



# The political economy of French industrial policymaking

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## Abstract

The aim of this article is to analyse how the current design and governance of French industrial policy is impeding technical and economic change. Industrial policy needs to address the “grand challenges” such as climate change by driving radically new economic and technical development. After analysing recent trends and the various stakeholders and levels involved in industrial policymaking in France, we show how the complexity; the conflicts between targets, instruments and stakeholders and the capture of industrial policymaking lead to inertia rather than change. The participation of incumbents at every stage of the policymaking reinforces short-term business strategies rather than creating a radical new path. We consider that a multi-level industrial democracy could enable the conditions of change to ensure sustainable industrial development. This requires reviewing the roles of each stakeholder, the way that funds are allocated, and how the implementation of these public policies is monitored.

**Keywords** Industrial policy · France · Political economy · Capture · Industry

**JEL classification** 025 · O38

## 1 Introduction

Industrial policy is back both in the economic literature and on the political agenda (Aiginger and Rodrik 2020; Chang and Andreoni 2020; Cherif and Hasanov 2019; Ferrannini et al. 2020; Mazzucato 2015; Mazzucato et al. 2015; Mosconi 2015; Voy-Gillis and Lluansi 2020). There is a broad consensus in the literature that industrial policy should be reconsidered as a tool not only to enhance economic development,

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but also to address the “grand challenges” of the twenty-first century (Kuhlmann and Rip 2018; Mazzucato 2018). Renewed theoretical thinking on industrial policy insists on a flexible, multi-layer and democratic industrial policy, able to adapt and channel technical change onto a new growth path. Qualitative rather than quantitative growth, or even less growth, is most likely needed to combat climate change (Aiginger and Rodrik 2020).

Despite recent efforts to develop a supranational industrial policy at the European level (Pianta et al. 2020; Mosconi 2015), this policy field has remained mostly national in scope (Bulfone 2022). Like any policy, industrial policy inherently creates conflicts among stakeholders, instruments, levels, between and within countries (Chang and Andreoni 2020; Andreoni and Chang 2019).

Many scholars insist on the importance of the policymaking process, emphasizing the need for democracy to avoid capture (Mazzucato 2018; Andreoni and Chang 2019; Chang and Andreoni 2020). Indeed, conflict and capture can create policy failures and misalignments. However, the policymaking process itself is still understudied compared to the research on policy instruments. For this reason, we aim to explore how policymaking itself can explain the success or failure of industrial policies.

In this article, we aim to contribute to this literature by analysing France’s new industrial policy framework. We question both the process and the rationales and outcomes of the policy. To do so, we conduct a qualitative analysis of institutional reports, press releases, speeches by public officials, and reviews from public and private-sector bodies. We complete our investigation with nine semi-structured interviews including interviewees from four public bodies in charge of industrial policy and five trade unionists involved in the industrial policy debates and processes.<sup>1</sup>

This questioning is highly relevant in France, where a renewal of industrial policy and recurrent changes in the policymaking process have been observed since 2008 (Klebaner and Assogba 2018; Buigues and Cohen 2020; Voy-Gillis and Lluansi 2020). As in the UK, France’s manufacturing base has been shrinking since the 1980s (Minovez 2019). Through sector-specific and horizontal policies, French industrial policy has been targeting both technical change and competitiveness. Moreover, since the COVID-19 outbreak, the Government has clearly been implementing a more proactive industrial policy in order to promote reshoring and restructure value chains.

We will, however, highlight two key factors that not only limit the technical and economic transformation required for a sustainable industry, but also give rise to inertia rather than change: on the one hand, the recurring changes and duplications in terms of instruments, layers and powers of state agencies, and on the other hand the pervasive presence of the expertise and leverage of business federations at every policymaking step. The issue is not policy misalignment per se. It is rather the fact that the policymaking process itself favours strategies aimed at short-term financial profit, rather than long-term technical and social targets. This leads us to argue that if the political process for developing industrial policy at the corporate, territorial,

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<sup>1</sup> See the list in the Appendix Table 3.

technical, sectoral and national scales is changed, this can create a new framework to enforce the necessary technical and economic changes. Although some of these structural political and economic changes are quite far-reaching, the institutional bases for such transformation already exist in France.

This paper is structured as follows. In the first section, we develop the political economy theoretical framework. In the second section, we present the alignment of the multi-level industrial policy changes and trends in France since 2008. In the third section, we analyse how the policymaking process itself diverts industry away from long-term technical change, then discuss how institutional change can orient industrial policy towards tackling grand challenges. The last section concludes.

## **2 The theoretical foundations of the twenty-first century industrial policy in France**

There is a broad consensus among economists on the need to reopen the industrial policy field of research (Aiginger and Rodrik 2020; Andreoni and Chang 2019; Bulfone 2022; Chang and Andreoni 2020; Cherif and Hasanov 2019; Ferrannini et al. 2020; Mazzucato 2015; Warwick 2013). The emerging theoretical and methodological framework combines technical, functionalist and normative perspectives (Ferrannini et al. 2020). In this section, we present the theoretical arguments supporting the implementation of a sustainable industrial policy in France, by showing in what way policymaking is crucial to successfully tackling grand challenges.

### **2.1 The industrial policy for radical socio-technical changes**

The renewal of the industrial policy concept is taking place in a context of the twenty-first century's grand challenges (Foray et al. 2012; Kuhlmann and Rip 2018; Mazzucato 2018; Mazzucato et al. 2019; Pianta et al. 2020). For instance, combating climate change and protecting the elderly through better healthcare are certainly some of the major issues for our times, and, clearly, they require solutions that cannot be based on technology alone.

To address these grand challenges, a "mission-oriented" innovation policy seems to be a major and coherent tool (Mazzucato 2018). Compared to previous mission-oriented innovation, new mission-oriented innovation policies need to be cross-sectoral. The ambition of these policies should certainly be to steer growth towards producing technologies capable of addressing grand challenges.

#### **2.1.1 Industry, growth and the environment**

New industrial policies need to target qualitative rather than quantitative growth (Mazzucato 2018; Aiginger and Rodrik 2020). There is a political and intellectual debate on the nexus between growth and the environment. The "green growth" perspective is considered by some as unrealistic to achieve the environmental goal for 3 reasons (Tordjman 2021): (1) producing more induces higher resource consumption

despite greater resource-efficiency, (2) clean technologies generally transfer problems or create new ones, and (3) we do not have time to wait for these technologies to mature if we are to achieve the objectives of the Paris Agreement. On the other hand, degrowth theories require a completely new social structure (like social security), which is not within the scope of industrial policy alone (Parrique 2019).

As Aigigner and Rodrik (2020: 201–2) develop, industrial policy should be “preparing for less growth”. While we certainly need less-energy-intensive products, technical change in itself is not enough; it must go hand in hand with social change in order to alter the production-consumption nexus. This raises the question of growth distribution. Better distribution of growth and better reallocation of profits may create more jobs and innovation than strong but unequal growth. It is clear that the trickle-down effect is a myth, and, nowadays, rewards are disconnected from risk (Lazonick and Mazzucato 2013). “Inclusive growth”, i.e. a better distribution of value among stakeholders, is thus a means of sustaining our well-being without generating more growth.

To steer such radical change, we need industries. Since the “new economy” of the 1990s, it has been assumed that developed economies should specialise in services and R&D. Europe’s Lisbon Agenda adopted in 2000 represented a significant move in this direction (Amable et al. 2009) — innovation policy replaced industrial policy, with R&D expenditure being the way to produce innovation as a goal.

However, innovation stems from manufacturing experience and the drive to improve production or products (Chang and Andreoni 2020). In many industries, as for example in the automotive industry, R&D centres follow production plants in order to develop products and processes closer to the final assembly. Innovation is produced within complex systems involving different stakeholders along a value chain where the assembly plant remains dominant. We can also challenge the idea that innovation can serve as the main goal for public policy. Innovation enables firms to compete as it allows them to capture demand thanks to new products or reduced costs. The vision of a globalised division of labour whereby developed countries can specialize in R&D without long-term consequences for their economic development is contradicted by the industrial organization of transnational companies (Warwick 2013). For example, in the automotive sector, the R&D function has been relocated from the old industrialized countries to newly industrialized countries in view of developing new products and processes locally (Midler et al. 2017).

Although the term “industry” now encompasses services and many sectors have evolved as service providers, in this article, we retain the narrower definition of industry as pertaining to manufacturing. The reason is twofold. Firstly, in France, the rise of services has not compensated for the job loss due to deindustrialisation (Minovez 2019). In political discourse and practice, French industrial policy implicitly or explicitly refers to manufacturing sectors as a potential solution for these issues. Secondly, in terms of economic policy, the manufacturing sector is differentiated from services for two reasons. First, the cost of transferring ideas into production is expensive. This means that innovation and industrial policy are much more attentive to the articulation between the three levels of an “innovation system”: research, techniques and production (Amable 2000). Second, manufacturing

sectors may suffer from tough international competition, which creates uncertainty and instability.

Keeping production local is also a matter of sovereignty. The COVID-19 crisis revealed that French consumption was highly dependent on other countries. This is the case even in critical sectors such as nuclear power. For example, the war in Ukraine has revealed that France relies on various Russian-based activities to run its nuclear plants. However, to tackle the ecological transition, it is crucial that each country be able to master their own technologies, especially in highly critical sectors such as energy. Moreover, reindustrialisation can act as a lever to reduce France's carbon footprint. The French energy mix can give industry a competitive advantage, particularly in terms of respecting stricter environmental requirements (Green Deal).

### 2.1.2 Industry and uncertainty

A second issue for industry is the ability to make financial commitments and investments in the face of uncertainty. Running an industry requires physical capital, organisational competencies and labour with specific skills. The cost is particularly high. Even though small and new companies can innovate, they may face enormous difficulties in moving from idea to manufacture. Indeed, the capital investment needed to advance through the industrialisation and production stages are often substantial, and these companies often find it difficult to evaluate their return on investment.

One function of industrial policy is thus to reduce uncertainty, either by reducing the uncertainty of demand by maintaining a market for products, or by providing technologies. Firms can then master emerging technologies and anticipate change. Furthermore, through state intervention and subsidies, industrial policy has the power to foster firms' growth by de-risking their investments.

Yet, as Mazzucato has shown (2015), the role of the state in reducing uncertainty is not only to correct for market failures, but mainly to *create* new markets. By financing advanced research, disseminating this knowledge via start-ups and giving business a long-term vision, industrial policy is able to create or reshape markets that were not even imaginable. This means that industrial policy instruments need to be flexible in order to adjust to technology life cycles, from early research through to mature technologies.

Economic financialisation reinforces the need for a long-term perspective. It changes the power balance between productive capital and finance capital (Lazonick 2021) and reverses the relationship between finance and production — production finances the financial sector. This leads to profound changes in the profit strategies of businesses as short-term strategies are prioritised and large firms restructure to focus on high-value-added branches. However, in some industries, these strategies are inconsistent with long-term product planning (Teti et al. 2021).

The failure of French industry is sometimes attributed to the lack of venture capital investment. Yet venture capital is, in fact, impatient capital. Instead of financing risky projects and sustaining a firm's development, venture capital finances projects where profits can be earned through opportune exit strategies rather than from

productive value. States, on the other hand, are able to take higher risks thanks to their public investment banks (Mazzucato 2015).

Today, the ecological transition requires this type of market creation and risky investment. In the energy sector, for example, the emergence of clean energies depends on the relative price of fossil energy (Hopkins and Lazonick 2013). However, the sector's major incumbents are more incentivised to innovate incrementally by improving fossil energy efficiency, which thus reduces the need for fossil energy and its price. As a result, if the sector does not see clean energy as a need for their future profits, the relative price of clean energy will remain high.

In addition, industry rests on complex interlinkages between technologies, actors and institutions (Malerba 2002). The value chain is constantly evolving as new products and new materials emerge, while the complex division of labour makes it tricky to identify the relevant technologies. In other words, every industry plays a key role, and no single industrialist can master a complex and deep change alone. This gives the state a crucial role in coordinating technological change and technology transfer based on well-thought-out planning.

Industrial policy thus has to take measures to reduce uncertainty while also taking into account the technology interlinkages. In this case, however, industrial policy also transforms industry and thus the technologies. Complex globalised value chains require a flexible policy that can adapt its measures not only during the industry life cycle, but also in line with the various sources of changes (Andreoni and Chang 2019).

## 2.2 The need for democratic planning

There is a broad consensus among industrial policy scholars (Mazzucato et al. 2019; Ferrannini et al. 2020; Aiginger and Rodrik 2020; Klebaner 2022) that a democratic approach to industrial policy would be beneficial. A democratic industrial policy can be conceived as an open and bottom-up form of governance in which stakeholders (firms, trade unions, states) and citizens can collectively decide on the direction of growth. By redirecting industry onto long-term objectives for benefit of society, these democratic arenas can determine the technical changes required to produce goods and services that meet social and environmental challenges, rather than relying on selection through market mechanisms.

Like any policy, industrial policy is thus a source of conflict, and even horizontal policies such as fiscal policies create winners and losers (Chang and Andreoni 2020). We can identify two sources of conflict. First, conflicts can arise within a value chain. Following Fligstein (2001), we need to open the box of social classes to study the sectoral dynamics. Within a sector, original equipment manufacturers (OEMs) and suppliers may not be following the same agenda. This may hold even truer when it comes to transnational corporations (TNCs), as these may develop a global strategy without any consideration for specific local business relations. This source of conflict also includes the conflict between productive capital and finance capital, as discussed above.

Second, conflicts can occur between and within countries. The mercantilist mindset is still drives industrial policy, especially in France, due to trade deficits (Bulfone 2022). At the European scale, the divisions not only between debt-driven countries and export-driven countries (Gräbner et al. 2020) but also between the old industrial and newly industrialized countries thwart the attempts for a coherent and fair European industrial policy. The “Europe of regions” creates strong competition among regions instead of cooperation (Albrechts et al. 2013). As for the Important Projects of Common European Interest (IPCEI), which is a mechanism enabling EU state aid regulations to be circumvented, Member States are also competing for the funding.

Within countries, conflicting interests can arise between ministries, departments and agencies (MDAs). This is the case when two MDAs either (1) are not following the same agenda, as when two ministries defend two different policy orientations, or (2) become redundant, a risk that is highly likely when politicians grant new prerogatives to an agency without removing them from another agency, or (3) fail to coordinate their work, especially at a multi-level scale.

If industrial policies aim to solve grand challenges, then the direction they take needs to target global societal issues. During the Cold War, the US Defense Advanced Research Projects Agency (DARPA) invested in new technologies for security reasons. The nuclear energy plan in France during the 1960s targeted energy independence concerns. This suggests that industrial policy should pursue *non-economic* targets, contrary to the current policies (Bulfone 2022).

Authoritarian states may decide to pursue economic directions and achieve multiple technical and economic successes, as in the case of China or South Korea. However, this is incompatible with the need for better growth distribution (Hénin and Insel 2021). Indeed, without any counter-force to capitalism, the power of capital leads to the capture of value (Nitzan and Bichler 2009). We do not consider the State as an impartial actor, but also as a field that can be captured (Fligstein 2001).

Capture does not result solely from information asymmetry, but also from the way in which policy questions are formulated (Klebaner 2018b). If firms are understood as political actors on account of their structural, instrumental and discursive power (Fuchs 2007), this confers on them the capacity to (1) put issues on the political agenda, (2) develop answers and (3) implement them. This can then lead to inertia and “business-as-usual” strategies, as incumbents may see no reason to turn the market around. Indeed, industrial policy is generally considered to protect inefficient firms (Warwick 2013). When public authorities leave firms with the (formal or informal) responsibility of creating diagnostics, deciding which solutions address the issues identified and then implementing them, their approaches are conservative rather than disruptive. Yet, tackling grand challenges like sustainability requires radical changes in business strategy and performance criteria — changes that are incompatible with captured industrial policy arenas.

We consider that democracy implies shared diagnostics, decision-making and implementation. It also implies having the capabilities to evaluate weaknesses and successes, to detect potential opportunities. To sustain strong democratic industrial policy planning, we argue with Warwick (2013) that what are needed are stable institutions able to monitor, discuss and implement the measures. As we will show

**Table 1** Summary of the main industrial policy measures in France since 2008

|                                | 2008                                      | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018                     | 2019               | 2020                            | 2021        | 2022 |                                |
|--------------------------------|---|------|------|------|------|------|------|------|------|------|--------------------------|--------------------|---------------------------------|-------------|------|--------------------------------|
| Horizontal and fiscal measures | Research tax credit                       |      |      |      |      |      |      |      |      |      |                          |                    |                                 |             |      |                                |
|                                | Competitiveness and employment tax credit |      |      |      |      |      |      |      |      |      | Social contributions cut |                    |                                 |             |      |                                |
|                                | Corporate and capital income tax cut      |      |      |      |      |      |      |      |      |      |                          | Production tax cut |                                 |             |      |                                |
|                                | Recovery plan                             |      |      |      |      |      |      |      |      |      |                          |                    |                                 |             |      | Recovery plan (France Relance) |
| Sectoral policy                | Filières policy                           |      |      |      |      |      |      |      |      |      |                          |                    | Automotive and aeronautic funds |             |      |                                |
|                                | Automotive fund                           |      |      |      |      |      |      |      |      |      |                          |                    |                                 | France 2030 |      |                                |
| Regional policy                | 34 plans                                  |      |      |      |      |      |      |      |      |      |                          | 10 solutions       |                                 |             |      |                                |
|                                | Cluster policy                            |      |      |      |      |      |      |      |      |      |                          |                    | Territories of industry         |             |      |                                |
| European policy                | Juncker plan                              |      |      |      |      |      |      |      |      |      |                          |                    | Invest EU                       |             |      |                                |
|                                |   |      |      |      |      |      |      |      |      |      |                          |                    | Green deal                      |             |      |                                |
|                                |   |      |      |      |      |      |      |      |      |      |                          |                    | IPCEI                           |             |      |                                |

Source: authors

in the last section, France lacks a stable organisation and the skills to implement such a policy.

### 3 Industrial policy renewal in France since 2008

Compared to its neighbours, France has seen its manufacturing base shrink dramatically since the 1980s (Minovez 2019; Buigues and Cohen 2020). In 2019, it represented only 10% of GDP, against 30% at the end of the 1970s and 15% in 2008. Since the 2008 crisis, successive governments have responded to this decline by developing new industrial policy measures, without however reviving the older *dirigiste* model (Levy 2017). In this section, we describe several instruments and their rationales to examine their internal coherence. We focus mainly on supply-side policy as it has become the main pillar of this new industrial policy (Levratto 2020). Due to France’s highly centralised power structure, the national scale is the main driver of industrial policy, even though some key changes have occurred at the European level. We summarise the main instruments and their position in the multi-level and temporal framework in Table 1.

#### 3.1 National policy

States use the notion of industrial policy in different ways. For instance, a state can act indirectly on the industrial sphere through horizontal policies that impact the broader business environment. For instance, France brought in the *Crédit d’impôt pour la compétitivité et l’emploi* (CICE — competitiveness and employment tax credit — €20 billion per year since 2013), which applies to businesses across the board and not just industrial activities. A state can also act on opportunities for companies through public procurement, export subsidies, protection of certain markets or incentives for household consumption (e.g. France has extensively supported the automotive sector). Governments can also act on corporate taxes, support to innovation and company law, all of which affect the environment in which companies operate. More narrowly defined, industrial policy can correspond to targeted sectoral interventions to preserve a country’s independence and autonomy, counter the inaction of firms in various emerging or mature sectors, and so on.



In 1946, France took action in this direction with the creation of the *Commissariat general au plan* (General Planning Commission) whose functions have evolved considerably since then. From 1946 to the early 1960s, plans and major programmes were put in place to structure the economy and ensure France's independence (Cohen 1977). This approach gradually gave way to a neoclassical logic, but subsequently returned to slightly *dirigiste* logic after the 2008 crisis (Levy 2008). The period 1960–2010 was marked by a phenomenon whereby each government-commissioned report led to the creation of a new institution, which induced deterioration in public decision-making. The ensuing multiplicity of programmes with no clear-cut allocation of funds per programme still makes it difficult for industrials to decipher public policies (Buigues and Sekkat 2011).

### 3.1.1 Horizontal measures and macroeconomic management

Fiscal policy plays a key role in both French economic policy and industrial policy. Since 2008, four important fiscal policies have had an impact on industry, the overarching rationale being to lower the costs of production or innovation in order to boost competitiveness.

First, the research tax credit (CIR) was thoroughly overhauled in 2008 in the hope of increasing private R&D expenditure. Originally incremental and based on the increase in a firm's R&D spending, the reformed CIR is calculated solely on the volume of R&D expenditure. Despite the cost (€6 billion in 2021) and its substantial impact on corporate R&D spending, it has had no significant effect on either business growth or foreign direct investment (France Stratégie 2021). Then, in 2013, the government implemented a tax credit on gross wages paid in the course of a year up to 2.5 times the legal minimum wage (CICE) to reduce labour costs and enhance cost-competitiveness. This was transformed into a long-term reduction of social contributions, even though no positive effects on employment, exports and investment had been observed (France Stratégie 2020a). Thirdly, in 2017, the Finance Act provided for a gradual reduction of the corporate income tax rate from 33.3 to 25% by 2025, while also providing for a flat-rate tax on investment income. Fourth, the most expensive post-COVID-crisis policy measure is the reduction of taxation on production.

In addition to these key tax rebates, there are numerous fiscal exemptions and subsidies that are almost impossible to list exhaustively. For example, Buigues and Sekkat (2011) identified 120 different mechanisms dedicated to starting a new business. The intensive use of fiscal policy as an industrial policy instrument is partly due to the loss of the government's powers in the areas of international trade and monetary policy.

States may still have some leeway with monetary policy as for example by regulating the financial and banking system. Along the spectrum developed by Hall and Soskice (2001) ranging between two ideal types of national political economy, France occupies an intermediate position midway between a liberal market economy and a coordinated market economy (Hall and Soskice 2001; Schmidt 2003; Hall 2021). The French state has a strong interventionist approach based on two major agencies: *Agence de participation de l'Etat* and *la Caisse des Dépôts et*

*Consignations*. These two entities directly finance the economy via their various subsidiaries including the *Banque Publique d'Investissement* (BPI), *La Banque des Territoires* and *La Banque Postale* (owned by the national Post Office). However, the lack of coordination among these institutions makes it difficult to discern any coherence in their interventions. Moreover, *La Banque Postale*, the commercial state-owned bank, competes in the market with financialised and internationalised banks, while the two others are pure investment banks with no commercial activities. By comparison, in Germany, the regional network of banks creates a local ecosystem of solidarity between savers and firms (Bleuel 2018).□□□□□□

### 3.1.2 Filières

After the 2008 financial crisis, the government also renewed its sectoral policy. In 2009, Minister of Industry Christian Estrosi initiated a broad-based national consultation with industry stakeholders. The ensuing report (Dehecq 2010) called for the revival of *filière* policies. While the French term “*filière*” has no statistical or legal definition, it denotes the politically driven structuring of national or regional supply chains (Klebaner and Assogba 2018). The 2010 report aimed to promote the structuring of the industry *filière* into an integrated ecosystem of innovation and production, thus reviving vertical policies. By enhancing cooperation, the government sought to develop a coherent and integrated supply chain, able to foster capabilities for innovation and manufacturing in order to resist competition and then expand within a globally competitive environment.

Following this report, the government created the *Conseil National de l'Industrie* (CNI), a high-level stakeholder council in charge of supervising strategic *filière* committees (CSFs). Each identified *filière* gathers stakeholders from business, trade unions and the government, which at the time chaired each of the committees. The CSFs produced contracts committing both the Ministry and firms. In some cases, as in the automotive or textile sectors, new business federations emerged to elaborate the *filière* policy — with some success for the textile sector which had been stagnating since 2009 after two decades of intensive degrowth.

The *filières* are defined either by the final output (automotive, aeronautics...), the common input (wood-paper; chemicals...) or the similar functions of the goods (fashion, health...). The *filière* roadmaps included measures to structure the supply chains, generally through agreements and good practices, employment initiatives such as specific training programmes and financial measures such as common funds for restructuring and R&D incentives.

Some unsuccessful attempts were made to convert the *filière* policies into mission-oriented policies. In 2013, the socialist minister of Industry, Arnaud Montebourg, decided to expand this policy and developed 34 plans. The idea was to give to each *filière* a specific technological target, as for example the “2 l/100 km car”. These plans were proposed to firms, and the government provided direct investment through the BPI and support for cooperation. In

bypassing the CSFs and the clusters, the Ministry's goal was to act quickly and monitor the progress made [Interview 2].

However, in 2015, the new minister for the Economy, Emmanuel Macron, merged the 34 plans into 9 "solutions" and one stand-alone plan, Industry 4.0. The nine solutions were more crosscutting and abstract ("ecological mobility", "smart city"...). However, there has been no mention of such "solutions" in the public reports since 2017, except for the Industry 4.0 plan which became a *filière* in 2021 through the creation of dedicated CSFs.

Some CSFs managed to effectively enhance cooperation, as in the fashion industry, by creating a dedicated business federation. According to Interview 2, this business federation is now autonomous and able to produce its own action plans.

In 2018, the government decided to reshape the *filière* policy. The idea was to drive the policy towards more concrete action plans, such as structuring investment projects. CSF governance changed radically, with major business representatives being appointed to each CSF chair. New budgets were dedicated to large-scale *filière* projects involving public and private funding. Moreover, every CSF amended its contracts to include various industrial greening initiatives. New CSFs were also created (19 CSFs in 2021 compared to 14 in 2015).

Despite the apparent coherence of the perimeters and definitions of the *filières*, many stakeholders [Interviews 4–8] see the CSFs as silos. The ambition to create technology interlinkages is indeed hampered by the separation between CSFs and the absence of cross-cutting projects.

### 3.1.3 The "Territories of Industry" approach

In this article, we focus on national policies. Policies for subnational, territorial industry do exist like the cluster policy, but the major policies are played out at the national level. In this context, the bottom-up approach of the Territories of Industry policy requires an explanation.

In 2019, the government implemented a new industrial policy initiative called *Territoires d'industrie* (Territories of Industry) in response to the 2018 "Yellow Vests" movement. The idea is to label some local territories as industrial territories with a view to developing specific measures such as training programmes or specific investments. The labelled territories cover several inter-municipalities, and the projects supported are defined at this scale.

Each of these policies is monitored at regional level by the prefect (the state's representative in a Department or Region), but also by the regional authorities, businesses, and the various national agencies that are funding the programme. Financial support is formalised through a contractual agreement for each territory of industry, under the guidance of mayors and local manufacturers. The regions are responsible for steering the whole process in conjunction with national agencies. Before the COVID-19 crisis, the *Territoires d'industrie* had no own resources, despite Prime Minister Edouard Philippe's 2018 announcement of a €1.3-billion allocation for the programme. The funds allocated came from other national programmes. Funds were allocated as part

of the recovery plan (about €700 million) and then supplemented by a further announcement of €150 million in September 2021. The regions also contribute financially to selected projects.

Local players [Interview 1] criticize the programme for its over-reliance on logic of calls for projects that leaves no room for the design of tailor-made policy measures. They also regret not being more involved in constructing the programme to make it an effective tool for local development.

### 3.2 The EU and the Franco-German Manifesto

Since the 2008 financial crisis, the European Union (EU) has renewed its industrial policy (Pianta et al. 2020; Mosconi 2015). The successive plans (Juncker Plan, InvestEU) are built on four pillars: research and innovation, infrastructure provision, regional and cohesion policy and small- and medium-sized enterprises. The European Investment Bank became one of the central coordinators. It should be noted that industrial policy is not an exclusive competence of the European Union and that each member state builds its own, sometimes conflicting, strategy. Originally on the initiative of the European Economic Community, state aid has been limited since the 1950s to promote competition between states.

However, many shortcomings can also be identified (Pianta et al. 2020). Firstly, policy tools are mainly horizontal (Article 173 of the TFEU) and do not focus on strategic industrial directions. Second, funding is still a source of tension between ensuring cohesion (i.e. finance the development of new industrial regions) and reinforcing the technological leadership (i.e. finance the “old” industrial regions). Third, despite the recent Green Deal policy, the available funds are inadequate to address grand challenges such as the dependency on fossil energies (Pianta and Lucchese 2020).

In March 2020, the European Commission presented its new industrial strategy, which was later revised due to the health crisis. It was designed to accompany European industry through the digital and energy transitions. The notion of strategic autonomy is regularly advanced although no very precise definition of this is offered in the European Commission’s communications. Moreover, we note diverging views among the Commissioners, on the topic of semiconductor reshoring for example. Divergent national views and interests are also apparent. For instance, issues such as reciprocity in accessing public procurement markets have not been resolved due to conflicting national strategies. The carbon tax, currently under debate, will be very difficult to bring to a successful conclusion, even though it would strengthen the European trade balance. There is also social and fiscal dumping within Europe, which does not encourage fiscal harmonization.

As for the industrial policy, the European Union’s ambitions are sometimes at odds with its other policies. For example, the Green Deal may be inconsistent with the need for strategic autonomy as it is likely to increase Europe’s dependence on certain critical raw materials, and therefore on China. The EU certainly faces supply chain bottlenecks and vulnerabilities due to its heavy reliance on

imports from single sources. For example, China accounts for 98% of the EU's supply of rare earth elements, Turkey for 98% of borate supplies and South Africa for 71% of the EU's platinum needs.

Moreover, EU competition rules remain a clear constraint on industrial policy. In the network and infrastructure industries, states are obligated to open up their national markets to competition, which rules out the possibility for direct state intervention. In 2019, the European Commission rejected the merger between Alstom and Siemens concerning the railroad industry. After this case, German and French Ministers for the Economy Peter Altmaier and Bruno Le Maire signed a joint manifesto to shape new competition rules.

State intervention also remains constrained by fiscal and budgetary rules. Despite numerous revisions, fiscal rules on public debt still seriously hamper debt-driven economies like France. Given the free movement of capital within the EU, national fiscal policies are trapped in a race to the bottom. Monetary rules also constrain national policies. The fixed exchange rate within the Eurozone and the high exchange rate with the US dollar have curtailed export opportunities for high-cost countries like France.

At the same time, the Important Projects of Common European Interest (IPCEI) is a clear breakthrough when it comes to rules on state aid. If the Commission labels a project as an IPCEI, Member States can directly and legally subsidise the investment. Such is the case of the new battery industry for electric cars. Under the IPCEI, many countries like France and Germany have granted subsidies for investment to build several battery assembly plants and conduct related research projects. This sectoral policy tool may be the cornerstone for the future European industrial policy. The instrument is not new since it was created in 1957 (Art. 92.3 of the Treaty of Rome). Before 2014, it was mainly used as a tool to finance cross-border infrastructure projects. Then, in its 23 February 2021 press release, the Commission signalled a revision of the IPCEI rules to address "important market failures in strategic value chains". The other change to these rule introduced between 2014 and 2021 relates to the nature of the investment. Initially, investment was to focus on R&D, but States can now finance industrial investments through an IPCEI. The majority of IPCEIs involve projects involving the automotive industry: batteries, Cloud, Hydrogen, etc. Germany has a leading role in all of these.

### 3.3 The COVID crisis: towards a new industrial policy?

In France, the COVID pandemic served as a wake-up call to the fact that the country was over-reliant on imported products, and especially on Chinese production (Chiappini and Guillou 2020). The country experienced shortages of masks, drugs and medical equipment such as respirators. In a key televised speech on 14 June 2020, President Macron announced a radical change in France's industrial policy: the push towards re-shoring (*relocaliser*) production. However, a few weeks later, the term "re-shoring" was replaced by "reindustrialisation". The underlying rationale was to focus on Schumpeterian re-shoring (Mouhoud 1989) or, in other words, attract industries able to bring in new value chains thanks to new technologies.

### 3.3.1 The French economic recovery plan

In the exceptional context of the pandemic, the government took measures to support the entire economy, which enabled companies to weather the crisis. Two major schemes were put in place: state-guaranteed loans (PGE) and a short-time working scheme for employees. The plan also deployed some sector-specific measures in the aeronautics (15-billion-euro plan) and automotive (8-billion-euro plan) industries. In aeronautics, a crucial industry for France, two funds were set up in favour of SMEs, as these often depend heavily on major OEMs such as Airbus, Safran, Thales and Dassault. The funds were used to support the SMEs' equity capital and help them modernise. The four above majors and the national airline Air France have also benefited from specific measures. For the automotive industry, the plan included incentive programmes in favour of clean vehicles, as well as a fund to modernise companies in the sector and support firms in difficulty. Despite this drive to preserve the skills of automotive subcontractors, the transition from thermal to electric vehicles will lead to the destruction of many jobs, thus revealing the government's failure to implement a policy that allows for effective anticipation and planning (PFA 2021). Few conditions were attached to the aid and plans deployed, particularly in terms of environmental sustainability.

As is often the case in other European countries, the horizontal aid was unconditional in order to preserve the national economic and industrial fabric (Bulfone et al. 2022) — “whatever the cost” may be, in the words of President Macron. The crisis also served as a reminder of the weaknesses of the French productive apparatus, more particularly its dependence on third countries for supplies to the national health system. Taking note of these weaknesses, the government implemented a €100-billion recovery and resilience plan (*France Relance*), including €30 billion for the ecological transition, €34 billion for business competitiveness and €36 billion for territorial cohesion. The aid provided under this plan took various forms: tax credits, grants, loans, etc.

Yet, these measures are different in nature. It is difficult to trace the exact origin of the funds mobilised, as much of the financing derived from reallocated funds previously earmarked for other programmes. One of the pillars of the *France Relance* recovery plan was to support relocating activities to France. Five sectors were considered as strategic: health, agribusiness, electronics, raw materials and 5G. In October 2021, Agnès Pannier-Runacher, deputy minister for Industry, announced that *France Relance* was supporting 624 relocation projects over a 12-month period. The projects supported appear to be very heterogeneous, and some seem not to involve re-shoring as such. Few of the announced projects involve the creation of new industrial sites, and more often involve extending or modernising existing sites so as to increase production capacity or develop new products. Some of the projects are financed under the programme “Investing for the Future”. Nine billion euros have been allocated to support the modernisation of industrial sites that are less robotised than the European average and to further the decarbonisation of industry.

Interestingly enough, support to certain projects under the recovery plan seems counter to the French government's ambition to improve France's industrial sovereignty. For example, as part of the recovery plan, a subsidy has been granted to the Indian company Electrosteel, which plans to set up in the south of France. This company is one of the main competitors of a French company specialising in pipeline technology, Saint-Gobain PAM. The decision to support Electrosteel raises questions about the strategic vision of French decision-makers to not protect national champions.

Finally, a further key recovery plan measure is a €10-billion cut in production taxes in order to enhance the competitiveness of French manufacturing (Guerini et al. 2018). Production taxes encompass all the taxes levied on firms that engage in production activities, independent of the quantity or value of the production. They are levied, for example, on land, fixed assets, labour and various activities or transactions.

This reduction responds to a long-standing demand from industrialists, but its effectiveness and sustainability can be challenged (Garsaa and Levratto 2015). In fact, the production taxes rebate adversely impacts the budgets of local authorities and, in turn, the quality of some local public services, which is nonetheless a factor for attracting foreign direct investment (Levratto 2020). Moreover, this reduction was applied uniformly, whereas it might have been more appropriate to target certain categories of companies.

Regarding the other economic emergency measures put in place since the beginning of the pandemic, we can make several remarks signalling the need for greater vigilance on the situation of French industry. The government's measures have attenuated the effects of the crisis, but industry is facing an abnormal economic situation. The rate of business failures in the manufacturing sector in November 2021 decreased by 50% compared to November 2019 (Table 2), which suggests that a catch-up effect will kick in as soon as the economic support measures are removed. The level of indebtedness has increased particularly due to the take-up of state-guaranteed loans. Some SMEs have taken advantage of these measures to shore up their economic health, or even strengthen their equity and/or improve their margins, while some already in debt may find it hard to repay their loans in the short term. A catch-up phenomenon in the wake of the shortages during the crisis explains the rather healthy state of order books, along with the temptation to overstock to protect against possible future shortages.

The overall objective of reshoring is interesting given the French trade balance deficit. For its implementation, the government entrusted the CSFs with the mission of working on value chain reshoring. However, the siloed functioning of CSFs prevents any transversal initiatives, as in the case of the electronics CSF [Interview 5]. In addition, the projects supported under the recovery plan sometimes not only seem far removed from the country's economic concerns (e.g. a subsidy for a church roof, the extension of subway lines which was already financed), but also do not necessarily address the issues of strengthening sovereignty or fighting climate change. In fact, the recovery plan and its measures raise the question of the French government's strategic vision. France wants to rebuild its industry, but lacks the planning capacity.

**Table 2** Bankruptcies in number of legal units, year-on-year change (%)

| Period    | Aggregate over the last 12 months (raw data) |           |           |                     |                     |                         |                     |                     |
|-----------|--|-----------|-----------|---------------------|---------------------|-------------------------|---------------------|---------------------|
|           | Oct. 2019                                    | Oct. 2020 | Oct. 2021 | Oct. 2021/Oct. 2020 | Oct. 2021/Oct. 2019 | Nov. 2021 (provisional) | Nov. 2021/Nov. 2020 | Nov. 2021/Nov. 2019 |
| Industry  | 3531   | 2342      | 1793      | -23.4%              | -49.2%              | 1805                    | -18.3%              | -48.5%              |
| All firms | 51,840                                       | 34,547    | 27,120    | -21.5%              | -47.7%              | 26,944                  | -18.2%              | -47.5%              |

Source: Banque de France



### 3.3.2 The return of the Commissariat au Plan, without planning

To master the grand challenges, an ambitious and flexible planning policy is required. France used to have genuine planning policy crafted by the *Commissariat général au plan*, which was transformed into *France Stratégie* in 2013. As Levy (2017) points out, even though France reverted to a *dirigiste* approach in 2008, the dismantlement of the *Commissariat général au plan* and its network of institutions reduced the capabilities to plan.

The COVID crisis response also revealed the government's inability to create efficient planning institutions. In fact, the Government created the *Haut Commissariat au Plan* (HCP — State planning agency) without really clarifying its role in relation to that of *France Stratégie*. The HCP is headed by François Bayrou, a former minister under the Macron administration, who had to leave the government due to a suspicion of complicity in the misappropriation of public funds. Recent developments in industrial policy also raise some doubts as to the ambition of such a central planning agency. Since its creation, the HCP has produced several notes on the issue of sovereignty without making any recommendations on how to reduce France's industrial dependency.

In October 2021, the government announced the France 2030 plan, which aims to achieve long-term goals. The programme will not be managed by the HCP, but by a general secretary with a team of some fifty people reporting directly to the prime minister. Its role is not yet clearly defined, hovering between a simple funds manager and an operator in charge of creating a national consensus around an industrial vision. Ten key objectives have been identified, and the government intends to invest €30 billion over 5 years. Eight billion euros will be dedicated to the energy sector, particularly nuclear power and the production of green hydrogen. It has not yet been specified whether the funds will be borrowed or recycled from existing funds.

Several observations can usefully be made about France 2030, notably the lack of clarity surrounding the government's ambitions. In the area of hydrogen power, France 2030 focuses on the production of renewable and low-carbon hydrogen with the ambition of becoming a "world leader in green hydrogen". A study of different speeches on the topic suggests that this objective will focus only on hydrogen production, not on demand. However, hydrogen could translate into a transversal *filière* project, working with sectors such as transport which have a potential demand for green hydrogen. Nonetheless, creating a local production-demand nexus around solutions and uses may help to give French industry a competitive advantage. Industrial start-ups that develop hydrogen-based solutions, sometimes supported by the regional policies, do not seem to be directly targeted by France 2030. A further observation is the apparent lack of integration with other multi-level public policies, notably training, the environment and infrastructure.

Yet, such ambitious targets like hydrogen production require a systemic policy to create a coherent socio-technical system. Despite the creation of the HCP, various key aspects such as collaboration within the local ecosystems,

the mechanisms for allocating funds, the monitoring of these objectives or the evaluation of policies have not been specified.

To conclude, French industrial policy since 2008 has been a complex multi-level policy comprising horizontal and sectoral measures to foster technical change and technology interlinkages, while improving competitiveness. The accumulation of measures can however create misalignments between the objectives and the means. In the next section, we will explore industrial policymaking in more depth to highlight how the governance of industrial policy raises problems in addressing the grand challenges.

## 4 The limitations and opportunities of French industrial policymaking

In this section, we discuss the limitations of French industrial policy governance. On the one hand, we show how the complexity of the policy heightens the risk of misalignments between objectives, instruments and policy levels over time (Andreoni and Chang 2019). On the other hand, we highlight the lack of planning capabilities due to the omnipresence of business representatives in the policymaking process. Finally, we suggest a new form of political governance that enables grand challenges to be tackled, while creating a new growth path.

### 4.1 Complexity and overlapping

As described in the previous section, French industrial policy is a mix of horizontal and sectoral/transversal measures at multi-level scales.

The multiplication of measures over time and on numerous levels creates overlaps and duplications. Whatever the policy domain, the regional and central authorities all have actionable powers. For example, the responsibility for training and education policy is shared among four different jurisdictions as well as with joint committees at the professional branch level. Multiple attempts have been made to create “one-stop-shops” for companies to enable them to benefit from various kinds of support, but the lack of coordination between and within the different scales of intervention complicates such initiatives. According to interviews 4 and 5, one success of some *filière* policies may indeed be the communication actions on the various subsidies available to small firms.

Moreover, this complexity is reinforced by the lack of continuity at the level of ministries, agencies and policies. Between 2008 and May 2022, there have been nine different ministers for industry, seven of whom had the status of deputy ministers. Montebourg’s ministry (2012–2014) was the only one dedicated exclusively to industry; otherwise, industry has been grouped varyingly with economy and finance, digital affairs and communication. This ministerial turn-over leads to lower budgets and a loss of skills and expertise.

As shown in the previous section, French industrial policy since 2008 has also undergone frequent change. Some policies aim to deepen or adjust previous policies, as for example the 34 plans of the *Nouvelle France Industrielle* (New Industrial France) programme which tried to boost the new *filière* policies, or the 2018 shift in governance of the CSFs, which reinforced the power of the *filières* while extending the scope to promote green innovations and projects. However, other policies like the 2019 Territories of Industry seem to be a clear duplication of what regional authorities are already able to implement.

As for demand-side measures, France continues to protect some of its industries through public-sector demand, as in the case of the rail, aircraft, defence and construction sectors. So far, however, no clear-cut initiatives have been rolled out for the telecommunications and data management, which now present major technological challenges. Nor is there a single approach by EU Member States to open their markets to ICT companies. For example, each State has its own strategy concerning companies such as Huawei, even though these issues are key to the strategic autonomy advocated by the European Commission.

In terms of final consumption, wage restraint is hobbling the development of French manufacturing. “Made in France” products carry higher prices due to labour and capital costs in France. Additionally, consumer demand is decreasing as the various fiscal schemes and the recent changes in labour law are limiting wage growth (Artus 2020). Higher wages in services could help French industry to benefit from increased consumer demand for French manufacturing goods.

Finally, contradictions exist between industrial policy and other policies, such as France’s mobility policy. In 2020, the minister for the Environment proposed two bills aimed at reducing the weight of cars and prohibiting short-haul flights in line with the recommendations of a special citizen assembly for climate. The minister for the Economy successfully negotiated trade-offs on the two bills, which means that they will have negligible effects on the industry. All of these conflicting interests create not only political tensions but also inertia. Conflicts are resolved in the Council of Ministers but an open debate is lacking.

## 4.2 The lack of planning capabilities

This unstable industrial policy creates uncertainty. If we analyse the policy changes in terms of political economy, it would appear that French industrial policy adheres to and reinforces the business strategies of industrial incumbents rather than disrupting their activities. The recurrent institutional changes reduce the government’s capacity to design a genuine industrial policy that covers the diagnostic, roadmap and monitoring phases. All of these functions are captured by companies, which leads to inertia and the primacy of short-term profit-oriented strategies.

For example, interviews 5, 6 and 7 mention deadweight effects. The aeronautics industry has been granted subsidies to develop hydrogen-powered aircraft. However, the firms have no well-staffed engineering teams working on this and still prefer to

work on improving their current technological paths. In addition, while their R&D subsidies are growing, the firms' own R&D expenditures have stagnated.

The planning policy also suffers from incoherence between objectives and means. In some industries, such as the automotive industry, the government has decided on a clear direction (2 million electrified vehicles will be produced yearly by 2030), but has left it to the industry to define exactly how it will transition. Since automotive business federation published its report in 2020 (PFA 2020), the federation and the government have encouraged the foundries to restructure in 2020. However, many of them are closing because the OEMs have stopped sourcing their supplies from domestic firms and begun importing similar products. The political discourse justifies these shifts by citing technological change as the sole cause, due to the fact that electric engines need fewer metal parts, but no specific policy measures have been introduced to support the transition. Furthermore, the automotive future fund is controlled by the two main carmakers, Renault and Stellantis Group (PSA). As was the case in 2008, it is they who will decide which suppliers are to receive funds and which ones will die.

A recurrent critique of French industrial policy is the lack of transparent diagnostics [Interview 8]. Many public agencies and experts regularly produce reports on the causes of deindustrialisation: France Stratégie (2020b), the *Conseil d'analyse économique*, business federations, joint committees, trade unions and parliamentary bodies, including the Economic, Social and Environmental Council (CESE), which is the "third chamber" or constitutional consultative body composed of representatives from trade unions, companies, business federations and NGOs. Yet, according to Interviews 5, 6, 7 and 8, there is no discussion on the causes of deindustrialisation. Taking a closer look, it appears that most reports explain deindustrialisation only by structural factors affecting competitiveness (labour costs, taxation...) (Cailletaud 2018). Certainly, such structural factors are key to understanding deindustrialisation, but none of the reports challenge the choices made by the industrialists or government.

One example of the active role played by large firms in deindustrialisation is the automotive industry. In 2019, Renault and PSA (Stellantis) halted the production of small cars in France, arguing the lack of competitiveness (Frigant and Jullien 2018). At the same time, Toyota's French subsidiary was ramping up its production of small cars thanks to recent investments in a modern plant. On the other hand, Renault and PSA were underinvesting in its French businesses. In sum, it can be said that the lack of competitiveness is a consequence of corporate strategies rather than the cause, contrary to what the *Conseil d'analyse économique* claimed (Head et al. 2020).

Capture also occurs at company board level. A recent study (Coutant and Viallet-Thévenin 2021) shows how the doctrine of state intervention changed during the 1980s to "normalise" state equity investments in large companies. As shareholders, they thus favour corporate business strategies rather than directing the firms' activities to respond to public policy needs.

In a nutshell, given that all policymaking arenas are dominated by large companies, French industrial policy seems to follow the technical changes desired

by these companies. For example, trade unions report trying to promote numerous projects related to sustainable development [Interview 6], such as hydrogen production for the steelmaking industry, and which imply substantial investment and value chain upgrading. Yet, industrialists refuse to take a closer look at them as the proposed projects are at odds with their own current or future plans.

In the areas of sustainable development, the most ambitious and clear-cut path is the shift to electric vehicle production. This shift appears to be a Schumpeterian reshoring to develop a new supply and value chain based on the battery and electronics industries. However, this move intervened in the wake of “Dieselgate” and in the face of the unavoidable demise of the thermal engine (Klebaner 2018a). So, like the IPCEI scheme, the electric vehicle policy only addresses market failures by helping carmakers to achieve their ambitions, instead of creating a disruptive market. Other projects like hydrogen production are limited to lip-service or dispersed actions. Moreover, there is little reflection on how to change the production-consumption nexus — for example by promoting consumption of sustainable goods.

### 4.3 Toward a democratic industrial policy

France is facing grand challenges such as the environment, health, mobility and employment. We have shown that conflicting policies, the complexity of the industrial policy framework and the capture of policymaking spheres reduce the possibility of a radical change in direction. On the contrary, current industrial policy reinforces inertia and “business as usual”. Apart from some long-term targets such as the reshoring of the electric vehicle value chain, the absence of coherent planning makes it difficult to tackle technical change and also creates dead-weight effects. However, environmental protection requires a totally new development model. It must first of all redefine what “value” means, to include the notion of public value (Ferrannini et al. 2020; Mazzucato 2018) and, secondly, prepare for less growth (Aiginger and Rodrik 2020) while also giving to industry a clear vision of the future.

For example, to resolve the mobility challenge, the whole socio-technical system needs to be rethought (Klebaner 2021). The goal of sustainable mobility requires a coherent action plan encompassing territorial policies, infrastructure, demand-side instruments, training policy, innovation subsidies and so on. This means that industrial policy can act as a tool to help achieve broader goals, such as combatting global warming, by giving direction to technical and economic development. However, to achieve this, industrial policy governance must be able to coordinate the goals and the instruments.

In this final section, we discuss the opportunity to change industrial policy governance in France and craft a more effective policy. The policy framework will need to incorporate several features.

First, democracy is the cornerstone of industrial policy. A single democratic centralised committee — which gathers pluralist views by including businesses, trade unions, elected members of parliament and citizens — must have four competences:

- Exchange opposing view in open debates on the diagnostics and problems. This phase is crucial in order to produce a well-defined path to change industrial development.
- Define the long-term targets, i.e. “the end of the road”.
- Create new indicators to take public value into account. Short-term financial indicators are clearly not suited long-term industrial development and radical technical change. Sea changes require more relevant indicators such as local outsourcing, product sustainability, CO<sub>2</sub> emissions...
- Evaluate the progress made by the policy and make flexible adjustments to the final plan.

The CESE would seem to be the body that most closely matches the above requirements. We suggest that it could become central to the policymaking process and the achievement of an ambitious and coherent industrial policy.

Second, a technical and pluralist agency needs to define an actionable plan to reach the targets. Professionals, workers’ representatives, public and private experts from diverse fields, ministers and regional authorities must establish the roadmap. The agency needs to investigate every field: education and training, R&D, technical development, manufacturing, distribution... and define the necessary instruments: regulation, taxation, public and direct investment... Currently, the CNI/CSFs are the closest match to this mission.

Third, according to what the above-cited council considers as public value, a public agency with expertise in technology intelligence must oversee technological development to protect emerging technologies. Sovereignty and technological expertise is crucial to resolving grand challenges, and this agency must ensure that no technologies for the future are lost. The agency could thus contribute new solutions based on its technical knowledge to the institution in charge of planning, while at the same time enhancing technological networking to help firms find new collaborative initiatives. The agency must also make technical platforms available to help technological demonstrations, prototyping and pilot manufacturing in order to foster the transfer from innovation to manufacturing. In the past, such platforms were the cornerstone of many successful French plans, in the aerospace and telecommunication sectors for example (Klebaner 2022).

Fourth, on the basis of the newly defined public value, territories need to create solidarity among firms through local anchoring. The networks of financial institutions must be downsized to the local scale, while keeping a strong public financing agency able to coordinate the interventions. The regions need to strengthen their intermediation capacities to help firms find potential local partners, new markets and opportunities and enhance the targeting of public aid.

Fifth, democracy within firms seems to be a prerequisite for radical change. Many studies show the advantages of workers’ participation at board level to reduce financialisation, as is the case in Germany.<sup>2</sup> Moreover, changes such as

<sup>2</sup> See Gomec and Sakinc (2020) for a literature review.

de-growth (or less growth) may be more socially acceptable if workers have their say in the firm's strategy. This would allow them to better anticipate the changes, the job opportunities and plan for the transition more effectively. Moreover, as financialisation depends on periodic market renewals to accelerate profit-making, reducing financialisation may enable the production of sustainable products and thus a reduction of the mass production/consumption model.

To sum up, we consider that the main limitation of French industrial policy does not lie in the instruments, but in the way that the policy is constructed. We consider that a deep change in the policymaking process is needed to enable the radical technical and economic transformations we need to tackle the grand challenges.

## 5 Conclusion

In this article, we analysed the construction of French industrial policy since 2008. After characterizing the features of the new industrial policy, we discussed the adverse effects of industrial policy governance. We consider that, on the one hand, complexity and conflicting interests reduce the opportunities to create a coherent framework for implementing a sustainable industrial development. On the other hand, the lack of state capabilities to effectively plan reduces the opportunity to propel a radical technical and economic change. The capabilities to evaluate weaknesses, design the policies and implement them are in the hands of large firms and business federations that are constrained to fulfil short-term financial targets. However, overcoming grand challenges such as climate change means profoundly rethinking the growth model in order to lay the foundations for less growth. We consider that a multilevel industrial democracy is required to really enable the change towards sustainable development.

On the theoretical side, our article contributes to the emerging political economy framework for analysing industrial policy. We focus mainly on manufacturing activities and on the national scale, as industrial sovereignty is a major national challenge both with regard to security and the creation of technological opportunities. By examining industrial policy trends since 2008, we elucidate how the industrial policy governance process can deter rather than promote technical change.

On the policy side, we discuss the opportunity to enable a deep technical change. Whereas some changes such as the local financial network are deep-seated, others can quickly be implemented in the French environment. Several institutions that could serve as the cornerstones for democratic industrial policymaking already exist. One main limitation of our study is the absence of a macro-view. Very few sectoral case studies explore the implications of French industrial policymaking for technical change (Moura 2020; Klebaner 2021, 2022). We should investigate further how specific measures are debated and decided and how they affect industry. Moreover, comparative studies involving countries like Germany may reveal the importance of policy governance in technical change.

## Appendix

**Table 3** List of interviews

| Number | Function                                      | Date             | Duration (min) | Location         |
|--------|---|------------------|----------------|------------------|
| 1      | Regional public body                          | 20 October 2021  | 72             | Video conference |
| 2      | Former national public body (minister)        | 22 October 2021  | 56             | Video conference |
| 3      | Prime minister advisor                        | 22 October 2021  | 50             | Video conference |
| 4      | National union representative (CNI)           | 17 November 2021 | 57             | Video conference |
| 5      | Sectoral union representative (CSF)           | 26 November 2021 | 54             | Video conference |
| 6      | Sectoral union representative (CSF)           | 30 November 2021 | 61             | Video conference |
| 7      | Sectoral union representative (CSF)           | 02 December 2021 | 59             | Video conference |
| 8      | National union representative (CNI)           | 03 December 2021 | 49             | Video conference |
| 9      | National public body (independent commission) | 06 January 2022  | 65             | On site (Paris)  |

## Declarations

**Competing interests** The authors declare no competing interests.

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