CEPS TASK FORCE REPORT

EXECUTIVE SUMMARY

TOWARDS A RESILIENT AND SUSTAINABLE POST-PANDEMIC RECOVERY

THE NEW INDUSTRIAL STRATEGY FOR EUROPE

Towards a Resilient and Sustainable Post-Pandemic Recovery

CEPS Task Force on the New Industrial Strategy for Europe

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INTRODUCTION: THE EU'S QUEST FOR INDUSTRIAL POLICY

Industrial policy has traditionally been a rough terrain for European Union (EU) policy and institutions. Both its nature and intensity have changed drastically over the past decades. In fact, during the 1950s and 1960s, the focus was mostly on avoiding that member states did not jeopardise the single market with their own national industrial policy decisions. In the 1960s, for example, state aid rules were designed to prevent member states altering the competitive playing field of intra-Community trade with export aid.[1] These were also the years in which member states sought to create a limited number of European champions. While many of these attempts reportedly backfired, some led to the creation of successful companies such as Airbus, and the mounting concern over Europe's inability to keep pace with the US led to the first attempts to coordinate industrial policy.[2] Many of these attempts, however, failed because of tensions between member states, and an overall hesitancy when it came to abandoning national prerogatives in favour of a more coordinated policy at EU level.[3]

After this first wave, the EU entered a phase of 'industrial policy winter': the emphasis on completing the single market and the gradual implementation of rather laissez-faire economic approaches inspired by the US gradually transformed the words 'industrial policy' into an increasingly taboo oxymoron in EU-level public discourse. On the other side of the Atlantic public policy gradually shifted towards exclusively remedying market failures, in the belief that governments should neither pick winners nor protect losers, but should limit themselves to ensuring competition, favouring innovation and promoting dynamic efficiency. In Europe, as can be seen from the wording of key documents such as the Colonna memorandum (1970), the Davignon Plan (1977) and the Delors plan (1985-1992), leaders gradually moved from a traditional vision of 'big government' to a lighter touch – the protection of consumers and the removal of barriers to intra-Community trade. At the same time, activism in the pursuit of a pan-European industrial policy was ramped up during the 1980s, mostly with initiatives on applied research and development such as ESPRIT, RACE, BRITE and later the creation of the Eureka agency. Against this background, it soon became clear that the progress in market integration had not generated the transformation of Europe's industrial structure that political leaders had expected.[4]

During the 1990s, the extraordinary progress made by the US in information technology and the rise of the World Wide Web shifted the attention of policymakers away from large collaborative efforts in pre-competitive phases of development, to a focus on venture capital and private R&D investment. At the end of the millennium, the Lisbon Strategy set targets for R&D investment and employment but fell short of laying the foundations of an effective industrial policy; by then, indeed, the term 'industrial policy' had become largely outmoded. The Lisbon Strategy was critically affected by a lack of coordination and commitment by member states, leading to a significant dilution of the ambition with the Kok Report in 2004.

The Europe 2020 strategy that followed, launched by the Barroso Commission in 2009 in the midst of the severe financial and economic crisis, tried to 'build back better' by refocusing the EU agenda towards "smart, sustainable and inclusive growth". This was eroded so rapidly by the unfolding post-crisis events that by 2014 the incoming Juncker Commission had decided not to review it, de facto replacing it with a more pragmatic focus on '10 priorities'. This left very little space for a coordinated and ambitious industrial policy, being oriented towards doing less, but more efficiently.[5] Despite the attempt to trigger an 'industrial renaissance' in Europe from 2014, the results have been rather meagre.[6]

Throughout the years, EU institutions and member states have shown increasing concern about the widening productivity gap with the US, and the gradual migration of manufacturing R&D and production capacity beyond the EU. The increased globalisation of value chains and the emergence of new production models such as 'just in time' or 'lean production', coupled with the rise of China as a manufacturing and trade superpower, has increasingly placed the EU in a corner, dwarfed by the rivalry between Washington and Beijing. EU traditions in law, industrial policy and innovation have gradually been replaced by an often explicit desire to emulate US models, including shareholder capitalism in the manner of Friedman, competition law in the manner of Bork, common law-based contractual schemes, a model of

innovation based on venture capital, and a sometimes implicit desire to replicate the American and Chinese cloud-based digital champions.[7]

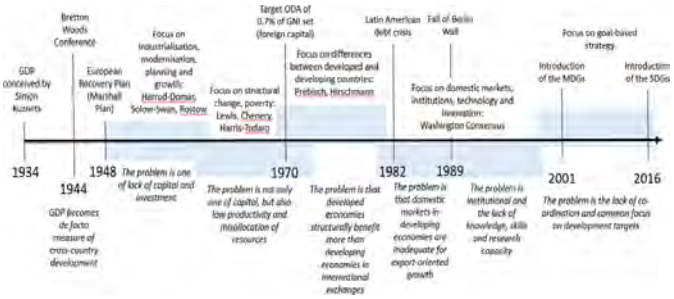
The growing 'performance anxiety' of EU institutions, especially when it comes to innovation, is easy to see in the proliferation of aggregation forms and collaborative investment schemes, which have skyrocketed over the past two decades. Research infrastructures, Knowledge and Innovation Communities (KICs), key emerging technologies, strategic value chains, industry alliances, both contractual and institutionalised partnerships and later missions and Important Projects of Common European Interest (IPCEIs) created a sometimes inextricable puzzle, in need of drastic consolidation.

Even before the Covid-19 pandemic, industrial and economic competitiveness had been extremely heterogeneous across European countries and economic sectors. **European companies are certainly among the most innovative and successful on a global scale**: so-called hidden champions (especially in Germany) have proved that medium-sized enterprises with strong and consolidated know-how can become uncontested leaders in their markets.[8] **The share of the EU in global exports of goods has been remarkably steady over the past decade**. This 'resilience' is remarkable because that of China has increased considerably, implying that the EU has done better than other economies in terms of goods exports. At the same time, **Europe's competitiveness in some manufacturing sectors, especially hi-tech, has increasingly been under pressure** because of the persistent (labour) productivity gap with the US, as well as the emergence of South Korea and China as producers of cheap, hi-tech products. The lack of full market integration, in products and even more so in services, is accompanied by a lack of policy coherence and alignment towards commonly set goals, which in turn depresses Europe's ability to compete on a global scale. And after the financial crisis, the deteriorating conditions of public debt in the EU led to a lack of proactive measures to support industry, and a general slowdown of productivity growth.

The von der Leyen Commission: departing from a growth-oriented narrative?

When the von der Leyen Commission took office in November 2019, the political attention shifted towards a more assertive European Commission, focused on 'competitive sustainability'. Emphasis on the need to reorient policy efforts towards the Sustainable Development Goals (SDGs) resulted in the implementation of these goals in the Semester, as well as in external action. The launch of the European Green Deal, accompanied by the 'Just Transition', increased the salience of social impacts alongside climate targets in the EU, although with an extremely narrow focus. The objective to achieve climate neutrality by 2050, later boosted with the ambitious commitment to cut 55% of emissions by 2030, became the defining trait of the EU as an internal and global change actor. This move also echoed an existing trend at the global level, i.e. the gradual transition from growth-oriented policies, often labelled as the 'Washington consensus', towards goal-based policy, centred around the SDGs. This is a fundamental shift, evoked by several governments, activists, and academics around the world, but only sparsely implemented in practice. More specifically, while a limited number of countries (including New Zealand, Canada, and Sweden) have started to adopt policies that more coherently shift from GDP towards other metrics, such as well-being and sustainability, most governments and regional blocs still essentially talk a Washington consensus language when they adopt and implement their policies. The von der Leyen Commission's bold move to put sustainability upfront has hugely raised expectations among those that have been advocating such a transition for decades.

Figure 1. Waves of approaches to economic development policy



Source: OECD (2017).

The big announcements about the Green Deal and the Just Transition also diverted attention from the lack of bold commitments on certain aspects of the SDGs, in which EU institutions have very weak competences. More work is still to be done in important sectors such as education, health, good governance, and the rule of law, where the current EU multilevel governance

arrangements makes this 'SDG minus' agenda inevitable. And unfortunately, the lack of competences in healthcare and other policy domains became apparent when the worst pandemic of the past century hit the entire planet.

The 2020 Communication on the industrial strategy

Alongside the Green Deal, the von der Leyen Commission immediately started to look at how to adopt an industrial strategy that would promote EU competitiveness and support the Commission's self-assigned 'geopolitical' role by boosting strategic autonomy. In March 2020, with the Covid-19 pandemic already dominating the public debate, the Commission adopted a Communication on 'A New Industrial Strategy for Europe'. This asserted that the 'twin transition' (green and digital) was a unique opportunity for the EU to "affirm its voice, uphold its values and fight for a level playing field", adding that this "is about Europe's sovereignty".[9]

The Communication also stated that "Europe's industrial strategy must reflect our values and social market traditions", which translates into an industrial policy focused on competition and open markets, rather than a revamp of protectionism or large industry subsidies. Europe's values and traditions, of course, do not end with its unique approach to competition, which is gradually evolving to adapt to the peculiarities of the digital economy, and is increasingly under pressure to align with more proactive industrial policy objectives.[10] **Europe's values and traditions are also rooted in its approach to innovation, to contracts, and to corporate governance and finance. The emphasis is on protecting small and medium-sized enterprises (SMEs), protecting fundamental rights and mainstreaming sustainability in all EU policies.** The 2020 Communication did not venture systematically into all these areas, but constantly referred to them in setting priorities for European industry.

The Commission also rightly argued that **industry must play a leading role in helping the EU achieve climate neutrality by 2050; all value chains are involved, including existing ones and others to be launched through proactive policy aimed at boosting 'lead markets'**. Value chains should be supported in several ways, by "a secure supply of clean and affordable energy and raw materials", and by sectoral actions in key markets such as steel, chemicals, construction, and mobility. The Commission also hinted at the need for a holistic approach to industry support, by adding that "regulatory policies, public procurement, fair competition and the full involvement of SMEs will be essential to make this happen".[11]

On the 'home front' of EU policy, key pillars of the Communication included actions on strengthening the EU's specialisation in critical digital technologies such as 5G, artificial intelligence (AI) and metadata analytics. The single market would be deepened by adopting an SME-centric approach,[12] revamping competition rules, including those on state aids, transitioning towards a circular economy, boosting innovation with a relaunch of the European Innovation Council, and leveraging public-private partnerships (PPPs) to help industry develop the technologies needed to meet their goals, upgrading skills available to European industry, and financing investment and innovation.

The Communication also touched on the external dimension of the EU industrial strategy by correctly observing that **ambitious goals in terms of sustainability, climate neutrality and even social policy cannot be obtained if Europe fails to act to establish a level playing field with other countries.** Key initiatives include the development of a deeper EU industrial base in strategic areas such as critical digital technologies, defence and space, and pharmaceuticals, and adopting legal and regulatory measures to rebalance global competition, including a screening mechanism for foreign investment, the enactment of a Carbon Border Adjustment Tax, and reinforcing customs controls.

Figure 2. Industrial Ecosystems in Europe

Source: European Commission (2021).

The provisions relating to governance included in the Communication, however, lacked sufficient clarity on how the implementation of the industrial strategy would be ensured. The Commission announced several steps, including a **focus on industrial ecosystems** (14 clusters of sectors and value chains that the Commission has started to adopt as a way to 'read' the European economy, as shown in Figure 2);[13] **the launch of a multistakeholder industrial forum** with the task of assisting the Commission in tracking the implementation of the industrial strategy and developing the work on ecosystems; and support for the instrument of **industrial alliances**, which has reportedly already proved beneficial in areas such as batteries, plastics, microelectronics, and hydrogen.

Against this background, however, **the March 2020 Communication fell short of laying the foundations for a complete set of governance arrangements**, which would have immediately ensured coherence between the several actions foreseen in the strategy, as well as the achievement of clear, measurable, and consistent impacts. It **lacked a set of indicators for monitoring and evaluating progress**, a big omission that industry groups and associations swiftly attempted to fill.[14] The Communication also failed to address other governance challenges, including: reorienting the better regulation agenda to ensure that EU law-making is designed to pursue the goals set by the Green Deal and the industrial strategy; enabling reform of corporate governance to boost systemic transformation; explaining how progress would be conceptualised and measured when adopting the 'ecosystem' as the unit of analysis; and reconciling the ecosystems with the several other aggregations and clusters of industry actors used in the same or other areas of EU policy (e.g. data spaces, strategic value chains, alliances, IPCEIs, partnerships, missions, KICs, and research infrastructures).

Some of these unresolved governance problems would likely have been addressed by the Commission in the months that followed the adoption of the Communication. But a serious event came to affect the agenda of the European Commission: Covid-19. The dramatic economic downturn triggered by the pandemic promises to leave an indelible mark on the EU's agenda, including of course its industrial strategy.

The pandemic changed everything, prompting the EU to refocus its strategy

The European Union has already learned several hard lessons from the enduring Covid-19 pandemic. **It emerged quite clearly that the resilience of the Union is lowest where the competences of the EU are weakest, as in healthcare**.[15] The need to reorient the EU's action beyond the areas originally identified as key priorities of the von der Leyen Commission also led to an overall shift in the focus of EU action during the first year of the pandemic.

In particular, **the need to ensure greater resilience has now become the top priority for EU institutions**, with several consequences for EU industrial policy. While EU policy aimed for 'competitive sustainability' before the pandemic, the post-pandemic recovery is aiming to achieve both resilience and sustainability, which in turn requires bolder action on all fronts. This includes: the systemic transformation of industry value chains; an ad hoc approach to digitalisation; a careful and pervasive mapping of the EU's dependencies on other powers, especially in key technologies and raw materials; and a renewed focus on mitigating the impact of the pandemic on labour markets, accelerating the up- and reskilling of workers in sectors that are likely to experience the worst downturn.

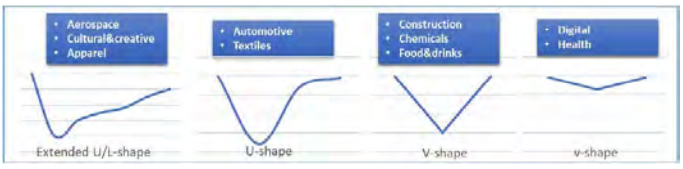
Greater coordination, however, does not necessarily imply greater centralisation. Resilience and sustainability have been insufficiently researched until now, but the pandemic has revealed that **decentralised governance** has **both features in many industrial settings**. In particular, the decentralisation of decision-making and value distribution in complex value chains, and the adoption of more decentralised governance in the digital ecosystem (e.g. through edge computing) represent key new frontiers for the EU in the attempt to reconcile competition, coordination, efficiency, resilience and sustainability.[16] **Decentralised governance approaches also become an essential way to empower all those industry sectors** that, with the (accelerated) digital transformation, are at risk of losing control of the value they generate. This is a concrete risk in several 'ecosystems', from agriculture and food to energy, manufacturing, automotive, and healthcare.

At the time of writing, the latest economic projections imply a rapid but uneven recovery across member states,

with some not returning to the pre-Covid path until 2023. **The projections for the EU are considerably worse than for both the US and China**, which seem destined for an earlier recovery from the crisis as well as sustained growth in the medium term. Notwithstanding the concerns about the tentative nature of these estimates (as well as the questionability of GDP as a measure of prosperity), these prospects show the uphill battle the EU will have to face in defending its geopolitical role in the global order. Some emphasise the danger of the 'scarring' that could be a long-term impact of the pandemic on the economy of many countries.[17] But the crisis is also likely to accelerate change that might improve productivity growth.[18] The key to avoiding scarring while still reaping the benefits of change seems to be to ensure the stability of the financial system, in large part due to the determined action of the European Central Bank (ECB) and the financial supervisory bodies.

When it comes to specific industries, a peculiarity of the Covid-19 pandemic has been the extreme diversity of its impact across and within sectors, as shown by a recent study (de Vet et al., 2021). Enabling industries such as chemicals, construction, and the food and drinks sector are likely to experience a 'V-shaped' recovery from the crisis; and automotive and textile industries will likely be on an earlier recovery path. The worst impacts may occur in sectors that are dependent on human contact and interaction, such as the cultural and creative industries (see Figure 3).

Figure 3. The impact of the pandemic on different sectors of EU industry



Source: de Vet et al. (2021).

Faced with such gloomy prospects, the EU has a moral and political imperative to approach the recovery by triggering a deep economic transformation, and to shift the whole direction of its action towards resilience and sustainability. The cornerstone of the EU post-pandemic strategy will inevitably be found in the Resilience and Recovery Fund (RRF), which provides a once-in-a-generation opportunity for the EU and its member states to pave the way for a coordinated transformation of the European economy. The stakes could not be higher, and the multilevel, public-private effort needed to restore a path to prosperity in Europe cannot be underestimated. In the work of the CEPS Task Force on Industrial Policy, which will be presented in the remainder of this report, we have observed **a sense of urgency, if not emergency**, not only in relation to the pandemic but also to the role of the EU in the world.

The history of EU industrial strategy, as well as the lessons from both the financial crisis and the Covid-19 pandemic, led to identifying future pillars of EU action, including:

- Refocusing all relevant EU and member states' policies towards well-being, resilience, sustainability, and fairness, and measuring progress consistently.
- Developing tools to assess National Recovery and Resilience Plans from the standpoint of the medium-term goals of the Union.
- Adopting an 'Industry 5.0' approach to the twin transition, stepping up the role of the private sector as a protagonist of change, and embedding this new approach in all alliances and multistakeholder efforts to boost EU industrial ecosystems.
- Promote the SDG and resilience agenda internationally, by insisting on measuring progress towards 2030 and beyond as key to measuring economic performance.

In October 2020, the Council invited the Commission to update the March 2020 Communication by embedding these pillars in a revamped industrial strategy for Europe,[19] which it adopted on 5 May 2021.

The May 2021 Communication on updating the EU industrial strategy

In the new Communication, the Commission reaffirms the March 2020 priorities and devotes significant attention to the measures adopted to increase the resilience of the single market. These include: accelerating the work on the forthcoming regulation on foreign subsidies; adopting a Single Market Emergency Instrument to ensure the free movement of persons, goods and services in case of future crises; taking action to improve the implementation of the Service Directive; strengthening the market surveillance of products by supporting competent national authorities; and

mobilising significant investment to support SMEs, including with a dedicated SME envoy, support by 'sustainability advisors', alternative dispute resolution schemes and measures to address solvency risks.

Beyond the protection and enhancement of the single market, the Communication reports the results of a thorough mapping and analysis of Europe's strategic dependencies and 'reverse dependencies', identifying 137 products in 'sensitive ecosystems', on which the EU is highly dependent, showing weaknesses in energy intensive industries, health, and advanced technologies. These 137 products, however, represent only a small share (6%) of total imports. The Commission presents six in-depth reviews on the strategic areas of raw materials, batteries, active pharmaceutical ingredients, hydrogen, semiconductors, and cloud and edge technologies. The resilience objective will also be pursued by taking action to diversify international supply chains and build international partnerships and alliances, in particular on processors and semiconductor technologies, industrial data, edge and cloud, space launchers, and zero-emission aviation.

The work on the 14 ecosystems shown in Figure 2 is boosted by initiatives to co-create 'transition pathways' with industry, public authorities, social partners and other stakeholders where needed, starting with tourism and energy-intensive industries. This is perhaps the most groundbreaking commitment included in the Communication; however, as noted below, **the extent to which this will configure a real *modus operandi* in the Commission is unclear** at the time of writing.

All in all, the Communication shows a remarkable commitment to protecting the single market and promoting competitiveness, productivity and resilience in European industry. However, **its ambition does not go as far as realising the systemic change that President of the Commission Ursula von der Leyen evoked with the Green Deal**. On the side of governance, the Industrial Forum launched in February also seems to have fallen short of the central role in governing the transition that it appeared to have acquired in the run-up to the adoption of the Communication.

Charting Europe's own future: the geopolitics of the post-pandemic recovery

The Covid-19 pandemic has forced the European Union to wake up to a world dominated by geopolitical competition and smell the coffee. Whereas the poly-crisis of the past decade still allowed Europeans to pursue the dream of cooperative, sometimes even global, solutions, the 'grey rhino' (highly probable but mostly neglected high-impact crisis) of the coronavirus crisis has forced the EU to confront the fact that the multilateral, rules-based order which guarantees its security and prosperity is unravelling.[20]

Over the past year, the blame game over the outbreak of the Covid-19 pandemic has soured relations between the US and China, undermining the WHO. In Europe, spats over vaccine nationalism have amplified a debate about the vulnerability of supply chains triggered by Sino-American tech and tariff wars. International trade in goods is likely to slow further post-pandemic. This poses an additional challenge to the multilateral system, especially the WTO and the resolution of trade disputes. At the same time, though, virtual globalisation is likely to accelerate, creating opportunities for multilateral solutions in other domains.

The most important structural feature of tomorrow's international relations is not the multilateralism that allowed the European Union to prosper, but rather a competition between the US and China.[21] In both the US and China, geoeconomics and geopolitics are merging. As a result, the nature of globalisation is changing. Rather than being a tool for de-confliction, interdependence is increasingly being weaponised by the EU's two most important economic partners. And while neither of the G2 powers wants a kinetic war, Covid-fuelled unilateralism has undermined the architecture of international relations and heightened the probability of armed conflict.

With the world's centre of economic gravity having moved toward Asia, and the US and China focusing on control of the Indo-Pacific, **the G2 are less likely to take European opinions into account**. In this era of geopolitical competition that is not focused on the European theatre and follows the logic of power rather than established rules, neighbouring disruptors like Putin's Russia and Erdogan's Turkey are filling the

vacuum and undermining wider Europe's security order and the international institutions that support it.

But Europe still has agency. The EU has a 'trade-regulatory power surplus',[22] some military capabilities and diplomatic dexterity to reduce its vulnerabilities and restore its position in a post-pandemic world.[23] But, unless it acts soon, it will become a pawn in the hands of competing powers rather than a player that protects its interests and values on the world's post-pandemic chessboard.

All of this has created a demand for more 'European sovereignty'.[24] While developed in the realm of external action to operationalise the EU's response to military aggression and hybrid threats by neighbouring and farther-flung adversaries, **the notion of 'strategic autonomy' has been expanded to increase Europe's self-sufficiency and boost its own industry in the wake of the Covid-19 pandemic**. Since its first-ever Strategic Foresight Report (September 2020), the von der Leyen Commission's transition-led agenda is guided by a compass of strengthening resilience and sustainability of the EU economy in a world tainted by Sino-American rivalry. **The mindset behind the Commission's new trade strategy is one of 'open strategic autonomy'**: the EU wants to be a trade actor in its own right and to shape the world around it in line with its own interests and values, working with others where it can, autonomously where it must. **'Autonomy', therefore, does not amount to 'autarchy'.** The strategic choice of openness means that the EU prefers to act multilaterally and with like-minded countries, such as the United States.

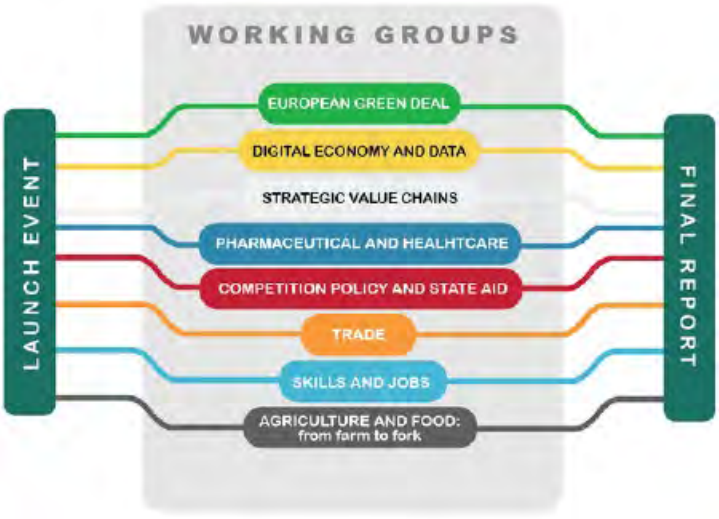
Like its predecessor, the Biden administration is keen to rewrite rules which it feels constrain the US while giving China a free pass. In the face of growing lawlessness, and in order to secure the Europe's future economic prosperity, **Brussels is happy to rewrite many of these rules, as long as an external body is able to ensure that the writ of the law is enforced**. This requires getting the WTO and its reform agenda unstuck. Here, Europeans are finding that the American offer to Europe is one of tough love. Even if the transatlantic partners are reunited in their support of NATO, the Paris climate accord and negotiations on a nuclear deal with Iran, Biden's predisposition to multilateralism does not mean that he will go soft on trade. His executive order reinforcing 'Buy American' provisions for government procurement, a longstanding irritant in transatlantic trade relations, signals his intent to staunchly protect US commercial interests.

It is important that the EU strikes a new transatlantic bargain that holds its regional and global aspirations together, if only for as long as it has a genuine ally in the White House. EU alignment with the US on China should not mean complete decoupling but leave room for diplomacy with China. In a redefined transatlantic alliance, the EU should use its economic heft to work towards shoring up the international rule-based order and respond with 'lawfare' to the interlinked security and economic challenges that powerful states present to the multilateral level playing field.[25]

The CEPS Task Force: structure, composition, and timeline

Faced with the prospect of a long-lasting and traumatic pandemic, we at CEPS decided to step up our efforts to support the work of EU institutions in the development of an industrial strategy fit for a brighter future. We started to advertise an ambitious work programme in early summer 2020, and officially launched the Task Force 'Towards a resilient and sustainable post-pandemic recovery' on 26 November 2020. We created eight working groups (see Figure 4), tasked with exploring policy recommendations.

Figure 4. Structure and timeline of the CEPS Task Force



The Task Force was a truly multistakeholder initiative, and we at CEPS were enriched by the discussions that took place in the different streams. Over the course of a mere two months, between mid-January and mid-March 2021, we managed to host 24 working group meetings (three per working group), plus a number of side events related to trade and the issue of indicators for monitoring progress in the EU industrial strategy. Several stakeholders joined the meetings and due attention was paid to ensuring balance in the debate, with invited external speakers that numbered academics, NGOs and policymakers, including several European Commission representatives from a variety of Directorate Generals.

The remainder of this report contains the main findings of those meetings. Part 1 presents general recommendations that emerged from our plenary meeting in November 2020, and from the discussions in the various working groups. Part 2 presents the main recommendations from each of the working groups. An annex at the end of the report contains the names of the participants, speakers, chairs, and rapporteurs of each working group.

Part I

General Recommendations

GENERAL RECOMMENDATIONS

R1. Adopt a fully-fledged strategy, including mission, timeline, adequate governance, and indicators to track progress.

A strategy can only be defined as such if it contains certain essential elements:

- **A 'North Star'**, i.e., a mission to be accomplished in the short and medium term. Currently, the strategy focuses on resilience but is only vaguely oriented towards competitive sustainability, or the twin transition. Below, we propose that the Industry 5.0 concept be further shaped and adopted as an overall framework for developing the objectives of the industrial strategy.
- **A concrete timeline**, not only for the launch of specific initiatives, but also to achieve specific goals. The goals should be aligned with the targets set for the Green Deal, the digital agenda, the skills agenda, and much more. The lack of coordination inside the EU institutions, however, means that the obvious interrelations and synergies between these different targets and goals are not joined up.
- First steps towards developing **concrete indicators would include** identifying key milestones and goals and a **governance framework and contingency plan** in case any of the progress towards any of the goals is too slow.
    - For indicators, the traditional focus on supply-side or input indicators (e.g. R&D investment as a percentage of GDP) should be complemented by a renewed attention on output, outcome and impact indicators that is linked to the overall North Star chosen for the strategy.
    - And on governance, clear rules of engagement with the private sector and a contingency plan appear to be essential elements of a well-drawn strategy. Below, we offer additional recommendations on all these aspects.

R2. Embrace the 'North Star' of its industrial strategy as a refined version of the Industry 5.0 paradigm.

It is clear that the Industry 4.0 paradigm, launched a decade ago in Germany, has not fully spread across European industry, which somehow remains anchored to pre-existing business models and organisational forms.[26] Surveys on the uptake of key technologies such as AI and the Internet of Things (IoT) across European industry show a slow diffusion, mostly concentrated on older-generation solutions such as expert systems, or machine learning aimed at basic industrial automation tasks such as anomaly detection.[27] This is true in nearly all ecosystems, including construction, agriculture, energy, mobility-automotive, and health.

Therefore, the Industry 4.0 paradigm does not, in and of itself, represent a suitable North Star for the EU industrial strategy. Besides the difficulties in definitions (there is no widely agreed understanding of what Industry 4.0 is), the concept mostly developed as a framework for supply-side, tech-driven industrial transformation, with very limited focus on a broad definition of sustainability, let alone resilience and workers' well-being. And while the impact of Industry 4.0 on jobs has been intensively investigated, this was more as an afterthought than as a design principle. This is why the CEPS Task Force decided to pay ample attention to an emerging socioeconomic paradigm for industrial transformation, currently under development in the European Commission, DG Research and Innovation, and known as **Industry 5.0.**

Figure 5. Five generations of industrial transformation

By shifting the focus from the shareholder and the stakeholder value of production to an emphasis on the role of industry as an actor of meaningful and sustainable change in society, Industry 5.0 tries to move past the mere

analysis of profit-driven production of goods and services. **Rather than representing a technological leap forward, though, Industry 5.0 broadens the context of Industry 4.0, providing directionality to the technological transformation of industrial production**. Industry 5.0 also recognises that industrial companies are working communities and that the well-being of workers, for too long confined to physical safety, has multiple dimensions.[28] The approach has the merit of potentially aligning industrial policy efforts with the overall agenda of the EU, surpassing the traditional separation between the state and the market, and charging both governments and the private sector with a shared responsibility to 'row in the same direction'. Impacts are achieved on three main fronts: building a humancentric industry focused on well-being, in particular that of workers; fostering sustainability from an economic, social and environmental perspective; and enhancing resilience.

R3. Embrace a European enterprise model as a new approach to capitalism by fixing the economics behind the industrial strategy.

An Industry 5.0 approach requires that unsustainable forms of capitalism that award uncontested 'shareholder primacy' be avoided. Even in the US, after bold statements by the American Business Roundtable, BlackRock's CEO and others, President Biden openly committed to "put an end to the era of shareholder capitalism".[29] **Even the increasingly popular notion of stakeholder capitalism is insufficient to enable a full transition to Industry 5.0. This is in spite of it recognising the corporate responsibility that ensures all relevant interests represented in the firm are catered for.** A new European enterprise model should be explicitly based on the principles of fairness, resilience and sustainability.[30] Only in this way can industry become the real engine of the twin transition.

More specifically, **the three main pillars of Industry 5.0 help to explain why a new European enterprise model is needed**. **First, adopting a humancentric approach to industrial transformation implies, as noted, empowering workers and protecting their well-being**. An emerging body of knowledge underpins the finding that both the productivity and the well-being of workers depend on factors such as: (i) a degree of autonomy at work; (ii) being equipped and having been provided by sufficient resources to do the job properly; (iii) social inclusion; (iv) feeling recognised for contributions to teamwork; (v) a linkage between the worker's contribution and corporate performance; and (vi) respect for management. These are precisely the features of working life that are not on offer in the shareholder model, and only occasionally found in the stakeholder model. Against this background, the European enterprise model calls for far-reaching delegation of responsibilities for the operations (the business units) in the interest of day-to-day resilience for ever-changing circumstances, as well as the perpetual improvement of multifactor productivity.[31] Corporate management is tasked with facilitating the units by providing common services and holding responsibility for investments in plant equipment, training and recruitment, from inception to integration in the operations. The Board becomes at once an entrepreneurial body in charge of optimising the portfolio of business units, the keeper of the ultimate vision for the company, and the custodian of the corporate values: reasonableness, fairness, and the principles of sound decision-making.

Moreover, **the sustainability pillar of Industry 5.0 requires enhanced corporate orientation towards the circular economy, mitigating climate impacts and ensuring fair value distribution along the value chains**. This requires an expanded circle of corporate responsibility, which could be based on enhanced non-financial reporting such as the one provided by the EU taxonomy for sustainable activities. The taxonomy, however, should be applied comprehensively, and incorporate all social and governance components, rather than only looking at the (extremely important) environmental dimension. The current Taxonomy Regulation already takes social and governance issues into consideration, at least to some extent.[32] However, more could be done in view of the forthcoming Commission report, due by the end of 2021, on extending the scope of the Taxonomy to social objectives.[33]

Third, **the resilience pillar requires a drastic departure from the prevailing model of capitalism and corporate governance**. This was confirmed during the Covid-19 pandemic, which revealed the fragility of many national economic systems, but which also showed the enhanced resilience of ESG funds and of corporations devoted to sustainable business models.[34] As a matter of fact, Euro area investors have pivoted towards ESG funds since the onset of the coronavirus, leading the aggregate exposure of euro area sectors to ESG funds to increase by 20% in a year.[35]

In turn, this also shows that the feared absence of a 'greenium' (a lower yield for green bonds compared with conventional bonds with similar risk profile) is not materialising.[36] **There is no evident trade-off between investing in sustainable ventures and maximising profit.** The resilience objective embedded in Industry 5.0 is also directly calling for more decentralisation in corporate organisation, as well as a fairer value distribution in value chains. The possibility to reorganise in the face of unforeseen events, thus absorbing the shock and 'building back better', is associated with decentralised organisational forms and sufficient knowledge and discretion in the hands of business units.

R4. Consolidate and streamline the many initiatives launched to support industry at the EU level.

The European Commission has made efforts to align the industrial strategy with the Green Deal and the twin transition. But **the lack of a common thread and direction is evident when one looks at the multitude of initiatives and strategies it has launched in the past year**, as well as in previous years. The timing and coordination of all those initiatives is key to the industrial strategy's success. For example, developing indicators and targets for industrial ecosystems is hard to reconcile with a data strategy that tries to organise data flows within the context of 'data spaces', the governance of which is still largely unknown. The data spaces proposed in February 2020 and currently under development also appear to overlap at times with industry sectors (e.g. finance), at other times with cross-cutting strategies (e.g. the Green Deal or skills), and yet in other cases with ecosystems (e.g. health, agri-food, or mobility). Against this backdrop, it is essential that the Commission tries to reconcile at least the notions of sector, ecosystem, and data space, to allow for a more coordinated approach to help reach medium- to long-term targets. After all, it would be very difficult to imagine a successful digital transformation in key ecosystems without coordinating such a transformation with a data governance strategy that matches the need, the actors and the value chains operating in that ecosystem. Or, to put it another way: **implementing a sectoral policy to achieve ecosystemic transformation would be preposterous.**

At a broader and equally important level, **the focus of all PPPs and various levels of EU or intergovernmental instruments launched to achieve results should be reconciled with the technology-neutral ecosystems, as well as with the data strategy**. This is the case for all the following: PPPs (including the yet-to-be-launched PPP on AI); IPCEIs (including the forthcoming one on the edge/cloud); to some extent Horizon Europe Missions (in particular the one on adaptation to climate change and societal transformation); institutionalised and contractual partnerships (which include KICs in domains such as health, ICT, food, energy, climate, manufacturing, raw materials, and urban mobility); the universe of strategic value chains (now tentatively renamed strategic 'areas', which awaits further systematisation in the new landscape of policies and public spending at the EU level (see our dedicated chapter below);[37] and other instruments such as research infrastructures, the Human Brain Project, Destination Earth (DestinE), the digital twin of the Earth, and flagship projects on graphene and quantum technologies.

At an even broader level, taking the transition towards ecosystems also means seriously **refocusing policies (and in principle, also the internal division of work in EU institutions) to account for impacts on ecosystems**. Once again, the decision to set targets at the ecosystem level leaves the Commission needing to redefine sectoral policies, so that impact can be achieved and measured consistently. This includes sector-specific policies such as those on specific modes of transport, or within 'digital' and 'retail' (perhaps the largest aggregations in the transition towards ecosystems), but also horizontal policies such as competition policy. For example, as will be briefly set out below in our dedicated chapter, the assessment of mergers and acquisitions, as well as the appraisal of possible anticompetitive effects, may have to take the so-called relevant product market as a benchmark, but also look at the overall impact of such transactions on the ecosystem they pertain to. The need for enhanced coherence in all EU policies, necessary to row in the same direction and measure progress consistently, is also reflected in the need to reorient the criteria and methodologies adopted to assess the prospective impacts of proposed new legislation at the EU level. The Communication on 'Better Regulation - joining forces to make better laws', adopted by the Commission on 29 April 2021, is a first, timid step towards mainstreaming the SDGs and resilience in the toolbox used by the Commission in ex ante impact assessments and ex post evaluation. However, for Europe to be able to fully achieve policy coherence, there needs to be a more decisive move towards changing the

economics behind the EU Better Regulation agenda.[38] Such coherence would be further boosted by a streamlining of terms and instruments used throughout the whole *acquis*. Currently, for example, the term 'ecosystem' has different meanings in different EU policy domains (e.g. the industrial strategy and the Digital Markets Act); and the use of 'flagships' is consolidated in research and innovation policy, but is also gaining new meaning in the context of Next Generation EU.[39]

R5. Fix multilevel governance: Next Generation EU is a 'once-in-a-century' opportunity to rebuild, reshape and repurpose Europe's industry.

It is no mystery that the multilevel governance of industrial policy is remarkably fragmented. **Europe is not only 'home to industry', but also to a multitude of industrial policy schemes and initiatives at all levels of government, with scant coordination that often risks confusion or sub-additivity**.[40] Such fragmentation dramatically prevents most of the objectives and ambitions of the EU industrial strategy. Without a meaningful solution, there will be no way to enhance the prospects for European companies to scale up and become competitive internationally; no way for 'lead markets', particularly in green and digital technologies, to diffuse throughout the territory of the Union at sufficient speed; and no chance for the EU to complete the transition towards a more resilient and sustainable future, powered by an Industry 5.0 approach.

The unprecedented resources made available to member states to build back better should be used in a consistent and efficient way to avoid the abovementioned problems. As recently observed by two authoritative commentators, "[t]he current political debate lacks an honest acknowledgement of how much is already decided: from EU recovery budgets to the 2030 climate targets. Instead of confusing industry and financiers with new debates, the strategy should clearly explain the implications of those decisions".[41] To put it more bluntly, system change cannot be achieved if Europe dances to two different tunes, one at the EU and another at the national level. The scrutiny, evaluation, and implementation of National Recovery and Resilience Plans should therefore be given maximum attention and use new instruments rather than legacy austerity-based tools. Merging abilities such as strategic foresight, knowledge on regional specialisation and the definition of pan-European industrial transformation pathways with key consequences for member states' agendas will be key to achieving the ambitions of the twin transition, as well as the 'systemic change' evoked by Ursula von der Leyen.[42]

Unfortunately, a first analysis of the available national plans reveals that member states have given priority to measures aimed at 'protecting' the economy and society, and thereby mitigating the short-term effects of the pandemic, rather than creating the preconditions for change.[43] De Vet et al. (2021) observe that "most measures consisted of horizontal support instruments without predetermined focus". They also mention the possible confusion generated by the multiplicity of targets given to national governments, including the twin transition, resilience, consistency with the country-specific recommendations, and the lack of metalevel coordination, especially for what concerns the need to reconcile national plans with the need to proactively shape inclusive, resilient, fair and sustainable industrial value chains (on which, see our dedicated chapter below).

R6. 'What gets measured gets done': choose future-proof indicators for systemic transformation.

'What gets measured gets done' is an old public policy adage. Therefore, continuing to track and reward corporate performance by referring to financial indicators and cost optimisation is likely to frustrate whatever attempts there are to transition towards Industry 5.0. Beyond the taxonomy (an essential piece of the puzzle), the EU industrial strategy and the various governance mechanisms it relies on (IPCEIs, partnerships, PPPs, missions, etc.) should measure progress way beyond mere inputs (e.g. R&D expenditure) and outputs (e.g. patent applications). Progress, however, is about outcomes and impacts, and EU institutions should be adequately equipped to measure those impacts on the ground, and take action when data show insufficient progress.

As already mentioned, neither the March 2020 Communication on 'A New Industrial Strategy for Europe' nor its recent 'Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery' take any concrete steps beyond competitiveness indicators when tracking the progress of the industrial strategy. The Commission, in its 2021 Single Market report, announces that it will 'limit' itself to tracking progress on: single market integration; productivity

growth (based on labour productivity); international competitiveness (EU's global market share or extra-EU trade); public and private investment (as a percentage of GDP); and public and private R&D expenditure (as a percentage of GDP). The Commission further announces that indicators will be monitored with specific reference to ecosystems but does not specify how the transition from existing to new indicators will take place.

Perhaps the first traces of a more systemic approach to change will be found in the initiatives announced in Section 5 of the new Communication on updating the industrial strategy, where the Commission announces 'transition pathways' for ecosystems. These are expected to "offer a better bottom-up understanding of the scale, cost, long term benefits and conditions of the required action to accompany the twin transition for the most relevant ecosystems, leading to an actionable plan in favour of sustainable competitiveness".[44] However, no concrete indication has so far been given as to how this new instrument will be shaped, governed, or monitored in the coming years, whether it will be integrated in the multilevel governance of the EU, or at least with the alliances and PPPs already in the launchpad, and whether it will eventually replace other initiatives or policy areas, such as the one on strategic value chains/areas.

Against this background, the proposed indicators developed by the European Roundtable of Industrialists (ERT) in 2020 marked a step forward in the addition of impact indicators to the more traditional input and output ones.[45] This constituted a good basis for the CEPS Task Force to organise a stand-alone discussion dedicated to indicators, which further highlighted the need to measure impacts related to the systemic transformation. An important stream of future work will be the development of **articulate and comprehensive indicators mirroring the economic, social, environmental and governance pillars of the transition towards Industry 5.0, centred on well-being (and thus inter alia on alternative measures to GDP), resilience (further to the first dashboard developed by the JRC) and sustainability.**

Part II

Working Groups' Recommendations

1. THE EUROPEAN GREEN DEAL

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The economic growth that the low-carbon transition could bring, in parallel with the digital transition, is an integral part of the European Green Deal. It is critical that this dual transition successfully transforms Europe's manufacturing base and carbon-intensive industries towards climate neutrality and increased circularity. The first important steps need to be taken now and continued throughout the rest of the decade up to 2030.

At the moment, carbon-intensive industries mostly overlap with energy-intensive industries, but in a future dominated by low-carbon energy the two will diverge. Together, these industries are currently responsible for just under a quarter of greenhouse gas (GHG) emissions in the EU, and account for half of the emissions in the EU emissions trading system (ETS). They include some of the most 'hard-to-abate'[46] sectors, such as (petro)chemicals, steelmaking and other basic materials production. The emissions in these sectors are hard to abate because of their high-energy intensity, in both electricity and heat, as well as non-energy-process emissions.

While the Green Deal addresses all emissions-intensive areas of society, in addition to a slew of other environmental objectives, this chapter focuses on industrial transformation of carbon-intensive industrial sectors. There are nevertheless important linkages to other areas. Electrification and massive deployment of low-carbon power will be needed throughout the economy. Improving resource efficiency through increased circularity is a common challenge that goes beyond the manufacturing economy. Digitalisation – the other half of the twin transition – can support both resource and energy efficiency improvements. In recent years, biodiversity has become both a complementary and competing 'green' priority which may impact agriculture, but the role of land and forests in climate change mitigation and adaptation has also risen (which may affect several UN Sustainable Development Goals (SDGs). Through substitution, biomaterials can also contribute to emissions reductions.

The importance of clusters, and the associated regional dimension, is a defining characteristic of carbon-intensive industries. Industrial hubs such as the *Ruhrgebiet* in North-Rhine Westphalia, Lombardy, the North Sea ports and Silesia are home to a great many of the EU's carbon-intensive industries. EU policy focus on these clusters is both wise and inevitable, particularly when clusters cross borders, such as in the Low Countries. Not all emissions can be covered in this way, however. Some sectors are dispersed throughout the EU but still require decarbonisation, cement being one example (this is the third-largest industrial emitter – heavy and unattractive to transport over great distance) or ceramics production, which tends towards many small production sites.

There is a general economic imperative for the EU to engage in the low-carbon industrial transformation, not least to position European industry competitively for the future. Politically, this will require an answer to the question of how the EU can build on its leadership role, whereby it can continue to offer solutions for emissions reductions and underpin growth in future low-carbon industries in Europe and globally while supporting increased resource efficiency. From a climate perspective, it does not matter where technologies are developed and deployed. From an economic and political acceptability perspective, however, the EU and other countries are keen to reap economic benefits by playing a leading role in this transition. There is likely to be both competition and cooperation between companies and economic blocs. Finally, the EU's choices in the energy transition will also affect the sustainable development pathways in the Global South.

Technologies exist but large-scale deployment is required

For most carbon-intensive sectors, low-carbon and climate-neutral technologies already exist, but they do not exist at scale. Hence, the industrial policy challenge is not so much about invention and R&D as it is about mid- and later-stage innovation, focused on deployment, scale and competitiveness of climate-neutral production and processes. Only rapid deployment and innovation diffusion will guarantee emissions reduction at the scale and speed required for climate neutrality in the EU and globally. Without a big increase in global, regional or national demand for low-carbon products, one cannot expect the global low-carbon economy to develop fast

enough to substantially reduce emissions and further drive cost reductions.

Being part of these future value chains as much as possible provides a competitive opportunity for the EU. Its interest here is not linked to strategic autonomy per se, but to competition. EU companies are at the forefront of developing climate-neutral industrial goods. A wise EU industrial policy ensures that these frontrunners benefit and grow in number, rather than putting up defences around carbon-intensive incumbents.

Temporary early deployment support in the EU and elsewhere will be needed to bring new breakthrough technologies into the market and foster cost reductions as a result of learning curves and economies of scale. Later, a combination of carbon pricing and product standards should re-establish a competitive market for low-carbon materials, either through decarbonisation or substitution of one material by a lower carbon one with the same functionality. A successful EU industrial strategy will ensure fair competition, based on CO_2 performance, between different low-carbon solutions.

The global low-carbon transition is creating low-carbon export opportunities, as other countries increasingly follow the EU in adopting net-zero emissions targets. Supporting the export competitiveness of low-carbon frontrunners does not only support industry in Europe; it also supports low-carbon technology deployment. This will lead to embedded carbon in trade reduced as 'by-product' and being seen more as 'reverse carbon leakage'.

Building blocks

Shifting industry towards climate neutrality will require very high levels of carbon-neutral energy (e.g. renewables, nuclear, and biomass). This energy will only be available if the European Commission makes low-carbon energy production one of its most urgent priorities. Crucially, with the circular economy advancing, materials feedstocks (e.g. recycled or reused) and lower resource demand are likewise important building blocks for low-carbon industries.

A successful industrial strategy will need to strike a careful balance between the role of the market and the state (whether EU or member state). Member states face softer budget constraints, but fiscal capacities between member states diverge. Coordination is possible whenever state aid is involved. Through Important Projects of Common European Interest (IPCEIs), significant amounts of state aid can be invested for the benefit of climate-neutral industry, but it requires member states to act first and to commit their own fiscal resources.

Private sector finance is indispensable. Growing markets – both sectoral and geographical – are more attractive to investment than staid and static ones. The circular economy is a precondition for successful industrial decarbonisation – to keep energy and resource use in check – but if primary industrial production declines, value-added will need to be found elsewhere, i.e. in new value chains to grow investment.

Private sector procurement can also drive demand for climate neutral (industrial) goods, and in fact is already doing so. A number of companies have given themselves net-zero targets for all direct and indirect emissions. To succeed, they will increasingly require low-carbon materials alongside low-carbon energy. Companies where materials represent a limited cost factor, such as in IT or consumer products, also start to demand low-carbon materials as a way of reducing their carbon footprint. A precondition for this to work is the emergence of 'lifecycle' accounting[47] methods and practices. While these are developed for voluntary systems,[48] notably for information and transparency purposes, they might give important guidance for government or standardisation efforts to create methodologies to calculate lifecycle emissions to later integrate in carbon-compliance obligations and regulations.

R7. Identifying revenue streams to invest in climate-neutral production.

Climate-neutral technologies exist, but companies need revenue streams to invest in climate-neutral production. The EU industrial strategy should identify possible revenue streams for (i) EU-level funding, (ii) member state funding, and (iii) the boundaries for member state funding to ensure the integrity of the internal market. Public support should be time-limited and aim to reduce costs and scale while being compatible with low-carbon and circular business models.

R8. Reward Innovators under the EU ETS.

While there is a need to protect the competitiveness of existing industry, a new focus should be added whereby innovators would be rewarded, possibly also under free allocation.

R9. Focus EU climate diplomacy on industrial decarbonisation partnerships.

For COP26, the EU should back up its emissions reduction pathway of at least -55% net by an accompanying set of industrial policy tools that are credible enough to interest other countries in industrial decarbonisation. In its climate diplomacy the EU should develop partnerships on industrial decarbonisation with a focus on deployment of low-carbon industrial products. Japan, which has taken a similar approach, is a natural starting point with other countries such as Canada or New Zealand to follow (and the US under President Biden).

R10. A strong EU ETS price signal is important.

A strong ETS price signal is important and a revised Market Stability Reserve is essential for this. A withdrawal rate of at least 24% should be continued, and ideally increased. A hybrid design with price triggers is also possible. A uniform, economy-wide carbon price signal is desirable even when industrial and lead market policies interact with the ETS. The long-term role of the EU ETS should be considered; how will the ETS relate to carbon dioxide removals (CDR)? When considering extension of the ETS scope, the benefits of a single cap as well as the impact on all ETS sectors should be considered, not just on the sector to be included.

R11. Slowly develop a CBAM and engage with international partners.

The carbon border adjustment mechanism is conceptually and economically attractive but difficult to implement. The European Commission should take time to develop it further, for example by publishing a White Paper, which could be used to engage its international partners. To keep the CBAM as a climate diplomacy tool (a 'sleeping gun'), its initial application should remain limited to those homogeneous sectors facing strong pressure from carbon-intensive imports (cement, electricity, refineries etc.). A CBAM and free allocation should ideally not be combined, for political as well as legal (WTO) reasons. However, a compromise could be to link free allocation just to export competitiveness. This could be done by focusing on export intensity rather than on overall trade intensity.

R12. ETS revenues can contribute to industrial transformation.

EU-level policies are most effective when their funding is structural rather than ad hoc. Both current and future carbon-pricing policies in the EU can contribute to industrial decarbonisation efforts.

R13. Treat domestic production and Imports alike?

Product standards can be a tool to ensure that domestic and imported products are treated the same, thus mitigating carbon leakage risk. Providing standards are dynamic, the industrial strategy could accelerate efforts to establish embedded carbon content requirements of industrial goods. Product standards need to be dynamic to account for technological developments and sectoral investment cycles. Technical WTO standards would need to mirror EU product standards to avoid trade disruption. The standards could be expressed as limits to the amount of kg of CO_2 per tonne of product. An open question is whether to apply such standards to intermediate goods or final goods.

R14. Identify skills to support rapid deployment of low-carbon technologies.

In its skills agenda, the industrial strategy should identify which labour market policies can support more rapid deployment of low-carbon technologies. Skills are important not only from a just transition and wealth creation perspective, but also to accelerate emissions reductions. Skills can support knowledge dissemination about low-carbon solutions throughout value chains. Identifying which skills are needed to accelerate emissions reductions should be part of the Covid-19 recovery plans.

R15. Strengthen public procurement and boost demand for low-carbon goods.

The current legislative framework for Green public procurement needs to be strengthened with compulsory criteria and targets. Such a move will need to be supported by actions to increase the competence of public buyers and other relevant actors. Examples include training activities targeted at specific sectors, online toolkits, national competence centres, information initiatives and guidelines for the full supply chain. It will also require the development of reliable tools and data to support public buyers in assessing the carbon content and/or resource efficiency of the products and services they procure.

R16. Do not forget about SMEs and non-ETS industry.

SMEs need to be able to benefit from the EU industrial strategy because transaction costs and information asymmetry may be greater barriers for them. New policy proposals based on the industrial strategy should include SME provisions, including making dedicated support available. The same goes for non-ETS industry, which accounts for nearly 10% of total GHG emissions in the EU.

R17. Regional dimension: focus on clusters but don't forget other areas.

From a lead market and scale perspective it makes sense to focus on industrial clusters, but industries away from clusters also need solutions and low-carbon infrastructure. Some clusters may also have their own governance structures, which should be targeted by both EU and member state-level industrial policies.

R18. Focus on the construction value chain to accelerate industrial decarbonisation.

The construction industry is one of the most difficult sectors to decarbonise because it lacks an integrated value chain. Yet it offers huge abatement potential and cost increases for final products using low-carbon materials are also small. Attention should be on tools to deploy low-carbon materials across the value chain, e.g. carbon budgets, carbon obligations, or carbon-reduction contracts. This also requires credible carbon-footprint rules for buildings connecting the different parts of the value chain.

2. THE DIGITAL TRANSITION

Authors: *Andrea Renda, Lorenzo Pupillo, Rosanna Fanni and Carolina Polito*

Ensuring a speedy, balanced rollout of connectivity technologies in Europe

R19. Evaluate the 5G rollout in relation to the territory and the broader mix of possible technology solutions.

According to the Commission Communication on the 2030 Digital Compass, by 2030 all European households should be covered by a Gigabit network, with all populated areas covered by 5G. The latter, if rolled out properly, is expected to provide ultra-low latency and increased capacity for high bandwidth data streams. However, any further network enhancement will become increasingly expensive, due to, among other things, the number of additional antennas and small cells to be deployed. Moreover, so far, the 5G market appears to be still mostly supply driven. Policies to promote the demand side will thus be critical to guarantee the sustainability of investment and allow business users to exploit the potential of enhanced connectivity.

At the same time, 5G is a long-term (almost decade-long) plan, rather than a short-term panacea. And it is important to ensure that by the time the technology is mature, its appeal to market players is still strong. In fact, other technologies are already becoming available. The EU should thus adopt a much more nuanced approach to 5G and acquire a thorough understanding of the mix of complementary technologies needed to fully achieve the connectivity goals for the digital decade. 5G capacity, speed and service availability needs to go hand in hand with cloud and edge services and infrastructures. Yet the business case for 5G should also be evaluated against the development of future technologies such as what might be termed '6G', including edge nodes, to avoid the rapid obsolescence of the EU's technological targets and ensure their coherence with one another.

Careful evaluation of the conditions that must be met for 5G rollout to be the preferred choice is essential, especially in the context of the National Recovery and Resilience Plans. A comparative analysis should be carried out with other solutions, especially for Internet of Things (IoT) applications in homes, public spaces such as railway stations and metros, industrial applications and smart cities. For these locations, Wi-Fi in unlicensed spectrum bands (e.g. at low 6GHz) and dedicated radio technologies for real-time control systems (ZigBee, etc.) are available and attractive. The EU should also start analysing the transition from 5G to '6G', building realistic business cases based on sensible use and realistic costing (e.g. a revised frequency allocation process).

In terms of 5G deployment, more attention should be devoted to:

1. Embedding cybersecurity in network design and management architecture, prioritising the security and confidentiality of data flows.
2. Smart policies for radio frequency allocation, prioritising cost-efficient range and effective building penetration, and minimising high-power operations and intense beamforming.
3. Sustainability, by ensuring low-power and low-energy consumption operation and connectivity.
4. Quality of service and resilience, through uninterruptible operations with suitable redundancy for continuity of critical infrastructure. Moreover, future 5G releases may incorporate improved broadband mission-critical service for public protection and disaster relief emergency services.
5. Avoiding dense (urban) networks with tens of thousands of base stations for a city, bearing in mind site availability and planning permission difficulties, plus the environmental challenges posed by backhaul cabling/microwave line-of-sight congestion, rejection of non-aesthetic designs and power supply complications.[49]
6. Societal aspects: EU citizens deserve relevant, up-to-date and evidence-based information on the health impact of 5G.

R20. Encourage infrastructure sharing.

The EU's ambitious connectivity targets will not be reached without enhanced investment, fair competition across the value chain and new forms of business partnerships. We therefore recommend that policies focus on incentivising voluntary infrastructure sharing based on commercial agreements. The huge investment

required for network deployment, coupled with the ambitious expectations held by public authorities and consumers regarding rollout timing and coverage, will be impossible to achieve without infrastructure-sharing agreements. Likewise, infrastructure sharing is key to promoting business sustainability, improving the efficiency of energy consumption and reducing environmental impact.

Sharing may take different forms, such as shared radio access networks (RAN) including spectrum, shared permanently or dynamically. It could also include the passive assets of the network environment base station sites, towers with power supplies, and ducts and wayleaves for backhaul where appropriate. Sharing will enable new investment and ownership models that may move away from the mobile network operator (MNO)-centred model to industrially suited paradigms and wider market access for new players. Thus, wholesale networking infrastructures for use by multiple mobile service providers could be considered.

R21. Carefully analyse the technology mix in non-dense urban areas.

Increasing long-term R&D efforts should be promoted to ensure consistent connectivity and adequate coverage in rural areas, at reasonable cost. This may include research into low-Earth-orbit solutions as part of a global initiative, with due consideration for European solutions. In most rural locations, fibre optic networks might represent a better solution than 5G.[50]

R22. Address the risks associated with 5G rollout effectively.

As far as health risks are concerned, the EU should support research into signal processing and radio physics, especially multiple propagation unknowns.[51] It should also promote a reliable multi-tiered approach to security and privacy, with adequate safeguards to protect information through system hardware and software design, and other appropriate security controls. The EU 5G security toolbox provides a valuable risk-based approach for evaluating 5G deployment. However, the EU needs to harmonise its assessment of and response to the risk stemming from third-party suppliers. It should also encourage cyber-risk diversification by requiring that every portion of the network has multiple equipment vendors. An initial and periodic security assessment of each participating entity could also be envisaged.

We recommend that the European Commission provide guidance to member states on the conditions and targets to be met for energy-efficient 5G deployment, consistent with the United Nations Sustainable Development Goals (SDGs) and the Green Deal. Energy performance and sustainability goals need to be aligned with financial and operational objectives. Greater renewable energy capacity and improved grid flexibility and storage will be necessary. The growing number and size of 5G base stations will require more efficient cooling systems, which should be powered by renewable energy. Microgrids could also be a helpful tool in the decarbonisation of energy networks. This should be complemented by research on biodegradable sensors to reduce, reuse and recycle hazardous material that cannot yet be substituted.

Artificial intelligence and industrial transformation

R23. Promote human-centric, sustainable and resilient AI technologies.

We recommend linking EU funding, for example via the Recovery and Resilience Facility (RRF), to research and innovation on artificial intelligence (AI) to support solutions that are consistent with the overall goal to make industry more humancentric, resilient and sustainable. This is in line with the Industry 5.0 approach described in the introduction to this report. Humancentric AI is already at the centre of the recently proposed AI Act. It should now be mainstreamed into national AI investment, especially in industrial ecosystems, as well as in the forthcoming European Alliance for industrial data, cloud and edge computing, the public-private partnership (PPP) on AI, and other forms of EU funding of AI solutions applied to industry. In particular, research and innovation on 'embedded AI', together with more decentralised infrastructure and data storage, and technological solutions aimed at protecting privacy and industrial data, can ensure that the EU promotes an approach to AI that is consistent with its overarching values and goals. When monitoring the industrial strategy, this may entail the use of ad hoc indicators (see R6).

R24. Prioritise sustainable and decentralised technological solutions.

Depending on how it is implemented, AI can be either a blessing or a curse for sustainability. There is ample evidence of the positive impact that AI can have on energy efficiency, but at the same time some advanced AI techniques are energy hungry. To ensure consistency with the EU's sustainability goals, **the criteria set by the European Green Deal should be fully applied to AI deployment projects**, thus ensuring the use of renewable energy in data centres, the adoption of energy-efficient AI techniques, and full respect for circular economy principles and rules. This could include the set-up of specific schemes and criteria for conducting environmental impact assessments prior to the implementation of major digital transition projects, including notably those involving AI deployment.

R25. Enhance and enforce workers' rights in a digitally enabled workplace.

The digital transformation of many sectors/ecosystems can lead to significant changes for European workers. The Covid-19 pandemic has already brought about an acceleration of digitalisation, which risks leaving entire areas of the EU, and their respective workers, behind. In the context of the RRF and in line with the SDGs, it is essential to ensure that the whole European workforce benefits from the industrial transformation, and that workers' freedoms in both a physical and a digital working environment are guaranteed. Workers in less digitally connected countries should thus enjoy the same rights and opportunities as their counterparts, otherwise societal and educational gaps will likely increase at the risk of jeopardising EU cohesion. To avoid this scenario, the impact of AI and automated decision-making systems on workers should be monitored on an ongoing basis. The proposed AI Act already prohibits certain practices and foresees strict rules for high-risk AI used in recruitment and human resources. Companies should be required to disclose any data processing of their employees to the competent authorities.[52] Workforce surveillance practices or other forms of analytical assessment during recruitment and throughout the entirety of employment should be prohibited.[53] Consent to the processing of worker-related data and to profiling based on machine learning should only be given collectively. Management should interact with trade unions or works councils, disclosing the data collected on workers, the algorithms used to process them, the data used to train them, the metrics used to evaluate work and the performance targets applied to workers. Workers should be able to detect errors or unfair treatment in this automated process, report them and gain redress.

R26. Seize the opportunity and adopt 'AI for good' as a key policy priority.

AI-enabled solutions, properly deployed, have proved helpful in the pursuit of the common good, including the SDGs. This requires adherence to trustworthy AI principles and the availability of large amounts of data from both the public and the private sector. We recommend that the forthcoming PPP on AI, together with other initiatives on the edge/cloud and the IoT, sectoral initiatives such as common European data spaces, the European Institute of Innovation and Technology (EIT) Knowledge and Innovation Communities (KICs), and the Horizon Europe missions and partnerships, work together to **create an environment that is conducive to the swift and inclusive application of AI techniques to address common challenges**. These challenges include climate change, infectious diseases, non-communicable diseases, biodiversity, agri-food sustainability, and the protection of democracy and fundamental rights. The pursuit of 'AI for good' can also be a suitable terrain for future global cooperation on AI. As already stated, this endeavour should remain consistent with the key principles of human centricity, resilience and sustainability.

The edge/cloud layer, data spaces and the future of GAIA-X

R27. Complete the puzzle: EU data governance is still fragmented and uncoordinated.

The Working Group analysed the various elements that should contribute to the completion of the whole EU vision on the data economy. These include the data protection framework, including notably the General Data Protection Regulation (GDPR); the need for personal information management systems such as IHAN or MyData, which implement user control over personally identifiable data; provisions on the creation of a market for non-personal data, such as the proposed

Data Governance Act (DGA) and the forthcoming Data Act; rules on trustworthy AI; the European Alliance for industrial data, cloud and edge; the governance of data spaces, currently defined in a non-homogeneous way; the nascent European Cloud Federation; and the European Interoperability Framework, with related initiatives such as eIDAS and the Single Digital Gateway. It is of utmost importance that all of these **policy and funding streams are made coherent, and that the various overlaps are resolved to ensure seamless data flows and the protection of user rights**. These policy streams should also be consistent with humancentric, resilient and sustainable technology features, as well as with the overall goals of the Green Deal. Only in this way will the twin transition fully take shape.

R28. Ensure a single market for IoT/edge applications and architectural solutions.

The Covid-19 pandemic has uncovered the many virtues of decentralised governance, including in industry. **'Embedded AI' applications should be vibrantly promoted in the EU's digital and data-rich industrial ecosystems**. Stronger efforts should be directed at capitalising on the EU's edge/IoT computing leadership to leverage opportunities from enhanced data and software exchange for edge computing. Specifically, the EU industrial strategy should **prioritise solutions that leverage decentralised data analytics architectures** to foster cost-efficient, resilient and sustainable solutions. Until now, the EU institutions have given insufficient attention to the blossoming world of IoT, which presents enormous opportunities, but also massive security risks. The work on trustworthy AI should become a reference also for developing criteria for trustworthy IoT solutions, in particular concerning fundamental rights and socio-technical robustness, which often lack adequate safeguards in the emerging IoT market.[54]

R29. Ensure that GAIA-X is scaled up into the European Alliance for industrial data, cloud and edge.

It is essential to **step up the coordination of two overarching EU instruments: GAIA-X and the European Alliance for industrial data, cloud and edge**. This is necessary for the economic and social sustainability of EU industrial ecosystems. So far, the digital transformation has led a subset of players, mostly at the platform layer, to harvest the value of the vast amounts of EU-generated data, also since the storage, processing, and monetisation of these data happens elsewhere. To redistribute this value and thus ensure that the EU economy and its citizens benefit from it, **the current EU data economy needs to be characterised by interoperability, openness and transparency**. In this respect, GAIA-X could become the blueprint for setting up common European data spaces, but only if the latter are coherently linked to the mechanisms in the Alliance. **The EU cloud rulebook, including standards, reference architectures, use cases and data spaces should also be an integral part of GAIA-X.**

R30. Establish a 'compliance by design' mechanism with EU legislation for members joining GAIA-X.

EU fundamental rights and values need to be protected while industrial capacity in critical digital infrastructure is enhanced. Therefore, the rulebook for new members and entities joining GAIA-X should translate EU principles and values into actionable processes and checks for technical practitioners. These would include detailed provisions on data transfer, open data, data integrity and consent/opt-out models for consumers, minimum requirements for datasets, cybersecurity provisions and increased guidance on compliance with EU technology regulation such as the GDPR or the Regulation on AI. Compliance with EU policy and its principles such as privacy, trust and transparency 'by design' would also benefit regulatory authorities and market surveillance.

R31. Step up the ambition of the Data Governance Act.

The ambition to create a common EU pool of data, in particular nine data spaces (health, environment, energy, agriculture, mobility, finance, manufacturing, public administration and skills), requires better guidance and links between regional, national and European entities. For instance, the health data space requires more stakeholder interaction and feedback for practitioners and patients to reap its full potential. Clearer guidance about the role of the European Data Innovation Board and the Support Centre for Data Sharing are needed for all stakeholders and SMEs in particular, in order to adapt their operations to the upcoming legislation.

Further, as the current version of the DGA does not cover objects and devices connected to IoT environments, the EU industrial strategy should make this crucial link by providing **incentives for actors and entities that generate value based on interconnected data-sharing services in the IoT environment**, through both edge and cloud computing, to support the uptake of high-value data sharing in the IoT.

More generally, there is a strong need to clarify the future patterns of **interaction between the new institutions foreseen by the DGA and other competent authorities**, either existing ones or those proposed by other EU legislative initiatives (Data Innovation Board, European Board for Digital Services, AI Board, European Data Protection Board and European Data Protection Supervisor). Synergies and overlaps should be thoroughly mapped so that SMEs and other businesses can adapt their operations to the relevant EU legislation. The same can be said for national competent authorities, which also feature a variety of possible overlaps.

R32. Foster interoperability as the key enabler of the EU's digital ambitions.

Limited interoperability is one of the key issues cutting across policy areas, and is particularly relevant to the development of the common European data spaces. Therefore, enhanced interoperability is necessary at both the technical and semantic levels (i.e. common infrastructure, common data models, etc.) as well as at the organisational and legal levels (ensuring that processes within organisations and legal requirements do not hinder the exchange of data), notably in the development of the health and public administration data spaces. This includes the successful integration of personal and industrial, vertical, horizontal and diagonal data spaces.

The EU should foster the uptake of common standards for data in both the public and private sector, based on specific sectoral needs. This is essential to support data sharing, while ensuring that the overarching framework of the data spaces is underpinned by key principles such as trust, data protection and privacy. The role of trusted data intermediaries is particularly relevant, and the EU industrial strategy should actively foster the creation of data intermediaries and reward their efforts. In addition, best practices (e.g. on quality assurance and internal auditing processes) should be collected and published by the EU institutions to promote the uptake of data-driven operations. Making this data-sharing space as open and inclusive as possible is paramount to its success, and to advancing the European vision of a trusted space that protects democratic values, privacy and equality.

R33. Link data spaces to ecosystems.

There is currently a disconnect between the aggregation of economic activities into (nine) data spaces and the identification of ecosystems as the basic unit of analysis for the EU industrial strategy. To the extent possible, **the two concepts should be reconciled and coordinated**, so that the EU industrial strategy becomes more streamlined and easier to govern.

3. STRATEGIC VALUE CHAINS

Authors: *Andrea Montanino, Alberto Carriero, Chiara Del Giovane*

R34. Perform stress tests to assess the resilience of value chains.

Stress tests should be introduced to assess the resilience of specific value chains. Similar to the stress test tool used on banks during the financial crisis, these would strike a balance between opportunities to make production more efficient and the risks of excessive length and complexity in logistics and trade.

A value chain stress test could assess resilience in a comprehensive way using five dimensions: industry attractiveness, corporate resilience, supply-chain exposure, operations exposure, and customer exposure. And because supply-chain risks are always changing, this stress test should not be a one-off but a recurring exercise (McKinsey, 2020).

The stress test can identify both the time it would take for a particular node in the supply chain to be restored to full functionality after a disruption (i.e. 'time to recover') and the maximum duration the supply chain can match supply with demand after a disruption (i.e. 'time to survive').

As noted by Simchi-Levi (2020), this approach could be particularly useful for critical supply chains, such as pharmaceuticals or personal protective equipment (PPE), as in case of the Covid-19 crisis, or more generally for supply chains heavily dependent on other countries. In addition, the promotion of dual sources would help to manage and mitigate the risks through diversification, which is essential to avoid excessive dependence on a single supplier. The Covid-19 pandemic caused some countries to call for nationalisation or regionalisation of supply chains to avoid future supply chain bottlenecks and increase resilience. However, it has been found that lower diversification might not be entirely beneficial (OECD, 2020). The pandemic showed that multilateral approaches are necessary to enable inclusive and sustainable industrial development (Seric et al., 2020b). Furthermore, despite regionalised value chains often being considered an important risk-mitigation mechanism, it may prevent firms and economies from allocating their resources efficiently, increasing productivity or realising higher potentials from specialisation (Seric et al., 2020a).

In light of these considerations, the systematic adoption of stress tests for value chains can become a fundamental tool for verifying the degree of autonomy and strength on international markets.

R35. Establish a mandatory due diligence obligation.

Mandatory environmental, human and labour rights' due diligence legislation should be established to ensure sustainable and responsible value chains. On 10 March 2021, the European Parliament adopted a resolution setting out recommendations to the European Commission on corporate due diligence and accountability, including a draft directive. The European Commission is working towards the introduction of a legislative proposal for a mandatory EU system of due diligence for supply chains to account for the potential harms on the environment and human rights that might arise along the value chains in the EU and beyond. The introduction of mandatory requirements should provide legal clarity and an effective enforcement system in the event of non-compliance. A fair and balanced legislation seems to be the priority for promoting a level playing field, to the extent that these requirements are also imposed on non-EU established companies with a significant footprint in the internal market (to be measured by a turnover threshold, for instance). Indeed, in introducing due diligence requirements, the European Commission should account for the specific needs of SMEs and make the legislation SME-friendly so that the measures adopted are proportionate to the size of the companies, thus encouraging their participation in value chains. However, this should be a well-established system that would be able to deal with possible counteractions from other countries (e.g. China).

R36. Foster cross-border and international cooperation.

Cooperation should be fostered across the EU borders and international trade by relying on a multilateral system of rules. This is key if the benefits of globalised supply chains are to be fully reaped. Interregional cooperation across borders can also play a crucial role in this context. Although global value chains have acted as transmitters of shocks, econometric results focusing on the first six

months of the health crisis showed that exports of domestic producers participating in global value chains fared better during the pandemic, as diversification through trade is considered an asset (Espitia et al., 2021). The effect of European and global value chains is that they spread the benefits of extra-EU exports all over the EU. Indeed, exports from an EU country incorporate intermediate goods and services from other EU countries. Interestingly, domestic value chains have been found to be less resilient than global value chains (Miroudot, 2020). Open and cross-border trade is necessary to allow global supply chain networks to function uninterrupted. Indeed, an open global trading system ensures agility and flexibility, especially in times of crisis. Global diversification ensures more flexibility, which is a key factor for avoiding dependency and enabling a consistent response to external shocks.

International cooperation could for instance focus on further promoting trade and transport facilitation measures. It could increase competition on major portal hubs to prevent international freight congestion (e.g. from ongoing scarcity and/or geographical misallocation of containers), including sanitary rules applicable for aviation and ship crews, and the traceability of international freight.

R37. Introduce phase-out measures.

Focused and temporary phase-out measures that make best use of the Recovery and Resilience Facility (RRF) should be introduced to aid recovery from the negative economic effects of the Covid-19 pandemic. In particular, financial support should be provided to SMEs so they can more easily export their products. The constraints on accessing finance that companies along the value chains might face should also be loosened. Indeed, the WTO (2018) estimated that over half of SME requests to access financial support are rejected, as opposed to only 7% of large firms' requests.

Structural solutions are needed as well as ad hoc measures. For example, the European Commission's plan to introduce the Single Market Emergency Instrument is meaningful because it creates a structural solution to future crises. Lessons learned from the current crisis would ensure the functionality of the single market and allow fast-track decisions to be made in times of crisis.

R38. Adopt a bottom-up approach.

A bottom-up approach that fosters discussion between EU companies and institutions should be adopted to satisfy the specific needs of EU industry. One tool is the regional Smart Specialisation Strategy, which encourages cooperation within regional ecosystems and with other regional ecosystems with complementary skills, thus enabling Europe-wide value chains and innovation pathways to be created. Imposing top-down solutions does not seem beneficial since EU companies often have practical solutions in place already, and these cope with disruptions along the value chains. EU institutions and EU industries should join forces to ensure flexible, productive, and functional value chains. New and agile alliances would help achieve powerful cooperation among all the stakeholders along the value chains.

R39. Effectively revise the IPCEIs communication.

The European Commission has announced that the Communication on Important Projects of Common European Interest (IPCEIs) will be revised by the end of 2021. The IPCEI approach is fit for purpose, but some changes are needed because of its limitations. First, the EU is de facto a loose collaboration and not all member states have the same chances to invest resources and to take part in such projects, and second, insufficient flexibility means projects are prevented from evolving over time.

In addition, it should be ensured that projects are truly pan-European. This also implies that the differences in the participation in IPCEIs between big and small enterprises should be minimised, favouring access for SMEs. In concrete terms, this could mean reducing the complexity, simplifying the procedure, and providing a timely dissemination of project descriptions to increase the interest (and reduce the entry level for SMEs) in setting up potential IPCEIs. Then, the structure of the projects should be flexible enough to ensure that the project can evolve once established. To this end, annual reports to assess the development of the projects are essential.

The European Commission should also revise the IPCEI framework to improve the efficiency of the procedures, particularly with regard to approval deadlines and notification procedures. Bearing in mind project

spillovers, and the effects of the possible synergies with other EU initiatives and projects, the IPCEI tool should also be used to finance projects that are of interest to the entire European Union, and not just those that benefit only certain member states.

R40. Make use of public-private partnerships to deliver on strategic projects.

Public-private partnerships (PPPs) should be used to define the relationship between governments and corporations as a contract to deliver on strategic projects. Indeed, PPPs helped some industries make it through the crisis, and public and private investments can be used to harness the potential of the digital transition and foster a period of technological growth and innovation in Europe to recover from the pandemic. PPPs should identify relevant stakeholders, partnerships, and collaborations.

Thorpe (2018) finds that PPPs applied to value chains seek to catalyse new investments, support chain upgrading, or improve the performance of poorly functioning chains through joint activities that capitalise on complementary resources and competencies of public and private partners. Usually, small firms are the ones that can benefit more from a PPP. As highlighted by Thorpe (2018), public sector actors, through PPPs, are able to shape governance within value chains.

R41. Analyse and recognise strategic elements along the value chains.

It is essential to recognise strategic elements along the value chains and identify key value chains that are crucial for Europe's future resilience and open strategic autonomy. Strategic value chains depend strongly on the external context, and therefore the concept of what is strategic evolves over time. The Covid-19 crisis highlighted the strategic importance of new value chains such as pharmaceuticals and protective medical equipment.

To accompany the update of the 2020 New Industrial Strategy, the European Commission published an analysis of the EU's strategic dependencies and capacities. The EU has significant dependencies on raw materials that are sourced exclusively from abroad. In particular, 98% of rare earth elements needed by the EU come from China and 98% of borate comes from Turkey. Many of these imports are essential for a broad range of strategically important new technologies. For example, the EU imports lithium for electric cars, platinum to produce clean hydrogen, and silicon metal for solar panels. All the value chains should be mapped to give a clear view of the EU strategic dependencies from abroad. The circular economy should be considered as part of the solution to reduce external dependency on raw materials by reusing and recycling products.

R42. Promote coherent and consistent actions across the EU.

Well-coordinated industrial policy measures should be promoted to ensure actions that are coherent and consistent across the EU. In a market like the EU's, without internal borders, companies' value chains are deeply interwoven (Kalff and Renda, 2019). A consistent strategy should be applied to ensure the coordination of the EU multilevel governance and the elimination of the existing barriers that hinder the deepening of the single European market policies. European, national, regional and local levels should work together to enable European industry to deliver jobs, growth, and innovation in Europe.

R43. Increase transparency of supply chains.

Better transparency along all the stages of the supply chains would help improve conditions in terms of resilience and sustainability by revealing information about the operations of the firms along the value chain. The complexity of supply chains might easily lead to generalised low transparency and knowledge sharing along the different stages of the value chains; in general, companies only know their immediate upstream and downstream partners. There is little knowledge of what is happening along a value chain beyond the closest suppliers. Data are not always available, and this makes it more difficult to identify and resolve disruptions that might occur along the value chain. Data sharing along the value chains can be facilitated by new technologies such as blockchain solutions. More data would lead to more information, making it easier to trace the supply chains, map the global value chains and eventually find which situations have excessive dependencies. This can be facilitated by the introduction of a common European data space in specific value chains (i.e. GAIA-X).

R44. Redesign contracts.

Contracts along the value chains should be redesigned to privilege smart contracts, while accounting for sustainability, protection of SMEs against predatory behaviour of large firms, and the promotion of high standards. Since value chains are chains of contracts, their contractual aspect is fundamental. Smart contracts, supported by blockchain technology, are able to provide decentralised, verifiable, and secure solutions that would allow time and cost savings. As stated by Kalff and Renda (2019), with increasingly complex value chains, large companies have the option of outsourcing entire phases of the value chains to smaller companies by establishing relational contracting schemes. These schemes are long-term contractual relationships, often based on trust and governance structures. The complexity of value chains requires that their management is based on transparency and traceability; the use of smart contracts is an important element that helps overcome the challenge. In this respect, while maintaining the bottom-up approach referred to above, the European Commission, in connection with sector-specific bodies, could develop non-binding guidelines towards EU companies. Directed at SMEs in particular, these would provide advice on redesigning contracts and toolkits to self-assess the robustness of their individual supply chain and help find tailor-made remedies.

R45. Make the best use of new technologies in value chains.

Blockchain and data in the value chains will reap the benefits of digitalisation. The EU needs to modernise the single market utilising digital and new technologies. Regulatory sandboxes could be vital in helping companies experiment by enhancing the integration of innovation and new technologies in the value chains. Decentralised solutions to storing data such as blockchain should also be privileged. It should be recalled, however, that SMEs need specific support in the use of digital tools. Indeed, a report from the WTO (2019) specifies that the significant challenges SMEs face trying to enter into global value chains are often exacerbated by the new digital economy. Although the digital economy could open up new opportunities for them, SMEs lag behind large firms in terms of digital technology use and capability. They face specific difficulties in accessing e-commerce platforms and payment systems and are adversely affected by complex customs procedures, regulatory uncertainty, and barriers to services trade. To add to this, firms are estimated to derive between $1.3 trillion and $2 trillion a year in economic value from the integration of artificial intelligence (AI) into supply chains and manufacturing, but SMEs could lose out on these economic benefits if they are not helped to access the new technologies.

R46. Invest in new skills for the workforce.

The twin green and digital transitions are reshaping the way people work. Moreover, the Covid-19 pandemic has accelerated the digital transition, and now more than ever the digital skills gap is a critical source of inequality. The European Union should invest in all the skills that the workforce needs to face the disruptive technological changes and to ensure the competitiveness of European enterprises globally. Investment in skills is fundamental for the new digitalised smart production processes; governments, regions and cities have an important role to play in attracting and developing skills, ensuring sound institutions and the good living environments that attract and develop talents (Bianchi and Labory, 2020). To efficiently allocate the new jobs to the workforce, the European Commission needs to be committed to providing European workers with new skills. Initiatives such as the Pact for Skills, launched in November 2020, will help the EU succeed in the evolving labour market.

4. JOBS AND SKILLS

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An EU industrial strategy for jobs and people

The Covid-19 pandemic has disrupted the European labour markets. Demand has collapsed in certain sectors, while teleworking has become the norm in others and the use of digital tools has increased sharply. This is accelerating the ongoing digital transition, and along with the new push for a greener economy, is challenging workers and employers. Job creation and destruction, protection of workers, up- and re-skilling of the labour force, and spatial or sectoral relocation of dismissed workers are emerging as major economic and social challenges.

The EU industrial strategy can play a critical role addressing them. It has the potential to affect the development of economic sectors and the demand for skills, as well as to influence the geography and pace of industrial change. Pre-existing poor infrastructures, both physical and digital, low skills availability and low administrative capacity could exclude some regions from any new industrial development plan and mark their fate for decades. For this reason, a truly EU industrial strategy should be considered alongside broader EU goals. Social cohesion and upward regional convergence,[55] as well as the principles defining the European Pillar of Social Rights and the EU's commitments to the United Nations' Sustainable Development Goals (SDGs), cannot be disregarded.

In a similar vein, member states cannot credibly subscribe to the EU industrial strategy without linking its design to their national development plans (or vice versa) and its implementation to their relevant national policies. In the coming years, national development plans are largely being defined by national recovery and resilience plans (NRRPs), and will be central to driving the digital and green transitions. Coherence between the plans and the principle of the strategy must be ensured.

Furthermore, the industrial strategy must be accompanied by national and EU policies to support those who will not thrive in the transition to a green and digital industry, and who may be left outside the labour market for long periods or even permanently. Last but not least, women must equally be part of such a process of change.

Such coordinated policy framework is sensible only if the **EU industrial strategy puts people and a job-rich recovery among its overarching priorities**. While some job losses will be inevitable as consequences of the pandemic, automation, and the phase-out of certain sectors, **an industrial strategy that enjoys EU legitimacy cannot afford a jobless recovery**. The potential for job creation in expanding and transformed sectors needs to be fully integrated into a new strategy for a sustainable and competitive EU industry. This mission requires clear objectives in the areas of skills, job quality and gender equality, with ad hoc policy measures to make their achievement possible (see Figure 6).

Figure 6. Framework for policy recommendations on the social dimension of the EU industrial strategy

Source: CEPS (2021).

R47. Up-date and future-proof education and training systems.

A skilled workforce is key to ensuring successful transition, supporting the competitiveness of the European industry and quality job creation. The pandemic has further accentuated two long-term trends associated with educational achievements: the declining employment of low-qualified workers and rising employment of those who are highly qualified. A key challenge for the EU industrial strategy is thus to ensure that people are provided with the right and most up-to-date skills to thrive in a digital and green economy. Yet, in a continuously changing economy, the demand for skills is also changing.

The EU industrial strategy should **foster and create opportunities for industry-led foresight studies** to link potential industrial scenarios to educational needs and trends. Such studies, together with constant and refined skills intelligence, should provide a compass for possible industrial developments and guide the transformation of European education and training systems. Foresight

exercises could be especially developed in the context of the Industrial Forum established by the EU industrial strategy. To match specific industry needs and inform Vocational Education and Training (VET), studies could also be carried out at sectoral level, relying on the framework provided by the blueprint for sectoral cooperation on skills.

The studies should contribute to developing a **new taxonomy for skills** (especially green and digital skills) that are relevant to new and expanding sectoral industries. Such taxonomy should start from what is already available in the ESCO classification[56] and be further developed by skills intelligence exercises. To ensure that the taxonomy's definitions and classifications are meaningful and useful to industry, this work should also be informed by the Industrial Forum and similar networks such as the above-mentioned blueprint. Part of this renewed skills taxonomy should be tailored to strategic value chains (or ecosystems), for example by providing clear definitions and enumeration of so-called green skills, similar to what is already available for digital skills (i.e. DigComp Framework).

Such taxonomy is a fundamental step towards assessing existing skills, developing relevant learning opportunities and, most importantly, defining certifications to validate and recognise micro-skills. The skills defined by the taxonomy could also be embedded in the Europass Portfolio, enhancing their visibility in a standard format for the EU labour market and internal mobility.

R48. Create EU incentives for firm-oriented training in strategic sectors.

Financial barriers, administrative costs and time constraints are major obstacles to timely and regular investment in employees' skills development. In addition, firms – especially small and medium ones – often lack information regarding which skills are available in the company and which ones are in need. This can slow down the transformation process towards the twin green and digital transition and jeopardise the acquisition of necessary skills across the EU.

The EU should provide **targeted financial incentives for upskilling and reskilling in SMEs in expanding and strategic sectors**. As these firms will be the ones with high and immediate demand for enhanced skills, incentives to provide continuous training to their existing employees and initial training to newcomers (e.g. through apprenticeships and work-based learning) would respond to new needs at firm and sectoral level. EU-level support would also help in coordinating and steering strategic national upskilling strategies, in line with action 3 of the European Skills Agenda. In this respect, the Recovery and Resilience Facility, which explicitly puts upskilling and reskilling as flagship objectives and has developed a first taxonomy of green and digital skills' investments, should be instrumental in steering public and private strategic investments in skills.

Operationally, incentives should cover time compensation for employees participating in training. This would overcome the reluctance to halt the production pace in the firm. Incentives should include investment in those employees, such as older or low-qualified workers, who tend to be excluded for return-on-investment reasons. Leveraging on the role of social partners, the system of EU incentives should also promote the creation of company networks dedicated to skills enhancement, along strategic value chains (or ecosystems), and encourage existing company networks to focus on skills. These networks would allow the different actors to join forces (i.e. for the purpose of information sharing, organisational capacity and financial resources) to foster industry-relevant skills investments and ensure the involvement of smaller firms.

R49. Provide individual entitlement to adult education and training.

An increase in non-standard forms of employment in recent years has translated into a growing number of self-employed, temporary, casual or platform workers, whose ties with the firm are blurred. Higher barriers hinder investment in skills for these individuals, resulting in their systematic lower participation in education and training in comparison to employees. For individuals with limited financial means, such as those in non-standard employment, uncertainty about whether investment in skills will be rewarded in the labour market is a major obstacle to engaging in upskilling and reskilling. Firms, on their side, cannot ensure that their investment in temporary employees' skills will be recouped before the employee leaves. In addition, increasing returns to scale on skills investment drive its bias towards highly skilled workers, when such investment is made by the firms. This leaves low-qualified, non-standard workers lagging behind, with far fewer adult learning opportunities and

lower participation rates than their more educated counterparts.

To support access to adult education and training opportunities, and the acquisition of skills to transit across sectors and occupations, the EU industrial strategy should endorse the **establishment of universal modular entitlement for individuals to participate in education and training**. This would allow all individuals to enhance skills that could prove crucial when managing labour market transitions, securing people's career paths in the long term. Incentives granted on an individual basis respond to skills needs in the absence of an employer, or when such needs do not represent a priority for the employer. Universal entitlement is necessary to go beyond eligibility according to employment status, which is likely to change multiple times and more often during an individual's working life, due to an expected increase in labour market transitions. Incentives should target especially those in non-standard employment and low-qualified jobs, as well as unemployed individuals or those employed in shrinking or disrupted sectors, who are at high risk of being left outside the labour market if not re-skilled and relocated across sectors or occupations in a timely manner. Importantly, the entitlement should require an initial assessment and validation of existing skills, along with career guidance for the beneficiaries, to make sure that the investment is well placed to tackle the individual's skills needs and aspirations.

In the long term, the EU should develop a fully-fledged Skills Guarantee, which could build on the experience of the recently launched Skills & Education Guarantee Pilot.

R50. Modernise public and private employment services.

Public and private employment services play a key role in managing and smoothing school-to-work and work-to-work transitions. They guide and support individuals in need of skills assessment, validation and up- and re-skilling to take up new job opportunities. Furthermore, they can advise firms when recruiting and/or providing training for newly created jobs. To anticipate labour market trends and orientate workers and firms accordingly, the support and guidance function of such services should be informed by skills intelligence.

A new EU industrial strategy should thus support the **enhancement of public and private employment services**. While employment services' work is relevant at local level and their coordination is a national (and sometimes regional) matter, EU cooperation on employment services could be strengthened to foster the functioning of the EU labour market and ensure mobility across countries and EU regions. This could leverage on the existing European network of Public Employment Services and the EURES platform.

Importantly, defining and enhancing the responsibility of public and private employment services is crucial to implement active labour market policies, as well as to strengthen the governance of skills ecosystems. The (re)definition of their roles and functions should account for the liaison of the key branches of skills ecosystems, and of different local/regional/national priorities: industrial development, education and training, employment and mobility.

R51. Ensure fair minimum wages.

The distribution of gross hourly earnings typically shows significant differences between member states and points to a low share among low-wage earners. The latter, traditionally in non-standard or temporary employment, have also been particularly hit by the pandemic, with an income loss three to six times higher than that of high-wage earners.

An EU industrial strategy that aims for competitiveness and social fairness should be accompanied by **a legally binding initiative on fair minimum wages across the EU**. The recently proposed EU directive on adequate minimum wages could help address distributional challenges. First, it would prevent in-work poverty and stimulate legal employment. At the same time, by ensuring compulsory implementation of fair minimum wages in a coordinated manner across the whole of the EU, it would create a level playing field and promote wage convergence, in particular between countries from Central and Eastern Europe and Western Europe. Second, an EU initiative on minimum wages could contribute to supporting internal demand, as through ripple effects it would influence general wage development. Third, research on the employment effects of an increase in the minimum wage has shown no significant adverse effects. Companies can cope with increased labour costs driven by a minimum wage in different ways than reducing employment. Besides increasing the price of goods and services, they can compress the wage structure and compensate for the wage

increases of low-wage workers by postponing wage increases of workers higher up the wage scale, or increase productivity by reducing staff turnover. A case in point that supports this argument is Germany. Despite concerns about job losses ahead of the introduction of the statutory minimum wage in 2015, no negative employment effects have occurred.

R52. Put social dialogue at the core of the EU industrial strategy.

Social dialogue, and notably collective bargaining, is a key means through which employers' organisations and trade unions can establish fair wages and working conditions, as well as bring about improvements in workers' productivity. Yet, in the past two decades, collective bargaining coverage has been on a downward trend in most EU member states, notably in Central and Eastern European countries. Moreover, in several EU countries, collective bargaining has shifted from the national, intersectoral or industry level to individual firm level. The decline in collective bargaining coverage has contributed to downward pressure on wages, including on minimum wages, and has been associated with a high share of low-wage earners in a number of countries, and increasing wage inequality overall. This has resulted in a lagging median wage, as compared to the average wage, especially in Central and Eastern European member states, thus further fuelling cross-country downward competition.

The new EU industrial strategy should ensure **inclusive governance by involving social partners in the co-design and co-creation of its actions**. To guarantee that the industrial transition goes hand in hand with job quality, the EU industrial strategy should guarantee workers' information, consultation, and participation in transition and restructuring processes. This should ensure effective social dialogue, as well as national and sectoral collective bargaining systems that guarantee the autonomy of the social partners.

R53. Centre EU sustainable business models on job quality.

Social protection in the case of unemployment, sickness, accident, old age, becoming a parent and other life circumstances is a fundamental part of the European social model. Existing social protection schemes, however, are based on the assumption that a person is either in standard employment or unemployed. As a result, people engaged in new and non-standard forms of employment (such as temporary or part-time contracts) or who are self-employed often fall between the cracks.

A forward-looking EU industrial strategy should aim to move away from a social protection system that hinges on a person's employment status, and towards social protection that is neutral with regard to the form of employment or self-employment. **Social protection benefits should thus be attached to the worker rather than to the job**. To this end, the new EU industrial strategy should promote a **European benchmark for industrial business models** based on job quality rather than on its erosion. Such business models should embed a new balance of the (production and market) risks borne by firms and workers, independently of employment status (European Commission 2019). Even when adopting strategies to outsource, decentralise and make production more flexible, industrial business models of firms involved in (international) supply chains can promote the definition of clear responsibilities towards their workers, including for social protection and regardless of their employment relationship. This choice is also important from a business perspective, as it would avoid socially responsible companies facing unfair competition from those adopting different practices.

R54. Include job quality in the EU industrial strategy KPIs.

In order to monitor the implementation of the new EU industrial strategy, the European Commission will propose the introduction of key performance indicators (KPIs) that measure the transformation of European industry and its resilience in the aftermath of the pandemic. Job quality indicators should be included in this list of KPIs, which should be coherent with the revisited Social Scoreboard within the European Semester and the new Recovery and Resilience Scoreboard that the Commission is expected to present by December 2021. The latter will be used to assess the implementation of the NRRPs.

The KPIs should include adequate indicators to measure job quality, such as employment and job status security, social dialogue, working time and work-life balance, autonomy, work intensity and work relationships. Most of these indicators are already available in the European Union Labour Force Survey (EU-LFS) or provided by Eurofound. An EU Job Quality Index (JQI), namely a

multi-dimensional synthetic indicator, could be used to monitor job quality in the EU industrial strategy. By complementing the traditional indicators of industry performance and competitiveness with job quality, the social performance of the new EU industrial strategy can also be monitored and assessed.

R55. Ensure the implications of telework on workers and businesses are understood.

Teleworking emerged as one of the key novelties of the labour market response to the outbreak of the pandemic. Sectors and occupations that could promptly adopt a teleworking regime experienced a limited impact on employment and hours worked. By contrast, other occupations for which workplace attendance is necessary were strongly impacted. In general, teleworking has been a dramatic change for both workers and companies. The former experienced new working conditions and had to quickly adapt their skills to a new way of working (above all – but not limited to – digital skills), whilst the latter faced the challenge of suddenly adapting their work organisation. The effects of this change on well-being, productivity and innovation performance are still unclear.

Existing research on the hazards associated with working from home focuses on rising gender inequalities and psychosocial risks. However, more substantial changes may emerge from the much larger scope of application of teleworking, including the adoption of new forms of contractual distancing between the firm and its 'remote' workforce. In practice, some firms may implement large-scale restructuring of existing contracts into more flexible arrangements whereby the worker works remotely, on a more or less regular basis, as a freelancer or independent contractor. Such arrangements could also shift towards platform intermediation, including offshoring.

As the overall impacts of teleworking are still unknown and highly uncertain, **monitoring and analysis of the implications of teleworking on employment and employment relations, working conditions, innovation and productivity should be a key priority for the new EU industrial strategy**. A structural shift to teleworking could be informed by defined pilot programmes to understand its overall implications. Such studies should include the transformation of working environments into a blended regime of remote and office work (e.g. hot-desking, open spaces), expected to accelerate in the post-Covid era. Social partners can play a key role in managing this shift, as well as in better understanding its implications.

R56. Ensure gender equality across sectors and at the workplace as part of the EU Industrial strategy.

Promoting access to equal job opportunities and working conditions for men and women across and within sectors is key to improving social inclusion, and can contribute to the EU industry's assets for innovation and competitiveness.

The new EU industrial strategy **should explicitly incorporate the Gender Equality Strategy 2020-2025**, in particular its principles of gender mainstreaming and intersectionality. The former entails involving members of the Task Force for Equality, created under the GES umbrella, in the policymaking and governance of the EU industrial strategy, to consider the gender perspective in all decisions. Moreover, there are two specific areas of intervention for the EU industrial strategy to act for gender equality. Gender balance across sectors should be pursued by means of incentives to promote equal opportunities in skills development and employment across fields and sectors traditionally segregated by gender. Adopting a gender-responsive approach, the EU industrial strategy should enhance women's roles in sectors boosted by the digital and green transition, but also contribute to making the care economy and related industries more attractive to both women and men.

At firm level, the EU industrial strategy should promote business and governance strategies that leverage on diversity, including but not limited to gender equality, and implement anti-discrimination measures, aimed in particular at gender equality across all hierarchy levels. These strategies would entail equality in job quality, including pay and social protection, gender-neutral job evaluation and equal career opportunities across genders, with flexible work arrangements for all. Existing EU initiatives and proposals for binding pay transparency measures and the 'women on boards' directive should be fully integrated in the EU industrial strategy.

5. COMPETITION POLICY AND STATE AID

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R57. Ensure that competition policy remains competition policy.

The enforcement of competition law is essential for the proper functioning of the single market. Competition law is a key tool in levelling the playing field and increasing consumer choice in the EU, as well as in supporting the global competitiveness of European companies. Accordingly, competition policy should have a central role to play in the EU industrial strategy.

At the same time, we recommend that competition policy remain a mainly technical field and be shielded as much as possible from contamination by broader industrial policy objectives. The strict and independent enforcement of competition rules – by both the European Commission and national competition authorities – is the most effective way to achieve lower prices, high levels of consumer choice, fairness, sustainable and productive growth, innovation and competitive undertakings, and to prevent the accumulation of excessive market power.

Competition policy in the EU should become an ally of industrial policy and support the digital and green transitions. The furtherance of these goals, however, should not be realised by turning competition policy upside down in the name of questionable industry consolidation objectives.

R58. Update the tools and scope of competition policy to make it compatible with a modernised industrial strategy and the peculiarities of the digital economy.

While the importance of strict and independent enforcement of competition rules should continue to be emphasised, the economic and political environment in which competition law operates has changed dramatically over the past decade. This necessitates the revision of the current competition law framework at EU level. Indeed, competition law does not operate in a socioeconomic vacuum, and needs to take into account and adapt to the changing policy environment so as to contribute to policy coherence.

One of the biggest challenges faced by competition policy is the increasing digitalisation of our economies. When one considers the unique blend of characteristics of digital markets, such as increasing returns to scale, substantial network externalities, the strengthening role of data and the emergence of so-called business ecosystems, some traditional antitrust tools are arguably rendered obsolete and are therefore in need of well-informed reform. For instance, in a digital economy, timing is the essence of any antitrust action. There is also a need to take dynamic effects into greater account in competition assessment. We therefore support the Commission in its ongoing evaluation of the current concepts, doctrines and methodologies used in EU competition law.

R59. Consider the adoption of an effective and sustainable competition standard in antitrust decisions.

It is high time to give new meanings to the notions of a 'competitive market' and 'consumer welfare' in the competition policy paradigm. We argue that, in light of the changing nature of markets and the challenges faced by society, the traditional consumer welfare standard used in EU competition law should be reinterpreted and reoriented towards a post-GDP welfare standard, in which short-term consumer price effects are no longer the only indicator of economic welfare and social progress.

The Commission should make an effort to develop new analytical perspectives on welfare and well-being, in order to adopt an effective and sustainable competition standard that incorporates sustainability, planetary boundaries, social progress, digitalisation and economic resilience goals to the same extent as the goal of effective competition. There is a need to assess the empirical impact of sustainability and digitalisation initiatives on consumer and societal welfare, and to engage in a discussion on how eco-social policies for sustainable welfare beyond GDP growth can be accounted for within the competition law framework. It should further be noted that not even under the traditional consumer welfare standard could any market conduct resulting in lower prices be justified. By focusing on the effects of anticompetitive practices on the structure of competition, EU competition law has traditionally favoured a longer-term perspective of competition than its US counterpart, which focuses on short-term efficiencies. This is well evidenced, for example, in the body of case law on predatory pricing.

State aid after Covid-19

R60. Guarantee a smooth exit from the temporary framework.

The exceptional flexibility currently offered by the Commission's temporary framework for state aid to support the economy in the context of Covid-19 needs to be balanced against the strong conditions that otherwise need to be satisfied under state aid policy. While we advocate against extending the temporary framework indefinitely beyond the current pandemic-induced crisis, as this could create lasting distortions in the single market, a smooth and proportionate exit is advisable.

Many expect that, even after the pandemic, there will be continued support to uphold the relaxed state aid framework and to provide additional help to companies, which might lead to some member states adopting national recovery and reform plans that display aggressive state aid policies. This would raise an important question as to whether such measures need to be assessed differently from normal state aid.

While guaranteeing a progressive reduction in the flexibility granted by the temporary framework in accordance with the evolution of the crisis, the Commission should assume a coordinating role to ensure that national recovery plans are synchronised with the EU's recovery and resilience facility and state aid framework. Instead of applying fragmented national industrial policy, wider support should be sought for the pursuit of a pan-European industrial strategy.

R61. The next R&R guidelines: out of the pandemic towards healthy support for European companies.

It would be extremely narrow in scope, when discussing possible improvements to the rescue and restructuring (R&R) guidelines, not to take into account the enormous repercussions of the pandemic for the European economy and its impact on state aid policy and control. However, it should be reaffirmed that R&R is also one of the most distortive types of aid and detrimental to a healthy industrial policy, and should therefore only be granted under very strict conditions.

Certain aspects of the temporary framework may be taken into account, as they may contribute some useful lessons to the reform of the 2014 R&R guidelines, especially when considering the limited practice by the Commission in this area to date. These aspects are summarised briefly below.

Definition of a UID

The tightening of the conditions in the 2014 R&R guidelines has generally been conducive to better identifying a workable definition of an undertaking in difficulty (UID). However, because of the concurrent application of the near-identical provisions in the General Block Exemption Regulation, effort should be made to provide certainty for all national authorities. In particular, the criterion of 'disappearing capital' has proved difficult to apply.

Furthermore, reflection seems necessary on whether the UID definition is too all-encompassing, as it even catches undertakings that hardly seem to fit with what is intended to be caught, for instance those without legal requirements on capital. Although in practice aid that is granted to those undertakings may be block exempted, clarification may be useful as some simplified rules could be more conducive to fostering innovation and providing certainty.

Anticompetitive measures

Despite several concerns over its adoption, the temporary framework contains additional requirements for restructuring aid to be cleared, as it sets out more detailed provisions in comparison with the existing R&R guidelines. The future R&R guidelines should thus usefully include some of those specific requirements.

R62. Update the common assessment principles in the state aid framework to accommodate the objectives of the Green Deal.

There is a need to adopt a forward-looking state aid framework that can help member states to 'build back better' and enable a green and socially just economic recovery from the Covid-19 crisis. To achieve the goals of the Green Deal, large amounts of state support will need to be invested in EU economies. The state aid framework needs to be revised by the Commission to deliver the objectives of the Green Deal as soon as possible.

According to recent case law of the European Court of Justice (e.g. the Hinkley Point C judgment), when assessing the compatibility of a state aid measure that

facilitates the development of certain economic activities pursuant to Article 107(3)(c) but does not include environmental objectives, the Commission is under no obligation to assess the negative impact of the project on the environment. We note that the regrettable outcome of this judgment is in line with a conservative reading of the proportionality test incorporated in the common assessment principles.

We recommend that the Commission update the common assessment principles and adopt new guidelines spelling out how sustainability considerations should be taken into account in the future.

R63. Clarify the meaning and application of the technology neutrality principle in energy and environmental state aid.

A fully technology-neutral and traditional market-based approach to state aid in energy and environmental issues will not deliver on the promise of European economies being carbon neutral by 2050. Such an approach is in fact not neutral, but is biased towards incumbent energy technologies, and forces a one-size-fits-all approach on a very complex market known for its diversity of technology profiles.

The Commission should clarify the notion of technology neutrality in energy state aid, and how it intends to apply this in the future in light of its overarching obligation to phase out fossil fuels, as enshrined in the Green Deal. In addition, we invite the Commission to consider adapting the state aid framework to enable differentiation between different technology profiles in the energy sector, while upholding the cost-effectiveness criteria. The differentiation should relate to the technical characteristics of a given technology, including the cost, size, risk profile, project lead time, ability to provide system services and potential to contribute to the decarbonisation of the EU economy.

R64. Stimulate member state spending on RDI.

Research, development and innovation (RDI) are one of the most important building blocks of the EU industrial strategy. Nevertheless, the EU's target of spending 3% of GDP on R&D remains out of reach. For more than a decade, the EU-27 has only spent around 2% of GDP on R&D. The US and Japan are way ahead of this figure, and China also seems to have caught up with Europe. However, the aggregate numbers do not necessarily show a representative picture. It is notable that quite large variation exists among member states regarding their R&D expenditure as a share of their GDP. By way of example, while Sweden, Austria, Germany, Denmark, Belgium and Finland spend around or more than 3% of their GDP on R&D, other countries such as Romania, Malta, Cyprus and Latvia do not even meet a 1% target.

The EU's budget for RDI funding was €133 billion in the 2014-20 multiannual financial framework. More than half of this was taken up by Horizon 2020 projects and the rest by structural funds. At the member state level, in 2018 the figure spent on RDI was €11.3 billion, amounting to 9% of all state aid, which is the second largest category of aid after subsidies spent on environmental protection and energy efficiency. However, remarkably wide variation can be observed across member states regarding the amount of aid awarded for RDI on the basis of GDP.

Based on the above considerations, it can be concluded that the wide variation in R&D spending and RDI state aid across member states might not be attributable to the inefficiency of the state aid framework at EU level and the RDI framework in particular, but to member states' lack of willingness and ability to allocate aid in this area.

Mergers & acquisitions

R65. Create a competitive environment in which European leaders may emerge.

We strongly caution against using EU merger control to create 'European champions'. Such industry leaders, if they emerge, should do so by thriving in a competitive environment, rather than being created artificially. That said, the current framework for European merger control does not necessarily prevent the emergence of European champions, nor does it encourage it. Neither is it our goal to demonise big players in the market. European leaders can be created via mergers provided that they bring about sufficiently strong synergies and complementarities. When such efficiencies are not present, however, the basic premise of competition law dictates that the removal of competition between two undertakings has anticompetitive effects in both the short and long run.

R66. Adopt a more flexible interpretation of efficiencies in merger control to incorporate the notions of sustainability and resilience.

We recommend that the Commission adopt a more flexible interpretation of the substantive framework in merger control to accommodate sustainability benefits within the context of its consideration of the concept of 'efficiencies'. To do this, the Commission needs to broaden its focus to enable the appreciation of non-price effects and a more sustainable interpretation of the notion of an as-efficient competitor.

While the Commission has traditionally been reluctant to take into account non-price effects in the analysis of efficiencies, it has considered innovation effects in a number of merger cases on the basis of the terms of the horizontal merger guidelines. These provide that consumers may "benefit from new or improved products or services, for instance resulting from efficiency gains in the sphere of R&D and innovation". In light of this, we argue that without any substantive amendment, the Commission can – and should – adopt a new interpretive lens for the analysis of mergers in order to appreciate the broader consumer benefits in the form of progress towards more sustainable production and services.

Horizontal cooperation agreements

R67. Adapt the legal framework for horizontal cooperation agreements to the needs of the green and digital transitions.

Certain cooperation agreements (such as R&D and production agreements) are not considered harmful to competition and have an important role to play in the achievement of the high-level goals of the EU. For this reason, the Commission allows and encourages cooperation among potential competitors in a several areas. Without weakening the protection of competition, we recommend a number of actions to align the policy framework for horizontal cooperation agreements with the EU's goals under the green and digital transitions.

First, the Commission should strengthen the role of individualised, ad hoc guidance. During the Covid-19 emergency, the Commission increased its willingness to provide more individual guidance to companies in cases where they coordinated their efforts to tackle the shortage of essential products and services. In light of the potential benefits such guidance can produce for legal certainty, the Commission should extend this practice and continue to provide individual guidance on those agreements that "pursue the key objectives of the EU strategy, namely innovation, competitiveness and sustainability".

Second, the Commission should update the horizontal cooperation guidelines to specify the scope of permissible horizontal agreements with sustainability goals such as (i) sustainability agreements with no appreciable impact on competition; (ii) agreements on broad sustainability targets; (iii) sustainability agreements not restrictive of competition compared to the counterfactual situation; (iv) exchange of information for sustainability reasons; and (v) infrastructure-sharing agreements.

Third, whenever the conditions apply, horizontal cooperation agreements could be facilitated by the adoption of experimental policymaking, whereby the authorities and the undertakings in question engage in a monitored sandbox. In this negotiated approach, and if relevant, undertakings could have the opportunity to prove to the authorities that their particular form of cooperation (such as the exchange of information) does not constitute a collusive practice under Article 101(1) TFEU and would be unlikely to lead to merit exemption under the four-pronged test in Article 101(3) TFEU.

The Digital Markets Act

R68. Clarify the underlying legislative technique of the DMA.

Current debates on the proposed Digital Markets Act (DMA) point out a fundamental divergence among experts regarding its underlying legislative technique. In particular, the question has arisen as to whether the DMA is essentially a competition or a regulatory policy tool. It is of paramount importance that the Commission – as well as other institutional actors involved in the ordinary legislative procedure – clarify its stance in this debate, as this question has bearing on many other aspects of the proposal, such as the enforcement modes and the optimal institutional architecture.

R69. Allow the legislative technique to determine the institutional design and enforcement model of the DMA.

While the Working Group did not reach a final common position on this issue, we argue that, depending on the framing offered to the DMA, the optimal institutional design and enforcement modes might change.

In many respects, the Commission's task of centralised public enforcement is arguably the optimal enforcement mode for ensuring consistency across the EU. However, some experts argue that the enforcement of gatekeepers' obligations should be decentralised to enable national authorities to apply the DMA rules against gatekeeper platforms directly upon receipt of complaints made by small businesses harmed by their conduct.

Alternatively, it is also possible to conceptualise different degrees of decentralised enforcement. For example, instead of giving competence to national authorities to enforce the rules in the DMA, national authorities could support the Commission in enforcing the DMA and act as intermediaries, being tasked with receiving complaints and referring cases to the Commission. This approach could alleviate the concern about the lack of sufficient resources at Commission level and address the issue of possible forum shopping or problems connected to a race to the top (or bottom) that are inherent in a decentralised enforcement system.

R70. Clarify the notions of contestability and fairness in the DMA.

The DMA proposal places a strong emphasis on the notions of fairness and market contestability. Nevertheless, these concepts are left undefined in the proposal, creating legal uncertainty regarding the amount of discretion available to the Commission in applying them. This is especially dubious in light of proposed Articles 10v and 15, which enable the Commission to introduce new additional obligations and to designate new gatekeepers following a market investigation. Therefore, there is a need to further clarify the legal significance of these notions.

Contestability and fairness should become a well-defined concept of the regulation of digital platforms. Without a clear understanding of the content and nature of these notions, the DMA risks creating arbitrariness and engaging in 'regulatory creep'.

R71. Add an 'ecosystem' criterion to the generic gatekeeper criteria.

It can be argued that the criteria used to designate gatekeepers enshrined in Article 3 of the proposal should be stricter. The stricter test should include a requirement for the gatekeeper to have control over at least two (as opposed to just one) core platform services. The imposition of this extra requirement would narrow the scope of the DMA. Given the exceptional nature of ex ante regulation and the fact that many welfare-balancing considerations are finely tuned under certain platforms, this seems to be the most proportionate response. By the same token, we believe that consideration should be given to the use of a fourth criterion, relating to the "control and orchestration of an ecosystem composed of several core platform services". According to some experts, this approach has the advantage of focusing on the most serious contestability challenges in the digital economy. It should be noted, however, that this additional criterion is to a large extent qualitative and might create significant trade-offs with legal certainty and accuracy, as well as increasing the time needed to establish the existence of a gatekeeper. Nevertheless, such trade-offs might be justified where one can establish a more future-proof framework that better achieves the goals of the legislation.

R72. Ensure that the DMA remains future-proof by introducing more general flexibility in the regulatory design.

The obligations imposed on gatekeepers controlling core platform services comprise existing obligations listed in the proposal and potential new obligations that can be added to adapt the DMA to changing technologies and markets. Indeed, it is important that the DMA framework remains flexible so it is as future-proof as possible.

We recommend the introduction of more principle-based obligations by drawing on the design of the Unfair Commercial Practices Directive. The benefit of adding more general flexibility from the outset in the regulatory design of the DMA, rather than leaving it up to the Commission to expand its remit at its discretion at some point in the future, is that it can future-proof the DMA and eliminate the need to add more obligations over time. As a result, a new Article 6a could replace the current Article 10 in the proposal, which allows the Commission to adopt new obligations on the basis of a market investigation. Alternatively, the current wording of

Article 10 could be kept in the regulatory framework to allow the Commission to eliminate those obligations that, as a result of the evolution of the market and of technology, are no longer necessary to achieve the objectives of the regulation.

R73. Introduce more room for specific individualisation of regulatory enforcement.

One of the main critiques levelled by some at the obligations and prohibitions currently stipulated in the proposal relates to the seemingly 'one-size-fits-all' approach and lack of balancing of pro- and anticompetitive effects of a given business practice. It is therefore argued that the regulation should contain more room for individualisation and provide further possibilities for the justification of specific conducts covered by the regulation.

By including more scope for individualised treatment, one specific change should relate to adding the possibility of a line of defence for undertakings regulated by the DMA. This defence could be put forward in the context of open coordination and dialogue between enforcers and the regulated entities. The main reason for the need for an explicit defence is that it is important to balance the positive and negative effects of different practices in the digital economy on contestability and fairness. The defence should not necessarily be an efficiency defence, as understood under competition law, but should rather relate to the overarching regulatory goal of the DMA, namely, the protection of the competitive process. The DMA should allow regulated entities to rely on the defence by demonstrating that their behaviour does not harm market contestability or the fairness of the competitive process.

Final recommendation

R74. Reinforce the complementarity, sequential nature, and coherence of competition policy instruments.

We recommend that the Commission clarify and reinforce the structural links between different competition policy tools. It is of utmost importance to ensure stronger coherence between different instruments that often pursue different policy priorities.

For example, in a number of markets, particularly digital, there is a need for strengthened scrutiny in merger control, including of killer acquisitions below the EU threshold. In analysing potential mergers and acquisitions, the uncertainty that is linked to the future evolution of the market or future behaviour of the merged entity is very high. It should be considered whether ex post control, for example through the DMA, is sufficient to tackle this problem. Depending on how the DMA is implemented, it could potentially be a substitute for deeper merger control. Otherwise, a more vigilant merger authority can also avoid harmful mergers.

Furthermore, there are already a plethora of regulatory instruments in different economic contexts that have been introduced only recently (such as Important projects of common European interest (IPCEI), public-private partnerships (PPPs), etc.), the common strategy of which is to confirm the idea that firms within different layers of a value chain in different markets should be able to cooperate and coordinate their operations to an extent that is mutually beneficial, while still delivering benefits to the consumer. This calls for an adaptation of the horizontal cooperation guidelines, and potentially the development of ad-hoc sets of rules for specific cases falling within the scheme of those guidelines (for example, data-sharing agreements in relation to markets where access to data is a critical commercial input). Therefore, we consider that the debate related to horizontal cooperation agreements is closely related to that on mergers and acquisitions. Similarly, we believe that the upgrading of those sets of rules touches significantly upon what we hope to achieve with ex ante regulation.

6. HEALTHCARE AND PHARMACEUTICALS

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Short- to medium-term recommendations

R75. Widely discuss and communicate any expansion of the mandates of the European Centre for Disease Prevention and Control (ECDC) and the European Medicines Agency (EMA), and enhance their responsiveness and toolkit, particularly the ECDC's. The creation of a new agency, such as the proposed European Health Emergency Preparedness and Response Authority (HERA), should be part of a clear institutional strategy and structure.

R76. Set HERA up to focus on being agile and fast-responding in case of emergencies, with clear mechanisms on how to cooperate with EMA, ECDC and industry (to bring demand and supply together fast), and ensure it is very well-resourced financially to act meaningfully, to be insulated from political pressure, and to use expert input and data to focus on what is needed to fight a new pandemic.

The upgrades of the EMA and ECDC agencies can be supported. They already have the expertise, networks, and budget, although it is questionable whether there has been sufficient consultation about the draft regulations. More thorough questions should be asked about the ECDC, specifically about its lack of responsiveness and action in the early days of Covid-19, and whether it can absorb these additional tasks. This raises the question of the ECDC's governance (and that of other European agencies), which has not been changed in the draft amendments. Creating a new agency is not an easy task; it would take years for HERA to become operational. It also leads to a further spreading of competences, rather than their concentration, unless there is clear agreement among the EU member states, and alignment with the existing agencies. In the interest of Europe's pandemic preparedness, the EU should also seek the inclusion of the UK, to the greatest extent possible, given its prominent role in healthcare research. The Trade and Cooperation Agreement (TCA) with the UK, after all, allows the UK to join specialised EU agencies. This possible inclusion also applies to other neighbouring countries in the context of the EEA or other trade agreements.

R77. Carry out stress tests on the preparedness and capacity of European healthcare systems.

The EU should take the initiative for an independent inquiry into the pandemic response at EU and member state level and act on the lessons learned. This will provide the basis for future stress tests, which should aim to map the performance and weaknesses of national healthcare systems. This would produce concrete recommendations that more resilient systems could be built on. Stress testing can contribute vast amounts of information and facilitate the exchange of best practice. Before embarking on such an ambitious exercise in the healthcare sector, the Commission should consider the following aspects:

i. **Standardisation is not the immediate answer.** We should not expect the outcome of stress testing to result in perfectly homogenous or standardised data. Instead, a stress test can start a process in which EU member states gradually establish interoperable standards and converging methods for collecting and storing information on their healthcare systems.

ii. **The stress test should not be 'pass' or 'fail'.** The Commission should focus on the process rather than the results of the stress test. This can encourage new habits and regulation and lead to intra-EU alignment that will strengthen responsiveness to another pandemic.

iii. **Use incentive measures.** The EU could combine its coordinating measures with incentives to increase the willingness of member states to proactively participate in the stress tests.

iv. **Incorporate the results of the stress tests in the European Semester**. Regardless of what the outcome of the test may be, the systemic problems identified will require a systemic response, new risk-sharing mechanisms, and solidarity. Based on the first stress test, the EU should develop specific indicators that can be incorporated in the European Semester.

R78. Accelerate the creation of a European Health Data Space and the collection of standardised health data throughout the European health system.

The Covid-19 crisis demonstrated the need for readily available digital health data of European citizens. However, only Big Tech seems to have this, based to some degree on data stored on personal devices. EU countries have different integrated health data pools of their citizens. These are not interoperable and can even be fragmented within countries (hospitals using their own IT systems, for example). This severely hampered the identification of demand for ICU medicines, face masks and other PPE across the EU in the early days of the Covid-19 crisis. Furthermore, because of the margin of manoeuvre available to EU member states in the General Data Protection Regulation (GDPR) to further specify the application of the regulation in health, there is still substantial fragmentation in the implementation and interpretation of the rules on health data.

The EU had started work on this well before the crisis hit and had laid the groundwork for a European Health Data Space. The many advantages of a common data space range from improving how authorities cooperate across the EU and the speed at which they share data, to more research opportunities. Citizens would be the ultimate beneficiaries. Nevertheless, the privacy and sheer sensitivity of health data poses major challenges. Trust could be enhanced by improving the transparency and accountability of the data providers, to clearly separate the often-confused concepts of data flows and data privacy; by developing common templates; and by applying the highest standards of cybersecurity. All of these are matters that cannot be solved easily or rapidly.

There is currently no macro picture of the capacities of the healthcare sector in the member states, of the medical research being done at member state and EU level, or of the strengths and weaknesses of the pharmaceutical sector in the EU and neighbouring countries. It is important to ensure, that in upgrading the ECDC and extending the mandate of the EMA, these agencies have (i) the necessary information and (ii) the capacity to act. Demand-side data has been a particular problem in the EU's response to the pandemic because of the fragmented nature of the data gathered and of the data-gathering systems (between and even within EU member states).

More data will also be required at the micro level, but this will be challenging if data privacy concerns cannot be addressed (e.g. by anonymising data and/or by separating data flows from data privacy), given the attachment to health privacy and the different sensitivities in member states to personal data storage and exchange.

R79. Coordinate and integrate national healthcare and biotech research spending at EU level.

The EU needs to better coordinate research and development (R&D) in healthcare and biotech. The respective EU-funded programmes need to be better coordinated and monitored, and the research domains better prioritised and steered. A strategic view is currently hampered by R&D being spread over different programmes with a variety of modalities. Furthermore, additional resources should be allocated (not reallocated) to R&D areas in which the EU wants to be a global leader in the next 10-20 years. The EU budget will therefore need to be increased; even the new one is inadequate, with just a tenth of the budget available to the US BARDA, for example.

Greater coordination and monitoring of national healthcare and biotech research spending is also needed because competition for advanced medical research is global, and fragmentation at EU level is costly and lowers the outcomes and returns, certainly (but not only) for smaller countries. The only source today on overall R&D spending in Europe seems to be the OECD data, but with the difficulty of aggregating different EU and national budget lines, and getting robust private sector data, the accuracy of these data is somewhat questionable. Correct data is crucial for planning and exploiting synergies.

R80. Develop public interest criteria to guide the governance and implementation of public-private partnerships (PPP) in the pharmaceutical sector to prioritise unmet medical needs and maximise societal impact.

Currently, PPPs do not adequately meet medical needs or deliver expected impacts on the overall life sciences value chain. The European Commission should develop the European Health Research and Innovation Strategy and base the PPP priorities and agenda on it. The strategy should be informed by the concept of unmet medical

needs and be linked to the EU pharmaceutical strategy. To identify the unmet needs, the Commission should facilitate an open, multistakeholder dialogue with the involvement of academia, research, and relevant civil society organisations. This could in turn enable an informed discussion on the areas where public money is needed.

The Commission should also develop a clear and transparent set of indicators that can be used to evaluate the added value of PPPs for society and EU citizens at large. The criteria should: set clear priorities for unmet medical needs; consider the notions of resilience and sustainability; and facilitate inclusive access conditions to funding under PPPs to ensure public return on public investment and affordable access to health technologies resulting from EU R&D funds.

R81. Simplify the EU landscape for healthcare research and create synergies between funding instruments.

The EU funding landscape for health research is rich and diverse, which indicates that it is a particularly attractive policy tool for EU institutions and member states. However, the complexity of the funding landscape creates several limitations. The overall lack of transparency needs to be addressed. Health stakeholders – private and public, small and big actors – need more coordination across the EU to get a full understanding of existing projects and initiatives and identify opportunities for funding and collaboration. The European Commission has a role in fostering this.

There is limited interaction between the governing boards of different instruments at the EU and national levels and other international programmes. Many PPPs under the Horizon 2020 programme fail to cooperate and maintain close relationships with member states. This prevents them from aligning their activities with other instruments with similar objectives, therefore failing to capture national research strategy synergies.

A simplified EU health research landscape would enable public and private actors to understand how the system works and where their involvement would be meaningful. Simplified rules and procedures and projects and calls for proposals synchronised across funding instruments would cover the gaps and avoid duplication. Furthermore, a common EU platform that gathers all research efforts and stimulates cross-project exchanges of information should be set up. The governance of PPPs needs to be redesigned to significantly reduce administrative burdens and costs, leaving investment for R&D to address unmet medical needs.

It is important to bridge the gaps between different funding instruments. Once we have mapped and understood the entire R&D landscape, we need to decide whether we can better address the gaps at the EU or national level. The Commission should play a coordinating role in this. A precondition would be to understand the mission of all funding instruments in the R&D landscape on both levels. This can help decide what gaps new instruments such as the Innovative Health Initiative (IHI) can fill and what needs to be in place for them to succeed. This way, synergies between funding instruments can be created.

R82. Ensure stakeholder participation in the European biopharma ecosystem Is balanced and includes SMEs and academia.

Facilitating SME participation should be a key objective for pharmaceutical PPPs. SME participation has the potential to drive competitiveness in the European health and pharmaceutical sector. By gaining access to such funding instruments, SMEs can become mid-size undertakings and potentially even the next big pharmaceutical R&D drivers of Europe. This trajectory is well evidenced in the US and can have a bearing on the overall resilience of the European biopharmaceutical industry. The interim evaluation report of the Innovative Medicines Initiative (IMI) 2 notes that SMEs are "essential cog-wheels that drive competitiveness of the European health industry" and represent a "key element for the success of this multidisciplinary approach to innovation".

Under the Horizon 2020 programme, PPPs have a 20% SME participation target. The Commission's interim evaluation of the programme revealed significant variation across PPPs, which to some extent can be attributed to the nature of the sector they operate in. Many PPPs, including the IMI, are not meeting this goal.

The main reason for the under-representation of SMEs in biomedical PPPs is that the rules and conditions of participation are significantly more burdensome for them than for large corporations. The main limiting factors include heavy administrative and regulatory burdens and micromanagement, which are more costly to comply with

for smaller companies. The narrow and prescriptive definitions of proposals and the complexity of intellectual property (IP) negotiations are further obstacles. IP negotiations are particularly challenging due to the fact IMI's main focus, pre-competitive research (wherein companies openly cooperate without restrictions, for example, IP rights), is a core business to SMEs.

The Commission should address this issue at the policy level before the new IHI is set up. In particular, we recommend that the IP policy of the future partnership allows SMEs and academia to negotiate exclusive rights.

R83. Strengthen open access to research outputs of PPPs.

In line with the public interest rationale for PPPs, if public money is invested in a given research project, information should be freely available to other European researchers, innovative industries and the public at large. Open access helps to (i) build on previous research results; (ii) increase efficiency in research by encouraging collaboration and avoiding duplicates; (iii) accelerate innovation and growth; and (iv) involve citizens and society and increase transparency. However, given the significant private sector investment in PPPs, access should also be sensitive to the private sector's interests; narrowly defined exceptions to access are needed to avoid distorting incentives.

We recommend that there should be mandatory and free open access to the research outputs, datasets and clinical results of publicly funded projects of pharmaceutical PPPs. While this is currently the default rule under the IMI, it is observed that large pharmaceutical companies have easy access to derogations and opt-outs.

According to IMI's key performance indicators (KPIs), 50% of all project outputs should be open access. Despite this already unambitious target, the 2018 KPIs show that only 19.2% of project results were made open access. While the lenient opt-out mechanisms are in place to protect the IP rights of pharmaceutical companies, it is argued that the unbalanced negotiation powers of large consortium players vis-à-vis SMEs and academia mean that the larger industry players get to opt out more often and without penalties from the open-access model. This does not seem to be in line with the public interest-driven model and further strengthens the barriers to access to projects for SMEs and academic institutions. Keeping a high share of project outputs openly accessible should be a top priority of IHI, while ensuring IP rules continue to facilitate further research. Reliance on exceptions and derogations from access should be carefully reviewed and treated transparently.

R84. Focus on strong incentives for long-term R&D investment in biotechnology and pharmaceutical industries, with a stronger IP framework than today, combined with other types of incentives, to ensure this.

Europe is falling behind global competitors on patents in life science innovation, with a much lower number registered than in the US or China. The number of new firm investments is lower in the EU than in the US or China, and the development of innovative medicines and treatments (an area where Europe was leading in the 1990s) is now lagging behind the US, with China soon to overtake the EU. European biotech was responsible for 13% of the new drugs approved by the US Food and Drug Administration (FDA) in 2017 and 2018, while US biotech firms were responsible for 78%. It is argued that many patents are never used and that they are a poor measure for innovation, and that the effectively used patents should be the accurate number. However, there are no available data on this. This could be related to the rigorous regulatory scrutiny and procedures, for example for clinical trials, that can mean patents end up not being used. However, licences should not be unreasonably withheld. Companies should not expand their patent portfolio to the maximum possible to thwart any conceivable competition. The low number of patents in Europe is also related to the incomplete patent law and the EU legal framework, which reduces the attractiveness of patenting. And now that the US has suggested waiving patents for vaccines, this debate is key.

The recently adopted EU trade strategy acknowledges that trade is becoming more and more IP-driven and that strong IP must underlie EU's global trade, especially for services like R&D. But there are no concrete proposals to put the trade strategy firmly into the 21st century and ensure it is in line with the IP Action Plan. The key element for the EU Free Trade Agreements is to continue to support the very strong export performance of the EU to date is strong IP provisions that create a level playing field for innovative EU industries – including the pharmaceutical sector. But, for that, the EU needs a strong local IP context, stronger IP provisions in EU FTAs and a stronger innovation framework in the EU itself.

None of these are fully in place yet, and other competitors are making big strides towards becoming future innovation hubs.

The IP and the underlying legal framework have long been debated in Europe, and while there is a consensus on its importance for the life sciences industry, it continues to be a source of concern. A single pan-European patent and a single court for litigation of European patents (a European Patent Court) remain under construction. The system as it stands does not provide sufficient certainty, as not all EU countries participate, and it is hybrid, with overlapping national and EU-wide systems. The biopharmaceutical industry is the most IP-intensive industry in Europe (and globally), and it will therefore go to those countries where IP is strong, clear-cut and properly enforced.

R85. Keep the global nature of the pharmaceutical industry in mind in the industrial strategy and aim to reduce the already low EU dependencies, not by increasing costs in supply chains by reshoring, but by diversifying supply and strengthening the EU's role in innovation so that it becomes a driver of innovative manufacturing of the medicines of tomorrow.

The EU needs to assess – based on facts – the robustness of the EU's pharmaceutical supply chains, whether there are any dependencies (in terms of imports from a very limited number of sources) and what constitutes the best way to improve the EU's strategic resilience in supply chains, via the structured dialogue.

The EU should consider how it could be a more attractive place for private R&D investment and encourage competitiveness in its biopharmaceutical industry. This can be done partly via HERA and PPPs like IMI/IHI, but it is crucial to provide appropriate and stronger incentives for the industry to invest in Europe instead of China, Japan, or the US.

The EU must continue to provide strong IP protection and to encourage innovation in new technologies and medicines – after all, these are the medicines that will be needed for the next pandemic. While the IP Action Plan is clear, the pharmaceutical strategy is, so far, a missed opportunity to achieve this. The trade strategy is also weak on the essential driver for the EU's strong export performance: intellectual property. The industrial policy is an opportunity to balance this out and ensure that EU industries – not only pharmaceuticals – will be meaningful competitors 10 or 20 years from now.

R86. Make the industrial strategy an umbrella policy linking other strategies such as pharmaceutical, trade, and open market and the various responsible DGs (see below).

At EU level, as a core public policy, healthcare is within the remit of different departments (DGs) in the European Commission. The main body in charge is DG Sante, which was given more responsibilities under the von der Leyen Commission, including the pharmaceutical sector. It also shares competences with DG Grow (competitiveness and IP), DG Ecfin (fiscal policy and the Semester), DG Research (R&D), DG Connect (digital and e-health), DG Competition (open markets and state aid) and DG Trade (tariffs and IP). It is crucial that the DGs coordinate in the different EU policies they are responsible for. Healthcare matters are also covered by different European Parliament Committees, most importantly Industry Affairs (ITRE) and Environment and Public Health (ENVI). As for the EU Council, healthcare is the task of the EPSCO Council (Employment, Social Policy, Health and Consumer Affairs Council, a 'Jumbo' Council), but the European Council itself also took a big role during the Covid-19 crisis.

Medium- to long-term recommendation

R87. Strengthen the EU's competence for pandemic preparedness with a targeted Treaty amendment.

The Covid-19 crisis created the momentum to build an EU Health Union and to expand EU competences in public health. This will address member states' inability to act individually in the face of their systems' fragility and the differing healthcare capacities across the Union. Whether and in what form a targeted Treaty amendment could be implemented in the medium to long term should therefore be considered.

The principle of subsidiarity is a constitutional obligation of the Union, enshrined in Article 5(3) TEU, which provides an interpretive lens for the use of EU

competence: if national authorities can sufficiently address an issue, EU institutions should not interfere with their autonomy. This is certainly the case when the expertise over a policy challenge is on the national or local level, which is often the case in health-related issues and especially in the event of health crises. In light of this, we do not recommend entrusting the EU with exclusive or even shared competence in the area of public health *in general*. However, we do recommend the strengthening of the EU's supervisory role in overseeing coordination among member states in responding to cross-border health threats. In our view, in the event of a cross-border health crisis, coordination should be binding. This issue should be discussed at the Future of Europe Conference. A targeted Treaty amendment should be considered to enable the EU – in addition to member states – to take public health initiatives when cross-border health is threatened.

The European Commission should not only coordinate and support national action in health, but also possess its own resources and competences so it can react to public health emergencies. The EU should be responsible for coordinating and streamlining research activities in coordination with member states.

The targeted Treaty amendment shall change the conditions under which the EU has a shared competence in public health. Currently, Article 4(2)(k) provides that the EU has a shared competence for "common safety concerns in public health matters, for the aspects defined in this Treaty". Article 168(4) TFEU lists what measures the EU can adopt, in accordance with the ordinary legislative procedure. We recommend the addition of a paragraph providing for EU competence for:

> **(d) measures for the purpose of coordinating research and development, manufacturing, purchasing and delivery of medical products and mobilising medical countermeasures.**

7. AGRICULTURE AND FOOD

Authors: *Giulia Meloni, Jane Arroyo and Chiara Del Giovane*

The imperative to ensure healthy diets and improved nutrition, enhance industry sustainability and competitiveness and reduce environmental and climate impact presents the EU's agricultural and food systems with many challenges. In the midst of the Covid-19 pandemic, trade wars and post-Brexit implications, the EU's new industrial strategy has never been more timely, highlighting as it does the capacity of the EU's agri-food system to drive sustainability through a new and more ambitious green architecture.

Finding diverse and innovative solutions is thus key to EU industrial policy priorities to improve the capacity of agricultural and food systems to respond to these challenges in Europe and globally, while at the same time ensuring the decarbonisation of the food and beverages industry.

Against this background, the Agriculture and Food Working Group of the Task Force focused on three main issues, discussed in three meetings. The aim of the first meeting was to discuss how to realise a more sustainable food production through a new and more ambitious green architecture. The second meeting focused on the need to build more resilient and sustainable agri-food industries. The third and final meeting discussed how fast-developing digital technologies and advanced plant-breeding techniques have the potential to completely transform agriculture and food, while reducing the environmental and climate footprint of food production.

Three general recommendations emerged from the discussion in the three different meetings:

I. For **farm production, food needs to be produced with much lower environmental footprint**, and help mitigate climate change, **while improving farmers' livelihoods and stimulating broader rural development**. The Common Agricultural Policy (CAP) should be reformed to support these objectives, but it is not the objective itself.

II. For the **food industry and distribution**, greater emphasis should be placed on **producing safe, healthy and nutritious foods**, in a sustainable manner.

III. These changes will require **much stepped-up investment in research and innovation**, but this should **embrace high-tech solutions** as well as **nature-based solutions and agroecological practices**.

R88. Develop more sustainable food production.

Agriculture and global food systems are putting pressure on our planetary boundaries as they are contributing significantly to greenhouse gas emissions, impacting natural resources, and using a large share of our energy resources. As a result, **food urgently needs to be produced with much lower environmental footprint**, and help mitigate climate change, while **improving farmers' livelihoods and stimulating broader rural development**. This implies ensuring access to a sufficient supply of affordable food for citizens, while fostering the competitiveness of the EU supply sector and creating new business opportunities.

The CAP is one of the most important EU policy mechanisms through which **EU agri-food systems could achieve the objectives of the European Green Deal.** This is why the CAP should be reformed to support these objectives; but it is not the objective itself.

The new CAP proposed by the Commission in 2018 called for greater environmental and climate ambition, mainly through an enhanced conditionality and the eco-schemes, as well as on well-designed agri-environmental-climate measures. In the coming weeks, the Council and European Parliament will negotiate their own positions to reach an agreement in the trilogues and put in place a revised approach on green objectives.

The negotiating mandates of the Council and the European Parliament in some **areas have watered down the more environmentally ambitious green architecture of the Commission proposal**. There should be a **common vision and willingness to keep ambitions high for the CAP**.

R89. Produce healthy, nutritious and sustainable food.

Over the past six decades, agricultural production has grown fast in the EU. However, the EU now faces the pressures of ill health caused by poor nutrition, overweight and obesity. To address these challenges, the EU needs to reshape its agri-food system, shifting the

emphasis from ensuring food supply to providing safe, healthy and nutritious foods, in a sustainable manner.

To achieve this objective, the way of producing, buying and consuming food should be transformed, through for example, reducing **food waste** or transition to a **more circular economy**. The food environment should also **encourage healthy decisions and sustainable diets by consumers**. There is the need to facilitate consumers in making informed food choices, including through harmonised front-of-pack labelling rules, measures on promotion, responsible food marketing, and targets to be set for reducing food waste, including on the date marking ('use by' and 'best before' dates). Finally, national regulations adopted at member state level should be avoided (e.g. as in the glyphosate case or concerning the mandatory labelling of foodstuffs), whereas an **EU-wide harmonised food labelling system should be introduced.**

R90. Invest in research and innovation in agri-food systems.

The need to provide safe, healthy and nutritious foods with much lower environmental footprint will **require much stepped-up investment in research and innovation**, but this should embrace **high-tech solutions** as well as **nature-based solutions and agroecological practices**.

New digital technologies, such as wireless connectivity, the Internet of Things (IoT), artificial intelligence (AI) and blockchain have the potential to transform elements of the agri-food system, sometimes in a fundamental way. The diffusion of digital technologies in agri-food chains promises to increase and stabilise yields, reduce waste and negative environmental effects, and trigger changes in consumption patterns.

However, the use of digital technologies faces a variety of potential risks, in terms of economic, social, and environmental sustainability, such as: i) aggravating inequalities when it comes to connectivity, skills and capital; ii) producing negative consequences for the environment and human health due to energy consumption and e-waste; and iii) opening major regulatory aspects (e.g. new ethical questions when it comes to digital privacy issues and ownership of data).

To contrast some of the challenges, there is the need to create (or enable) a **new generation of farmers in agriculture** who do not fear the new and are well educated towards the use of AI and new technologies in agriculture. To this end, **investments in education, skills, R&D, and infrastructure** (such as **access to fast and reliable broadband**) in rural and remote areas are needed to make sure farmers have a wide range of opportunities.

In addition to new digital technologies, **advanced plant-breeding techniques can also help tackle sustainability issues** and contribute to the transformation in agri-food systems. The new techniques, for instance, make use of genome editing for crop improvement and may further support sustainable agricultural productivity.

In this case as well, these new techniques also generate important debates on **major regulatory aspects** (GMO-like controversy). Therefore, a **smart policy framework and a regulatory reform based on scientific evidence is needed** to guarantee safe, advanced plant-breeding techniques and sustainable agri-food industries.

Finally, even if **high-tech solutions** are needed to meet the Green Deal objectives, **further investments in research and innovation** are also needed to **foster nature-based solutions** (sustainable management and use of nature) **and agroecological practices** (such as crop diversification or long crop rotations). These practices not only have the potential to achieve the Green Deal objectives by decarbonising agriculture, reconquering biodiversity and restoring soil fertility, they can also be instrumental in revitalising rural areas across the EU and enhancing the economic and social resilience of EU farms.

8. TRADE POLICY

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EU trade policy, which is essential to a prosperous European economy and industry, has an important role to play in tackling the major challenges of our times relating to worsening geoeconomic and trade tensions, enduring global sustainability issues and a deteriorating multilateral order. It is important to try to surmount these challenges by adopting a non-protectionist and peaceful approach, to the benefit of EU industry, consumers and citizens, and more generally the world.

In response to these numerous challenges, the European Commission recently released a Trade Policy Review promoting an open, sustainable and assertive trade policy, in line with the EU's fundamental treaty commitment to free and fair trade,[57] as well as with the overarching green and digital transitions as supported by the EU industrial strategy. In this respect, open strategic autonomy becomes the new horizon towards which EU trade policy is directed. The aim is to balance the benefits of trade openness and competitiveness with strengthened resilience, sustainability, a more assertive stance towards unfair trade practices, and rules-based cooperation.

In this regard, the new model of open strategic autonomy should be generally understood and implemented as uniquely supportive of emerging or new forms of trade openness, and not as buttressing any type of protectionism. This trade openness should therefore essentially be founded on and contribute to sustainability, fair conditions of competition and a level playing field, security and predictability, multilateral trade cooperation to the greatest extent possible, and legal and economic grounds.

Sustainable trade

R91. Achieve sustainable trade in the best way possible through the adoption of concrete and measurable trade policy instruments, as a complement or alternative to domestic environmental and social policies.

Trade and sustainability must be compatible, even though this is not necessarily the case automatically. In this respect, diverse EU policies may contribute to sustainable trade, including EU environmental and social policies, as well as EU trade policy whose main perspective currently relates to the trade and sustainable development (TSD) chapters in its new generation of free trade agreements (FTAs).

Nevertheless, based on the theory of economic policy, domestic environmental and social policies are generally considered first-best policies to correct market failures, while trade policies are generally qualified as "blunt and rarely, if ever, efficient when addressing market failures" (Mavroidis, 2016). **EU trade policy should therefore be applied for sustainable trade purposes only to the extent that it effectively improves the impact of international trade on environmental, climate or social realities, and that this transition towards a more sustainable economy and trade creates new market opportunities and increased employment.**

Furthermore, EU trade policy should contribute towards sustainable trade through **concrete, measurable and direct instruments addressed primarily – or at least ultimately – to companies**, which should be considered as the core actors in this transition towards sustainability.

Against this background, the following specific trade policy instruments should be adopted by order of preference:

I. Trade liberalisation in environmental goods (EGs) and services (ES) at the multilateral level.
II. Mandatory EU system of due diligence with international private certification.
III. Single-topic sustainability agreements.
IV. Improved EU FTAs in terms of both substance and enforcement.

R92. Promote trade liberalisation in environmental goods and services at the multilateral level, to represent the first-best trade policy option that can contribute to sustainable trade.

Trade liberalisation in EGs at the multilateral level represents the first-best trade policy option to contribute to sustainable trade in facilitating access – at lower cost – to EGs. On the one hand, as shown by the trade and environmental indicators of the Organisation for Economic Co-operation and Development (OECD), international trade in EGs more than doubled in the period 2003-16 (OECD, 2019). This growth may relate in part to domestic environmental policies (Sauvage, 2014). On the other hand, Shapiro (2020) shows that in

most countries, import tariffs and non-tariff barriers are substantially lower on dirty (more upstream) than on clean (more downstream) industries, and that limiting the greater protection of the latter could address climate change and increase welfare.

Trade liberalisation in environmental goods (and services) should be approached in a holistic manner at the World Trade Organization (WTO) by reviving the currently suspended Environmental Goods Agreement (EGA) negotiations. The latter should proceed on the basis of a plurilateral agreement, and should cover the majority of international trade in EGs and be extended to include developing countries. They should aim to eliminate tariffs on EGs, which should benefit all WTO members on a most-favoured-nation (MFN) basis.

As the EGA would represent a paradigm shift by integrating the environmental policy purpose with the international trade agenda, its scope should first cover the most obvious EGs, i.e. those: i) that contribute directly to climate change mitigation in a measurable way, ii) that already greatly benefit from domestic environmental policies, and iii) for which consensus among participating WTO members may be more easily found. The scope of the EGA should then be incrementally extended to progressively cover all EGs of a value chain based on a periodic review mechanism.

For a meaningful impact on environmental protection, multilateral trade liberalisation in EGs should be extended to environmentally related services (ES), as they generally represent a joint component as part of environmental projects.

R93. Provide for a mandatory EU system of due diligence with international private certification systems, which should represent a critical step towards a global standard on responsible business conduct.

The European Commission is expected to release a proposal for a directive on mandatory corporate due diligence later this year, which is a welcome initiative. Compared to voluntary due diligence and reporting systems, mandatory due diligence requirements may contribute more positively to a reduction in adverse human rights and the environmental impacts of business activities and supply chains, thereby increasing their resilience (European Commission study, 2020).

An EU-wide mandatory due diligence system should be based on an obligation of conduct in the form of a **context-based legal standard of care**, according to which undertakings must adopt all objectively necessary and sufficient measures to identify, prevent and mitigate the most severe or likely adverse corporate-related impacts on human rights and the environment. In this respect, the applicable standard of care should vary according to the size and means of the undertakings, as well as to their sector of activity and the context of operations, in order to guarantee both the effectiveness of the due diligence system and legal certainty.

The due diligence requirements should be applicable to all EU undertakings and also non-EU undertakings operating in the internal market, in order to **ensure a level playing field at both EU and global level. A**ccess to the EU internal market should be conditioned or made more tariff-advantageous (e.g. based on a future WTO EGA) upon compliance with the due diligence requirements.

Beyond an appropriate standard of care, the effectiveness of the due diligence system depends on consistent and coordinated monitoring and enforcement by the Commission and EU member states. As this will entail significant costs (European Commission study, 2020, at p. 22), undertakings should be given the possibility to demonstrate their compliance through reference to **internationally recognised private conformity assessment systems**, which themselves are based on internationally recognised standards (e.g. international product-related standards, including standards on conformity assessment, developed by the International Organization for Standardization (ISO)).

This EU-wide cross-sectoral due diligence system should therefore also contribute to the further development of international private standards and conformity assessment systems into a **private world agreement, which should further support other relevant international treaties** (e.g. the United Nations Treaty of Business and Human Rights, and WTO's Technical Barriers to Trade (TBT)-plus and Sanitary and Phytosanitary (SPS)-plus Agreements).

R94. Prioritise single-topic sustainability agreements over EU FTAs.

The EU should **give priority to the development of dedicated sustainability agreements** with its trading partners with a wider multilateral perspective. The unique example in this respect is the Agreement on

Climate Change, Trade and Sustainability (ACCTS) between Costa Rica, Fiji, Iceland, New Zealand, Norway and Switzerland.

R95. Improve EU FTAs in terms of substance and enforcement.

To enhance the effectiveness of the **TSD chapters** in the EU's FTAs, they should contain **more concrete and targeted rules** on various sustainable trade-related topics, beyond the areas currently covered, and these rules should all be legally binding. The level of ambition of the TSD commitments should, however, be flexible and vary according to the trading partner, to ensure that the EU continues to conclude FTAs with partners that are not necessarily like-minded.

The TSD chapters in the new generation of EU FTAs have also proved to be of limited effectiveness in their enforcement. The appointment of a chief trade enforcement officer and the establishment of a single entry point are therefore worthwhile initiatives. Specific dispute settlement mechanisms based on a panel of experts should still be rendered more operational, however, notably in providing for **economic or trade sanctions** in case of non-compliance. This should be made contingent on a **'competitiveness test'** (e.g. Article 9.4 of the level playing field chapter under the Trade and Cooperation Agreement (TCA) between the European Union and the United Kingdom).

Fair trade

R96. In the absence of negotiated solutions at the multilateral level, adopt a more assertive legal stance aimed at contributing to fair conditions of competition and public security in the single market, beyond any form of protectionism, based on legally predictable rules founded in economics.

Europe's traditional openness to trade and investment firmly underpins its economic competitiveness and resilience (European Commission, 2020). In this respect, foreign investment in the EU economy has become increasingly important over the past 10 years. This may notably be explained by the increase in value chain production (OECD, 2013). Visible trends in this respect relate to the increasing relevance of emerging foreign direct investment (FDI) providers and an increase in investment from emerging economies and state-owned enterprises (SOEs), as well as the growing presence of "offshore investors" (European Commission, 2019).

This increasing openness to foreign investment represents a great economic opportunity for Europe. It may, however, also raise concerns with respect to certain foreign investments and other trade practices, which represent potential **significant challenges to public security and the EU's level playing field.**

On the one hand, FDI in the internal market has increasingly concerned **foreign investors with close ties to their home governments**, such as SOEs that strategically target European companies involved in the development of critical technologies or infrastructure (e.g. energy). Other **critical assets** that could be strategically targeted by FDI relate to critical inputs, access to sensitive information, or the freedom and pluralism of the media. These trends and potential risks relating to FDI warrant a more comprehensive approach at EU level, given the operation of firms over several EU member states, the importance of the **proper functioning of the single market** and the necessity for greater leverage over foreign countries that may limit access to their markets.

On the other hand, with the generally low tariff levels, governments in both high-income and emerging economies are **increasingly using subsidies** as a substitute for protection (Evenett, 2019; Hoekman and Nelson, 2020). Most importantly, **the increase in value chain-based production and trade**, which is highly correlated with an expansion in FDI (OECD, 2013), is expected to limit the incentives to use traditional trade policy instruments such as tariffs, and to increase the incentives to use subsidies and subsidy-like instruments (Hoekman, 2016). However, subsidies will generally have spillover effects on trade, which may even be the intention. While subsidies are presumed to be the first-best instruments to address market failures implying positive spillover effects, they may also be adopted based on other rationale, such as an industrial policy-driven (competitive) objective that can imply **negative cross-border spillover effects**. More specifically, in a value chain world, negative cross-border spillovers can and will occur, as will deadweight losses (Hoekman, 2016).

Against this backdrop, foreign subsidies can, through their negative effects, distort competition and challenge

the EU's level playing field. Indeed, EU state aid rules, which aim to preserve such a level playing field among undertakings in the internal market, are solely applicable to subsidies provided by EU member states. Moreover, in this context of increasing importance of subsidisation and global value chains, the WTO legal disciplines on subsidies have to be adjusted and extended to cover services and investments. However, this endeavour is expected to be difficult to achieve at the multilateral level.

Against this background, and in the absence of negotiated solutions at the multilateral level, **EU initiatives relating to the recent EU Regulation for the screening of FDIs in critical assets that may affect security or public order[58] and the Commission's proposal on foreign subsidies[59] should be supported** to the extent this more assertive legal stance by the EU is genuinely aimed at contributing to fair conditions of competition and a level playing field in the single market, as well as public security beyond any form of protectionism, based on legally predictable rules founded in economics.

R97. Establish an EU-wide investment screening mechanism on grounds of public security with respect to (at least) projects or sectors of Union interest, adopt complementary legislative instruments founded in economics and make full use of competition policy with the objective to guarantee the achievement of an open and properly functioning single market.

The EU Regulation on the screening of foreign direct investments establishes a framework for member states to screen FDIs into the EU on the grounds of security or public order, and a mechanism for cooperation and information sharing. Despite its contribution to enhanced legal certainty and transparency, **the EU FDI Screening Regulation still provides for an incomplete and imperfect system at EU level, which may compromise the achievement of a properly functioning and open single market.**

On the one hand, the regulation relies essentially on national proceedings that are typically confidential, and the EU-wide cooperation and information-sharing mechanism also shows limited transparency in some respects. Furthermore, investors may continue to face multiple parallel national (formal and informal) investment screening proceedings within the single market. Against this background and as part of its five-year review, the Commission should propose the establishment of an **EU-wide investment screening mechanism on the grounds of security or public order with respect to (at least) projects or sectors of Union interest based on the EU's exclusive competence regarding the common commercial policy (Article 3(1)(e) of the TFEU)**.

On the other hand, despite the list of factors on critical assets and foreign investors provided for in the regulation, there is a risk that national investment screening authorities may expand their interpretation of the grounds of security and public order to cover other hidden grounds, in particular economic. To overcome this risk, the EU should adopt **complementary legislative instruments founded in economics and make full use of its competition policy** (e.g. General Court, *Gencor*, 1999)[60] with the objective of ensuring fair conditions of competition and a level playing field in the single market.

R98. Improve the balancing test, limit the undertakings' administrative burden and ensure the WTO-consistency of the Commission's proposal on foreign subsidies.

The European Commission's recent proposal for a regulation on foreign subsidies distorting the internal market aims to establish new rules with respect to subsidies received from third countries by undertakings active in the EU. In this respect, it emphasises and targets the distortive effects that foreign subsidies may cause in the single market. As mentioned previously, this can indeed be the case. The Commission's proposal, therefore, proceeds on the basis of indicators to identify the distortive effects of foreign subsidies, and importantly it mentions the purpose of the foreign subsidy. Nevertheless, the latter also expresses itself in the determination of the potential positive effects of the subsidy. In this regard, however, we observe that the balancing test in the proposal has become wider and less specific, and gives quite a broad discretionary power to the Commission compared to the EU interest test in the White Paper. This lack of specificity, with the ensuing risk that the Commission does not recognise the positive effects of foreign subsidies, clearly creates legal uncertainty and may dissuade companies and operators from investing in the single market, at the expense of its

competitiveness. Instead of contributing to fair conditions of competition in the internal market, the proposal risks promoting protectionism. Against this background, the Commission should base its actions on the theory of economic policy and develop guidance or further rules providing for safe harbours regarding foreign subsidies. More generally, the proposed regulation on foreign subsidies and its application should not be more restrictive than the state aid rules applicable to EU member states. Importantly, all necessary measures should be taken to limit the undertakings' administrative burden and to ensure the proposal's WTO compliance.

Multilateral trade

R99. In the medium to longer term, strive to address the major challenges of our times through multilateral solutions at the WTO.

Major challenges that our world is facing are best addressed through solutions negotiated at the multilateral level, and importantly at the WTO, even if they require strenuous medium to long-term efforts. The General Agreement on Tariffs and Trade (GATT) and the WTO have indeed proved to be indispensable for the operation of the global economy, its openness and development, and the security and predictability of the multilateral trading system, thereby also contributing to peacekeeping.

It is therefore of utmost importance to restore and improve the multilateral rules-based trading system in its core functions, including notably through the modernisation of its rules and the reform of its dispute settlement system. It is important to note here that the EU strongly supports the reform of the WTO, as evidenced by the Annex to the Trade Policy Review "Reforming the WTO: Towards a sustainable and effective multilateral trading system".

R100. Contribute by priority to the reform of the WTO dispute settlement system with the objective to ensure the security and predictability of the multilateral trading system.

The restoration of a fully functioning WTO dispute settlement system, in particular the Appellate Body, should be given **priority** on an independent basis as part of the WTO reform. In fact, it is crucial for the core existing WTO legal disciplines to again be completely effective, and for their modernisation to be justified and incentivised. Indeed, the WTO dispute settlement system has proved to be essential to the maintenance of the multilateral rules-based trading system. It is therefore crucial to restore it on a strong and lasting basis, maintaining and further promoting its core characteristics relating to its binding nature, the independence of the WTO adjudicators, as well as the WTO dispute settlement system's fundamental contribution to the security and predictability of the multilateral trading system.

Some aspects of the WTO adjudicative system deserve, however, to be improved and clarified. First, the **90-day time limit for the issuance of Appellate Body reports**, which has been constantly exceeded with an average duration of 395 days in 2018 (WTO, 2020), **should be extended to a more realistic mandatory period estimated at an average of six months**, with the possibility to extend this period rendered more difficult. In fact, the 90-day time limit imposed by the US negotiators in 1993 was already widely criticised for being an unreasonably short time frame given the practices of other courts.

Second, given the nature of WTO law and the claims, arguments and evidence provided by litigant parties, a certain number of **panellists and Appellate Body members should be requested to have demonstrated expertise in economics**, in particular econometrics (Mavroidis and Neven, 2017).

Third, the Appellate Body's mandate limited to issues of law covered in the panel report and legal interpretations developed by the panel should be clarified. In this respect, an Understanding of Article 17.6 of the Dispute Settlement Understanding (DSU) providing for **general guidance as to the required degree(s) of correspondence between facts and law for the meaning and operation of domestic law to be subject to appellate review** should be adopted. It should notably be determined according to the type of WTO-covered agreement or legal obligation at stake, and the type of claim (*de facto* vs *de jure* cases) (Schaus, 2020).

R101. Contribute to the development and adoption of an international code of conduct on state-owned enterprises that would clarify and reinforce existing WTO legal disciplines.

In addition to adapting WTO rules to climate and environmental challenges, an **international code of conduct on state-owned enterprises** should be adopted. In fact, SOEs are used in numerous countries, and may sometimes create market-distortive effects. For instance, they are quite present in the European economy (Amatori, 2017), and state-led economies generally rely heavily on SOEs, which may have differing characteristics (Pelkmans and François, 2018).

Since GATT 1947, WTO law has comprised some disciplines regarding SOEs, including **Article XVII GATT**, which concerns the behaviour of state trading enterprises (STEs) in their commercial activities. The Article should, however, be clarified and expanded with respect to the obligations that it covers. On the one hand, it provides that STEs will act in a non-discriminatory manner in their commercial activities, and on the other hand, it states that STEs shall act solely in accordance with commercial considerations and shall afford other enterprises adequate opportunity to compete for participation in their commercial activities.

In the context of divergent WTO case law, these obligations should be understood as being **independent obligations** (Mavroidis and Sapir, 2021). In fact, SOEs may contribute to market distortions based on behaviour that is not consonant with commercial considerations, while perfectly non-discriminatory. In this respect, **an Understanding of Article XVII GATT based on the relevant disciplines developed in the EU's FTAs (e.g. the EU-Vietnam FTA) and beyond should be adopted.**

Second, subsidies may be granted through the sometimes opaque systems of SOEs. Under the WTO Agreement on Subsidies and Countervailing Measures (the SCM Agreement), a subsidy is established based notably on the existence of a financial contribution provided by a government or a public body, or by a private body entrusted or directed by the former. In this respect, the **SCM Agreement should be clarified and reinforced through the development of an illustrative list, annexed to the Agreement, of SOEs that would *presumptively* qualify as public bodies** (Mavroidis and Sapir, 2021). Qualification would be based on one or two criteria referred to in WTO case law with respect to the entity-based public body enquiry and typically included in the definition of an SOE in EU FTAs and beyond, i.e. majority government ownership, governmental appointment of the majority of board members, governmental control over strategic decisions, the exercise of governmental functions or the pursuance of government policies.

9. CAPITAL MARKETS

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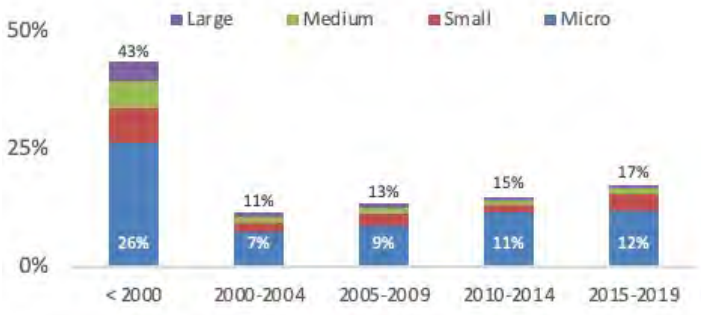
R102. Enhance capital market financing for Europe's growth companies.

If European industry is to thrive, innovative new companies with good business ideas must be able to obtain the finance they need. This may seem obvious, but European SMEs currently rely almost exclusively on banks for their external finance, and these often do not provide the risk capital that innovative companies need. In the past few years, progress has been made to enhance access to capital for these growth companies. For example, venture capital has become more available and it has become easier to get listed. Nevertheless, there are still challenges to realising growth potential. These recommendations seek to identify factors that impede growth companies' ability to raise public capital and suggest ways to overcome them.

In recent years, EU policies have been relatively successful in bringing small companies to the capital markets. The number of listed micro companies has consistently risen since 2000, albeit rather slowly. Micro caps (i.e. companies with up to €200 million in market capitalisation) account for more than two thirds (65%) of all companies listed in the EU. Most of these (60%) were listed in the past two decades (see Figure 7). The gradual increase in micro-cap listings can be partially explained by policy interventions such as the creation of SME growth markets under MiFID II (ESMA, 2021), which reduced the costs and requirements for micro caps to get listed.

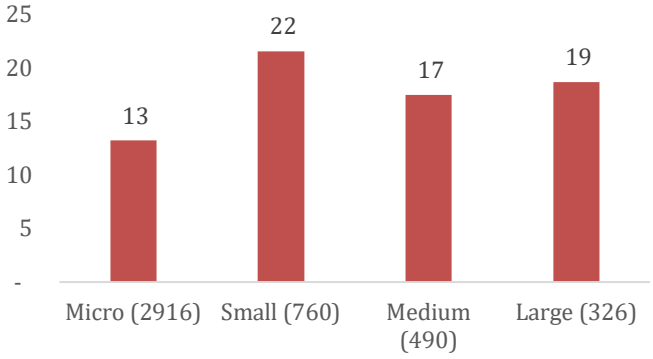
Figure 7. Companies listed at EU regulated and growth markets by initial listing period and size



Nevertheless, **only a small share of micro caps are successful**, i.e. able to continue growing post initial public offering (IPO). Indeed, the micro caps in the EU have grown more slowly than larger companies in recent years, contradicting economic theory that smaller companies outperform larger ones. In fact, out of all micro caps that went public over 2015-19, approximately only 5% managed to become a small, medium or large cap (market capital above €200 million) by the end of 2019.

Micro caps prove to be less liquid and undervalued compared to other market segments. More specifically, the stocks of micro caps are relatively less frequently traded than those of larger caps. Similarly, as expressed by their lower price-earnings ratios, micro companies have a relatively lower value than larger companies. For example, the average value of micro caps between 2015 and 2019 is just more than half of small caps (Figure 8). These results are generally consistent across most countries, exchanges, and sectors.

Figure 8. Aggregate price-earnings ratio of listed companies by size



Note: The data presents aggregate price-earnings ratios over 2015-20. The figure includes individual companies listed on EU regulated markets (main and SME growth markets) and does not include companies that were delisted.

Source: CEPS (2021).

The mediocre market performance might well be due to **limited investor interest**. More specifically, the lack of information available about micro caps makes it difficult to price them properly. Moreover, the smaller size reduces the scale advantages for institutional investors, leading to higher transaction costs. It might be particularly challenging to improve this situation for micro caps that are incentivised to go public with less substantial and stringent information requirements and a shorter track record. Increasing the information requirements might remove some of these incentives.

We therefore formulate the following recommendations:

R103. Improve the dissemination of corporate information (financial, environmental, social, governance, etc.) either through a central EU database or one set up by the exchanges and made freely accessible to investors.

It is recommended to improve the information provisioning on smaller listed companies. The micro caps (including many innovative new companies) are currently relatively less liquid and undervalued than other larger publicly listed companies. This seems to be primarily explained by limited investor demand. In order to stimulate investor demand, while not reducing the attractiveness of a public listing (reporting costs), it is recommended to improve the dissemination of corporate information (financial, environmental, social, governance, etc.) either through a central EU database or one set up by the exchanges. The database should be freely and easily accessible to investors and analysed.

R104. Promote the involvement of anchor investors to enhance the investor trust of retail investors and reducing the under-pricing.

It is recommended to promote the involvement of anchor investors to enhance the trust of investors in smaller listed companies. Despite a growth in the public listings of micro caps (including many innovative new companies) in recent years, the market is not reaching its full potential as signalled by illiquidity and undervaluation of micro caps. The involvement of anchor investors can contribute to overcoming the limited trust of investors in smaller companies as well as that they can contribute to a better governance in micro caps.

R105. Develop alternatives to public markets, including business angels, venture capital and other forms of private equity, to serve as a stepping-stone to public listing.

It is recommended to further develop the alternative forms of risk-financing for smaller companies. European small and medium-sized companies are traditionally heavily reliant on banks for their external financing. However, innovative new companies with large growth potential often do have the proof of business, track records, and collateral needed to obtain bank financing, while public listing is still relatively costly for them. The promotion of alternatives to public listings such as business angels, venture capital, and other forms of private equity could help EU growth companies to obtain the growth financing before they are seeking public listing.

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List of Recommendations

LIST OF RECOMMENDATIONS

GENERAL RECOMMENDATIONS

R1. Adopt a fully-fledged strategy, including mission, timeline, adequate governance, and indicators to track progress.

R2. Embrace the 'North Star' of its industrial strategy as a refined version of the Industry 5.0 paradigm.

R3. Embrace a European enterprise model as a new approach to capitalism by fixing the economics behind the industrial strategy.

R4. Consolidate and streamline the many initiatives launched to support industry at the EU level.

R5. Fix multilevel governance: Next Generation EU is a 'once-in-a-century' opportunity to rebuild, reshape and repurpose Europe's industry.

R6. 'What gets measured gets done': choose future-proof indicators for systemic transformation.

THE EUROPEAN GREEN DEAL

R7. Identifying revenue streams to invest in climate-neutral production.

R8. Reward Innovators under the EU ETS.

R9. Focus EU climate diplomacy on industrial decarbonisation partnerships.

R10. A strong EU ETS price signal is important.

R11. Slowly develop a CBAM and engage with international partners.

R12. ETS revenues can contribute to industrial transformation.

R13. Treat domestic production and Imports alike?

R14. Identify skills to support rapid deployment of low-carbon technologies.

R15. Strengthen public procurement and boost demand for low-carbon goods.

R16. Do not forget about SMEs and non-ETS industry.

R17. Regional dimension: focus on clusters but don't forget other areas.

R18. Focus on the construction value chain to accelerate industrial decarbonisation.

DIGITAL AND DATA

R19. Evaluate the 5G rollout in relation to the territory and the broader mix of possible technology solutions.

R20. Encourage infrastructure sharing.

R21. Carefully analyse the technology mix in non-dense urban areas.

R22. Address the risks associated with 5G rollout effectively.

Artificial intelligence and industrial transformation

R23. Promote human-centric, sustainable and resilient AI technologies.

R24. Prioritise sustainable and decentralised technological solutions.

R25. Enhance and enforce workers' rights in a digitally enabled workplace.

R26. Seize the opportunity and adopt 'AI for good' as a key policy priority.

R27. Complete the puzzle: EU data governance is still fragmented and uncoordinated.

R28. Ensure a single market for IoT/edge applications and architectural solutions.

R29. Ensure that GAIA-X is scaled up into the European Alliance for industrial data, cloud and edge.

R30. Establish a 'compliance by design' mechanism with EU legislation for members joining GAIA-X.

R31. Step up the ambition of the Data Governance Act.

R32. Foster interoperability as the key enabler of the EU's digital ambitions.

R33. Link data spaces to ecosystems.

STRATEGIC VALUE CHAINS

R34. Perform stress tests to assess the resilience of value chains.

R35. Establish a mandatory due diligence obligation.

R36. Foster cross-border and international cooperation.

R37. Introduce phase-out measures.

R38. Adopt a bottom-up approach.

R39. Effectively revise the IPCEIs communication.

R40. Make use of public-private partnerships to deliver on strategic projects.

R41. Analyse and recognise strategic elements along the value chains.

R42. Promote coherent and consistent actions across the EU.

R43. *Increase transparency of supply chains.*

R44. *Redesign contracts.*

R45. *Make the best use of new technologies in value chains.*

R46. *Invest in new skills for the workforce.*

JOBS AND SKILLS

R47. *Up-date and future-proof education and training systems.*

R48. *Create EU incentives for firm-oriented training in strategic sectors.*

R49. *Provide individual entitlement to adult education and training.*

R50. *Modernise public and private employment services.*

R51. *Ensure fair minimum wages.*

R52. *Put social dialogue at the core of the EU industrial strategy.*

R53. *Centre EU sustainable business models on job quality.*

R54. *Include job quality in the EU industrial strategy KPIs.*

R55. *Ensure the implications of telework on workers and businesses are understood.*

R56. *Ensure gender equality across sectors and at the workplace as part of the EU Industrial strategy.*

COMPETITION AND STATE AID

R57. *Ensure that competition policy remains competition policy.*

R58. *Update the tools and scope of competition policy to make it compatible with a modernised industrial strategy and the peculiarities of the digital economy.*

R59. *Consider the adoption of an effective and sustainable competition standard in antitrust decisions.*

R60. *Guarantee a smooth exit from the temporary framework.*

R61. *The next R&R guidelines: out of the pandemic towards healthy support for European companies.*

R62. *Update the common assessment principles in the state aid framework to accommodate the objectives of the Green Deal.*

R63. *Clarify the meaning and application of the technology neutrality principle in energy and environmental state aid.*

R64. *Stimulate member state spending on RDI.*

R65. *Create a competitive environment in which European leaders may emerge.*

R66. *Adopt a more flexible interpretation of efficiencies in merger control to incorporate the notions of sustainability and resilience.*

R67. *Adapt the legal framework for horizontal cooperation agreements to the needs of the green and digital transitions.*

R68. *Clarify the underlying legislative technique of the DMA.*

R69. *Allow the legislative technique to determine the institutional design and enforcement model of the DMA.*

R70. *Clarify the notions of contestability and fairness in the DMA.*

R71. *Add an 'ecosystem' criterion to the generic gatekeeper criteria.*

R72. *Ensure that the DMA remains future-proof by introducing more general flexibility in the regulatory design.*

R73. *Introduce more room for specific individualisation of regulatory enforcement.*

R74. *Reinforce the complementarity, sequential nature, and coherence of competition policy instruments.*

HEALTHCARE AND PHARMACEUTICALS

R75. *Widely discuss and communicate any expansion of the mandates of the European Centre for Disease Prevention and Control (ECDC) and the European Medicines Agency (EMA), and enhance their responsiveness and toolkit, particularly the ECDC's. The creation of a new agency, such as the proposed European Health Emergency Preparedness and Response Authority (HERA), should be part of a clear institutional strategy and structure.*

R76. *Set HERA up to focus on being agile and fast-responding in case of emergencies, with clear mechanisms on how to cooperate with EMA, ECDC and industry (to bring demand and supply together fast), and ensure it is very well-resourced financially to act meaningfully, to be insulated from political pressure, and to use expert input and data to focus on what is needed to fight a new pandemic.*

R77. *Carry out stress tests on the preparedness and capacity of European healthcare systems.*

R78. *Accelerate the creation of a European Health Data Space and the collection of standardised health data throughout the European health system.*

R79. *Coordinate and integrate national healthcare and biotech research spending at EU level.*

R80. *Develop public interest criteria to guide the governance and implementation of public-private partnerships (PPP) in the pharmaceutical sector to prioritise unmet medical needs and maximise societal impact.*

R81. *Simplify the EU landscape for healthcare research and create synergies between funding instruments.*

R82. *Ensure stakeholder participation in the European biopharma ecosystem Is balanced and includes SMEs and academia.*

R83. Strengthen open access to research outputs of PPPs.

R84. Focus on strong incentives for long-term R&D investment in biotechnology and pharmaceutical industries, with a stronger IP framework than today, combined with other types of incentives, to ensure this.

R85. Keep the global nature of the pharmaceutical industry in mind in the industrial strategy and aim to reduce the already low EU dependencies, not by increasing costs in supply chains by reshoring, but by diversifying supply and strengthening the EU's role in innovation so that it becomes a driver of innovative manufacturing of the medicines of tomorrow.

R86. Make the industrial strategy an umbrella policy linking other strategies such as pharmaceutical, trade, and open market and the various responsible DGs (see below).

R87. Strengthen the EU's competence for pandemic preparedness with a targeted Treaty amendment.

AGRICULTURE AND FOOD

R88. Develop more sustainable food production.

R89. Produce healthy, nutritious and sustainable food.

R90. Invest in research and innovation in agri-food systems.

TRADE POLICY

R91. Achieve sustainable trade in the best way possible through the adoption of concrete and measurable trade policy instruments, as a complement or alternative to domestic environmental and social policies.

R92. Promote trade liberalisation in environmental goods and services at the multilateral level, to represent the first-best trade policy option that can contribute to sustainable trade.

R93. Provide for a mandatory EU system of due diligence with international private certification systems, which should represent a critical step towards a global standard on responsible business conduct.

R94. Prioritise single-topic sustainability agreements over EU FTAs.

R95. Improve EU FTAs in terms of substance and enforcement.

R96. In the absence of negotiated solutions at the multilateral level, adopt a more assertive legal stance aimed at contributing to fair conditions of competition and public security in the single market, beyond any form of protectionism, based on legally predictable rules founded in economics.

R97. Establish an EU-wide investment screening mechanism on grounds of public security with respect to (at least) projects or sectors of Union interest, adopt complementary legislative instruments founded in economics and make full use of competition policy with the objective to guarantee the achievement of an open and properly functioning single market.

R98. Improve the balancing test, limit the undertakings' administrative burden and ensure the WTO-consistency of the Commission's proposal on foreign subsidies.

R99. In the medium to longer term, strive to address the major challenges of our times through multilateral solutions at the WTO.

R100. Contribute by priority to the reform of the WTO dispute settlement system with the objective to ensure the security and predictability of the multilateral trading system.

R101. Contribute to the development and adoption of an international code of conduct on state-owned enterprises that would clarify and reinforce existing WTO legal disciplines.

CAPITAL MARKETS

R102. Enhance capital market financing for Europe's growth companies.

R103. Improve the dissemination of corporate information (financial, environmental, social, governance, etc.) either through a central EU database or one set up by the exchanges and made freely accessible to investors.

R104. Promote the involvement of anchor investors to enhance the investor trust of retail investors and reducing the under-pricing.

R105. Develop alternatives to public markets, including business angels, venture capital and other forms of private equity, to serve as a stepping-stone to public listing.

Task Force sessions, speakers, participants

TASK FORCE SESSIONS AND SPEAKERS

EUROPEAN GREEN DEAL

- Chair: Christian Egenhofer
- Rapporteurs: Vasileios Rizos, Milan Elkerbout

LOW CARBON MARKETS IN THE EU AND BEYOND

- **Carl De Maré,** VP, Head Emerging Technologies, ArcelorMittal Group
- **Gwenole Cozigou,** Director, Industrial Transformation and Advanced Value Chains, DG GROW, European Commission
- **Yan Qin,** Senior Analyst at Refinitiv
- **Gökçe Mete**, Research Fellow at Stockholm Environment Institute

TESTING THE TOOLS WITH CARBON-INTENSIVE EU INDUSTRIES

- **Oliver Sartor**, Senior Advisor AgoraEnergiewende
- **Anna Kadefors**, Professor in Real Estate Management, KTH Stockholm
- **John Cooper**, Director General, FuelsEurope
- **Marco Mensink**, Director General, CEFIC
- **Johanna Lehne**, Senior Policy Advisor, E3G

CONSTRUCTION VALUE CHAINS IN EUROPE

- **Fulvia Raffaelli**, European Commission, Unit C1 Circular Economy and Construction DG GROW
- **Robert Lowe**, Energy Institute, UCL
- **Judith Kirton-Darlin**, IndustriALL
- **Rob van der Meer**, HeidelbergCement

EU'S CARBON BORDER ADJUSTMENT MECHANISM (CBAM) (JOINT MEETING WITH THE TRADE POLICY WORKING GROUP)

- **Gerassimos Thomas**, Director General Taxation and Customs Union, DG TAXUD, European Commission
- **Susanne Dröge**, Senior Fellow, SWP, German Institute for International and Security Affairs
- **Dominic Coppens**, Senior Associate, Sidley Austin

DIGITAL ECONOMY AND DATA

- Co-Chairs: Andrea Renda, and Lorenzo Pupillo
- Rapporteurs: Rosanna Fanni and Carolina Polito

SPEEDING UP THE ROLLOUT OF 5G AND OTHER FORMS OF CONNECTIVITY IN EUROPE: WHAT ARE THE OPTIONS?

- **Simon Forge**, Director, SCF Associates

ARTIFICIAL INTELLIGENCE AND INDUSTRIAL TRANSFORMATION

- **Lars De Nul**, European Commission
- **Sebastian Wieczorek**, SAP
- **Max Lemke**, European Commission
- **Judith Kirton-Darling**, Deputy General Secretary industriALL
- **Barry O'Sullivan**, Professor, University College Cork

THE EDGE/CLOUD LAYER, DATA SPACES AND THE FUTURE OF GAIA-X: ANATOMY OF SINGLE MARKET 2.0

- **Andrea Renda**, Senior Research Fellow, CEPS
- **Klaus Ottradovetz**, Distinguished Expert Cloud, IoT, Blockchain, Atos.
- **Jaana Sinipuro**, Project Director responsible for the IHAN®, Sitra
- **Jakob Greiner**, Head of EU Regulatory Affairs, Deutsche Telekom
- **Monique Calisti**, CEO Martel Innovate and Digital for Planet

STRATEGIC VALUE CHAINS

- Chair: Andrea Montanino, Chief Economist, Cassa Depositi e Prestiti, and President of the Italian Investment Fund SGR
- Rapporteur: Chiara Del Giovane

THE EVOLUTION OF VALUE CHAINS: THE PROSPECTS FOR DIVERSIFICATION AND RESHORING

- **Jennifer Bair,** Professor and Chair, Department of Sociology, University of Virginia
- **Adnan Seric**, Research and Industrial Policy Officer, United Nations Industrial Development Organization (UNIDO)
- **Patrizio Bianchi,** Full Professor, University of Ferrara (and Italian Minister of Education)
- **Slawomir Tokarski** – Director of Industrial Policy and Innovation, European Commission, DG GROW.

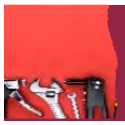
GOVERNANCE AND POLICY OF STRATEGIC VALUE CHAINS IN EUROPE

- **Demos Spatharis**, Head of Unit on R&D&I, IPCEI and environment, DG COMP, European Commission

- **Fabrice Stassin**, Director Government Affairs Electromobility Projects and Director Government Affairs Northern Europe & Japan, Umicore
- **Fabrizio Pagani**, Global Head of Economics and Capital Market Strategy, Muzinich & Co.

INNOVATIVE GOVERNANCE SOLUTIONS FOR SVCS

- **Carsten Jäkel**, Partner and the Head of Global Treasury Services of EY Germany, Austria and Switzerland, and Dr Heiko Borchert, Borchert Consulting & Research AG
- **Donald Kalff**, former Manager of Royal Dutch Shell and a former Director of KLM, entrepreneur in biotech and ICT
- **Joachim Schwerin**, Principal Economist, Unit H3 SME Access to Finance, DG GROW, European Commission
- **Peteris Zilgalvis**, Head of Unit, Digital Innovation and Blockchain, DG CONNECT, European Commission



JOBS AND SKILLS

- Chair: Cinzia Alcidi
- Rapporteurs: Sara Baiocco and Francesco Corti

CHANGING LABOUR MARKETS: DIGITAL AND GREEN TRANSFORMATIONS AFTER THE PANDEMIC

- **Carl Benedikt Frey**, University of Oxford
- **Daphne Ahrendt**, Eurofound
- **Sanna Markkanen**, Cambridge Institute of Sustainable Leadership

PROTECTING AND RELOCATING: WHICH SKILLS, FOR WHOM AND BY WHOM?

- **Glenda Quintini**, OECD senior economist
- **Jasper Van Loo**, Cedefop senior expert

SOCIAL DIMENSION OF THE NEW EUROPEAN INDUSTRIAL POLICY

- **László Andor**, FEPS Secretary General and former EU Commissioner for Employment, Social Affairs and Inclusion
- **Christina Behrendt**, ILO Social Protection Department, Head of Social Policy Unit

COMPETITION POLICY AND STATE AID

- Chair: Andrea Renda
- Rapporteur: Agnes Sipiczki

STATE AID AFTER COVID-19

- **Lluis Sauri Romero**, Coordinator State Aid, Chief Economist Team, DG COM
- **Phedon Nicolaides**, Professor at the University of Maastricht and Visiting Professor at the College of Europe, Bruges, and LUISS University
- **Andrea Biondi,** Director of the Centre for European Law, King's College London
- **Catherine Banet,** Professor, University of Oslo, Faculty of Law; CERRE Academic Fellow

HORIZONTAL COOPERATION AGREEMENTS & MERGERS AND ACQUISITIONS AS INDUSTRIAL POLICY TOOL

- **Ginevra Bruzzone**, Deputy Director General of Assonime
- **Maarten Pieter Schinkel**, Professor of Economics, Faculty of Economics and Business, University of Amsterdam
- **Martin Peitz,** Professor, University of Mannheim, Director of the Mannheim Centre for Competition and Innovation

THE DIGITAL MARKETS ACT – FOR WHAT PURPOSE?

- **Heike Schweitzer**, Professor, Humboldt University Berlin, Law Faculty
- **Alexandre de Streel**, Professor EU Law, University of Namur, Academic Co-Director, Centre on Regulation in Europe (CERRE)
- **Fiona Scott Morton,** Professor, Yale University School of Management

HEALTHCARE AND PHARMACEUTICALS

- Co-Chairs: Donald Kalff, Dutch entrepreneur, and Karel Lannoo
- Rapporteur: Agnes Sipiczki

HEALTHCARE AND THE EU HEALTH UNION

- **Sylvain Giraud** (Head of Unit - Medical products, DG Health and Food Safety at the European Commission)

THE EU PHARMACEUTICAL STRATEGY

- **Anthony Rodiadis**, Policy Officer, DG SANTE, Directorate B - Health Systems, Medical Products and Innovation
- **Martin Wenzl**, Health Policy Analyst at Organisation for Economic Co-operation and Development

PUBLIC-PRIVATE PARTNERSHIPS IN PHARMA

- **Magali Poinot**, Advisor to the Executive Director, Innovative Medicines Initiative
- **Michel Goldman** (Full Professor at the ULB, former Executive Director of the IMI and Founder of the I3h Institute)

AGRICULTURE AND FOOD

- Chair: Giulia Meloni
- Rapporteur: Jane Arroyo, and Chiara Del Giovane

REFORMING THE CAP TO ENHANCE SUSTAINABILITY

- **Harriet Bradley, Senior Agriculture and Land Use Policy Officer, BirdLife Europe.**
- **Tassos Haniotis**, Director "Strategy, Simplification and Policy Analysis", DG AGRI, European Commission
- **Alan Matthews**, Professor Emeritus of European Agricultural Policy, Trinity College Dublin, Ireland

THE FUTURE OF EU FOOD POLICY: RESILIENT AND MORE SUSTAINABLE VALUE CHAINS?

- **Mathilde Chareyron**, EU Representative, OriGIn
- **Nathalie Chaze**, Director "Food sustainability, international relations", DG SANTE, European Commission
- **Mella Frewen**, Director General, FoodDrinkEurope
- **Vincenzo Lenucci**, Director, Confagricoltura

SCIENCE AND TECHNOLOGY: OPPORTUNITIES FOR AND RESISTANCE TO CHANGE

- **Tassos Haniotis**, Director "Strategy, Simplification and Policy Analysis", DG AGRI, European Commission
- **Petra Jorasch,** Manager Plant Breeding Innovation Advocacy, Eurosseds
- **Urs Niggli,** President, agroecology.science
- **Riccardo Valentini, Professor, University of Tuscia, Italy**
- **Justus Wesseler,** Professor, Wageningen University & Research, Netherlands
- **Erika Widegren**, Chief Executive, Re-Imagine Europa

TRADE POLICY

- Chair: Malorie Schaus
- Rapporteur: Chiara Del Giovane

EU TRADE AND SUSTAINABILITY

- **Dirk De Bièvre**, Professor, University of Antwerp
- **Arnoud R. Willems**, Partner, Sidley Austin
- **Louise Curran, Professor, TBS Education**
- **Jacques Pelkmans**, Associate Senior Fellow, CEPS, and Professor, College of Europe and Goethe University

EU'S CARBON BORDER ADJUSTMENT MECHANISM (CBAM) (joint meeting with the European Green Deal Working Group)

- **Gerassimos Thomas**, Director General Taxation and Customs Union, DG TAXUD, European Commission
- **Susanne Dröge**, Senior Fellow, SWP, German Institute for International and Security Affairs
- **Dominic Coppens**, Senior Associate, Sidley Austin

A LEVEL PLAYING FIELD IN THE SINGLE MARKET: FDI SCREENING AND FOREIGN SUBSIDIES

FDI Screening

- **Jacques Bourgeois**, Professor, College of Europe and University of Ghent

Foreign subsidies

- **Eddy De Smijter**, Head of Unit International Relations at DG COMP
- **Jacques Bourgeois**, Professor, College of Europe and University of Ghent
- **Arnoud Willems**, Partner, Sidley Austin

THE EU'S CONTRIBUTION TO THE REFORM OF THE WTO

- **Myrto Zambarta**, Head of Unit on Multilateral Affairs and the WTO, DG TRADE, European Commission
- **Pascal Lamy**, President emeritus, Institut Jacques Delors, former EU Trade Commissioner and former Director-General of the WTO
- **Petros C. Mavroidis**, Professor, Columbia Law School and University of Neuchâtel
- **Elisa Baroncini**, Professor, University of Bologna

EU'S TRADE RELATIONS WITH THE UNITED STATES

- **David O'Sullivan**, Senior Counselor at Steptoe & Johnson LLP and former European Union Ambassador to the United States
- **Richard Baldwin**, Professor, Graduate Institute, Geneva

EU'S TRADE RELATIONS WITH AFRICA

- **Ms. Ewa Synowiec**, Director of Directorate C: Africa, Caribbean & Pacific, South East and South Asia, Trade and Sustainable Development, and the Green Deal, DG TRADE, European Commission
- **Dr. San Bilal**, Senior Executive, Head of Programme, Trade, Investment and Finance, ECDPM
- **Mr. Ian Mitchell**, Senior Policy Fellow and Co-director, Europe, Centre for Global Development

EU-CHINA COMPREHENSIVE AGREEMENT ON INVESTMENT (CAI)

- **Pascal Kerneis**, Managing Director, European Services Forum (ESF)
- **Jacques Pelkmans**, Associate Senior Research Fellow, CEPS, and Professor, College of Europe and Goethe University

TASK FORCE MEMBERS

The Task Force Members are comprised of representatives of commercial companies, trade associations, consumer interest groups and individuals from EU Institutions, policymakers, academics, regulators and supervisors. They are participating in the activities of the Task Force in a *personal* capacity.[1]

Below you can see a work-in-progress list of participants.

CORPORATE MEMBERS

- Afep
- Afore Consulting
- American Chamber of Commerce to the EU (AmCham EU)
- Amgen
- Apple
- Arcelor Mittal
- Assonime
- Austrian Economic Chamber (WKO)
- Austrian Mining, Steel and Non Ferrous Metals Association
- BMW
- BNP Paribas Fortis
- BusinessEurope
- Cargill
- Cassa Depositi e Prestiti (CDP)
- Cattus Management BV
- Cleary Gottlieb Steen & Hamilton LLP
- Compass Lexecon Europe
- Computer & Communications Industry Association (CCIA Europe)
- Confagricoltura
- Confindustria
- Copenhagen Economics
- Danish Agriculture and Food Council
- Deloitte
- Deutsche Telekom AG

[1] Please refer to the "Principles and Guidelines for the Task Force and its Working Groups".

- EDF
- Ernst & Young (EY)
- European Builders Confederation
- European Cement Association (CEMBUREAU)
- European Chemical Industry Council (Cefic)
- European Council of Young Farmers
- European Federation of Origin Wines (EFOW)
- European Federation of Pharmaceutical Industries and Associations (EFPIA)
- European Services Forum
- European Wireless Infrastructure Association (EWIA)
- Euroseeds
- Fachverband Steine-Keramik
- Facebook
- First Solar
- FoodDrinkEurope
- Frontier Economics Ltd
- FTI Consulting
- FuelsEurope
- Gibson, Dunn & Crutcher LLP
- Global Cement and Concrete Association (GCCA)
- Grayling
- HeidelbergCement
- Herbalife Nutrition
- Huawei
- Innovative Medicines Initiative (IMI)
- Intesa Sanpaolo
- Kennedy Van der Laan
- Landbrug & Fodevarer
- Latham & Watkins LLP
- LKAB
- Martel Innovate
- McKinsey & Company
- Microsoft
- Monckton Chambers
- MSD/Merck
- Muzinich & Co.

- Norsk Hydro ASA
- Novartis
- Orange
- Oxera Consulting LLP
- Phoenix Tower International LLC
- PJSC Acron
- Reed Smith LLP
- Refinitiv
- Repsol
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- SCF Associates Ltd
- Sidley Austin LLP
- Siemens
- spiritsEUROPE
- Steptoe & Johnson LLP
- Stora Enso
- Svenskt Näringsliv – Confederation of Swedish Enterprise
- Swedish Forest Industries Federation
- Swedish Wood
- SYSTEMIQ Ltd
- Telefonica
- Uber
- Umicore
- Van Bael & Bellis
- Volterra Fietta
- Wavestone Luxembourg
- Wello.ai, Romania
- Zurich Insurance Group

INSTITUTIONAL MEMBERS

- Banco de España
- BMWi – German Federal Ministry of Economics and Energy
- Eurofound
- European Bank for Reconstruction and Development (EBRD)
- European Centre for the Development of Vocational Training (CEDEFOP)
- European Commission
- European Committee of the Regions (CoR)

- European Defence Agency (EDA)
- European Economic and Social Committee (EESC)
- European Free Trade Association (EFTA)
- European Investment Bank (EIB)
- European Parliament
- French Competition Authority
- International Labour Organization (ILO)
- Italian Innovation Fund
- Luxembourg Competition Council
- Mission of Japan to the EU
- Mission of the Republic of Korea to the EU
- Mission of the United Kingdom to the EU
- Mission of the United States to the EU
- Organisation for Economic Cooperation and Development (OECD)
- Slovenian Competition Protection Agency
- Spain National Authority for Markets and Competition (CNMC)
- United Nations Industrial Development Organization (UNIDO)
- World Health Organization (WHO)

CIVIL SOCIETY AND ACADEMIA

- Agora Energiewende
- AI Governance International
- AllBeHealth
- Avans University of Applied Sciences
- Barilla Centre for Food & Nutrition Foundation (BCFN)
- Bellona Europa
- Bertelsmann Stiftung
- BirdLife Europe and Central Asia
- Bocconi University
- Brookings Institution
- Center for Global Development in Europe
- Centre national de la recherche scientifique (CNRS)
- Chalmers University of Technology
- College of Europe
- Columbia Law School
- E3G
- ecoSurge
- Eindhoven University of Technology
- EIT Food
- ELARD
- Ellen MacArthur Foundation
- EnergyVille
- Erasmus School of Law
- European Centre for Development Policy Management (ECDPM)
- European Consumer Organisation (BEUC)
- European Policy Centre
- European Social Observatory
- European Trade Union Institute (ETUI)
- European University Institute (EUI)

- EU-Japan Centre for Industrial Cooperation
- Federation of European Academies of Medicine (FEAM)
- Foundation for European Progressive Studies (FEPS)
- Georgia Institute of Technology
- German Institute for International and Security Affairs (SWP)
- German Marshall Fund
- Graduate Institute of International and Development Studies (IHEID)
- Greenpeace
- Hertie School
- Hitotsubashi University, Japan
- Humanity of Things
- IHAN – Human-driven data economy
- Institut Jacques Delors
- Institute for European Environmental Policy (IEEP)
- Institute of Management and Technology (IMT) Delhi, India
- ICANN
- IDDRI
- IPES food
- JPS Public Policy Consulting
- King's College London
- KTH Royal Institute of Technology, Stockholm
- KU Leuven
- Leibniz Centre for European Economic Research (ZEW)
- LUISS Guido Carli
- Mercator Institute for China Studies (Merics)
- Open University of Catalonia (UOC)
- origin
- Re-Imagine Europa
- Research Institute of Industrial Economics (IFN)
- Safe Food Advocacy Europe
- Saher (Europe)
- Scandinavian Institute of Maritime Law
- Sciences Po's Paris School of International Affairs (PSIA)
- SOAS University of London
- Stockholm Environment Institute (SEI)
- Swedish Environmental Research Institute (IVL)
- Swedish Foundation for Strategic Environmental Research (Mistra)
- Tenman Research Institute on Knowledge-based Economic Systems (RIKES)
- Thünen Institute
- Tilburg University
- TBS Business School
- Trinity College Dublin
- Università Cattolica, Milan
- Università degli studi della Tuscia
- Università del Salento
- University College Dublin
- University College London
- University of Amsterdam
- University of Antwerpen
- University of Birmingham
- University of Cambridge
- University of Clermont Auvergne

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- University of Leiden
- University of Ljubljana
- University of Lorraine
- University of Lund
- University of Luxembourg
- University of Maastricht
- University of Malaga
- University of Milan
- University of Murcia
- University of Namur
- University of National and World Economy (UNWE), Sofia
- University of Oxford
- University of Padua
- University of Pavia
- University of Strathclyde
- University of Virginia
- University of Wageningen
- Vienna University of Economics and Business
- VITO
- Wellcome Trust

EDITORS AND RESEARCH TEAMS

Editors

Andrea RENDA is Part-Time Professor at the School of Transnational Governance of the European University Institute, in Florence (Italy). He is a Senior Research Fellow and Head of the CEPS Unit on Global Governance, Regulation, Innovation and the Digital Economy (GRID). Andrea is also a non-resident Senior Fellow at Duke University's Kenan Institute of Ethics and he was Adjunct Professor of Law and Economics at Duke Law School (United States) for Academic Year 2016/2017. He is also Visiting Professor of Competition Policy and the Digital Economy at the College of Europe in Bruges (Belgium). He is also a Fellow of the World Academy of Arts and Science, and a CITI Fellow at Columbia University's Centre for Tele-Information. He is a member of the EU High Level Expert Group on Artificial Intelligence; a member of advisory group on Economic and Societal Impacts of Research (ESIR), for the European Commission, DG Research and Innovation; and since October 2020, a member of the European Parliament's STOA international Advisory Board. His current research interests include regulation and policy evaluation, regulatory governance, innovation and competition policies, and the ethical and policy challenges of emerging digital technologies, in particular Artificial Intelligence. A very prolific author and keynote speaker, Andrea provides regular advice to several institutions, including the European Commission, the European Parliament, the OECD, the World Bank, the Inter-American Development Bank, and many more.

Malorie SCHAUS is a Researcher at the GRID Unit of CEPS and Coordinator of the *Hidden Treasures* Programme and the Task Force on the *New Industrial Strategy for Europe*. Her core research interests cover EU and international trade and investment law and economics, the WTO dispute settlement system and international arbitration, as well as EU competition law and economics. Prior to joining CEPS, she has worked as a company lawyer defending the interests of Belgian companies. She has furthermore built experience through internships at the WTO, the UNCTAD, the Court of Justice of the European Union, and in an international law firm. She graduated in law from the University of Liège (Belgium) and the University of Maastricht (The Netherlands). She earned a LL.M. in International Economic Law from the Graduate Institute in Geneva (Switzerland). Malorie Schaus holds a Ph.D. in WTO law from the European University Institute in Florence (Italy).

Research Teams

European Green Deal

Christian EGENHOFER is a Senior Research Fellow within the Energy, Resources and Climate Change Unit at CEPS, where he heads the Energy and Climate House (ECH). He is also Visiting Professor at the College of Europe in Bruges (Belgium) and Natolin (Poland), SciencesPo (Paris/France) and LUISS University (Rome/Italy). Christian Egenhofer has more than 20 years' experience working with EU institutions on numerous policy areas. Over the last decade he has been specialising in EU energy and climate change policy, with a particular focus on the EU energy, climate and transport policies. He is currently Senior Fellow and Head of the Energy, Climate and Environment Programme at the Centre for European Policy Studies (CEPS), a Brussels-based think tank. Christian is also Visiting Professor at the College of Europe in Bruges (Belgium) and Natolin (Poland), SciencesPo (Paris/France) and LUISS University in Rome/Italy. From 1997 to 2010 he was Senior Research Fellow and Jean-Monnet Lecturer at the Centre for Energy, Petroleum and Mineral Law and Policy at the University of Dundee in Scotland/UK (part-time). Christian Egenhofer holds a Master's degree in Administration from the University of Konstanz as well as a Public Law degree.

Vasileios RIZOS is a Research Fellow and Head of Sustainable Resources and Circular Economy at CEPS. He is an expert in various aspects of the circular economy and analyses regulatory and market barriers to the adoption of circular economy practices in Europe and beyond. Vasileios' main research areas at CEPS include circular economy policies, industrial sustainability, green value chains, low-carbon transport and resource efficiency indicators. He was co-chair of the Circular Economy Task Force of the Think20 (T20) network that supported G20 activities under the German presidency 2016-17. Between 2016 and 2018 he was the coordinator of the CEPS Task Force on the Role of Business in the Circular Economy. Previously Vasileios worked in DG Environment at the European Commission and the Confederation of European Paper Industries (CEPI). As a trainee at the European Commission he dealt with the implementation of the Waste Framework Directive and the use of economic instruments for improving resource efficiency across the EU. As a Project Officer at CEPI he worked on an assessment of producer responsibility schemes across Europe. He is the lead author of several publications on circular business innovation and policy instruments that can encourage the green market transition.

Milan ELKERBOUT is a Research Fellow in the Energy, Resources and Climate Change Unit. His research focuses on EU climate policy, in particular the EU Emissions Trading System. He has been closely involved in analysing the EU ETS Phase 4 revision processes. For a number of ETS sectors he has been involved in projects regarding their energy and carbon efficiency performance and the impacts of carbon pricing thereon. Other topics of interest include industrial transformation and decarbonisation, mobility, state aid control, Energy Union governance, and the impacts of Brexit. His academic background is in political economy and European Studies.

Julie BRYHN is a Researcher at CEPS, where she focuses on climate change policy, the sustainable use of resources and circular economy. Beyond her work at CEPS, she has experience researching and writing on sustainable development and the SDGs, and has an interest in the interlinkages between climate, resources and development policy, geopolitics, and diplomacy. Julie has a Master in International Economic Policy from Sciences Po Paris, and a BSc (Hons) in International Politics from City University London.

Digital Economy and Data

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NOTES

[1] See Thomas, Kenneth P. (1996), "EU Regulation of State Aid to Industry", in Christos C. Paraskevopoulos, Ricardo Grinspun and George E. Eaton (eds.), Economic Integration in the Americas, Edward Elgar, Aldershot. The Treaty of Paris establishing the European Coal and Steel Community (ECSC) already contained Article 4, devoted to the prohibition of state aids. The ECJ declared export aid for intra-Community trade illegal in *EC Commission v France, re: export credits*, Cases 6/69 and 16/69, involving preferential interest rates for steel exporters in intra-Community trade.

[2] Examples include as the PREST committee (*Politique de Recherche Scientifique et Technologique*); the COST programme, set up under the leadership of Ralf Dahrendorf; and the European Launcher Development Organisation, set up in 1961 by six European countries to boost Europe's space technologies.

[3] See Pavitt, K. (1971), Technology in Europe's future, Research Policy Vol 1 (1971/1972), p 266.

[4] See Owen, G. (2012), *Industrial policy in Europe since the Second World War: what has been learnt?* ECIPE Occasional paper 1/2012. The European Centre for International Political Economy, Brussels, Belgium.

[5] In its Communication on "An Integrated Industrial Policy for the Globalisation Era: Putting Competitiveness and Sustainability at Centre Stage", adopted in 2010, the Commission observed that it was "essential to increase productivity in manufacturing industry and associated services to underpin the recovery of growth and jobs, restore health and sustainability to the EU economy and help sustain our social model".

[6] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "For a European Industrial Renaissance", COM(2014)014 final, Brussels, 22.1.2014.

[7] Kalff, D., A. Renda, W. P. De Groen, K. Lannoo, F. Simonelli, N. Iacob and J. Pelkmans (2019), Hidden Treasures. Mapping Europe's Sources of Competitiveness Advantage in Doing Business, CEPS.

[8] See Simon, H. (1996), Hidden Champions: Lessons from 500 of the World's Best Unknown Companies, Boston, Harvard Business School Press. And Rammer, Christian & Spielkamp, Alfred. (2019). The Distinct Features of Hidden Champions in Germany: A Dynamic Capabilities View. SSRN Electronic Journal. 10.2139/ssrn.3381500. ZEW Discussion paper NO.19-012 | 04/2019.

[9] European Commission (2020), Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, A New Industrial Strategy for Europe, COM(2020) 102 final.

[10] See Kalff et al. (2019), *Hidden Treasures*, cit. Chapter 6.

[11] See "A new Industrial Strategy for Europe", cit. *supra* note 9, at Section 2.2.

[12] The 2021 Single Market Report documents (pp. 197/8) that over the past decade employment and output has stagnated for SMEs but increased considerably for large enterprises. See https://ec.europa.eu/info/sites/default/files/swd-annual-single-market-report-2021_en.pdf.

[13] However, the ecosystems were not fully presented and explained in the Communication, and for several months remained more an internal tool of the Commission, rather than an actionable industrial policy instrument.

[14] See European Roundtable of Industrialists (2020), Putting the EU Industrial Strategy into action.

[15] The resilience of the EU economy can potentially be enhanced thanks to a massive stimulus programme, with a total envelope of almost €2 trillion. At the same time, the initial lack of coordination in the production and distribution of essential medical equipment, in the coordination of the health emergency response and the orchestration of R&D for the production of vaccines, forced the Commission to significantly improvise. And while a lot has been achieved, the consequences of the EU's lack of preparedness and sovereignty have become quite evident: the battle to save the single market from intra-EU trade bans, the delays and the contractual problems experienced in procuring vaccines, the divergence between national strategies aimed at mitigating the

effects of the pandemic, the lack of interoperability in contact-tracing apps, all testify to the need for greater coordination.

[16] See below, Sections on Digital and Data; and on Strategic Value Chains.

[17] Cfr. Moghadam R., M. Guetschow and C. White (2021), *Scarring in Europe*, SUERF Policy Note Issue No 227, March 2021.

[18] Kotz H-H, J Mischke and S. Smit (2021), Pathways for productivity and growth after the COVID-19 crisis, VoxEU, at https://voxeu.org/article/pathways-productivity-and-growth-after-covid-19-crisis.

[19] Conclusions of the European Council, 1 and 2 October 2020, EUCO 13/20.

[20] Renda, A., and R. Castro, R. (2020). Towards Stronger EU Governance of Health Threats after the COVID-19 Pandemic. *European Journal of Risk Regulation*, 1–10. https://doi.org/10.1017/err.2020.34

[21] See i.a. Leonard, M. (2020), Geopolitical Europe in times of Covid-19, at https://www.europesfutures.eu/vault/geopolitical-europe-in-times-of-covid-19.

[22] See Bercero, I. and K. Nicolaidis (2021), *The power surplus. Brussels calling, legal empathy and the trade-regulation nexus*, CEPS Policy Insights PI2021-05, March 2021.

[23] Blockmans, S., C. Hillion and P. Vimont (2021), *From Self-Doubt to Self-Assurance: The European External Action Service as the Indispensable Support for a Geopolitical EU* (January 29, 2021). CEPS Task Force Report 2021.

[24] Speech by Emmanuel Macron, President of the Republic at European Parliament, 17 April 2018.

[25] Blockmans, S. (2020), Why Europe should harden its soft power to lawfare, CEPS In Brief, 15 June 2020.

[26] The term 'Industry 4.0' or the fourth industrial revolution, refers to "the use in industrial production of recent, and often interconnected, digital technologies that enable new and more efficient processes, and which in some cases yield new goods and services. The associated technologies are many, from developments in machine learning and data science, which permit increasingly autonomous and intelligent systems, to low-cost sensors which underpin the IoT, to new control devices that make second-generation industrial robotics possible". See OECD (2017), *The Next Production Revolution: Implications for Governments and Business*, OECD Publishing, Paris, https://doi.org/10.1787/9789264271036-en, p. 27.

[27] Ipsos (2020). European Enterprise Survey on the Use of Technologies based on Artificial Intelligence. Report. European Commission. Brussels. Available at: https://ec.europa.eu/digital-single-market/en/news/european-enterprise-survey-use-technologies-based-artificial-intelligence.

[28] In fact, prevailing management practices do considerable damage. Depression and burnout are now the most significant health risks workers face; motivation is poor and trust in management, let alone commitment to the company, is often lacking. In tackling an important but thorny issue, the Industry 5.0 approach could provide a platform for renewal of corporate governance and management (see R3 below.)

[29] The US President also judged the idea that the only responsibility of a corporation is to its shareholders "an absolute farce. They have a responsibility to their workers, their community; to their country." See also the U.S. Business Roundtable Press Release of 19 August 2019: Business Roundtable Redefines the Purpose of a Corporation to Promote 'An Economy That Serves All Americans', at https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans.

[30] Kalff, D. (2021), Enterprise Models and the EU Agenda, CEPS Policy Insights, PI2021-02.

[31] See for a more comprehensive description of the model Donald Kalff et al., *Hidden Treasures*, cit. *Supra* note 7, pages 45-69.

[32] By considering an economic activity environmentally sustainable only if carried out in alignment with minimum safeguards such as the OECD Guidelines for Multinational Enterprises, the UN Guiding Principles on Business and Human Rights, including the ILO declaration on Fundamental Rights and Principles at Work, the eight ILO core conventions and the International Bill of Human Rights.

[33] See this Explanatory Document on the work of the European Commission and the Technical Expert Group on Sustainable Finance on EU Taxonomy & EU Green Bond Standard. At

https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/200610-sustainable-finance-teg-taxonomy-green-bond-standard-faq_en.pdf

[34] Barbéris J.J. & M. Brière (2020), ESG resilience during the Covid crisis: Is green the new gold?, ECMI Commentary No. 67, July 2020. See also https://www.riacanada.ca/magazine/why-esg-portfolios-have-proven-resilient/.

[35] See Marco Belloni, Margherita Giuzio, Simon Kördel, Petya Radulova, Dilyara Salakhova and Florian Wicknig, "The performance and resilience of green finance instruments: ESG funds and green bonds", Part of the Financial Stability Review, November 2020, available at https://www.ecb.europa.eu/pub/financial-stability/fsr/focus/2020/html/ecb.fsrbox202011_07~12b8ddd530.en.html

[36] Id.

[37] Six in-depth reviews were carried out in strategic areas, i.e. raw materials, batteries, active pharmaceutical ingredients, hydrogen, semiconductors and cloud and edge technologies.

[38] https://ec.europa.eu/info/files/better-regulation-joining-forces-make-better-laws_en. See also Renda, A. (2017), *How can Sustainable Development Goals be 'mainstreamed' in the EU's Better Regulation Agenda?*, CEPS Policy Insights No 2017/12, March 2017.

[39] Power Up; Renovate; Recharge & refuel; Connect; Modernise; Scale-up; Reskill & upskill. See https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1658.

[40] Granieri, M and A. Renda (2012). *Innovation Policy in the European Union: towards Horizon2020*, Springer Publishers, April 2012. Konnola, T., J. Leceta, A. Renda and F. Simonelli (2016), *Unleashing Innovation and Entrepreneurship in Europe: People, Places and Policies*, Report of a CEPS Task Force, to be published by CEPS in May 2016. Tagliapietra, S. and R. Veugelers (2020), *A green Industrial Policy for Europe,* Bruegel Blueprint Series 31, at https://www.bruegel.org/wp-content/uploads/2020/12/Bruegel_Blueprint_31_Complete_151220.pdf.

[41] Janez Potočnik and Sandrine Dixson-Declève, "Recover today, lead for 2030: A future-fit industrial strategy for Europe", Euractive 24 March 2021.

[42] See Sistemiq and the Club of Rome, A System Change Compass - Implementing the European Green Deal in a time of recovery, at

https://www.systemiq.earth/wp-content/uploads/2020/11/System-Change-Compass-full-report_final.pdf.

[43] de Vet, J.M, et al. Impacts of the COVID19 pandemic on EU industries, Publication for the committee on Industry, Research and Energy, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 2021.

See also the ESIR éolicy Brief n. 1, Protect, prepare and transform Europe - Recovery and resilience post COVID-19. At https://ec.europa.eu/info/sites/default/files/research_and_innovation/groups/esir/ec_rtd_esir-recovery-resilience-covid19.pdf.

[44] Here, incidentally, the term 'sustainable competitiveness' replaces the term 'competitive sustainability' used so far, and also referred to in the same Communication.

[45] European Roundtable of Industrialists (2020), Putting the EU Industrial Strategy into action.

[46] In practice, 'hard-to-abate' often comes down to the difficulties of electrification. Production processes based on carbon-neutral molecules (i.e. fuels and feedstock) or carbon capture may offer solutions.

[47] The increased use of CO_2 as part of 'carbon capture and use (CCU)' projects also requires strong accounting rules as some use cases of CO_2 (such as synthetic fuels) only defer the release of carbon into the atmosphere, and are therefore not compatible with climate neutrality.

[48] See also Michael Liebreich (2021), Climate and Finance – Lessons from a time machine (https://about.bnef.com/blog/liebreich-climate-and-finance-lessons-from-a-time-machine/).

[49] Some members of the Task Force disagree with this point.

[50] Some members of the Task Force disagree with this statement. In these participants' view, for rural areas a mix of technology might instead be promoted, relying on fibre, 5G, 5G fixed wireless access (FWA) and others such as satellite.

[51] For example by measuring and controlling radiofrequency electromagnetic field (RF-EMF) exposure with MIMO technologies at millimetre wave frequencies for active antenna systems.

[52] Further to Article 9 GDPR, which specifically prohibits the processing of "special categories of personal data" that explicitly describe the current situation of a person, such as health, trade union membership, ethnic origin, religious/philosophical belief, sexual orientation, genetic data, and biometric data for the purpose of identification, it should be noted that the prohibition of data also applies to machine-learning systems that are able to predict or implicitly evaluate this information using indirect data sources.

[53] This is necessary as the prevailing power structures in employment or dependent work contexts threaten individual and freely given consent (GDPR, Art. 4 (11)).

[54] Laurer and Renda (2020).

[55] These are formally enshrined in the Treaties. See Articles 151-5 of the Treaty on the Functioning of the European Union (TFEU).

[56] The multilingual classification of European skills, competences, qualifications and occupations.

[57] In the Treaty on European Union (TEU), the EU commits itself to contributing to the sustainable development of the Earth, free and fair trade, and to the observance and development of international law, including the principles of the United Nations Charter (Article 3(5) TEU).

[58] Regulation (EU) 2019/452 of the European Parliament and of the Council of 19 March 2019 establishing a framework for the screening of foreign direct investments into the Union.

[59] European Commission (2021), Proposal for a regulation on foreign subsidies distorting the internal market, COM(2021) 223 final, 5 May.

[60] Case T-102/96 *Gencor Ltd v Commission of the European Communities* [1999] ECR II-759.