

Industry 2030 –

Scoping paper on vision for the European industry until 2030

Disclaimer: The views set out in this report are those of the Members of the Industry 2030 high level industrial roundtable and do not necessarily reflect consensus among the Members or the official opinion of the European Union.

1) Vision 2030

This vision should define the industrial, macro-economic and societal **model that Europe wants to lead**. Europe should use the chances of globalization, digitalization and sustainability to grow further, exercise global leadership and promote our values, including openness, solidarity, ethics, sustainability, inclusiveness, trust, entrepreneurship. The industrial model should create value for all European regions.

Industry holds a key role for the **resilience** of society, by providing quality jobs. That is especially important in the context of young generations, who still in many countries across the EU face challenges largely related to employment and their financial situations. However, the value of industry should go beyond that, and should increasingly reflect the shift from a volume-driven economy to value-driven economy.

Rather than an economy based on growth-consumption-obsolescence-disposal that continually exploits the planet's resources, we need a circular economy where waste is feedstock, recycling rates are 100% and fossil carbon stays in the ground. Rather than relying on polluting energy systems, we need to focus on the **decarbonised circular economy** and renewable energy production and consumption. We also need to rethink the mobility. All of these should be in line with the 2050 energy and climate targets.

Financial systems will need to shift from short-term returns focused only on financial gains towards capital designed to value also the social and environmental benefits of investment to allow for the necessary **sustainable investment** to happen.

The digitalisation of production processes and products and increasing data-driven economy should be shaped towards a **socially sustainable digitalisation**, ensuring the creation of value in Europe and respect for European values.

To strengthen our resilience, we need a pro-active, ex-ante adaptation of our communities and policies rather than responding to damage only once it has incurred. **Industry should become part of the solution**, instead of part of the problem. This will be, on a sustainable path, valid for societal, environmental and economic challenges, following a triple bottom-line approach (profit, people and planet). This vision should also provide a new definition of "industry".

Continuing to work through gradual, incremental changes will not be enough. The exponential nature of change and of **transformation** has to be recognised. Beyond automation and digitisation, the nature of our economy is being transformed: for example, sharing economy, platforms, servitisation, radically new business models. The outcome of all this transformation is not known yet, but it is clear that it will lead to increased **complexity** at all levels, including regulatory. The political and societal challenge in dealing with this complexity will not be to resist it, but to get ready for it. This increased complexity requires a systemic approach.

The Industry 2030 vision should start an **innovation** movement that can instigate and catalyze innovation at the systems level and movement for rapid change. Innovation should stimulate a fundamental transformation of economic, social and financial systems that will trigger exponential change in different areas. This means using deliberate innovation experiments that intervene within and across whole industrial systems. We need to nurture supply-side innovation that helps to introduce avalanches of new ideas and perspectives. And connect those ideas to demand-side, challenge-led innovation, which emerges from identifying existing assumptions, habits and value generation models that need to change.

This vision requires not only high investment certainty and a reliable and practice-oriented legal framework in the EU itself, linked with a massive reduction of bureaucratic burden, but also targets and goals that allow for a **level playing field in international competition**. We need to take into account the **cost competitiveness** (e.g. in manufacturing and associated services, energy & raw materials). European industry is currently facing the challenge of developing cost competitive solutions for highly demanding requirements. Automotive, aerospace, energy markets, to mention some, face the same (or more) highly demanding requirements than before but need much more cost-effective solutions. The production of robust and cost-competitive equipment, components, systems and services creates a big opportunity for European industry.

Europe needs **dialogue and action** between policy makers, industry and citizens on the evolution of industrial & innovation policy.

This should be a vision that we would like to **promote to other parts of the world**, together with the values which are at the heart of this model. Our ability to demonstrate the long-term competitiveness and sustainability benefits of this model in comparison to alternative models will be a precondition for our ability to succeed in the global race.

A vision 2030 of the EU industry must be **aligned with the overall vision 2030 of the EU**. Only in a strong, fair, competitive and future-oriented European Union, based on common principles and values, will industry be successful on a global scale. Moreover, this vision should also be aligned with the **United Nation's Sustainable Development Goals**. This can only be done in cooperation, within larger initiatives, using a systemic approach and together with responsible partners from both the private and public sector.

2) Trends towards 2030

We can only take into account the trends as we know and anticipate them today, but we will not be able to anticipate all trends. Industry needs to stay flexible: the concept of **agility**, not just speed, is key, including for governance and regulation. Traditional (rigid) regulatory models will not, on their own, work in an age of exponential transformation but at the same time they need to continue to serve the purpose of stability and clarity for investments.

a) Global economic developments

Traditional patterns of economic and social interaction are being challenged by **global power shifts** (such as China's increasing presence in global value chains and the impact of automation for Chinese industry), **financial and economic crisis**, weak economic recovery, **security threats** by non-state actors, **climate change** and instability, and **threats to the liberal world order**. Opposing globalisation, economic nationalism (seen through renationalization and tariffs), populism, alternative political models and their consequences for international trade, have all been on the rise in the last few years. Although there are many threatening scenarios, Europe should adopt a **positive, forward-looking stance** and seek to turn the trends to opportunities and ways to influence the global development in the right direction.

b) Scientific and technological developments

Servitisation and blurring borders between sectors are signs of the new industrial revolution. **Digital technologies** such as artificial intelligence and big data, are major crosscutting “enablers” of increasing importance. Digital technologies themselves also need a hardware and materials technology breakthrough via advanced materials, photonics and manufacturing processes. Further integration along the innovation chain including co-creation with users would be beneficial and provide sources of competitive advantage for Europe, and the interoperability of ICT solutions across EU borders is essential.

The pivotal role of **AI-enabled next generation robotics** (machine intelligence) will transform the societal and economic landscape at least as much as the computer and digital revolution over the past 50 years. The years leading up to 2030 will see a pervasive and seamless penetration of this breakthrough technology into all aspects of life (work, mobility, health, private sector, defence etc.).

The goal is not mass production as in the first half of the 20th century, but massive digital technology drawing on **big data**. Large virtual services platforms are occurring everywhere. The pace of their growth and capitalization exceeds all predictions, which may have an impact on competition. In order to minimise such potential impact, it is important to understand that in the digital age, the nature of ownership, learning and the related social relationships is changing. Material property is something quite different from intellectual property. And what we are dealing with today is a generally gratuitous appropriation of the intellectual creations of other people on a mass scale. The subsequent upshots of technological innovations are mainly used for this purpose.

Security related issues, such as disruptive technologies and dual use, also require attention. Already now, hacker attacks happen every 39th second¹. What can be done? We need adequate level of these technologies in Europe. But we should also tackle an increasing tendency of SME takeovers by large foreign competitors by promoting firms' scale-ups, which is hampering EU technological sovereignty and long term competitiveness. Moreover, there is a need for a general security awareness and education and an understanding for the type of vulnerabilities related to the connected industry.

The more advanced a given technology is and the more significant breakthrough it causes, the longer and the more unpredictable its consequences. As a result, its development and implementation should be accompanied by social reflection understood as an expression of accountability. New technological developments can bring perceivable benefits to the user, society, and environment. But if there is no such reflection and no preventative and security measures are employed, the more likely it is that technological change will cause irreversible consequences. **Ethical, Legal and Social Issues** are not just a constraint on emerging technology innovation, but should be the key to creating technology for human flourishing.

c) Social and societal developments including skills needs, acceptance for new technologies and business models, demography and inequalities

The EU is facing **demographical challenges**, which includes both ageing populations in some areas and the consequences of migration. Apart from this, we are also facing challenges related to the technological change, and need urgently change our skills approach. The industry and the **future of work** are changing rapidly. According to the world economic forum future of jobs report, '65% of children entering primary school today will ultimately end up working in completely new job types that don't yet exist'. We therefore need major changes in the current approach to anticipating and developing skills to equip employees and students with different skills and learning abilities.

In the case of some of the largest corporations, a large share of their market value is represented by **intangible assets**. Gradually, they might cease to be concerned about material infrastructure altogether, relying rather on renting it, which will be cheaper than owning it. Instead access to information and transforming it into intangible assets play an increasingly important role.

¹ According to a study done by A. James Clark School of Engineering.

In this context, proper intellectual property (IP) protection is a key driver of innovation and growth. At the same time, the shift towards **open innovation** requires us to rethink our approach to IP protection. IP is often considered a defensive right, a right to protect oneself against competition by others. But IP is also – and foremost – an enabling mechanism.

Developments in smart factories, additive manufacturing are enabling mass-customization, contrary to the previous mass production. That means that we need to be open to that Industry 2030 might be impacted by **new and unexpected entrants** – individuals or companies outside the existing industry who can serve the market.

The industrial transformation process can be shaped so that it gets **social acceptance**. There is a role for policy makers, but also industry to raise awareness and facilitate the social acceptance of new technologies and related changes in industry. Consumers are increasingly asking for customized products, personalized information and are increasingly aware of the need for a more circular economy.

Breaking down the silos between technology and society and democratizing technology development with more bottom-up initiatives could stimulate responsible disruptive innovation. The European way of creating intelligent machines should be based on collective human-machine dynamism, enhancing human labour with new tools instead of substituting human labour with robots. The **human-centred design** of technology is a competitive advantage for the EU.

There is a risk of rising geographic and social inequalities within Europe.

d) Environmental developments

Rapid transformation of all the sectors that are emitting greenhouse gases is needed, otherwise we risk overusing critical resources. The availability of raw materials will put constraints on economic and technological developments.

Social changes, urbanization, increasing wealth, and consumer behavior is leading to a rapid exploitation of natural resources that exceeds earth's capacity. At the same time, industry needs exploration and extraction of minerals and metals. This requires finding a better balance between ecology and extraction. Whilst the Circular economy model has proven successful in reconciling economic imperatives of development with resource efficiency, the EU is still far from absolute resource efficiency. In order to achieve this, we need an industry that remains competitive while implementing resource-efficient, low carbon production processes that protect the natural capital at the basis of its economic activities and safeguard people from environmental health risks. Climate, energy and raw materials policies are therefore key areas considered essential for the future of EU industry.

e) Others

It should be considered that the productivity benefits of innovative technologies are exploited by a small group of frontrunners.

3) Key drivers of success:

a) Uptake and diffusion of technologies

Industry, and especially SMEs, need to increase their ability to **adapt to digitization**. Advances in digital technologies are changing the way we design, produce, commercialize and generate value from products and services.

The following emerging technologies will continue to transform products, processes, and business models throughout the economy, particularly in the industrial economy:

- Internet of Things and Machine to Machine communication, which leverages 5G infrastructure
- Big data analytics, Artificial Intelligence, cyber security which keeps systems resilient
- Key Enabling Technologies (KETs)
- Others, including synthetic biology (purposely included in this list of digital advances).

Moreover, **data-driven decision-making** is gaining importance. Currently, a low percentage of all the data collected by companies is actually being processed (Dell claimed that up to 90% of collected data is never read) – there is a lot of potential for the EU to be more proactive with data to increase productivity and identify business opportunities. The analysis of Big Data might be included in new technologies and services.

Apart from digital technologies, there is also a need to further stimulate **market demand for KETs**-based products and solutions, made in Europe.

Supportive measures are needed to create level playing field and to enable market entry of **low carbon and resource efficient processes and products**. For example, bio-based technology is currently competing against well-established fossil-based technologies.

To improve diffusion of technologies and business models we need a wide pallet of instruments ranging from RTOs, applied research, test beds, Single Market, scale-up support, institutional change to facilitate knowledge transfer and sharing between actors in innovation systems to linking regional innovation ecosystems and clusters in different parts of Europe. In particular, Europe should become a testbed for new high value-added sustainable solutions.

Finally, **strong basic and applied research** has to be carried out continuously and they constitute the soil on which we build industrial and commercial success.

Proper Intellectual Property (IP) protection is what allows companies to be rewarded for their inventions, knowledge and creativity and bring them to the market. Looking at IP as an enabling mechanism has policy implications. It requires policy makers to focus on ensuring that businesses are able to make use of IP as a strategic asset. And it requires them to focus on issues relating to a how **IP-protected knowledge is shared and diffused**. But the change in business operation is **not limited to technologies**. Organizations which are traditionally and hierarchically organized increasingly **reorganize to become more agile and adaptive** – offering clients a more holistic value proposition. An example is that more mandate is needed closer to the client in the organization for faster response time, talent will be more mobile and sourced also through gig-economy solutions. The leadership will have to move from traditional hierarchies to more network-based structures.

b) Focus on strategic value chains

European industry needs a **value chain and systemic approach**: we need to have enough actors, across sectors, to join forces and reach critical mass in Europe. Resources should be invested in value chains for resource-wise production in Europe to provide jobs in Europe. Even though value networks are global, we need to have sustainable value chains in Europe. The recently launched “EU Battery Alliance” may be a good model to follow, and the work of the EC’s [“Strategic Forum for Important Projects of Common European Interest” \(IPCEI\)](#) will be important to identify key value chains of strategic importance for the EU. It will also be important to define what the benefits are e.g. tax breaks, R&D support for pilot installations.

Interregional collaboration with matching ‘smart specialisation’ assets linking industrial clusters can create European value chains.

Collaboration across sectors can be enhanced with standards that should be developed at the required speed for the introduction of new products into the market.

c) Anticipating and developing skills needs

In the future linear thinking will be fully replaced by a system-high complexity thinking that will require major shifts in business, research and society. That requires major changes in the current approach to anticipating and developing skills.

Europe needs more **lifelong learning, cross-disciplinarily and creativity**. This change should happen within and outside formal educational system. We should strengthen technological platforms/hubs for pulling together resources for technical, digital and soft skills acquisition. The work environment could also contribute to value creation. But we also need capacity for lifelong learning (adaptability), but also an “appetite” for lifelong learning, also participation in continuing vocational training needs to be made “attractive”.

Europe needs **policies that enable creativity**. We should become forerunners and search for skills that are needed in problem solving and complexity thinking. Interdisciplinary approach involving research and deployment (STEM) and Key Enabling Technologies can make a real difference in addressing our societal challenges. Young generations are our transferable talents who can easily learn to create with new technologies. This makes a case for teaching science and arts together, as well as offering platforms for scientists and technologists to work together with artists and designers.

The anticipation of skills should be considered only the first step. Equally important is the **ability to adapt the educational system** to equip our society with the required set of skills. It must be the goal to keep world-class researchers and teachers in the EU for leading the research, development, and training agenda of the future workforce in the year 2030 and to enhance collaboration between academia and the business sector. At the same time, new skills are also needed in public administrations for the change management.

A new societal deal based on European values could include skills for the future, changing business models and **better cooperation between companies and educational providers**. In that context, the value of technical education needs to be better communicated to people. There is a role for public actors as a moderator between the different economic actors, e.g. the involvement of companies, higher education and training providers to ensure the appropriate skills development.

Vocational Education and Training including Continuing Vocational Training should be part of the systemic approach. Vocational training and skills play a crucial role in ensuring a qualified workforce for industry. Successful career development and transitions will depend on vocational training policy and provision that gives workers access to upskilling and reskilling opportunities throughout their working lives.

d) Ecosystems stimulating innovation, creativity and co-creation

Innovation ecosystems create focal points: where universities and companies meet; companies are clustered; investors meet up with SMEs and start-ups; bottlenecks in legislation are recognized and communicated; regional, national and European and private funding sources are combined in synergy; full scale demonstration projects developed; international trade mission organised; incoming trade missions received. They act as a multiplier of EU efforts and increase exponentially the combined efforts of the innovation ecosystem.

Considering the speed needed to cope with changes, European industry faces the challenge of quick and efficient adoption of technologies. However, we often see the **disconnection of European innovation system that is hindering the conversion of excellent research in economic value**. Continuous place-based interactions between companies and research communities need to be fostered.

Clusters play a crucial role in generating innovation ecosystems, and promoting place-based industrial transformation, offering solutions to test our ways into the future, the possibility of experimentation and of scaling up new innovations. In clusters, SMEs are more innovative, register more patents and create more jobs than they do alone. Currently, there are more than 2.500 industrial clusters in Europe. But **clusters also need to shift from an inward-looking silo type,**

towards an open, innovation and entrepreneurship-driven, cross-sectorial, multi-collaborative, global type of clusters, that generates innovation

Furthermore, **smart specialisation** strategies and reforms of the regional research and innovation systems enable public investments to flow in alignment with industry priorities and market needs.

Moreover, there could be a role for local production networks of entities with different functions, competencies, and resources interested in **partnership and co-production of values**. This partnership would consist in a joint production of intangible assets and their active management. It would be a 'sharing economy' associated with production, not with consumption and could support industrial symbiosis models. Part of what they would produce should belong to the public domain, or be available to stimulate the collective learning.

We should rethink our scientific and innovation approach. **Open innovation pilot** environment become the source of inspiration for many companies creating different applications of the same concepts. In this context also the **open access to infrastructure** needs clear, beneficial and fair rules, both for service providers and users (business models, pricing, IPR). In particular, reaching a balanced approach between Open Data and Strategic Data (sensitive, private, commercial, dual use) still needs work.

The diversity of ecosystems in the EU can be turned into an advantage if pan-European policy interventions and measures promote cross-border collaboration. Innovation ecosystems and industries need to work across boundaries. They lead to more **critical mass** in specific innovation ecosystems in Europe.

e) Industrial collaboration and partnership across boundaries and borders

Traditionally, European universities have strong relationship with industries, but more in collaborative way. While encouraging universities to continue to collaborate with industries, incentives need also be given to university faculty members and students to start up their own business to compete and challenge the existing industries, and create new industries. It is important to get industry on board as early as possible and forerunner companies need to get engaged. These partnerships should be also more innovative by extending also to other types of education and training providers, such as vocational, including at higher level. Similarly, more collaboration between established companies and start-ups would allow the combination of the resources of large companies and the creativity and flexibility of innovative start-ups needs.

Cross-industrial dialogue and collaboration is needed in a wider sense, also between funding agencies, investors and legislators. We should build on our existing value chains and regional "pockets of excellence" by carefully considering how the new framework conditions and investment mechanisms can be used to strengthen ecosystems already existing in Europe.

Co-creation and collaboration need to happen within the EU but we will also need to seek collaborations with other international partners. Moreover, integration into the global trading system, free and fair trade, and improved market access to growth markets by means of Free Trade Agreements with third countries will also remain crucial and current situation with the US-China trade conflict shows this is not for granted.

f) Favourable and stable regulatory framework

We need a predictable, reliable, coherent approach to policy design, including:

- ✓ cost of doing business in Europe / cost-competitiveness
- ✓ focus on fostering innovation and implementing the "Innovation Principle"
- ✓ not overregulating new technologies (e.g. Industry 4.0)
- ✓ constant monitoring of the cumulative cost of regulation as well as of the related flow of investment generated (e.g. in the area of energy or environmental policy) and ensure cost/benefit analysis of measures taken through Delegated/Implementing Acts

- ✓ financial burden such as high levels of taxation in Europe and need for a sectorial, SME and resource efficiency related tax approach

g) Access to funding

Increased research and innovation investment & funding (e.g. MFF/FP9) will be another key driver of EU's competitiveness as industrial success depends ever more on the speedy conversion of knowledge into innovation that reaches the market.

We should also look at financial innovations, such as Fintech, and be aware that the ERDF provides funding for the Smart Europe policy objective.

h) Social fairness

Fairness in the geographic and social distribution of value added (which induces willingness to cooperate by all stakeholders, incl. SMEs and start-ups) is essential to ensure that all citizens across Europe can benefit from Industry 2030. It is also necessary to reduce the productivity gap between frontrunners and the majority of SMEs to allow progress throughout the industrial ecosystem.

4) How the EU can deliver? What role for MS/regions?

Regions and cities play an important role as leaders in the digital transformation process. The exponential nature of change and need for agility imply reassessing the respective roles of policy makers, industry and civil society in delivering on common values and objectives, and requires exploring new types of policy and governance models.

A centralized and **cooperative European-scale approach** would be needed, in order to address global challenges of world-wide competition, also in fields where the European Union has less direct competence (skills, energy).

EU

Europe in order to be successful as Union, on political level requires faster decision making processes and shorter reaction times to respond quickly to changing political or technological changes. The EU will need to deliver on (a) policy (e.g. Single Electricity Market), (b) policy design (see above, especially regulatory framework), and (c) governance (including improvement of EU's decision making process e.g. comitology).

Member States

In terms of policy environment, Member States should decide on a common approach when it comes to the business environment: tax law, labour rights. An alignment of innovation policies at national and EU level is indispensable. There should be some concerted effort among EU members so every member has its own focused areas. In this way, there are no duplicated efforts and resources are optimally utilized. The networking of ongoing and future activities under these schemes need steering and firm top-down coordination from funding agencies.

Finally, Member States should not offer subsidies to un-sustainable (as in sustainability) industries. Europe and Member States should incentivize industries that will meet the needs of tomorrow.

Business

Business associations can also play a key role in this process. Due to their well-established role as business community representatives and support providers and business associations have unparalleled expertise and knowledge of the real economy and can therefore effectively contribute to defining and implementing a new industrial policy for Europe and promote the value for society approach, playing a triple role for prosperity, planet and people.

Ownership & advocacy

Ownership of the industrial policy at national and regional level and by the society is key for successful implementation.

Social relevance and social acceptance of this evolving paradigm will be key elements in shaping an industrial strategy. It is not just about public acceptance of “technology” as indicated in the draft chapter title, but public acceptance of a different understanding of the respective roles of industry, society and government. We will not achieve Vision 2030 if the public is not involved in, and supportive of, developing the required new policy and governance models. The public should be able to witness first-hand the benefits of industry and how it protects, and empowers rather than deprives them.

The aim of the global advocacy is to institutionalize - from the get go - the leadership we believe the EU can take in demonstrating models for how to redefine "Industry" with inclusive and ethical technology, responsible disruption and Sustainable Development Goals-driven prosperity. This point would make clear this intention and set the stage for the EU to rightfully chair an embedded dialogue globally.

The advocacy is also related to communication around Europe’s strengths globally – in order to attract top international talent – how do we share the vision with the world? What and how do we want to stand for internationally?

5) How to monitor performance?

A set of indicators is crucial to measure the progress of Industrial Policy. A dashboard should supplement the 20 % of GDP manufacturing target with additional indicators. This part should build on existing preliminary work, especially of the Trio Presidencies to the High Level Working Group on Competitiveness and Growth.

At the same time, the 2030 vision presumes that it will be disruptive – and that by definition the indicators based on today’s industry will not fully capture that. Therefore, after defining the 2030 vision first we should centralize the follow-up of indicators including traditional indicators for industrial performance, social indicators and integrated indicators for (some of these will likely not be available today).

The choice of indicators used should reflect what European industry prides itself in being – innovative, differentiated & with high value added. And it should allow:

- to compare the different industrial sectors in Europe;
- to measure the part of manufacturing transformation from products to services;
- to measure the manufacturing ratio (vs. services);
- to measure the improvements towards sustainability (i.e. resource efficiency of the industry).

Comparing the EU with the rest of the world should also be possible (e.g. EU has been lagging behind the global pace, especially far behind the USA and China in term of new business creation. Among 2017’s newly added 57 unicorns, 32 came from the USA, 18 from China; the remaining 7 came from the rest of world). Global-wide comprehensive benchmarking on industry growth strategies, would help to both to understand how the USA, China, Japan, Korea, other regions have developed their industry growth strategies, but also allow for global comparison.

The intra-EU comparison should only be made as form of complementary information. It is in that sector that a set of meaningful indicators should be developed, in connection with the definition of appropriate target.

We also need a framework for measuring progress for each goal, create a pathway to achieve those marked by measurable outputs in 2020 and interim outcomes in 2022.

6) Call for action

To be developed at a later stage.