

Discussion Paper

Technological Sovereignty, Industrial Resilience and European Competences

The electrical industry's view on Europe's recovery post-Covid-19 and future industrial strategy

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German Electrical and Electronic Manufacturers' Association

Index:

Key Messages

1 Introduction

2 The electrical industry's pitch for a smart industrial policy

2.1 Technological sovereignty: the protection of system-critical infrastructure and free competition

2.2 Industrial resilience: capacity-building and risk management

2.3 European competences: innovation leadership in key sectors

3 Recommendations for increasing Europe's competences in key technologies

4 Open global trade: crucial for a successful industry

ZVEI – the Electrical and Electronics Industry

ZVEI represents the interests of a high-tech sector with a very dynamic product portfolio in the lead markets of (1) Industrie 4.0, (2) health, (3) energy, (4) mobility, and (5) building. ZVEI is committed to the collective interests of the electrical industry in Germany and Europe and at international level. Its member companies include both global players and medium-sized and family-owned companies – headquartered in Germany, Europe, and all over the world. In 2019 these companies' turnover in Germany was approximately €190.1 billion and R&D spending was at €19.6 billion, equating to 23 percent of all expenditure by German industry on innovation.

Key messages

Technological sovereignty:

1. EU Member States should regard technological sovereignty as the ability of governing bodies to choose and take political, economic, and scientific measures of their own within the operational framework of their international commitments.
2. The aim is to protect well-defined system-critical infrastructures, including the competence to control risks associated with the use of certain technologies.
3. A high level of technological sovereignty may be necessary in core areas of the economy. However, this is applicable only to a manageable number of very carefully selected, system-critical infrastructures. In all other areas, the freest possible market conditions should have priority, in order for the positive effects of competition to be exploited.
4. The concept should not be misused as an assertion of full independence, or as the basis for efforts to achieve economic, technical or scientific self-sufficiency or to create discriminatory access to the European market.

Industrial resilience:

1. Resilience is to be regarded as the appropriate, desirable ability of economic operators to deal with uncertainties and risks in the globally networked economy of the 21st century.
2. Companies should prepare for unexpected events and develop ways of managing permanent risks, e.g. by dual sourcing strategies or by diversification.
3. Resilience does not mean that all technical components must be manufactured independently in Europe. Rather, it concerns the ability of companies to manage the existing technologies independently.
4. ZVEI believes that diverse and digitally enabled value creation networks provide the European economy with a sound footing on which it can rebound and retain its flexibility during a period of prolonged uncertainty.

European competences

1. Europe's technological and economic strengths must be developed purposefully and based on open competition. Achieving this requires the private and public sectors across Europe to act collectively.
2. Upgrading competences in digital technologies, services and platforms should be a key objective for EU decision-makers. This requires the EU to concentrate on enhancing its capacities for innovation and to invest in strategic value creation networks.
3. The Important Projects of Common European Interest (IPCEI), the Digital Europe Programme, and the Horizon Europe Programme are important instruments that are already in place and should therefore be funded and implemented efficiently.
4. The digital and green transition of Europe's economy requires a focus on competences and the digital skills needed by all citizens. This improves employment, strengthens social inclusion, and reflects our fundamental European values of the protection of human dignity and a social market economy.

1 Introduction

The Covid-19 pandemic has affected societies and economies all over the world in an unprecedented manner and requires collective action and solidarity. It has presented the European Union with the biggest economic crisis in its history. From the beginning of the crisis, the electrical industry has provided much-needed medical equipment and critical infrastructures, services, and products with which the European economy and society have been kept running.

In Europe, the crisis has intensified an ongoing political discussion of the state of the continent's industry in critical core areas and new digital technologies. Given the increasing global competition and tensions in international trade, a fitness check of the existing political toolbox appears appropriate. The short-term task for all of us is still that of preventing the virus from spreading, and of limiting economic losses. However, the long-term strategy for industry in Europe must address new technologies, the digital transformation of industry, and Europe's sustainable future – objectives extending far beyond the immediately pressing recovery from the fall-out of Covid-19. Such a strategy is essential for Europe's leading position in digital and advanced manufacturing, Industrie 4.0 and the industrial internet of things to be strengthened further.

In the current dynamic political debate, the division of roles between the regulator and the private sector appears to be shifting. With the objective of boosting industrial capabilities and enabling Europe to remain a continent at the forefront of industrial digitalisation, the electrical industry is presenting its position for a clear understanding of the terms (1) technological sovereignty, (2) industrial resilience and (3) European competences.

Industry in Europe covers all companies that are either active exclusively in Europe, headquartered in Europe and active worldwide, or headquartered outside Europe and active in Europe. These companies and their employees are all regarded as equal parties within a cosmopolitan Europe. They contribute to Europe's economic power, are members of associations and standardisation organisations, and should be listened to equally by policymakers and granted equal participation in funding programmes.

The outcome of the current political debate should be a Europe in control of its own future. It should achieve this by fostering opportunities for industry in Europe to compete and grow both across the EU and in the global market. Europe's ambition should be to become a worldwide hub for innovative industrial technologies and services which it is able to develop in Europe and trade around the globe. At a time in which technological sovereignty is an issue for European Member States, it is important to consider the balance between the legal framework conditions required for a free market economy to function and the individual economic operator's business priorities and decisions. The state has a legitimate interest in ensuring a resilient industry at the forefront of technology. Business on the other hand needs a free market, international collaboration, and fair competition in order to create the most innovative products and services.

2 The electrical industry's pitch for a smart industrial policy approach

For Europe to become a continent at the forefront of the digital transformation, the concepts of technological sovereignty, resilience, and competences must be adequately grasped. Europe must put the right political framework conditions in place to ensure that enhanced technological sovereignty is also beneficial to its economy.

2.1. Technological sovereignty: the protection of system-critical infrastructure and free competition

EU Member States should understand technological sovereignty as the ability of the governing bodies at European and Member State level to take their own political, economic and scientific measures, within the operational framework of their international commitments¹. Technological sovereignty means protecting well-defined system-critical infrastructures. It includes the competence to control risks associated with the use of certain technologies, and their respective suppliers. This applies especially for so called “back doors” of third country governments, which allow unauthorized access to data. However, imposition of a requirement that only suppliers headquartered in Europe may be used is neither constructive, nor favourable to competition. The assurance of protection must also follow free market principles.

The aim is to ensure adequate availability of the technical components, systems and software which form the basis for the development of key technologies in Europe². Technological sovereignty is achieved through the ability of the economy to build and maintain technical and scientific competence, coupled with adequate investment into new innovative hardware and software. The concept should not be misused to assert full independence, or to justify efforts to achieve the economic, technical or scientific self-sufficiency of an industrial sector, or create discriminatory access to the European market. This has been proven time and again to be counterproductive.

A high degree of technological sovereignty in system-critical core areas of an economy may be beneficial and indeed necessary and may also lead to intervention by the regulator. However, this should apply only to a limited number of strictly selected system-critical infrastructures. In all other areas, priority should be given to the freest possible market conditions in the interests of the positive effects of price and quality competition.

In addition, the regulator must take action against anti-competitive and unfair trading practices by other countries, and the system of free world trade without protectionist restrictions must be advocated. In order to achieve this goal, both the political and legal instruments, for example in competition and antitrust law, must be developed further. Should competition in certain sectors be at risk of failing completely, the first

¹ E.g. WTO, OECD, G20

² cf. <https://www.stiftung-nv.de/de/publikation/global-semiconductor-value-chain-technology-primer-policy-makers>

step is to use the measures under competition law aimed at restoring it. At the same time, Europe must take steps to ensure a level playing field with its global partners to ensure fair competition³.

2.2. Industrial resilience: capacity building and risk management

The electrical industry understands resilience as the capacity of the economy and its stakeholders to deal with uncertainties and risks in the globally networked digital economy of the 21st century, and the objective of doing so. The companies are the stakeholders called upon to increase the resilience of Europe's economic system further. Their activity can be flanked by political action in the interests of creating the best possible framework conditions. Companies must prepare for unexpected events and external shocks, as well as to learn to cope with permanent risks, for example by developing dual sourcing strategies for critical supply chains, or by diversifying.

Resilience does not mean, for example, that all technical components must be manufactured independently in Europe, but that the existing technologies should be handled independently. A resilient industry in Europe should not cut ties with global business partners, international ecosystems, or value chains which have been a foundation of Europe's success story. In this context the electrical industry rejects general requirements concerning the storage location of industrial data. Industry players should, however, be able to choose freely from among different suppliers according to their individual assessments and needs. Therefore, investment in especially edge-cloud capacities in Europe is necessary. ZVEI believes that diverse and digitally enabled value creation networks provide a foundation for the European economy to bounce back and remain flexible during a period of prolonged uncertainty.

Suitable economic framework conditions and strong support programmes for research and development (R&D) in Europe will ensure that many of the companies – whether headquartered in Europe or elsewhere – invest, grow, and prosper here. This is the only way to ensure that important technologies and skills are available in Europe and increase the resilience of industry.

2.3. European competences: innovation leadership in key sectors

Technological and economic strengths in Europe must be developed purposefully and in an openly competitive environment, as is currently the case for example in the IPCEI projects and is planned for the European AI strategy. This requires collective action by the private and public sectors across Europe. A careful balance must be struck between the promotion of individual technologies and an open-technology approach, and also in the area of competition policy.

³ cf. <https://www.businesseurope.eu/publications/smart-technological-sovereignty-how-it-could-support-eu-competitiveness>

Upgrading competences in critical technologies, services and platforms should be a key objective for EU decision-makers. Attaining this objective requires the EU to concentrate on enhancing its capacity for innovation and investing in strategic value creation networks and digital ecosystems. The electrical industry has a key role to play owing to its function as the central link between the analogue and digital worlds. Electronics form the core of every digital system. Only with secure electronic systems and the associated software will further technological developments of the future, such as in Industrie 4.0 or artificial intelligence, be possible. Secure and trustworthy electronics therefore constitutes an important basis for attainment of a digital European ecosystem.

There are very few European providers of cloud infrastructures of appreciable size and performance, neither is there a restriction of competition. European development of competence in this area is desirable in goal, however, it must be taken into account that the very high standards required in this area necessitate extremely high investments. Therefore, a decentralized approach such as currently developed with GAIA-X, which aims for an adequate security level via a requirement management system for cloud-nodes defined for European applications, is a promising way forward. Furthermore, increasing competences especially for SMEs in the area of edge-cloud capabilities will benefit industry, because data storage at the device level is becoming increasingly important for smart data management.

A focus on competences, combined with the necessary digital skills for all citizens, is an important aspect of the digital and green transition of Europe's economy. This not only strengthens the employment and social inclusion situation of each individual citizen but is also integral to an enlightened and democratic society. Society's acceptance of new innovations and technologies is almost as important as the innovation itself. Efforts should be increased to educate, upskill and reskill both workers and the general public and make them fit for the economy of the future.

3 Recommendations for increasing Europe's competences in key technologies

The enhancement of competences is the key element in preventing imbalances and creating a position of strength. The best way for Europe is to boost its attractiveness for global cooperation, whilst at the same time strengthening European standards in global competition. ZVEI therefore makes the following recommendations:

Digital competences

- The **Important Projects of Common European Interest (IPCEI)**, the **Digital Europe Programme** and the **Horizon Europe Programme** are important instruments already in place, and their efficient funding and implementation is warranted. The budget shifts away from common European programmes towards those of individual Member States is not the right approach.

- A need exists for focused vertical “fast-track” R&D projects for key areas of innovation in which the EU intends to position itself. Such areas include 6G, quantum computing, AI and automated driving. These projects are key for early intellectual property (IP) development and should target the entire value creation network concerned.
- Europe must establish an industrial **data economy** that exhausts the full potential of data-driven business models throughout the full product lifecycle. This allows industrial players to reassert their position and to promote open markets, European values, and European standards internationally. New industrial data-based business models increase the competences and competitiveness of industry in Europe.
- Industry should be free to choose its business partners itself. In this context, the electrical industry rejects general requirements concerning the location of industrial data. Each economic operator should be free to decide where and how to store its data – edge or cloud, in Europe or elsewhere.
- Promotion of **cybersecurity, industrial AI and industrial IoT technologies** (including edge computing) in research, development and applications.
- Acceleration of **5G** roll-out as an enabler through harmonisation of the frequency bandwidth in Europe (exclusive Industrie 4.0 frequency band and preparation of 6G).
- **Software** is playing an increasingly important role as the interface between product and user. In an IoT world, physical products are vehicles for new services and creation of value for customers. Europe’s very successful Operation Technology World (OT) must increase its competences and collaboration with the Information Technology World (IT).
- Positioning of digital technologies, e.g. the **digital twin**, in industry for significant improvement of real-case production (higher productivity, shorter development times, lower resource consumption).
- The concepts of Common European Data Spaces and European Cloud Federation are important first steps; a good practical example is the **GAIA-X** project, which is intended to deliver an open, federated, secure and trustworthy data and cloud infrastructure for Europe.
- **Electronics** is the core of every digital system and is therefore a key technology for the digital transformation. Consequently, the availability and mastery of electronics are important elements for the attainment of industrial resilience.
- Europe’s competences in fields including **power electronics, sensor technology, embedded and edge computing, as well as security chips and embedded security**, must be maintained and expanded. All electronics manufacturers are closely integrated into global value chains. For this reason, exclusion from other regions is not an option. However, expertise in as many areas of microelectronics as possible is essential.
- **Micro and nanoelectronics** constitute the technological foundation of all electronics, and it is important that these technologies be promoted purposefully and over the longer term. Electronic components and systems

must be tested for security and checked for trustworthiness, especially where they are relevant to the functioning of critical infrastructures. Reliable underlying conditions for competitive production of components in Europe must be created and maintained.

- The creation of a **trustworthy European data infrastructure** can underpin data-driven innovation in the economy. A digital ecosystem based on European values should permit data exchange across borders and sectors and thereby ensure the competitiveness of industry in Europe. Transparent and secure exchange of industrial data promotes data-based innovation across all areas and sectors of industry.

Green technologies

- The aim must be to expand Europe's innovation leadership further in the field of **climate protection technologies**, in the interests of supplying global markets. Europe's international climate protection ambitions should be combined with active promotion of exports to create a level playing field.
- **Modernisation and improvement of energy networks** through the development of centralized and decentralized energy systems. A target renewable energy share of over 80 percent, to be achieved by sector coupling.
- Development of **new power storage technologies using Power-to-X and hydrogen** technologies, and implementation of available energy efficiency technologies.
- Improving efficiency and security by **digitalising public transport and infrastructures** and prioritising investments in sustainable transport.
- Restoring competence in production of **batteries for e-mobility** in the European Union and improving the processes to recycle these batteries.

Strategic industrial policy

- The European Commission's new concept of **industrial ecosystems** must be clarified and developed further in conjunction with industry. The Industrial Forum of the EU announced recently must therefore play a key role in assessing the needs and the required action.
- The concept of industrial ecosystems is based on a sound analysis of the status quo of European industry. However, a strategic view must now be taken of the medium and long-term development of the European economy over the next decade. This must be at the heart of the upcoming review of the EU industry strategy.
- It is critical that the European Commission establish an interconnected cross-sectoral layer across the defined ecosystems. **Digital and advanced manufacturing** plays a key role in linking stakeholders from different ecosystems and enables all sectors through new technologies, regulatory sandboxes and industrial AI applications.

- The final report of the **Strategic Form for Important Projects of Common European Interest** (IPCEI) lays out the key areas for future investments⁴. These must be implemented, especially in the area of the Industrial Internet of Things. IPCEI 2.0 should be used as a key instrument to boost R&D in key areas of technology, delivering an enhancement of the EU's competitiveness.
- The concept of international **value creation networks** should be taken up by policymakers. Value chains are no longer linear chains from raw material to products. Multilateral value creation networks of many providers, services and customers are emerging across all sectors.
- **Set the right priorities for the single market:** implementation of the Posting of Workers Directive in many Member States creates immense bureaucracy for the high-wage electrical engineering sector without being suspected of wage dumping; this is a big obstacle for all companies in the EU.
- Digitalisation in the field of product compliance and product documentation can create new levels of efficiency, reduce bureaucracy and eliminate the "paper logjam".
- A real Digital Single Market will become a reality only if **uniform rules apply across Europe** in the digital field – and especially in the area of cybersecurity.
- The **New Legislative Framework**, which serves as a basis for product regulation, should be strengthened, since legal certainty of standards increases Europe's competitiveness. The publication of standards must be accelerated and the bottleneck in legal review must be solved.

4 Open global trade: crucial for a successful industry

For decades, the exchange of goods, services and expertise has boosted innovation, new technologies and the welfare of societies. The founding idea of the EU as we know it today was the creation of dependencies between the economies of its Member States, in the interests of peace and prosperity and for the avoidance of conflict and nationalism. At a time in which the global economy is coming under geopolitical pressure, Europe must stand for an open, collaborative, and multilateral global economy – while at the same time pursuing its own strategic interests. Europe needs a more strategic and future-oriented trade and industry policy: one which ensures the continent's future prosperity and economic resilience and is also geared towards attainment of Europe's strategic goals.

With an export volume of €216.5 billion in 2019, the German electrical and electronics industry is one of the four largest suppliers of electrical and electronic products, systems and services worldwide. Its competitiveness depends largely on its integration into international value creation networks. ZVEI is therefore advocating that the liberalisation of world trade be continued, the WTO be strengthened, and all forms of protectionism avoided.

⁴ cf. <https://ec.europa.eu/docsroom/documents/37824>

Improve framework conditions – avoid decoupling

European companies rely on international trade and contracts, but they continue to face tough and sometimes unfair competition outside the EU's borders. For the electrical industry, the guiding principle is that of using global opportunities, facing challenges, and minimising risks. This requires even more action towards global collaboration for the current obstacles to be overcome. The current proposals for reform of the WTO's rules on industrial subsidies and the new EU public procurement instrument (IPI) are the right tools with which to respond to increasingly unfair competition. Reshoring or decoupling, however, should not be political strategies of states or supranational institutions, but can in individual cases be business decisions by industry players themselves. The regulator must focus on the best framework conditions for companies to build up capacities in Europe.

In a post-Covid-19 world, businesses will need to develop resilience, which is better achieved through international collaboration than fragmentation. Digital technologies have provided the global community with sustainable ways of working, learning and communicating and other effective tools to cope with this crisis. Removing barriers to trade, and the trade of technologies, are crucial for Europe's recovery.

Embracing global value creation networks

There is little doubt that a well-coordinated industrial strategy with a set of measures to boost international trade will help Europe recover more quickly. The EU and its Member States should therefore refrain from restrictive and discriminatory measures – such as unilaterally closing borders, adopting border adjustment measures or increasing import quotas for much-needed resources. The same rules must apply to international partners. The EU and its member states must therefore produce an aligned strategy for tackling the challenges arising from recent geo-political developments, in order to ensure a global level playing field.

The terms of technological sovereignty and resilience should therefore not be misused for protectionist policies, disruption of global value networks or limited access to technologies by companies with global operations. Technical sovereignty must be consistent with the international commitments of the EU and must avoid discriminatory practices against companies accessing or operating on the European market. Many industrial innovations in Europe stem from complex value creation networks, collaborative ecosystems and well-functioning relations with partners, suppliers and customers inside and outside Europe.

Europe has been a relentless defender of open, rules-based and fair trade worldwide. It now has a unique opportunity to re-shape globalisation to make it fairer and more sustainable. In order to do so, the EU needs to bring together the diverse set of policies – on regulation, investment, and trade facilitation – within a single, aligned strategy.



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