



# WHAT 'NORTH STAR' FOR FUTURE EU INDUSTRIAL POLICY?

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# SUMMARY

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Over the past three decades, EU institutions have gradually shifted towards greater reliance on goal-based strategies. This implies formulating an array of objectives and targets to achieve in the medium to long term, often encompassing economic and social dimensions and gradually incorporating environmental ones.

This analysis first takes stock of the different long-term goals pursued by key EU policy initiatives, with specific emphasis on industrial strategy, the twin transition and the emerging economic security imperative. It then distinguishes between intermediate and ultimate objectives (clarifying the 'North Star') and discusses the use of relevant instruments for a coherent, multilevel EU industrial policy (e.g. backcasting and multi-criteria analysis). These are applied to a number of examples, such as transition pathways, as well as select cases of goal-based industrial policy in Member States and outside the EU. Finally, the analysis provides policy recommendations, specifically for DG GROW, to shape future EU industrial policy.

**Tags: industrial policy, industry, twin transition, competitiveness, single market**



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## 1. The EU and goal-based policymaking: drifting off course?

In the domain of public policy, the past decades have marked a gradual shift towards greater reliance on goal-based strategies. The limitations of the neoclassical economics model of GDP growth (at least in its 'textbook' version) have been shown: it disregards distributional impacts and does not sufficiently address well-being or sustainability. These have led the global community to look for a more multidimensional understanding of progress, embracing a brand new agenda that focuses on a medium-term vision for society, the economy and the environment. Even in the US, where the neoclassical approach has found its most evident stronghold, the Biden administration has introduced corrections, aimed at ensuring that equity and distribution feature in cost-benefit analyses ([Hahn 2023](#)).

At the global level, such a transition has been marked by the adoption of new indicators of progress and performance (e.g. the [Human Development Index](#), based on Amartya Sen's 'capabilities' approach; see [Stanton 2007](#)). It can also be seen in agreement on the [Millennium Development Goals](#) in 2000, and later the [Sustainable Development Goals](#) (SDGs) in 2015. Several organisations, including the World Bank (though intermittently) and the OECD (mostly through its [Development Centre](#)) have welcomed the move from a growth-based towards a goal-based approach to government strategy.

At the EU level, the transition towards goal-based agendas became evident with the launch of the decade-long [Lisbon strategy](#) in 2000. The strategy was then revamped in 2005 with a sharper focus on [growth and jobs](#), as well as on red-tape reduction (with an ad hoc 5-year plan [launched](#) in 2007). It was replaced in 2010 by the [Europe 2020 strategy](#) for smart, sustainable and inclusive growth under the new Barroso Commission. This strategy, however, was heavily affected by the financial and economic crisis at the end of the 2000s, during which most of the targets quite rapidly became unfeasible or obsolete. This led to a decision by the Juncker Commission to not review the strategy halfway through the decade ([Renda 2014](#)).

At the same time, the agreement on the SDGs in 2015 led to new momentum for a goal-based strategy encompassing economic, social, environmental and governance dimensions. The SDG agenda, however, proved challenging for the EU ([Renda et al. 2023](#)). One of main reasons was probably that embracing the whole agenda at the EU level implied committing to results and achievements in some areas that were (and still are) firmly in the hands of Member States (e.g. health, rule of law and employment policies).

During the Juncker Commission, the communications adopted under the leadership of Vice-President Frans Timmermans led to intermittent and contradictory results for

mainstreaming the SDGs in EU policies. Later, the Von der Leyen Commission relaunched the EU's commitment by adopting a 'whole-of-government approach' to the SDGs in [2020](#).

Since then, as recently [recalled](#) by the Commission, every work programme has 'put the SDGs at the heart of EU policymaking'. Importantly, policy coherence is in principle guaranteed by the fact that the six priorities adopted by the Von der Leyen Commission are interconnected with the five Ps (people, planet, prosperity, peace and partnership) set out in the preamble of the 2030 Agenda for Sustainable Development (see Figure 1 below). Very recently, the EU's [Voluntary Review](#) of progress on the implementation of the 2030 Agenda reiterated the EU's strong commitment to achieving the SDGs.

Figure 1. European Commission priorities and the SDGs



Source: European Commission.

The EU's emphasis on the SDGs can also be found in flagship policies and programmes. These include, *inter alia*, the [Horizon Europe](#) programme for funding research and innovation between 2021 and 2027, the [Africa strategy](#) adopted in 2020 and the proposed [EU global health strategy](#), which is still pending approval and adoption by the Council of the EU after a failed attempt during the Swedish Presidency.



Still, this is not the case for many other ambitious initiatives launched by the European Commission over the past few years. For example, the recent proposal for a '[Net Zero Industry Act](#)' makes no reference to the SDGs or even to the notion of sustainable development. The same can be said for other landmark initiatives launched during this mandate, including the Regulation establishing a carbon border adjustment mechanism (CBAM), the [RePowerEU Plan](#), the [Digital Services Act](#), the [Artificial Intelligence Act](#) or even the [Pact for Skills](#) or the [European Democracy Action Plan](#).

A related issue is the lack of full mainstreaming in horizontal EU policies, notably: (i) the lack of true mainstreaming of the SDGs in the better regulation agenda, despite expectations that this would lead to a major announcement in the 2021 Communication on Better Regulation; and (ii) the very partial implementation of the SDGs in multilevel policies, including the European Semester and NextGenerationEU. The latter refers to the need to build a 'more sustainable, resilient and fairer Europe for the next generation'. But the notion of sustainability is rather diluted and coupled with resilience, fairness and growth, and far from reiterating the EU's commitment to the SDGs.

Table 1, from the UN Sustainable Solutions Development Network (UNSDSN), maps the relationship between specific EU policies and the 17 SDGs, showing a remarkable difference in the extent to which individual goals are targeted by EU strategies. While this may partly be explained by the different extent of EU competences in specific domains, the problem remains.

Table 1. Connection of EU policies to the SDGs

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17	Total Score
A New Industrial Strategy for Europe	1	2	1	2	0	0	3	2	3	0	1	2	2	1	2	2	2	26
Circular Economy Action Plan	0	2	1	0	0	2	2	2	3	2	0	3	2	2	2	0	0	23
EU Biodiversity Strategy for 2030	0	2	2	1	1	0	2	2	1	1	0	2	2	3	3	0	2	24
Farm to Fork Strategy	2	3	2	0	0	0	2	2	1	2	0	3	2	2	2	0	1	24
EU Hydrogen Strategy	1	0	0	2	0	0	3	2	3	1	2	2	3	0	0	2	1	22
7 technology flagship Areas, ASGS for 2021	0	0	2	1	1	0	2	3	3	3	3	2	2	0	1	2	1	26
Stepping up Europe's 2030 climate Ambition	0	0	2	1	0	0	3	2	3	3	2	3	3	1	2	0	0	25
Chemicals strategy for Sustainability	0	1	3	0	0	0	1	0	3	0	1	2	3	3	3	1	0	21
EU Strategy to reduce methane emissions	1	3	1	1	0	0	2	1	2	0	1	2	1	1	1	1	1	19
A Renovation Wave for Europe	1	0	0	1	0	0	3	1	2	0	3	2	3	1	1	1	1	20
EU Commission Recommendation on Energy Poverty	3	0	0	0	0	0	2	2	0	3	1	1	2	0	0	0	0	14
EU Strategy to harness the potential of offshore renewable energy for a climate neutral future	0	0	0	1	0	0	3	2	3	0	2	1	3	2	0	2	2	21
European Climate Pact	0	2	1	2	1	0	0	1	2	1	2	2	3	2	2	0	0	21
Smart Mobility Strategy	0	1	2	0	0	0	3	0	3	2	2	2	3	2	0	0	1	21
The European economic and financial system: fostering openness, strength and resilience	0	0	1	0	0	0	2	2	2	1	0	1	1	0	1	3	3	17
EU Strategy on Adaptation to Climate Change	2	2	2	1	1	3	2	3	3	2	3	1	3	2	2	2	2	36
Directing finance towards the European Green Deal	0	0	0	0	0	0	0	2	0	2	0	2	3	1	1	0	0	11
Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery	1	2	1	2	0	0	3	2	3	0	1	2	2	1	2	2	2	26
The EU's Blue Economy for a Sustainable Future	0	2	0	1	1	2	2	1	1	0	2	2	2	3	0	0	1	20
European Climate Law	0	2	2	0	0	2	2	2	2	2	0	2	3	2	2	0	2	25
Strategy for Financing the Transition to a Sustainable Economy	0	0	0	0	0	1	1	3	3	3	1	1	2	1	2	3	2	23
Fit for 55	0	0	1	1	0	1	3	2	3	3	3	3	3	0	2	0	2	27
<b>Total Score</b>	<b>12</b>	<b>24</b>	<b>24</b>	<b>17</b>	<b>5</b>	<b>11</b>	<b>46</b>	<b>39</b>	<b>49</b>	<b>31</b>	<b>30</b>	<b>43</b>	<b>53</b>	<b>30</b>	<b>31</b>	<b>21</b>	<b>26</b>	

Source: [UNSDSN](#).

On the one hand, major EU policies hardly deal with key social issues such as poverty and inequality, clean water and health or peace, justice and strong (national) institutions, and this *per se* reveals of a limited embedding of the SDGs ‘at the heart of EU policymaking’. On the other hand, and perhaps even more importantly, the SDGs are conceived to be ‘interrelated’ and ‘indivisible’, and as such cannot be satisfactorily pursued through a piecemeal approach, with some policies addressing one subset of the goals and others compensating by addressing other subsets. The Joint Research Centre (JRC) of the European Commission recognises the indivisibility of the SDGs, and has published [studies](#) on the related interlinkages between them. Even so, these do not seem to be fully reflected in EU-level policies or the methodologies used to design them.

Against this background, one could conclude that the SDGs have not made it to the top of the EU’s priorities in recent years, a substantial period in the crucial decade for Agenda 2030. There can, of course, be many reasons for this.

First, as already recalled, the lack of strong EU competences in some of the key areas of sustainable development limits the SDGs to certain domains within the EU’s multilevel governance, as well as in external action and specific policies, like that on research and innovation (R&I).

Second, the Covid-19 pandemic revealed the need for policies oriented towards resilience, intended as the ability of the EU to withstand future shocks. At a time of emergency, emphasis was placed on the protection of society, the economy and even the single market, while progress towards some of the SDGs fatally [backtracked](#). Little attention was devoted to the systemic transformation that is needed to embrace social, economic and environmental sustainability (ESIR [2020](#), [2023](#)).

Third, as a consequence of the pandemic and additional geopolitical developments – such as supply chain disruptions and growing competition for critical natural resources – the EU started looking at new goals: (open) strategic autonomy, economic security and technological sovereignty, among others. This led to a proliferation of new goals, often perceived and pursued in different ways across EU institutions, and within the European Commission across various DGs.

### 1.1 INDUSTRIAL POLICY: COMPETITIVE SUSTAINABILITY, SUSTAINABLE COMPETITIVENESS OR NONE OF THE ABOVE?

In the domain of industrial policy, a similar blossoming of goals has affected the traditional emphasis on the single market as an instrument of economic growth, as well as on the approach to a sustainable industry transition. The 2020 Communication on a [New industrial strategy for Europe](#) was heavily grounded on the twin green and digital transitions, and referred to the need to ‘transform and grow traditional and new

industries, support SMEs and drive our competitive sustainability across the EU', adding that this is 'as important for services as it for goods'. The notion of 'competitive sustainability' appeared once in the Communication<sup>1</sup>. Somewhat confusingly, a precise definition was not provided in that document.

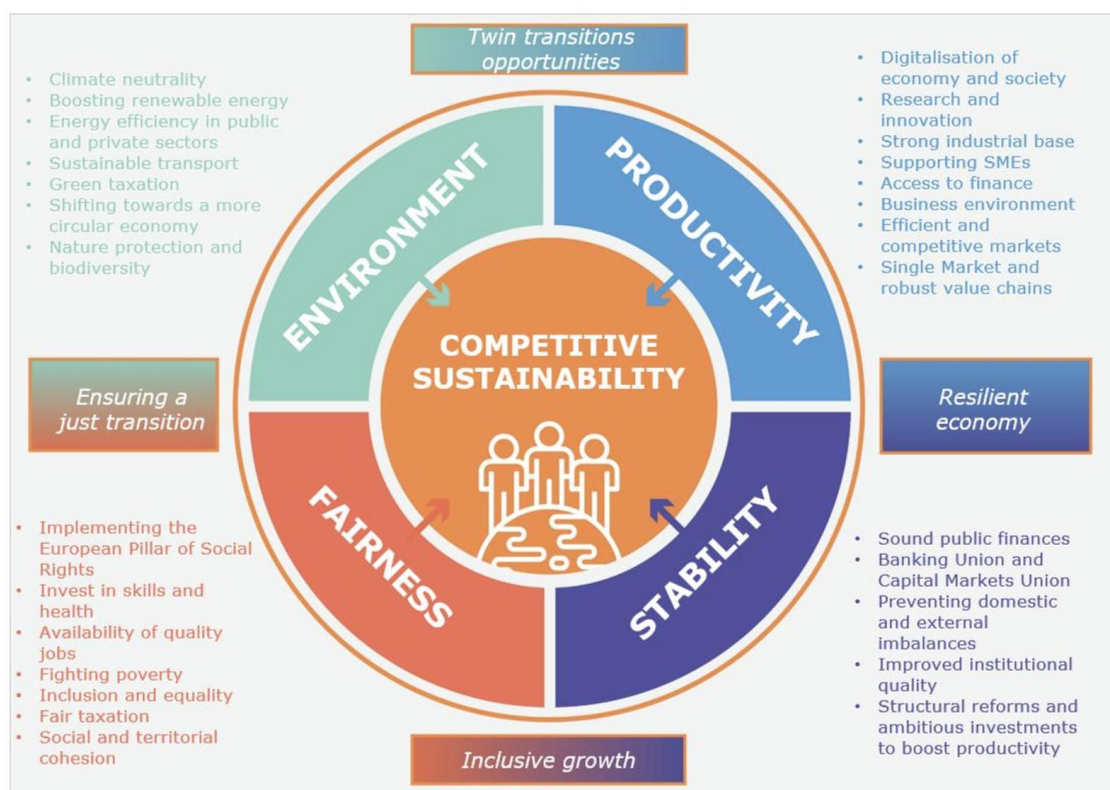
Yet the earlier [Annual Sustainable Growth Strategy \(ASGS\) of 2020](#) had given some guidance for the EU's 'growth strategy' (equated with the Green Deal) by clarifying that such a strategy was centred on sustainability and public well-being. It noted that in the eyes of the European Commission, these terms encompassed four dimensions: the environment, productivity, (macroeconomic) stability and fairness. The terms growth, well-being and sustainability were thus conflated into a single, four-dimension strategy with no specific mention of how to address or unpack possible trade-offs. The same four dimensions were specified as the guiding light for a national recovery and resilience strategy in the ASGS 2021. They were reiterated in the ASGS 2022, where the European Commission explained that the four dimensions pertain to 'competitive sustainability'. The same document also specifies that 'policy priorities will be structured around the four dimensions of competitive sustainability and in line with the Sustainable Development Goals' (Figure 2).

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<sup>1</sup> Commentators such as [Hedberg and Porter](#) flagged the lack of a suitable theoretical backing and measurement framework for the notion of competitive sustainability already in November 2020.



Figure 2. The four dimensions of competitive sustainability in the ASGS 2022



Source: European Commission.

One year later, in the midst of Covid-19, the European Commission decided to update its industrial strategy to reflect the changing landscape. Its [Communication](#), adopted in May 2021, marked a commitment to achieve ‘more speed in the transition towards a cleaner, more digital, and more resilient economic and industrial model’, adding that this would be needed ‘in order to maintain and enhance Europe’s drive towards sustainable competitiveness’. Later in the document, however, the Commission reiterates that ‘competitive sustainability enabled by new, often digital technologies and services remains our goal’. Yet a few pages afterwards the Commission argues again that the new instrument of transition pathways will lead to ‘an actionable plan in favour of sustainable competitiveness’.

Since then, the goal of achieving sustainable competitiveness seems to have gradually replaced that of competitive sustainability, at least within DG GROW. The term is not new to the European Commission: for example, it was used in 2020 in launching the [European Skills Agenda](#). But its use in EU industrial policy is relatively novel, and comes with yet another theoretical framework based on four axes and eight drivers (at least in the draft version the author has had access to). As shown in Figure 3, the four axes partly overlap with those of competitive sustainability: the sustainability dimension is limited to

productivity and the environment, with the socioeconomic dimension being represented under the well-being for all/fairness axis and macroeconomic stability rephrased as resilience.

Figure 3. Sustainable competitiveness: Axes and drivers



Source: European Commission (draft).

Figure 3 shows that the eight drivers of sustainable competitiveness encompass mostly input indicators, rather than outputs or outcomes. Importantly, the completion and effective functioning of the single market is listed as driver, which confirms the intermediate nature of the single market as a goal (see Section 3.3 below). Among the 'evergreens', the drivers include spending on research, development and innovation as a share of GDP, accompanied by public mission-oriented investment, which is interpreted as based on input rather than assessed on its actual output, outcome or impact.

Given the emergence of sustainable competitiveness as a goal, one would argue that competitive sustainability is now *passé* at the European Commission. However, this is not the case if one looks at recent documents. For example, Horizon Europe's [Work Programme 2023-2024](#) refers to the competitive sustainability of SMEs as an outcome depending on increased access to technology; the [ASGS 2023](#) continues to refer to competitive sustainability and its four dimensions, as described above and in Figure 2.

More recently, also as a result of tensions generated in the EU by the launch of the Inflation Reduction Act in the US, the narrative seems to have shifted again, leading to the revival of 'competitiveness' as a self-standing goal, with no specific reference to sustainability. A prominent example is the latest State of the Union [speech](#) by

Commission President Ursula von der Leyen, which uses the term ‘sustainable’ only with respect to agriculture and the Global Gateway, and otherwise calls for a strategy that targets competitiveness – a topic that will form the subject of an ad hoc study entrusted to Mario Draghi. This portrays a rather retro narrative, mostly focused on cost reduction. That is confirmed by Von der Leyen’s call for reducing red tape by 25 % and her decision to trigger a competitiveness check on each major new legislative proposal by the Regulatory Scrutiny Board.

## 1.2 THE RISE OF GEOPOLITICAL AND GEO-ECONOMIC GOALS

The situation described in the previous section is further complicated by the emergence of more geopolitical, risk- and security-related goals that interact with the EU’s overall social, economic and environmental development agenda. The pandemic, the war in Ukraine and the further rise of tech giants – as well as the economic downturn and social unrest that followed these events – have led the EU to introduce new goals that have significantly guided EU actions over the past 3 years. They include resilience-related goals, open strategic autonomy, technological sovereignty and (more recently) economic and national security.

The need to ensure that the EU thrives despite shocks has led to the introduction of measures to reduce the EU’s dependence on other countries, such as the [Critical Raw Materials Act](#) and the [CHIPS Act](#), neither of which refers either to competitive sustainability or to sustainable competitiveness (rather, they refer to sustainability in general). Other measures seek to strengthen Europe’s strategic autonomy in the digital domain, such as the Digital Services Act, the Digital Markets Act and the Data Act, among others. Trade-related measures increasingly aim at responding to protectionist measures in other countries (e.g. the US Inflation Reduction Act). [Bauer \(2022\)](#) offers a taxonomy of strategic autonomy policies, as shown in Table 2 below.

Table 2. Taxonomy of EU strategic autonomy policies

Category 1	Category 2	Category 3	Category 4
Measures aimed to achieve long-term industrial and trade policy objectives (including geostrategic objectives)	Measures aimed at correcting market failures in the EU associated with products and activities	Measures primarily aimed at correcting market failures related to production and processing methods, with extra-territorial reach	Contingent measures in response to trade measures or behaviour by non-EU jurisdictions
<ul style="list-style-type: none"> <li>▪ EU Foreign Investment Screening Mechanism</li> <li>▪ EU Chips Act</li> <li>▪ EU Emergency Framework Regarding Medical Countermeasures</li> <li>▪ EU Dual Use Regulation</li> <li>▪ EU Hydrogen Strategy</li> <li>▪ EU Pharmaceutical Strategy</li> <li>▪ EU Revised Renewable Energy Directive</li> <li>▪ EU Space Package</li> <li>▪ EU Standardisation Strategy</li> <li>▪ EU State Aid and IPCEI (Important Projects for Common European Interest) exemptions</li> </ul>	<ul style="list-style-type: none"> <li>▪ EU Artificial Intelligence Act (AI)</li> <li>▪ EU Digital Levy</li> <li>▪ EU Cybersecurity Certification Scheme for Cloud Services (EUCS)</li> <li>▪ EU Green Bond Standard</li> <li>▪ EU Data Governance Act</li> <li>▪ EU Data Act</li> <li>▪ EU Digital Markets Act (DMA)</li> <li>▪ EU Digital Services Act (DSA)</li> </ul>	<ul style="list-style-type: none"> <li>▪ EU Corporate Sustainability Due Diligence Regulation</li> <li>▪ EU Deforestation Free Products Regulation</li> <li>▪ EU Sustainable Batteries Regulation</li> </ul>	<ul style="list-style-type: none"> <li>▪ EU Anti-coercion instrument</li> <li>▪ Carbon Border Tax Adjustment Mechanism (CBAM)</li> <li>▪ Amendment of the EU Blocking Statute</li> <li>▪ EU Foreign Subsidy Instrument</li> <li>▪ EU International Procurement Instrument</li> <li>▪ Review of the EU Enforcement Regulation for trade Disputes</li> </ul>

Source: ECIPE and Frontiers, quoted in Bauer (2022).

Importantly, the notion of (open) strategic autonomy, dear to French President Emmanuel Macron, has become increasingly controversial and is now openly rejected by some Member States, which favour trade openness and economic security as guiding principles of EU action in select domains. Furthermore, the trade-off between strategic autonomy and other EU goals is starting to surface in the debate. [Bauer \(2022\)](#) argues that the strategic autonomy agenda is expected to harm EU competitiveness by leading to a loss of national per capita income of 0.5-0.75 % of GDP, with very different impacts across Member States (larger Member States being less affected than smaller, open-to-trade countries such as Ireland or Estonia). Similar views have also been expressed by [Tagliapietra \(2023\)](#), [Poitiers et al. \(2023\)](#), [Tagliapietra and Zettelmeyer \(2023\)](#) and [Pisany-Ferry \(2023\)](#).

What is most important, for the purposes of this analysis, is to highlight the potential trade-off between the pursuit of an open strategic autonomy policy and the quest for sustainable competitiveness. This is even more explicit if one considers that the four axes of sustainable competitiveness include openness to trade (subject to stability and

resilience). As a result, it may end up being increasingly difficult for EU institutions to coherently pursue a strategy aimed at achieving medium- to long-term goals, as well as measure progress and assess, both *ex ante* and *ex post*, the impacts of enacted policies and spending programmes. As discussed in Section 2 below, the rather confusing *entrée* of the geopolitical dimension of strategic autonomy in the EU's overall priorities results in a set of trade-offs or a trilemma, which the Commission will have to address in the months to come and certainly in the next mandate.

Finally, the quest for economic security has led the European Commission to develop a three-pillar approach, which now includes:

- (i) the promotion of the EU's economic base and competitiveness;
- (ii) protection against risks, mostly revolving around the resilience of supply chains (including energy security), physical and cyber-security of critical infrastructure, technology security and leakage, the weaponisation of economic dependencies and economic coercion;
- (iii) partnership with the broadest possible range of countries to address shared concerns and interests.

It is easy to notice, in this latest framework, that the sustainability element has disappeared from the Commission's radar, and has been replaced by a strong security element. Much in the same vein, the Commission has recently developed a plan to reduce dependencies on other countries, and seek leadership in some of the critical technologies that will drive the future of innovation and industrial leadership<sup>2</sup>. That plan, too, carries little or no reference to sustainability.

Has the EU ushered in a 'security era', abandoning the goals related to social and environmental sustainability? To be sure, the proliferation of goals and strategies requires an effort to clarify which priorities constitute the EU's North Star and at the same time, the identification of possible ways to address the inevitable trade-offs between the pursuit of these goals. A recent [report](#) by the European Parliamentary Research Service is adamant in this respect: 'in spite of the assumptions of the Commission and JRC foresight reports that the challenges to the green transition can be met one way or another, there are serious indications that they will not be met. Moreover, the other important objective of achieving open EU strategic autonomy is equally in danger.'

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<sup>2</sup> In October 2023, the Commission released a [Communication](#) on *Critical technology areas for the EU's economic security for further risk assessment with Member States*. It identifies four main areas (advanced semiconductors, AI, quantum technologies and biotechnologies) that should, as a matter of highest priority, be subject to a collective risk assessment with Member States by the end of the year.

## 2. Why the North Star counts: Policy for the poly-crisis age

Establishing a framework and overall vision is not *stricto sensu* necessary to undertake coherent public policy initiatives. Indeed, policymaking can be guided by criteria such as Pareto efficiency or Kaldor-Hicks efficiency, on which policies provide a net addition to societal welfare, without requiring any further conditions. Similarly, a strategy would represent an improvement for society whenever its overall societal benefits are greater than the costs.

To a large extent, this is also the logic behind growth-based policymaking: increments in GDP growth or in productivity are regarded as always positive. Large positive results attract the favour of international investors and financial markets, i.e. the 'little big number' ([Philipsen 2015](#)) continues to drive investment decisions around the world, despite the fact that it bears very scant relation to sustainability or resilience, as confirmed by a substantial body of academic literature. The European Commission itself [acknowledged](#) since 2007, thus before the 2007-2008 financial crisis, that 'economic indicators such as GDP were never designed to be comprehensive measures of prosperity and well-being', and that 'we need adequate indicators to address global challenges of the 21<sup>st</sup> century such as climate change, poverty, resource depletion, health and quality of life'.

As a result, policymakers wanting to measure progress have to rely on a different indicator of performance. The need to go beyond GDP was endorsed by, inter alia, the UN Secretary General's report on *Our Common Agenda* and by the Think7 Communiqué under the G7 Japanese Presidency in April 2023. That said, the ongoing debate on 'beyond growth', while fully aligned on the need to go beyond GDP, has not converged on a univocal alternative measure.

From one angle, scholars have highlighted the need to account for the distribution of income and wealth, factors that GDP typically disregards, just as traditional cost-benefit analysis does in public policymaking (as increasingly acknowledged even in the US, see [Hahn 2023](#)). In both macro- and microeconomics, the neoclassical economic approach has prioritised wealth creation over wealth distribution, often relying on the (rather acrobatic) assumption that income has constant marginal returns ([Renda 2020](#)). Meanwhile, besides distribution, also the composition of the indicator and in particular its social and economic components have been subject to hot debate among scholars. From Kate Raworth's Doughnut to Gross National Happiness indicators, and from Rockström's planetary boundaries to the Happy Planet index, there is a plethora of [alternatives](#), none of which has come to dominate the spotlight until now.



## 2.1 ALTERNATIVE PATHS TO MEASURE PERFORMANCE

All in all, there are at least three distinct strategies that could be followed to overcome the limits of GDP as an indicator of economic performance.

- *Complement GDP with additional indicators*, in particular to account for distribution/inequality, as well as social and environmental dimensions.
- *Develop a wholly new ‘compass’, an alternative to GDP*, which would then provide a different perspective on the economy’s total output.
- *Adopt a goal-based strategy*, which would shift the attention from outputs to outcomes and impacts. This approach, in turn, could take various forms:
  - It could be based on a *defined frontier within a given timeframe*, as in the case of the SDGs. Or it could be based on a *series of indicators without associated targets*, as in the case of the JRC’s resilience dashboard or DG GROW’s framework for sustainable competitiveness.
  - It could entail the *specification of criteria and conditions or simply specify the pillars to be considered*, as in the case of the [Living Standards Framework](#) in New Zealand. This means that it could provide generic guidance on how to manage trade-offs or specify priorities (e.g. as in John Rawls’ lexicographic ordering or in ‘prioritarian’ approaches, such as those proposed by [Adler 2019](#)).
  - It could take a *piecemeal approach*, i.e. focus on specific policy domains (e.g. the Net Zero Industry Act) or be a *whole of government approach*, an indivisible and pervasive strategy (e.g. the SDGs). The latter requires integration with better regulation.
  - It could be based on alternative scenarios or on single future scenarios.
  - It could focus on *one level of government or on coordinated action* at different levels, allowing for a consideration of the geographical dimension.
  - It could involve single-stage or multistage decision-making over time.

All these variants bear important consequences for the development of a coherent industrial strategy. As put forward in several recent contributions (e.g. [Club of Rome and Sistemiq 2020](#)), once the overall North Star has been established for a legal system as a whole, industrial policy has to proceed in a consistent direction, through a whole of government, multilevel strategy. Below, the possible contours of a future, goal-based industrial strategy are outlined.

Finally, the choice of an appropriate strategy design is also heavily affected by the ongoing shift towards a poly-crisis age ([ESIR 2023](#)), in which existential or massive risks interact, making uncertainty a prominent feature for policymakers. Strategies that bet on one possible future scenario, without incorporating a degree of risk management and

diversification, are unlikely to be a good fit for an age that promises new disruptions after the pandemic, the war and the ensuing economic crisis and supply chain disruptions.

## 2.2 IS THERE A TRILEMMA BETWEEN DECARBONISATION, COMPETITIVENESS AND ECONOMIC SECURITY?

As recently highlighted by, inter alia, [Tagliapietra and Zettelmeyer \(2023\)](#), the ever-changing geo-economic landscape today threatens the stability and viability of Europe's plan to create sufficient (good-quality and green) jobs. Aggressive industrial policy measures such as those included in the US Inflation Reduction Act threaten Europe's ambition to become a hub for green investment and to manufacture 40 % of clean tech domestically. This has been demonstrated by the fact that planned investments by car manufacturers (VW and Tesla) and semiconductor companies (Intel) have been abandoned due to more favourable conditions in the US. The real question to answer is this: can Europe pursue an economic security/strategic autonomy agenda, while at the same time decarbonising its economy and achieving global competitiveness?

Some commentators have recently signalled that the EU may have set too many (incompatible) goals over recent years. [Tagliapietra and Zettelmeyer \(2023\)](#) analyse the emerging trilemma between decarbonisation, competitiveness and economic security, and argue that such tensions 'can probably be reconciled. But to pretend that there are no such tensions and that all three objectives can be simultaneously attained through aggressive reshoring – like the draft Net-Zero Industry Act does – is a mistake.' [Pisani-Ferry \(2023\)](#), even more patently, observes that 'given the substantial political capital that has been invested in pursuing carbon neutrality, it is hard to envision the bloc explicitly renouncing it'. But given the emerging leadership and ambition of China and the US on green policies, an increasingly likely scenario is that Europe fails to meet its 2030 targets, and then gradually accepts its new position as a follower. The alternative is to sacrifice competitiveness, with inevitable social, economic and political consequences or to pursue it at the expense of its ambition to shape global rules and standards, again with dramatic consequences at the global level<sup>3</sup>.

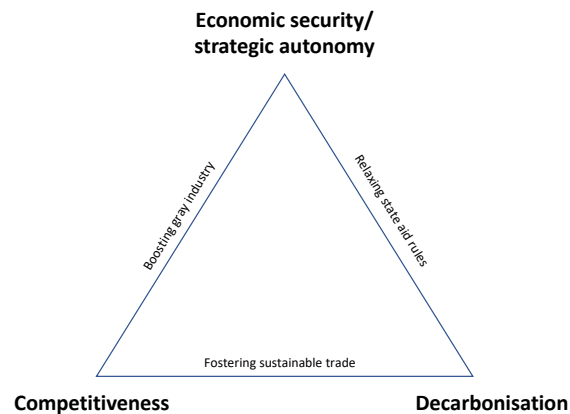
Against this background, Europe is facing a daunting trilemma. It is constrained by the foundational, non-negotiable nature of some of the goals being pursued (not only decarbonisation but also the pursuit of higher global and domestic standards, including fundamental rights, jobs, health and well-being). It is also confronted by the existential risks its industrial sectors are facing, threatened by mounting global competition as well

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<sup>3</sup> Some of these scenarios were also captured in a recent foresight exercise on EU integration in 2040, which outlined the possibility of Europe becoming a 'wretched fortress', abandoning global ambitions or even a 'Chinese province' after losing some of its key Member States ([Renda et al. 2023](#)).

as by an ongoing digital transformation that, in the absence of corrective measures, promises to transfer most of the value to non-EU cloud giants. At the time of writing, still a few months away from the EU elections, the dominant narrative seems to focus on the left axis of the triangle in Figure 4: boosting competitiveness and economic security, with less emphasis on decarbonisation.

Figure 4. Europe's trilemma



Source: Author.

Yet, solving the trilemma without sacrificing sustainability is not impossible, as recently shown by the US revamp of industrial policy through the Inflation Reduction Act and the Regional Innovation Engines programme.

### 3. EU industrial strategy: Mapping outstanding questions

The turmoil that followed the pandemic and the war in Ukraine have led EU institutions to develop goals that respond to economic as well as geopolitical priorities. As explained above, this process is likely to create several trade-offs, which must be unpacked in devising a coherent industrial strategy.

#### 3.1 THE TWIN TRANSITION AND EUROPE'S PRIORITIES

The twin transition is often quoted as being a priority in Europe's quest for sustainable competitiveness. Yet, many digital technologies and business models are deeply incompatible with economic, social and environmental sustainability goals, be that because of the concentration of market power, the treatment of workers or the energy consumption of data centres and deep learning models. A mapping of the digital solutions that are compatible with the twin transition is thus extremely important, but still lacking at the EU level.

One notable exception is the attempt to develop technological solutions that are trustworthy. This was the case of AI, for which the EU High Level Expert Group on it originally included an orientation towards societal and environmental well-being among the key requirements of trustworthy AI. However, the European Commission excluded this requirement from its proposed AI Act, and the European Parliament is trying to reintroduce it in the final version to be agreed upon during the trilogue.

Another important issue related to the twin transition is the hierarchy between 'green' and 'digital'. While the current narrative in Brussels seems to refer to the two transitions as equally important, in reality climate goals and targets should be given higher status, as they are rooted in the goals of the EU as well as in its international commitments (e.g. in COP21). Hence, digital technologies should be seen as functional to a systemic transformation of industry and society, towards more sustainable and resilient paradigms. For this same reason, as will be discussed in the next section, the Industry 4.0 paradigm cannot be considered sufficient to drive a meaningful twin transition.

The following overarching questions deserve more in-depth discussion in the coming months, ahead of the elections and the next European Commission.

- Q1. Which combinations of green and digital technologies maximise impacts on sustainable competitiveness, and in which sectors/ecosystems are such combinations most likely to materialise?
- Q2. What geopolitical developments and other potential future events and scenarios could affect Europe's sustainable competitiveness in these technologies, under an alternative future scenario?
- Q3. Which digital technologies and governance/business models are the most appropriate to foster the green transition and sustainable competitiveness, thus warranting a deviation from the technology neutrality principle in setting policies?
- Q4. What link is there between digital technological developments and the green technologies needed to realise industrial transition pathways as identified in the EU's industrial policy?
- Q5. Should (and will) Europe's relative technology specialisation and leadership affect the choice of which transition pathway Europe should focus on in specific ecosystems? This involves, e.g. deciding whether Europe should prioritise future industry scenarios in which it has greater autonomy, and thus economic security, in order to minimise exposure and vulnerability (see [Arjona et al. 2023](#)).
- Q6. Which geographical areas in the EU have the highest technological specialisation in key parts of the value chain of those digital and green technologies?
- Q7. Which regions of Europe possess the skills that will be needed to implement a human-centric, sustainable and resilient approach to the deployment of those digital and green technologies?

### 3.2 MAINSTREAMING DECARBONISATION AND JOBS IN THE 'INDUSTRY 4.0' PARADIGM

The Fourth Industrial Revolution (4IR) or Industry 4.0 paradigm pursued so far by DG GROW and at the international level (particularly by the World Economic Forum) has many commendable features, such as attention to the deepening of digital technologies in cyber-physical objects. However, it has been criticised for lacking sufficient emphasis on the complementarity between humans and machines/connected objects and on a true human-centric approach to the industrial transformation. Other criticisms include a lack of attention on the creation of good-quality jobs and a limited focus on resilience and sustainability.

Understanding whether the transition to a broader framework, such as Industry 5.0, would be a smart choice for Europe entails giving a transparent response to which model

of industrial transformation is most appropriate for the current strategic positioning of the EU in the global competition for industrial goods and services. At a minimum, a greater attention to the creation of 'good jobs', especially after the emergence of generative AI models, seems to be in order, and was only partly reflected in the proposed launch of net zero academies as part of the EU's new Net Zero Industry Act.

Harvard economist Dani Rodrik recently [observed](#) that while 'climate change is the biggest threat to our ecological environment, labor market shocks are the biggest threat to our social and political environment'. One of the consequences of this is the full mainstreaming of job quantity and quality in the design of industrial policy. And given the specificities of regional specialisations and competitive advantages in the US, another is the conflation of industrial policy with local, community-based development. Echoing this discussion, [Renda, Bosoer and Balland \(2023\)](#) discuss the potential mainstreaming of job quantity and quality in the development of a future industrial policy at the EU level.

More recently, industrial policy interventions in the US have proven that the goals of sustaining industrial manufacturing and services, fighting climate change and pursuing good jobs at the same time is possible. The Inflation Reduction Act, according to an [independent study](#), has boosted investments in clean energy and the climate that have already created more than 170,000 jobs, and are projected to create more than 1.5 million additional jobs over the next decade. This is also due to the conditions imposed by the Biden administration, which relate to both clean energy and the creation of good jobs. Another [study](#) commissioned by the BlueGreen Alliance from the Political Economy Research Institute at the University of Massachusetts Amherst is even more optimistic. It finds that 'the more than 100 climate, energy, and environmental investments in the Inflation Reduction Act will create more than 9 million good jobs over the next decade – an average of nearly 1 million jobs each year'.

The imperative of creating good jobs, alongside decarbonisation and industrial competitiveness, is deeply embedded in the Biden administration's industrial policy efforts. Proof can be found in the administration's decision to largely align with the definition of good jobs adopted by the [Good Jobs Champions Group](#), made up of more than 100 industry, labour and philanthropy leaders convened by the Aspen Institute. Moreover, the CHIPS Act imposes clear conditions related to the creation of good jobs, which according to Secretary of Commerce Gina Raimondo will translate into 'hundreds of thousands of good jobs that have the potential to change lives, offer family-sustaining benefits, and lead to long-term careers'. Finally, to receive the full value of the tax credit provided by the Inflation Reduction Act, recipients have to commit to paying a relatively high wage and utilising a certain percentage of registered apprentices in their projects.



Addressing the trilemma between economic security, decarbonisation and competitiveness requires Europe to find a way to use conditions in a pan-European industrial policy effort. It also requires that the Industry 4.0 paradigm is made consistent with these goals, independently of the label used to signify this change ([Industry 5.0](#) being one of the terms used to represent a more human-centric, resilient and sustainable approach to industrial transformation). With this in mind, several questions remain unanswered, as listed below.

- Q8. What are the dynamics between Industry 4.0 and the green transition? Here, there is a need for deeper understanding, as highlighted also by other researchers (e.g. in [Berg et al. 2021](#)), in particular of the enabling of circular economy practices powered by cyber-physical objects (e.g. the Internet of Things (IoT)).
- Q9. Under what conditions can Industry 4.0 approaches impact the green transition? Industry 4.0 business models can lead to distributed/decentralised architecture, in particular with the implementation of Edge/Cloud/IoT technology. The relevance of design for the environmental compatibility of Industry 4.0 solutions should be subject to more in-depth study, leading to guidance on, inter alia, what level of decentralisation maximises the energy-saving potential of cyber-physical objects, and for what use cases (see e.g. [Renda and Laurer 2020](#)).
- Q10. Under what conditions can Industry 4.0 lead to the creation of sufficient good jobs? The creation of high-quality jobs for all is extremely salient, e.g. with respect to the SDGs and in modern interpretations of industrial policy.
- Q11. What future technology trends can possibly affect Europe's ability to successfully deploy Industry 4.0 solutions in a way that create sufficient employment? For example, the emergence of generative AI seems to cast darker shadows on future job creation, leading to more consolidated findings of job substitution ([Renda et al. 2023](#); [TTC 2022](#)).

### 3.3 THE SINGLE MARKET AND THE EU'S LONG-TERM GOALS

The single market is widely praised at the EU level as a driver of growth, accounting for a significant portion of GDP (12-22 % according to [Lehtimäki and Sondermann 2022](#)). However, as the priorities of the EU shift, a deeper analysis should be undertaken of the impact of alternative scenarios for economic integration on goals such as inequality, social and economic sustainability and economic security. This does not mean reopening discussion of whether economic integration in goods and (possibly) services is good for Europeans or not. Rather, it means discussing whether the single market should allow for distortions such as rather generous state aid, in the name of strategic autonomy or economic security; and whether these deviations are justified by other goals such as

sustainable development or making the EU a leader when it comes to investment in green business.

The past months have been characterised by a vibrant debate on the possibility of relaxing state aid to allow Europe to pursue more proactive industrial projects, seeking to bridge the gap created by the US Inflation Reduction Act and boost the competitiveness of national industry. The evident shrinking of the EU economy compared with the US (EU GDP was 91 % of US GDP a decade ago, but now it is 65 %) has raised a clear alarm among businesses and policymakers. Yet abandoning the single market as a level playing field to allow for more generous state aid does not seem to be a good solution for at least three reasons. First, state aid is by definition national, which prevents the EU from setting up pan-European, macro-regional projects that would boost its competitiveness. Second, state aid has already become easier to introduce since the pandemic, yet the economic and industrial boost of this move does not seem to have materialised. And third, the relaxation of state aid rules typically favours only a fistful of large European countries, and in particular Germany and (to a lesser extent) France, and as such reduces social cohesion and exacerbates inequality across the EU.

Moreover, the alignment of current state aid policy with decarbonisation objectives appears increasingly [shaky](#), with France and Germany veering towards nuclear energy and the re-firing of coal plants, respectively. As reported by the European Commission in the *State of the Energy Union Report 2023*, last year saw a surge in fossil fuel subsidies (reaching EUR 123 billion), whereas subsidies paid to renewable energies fell slightly; more than half of the fossil fuel subsidies have no end date yet or an end date after 2030.

Given this backdrop, the future of the single market depends on Member States' willingness to find a 'third way' between a purely market-based view and the relaxation of state aid rules. This third way, presented in Section 4 below, requires the design of a truly pan-European industrial policy, respectful of local specificities and place-based innovation, and attentive towards the creation of synergies and interrelations across national borders.

Today, the focus on the single market as a driver of growth is far from enabling this more integrated view. The Communication on an update of the EU's industrial policy, released by the European Commission in May 2021, came with the definition of extensive indicators to track the progress in completing the single market, but not yet with indicators related to the single market's contribution to systemic industrial transformation, towards decarbonisation, economic security or competitiveness.

Here, future questions to address include the ones listed below.

- Q12. How can the single market contribute to the creation of the specific technological solutions that correspond to the identified industrial transition pathways? This relates to embracing a mission-oriented view of the single market, and taking the needed actions at all levels of government along the desired pathway (for insights and examples, see [Vandermeeren 2022](#)).
- Q13. Are there different future configurations of the single market, which may have different impacts on sustainable competitiveness? For example, options could encompass centralised vs decentralised governance options, as well as a specific emphasis on regional smart specialisation, coupled with ad hoc rules and principles. This also calls for a better specification of the relationship between place-based innovation and the single market.
- Q14. Which alternative future scenarios for the single market feature the strongest impacts on the six axes of sustainable competitiveness, and for which industrial ecosystems? Are there trade-offs between the different axes (e.g. one scenario performs better on some of the six axes, and other scenarios perform better on other axes)?
- Q15. Should industrial policy trump the level playing field of the single market through loose state aid policies for certain ecosystems and ‘missions’? What are the possible mitigating measures (e.g. InvestEU and the Innovation Fund) and how can they be used in a truly mission-oriented way?

### 3.4 PURSUING SPECIFIC GEOGRAPHICAL IMPACTS OF THE EU’S INDUSTRIAL STRATEGY

Current trends in industrial policy, including in the US, have highlighted the need to move away from a purely centralised, top-down industrial policy. Embracing economic complexity ([Hausmann 2014](#)) and focusing on geographical aspects and impacts can offer more effective solutions to ensure a balanced transition towards the well-being of all of society, as well as a good match of technological specialisation and relatedness with available skills and local needs. [Rodrik and Sabel \(2022\)](#), in their quest for an industrial policy for good jobs, and [Muro et al. \(2022\)](#), in unpacking recent US initiatives to promote domestic economic development, point at the return to a place-based industrial policy as a way to avoid the deep polarisation of the economy observed during purely growth- (and largely market-) based years. The recent designation of 31 Tech Hubs in regions across the US, in line with other initiatives mentioned above, aims at boosting technological

innovation, strengthening competitiveness, protecting national security and also creating good jobs throughout the country<sup>4</sup>.

In Europe, emphasis on place-based industrial and innovation policy has emerged in select institutions and research units, including the JRC and the Committee of the Regions (see, inter alia, [Cinar et al. 2023](#)). But the integration of place-based industrial policy with EU-level industrial policy is still limited. This potentially hampers alignment between industrial policy and goals such as the reduction of inequality, the 'leave no one behind' principle, the launch of consistent, smart specialisation strategies for sustainability (S4), and the overall link between the *Playbook for Regional Innovation* and the EU-level transition pathways and EU Missions, among others.

Three main streams are emerging in this domain. First is the need for place-based solutions to green investment in cities, which (at least in UK and US debates) promise to deliver massive benefits in terms of reaching the net zero target. Second is the need to tailor policy measures to local specificities, going beyond compensatory approaches such as those implemented so far as elements of a 'just transition', and empowering communities as a form of competitiveness, resilience and sustainability. Third is the need to identify large-scale local projects that require ad hoc solutions and action at different levels of government, in order to generate significant results in terms of sustainable competitiveness (e.g. the [HYBRIT project](#) in northern Sweden).

Most importantly, future industrial policy at the EU level should embrace the richness, heterogeneity and complexity of the single market, identifying and predicting those areas in which existing technological specialisation and skills could lead to the emergence of competitive technology hubs in the future. This approach, advocated by, inter alia, [Haussmann and Ahuja \(2023\)](#), is also reflected in other recent publications, such as those by [Balland, Bosoer and Renda \(2023\)](#) and [Balland and Renda \(2023\)](#). This approach entails analysing the technological specialisation of individual geographical areas in the EU; observing the current jobs and university specialisations at the regional level; computing the technological relatedness of different specialisations across regions; identifying hubs and possible interrelations/complementarities across regions; and building a specific vision for the industrial development of each European region in the coming years, possibly related to each industrial ecosystem. As an example, [Balland and Renda \(2023\)](#) identify five main AI hubs in Europe, and observe that the level of interaction between those hubs is minimal at best.

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<sup>4</sup> Tech Hubs are located across 32 states and Puerto Rico, and represent a cross-section of urban and rural regions. The Tech Hubs focus on industries ranging from autonomous systems and quantum computing to biotechnology, precision medicine, clean energy advancement, semiconductor manufacturing and more.

Against this background, the following questions remain outstanding, and await an answer to inspire future EU industrial policy.

- Q16. How can local characteristics and regional specialisation meaningfully contribute to the design of industrial transition pathways?
- Q17. What are the points of contact between cities as platforms for local industrial solutions and EU industrial policy? (For example, can the Mission on Climate Adaptation in Cities contribute to the definition of transition pathways? Or should there be a dedicated pathway for local solutions?)
- Q18. How can large-scale projects with a strong regional dimension, like HYBRIT, be placed under a special regime that facilitates solutions across levels of government?
- Q19. How to identify and source industrial transformation proposals with clear place-based features (e.g. awards such as the Regional Innovation Engines in the US)?

### 3.5 MAKING THE MOST OF INDUSTRIAL TRANSITION PATHWAYS

One of the novelties of the Von der Leyen Commission has been the introduction of a new way to look at European industry sectors, clustered around 14 industrial ecosystems<sup>5</sup>. Initially, the 14 ecosystems struggled for a firm footing in the realm of EU industrial policy. That is partly due to the difficulty of using indicators to monitor progress at the right level of aggregation (at least confidence indicators have been [released](#)) and partly to the perceived urgency of protecting the single market, which dominated the update of the EU industrial strategy in 2021. Lately, industrial transition pathways have been launched for most of the ecosystems, with a view to enabling a multi-stakeholder dialogue with the participation of industry, public authorities, social partners and other stakeholders. This has been possible thanks to the creation of a High-level Industrial Forum, launched in 2021, which prepared a blueprint for transition pathways, and further adjusted the blueprint in view of Russia's war against Ukraine.

The resulting blueprint is focused, once again, on 'sustainable competitiveness', centred around the twin transition. However, it leads to the co-creation of scenarios by incumbent players, which inevitably hampers the likelihood that ground-breaking systemic transformation pathways will be embraced. Moreover, it insufficiently addresses the need for alternative futures (only the addendum to the blueprint mentions

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<sup>5</sup> These are aerospace and defence, agri-food, construction, cultural and creative industries, digital, electronics, energy-intensive industries, energy renewables, health, mobility-transport-automotive, proximity, the social economy and civil security, retail, textile and tourism.

foresight and risk analysis), at a time when uncertainty and a portfolio approach to achieving long-term sustainability goals is an imperative.

So far, the pathways take a rather deterministic view of where a specific ecosystem will be going in the coming years, which in turn triggers R&I support, regulatory reforms and other policy measures. In other words, the process does not lead to building alternative futures for the individual European industrial ecosystems, yet directly incorporates the objectives of competitiveness, resilience and strategic autonomy into the selection of the desired pathway. Finally, the blueprint does not sufficiently emphasise regional specialisation or place-based innovation in mapping the potential contributions to the individual ecosystems. Current examples, such as the [transition pathway for the chemical industry](#) or the one on [construction](#), confirm the limited focus on geographical impacts.

Recently, a dedicated [Flagship Project](#) was launched to support the industrial ecosystems with measures to simplify administration and governance, to protect and promote intellectual property, and to upskill and re-skill the workforce.

Key outstanding questions on ecosystems include those below.

Q20. Are transition pathways 'betting on one future', and how likely is that future to materialise? Are there possible/plausible future geopolitical, natural, socioeconomic and technological shocks that may hamper the achievement of the desired pathway, which have not been duly considered?

Q21. Do transition pathways sufficiently incorporate a human-centric, resilient and sustainable view of the future of work? In other words, do the desired transitions consider future good jobs and how to develop the related skills? So far, the transition pathway documents limit themselves to launching a process of skills mapping coupled with extremely vague actions (in the case of construction, see Topic 23).

Q22. Are transition pathways differentiated enough across European regions, identifying possible areas where the ecosystem will flourish in future?



## 4. Implementing a coherent, agile, goal-based industrial policy in the EU

Caught between too many priorities and an incomplete set of policy tools, EU-level industrial policy is at a crossroads and faces significant risks of impasse in the coming years. This analysis assumes that the EU wants to maintain a high level of ambition for its industrial policy and will address the possible trade-offs between decarbonisation, good jobs, economic security, resilience and competitiveness by designing a new approach to industrial policy with well-defined goals.

In line with recent developments at the global level and in the scientific literature, the EU should also include conditions (both green and good jobs), foresight and place-based innovation in its industrial strategy. It should aim at a systemic industrial transformation rather than an incremental, path-dependent transition in industrial ecosystems. Finally, a third way needs to be found between the purist view of the single market and the current 'state aid far west'.

Overall, a future EU industrial policy should thus incorporate at least the following elements:

- a clear distinction between intermediate and ultimate goals (the latter possibly based on sustainable development or 'people, planet and prosperity' pillars);
- a foresight-based approach that builds in uncertainty and makes use of risk management and stress-testing strategies, along with pathways for enhanced resilience, especially of supply chains;
- a polycentric governance approach, based on a granular understanding of differences and technological relatedness across European regions, which aims at clearing specific paths for large-scale industrial investment;
- a human-centric, resilient and sustainable approach to systemic industrial transformation in the formulation of transition pathways, turning them into concrete 'transformation pathways' and crucially including the dimensions of good jobs and economic security.

Below, Section 4.1 clarifies the difference between intermediate and final goals. Section 4.2 explores the concepts of foresight, backcasting and multistage decision-making as an emerging approach to policymaking in times of uncertainty. Section 4.3 then outlines the elements of a future comprehensive industrial policy at the EU level.

### 4.1 DISTINGUISHING BETWEEN INTERMEDIATE AND FINAL GOALS

A key distinction in modern goal-based policymaking is between intermediate goals or targets, and ultimate or final goals or objectives ([Giovannini 2011](#)). In this respect, there

is a degree of confusion in the EU policy debate, as many intermediate objectives are treated as final goals, and vice versa. In goal-based policymaking, decision-makers have to set goals that correspond to the 'preferred future': such goals should be related to impacts and specific conditions for people, planet and prosperity. As explained above, once these goals have been identified, policymakers' navigation towards these goals could be facilitated by the adoption of ad hoc criteria, methods and tests to verify that current policies are on track to achieve the desired goals within a given time horizon (e.g. 2030).

Distinguishing between intermediate and final goals is possible and useful for establishing hierarchies among policy objectives. For example, imagine that EU leaders aim at achieving higher levels of prosperity by 2030 for as many people in Europe as possible (à la Bentham). Does it ultimately matter if these goals require a departure from the 'purist', market-based view of the single market? No, unless one can prove that such a deviation makes it impossible for Europe to achieve the final goal (prosperity). The integrity/remodulation of the single market is then an intermediate, rather than a final goal for EU policy.

However, could the prosperity goal be achieved in a way that wildly violates planetary boundaries? Unless EU leaders change their vision, as things stand the goals of 'planet' and 'prosperity' are to be placed on an equal footing. Accordingly, respecting planetary boundaries through effective decarbonisation should be included among the EU's final goals.

The same can be said about the protection of fundamental rights and human flourishing ('people'). By contrast, a similar reasoning puts strategic autonomy, technological sovereignty, the twin transition and even sustainable competitiveness among the (very important, yet still) intermediate goals of the EU. Intermediate goals could then be classified as 'neither necessary nor sufficient', 'necessary but not sufficient' or 'necessary and sufficient'. In the latter case, they would become critical milestones for the EU to achieve its long-term people, planet and prosperity goals.

Another important distinction introduced in the scientific and grey literature is between promoting the well-being of the current generation and securing intergenerational altruism by nurturing the 'Four Capitals' (natural, human, social and economic capital), as explicitly promoted in countries such as [New Zealand](#) and [Canada](#) and at the regional level in [Scotland](#). A meaningful medium- to long-term strategy for Europe would imply embracing the Four Capitals framework and mainstreaming it in all horizontal and (relevant) sectoral policies of the EU.

## 4.2 FORESIGHT, BACKCASTING AND MULTISTAGE DECISION-MAKING

Three additional features are essential in a future industrial policy, as remarked above: (i) the incorporation of alternative futures in industrial pathways; (ii) backcasting from final goals to the current situation; and (iii) the inclusion of uncertainty in the policy implementation phase. These are briefly explored below.

First, embedding foresight and alternative futures when shaping EU industrial policy, as well as pathways for industrial transition (or transformation, see below Section 4.3), is an important way to achieve two objectives:

- the mainstreaming of radical uncertainty in the design of the policy, thereby possibly including risk identification and mitigation strategies through regular horizon scanning; and
- the adoption of a portfolio approach to industrial transformation in which, depending on the circumstance, the EU could achieve its goals through a menu of possible strategies, following mission-oriented industrial policy actions ([Mazzucato and Kettel 2023](#)).

To achieve these changes, the ongoing activities of the JRC and DG Research and Innovation would need to be further embedded in the preparation of industrial transformation pathways, and translated into a risk management strategy for the full duration of the pathways.

Second, backcasting has been [defined](#) by the World Health Organisation as ‘moving step-wise back in time from a future scenario to the present in order to identify the decisions and actions that must be taken at critical points if the scenario is to be achieved’. Backcasting is typically coupled with foresight, and involves the identification of possible ways to achieve the desired future goals from the *status quo*. As explained in [Ashford and Renda \(2016\)](#), in industrial policy decision-makers may have to face a double backcasting challenge: understanding what kind of innovation (or alternative innovation paths) could lead to achieving the set goals, and what kinds of policy mixes (at various levels of government) could potentially trigger that innovation.

Third, a medium-term strategy adopted in times of uncertainty may imply the identification of critical junctions or milestones at which possible course-correction would be needed. This is essential for the strategy to succeed, as it further embeds a risk management approach.

To understand how multistage decision-making may work in this respect, assume that a policymaker faces two possible future states of the world (‘better’ and ‘worse’), and that there are three alternative pathways (A, B and C) to achieve the desired goals in a given

industry sector. Assume also that A is by far the preferred option if the better scenario materialises, yet B is the best if the worse scenario occurs. Furthermore, the policymaker knows that in 5 years it will become clear which of the scenarios (better or worse) will eventually materialise.

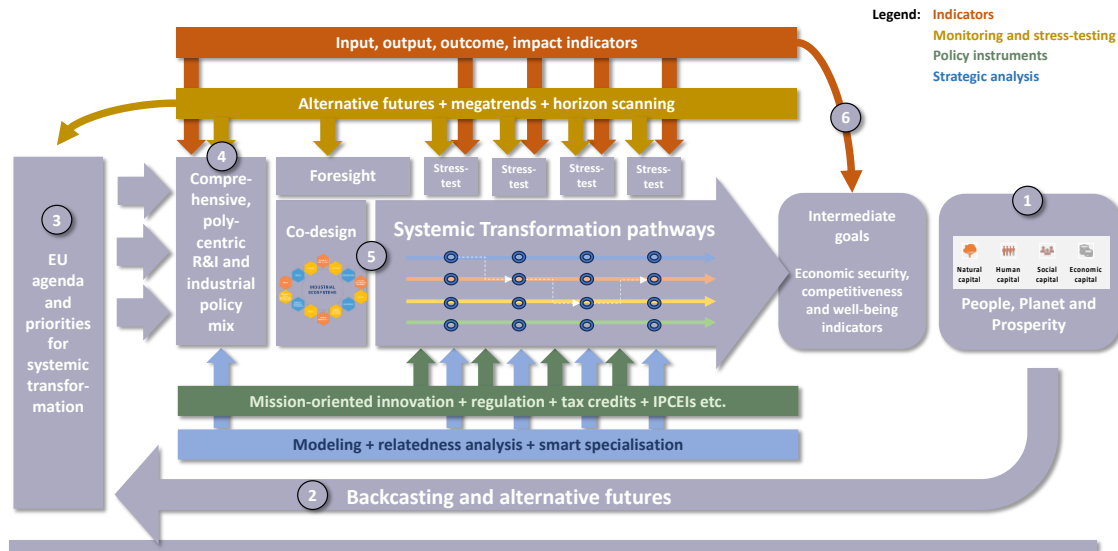
Under such uncertainty, deciding between A and B could be difficult, and the policymaker may have to decide based on the 'real option' value of the scenario. For example, if scenario C allows for more effective course-correction (towards A or B) after 5 years, it may eventually be chosen as the preferred option from a risk mitigation and a portfolio-based viewpoint.

This approach, commonly used in finance and investment decision-making, is gaining attention also in the domain of public policy: in cases of extreme uncertainty, leading authors such as [Sunstein \(2021\)](#) even suggest placing more weight on less desirable (catastrophic) scenarios, to avoid cascading effects.

### 4.3 A MULTISTAGE PROCESS FOR SYSTEMIC INDUSTRIAL TRANSFORMATION

Putting together all the changes proposed in this paper, Figure 5 shows a possible six-step approach to future EU industrial policy. The figure sketches a framework that goes from the entry into office of the next Commission in late 2024 to the end of the following decade. The steps are described in more detail below.

Figure 5. A six-step approach to EU industrial policy



Source: Author.

### *Step 1. Selecting the final goals*

In this phase, policymakers would have to choose the North Star, ideally aligned with people, planet and prosperity, and certainly going beyond the goal of maximising GDP growth or competitiveness. These goals, once agreed upon by the Council, should also be fully mainstreamed in the multilevel governance of the EU, namely in the European Semester and cohesion policy, as well as in trade policy, large-scale spending programmes and single market policies. Ideally, they should be spelled out for both 2030 (end of the legislature) and 2040 (longer term). Even more ideally, they should be discussed with a large group of stakeholders.

### *Step 2. Backcasting and alternative futures*

The final goals selected in Step 1 would have to be analysed in terms of their feasibility under a variety of alternative future scenarios. These should account for macro trends (as already monitored by the JRC), horizon scanning for future technologies and the modelling of future shocks. The key question here is what alternative pathways would lead the EU to achieve its final goals, under a variety of alternative scenarios. Related ones are how to avoid worst-case scenarios and whether to pay extra attention to possible moves that make the worst-case scenario more plausible (e.g. ‘averting catastrophe’ or *maximin* strategies). Once the final goals are clear, the backcasting activity implies that policymakers ask themselves the following sets of questions:

- What societal and economic changes would lead Europe to achieve these final goals? What intermediate goals would be necessary? What steps should be avoided at all cost?
- Which policies and investment programmes are likely to make goal achievement more likely? Which ones are most likely to shield Europe from shocks?

In answering these questions, policymakers may want to adopt a mission-oriented approach, which implies a portfolio of policies with enhanced attention to the possibility of course-correcting these policies over time.

### *Step 3. Setting the agenda and policy priorities*

Step 3 should translate into a multiannual policy and investment programme, aimed at realising the actions identified in the backcasting. The Commission’s work programme should mention the new legislative and investment initiatives planned for the year ahead, and their link to the intermediate and final goals for 2030 and 2040. The publication of the work programme should be accompanied by a stocktaking communication on the progress achieved towards the 2030 goals.

#### *Step 4. Formulating a comprehensive, polycentric R&I and industrial policy mix*

This involves a comprehensive, multilevel industrial policy aimed at achieving economic security, competitiveness, sustainability and good jobs, to be spelled out more concretely in the form of transformation pathways (see the next step). The policy mix should include, at a minimum:

- a new pan-European investment programme financed with own resources, replicating NextGenerationEU yet with the aim of taking much more consistent, centrally coordinated and locally tailored actions;
- a better regulation agenda that fully mainstreams resilience and sustainability ([Renda 2021](#)) by, inter alia,
  - incorporating alternative futures in the definition of the baseline (or 'option zero');
  - making the 2030 goals the basis for comparing alternative options (under a multi-criteria analysis framework that replaces cost-benefit analysis);
  - using indicators related to the 2030 goals as the basis for evaluating policies over time;
  - building in stress-testing and experimentation (e.g. sandboxes) to test possible ways to improve the effectiveness of policy options, as well as their alignment with the 2030 goals;
- the design of a work programme for research and innovation (through the next framework programme) that is much better coordinated with cohesion policy and Structural Funds, and more aligned with the direction set by the pan-European investment programme;
- the identification of a number of large-scale industrial transformation projects that can significantly advance the pursuit of the 2030 goals (example, the [HYBRIT](#) project). These projects would be accompanied by fiscal measures, tax credits and ad hoc, simplified permitting arrangements and coordinated subsidies where needed (replacing state aid). Crucial conditions would include decarbonisation, economic security and the creation of good jobs;
- a regional/cohesion policy that is explicitly complementary to the EU-level measures, as well as an in-depth analysis of the economic and technology specialisation of each region. The hitherto isolated notion of smart specialisation, at the regional level, should be applied through an integrated programme to exploit Europe's key technological knowledge and skills as part of a comprehensive plan to raise living standards across the EU. The identification and interlinking of regional hubs (similar to the US Tech Hubs), along with modelling based on economic complexity indicators, should be a key part of this phase;



- a new strategy for the restructuring and resilience of supply chains, based on evolving priorities related to enlargement and external action (e.g. the Global Gateway programme).

#### *Step 5. Co-creating and implementing systemic transformation pathways*

The horizontal policies described above should then translate into consistent priorities at the ecosystem level. Transition pathways could be revamped as systemic transformation pathways, and should be designed in a way that leverages the (actual and potential) economic and technology specialisation of the EU's different regions. In this phase, particular attention should be devoted to the more foundational ecosystems, such as those for energy-intensive industries and for digital, to ensure that the twin transition contributes to meaningful and diffuse progress towards the 2030 goals, accounting for possible shocks along the way. Systemic transformation pathways will have to be expanded to gradually also include accession countries and possibly non-EU countries that participate in key aspects of an ecosystem's value chains.

#### *Step 6. Monitoring and possible course-correcting towards the final goals*

This phase implies selecting input, output, outcome and impact indicators, and then monitoring such indicators against the goals to be achieved. In choosing the direction to take by systemic transformation pathways, policymakers would adopt a mission-oriented as well as a risk mitigation approach, which prioritises (all other conditions being equal) those options that can more easily be course-corrected for shocks and unforeseen events.



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