

Important projects of common European interest: State of play

SUMMARY

The concept of important projects of common European interest (IPCEIs) is enshrined in Article 107(3)(b) of the Treaty on the Functioning of the European Union. It enables the Commission to allow Member States to design and implement national investments targeting important market failures or societal challenges that could not otherwise be addressed.

In November 2021, the Commission adopted a communication updating a 2014 communication that established the first set of guidance to be used for the assessment of IPCEIs. The revision is designed to align the criteria more closely with EU political priorities, in particular the European Green Deal and the digital strategy, while also making the setting up of IPCEIs more transparent and open to new participating Member States and economic players.

In the context of the twin digital and ecological transition, IPCEIs are expected to boost the EU's strategic autonomy by ensuring Member States' capacity to invest together in technological development, and by encouraging the dissemination of solutions and promoting cooperation across the EU and the economy.

As of February 2022, three IPCEIs have been approved by the Commission: one on microelectronics and two on batteries (with up to 12 participating Member States). A further initiative on microelectronics, with 20 participating Member States, was notified to the Commission in December 2021 and is awaiting approval. Other initiatives, on clean hydrogen, next generation cloud and health, are being explored.



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Introduction

In 2014, the European Commission adopted a communication providing Member States with guidance on how to encourage the development of collaborative projects – important projects of common European interest (IPCEIs) – promoting common European interests. These projects have as their legal basis Article 107(3)(b) of the Treaty on the Functioning of the European Union (TFEU), which allows the Commission to authorise State aid schemes targeting important market or systemic failures, or societal challenges that could not otherwise be addressed, under certain conditions. Three IPCEIs have been approved by the Commission as of February 2022: one on microelectronics and two on batteries.

In 2021, the Commission adopted a communication updating the original 2014 rules that established the first set of guidance on IPCEIs. The revision accentuates further on the cross-border dimension of these projects and on their openness to all relevant undertakings, including small and medium-sized enterprises (SMEs).

This briefing presents the context of the Commission's communication, assesses the early impacts of the IPCEIs already launched, and identifies pathways to ensure that all IPCEIs are aligned with the EU overarching priorities linked to the green and digital twin transition, and the attainment of open strategic autonomy.

Context

The 2014 communication has enabled three initiatives so far

In 2014, the Commission adopted a [communication](#) setting out the rules that apply where public financing of IPCEIs constitutes State aid, in order for State aid for IPCEIs to be considered to be compatible with the internal market. IPCEIs therefore should demonstrate a common interest and that any competition distortion they cause would be effectively mitigated and outweighed by their positive impact. A project can qualify as a common interest based on its objectives and design. As far as objectives are concerned, it can encompass complementary activities by different participants, ranging from technological research to the development of innovative products or services. The objectives must have the potential to make an important contribution to one or several EU overarching political priorities, and the benefits of the project must spill beyond the enterprises or the sector being supported. As far as design is concerned, a project must include more than one Member State and be co-financed by the beneficiaries of the State aid.

IPCEIs are [instrumental](#) in furthering both EU competition and industrial policies: they are to facilitate the channelling of Member States' investments to cross-border initiatives aimed at supporting breakthrough innovation and overcoming market and systemic failures, whilst preserving the integrity of the European single market.

In order to gather the expertise needed to monitor and encourage IPCEIs, in March 2018 the Commission set up the Strategic Forum on IPCEIs – a high-level expert group representing Member States, industry and the research community. In a [report](#) published in 2019, the group identified six key value chains where large scale transnational public investments would bolster EU competitiveness: connected, clean and autonomous vehicles, hydrogen technologies and systems, smart health, industrial internet of things, low-CO₂ emission industry, and cybersecurity. It also identified three further strategic value chains (batteries, high performance computing, and microelectronics), without formulating any specific policy recommendation. Following the outbreak of the coronavirus pandemic, the Commission [updated](#) the 2020 industrial strategy for the EU, which led to the identification of six key strategic dependencies: raw materials, batteries, active pharmaceutical ingredients, hydrogen, semiconductors and cloud and edge technologies.

Since 2014, the European Commission has approved three IPCEIs: one on microelectronics, run by [five Member States](#), worth up to €1.89 billion, to be spent between 2018 and 2024, and two projects

on batteries, the first run by [seven Member States](#) and the second by [12 Member States](#), worth up to 3.2 billion (between 2019 and 2031) and €12.9 billion (between 2021 and 2028) respectively. In 2021, a new IPCEI on microelectronics involving [20 Member States](#) was notified to the Commission.

From 2022, different Member States, such as [France and Germany](#), are considering launching further projects: one on clean hydrogen, another on next generation cloud infrastructure and services, and a third on [health](#).

The 2021 communication enhances the reach of initiatives

On 30 December 2021, the Commission updated its [communication](#) on IPCEIs, most notably to facilitate the involvement of more Member States and make the projects more accessible to industrial players, among them small and medium-sized enterprises (SMEs).

IPCEIs are linked to the rationale behind EU competition policy. As highlighted by a Commission [communication](#) of November 2021, while aiming at preventing and remedying market distortions, IPCEIs are also to respond to new market developments and the evolution of EU policy objectives. In this framework, IPCEIs allow Member States to set up inclusive pan-European projects as a way to jointly overcome market failures or societal challenges.

The updated communication on IPCEIs sets out the eligibility criteria for these projects, as well as the compatibility requirements needed to ensure that the EU added value these projects generate would offset any distortion on the single market.

The eligibility criteria aim at ensuring that a project is of common European interest; is governed in an inclusive manner; and contributes to one or several EU policy objectives. To qualify as a project of common European interest, an IPCEI must involve a minimum of four Member States (compared to one under the 2014 communication) and be open to all of the Member States. Projects must be of a highly innovative nature or create important added value in terms of breakthrough research and innovation. A first industrial development, notably through the upscaling of pilot facilities or the use of a first-of-its-kind equipment and facilities, is allowed. As for inclusive governance, a wide range of European stakeholders have to be invited, including SMEs. Last, the European added value of the project needs to be established by measurable benefits to EU markets and societies beyond the Member States and legal entities involved.

The compatibility criteria aim at reducing and mitigating any distortion to the markets. The overall elements to perform the balancing test are in line with those of 2014. In particular, the necessity and proportionality of the State aid is to be reviewed in comparison with a counterfactual scenario. One significant novelty refers to the assessment of the potential direct and indirect distortive effects on international trade. The aid received by competitors located outside of the EU for similar projects is to be taken into consideration. In addition, the Commission may also take appropriate action to address competition distortion arising from subsidies received outside the EU.

Overall, the updated communication seeks to ensure that IPCEIs are geographically open and inclusive, and that their objectives align with one or several EU political priorities, such as the European Green Deal or the Digital Decade.

Industry policy schemes in the US and China

The [adoption](#) by the US Congress of the Creating Helpful Incentives to Produce Semiconductors for America ([CHIPS Act](#)) in 2021 has paved the way for further federal investment to support US competitive-edge and capacity production, through investment schemes that bear similarities with EU IPCEIs in terms of scope, objective and funding. In particular, section 9902 of the act authorises the secretary of commerce to provide financial assistance to 'covered entities' in order to incentivise investment in semiconductor facilities and equipment in the United States. Up to US\$39 billion (roughly €35.7 billion) of appropriations have been authorised from 2022 to 2026.

China has also harnessed its industrial policy to gain technological and industrial leadership in key fields such as microelectronics and batteries: according to the [Centre for Strategic and International Studies](#), from 2009 to 2019, the Chinese authorities are deemed to have invested a minimum of RMB196.6 billion (roughly €28.5 billion) in different research grants and procurement schemes to develop the technological chain needed to the enhancement of the Chinese share in global battery shipments.

Outlook for IPCEIs on microelectronics and batteries

IPCEIs are a tool of industrial policy, whose socio-economics impacts are set to be delivered continuously over the medium term (until 2031 as mentioned above for projects that are already submitted). According to the [Commission](#), their immediate impact on the single market is limited: since 2015, 96 % of the State aid granted has been submitted under the General Block Exemption Regulation. However, from a macroeconomic point of view, IPCEIs focus on growing upstream markets that are expected to have a positive impact on the downstream sectors. So far, no macro-economic impact assessment of IPCEIs has been made.

In assessing the impact of IPCEIs, it is helpful to review the respective objectives and dynamics of the technological fields they support, and to identify synergies with other EU investments and initiatives in research and innovation.

As mentioned above, the three IPCEIs launched so far are focused on microelectronics and batteries. The main source for assessing them is a Commission decision regarding the first of the two microelectronics IPCEIs. For the other two projects, no decision is available in the State aid register.

Microelectronics (i and ii)

Objectives and participants

Under the first IPCEI project, approved by a Commission [decision](#) from 13 December 2018, 29 undertakings (industry including SMEs, [research and technology organisations](#)) from five Member States have been contributing to the activities (technological development, creation of infrastructures) under one or several of five technological fields: energy efficient chips, power semiconductors, smart sensors, advanced optical equipment and compound materials. The overarching innovation goals can be grouped into two technologically complementary directions: '[more Moore](#)' (Moore's Law refers to the empirical [observation](#) that the number of transistors per microchip doubles every two years, as a proxy for the increase of computing power per microchip) and '[more than Moore](#)'¹ (technologies operating beyond the limitations of Moore's Law, based upon or derived from silicon technologies), hinting at the objectives of further miniaturisation (increasing both speed and density by scaling down the size of transistor gates, together with reduced energy dissipation), and of combining digital and non-digital functions on the same chip. To deliver on these objectives, the main funding activities were composed of grants for research and innovation

projects, and investments in infrastructures to cover the research and innovation continuum up to the first industrial deployment. With €1.89 billion of public investments between 2018 and 2022, the participating states are [expecting](#) to unlock an additional €6 billion from private investments over the same period.²

Table 1 –The first IPCEI on microelectronics (2018-2022)³: structure and participants

Energy Efficient Chips	Power Semiconductors	Smart Sensors	Advanced Optical Equipment	Compound Materials
CEA-Leti	3-D Micromac*	CEA-Leti	AMTC*	AZUR Space Solar Power
Cologne Chip	AP&S International	CorTec	Carl Zeiss	CEA-Leti
Globalfoundries	AT&S	Elmos Semiconductors		Integrated Compound Semiconductors
NXP Semiconductors Austria	CEA-Leti	Fondazione Bruno Kessler		IQE
Ray/Cs	Elmos Semiconductors	Infineon		Newport Wafer Fab
Soitec	Infineon	Robert Bosch		SPTS Technologies
ST Microelectronics	Infineon Austria ★	<i>Microelectronics</i>		OSRAM
X-FAB	MURATA	TDK-Micronas		SYNRED
	Robert Bosch	LYRED		Soitec
	SEMIKRON	X-FAB		ST Microelectronics
	ST Microelectronics			
	X-FAB			

SMEs: in *"italic"*
Associated partners:*

Source: (IPCEI on microelectronics), 2019.

The second project, still not approved by the Commission, builds on the first one, but its scope is wider and participants more numerous. In December 2021, the German Federal Ministry for Economic Affairs and Climate Action [pre-notified](#) to the Commission an authorisation request for an IPCEI on microelectronics, on behalf of 20 Member States. The project will involve more than 90 undertakings and will cover activities ranging from chip design to the production of materials and semiconductors to their integration into components and systems. According to the [Commission](#), the project would give more prominence to cross-border innovative activities along the microelectronics value chain (including AI processors, edge computing, electric mobility, and security and energy efficiency). Funding by the Member States would be provided with partial support from the Recovery and Resilience Facility and the structural funds.

Activities and achievements

As reporting is done for all funded activities carried out in each of the respective [technological fields](#), this makes tracking their main technological and socio-economic impacts possible. In addition to the creation of knowledge and solutions through the work done in the technological fields, the IPCEI has supported the creation of a set of tangible and intangible assets whose benefits will be shared based on open access, therefore not being limited to the participating undertakings. First, by supporting the update of European technological infrastructures in microelectronics, the IPCEI is expected to spur both knowledge accumulation and the activity of the European microelectronic value chain. Academic research in microelectronics technology requires the use of pilot R&D equipment that is beyond the budgets of the relevant academic and SME partners across Europe. Therefore, the IPCEI is facilitating European scientific excellence and its dissemination. What is more, through the objective of 'open foundries' (semiconductor fabrication capability), the IPCEI investments in [first industrial deployment](#) are also expected to provide research and business benefits to undertakings active in microelectronics beyond the IPCEI participants. Open access to foundries is also enabled through the recruitment of specialists at the undertakings participating in the IPCEI (at least [1 000 research and development jobs](#) have been created so far). This is key to equipping the users of the open foundries with the know-how needed to optimise access to the infrastructure, and to contribute to getting the EU workforce trained in microelectronics.

Synergies with EU initiatives

The adoption of the European Chips Act in February 2022 highlights the significant potential synergies between the IPCEIs on microelectronics and the implementation of the EU political priorities. First, this act helped embed the IPCEIs on microelectronics within the EU overarching [objective](#) of a 20 % global chips market share by 2030. The explanatory memorandum to the proposal for a [regulation](#) establishing a framework of measures for strengthening Europe's semiconductor ecosystem notes that Member States' investments cannot reach alone the capabilities (pilot lines and design infrastructures) needed for the EU to play a stronger role in a global and interdependent ecosystem. Enhancement of the existing capabilities and creation of additional ones are among the specific objectives of the proposal. Article 11, dedicated to open EU foundries, aims at promoting initiatives similar to the ones under the IPCEI on microelectronics. It defines these infrastructures as first-of-a-kind semiconductor manufacturing facilities (front-end or back-end, or both) in the EU that offer production capacity to unrelated undertakings and thereby contribute to the security of supply for the internal market. The joint undertaking, renamed as the Joint Chips Undertaking by the [proposal](#) for a regulation amending Regulation (EU) 2021/2085, also builds on the IPCEI on microelectronics. In the joint undertaking's [work programme](#) for 2021, one of the participating Member States (France) invited its applicants to participate both in the research and innovation activities funded² by the joint undertaking and the IPCEI.

Batteries (i and ii)

Objectives and participants

There are two ongoing IPCEIs on batteries. The first one (on batteries), was approved by the Commission in December 2019.⁴ It includes seven Member States that will grant support to 17 direct participants (including SMEs), which are expected to cooperate further with 70 external partners. The second IPCEI (on European battery innovation), which is complementary to the first one, was approved in January 2021. It was submitted by 12 Member States; support will be granted to 42 direct participants (including SMEs), which are expected to implement 300 cooperation activities, also through the involvement of 150 external partners. The overarching goal of the combined project is to support the production of innovative batteries and the sustainability of the associated value chain, through a holistic approach. The two projects operate in four technological areas:

- IPCEI on batteries: [raw and advanced materials](#), [cells and modules](#), [battery systems](#), [recycling and sustainability](#).
- IPCEI European battery innovation: [raw and advanced materials](#), [battery cells](#), [battery systems](#), [recycling and sustainability](#).

The IPCEI on batteries is expected to raise €3.2 billion in public investment that would unlock €5 billion in private investment until 2031. The European battery innovation project has been awarded public funding worth €2.9 billion, and would unlock an additional €9 billion until 2028.

Table 2 – IPCEI on batteries (i): structure and participants (2019-2031)

RAW MATERIALS AND ADVANCED MATERIALS	CELLS/MODULES	BATTERY SYSTEMS	REPURPOSING, RECYCLING AND REFINING
BASF  	ACC  	BMW  	BASF  
ENERIS 	BMW  	ENDURANCE  	ELEMENTAL STRATEGIC METALS 
KELIBER 	ENDURANCE  	ENEL X S.R.L.  	ENDURANCE  
NANOCYL  	ENERIS 	ENERIS 	ENERIS 
SOLVAY    	FAAM  	FLASH BATTERY SRL  	FAAM  
TERRAFAME 	SEEL SWEDISH ELECTRIC TRANSPORT LABORATORY  	SEEL SWEDISH ELECTRIC TRANSPORT LABORATORY  	FORTUM RECYCLING & WASTE 
UMICORE AG & CO. KG 	VARTA 		SEEL SWEDISH ELECTRIC TRANSPORT LABORATORY  
			UMICORE AG & CO. KG 

Source ([IPCEI on batteries](#)), 2020.

Table3 – IPCEI on European battery innovation (ii): structure and participants (2021-2028)

RAW AND ADVANCED MATERIALS	BATTERY CELLS	BATTERY SYSTEMS	RECYCLING AND SUSTAINABILITY
ACI SYSTEMS 	ALUMINA SYSTEMS 	ACI SYSTEMS 	BOREALIS 
ARKEMA 	BMW 	ALUMINA SYSTEMS 	ENEL X 
BOREALIS 	CELLFORCE GROUP 	AVL 	ENGITEC 
FERROGLOBE 	ELRINGKLINGER 	BMW 	FORTUM 
FLUORSID 	FCA 	ENDURANCE 	HYDROMETAL 
GREEN ENERGY STORAGE 	GREEN ENERGY STORAGE 	ENEL X 	ITALMATCH CHEMICALS 
HYDROMETAL 	INOBAT ENERGY 	ENERGO-AQUA 	KELIBER 
ITALMATCH CHEMICALS 	MANZ 	FCA 	LIOFIT 
KELIBER 	MIDAC 	FPT INDUSTRIAL 	LITTLE ELECTRIC CAR 
SGL CARBON 	NORTHVOLT 	INOBAT ENERGY 	MIDAC 
SOLVAY 	SGL CARBON 	MANZ 	SGL CARBON 
TOKAI COBEX 	SKELETON TECHNOLOGIES 	MIBA 	VALMET AUTOMOTIVE 
VARTA MICRO INNOVATION 	SYSTEMS SUNLIGHT 	MIDAC 	ZTS 
	VARTA MICRO INNOVATION 	RIMAC AUTOMOBILI 	
		ROSENDAHL NEXTRON 	
		SKELETON TECHNOLOGIES 	
		SYSTEMS SUNLIGHT 	
		VALMET AUTOMOTIVE 	
		VOLTLABOR 	

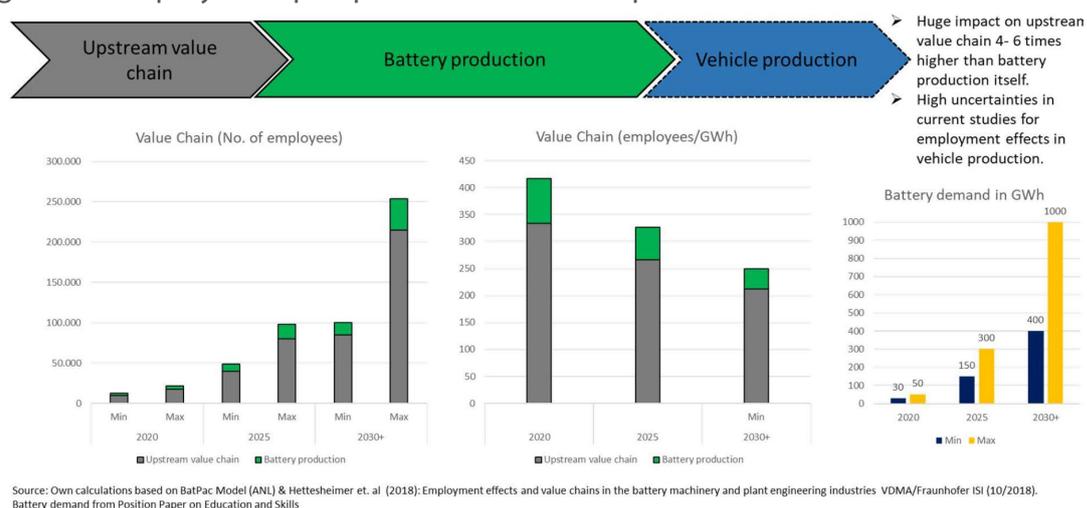
Source ([IPCEI on batteries](#)), 2020.

Activities and achievements

A first assessment of the activities and early achievements of the IPCEIs can be made by screening a set of complementary outcomes: technological development, creation of knowledge and infrastructures, and creation of high-skilled jobs. As for the technological development side, the website for the two IPCEIs provides access to the [task descriptions](#) of all the direct participants, under each of the technological fields. However, in absence of a public version of the Commission decision,⁵ it is not possible to reconcile those descriptions with a set of specific instruments (a consolidated view would require gathering all the relevant national information and data).

Nevertheless, the available information already provides an indication of the investment that is being channelled to research and technology infrastructure – such as the [three facilities](#) on electrified transport, to be developed by the Swedish Electric Transport Laboratory – that will benefit the European industrial and academic stakeholders and not just the participants. The contribution of the IPCEIs to job creation is also a key point. The batteries sector in Europe currently faces a significant shortage of workers, including highly skilled ones. According to the Commission Vice President, Maroš Šefčovič, by 2025 this shortage could account for some [800 000 jobs](#) across the entire battery value chain. This aggregate estimate includes both the upstream activities involved in battery production and the downstream sectors, where the uptake of batteries might also have a significant impact (the job-creation potential for the downstream sector has been assessed in a [joint study](#) by the European Institute of Technology (EIT) RawMaterials consortium and the Fraunhofer Institute for Systems and Innovation Research. For instance, the further integration of batteries in the automotive sector might soften the current downward employment trend.

Figure 1 – Employment prospects across the European batteries value chain



Source: [IPCEI](#) on batteries, 2021.

Synergies with EU initiatives

Like the IPCEIs on microelectronics, the two IPCEIs on batteries are embedded into a set of legislative and investment initiatives, based among other things on the input of the [European battery alliance](#), launched by the Commission in 2017 to structure the dialogue among European stakeholders and policy-makers. As regards the legislative initiatives, the [proposal for a regulation](#) of the Parliament and the Council concerning batteries and waste batteries will facilitate the uptake of the technologies and solutions developed under the IPCEIs, through the single market. As regards investment initiatives, technological development in battery manufacturing and batteries pan-European stakeholders receive further support from Horizon Europe. For instance, a European partnership on [batteries](#) ensures support to targeted research and innovation activities. Also, Horizon facilitates the connection among European stakeholders. Under the cluster climate-energy-mobility, a 2021 call ([HORIZON-CL5-2021-D2-01-07](#)) has this as its explicit aim. A [publication](#) of the German Federal Ministry for Economic Affairs and Energy assesses the added value of the transnational collaborative activities under Horizon. It notes that in general, projects implemented under Horizon have a higher number of participants, which allows for the inclusion of a higher number of participant profiles and countries of origin in the activities. Taking into consideration the existence of different downstream markets for batteries, EU investment in research and innovation helps to ensure that knowledge and solutions are properly disseminated across the economic sectors.

Opportunities and risks

Beyond obtaining clarity on the objectives and achievements of the IPCEIs launched so far, there is a need to make a comprehensive review of their contribution to the goals of the [industrial strategy for the EU](#), and to reflect on their capacity to take into account transversal overarching policy objectives such as gender equality, or to ensure abidance by the 'do no significant harm' principle.

Unleashing EU competitive sustainability in the twin transition

Since 2019, as established in the annual sustainable growth surveys, competitive sustainability has become the new growth strategy of the EU. It consists of four main interlinked dimensions: the twin transition, resilience, inclusive growth, and a just transition. The new industrial strategy of the European Union features the prominence of the digital and green transformation of the EU industry to design transition pathways towards sustainability. As mentioned above, by targeting key technological challenges, IPCEIs incentivise public and private investment in technological

development, while facilitating transnational cooperation among research and industrial ecosystems.

However, there is a need to ensure these initiatives' capacity to disseminate their results widely enough, so as to offer opportunities across Europe. It is all the more important, given that the EU, just like countries from the Organisation for Economic Cooperation and Development (OECD), is facing a growing [productivity gap](#) between businesses that are active in the technological domain and those that are lagging behind. In the EU, this gap is particularly pronounced among SMEs, which create the bulk of EU jobs and yet are on the side of the laggards. According to the [European Innovation Bank](#), in 2020, less than 40 % of the European micro enterprises had adopted an advanced digital technology versus almost 50 % in the USA. These worrying numbers suggest that efforts should be made to facilitate the dissemination of the knowledge and know-how accumulated under IPCEIs. As for research deliverables, dissemination can be accomplished notably by granting open access to scientific publication or specific access rights to intellectual property. The only publicly available decision on IPCEI on microelectronics shows that open access will be granted to the results created through the supported activities. Moreover, the creation of EU open foundries affords access to state-of-the-art [technological infrastructure](#) with the associated know-how. Similarly, the rate at which the Horizon dashboard is being consulted indicates that almost all the undertakings active in the ongoing IPCEIs are also participating in Horizon collaborative research and innovation activities. That is to say that the knowledge and solutions developed under the IPCEIs can be disseminated further through Horizon, not least thanks to the [open access](#) and [collaborative friendly access rights](#) granted to the beneficiaries. Also, as mentioned above, consortia established under Horizon Europe are larger and more diverse than nationally funded projects. Horizon Europe therefore represents a powerful tool to effectively disseminate the results achieved under the IPCEIs.

More broadly, IPCEIs are in need of inclusive governance. Their complex structure and linkages with different policy streams might [hamper](#) the inclusion of small and medium players. For instance, the linkages between the IPCEIs, the relevant existing and [incoming](#) industrial alliances, and the EU programmes such as Horizon should be as transparent as possible to facilitate the information and participation of a maximum number of businesses, including SMEs.

Building EU strategic autonomy and resilience

Competitive sustainability and resilience are two sides of the same coin. The coronavirus pandemic and geopolitical tensions, such as most recently the Russian war of aggression on Ukraine, have laid bare issues that have reinforced the expectation that in addition to contributing to the EU's growth strategy, IPCEIs should contribute directly and indirectly to EU strategic autonomy and resilience. They do make a direct contribution in this regard, by ensuring EU technological sovereignty in key fields. This sovereignty is [defined](#) as the capacity of the EU to develop technologies and source their components, avoiding one-sided dependencies. In 2021, the Commission published a staff working document on EU strategic dependencies and capacities, in relation to both of which batteries and microelectronics were among the key technologies identified. According to an article by the [Fraunhofer Institute for Systems and Innovation Research](#), by 2025, the EU is set to become the second largest battery cell producer in the world, behind China. However, [China](#) is deemed to control 80 % of the world's battery raw material refining capacity, 77 % of cell production capacity and 60 % of battery component manufacturing capacity. This article notably stresses the need to invest in the sustainability of batteries, in relation to which there is an emerging market but also technologies that are to be developed further. Whilst this trend echoes the prominence given to strategic autonomy in the IPCEI, it is not expected to solve the EU's dependency on raw materials. This example shows both the different dimensions of technological sovereignty and the fact that an IPCEI alone cannot solve a complex dependency. The microelectronics sector exhibits a similar [trend](#). This means that IPCEIs are to be associated with other policy initiatives, aiming at diversifying the sourcing of raw materials. In the [communication](#) on critical raw material resilience, the

Commission underscores that it cooperates with partners on critical raw materials and sustainability in a range of international fora. These include the annual EU-US-Japan Trilateral on Critical Raw Materials (supply risks, trade barriers, innovation and international standards), the OECD (conflict minerals, guidance on raw materials, responsible sourcing), the United Nations (global outlook, environmental pressures, resource management, mineral governance), the World Trade Organization (WTO) (market access, technical barriers, export restrictions) and the G20 (resource efficiency).

IPCEIs are also expected to contribute indirectly to EU resilience and the future-proofing of EU strategic autonomy. This is especially relevant to the creation of opportunities for jobs and upskilling among the industrial ecosystems upstream and downstream of the IPCEIs. For instance, it is expected that up to 4 million jobs will be created in the EU by 2025 in the batteries sector. In addition to the quantitative dimension of the trend, it could also facilitate the achievement of horizontal EU policy priorities such as gender equality. According to the Commission, women account for a mere 17 % of the people engaged in information communication and technologies studies and careers in the EU and for only 36 % of Sciences Technologies Engineering Mathematics (STEM) graduates. Due to their technological and industrial background, IPCEIs could incentive girls' participation in STEM trainings and jobs, which would contribute positively to economic growth. That said, the public version of the above-mentioned Commission decision on the first IPCEI on microelectronics does not feature any specific wording on gender. The decision does, however, include other transversal policy objectives, such as sustainability, where the expected technological outcomes are linked with their expected impacts on climate and environmental sustainability. The inclusion of this requirement ensures alignment of the IPCEI agenda with the framework conditions that apply to EU research and innovation funds that aim at reducing the risk of technological lock-in weakening the ecological transition.

European Parliament positions and stakeholders' views

European Parliament position

National parliaments' responses to IPCEIs

As the Member States provide funding for IPCEIs, opinions on the IPCEIs' objectives and implementation by the relevant national parliaments play a key role in their assessment.

In Germany, on 25 February 2021, following a [written answer](#) by members, the government provided an overview of microelectronics, while also making a reference to the IPCEIs.

In France, on 25 March 2021, an [information report](#) on the future of the European industrial policy was tabled to the French National Assembly's Committee for European Affairs. Overall, whilst recognising the effectiveness of IPCEIs, the report calls for a better interface among industrial policy instruments, on the one hand, and among those instruments and the overarching EU policy priorities, on the other.

In Italy, on 22 February 2022, the House of Deputies adopted a [resolution](#) supporting the government's intention to take part in the design of a new IPCEI on hydrogen.

Outside of the national parliaments, IPCEIs are also discussed among Member States governments, as part of their bilateral initiatives (here is an [example](#) of a Polish and German discussion).

The Parliament has acknowledged the role that IPCEIs can play in accelerating the transition toward a clean and digital Europe. For instance, in its [resolution](#) of 18 June 2020 on the competition policy annual report for 2020, it voiced full support to the implementation of IPCEIs such as the European Battery Alliance. It also expressed its views that IPCEIs should be designed to secure EU strategic autonomy: in its [resolution](#) of 25 November 2020 on a new industrial strategy for Europe, it stressed that resilience and strategic autonomy should be considered as defining criteria and that the Commission should increase transparency in the implementation of IPCEIs and ensure the participation of SMEs. In a [resolution](#) of 10 June 2021, the Parliament expressed support for gender

equality in the research and innovative economic sectors in general. It also invites the Commission and Member States to further engage with all ICT, digital, telecoms, media, audio-visual and technological business partners to promote an inclusive and gender-balanced working culture and environment.

Stakeholders views

Overall, IPCEIs are supported by academic, industrial and institutional players across Europe. This is especially true of research and technological organisations, which praise the capacity of IPCEIs to invest in technological infrastructures and know-how that will be open to businesses beyond the IPCEI participants. In a 2021 [workshop](#) organised with the Joint Research Centre, the European Association of Research and Technology Organisations (EARTO) associated IPCEIs with the challenge of ensuring the building, access and curation to the technology infrastructure needed to achieve the EU ambitions in industrial and research policy.

In the context of the [public consultation](#) organised by the Commission on the update of the 2014 communication, IPCEIs got positive feedback from the industry (both participants and non-participants in IPCEIs), with certain remarks. For instance, Global Foundries Dresden (participant) and the Polish Steel association (non-participant), while supporting IPCEIs in general, suggested broadening the scope of economic activities eligible under the notion of first industrial deployment, as a way to de-risk further private investment and facilitate market uptake.

Member States echo these positive stakeholders' views and factor in IPCEIs in their bilateral cooperation. For instance, in 2021, a [joint statement](#) by France and Germany suggests that further projects should be developed.

Social partners also gave their views on IPCEIs. In 2021, [Business Europe](#) identified IPCEIs as an important tool to boost private investment in Europe in key enabling technologies. It supported the update of the communication on IPCEIs along the lines of reinforcing their cross-border dimension (Business Europe supports a minimum threshold of four participating Member States), and the transparency of the initiatives (Business Europe invites the Commission to publish and update information on the internet about the implementation of current and preparation of future IPCEIs). With a 2021 paper on [EU open strategic autonomy](#), the European Trade Union Institute echoes Business Europe's assessment of IPCEIs. To facilitate the projects' transparency and make them available to more industrial partners and Member States, it suggests exploring a framework to enable the Commission to coordinate IPCEIs. However, a 2022 [article](#) by the Bruegel research institute stresses that the November 2021 update of the guidance on IPCEIs failed to address their major flaws. It points to the need to reinforce the number of participating Member States (only France, Germany, Italy and Sweden have taken part in more than two projects so far, while 14 Member States have not taken part in any), and to improve the transparency of the governance and reporting of IPCEIs.

MAIN REFERENCES

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ENDNOTES

¹ 'More-Moore' corresponds to the miniaturisation of the digital functions leading to electronic components benefiting from exponentially increasing computational power from one generation to the next. 'More-than-Moore' refers to functional diversification of semiconductor-based devices. It complements digital signal and data processing in a product. These functions may imply among others analogue and mixed signal processing, the incorporation of passive components, high-voltage components, microsystems, sensors and actuators. 'More-than-Moore' technologies allow non-digital functionalities to migrate from the system board-level into the package or onto the semiconductor chip. Technological progress from one technology generation to the other is not based on pure downscaling of structure widths on the semiconductor chip, but on optimising a variety of parameters on the semiconductor chip and the package design.

² The amounts disclosed include the financial commitment from Austria, which [joined](#) the project in 2021.

³ Regarding the participation of the United Kingdom in the first IPCEI on microelectronics, the Commission decision mentioned above [specifies](#): 'Since the United Kingdom notified on 29 March 2017 its intention to leave the Union, pursuant to Article 50 of the Treaty on European Union, the Treaties will cease to apply to the United Kingdom from the date of entry into force of the withdrawal agreement or, failing that, two years after the notification, unless the European Council, in agreement with the United Kingdom, decides to extend that period. As a consequence, and without prejudice to any provision of the withdrawal agreement, this decision only applies to the UK until the United Kingdom ceases to be a Member State'.

⁴ On 1 March 2022, the Commission had not yet uploaded any [public version](#) of the decision on the State aid register.

⁵ *idem*.

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