

Position paper on ECSEL II

By ECSEL-Austria – September 2018 www.ecsel-austria.net

ECSEL-Austria is a non-profit association supported by the Federal Ministry for Transport, Innovation and Technology (BMVIT), the Association for the Electrical and Electronics Industries (FEEL), and Austrian research institutions as well as industry. It aims to raise awareness of Austria's electronic-based systems (EBS) expertise in the context of the ECSEL Joint Undertaking (ECSEL JU) European initiative, and to support its members as they participate in transnational European research projects in the field of EBS and EBS applications.

In this document, **EBS** will be used in place of the following terms that are more commonly used in the EU: the internet of things (IoT) and cyber-physical systems (CPS). EBS also cover core capabilities related to digitalisation, such as industry 4.0, digital twins, artificial intelligence (AI) and machine learning (ML). EBS are therefore the **key enabling technologies** of innovation in all these applications, which will be indispensable in solving the global challenges tackled in the future by the **Horizon Europe** missions.

World-class expertise in Austria delivers excellence for electronic-based systems made in Europe

The EU's electronics strategy, and incorporation of the ENIAC, ARTEMIS and EPoSS programmes into ECSEL JU, have set a course for the reindustrialisation of the EBS sector.

The strategy supports Austria's areas of strength in EBS, with a specific focus on sensor systems, power electronics, high-frequency systems, and software for embedded systems, especially in safety and security applications [3]. More than 60,000 employees and 4,000 researchers work in major companies, SMEs and research institutions involved in the EBS sector in Austria. They possess leading technological expertise and are therefore in an ideal position to meet the global challenges connected with topics such as energy for all, transportation, the environment and health – with EBS innovations.

Current **megatrends**, such as **digitalisation**, would simply not be possible without electronic components and systems. The challenges of digitalisation (e.g. smart digital technologies) require a significantly broader range of competencies than that which large companies can offer on their own. This necessitates close cooperations between businesses and research partners beyond Austria's borders. Europe has the capabilities that are needed to take a leading role in shaping the whole of this sector.

In addition to research excellence, world-leading EBS activities require high levels of investment and complex production structures, in industrial-scale businesses as well as in SMEs and research organisations. Grants can provide support here. In the European environment, EBS research and innovation is characterised by high complexity, a high degree of necessary interconnection and the large number of leading-edge technologies that are required. The value chain in Austria features many of the elements of a completely digitalised system, for example infrastructure and connectivity, manufacturing plant and production control systems, firmware/software, communications, data management, data security and data reliability, systems integration, integrated circuit packaging, miniaturisation, integrated circuit components, semiconductor technologies and basic materials. To underpin competitiveness, corresponding applications along the global value chain will also be

enhanced by aspects of digitalisation such as big data, AI and ML. A comprehensive approach of this kind is vital for EBS in Austria, and the required scope can only be provided by the ECSEL regime. That is why ECSEL, and in the future ECSEL II, represent essential instruments for strengthening the position of European and Austrian EBS actors on the international market.

Abundant benefits for European society, research and industry

In many regions of the world (e.g. in the USA and in Asia), EBS is recognised as a national priority and is supported strategically. These regions are making enormous efforts to catch up with Europe in the areas in which the continent still leads the way, with the objective of taking the lead. With ECSEL II, Europe must define an appropriate strategy to see off this threat, as well as defining priorities.

Electronic systems and components are considered a key technology for overcoming global societal challenges. The outcomes of ENIAC, ARTEMIS and ECSEL JU projects have clearly demonstrated relevance and impact (see programme evaluations).

ECSEL-Austria has made essential contributions to numerous European projects and has had an extraordinary impact [1] [2] [4]. First and foremost, Austrian industry and research institutions have demonstrated leadership and commitment in the professional coordination of major research projects. Interdisciplinary collaboration across national borders makes it possible to employ sufficient resources to respond to the competitive pressure from outside Europe, and to reduce the economic risk for participating project partners to a reasonable level.

Shaping the future with ECSEL II

Using the public-private partnership (PPP) model, projects will acquire a critical mass of funding and project partners to develop new technologies, processes and products (research and innovation actions, RIA), to test them in relevant use cases, and efficiently take them to a high level of maturity – transferring them out of the lab and raising the technology readiness level (TRL) from basic research to application.

The innovation actions (IA) category and the related high maturity of technologies have enabled the creation of a mechanism that supports the key consideration of time to market. This underpins the competitiveness of Europe's EBS value chain. The model secures and creates many sustainable, high-value jobs in Europe.

Close cooperation between the research sector and industry in ECSEL projects results in knowledge transfer in both directions. Research receives impetus from industry, and industry gains access to know-how in applying new technology. The latter leads to new products reaching the market more quickly, as well as accelerating improvements in development processes within industry.

In this context, ECSEL-Austria recommends implementation of the following seven points in the design of ECSEL II:

1. ECSEL II JU should continue to work as an industry-focused, strategic tripartite instrument: Horizon 2020, and in particular the LEIT ICT and NMBP programmes, transferred the focus on EBS research and innovation to ECSEL. The current tendency in the EU continues to point in this direction.

This means that **ECSEL II will be an essential instrument for supporting cross-border research and innovation cooperations in the EBS sector, with the objective of strengthening and underpinning Europe's competitiveness.**

2. The importance of EBS justifies doubling the budget [5]:

Since EBS will provide the basis for all social and economic systems to an even greater degree in the future, and the USA and Asia are making enormous efforts to dominate the sector, a doubling of the EBS budget is called for. The doubling of the framework budget (at EU and national level), as well as national priorities, should be coordinated and discussed with all participating countries, taking a longer-term perspective. A long-term view translates into greater planning certainty with regard to the research and innovation roadmaps. A roadmap agreed between the EU and participating countries permits a clearer focus on EBS, and makes it possible to counter all of the activities of competitors in the USA and China.

3. Simplified two-step application process: ECSEL II should include a significantly simpler submission process. In principle the two-step process is based on a project outline (PO) and a full project proposal (FPP). The current implementation of the PO requirement does not lead to an effective preselection process, and it should be revised.

The following changes are proposed in order to improve the effectiveness of the PO phase:

- **Stricter page limit and structured preselection:** These changes would ensure that proposals which get past the PO phase represent preselected projects, and are only rejected if they perform poorly in the FPP evaluation (examples of this can be found at national level and in Horizon 2020, and could be analysed and adapted).
- **Forecast partner budgets in the PO phase** representing the maximum level of financing: this measure relates to local and national co-financing. It should prevent situations where approved European projects lose national funding at a very late stage (after the FPP). When this happens, project consortia are suddenly forced to make major changes to project contents.

4. Simplification is good – but not if it increases the burden on project coordinators: As a key enabling technology, EBS can only be developed to a world-leading level in a European context. For this purpose, close collaboration among the EU, member states and the key actors in research and industry needs to be ensured. In this context, ECSEL has proven itself as a highly effective tripartite instrument, galvanising joint efforts. The national ECSEL organisations can help to reduce the complexity that is inherent to this tripartite instrument, particularly for SMEs and new participants. Better coordination of priorities between member states, and further harmonisation of national procedures and rules are needed to reduce the work demanded of project coordinators. Simplification cannot be allowed to result in more administrative work being passed on to coordinators and consortia. Professional support from the ECSEL project officer is helpful and necessary in order to be able to handle the complex regime efficiently.

5. Lighthouse initiatives must be integrated into and aligned with the Multi-Annual Strategic Research and Innovation Agenda (MASRIA) and the Strategic Research Agenda (SRA) to support mission-oriented work (Horizon Europe Framework Programme). It is also necessary that support for such initiatives is integrated into ECSEL project proposals, and related costs in project implementation can be funded. Projects that are significantly mission-oriented, and that

correspondingly carry higher risk, should receive a bonus in the form of higher funding from the EU and national levels.

6. Fast track to innovation (FT2I – ECS innovation speedboats): Generally it takes 15 to 20 months from the formulation of a project idea until the project actually commences. The time from project submission to starting the project is usually about six to eight months. In segments where change is very fast-paced, such as software and digitalisation, these time frames are too long. Therefore, we recommend establishing innovation speedboats, beginning with the aforementioned segments. These would comprise small innovation actions, with short proposal texts (max. 50 pages), a budget of between 3 and 5 million Euros, and up to eight partners. Greatly simplified proposal and decision processes should mean that these small innovation actions can be implemented quickly. The aim could be to reduce the time that elapses from the project idea to starting the project to just eight months, and to offer four submission deadlines a year. This proposal is intended for independent projects and not for cascade funding.

7. AENEAS, ARTEMIS and EPoSS industry associations: In ECSEL-Austria's view, these three industry associations could be, as far as possible, united in order to strengthen and focus an overall European EBS strategy.

Summary:

- The USA and Asia have made electronic-based systems (EBS) a strategic focus, providing massive financial support for implementation.
- ECSEL II is therefore essential for Europe's competitiveness and the continued development of its technical expertise; this justifies doubling the budget.
- ECSEL is currently the only EU funding regime that is in a position to bring industry and research together to work on complex research projects along the entire value chain.
- Add application-specific measures for artificial intelligence and machine learning to the ECSEL II programme.
- Increase the efficiency of the process:
 - Simplify the submission procedure – adapt the two-stage submission process to make it more effective
 - Adjust and harmonise national procedures and rules (ensuring no redundancy in national languages)
 - Do not pass on administrative burden to project coordinators and consortia
 - Further simplify reporting (not duplicate – once to the EU and once to member state)
- Better coordination of substantive priorities of the member states, including coordination of their budgets.
- Longer-term EU and member state budget framework, providing greater planning certainty.
- To support mission-orientation, incorporate **lighthouse initiatives** into Multi-Annual Strategic Research and Innovation Agenda (MASRIA) and the Strategic Research Agenda (SRA) and recognise these in funding arrangements.

References:

[1] ECSEL JU Impact analysis study: https://www.ecsel.eu/sites/default/files/2017-09/Ecsel_Impact_Analysis_study_website.pdf

[2] Interim Evaluation of the ECSEL Joint Undertaking (2014-2016) Operating under Horizon 2020:
http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=47737

[3] Electronic Based Systems in Austria – Facts, Figures and Data
https://www.ecsel-austria.net/files/ECSEL/media/Library%20Documents/WEB_EBS-Studie_ENG.pdf

[4] COLLABORATIVE ECSEL-AUSTRIA PROJECTS
http://www.ecsel-austria.net/files/ECSEL/media/Broschueren/Broschuere_web1.pdf

[5] Re-finding Industry (key enabling technologies)
https://ec.europa.eu/research/industrial_technologies/pdf/re_finding_industry_022018.pdf