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Perspectives for ECSEL beyond the 2020 Horizon

In view of the forthcoming political debate on European research and innovation (R&I) in the period beyond 2020, the industry associations AENEAS¹, ARTEMIS-IA² and EPoSS³, as the three private members of the ECSEL Joint Undertaking, would like to put forward some considerations in reply to the renewed industrial policy strategy proposed by the European Commission in September 2017, and more particularly as their input for the Commission's forthcoming communication on the interim evaluation of Horizon 2020 including ECSEL, its proposal for the next Framework Programme for R&I (working title "FP9"; expected by mid-2018) and – ultimately – its proposal for an extension or successor of ECSEL beyond 2020 ("ECSEL2"), to be tabled early in 2019.

1. Observations on the functioning of ECSEL since 2014

In a nutshell, the three Industry Associations see the following key strengths of ECSEL:

- ECSEL delivers on industrial competitiveness, economic value and societal impact:
 - ECSEL⁴ is focussed on supporting research, development and innovation in the area of Electronic Components and Systems (ECS). These are key enablers for Digitising European Industry and their applications are instrumental in addressing the Societal Challenges that Europe is facing, such as health and well-being, energy, mobility, security and production. "Components" are to be seen as hardware components as well as software components.
 - ECSEL has proven to have the critical mass needed for successfully implementing its industry-driven Multi-Annual Strategic Plan (MASP), ranging from low to high Technology Readiness Levels (TRL), complementing and exploiting the bottom-up low-TRL actions in the regular Work Programme of Horizon 2020.
 - Its vibrant innovation ecosystem involving large firms, SMEs, universities and institutes fosters fruitful collaborations between industry sectors and along value chains, covering not only ECS technologies such as micro- and nano-electronics, embedded/cyber-physical systems and smart system integration, but also their applications beyond the ECS industry.
 - ECSEL actions strengthen the European ECS industry and ensure the availability of ECS for Europe's other industries and markets.
 - Successful ECSEL projects⁵ are underway; the ENIAC and ARTEMIS JUs have delivered with impact⁶.

¹ <https://aeneas-office.org>

² <https://artemis-ia.eu>

³ <https://www.smart-systems-integration.org/public>

⁴ <http://www.ecsel.eu/what-we-do-and-how>

⁵ http://www.ecsel.eu/sites/default/files/2017-08/ecsel_ju_book_of_projects_volume1_website.pdf

⁶ http://www.ecsel.eu/sites/default/files/2017-09/ecsel-ju_artemis-eniac_programme_impact_2015.pdf



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- ECSEL operates effectively and efficiently:
 - Its unique tri-partite Public-Public-Private Partnership will leverage 1.2 B€ EU funding from Horizon 2020 with 1.2 B€ national co-funding and 2.4B€ in-kind contributions from R&I actors.
 - The Office of the Joint Undertaking (JU) has proven to be a valuable asset by managing and implementing the R&D programme in a cost-efficient way and providing high quality services to members, beneficiaries and other stakeholders.
 - Although JUs may sometimes be perceived as “closed clubs”, ECSEL is actually fully open, transparent and inclusive, thanks to its open calls for proposals, the open membership of the three Industry Associations, the transparent governance structures and processes in the JU and the associations, and its broad annual stakeholder forum. Throughout the whole application process, prospective project participants are encouraged to look for partners outside their normal network so as to build the best consortia possible. Actions have been taken to include SME’s and guide them through the process, which for some of them is relatively unknown. Already in the period 2014-2016 2,653 entities were engaged in funded projects, of which 31% SMEs. In the 2016 calls more than one third of applicants were new to ECSEL⁷.

- ECSEL effectively implements the European Research Area (ERA) in the ECS domain:
 - Its pan-European MASP and its co-funding mechanism align European and national R&I efforts on ECS.

For a more extensive description and assessment of ECSEL we refer to its interim evaluation, the observations and recommendations of which we largely support⁸.

2. Policy arguments for the extension or succession of ECSEL beyond 2020

Taking into account above strengths and the positive results from the interim evaluation of ECSEL, the three Industry Associations are convinced that a continuation of ECSEL will help realize the objectives of FP9. Additional policy arguments are:

Better aligning EU and national investments

In its report LAB – FAB – APP⁹, the High-Level Group on maximising the impact of EU R&I programmes, chaired by Pascal Lamy, recommends to “better align EU and national R&I investments”. “A simplified and flexible co-funding mechanism should be established to this end, with lead agencies specialising in their implementation. The EU contribution should

⁷ http://www.ecsel-ju.eu/web/downloads/Documents_GB/ecsel_rapportannuel_a4_2016.pdf

⁸ <https://ec.europa.eu/research/evaluations/pdf/ecsel.pdf>

⁹ https://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/hlg_2017_report.pdf



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maximise the leverage of national and private investments”. “Partnerships (public-private and public-public) with industry, foundations and public authorities should be taken forward in as far as they mobilise joint investment in established missions, through a simple and flexible co-fund mechanism”. Even though its co-funding mechanism would benefit from further simplification and flexibility, ECSEL with its tri-partite approach definitely meets these requirements. Apparently, also the Commission is convinced that this is the right way forward, as it is considering setting up a new Joint Undertaking pooling funds from EU, national and private sources as one of the options¹⁰ for implementing the Common European Initiative on High Performance Computing.

Encouraging more industry participation

Industry participation in ECSEL is very much higher than in Horizon 2020 in general. The Lamy report recognises the fundamental role that industry is playing in the transformation of knowledge into innovation and sees academia and industry not as rivals in this, but as allies. Whereas according to the report “the participation of academia is natural, that of industry is to be encouraged”.

The need to involve and fund (large) industry in FP9 is sometimes questioned, also in the European Parliament¹¹. However, a recent report¹² on the economic rationale of public R&I funding and its impact, which was prepared for the Commission by an expert group consisting of prominent economists, confirms that a number of market failures are linked to investment decisions in R&I. High risks, sunk costs, market uncertainty, lack of full appropriability of results, or unavailability of funding, all induce underinvestment in R&I below what is desirable from a societal point of view. Therefore, to maximize the spill-overs that the creation and diffusion of knowledge generate, public R&I funding, for both public and private investment, is needed. Obviously, this rationale also applies to the domain of ECS.

The three Industry Associations are of the opinion that FP9, including ECSEL2, should continue to provide public funding to large firms, as these will play a pivotal role in creating and maintaining innovation ecosystems, public-private partnerships and global value chains, of which also many smaller firms will benefit. Whereas smaller firms often pave the way for innovation, large firms are essential for exploiting the results from FP projects, as they have the critical mass and market access channels needed to ensure exploitation, standardisation and market uptake. Furthermore, leaving out large firms would only marginally contribute to solving the oversubscription problem currently encountered in Horizon 2020, but it would also drastically weaken of the programme.

¹⁰ https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-3896569_en

¹¹ <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A8-2017-0209+0+DOC+PDF+V0//EN>

¹² <https://publications.europa.eu/en/publication-detail/-/publication/0635b07f-07bb-11e7-8a35-01aa75ed71a1/language-en>



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Enabling the renewed EU industrial policy strategy

In September 2017, the European Commission unveiled a renewed EU industrial policy strategy¹³. As a major industry sector in itself and a key driver for digitisation and innovation in other industrial sectors and in services, ECS will be instrumental for its implementation. The renewed industrial policy strategy pays particular attention to ensuring leadership in Key Enabling Technologies (KETs). In their forthcoming review, the KET-status of nano-electronics should be continued, and extended to the whole ECS domain.

Ensuring Europe's sovereignty in ECS

Increasing protectionism in the US and other geopolitical developments force Europe to become more self-reliant. To ensure Europe's sovereignty and autonomy, the need for independent and unrestricted access to electronic components, embedded/cyber-physical and smart integrated systems, as being fostered by ECSEL, will only increase further. This requires joint European action.

Externalising programme implementation

Over the years, the Directorates-General within the Research family¹⁴ have outsourced the management of successive Framework Programmes more and more to executive agencies and joint undertakings. In view of positive experiences in Horizon 2020 and to increase efficiency in FP9, this shift is likely to continue.

3. Suggestions for implementing the extension or succession of ECSEL beyond 2020

For ECSEL2 the three Industry Associations advocate:

Wider scope

For the scope proposed for the remainder of ECSEL we refer to the ECS Strategic Research Agenda 2017, which is currently being developed as a new initiative by the three Industry Associations jointly¹⁵. This ECS SRA will be the basis for the ECSEL MASRIA 2018 and its MASP 2018. Given the successful tri-partite approach of ECSEL, the scope of ECSEL2 should be

¹³ <http://ec.europa.eu/docsroom/documents/25384>

¹⁴ Within the European Commission, Horizon 2020 is managed jointly by the Research family which is composed of: Directorate-General for Research and Innovation (DG RTD), Directorate-General for Agriculture and Rural Development (DG AGRI), Directorate-General for Communications Networks, Content and Technology (DG CNECT), Directorate-General for Education and Culture (DG EAC), Directorate-General for Energy (DG ENER), Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), Directorate-General for Migration and Home Affairs (DG HOME), Directorate-General for Mobility and Transport (DG MOVE), Executive Agency for Small and Medium-sized Enterprises (EASME), European Research Council Executive Agency (ERCEA), Innovation and Networks Executive Agency (INEA), Research Executive Agency (REA), Joint Undertakings (Clean Sky, ECSEL, FCH2, IMI2, BBI, Shift2Rail, SESAR).

¹⁵ <https://artemis-ia.eu/ecs-sra-day-2017.html>



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extended with adjacent domains, e.g. (parts of) photonics, robotics, and/or Internet of Things.

Strong industry involvement

As a co-investor, industry should remain strongly involved, driving the R&I agenda, with commitments on the basis of in-kind contributions and with sufficiently attractive funding rates, also for the other categories of participants. A revamped, broadened Electronics Leaders Group (ELG) could steer the strategy for the whole ECS domain, also in the context of the Digitising European Industry (DEI) initiative and the forthcoming EU industrial policy. By the way, the implementation plan of the ELG covers the period up to 2025, which is another reason for extending or succeeding ECSEL beyond 2020.

More synergy with and funding from other initiatives

Whereas ECSEL2 should primarily remain grant-based and focused on collaborative R&I, additional funding – also for the Lighthouses initiated by ECSEL (see below) – could be found from regions, ESIF, EIB and EFSI (Juncker fund). Also potential synergies with the forthcoming European Innovation Council (EIC¹⁶) should be explored, in particular for market-creating, disruptive innovation in new areas of growth beyond current roadmaps, where the specific capabilities and agility of start-ups and small companies can stimulate innovation in medium-sized and large firms.

Simplified co-funding

To further streamline the tri-partite approach and simplify its co-funding mechanism, more alignment of funding rates, procedures, timing and requirements between ECSEL Participating States would be essential, as well as multi-annual financial commitments. In view of subsidiarity, ECSEL needs to cater to the common European interest, which is not necessarily the same as the sum of national interests.

Unfortunately, the tri-partite funding model has become more complex in the transition from FP7 to Horizon 2020. Whereas beneficiaries of ARTEMIS and ENIAC had to report their costs only according to national rules, ECSEL features triple reporting on costs: once for EU funding according to Horizon 2020 rules, once for national funding according to national rules, and once for reporting on in-kind contributions under yet another set of rules. In ECSEL2 the reporting on costs should be limited to the minimum necessary.

Increased efficiency

The efficiency of the ECSEL JU Office could be increased even further by sharing back office

¹⁶ <https://ec.europa.eu/research/eic/index.cfm>



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tasks with the other JUs located in the same building.

Pivotal role for Lighthouse initiatives in mission-oriented approach

If a mission-oriented approach were to be adopted for FP9, the Lighthouses¹⁷ initiated by ECSEL and the related “Lighthouse Initiative Advisory Services” (LIASEs) could be instrumental in orchestrating the actions under different instruments towards the same mission. Current examples are the Lighthouses on mobility and digital industry.

Moonshots

For the coordination of different instruments within such mission-oriented approach, the interagency Semiconductor Moonshots proposed in the United States¹⁸ could be an interesting example.

4. Making it happen

For implementing the above, ECSEL2 will need a larger budget, also depending on a potential widening of its scope. Therefore, we very much welcome the plea from the European Parliament for a €120 billion budget for FP9, or preferably even a doubling w.r.t. Horizon 2020, as suggested in the Lamy report.

We look forward to discussing the status of ECSEL and the arguments, options and next steps for its extension or succession after 2020 with EU institutions and our other stakeholders.

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¹⁷ [http://www.ecsel.eu/sites/default/files/2017-09/ecsel_gb_2017_79 - lighthouse_initiatives_0.pdf](http://www.ecsel.eu/sites/default/files/2017-09/ecsel_gb_2017_79_-_lighthouse_initiatives_0.pdf)

¹⁸ https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/semiconductors_pcast_presentation.pdf