Competence Centres

working document v0.3

Table of Contents

1. Introduction

Competence centres in semiconductors (aka "Chips Competence Centres" or "Chips CCs") will play an essential role in the Chips for Europe Initiative. The centres will provide access to technical expertise and experimentation in the area of semiconductors, helping companies, SMEs in particular, to approach and improve design capabilities and developing skills. Competence centres will provide services to semiconductor stakeholders, including start-ups and SMEs. Examples include facilitating access to pilot lines and to the design platform, providing training and skills development, support to finding investors, making use of existing local competencies or reaching out to the relevant verticals. The services should be provided on an open, transparent and non-discriminatory basis. Each competence centre should connect and be part of the European network of competence centres in semiconductors and should act as an access point to other nodes of the network.

This working document aims to outline the expectations on competence centres in semiconductors. In this document, readers find information on the role of competence centres in the Chips for Europe Initiative (Section 2), the functions and activities of a Chips CC (Section 3), candidate entities and end users (Section 4), size, funding, and access to services of Chips CCs (Section 5), and the process to select Chips CCs (Section 6).

This document builds on a number of workshops and discussions with the public authorities in the Key Digital Technologies Joint Undertaking. In particular, a first workshop was held on 30 November 2022, and focused on experiences of existing hubs and centres with similar objectives, and requirements from companies and other stakeholders making use of such centres[1]. A second workshop was organised on 21 February 2023 for Member State representatives, and focused on activities, end users, funding model, and selection process[2]. A third workshop for industry representatives on 18 April 2023 addressed activities, end users, funding model, and selection process[3].

2. Role of competence centres in the Chips for Europe Initiative

The **European Chips Act**, proposed by the European Commission on 8 February 2022, proposes to develop a thriving semiconductor ecosystem and resilient supply chain, building on Europe's strengths and addressing outstanding weaknesses, while setting measures to prepare, anticipate and respond to future supply chain disruptions[4]. It creates an opportunity to

[1] https://digital-strategy.ec.europa.eu/en/library/workshop-competence-centres-semiconductors
[2] https://digital-strategy.ec.europa.eu/en/library/workshop-competence-centres-semiconductors-february-2023
[3] https://allpros.eu/events/online-workshop-competence-centres-semiconductors
[4] COM(2022) 45, 8 February 2022.

act jointly across all Member States to ensure the EU's resilience and technological sovereignty in semiconductor technologies. Its ambition is to see Europe improve its technology leadership, its security of supply, and its ability to respond to crisis situations. These ambitions are in line with the wish to obtain 20% of the global semiconductor market by 2030, in accordance with the objectives of the Digital Compass communication[5].

The **Chips for Europe Initiative** is the so-called "Pillar 1" of the European Chips Act. It aims to support technological capacity building and innovation in the Union. It will create large-scale infrastructures, such as pilot lines and a design platform to facilitate research, development, test, experimentation and validation of new technologies. These new infrastructures will be open to EU players, large or small, industry or researchers, designers or SMEs, from various vertical sectors. Such users are central to the Initiative.

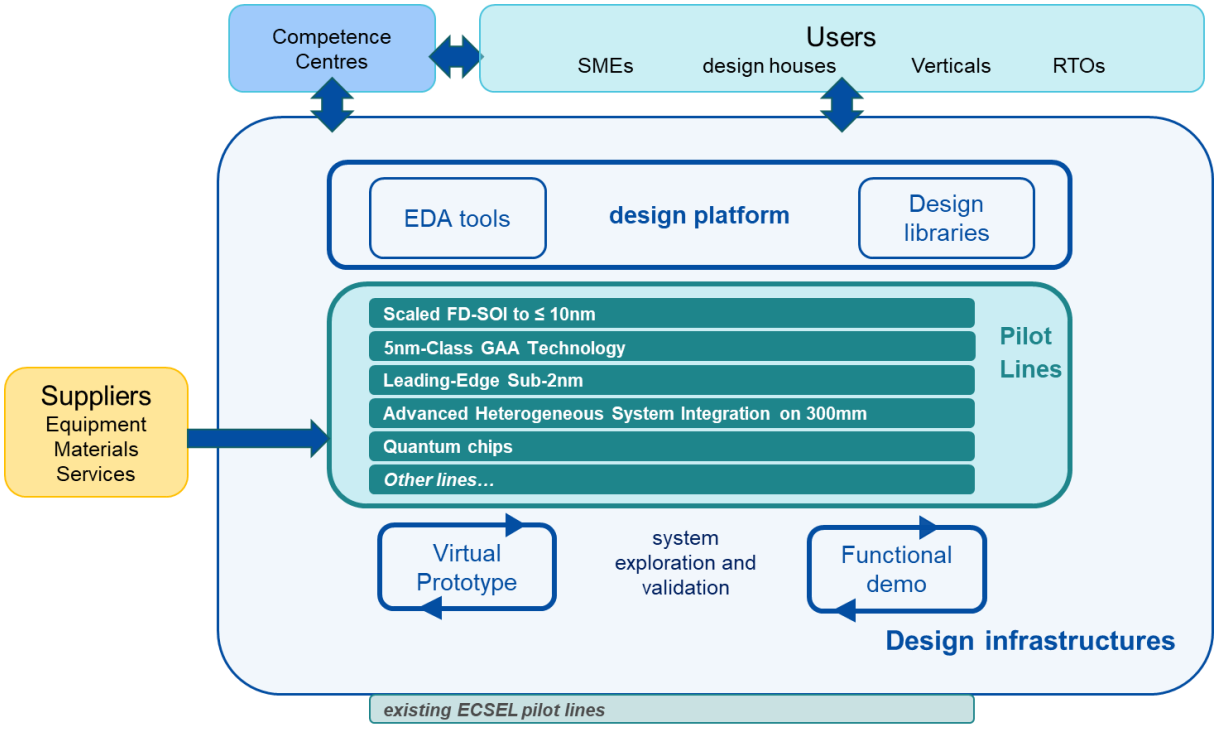

Figure 1 Initiative components

The **competence centres** are will typically be a first entry point for users. The Initiative will support a network of competence centres, located across Europe, that will provide access to technical expertise and experimentation in the area of semiconductors. The centres will help companies, SMEs in particular, to approach and improve design capabilities and developing skills. The competence centres will guide users in accessing the other infrastructures set up under the Initiative.

[5] COM(2021) 118, 9 March 2021.

A new **design platform** will help create designs of semiconductor devices. Designers can use the platform to examine the impact of various design options on – for instance – the costs and overall performance of a semiconductor device. Such virtual prototyping could shorten the product development cycle and lead to cost savings.

The design platform will offer access to EDA (Electronic Design Automation) tools. It will have in place contracts with EDA tool vendors. It will also contain IP libraries, from both open-source initiatives and commercial libraries.

Competence centres will support SMEs, startups, and other stakeholders to get access to the design platform. Consortia behind the design platform and competence centres may team up to provide trainings in using the design platform for interested users. Competence centres may guide their clients in using the tools and libraries of the design platform.

The design platform will work in synergy with **pilot lines**. After virtual prototyping, the validated designs can be implemented on the pilot lines. Designers will be able to use the resulting specifications and performances to refine and improve their models before going to the next prototype stage, or before transfer to actual manufacturing sites.

The Initiative will build on existing pilot lines, such as those developed under the ECSEL Joint Undertaking, but also from the Photonics Public-Private Partnership. The Initiative will support the development of new pilot lines. Candidates are a pilot line on FDSOI (10 nm and below), one on leading edge nodes (below 2 nm), and one for 3D heterogeneous systems integration and advanced packaging. Other pilot lines may be supported as well, such as pilot lines for **quantum chips**, photonic components, power electronics, etc. Pilot lines do not only play a role in the validation of chip designs, but also in the validation of new production technologies.

Just like for the design platform, competence centres will support SMEs, startups, and other stakeholders to get access to the pilot lines. Consortia behind the pilot lines and competence centres may team up to provide trainings in using the pilot lines for interested users. Competence centres may guide their clients in using the services offered by the pilot lines.

These new infrastructures would not be worth much without adequate expertise and skills needed to use them. The Chips for Europe Initiative will support education, **training, skilling** and reskilling initiatives. It will support access to postgraduate programmes in microelectronics, short-term training courses, job placements/traineeships and apprenticeships, training in advanced laboratories, etc. The competence centres will be essential in delivering and facilitating these training activities.

Finally, the Initiative will set up a '**Chips Fund**' to facilitate access to finance and support the development of a dynamic and resilient semiconductor ecosystem. The Fund should help especially start-ups and SMEs to secure adequate financing for investments into innovative high-tech or digital technologies.

Competence centres will support companies in accessing the Chips Fund. They may also provide access to investors.

3. Services offered by competence centres in semiconductors

Competence centres will provide services to semiconductor stakeholders, including start-ups and SMEs. Examples include facilitating access to pilot lines and to the design platform, providing training and skills development, support to finding investors, making use of existing local competencies or reaching out to the relevant verticals. Each competence centre should connect and be part of the European network of competence centres in semiconductors and should act as an access point to other nodes of the network[6].

Chips CCs should have a **specialised area of expertise**. Each competence centre decides on its specialisation in a certain technology, domain, or set of activities, and pushes innovation in that area within the Union. Examples of areas of expertise are chips for medical devices, power electronics, cutting-edge semiconductors, packaging, metrology, EDA simulation tools, chips for automotive, silicon photonics, quantum chips, system design, etc. As a result, a Chips CC can offer a number of support activities in that particular area of expertise, such as specialised technology transfer based on a specific request for its area of expertise from anywhere in the Union; dedicated trainings to other Chips CCs in its area of expertise; consulting on its scientific/technical area of expertise, etc.

Chips CCs offer a number of **support activities**. Offering such support activities is a common function for all Chips CCs, and is a necessary characteristic to belong to the network of competence centres. For instance, support activities of a Chips CC include:

- **Facilitating access to the design platform and to pilot lines**: a Chips CC should help stakeholders, and especially smaller companies including SMEs and startups, to connect to the design platform and to pilot lines. They should do so by providing information and support on how to access the platform or the pilot lines when stakeholders do not have the knowledge or expertise to do so directly.

[6] Adapted from the European Chips Act, recital 29, link. See Annex 1 for a full overview of relevant texts from the legal act.

- **Supporting interested stakeholders in developing semiconductor solutions (technology transfer)**: SMEs often experience a lack of expertise and resources to acquire knowledge in new technologies, but also in fields such as legal, business coaching, and IPR. With limited resources, SMEs find it difficult to access the latest research and market data in the semiconductor industry. Chips CCs should support technology transfer activities at local/national level and – where needed – at EU level. Research activities as well as operation, administration or procurement of infrastructures are not within the scope of Chips CCs, but competence centres are expected to advise on such activities and support knowledge transfer e.g. from relevant R&D initiatives to the local semiconductor ecosystem. In addition, Chips CCs could grant facilitated access to experts in such areas as legal compliance and business development. They may offer assistance to SMEs in creating business plans and conducting market studies.
- **Providing (access to) training on skills**: Advanced training on specific design and manufacturing skills and practices is often difficult to access for SMEs and other stakeholders. They need access to education services for development of skills in different disciplines but also for different audiences or levels (e.g. bachelor, masters level), access to top-level teachers, or support for the set-up of a credentials/micro-credentials framework. A specific need relates to connecting with universities and leading authorities in the field to exchange knowledge, establish collaborations to incentivise training, and attract talent. Chips CCs should support local and national training and skills development in the area of semiconductor technologies through face-to-face as well as online training (e.g. via MOOC platforms). Chips CCs should determine what is needed in their countries, should know the competences of other Chips CCs, and – where needed – provide trainings to other CCs ('train-the-trainer'). Trainings can be provided by CCs themselves, or by third parties hired by the centres. A variety of training models can be used, ranging from alternation model or cluster model, via on-the-job trainings and apprenticeships, to crash courses and mentoring programmes.
- **Facilitating access to the European Network of Competence Centres**: Chips CCs should help stakeholders, especially smaller companies such as SMEs and start-ups, to connect to other competence centres within the overall network of competence centres. They should provide stakeholders with information on relevant competences in the network as well as on national and international programs, companies, and research centres in semiconductors. They should act as entry points to other European initiatives, such as the network of European Digital Innovation Hubs, HPC competence centres, cybersecurity centres, etc. The goal is to ensure that national stakeholders have access to the best available expertise and support in Europe, by matching stakeholders' needs

with the available expertise in the network of competence centres. Such expertise may be the specialisation of another competence centre. A Chips CC should help a stakeholder to connect to the right competence centres within the overall network of competence centres, if the local/national Chips CC does not have the right competences to support the stakeholder. In return, a Chips CC will support stakeholders from other regions and countries that need its (specialised) expertise through the network of competence centres.

- **Promoting the Chips Fund and facilitating access to venture capital:** SMEs and startups are often faced with insufficient financial support and have difficulties to get loans, equity, and/or grants. In particular, startups experience difficulties in managing resources and investment at the initial stage. Competence centres in semiconductors may support SMEs, startups, and other companies to access the Chips Fund. They may also support companies in finding investors, including venture capital.
- **Awareness raising, promoting services, promoting success stories**: the services offered by Chips CCs may be new and may not be well recognised in the beginning. Therefore, Chips CCs need to raise awareness about their services, need to promote their services, and may need to develop an outreach program to promote the Chips CC services to potential user companies, esp. smaller enterprises. Chips CCs may need to go to many events in their countries to increase familiarity of their services with their target customers. They may need to target specific vertical sectors. They may need to promote success stories that show how their services benefit their customers. They may need to hire staff with the right soft skills to interact with customers and provide the interface between technical Chips CC staff and customers.

Chips CCs should primarily offer services that address the needs from their prime user communities. Nevertheless, Chips CCs should also answer the needs from other organisations, e.g. from other countries, and work in close coordination and collaboration with the rest of the Network to achieve the highest possible impact, ensure the most efficient use of the CCs' resources, and to avoid duplication of efforts among the Chips CCs and with other initiatives, such as the European Digital Innovation Hubs.

4. Candidate entities and end users

A Chips CC is a **single organisation** or a **coordinated group** of organisations with complementary expertise, established with a **non-profit objective**, aiming to promote the use of semiconductor technologies.

Although there is formally no limit on the number of entities setting up a competence centre, a small number of partners per Chips CC is desirable. There is no obligation for a group of organisations to create a dedicated legal entity. A Chips CC can be built on established entities in the field or can be set up from scratch.

Research and Technology Organisations (RTOs) and universities are **key candidates** to become competence centres in semiconductors. Enterprises may also set up a competence centre, or be part of a group establishing a competence centre. However, the centre must have a non-profit objective and services must be offered not-for-profit.

Candidates for competence centres are not limited to those legal entities that are involved in the set-up of pilot lines, the design platform, or are somehow involved in any other way in the Chips for Europe Initiative. Being involved in the setup and/or operation of infrastructures is not a requirement for competence centres.

Typical **users** of the services offered by a Chips CC are companies, in particular local/national SMEs and startups, RTOs, and academic institutions at the regional, national and EU level. Public authorities and large enterprises may also use the services of a competence centre, but normally they are not the prime customers.

5. Size, funding and access to services

The Chips for Europe Initiative will support the establishment of competence centres **throughout the Union and EEA countries**[7]. The European Network of competence centres in semiconductors may comprise zero, one, or more centres per eligible country. It is expected that most Member States (and EEA countries) would opt to support one competence centre or a very small number (say 2-3) in their countries. As indicated before, a competence centre may consist of a group of legal entities with complementary expertise.

Setting up competence centres in a country is **voluntary**, and Member States may decide not to support Chips CCs in their country. There is no obligation to have one or more competence centres in a certain country. Member States may also decide to team up with other countries and support **cross-border competence centres**.

The Union will make available **EUR 1 million per year, per country, for a 5-year period**. There is no differentiation based on country size, i.e. all countries may get the same maximum

[7] Here: Iceland and Norway. Liechtenstein is not a member of the Chips Joint Undertaking.

amount of EU funding per year to support their competence centres. There is also no differentiation based on the number of competence centres that a country wants to support, i.e. the maximum, annual amount of EU funding may be used to support one or more competence centres.

Member States are expected to **co-finance** their national competence centres together with the Union, i.e. 50% will be funded through EU contributions and 50% through national contributions. Union funding is conditional on the availability of the same (or higher) amount of national contributions. Member States may provide the same amount of maximum annual, financial contributions as the Union, i.e. EUR 1 million per year. Member States may provide a higher amount of annual national contributions (i.e. higher than EUR 1 million per year), but this will not lead to a similar, higher annual Union contribution. Member States may provide a lower amount of annual national contributions (i.e. lower than EUR 1 million per year), and this will lead to a similar, lower annual Union contribution.

State aid considerations may enter into play for Member States' contributions to the competence centres.

The EU funding for the competence centres will be made available through Digital Europe grants, which allow to fund **specific cost items**:

- Qualified personnel of the competence centre to deliver the services mentioned in Section 3 to companies, RTOs, academic institutions, and public administrations, including subcontracting for specialists;
- Procurement and/or depreciation costs for equipment and facilities, both hardware and software;
- Travel grants for personnel of the competence centre and local stakeholders to work with other competence centres.

Access to a competence centre's services shall be open to several users and be granted on an **open, transparent and non-discriminatory basis**.

Services need to be made available for **free or against reduced prices** to SMEs and public sector organisations, and **against market price or actual costs** incurred for larger companies. In the exceptional cases where undertakings have financed at least 10% of the investment costs of a centre, they may be granted preferential access under more favourable conditions.

Moreover, services provided should be accessible in the national languages as well as in English.

The Chips CCs must be established as organisations with appropriate visibility to national and local communities. In general, Chips CCs should employ semiconductor specialists, primarily with full-time contracts, and with expertise in areas that are most relevant for the national communities and the specialisation of their centres. A Chips CC should have an independent organisational structure and its staff should not work under external supervision.

6. Selection process

The process to select competence centres in semiconductors will consist of two phases: a pre-selection phase by Member States, and an evaluation (or quality assessment) phase by the Chips Joint Undertaking[8].

In the **pre-selection phase**, Member States and EEA countries are invited to designate a number of Chips CC candidates in accordance with their national procedures and administrative and institutional structures through an open and competitive process. A Member State decides itself on the exact manner how candidates are designated. In a similar note, Member States may designate cross-border centres, i.e. two or more countries decide to team up and propose a joint candidate competence centre.

Member States may decide on the desired number and size of competence centres in their territory, including the associated national financial contribution and EU contribution (within the limits of EU contribution as indicated in the previous section).

Member States are free to designate a different number of candidate Chips CCs than the desired number of centres. They may designate more candidates than the number that can be funded in order to increase competition during the next step of the selection process.

Designated candidates should at least fulfil the following criteria:

- Appropriate competences to provide the services outlined in Section 3;
- Appropriate management capacity, staff and infrastructure necessary to provide the services outlined in Section 3;
- Operational and legal means to apply the administrative, contractual and financial management rules that come with a grant agreement;

[8] Adapted from the European Chips Act, article 11.

- Appropriate financial viability, corresponding to the level of funds they will be called upon to manage.

In designating candidates, Member States should maximise synergies with existing structures that share certain characteristics with Chips CCs, such as European Digital Innovation Hubs (EDIHs). For example, Member States could designate an existing EDIH focused on semiconductors as a competence centre in semiconductors, as long as the prohibition of double financing is not breached.

In the **evaluation phase**, the Chips Joint Undertaking will evaluate proposals by designated candidate centres. In case a Member State has designated more candidates than its desired number and size of competence centres, the evaluation will be competitive. Otherwise, the evaluation will be a quality assessment of designated candidates.

The Chips Joint Undertaking will launch a **restricted call for proposals** to set up competence centres in semiconductors. The restricted call will be open only to those entities that have been designated by Member States as candidate centres. To be eligible, a proposal submitted to the restricted call will have to provide proof that the centre has been designated by its Member State and that it will be co-financed by the Member State.

Eligible proposals will be evaluated and all those scoring above all thresholds will be ranked. Based on the ranked list, the Chips JU's Public Authorities Board will select proposals for funding. Selected proposals will get a grant from the Chips JU for a duration of 5 years.

The award criteria that will be used in the restricted calls are given in Annex 2.

Annex 1 – Competence centres in semiconductors in the Chips Act

This Annex contains the most relevant provisions with respect to competence centres in semiconductors, as mentioned in the agreed legal text of the Chips Act, which currently goes through lawyer-linguist revision[9].

Recital 18:

"*Fourth, in order to promote the use of semiconductor technologies, to provide access to design and pilot line facilities, and to address skills gaps across the Union, the Initiative should provide Member States with the possibility to establish at least one competence centre on semiconductors in each Member State, by enhancing existing centres or creating new facilities. Access to publicly funded infrastructure, such as pilot and testing facilities, and to the competence centres, should be open to a wide range of users and should be granted on a transparent and non-discriminatory basis and on market terms (or cost plus reasonable margin basis) for large undertakings, while SMEs and academic institutes can benefit from preferential access or reduced prices. Such access, including for international research and commercial partners, can lead to broader cross-fertilisation and gains in know-how and excellence, while contributing to cost recovery.*"

Recital 28:

"*To facilitate access to technical expertise and ensure dissemination of knowledge across the Union, as well as support to diverse skills initiatives, a network of competence centres should be established. To this end, the Chips Joint Undertaking should establish the procedure for establishing competence centres, including the selection criteria, as well as further details on the implementation of the tasks and functions mentioned in this Regulation. The competence centres forming the network should be selected by the Chips Joint Undertaking and should have substantial overall autonomy to lay down their organisation, composition and working methods. However, their organisation, composition and working methods should comply with and contribute to the objectives of this Regulation and the Initiative.*"

Recital 29:

"*Competence centres should contribute to maintaining the Union's lead with regard to chip research, development and innovation and design capabilities by focusing on the promotion of research, development, innovation and design, together with a focus on manufacturing. The promotion of human potential and skills through education in science, technology, engineering and mathematics (STEM) subjects up to the postdoctoral level is crucial for achieving that objective. In particular, competence centres should provide services to the semiconductor*

[9] This means that the text that will be adopted in September 2023 (as currently foreseen) may be slightly different from the quoted text here.

stakeholders, including start-ups and SMEs. Examples include facilitating access to pilot lines and to the virtual design platform, providing training and skills development, support to finding investors, making use of existing local competencies or reaching out to the relevant verticals. The services should be provided on an open, transparent and non-discriminatory basis. Each competence centre should connect and be part of the European network of competence centres in semiconductors and should act as an access point to other nodes of the network. In this regard, synergies with existing similar structures, such as European Digital Innovation Hubs established under the Digital Europe Programme, should be maximised. For example, Member States could designate an existing European Digital Innovation Hub focused on semiconductors as a competence centre for the purposes of this Regulation, provided that the prohibition of double financing is not breached."

Article 11:

"*Article 11:*

European network of competence centres in semiconductors

1. *For the purposes of the Initiative's operational objective 4, a European network of competence centres in semiconductors, system integration and design (the 'network') shall be established. The network shall be composed of the competence centres selected by the Chips Joint Undertaking in accordance with paragraph 3.*
2. *Competence centres shall perform all or some of the following activities to the benefit of and in close cooperation with the Union industry, in particular SMEs and mid-caps, as well as research and technology organisations, universities, and the public sector and other relevant stakeholders across the semiconductor value chain:*
   a) *providing access to design services and design tools under the Initiative's operational objective 1, as well as to the pilot lines supported under the Initiative's operational objective 2;*
   b) *raising awareness and providing the necessary know-how, expertise and skills to the stakeholders for helping them accelerate the development of new semiconductor technologies, semiconductor manufacturing, equipment, design options and system concepts as well as the integration of new semiconductor technologies, by using effectively the infrastructure and other available resources of the network;*
   c) *raising awareness and providing or ensuring access to expertise, know-how and services, including system design readiness, new and existing pilot lines and supporting actions necessary to build skills and competences supported by the Initiative;*
   d) *facilitating the transfer of expertise and know-how between Member States and regions encouraging exchanges of skills, knowledge and good practices and encouraging joint programmes;*

e) developing and managing specific training actions on semiconductor technologies and their applications to support the development of the talent pool, by skilling and reskilling, and to increase the number of students as well as the quality of education in relevant fields of studies up to PhD level at schools and universities located in the Union by facilitating connections between students and semiconductor companies across the Union, while paying particular attention to women's participation.

3. Member States shall designate candidate competence centres in accordance with their national procedures, administrative and institutional structures through an open and competitive process.

The Work Programme of the Chips Joint Undertaking shall set the procedure for establishing competence centres, including the selection criteria as well as further details on the implementation of the tasks and functions referred to in this Article. The Chips Joint Undertaking shall select the competence centres forming the network.

Member States and the Commission shall maximise synergies with existing competence centres established under other Union initiatives such as the European Digital Innovation Hubs.

4. The competence centres shall have substantial overall autonomy to lay down their organisation, composition and working methods. The organisation, composition and working methods of the competence centres shall comply with and contribute to the objectives of this Regulation and the Initiative."

Annex 2 – Award criteria used for restricted calls

The award criteria used in the calls under DEP work programme 2021-22 were as follows:
Criterion 1 - Relevance

- Alignment with the objectives and activities as described in the Call document;
- Contribution to long-term policy objectives, relevant policies and strategies, and synergies with activities at European and national level;
- Extent to which the project would reinforce and secure the digital technology supply chain in the EU; *
- Extent to which the project can overcome financial obstacles such as the lack of market finance. *

Criterion 2 - Implementation

- Maturity of the project;
- Soundness of the implementation plan and efficient use of resources;
- Capacity of the applicants, and when applicable the consortium as a whole, to carry out the proposed work.

Criterion 3 - Impact

- Extent to which the project will achieve the expected outcomes and deliverables referred to in the call for proposals and, where relevant, the plans to disseminate and communicate project achievements;
- Extent to which the project will strengthen competitiveness and bring important benefits for society;
- Extent to which the project addresses environmental sustainability and the European Green Deal goals, in terms of direct effects and/or in awareness of environmental effects. *

* May not be applicable to all topics (as mentioned in Call documents).

It is proposed to use the same criteria and subcriteria as above, without the subcriteria that may not be applicable to all topics.