acts of economic coercion, tensions over critical supplies, and persistent weakness in European domestic demand.

These trends are creating major uncertainty about the viability of industrial projects, given distorted international competition and a multilateral framework that is losing its regulatory capacity. The French government must focus its political action within the EU on three areas:

- Mobilizing European trade defense instruments in a more coordinated and strategic manner. Existing instruments (anti-subsidy, anti-dumping, safeguard measures) are currently used sporadically and on an ad hoc basis. They must be deployed in the service of a coherent strategic agenda for the protection of European industry, in a methodical manner and with a carefully considered timing so that the sequence of procedures has maximum impact. To achieve this objective, it is necessary to speed up the procedures for initiating trade defense instruments by strengthening the European Commission's investigative capabilities.
- Mobilizing targeted economic diplomacy to secure critical supplies. The new European trade policy instrument (Clean Trade and Investment Partnership) is a promising tool that is currently being tested in negotiations with South Africa. It can be used to conclude simplified agreements focused on critical materials, resilience issues, and Europe's industrial interests. They should be used to build structural industrial partnerships (co-investment, co-processing, value sharing) in order to anchor capacities in Europe and with partner countries willing to play by balanced rules on a long-term basis.
- Adopting a coalition trade policy by deepening agreements with economies willing to commit to resilience and industrial competitiveness interests, particularly around the alignment of public procurement criteria. The French presidency of the G7 offers an opportunity to push this agenda in 2026 within a framework that could be extended by a multilateral initiative led by the EU.
- Making the CBAM and ETS true guarantors of our industrial sovereignty. The ETS system, combined with the Carbon Border Adjustment Mechanism (CBAM), must become a tool for competitive fairness rather than a factor weakening energy-intensive industries.
    - Gradually extending the CBAM to intermediate and finished products in order to prevent circumvention and protect the entire European value chain.

- Combining the European target of a 90 percent reduction in emissions by 2040 with a pooled financing mechanism, enabling strategic industrial sites to make the necessary decarbonization investments.
- Recycling CBAM and ETS revenues according to three priorities:
  - Targeted compensation for exposed industries.
  - Financing industrial transformation and decarbonization projects on European soil.
  - Decarbonization partnerships with countries that supply critical resources, in order to secure supplies while supporting their transition, in a spirit of strategic reciprocity.

3.9. THE CHALLENGE OF GOVERNANCE THAT IS ILL-SUITED TO THE URGENCY AND COMPLEXITY OF EVENTS

Beyond the public policy issues discussed above (energy policy, financing policy, competition policy, industrial policy, and trade policy), it is important to highlight the significance of the political and institutional issues related to EU governance. First, defining common objectives by setting clear priorities is essential for developing a genuine common industrial policy strategy at the EU level. While the aggregation of ad hoc efforts is sketching out a European industrial strategy around green industries, critical technologies, the digital sector, and critical inputs (minerals in particular), a clear and formal framework is still lacking. Defining such objectives is only the first step. The second is to improve Europe's capacity to decide on and implement joint actions to achieve these objectives. However, the dual national and partisan affiliations that make up the EU's governing bodies—and their collegial functioning—hinder the pursuit of these objectives, particularly when compared to the capabilities of a traditional state. At the same time, our industrial competitors are strengthening the power of an executive that is more directly engaged in these geo-economic issues. Furthermore, the dynamics of partisan

fragmentation and the rise of populism at work in Member States and across the Union[159] in recent years have complicated decision-making in the EU.[160] At the same time, the continent's budgetary and demographic constraints also call for greater coordination of our joint efforts.

In a situation of increased competitive and security vulnerability, these divisions and burdens become deadly, politically, economically, and geopolitically speaking. The inability to make decisions increases popular dissatisfaction and fuels populism—which in turn reinforces political fragmentation—and weakens us in relation to other powers. Economically, our indecision leads economic actors to postpone their investments.

Faced with such a situation, the impression from outside is that the EU and its Member States seem caught off-guard and confined to reactions that are too slow, too modest, and too fragmented. In response to the predatory measures of the 2022 IRA, the initial measures of the recent NZIA directives of May 2025 seem very limited and belated, especially for a continent that is so ambitious on environmental issues. Faced with Chinese dumping that threatens to destroy European industries, not just the automotive, chemical, and steel sectors but also green industries, the emergency plans and welcome declarations of intent from the European Commission in the "Competitiveness Compass"[161] and the "Clean Industrial Deal"[162] must be implemented as quickly as possible.

[159] *See on this point Thierry Chopin, Jean-François Jamet, Nicolas Fraccaroli, and Nora Hernborg, Political Dynamics Ahead of the European Parliament Elections: Implications for the EU's Political Direction and Policy Priorities, Jacques Delors Institute, May 5, 2025, https://institutdelors.eu/en/publications/political-dynamics-ahead-of-the-european-parliament-elections-implications-for-the-eus-political-direction-and-policy-priorities.*

[160] *Thierry Chopin, "European Elections: One Year Later, the Need for Radical Change," Institut Montaigne, June 6, 2025, https://www.institutmontaigne.org/en/expressions/european-elections-one-year-later-need-radical-change.*

[161] *European Commission. (2025, 29 janvier). EU Compass to regain competitiveness—European Commission [Press release, IP/25/339]. https://ec.europa.eu/commission/presscorner/detail/en/ip_25_339, accessed November 27, 2025.*

[162] *European Commission, "Clean Industrial Deal," accessed November 11, 2025, https://commission.europa.eu/topics/eu-competitiveness/clean-industrial-deal_en.*

In such a situation, the key question is therefore how we can best organize ourselves in the face of this new era of challenges and threats. At the institutional level, the experience of recent crises suggests two approaches. The first is for the heads of institutions to present a united front, agree on a few priorities, and focus their political capital on these. At the European level, it was this approach that made it possible to emerge from the sovereign debt crisis: The reform of the eurozone's economic governance was the result of a common agenda defined in a report co-signed by the presidents of the main European institutions (European Commission, European Central Bank, European Council, Eurogroup, European Parliament). The second consists of appointing a figurehead to lead the negotiations on the basis of a clear mandate entrusted to them by the political authorities, reporting regularly to them and drawing on the EU's public administration in a cross-cutting manner. At the European level, this is what was put in place in the context of Brexit, which helped ensure European unity and cohesion in the negotiations with the United Kingdom.

Faced with geopolitical and industrial challenges, the Commission, Parliament, and Council could agree on a common industrial vision and strategy embodied politically. This strategy would largely organize and implement the numerous declarations of intent, strategies, and contingency plans published in recent months by European bodies on industrial issues. It should provide clear answers to the key problems facing European industry in order to strengthen its competitiveness in such an international context: the cost of energy; the level of financial support; the burden of regulations; the degree of protection against unfair competition from non-European players; and the strategic importance of supporting the priority development of territorialized industrial clusters on European soil. Given Europe's vulnerability, we also need a figure who embodies European industrial ambition and implements the Union's multidimensional strategy.

Recommendation 10

Ensure that the Commissioner for Prosperity and Industrial Strategy promotes a coherent policy among Member States, industry, and the general public.

Despite numerous national and European initiatives in the field of industrial policy, there is currently no overall vision or strategy that takes into account the reality and potential of Europe's territories. While sectoral plans are multiplying (semiconductors, hydrogen, cleantech, etc.), governance is struggling to develop an overall strategy with a territorial dimension. A clear mandate from the heads of national and European institutions to agree on a few priorities is undoubtedly necessary, particularly to coordinate the various public policy silos that such an ambition must mobilize. This approach has been successful in overcoming the euro crisis and could represent, with regard to industrial ambition, a necessary step toward political convergence at the relevant level.

Given the urgency of the situation, the realization that we need to reinvest in industrial policy must be accompanied by a willingness to move more quickly in the transition and its implementation.

As one of the individuals interviewed pointed out: "The key issue is speed: we need to wake up and get moving!"

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Institut Montaigne
59 rue La Boétie, 75008 Paris
Tél. +33 (0)1 53 89 05 60
www.institutmontaigne.org/en

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At a time of environmental transition, of the crucial reduction of our dependencies in an increasingly volatile globalization, and of the necessary boost of European competitiveness, the deployment of industrial capacity on our own territory has never been more essential. In France, where industry accounts for less than ten percent of GDP (compared with twenty percent on average across European countries), the challenge is immense.

Against this backdrop, Institut Montaigne delved into the dynamics at work in Dunkirk. A historic industrial port, Dunkirk embodies both France's former deindustrialization as well as its new ambitions. Over the past decade, local actors—both public and private—have driven an industrial renewal, one characterized by decarbonization and the creation of new value chains through a so-called "battery valley." These projects have been developed in line with national and European policies over recent years.

Dunkirk is therefore at the very heart of national and European stakes of industrial renewal and transition. In this sense, the area can be understood as a testing ground for the challenges of European ongoing industrial ambitions. Not immune to energy shocks, nor the hesitations of our transition policies, American protectionism or subsidized Chinese competition, its experience sheds light on the conditions for success during a time when Europeans are questioning their industrial strategies.

This study is based on more than fifty interviews with local economic and industrial actors, as well as public actors at the local, national, and European levels. This close-to-the-ground approach helps to better understand, from concrete experience, the obstacles and constraints as well as the strengths and conditions for success, for the industrial renewal in France and Europe.

On this basis, the report provides new insights for local, national, and European reflections and initiatives, aiming to rethink public action in support of industry. Drawing on these lessons, we put forward ten recommendations to French and European public authorities.

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