# AIM TO ECSEL

PROFESSOR DR HEINRICH DAEMBKES

CHAIR OF THE GOVERNING BOARD, ELECTRONIC COMPONENTS AND SYSTEMS FOR EUROPEAN LEADERSHIP JOINT UNDERSTANDING
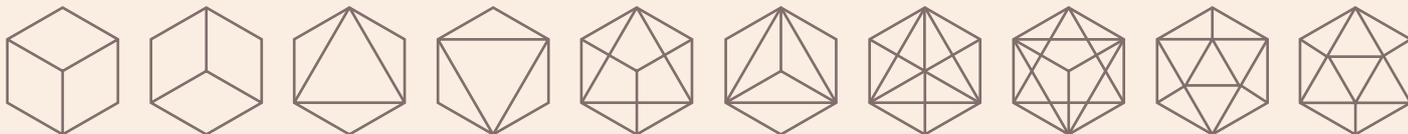
As **ECSEL JU** issues its first call for project proposals, *International Innovation* speaks with Professor Dr Heinrich Daembkes, Chair of the ECSEL Governing Board meetings and ARTEMIS Industry Association President, about the future of European competitiveness in the electronics sector

To begin, could you introduce your role within the Advanced Research & Technology for Embedded Intelligence and Systems Industry Association (ARTEMIS-IA), and outline your vision for the Association?

My background is in electrical engineering and semiconductor technology. For about the last 10 years, I have essentially focused on processes, methods and tools in software design and systems engineering, including their application to real products. Throughout my career, I have always tried to push the European research landscape to cooperate more and focus on areas vital to our competitiveness. Particularly, we have to recognise the role of microelectronics, and more specifically embedded systems, especially software, in determining the key characteristics of devices and final products; that the final characteristics of, for example, an Airbus A380 or a Mercedes car are to a very high degree determined by built-in intelligence in the form of electronic systems.

I was the representative of EADS on the ARTEMIS-IA steering board for several years, during which time I was continually pushing for progress in these critical areas. I became President of ARTEMIS-IA in 2013. In this role, I am working to defragment the European landscape, developing common approaches to speed up development and make state-of-the-art capabilities available.

Could you briefly describe the purpose and aims of the Electronic Component and System for European Leadership Joint Undertaking (ECSEL JU)?

If we look at where European industry and products are competitive, we recognise that the domain of complex systems, commercial systems and all systems in which safety is a primary concern is a real strength for European industry. That is where we are able to make one-stop shopping deliverable to customers. The key performance of all these products comes from their built-in intelligence; it is not only the mechanics we are delivering, but embedded and smart systems, especially through software. This is the area where ECSEL JU is coming into the game.

Until now, there have been two JUs working in parallel in this area: the European Nanoelectronics Initiative Advisory Council (ENIAC) and ARTEMIS Joint Undertaking. Besides ARTEMIS IA, we also have the Association for European NanoElectronics ActivitieS (AENEAS), an industrial association that deals with semiconductors and micro/nano electronics; and a third player, the European Technology Platform on Smart System Integration (EPoSS), that creates smart systems roadmaps. These three industry associations will stay active in the merged JU that is now ECSEL.

What was the impetus behind ECSEL JU's formation?

There is no reasonable justification for continuing in a separate manner. The EC's idea was to merge these three different activities, which up to now have been largely unharmonised, into one common JU. This should remove potential duplication and create a lot of synergy, leading to mutual cross-fertilisation.

Hardware experts recognise they need software and system design to serve users' needs. We are all aware that we cannot, for example, just ask Renault or BMW to build a car in order to use a new sensor or microcontroller we developed. The mentality has to be reversed; we have to take a systems perspective, see what is required in order to achieve certain characteristics and performances that make the product attractive for the final user, and then provide electronics that serve our customers. Therefore, there is a need to extend the perimeter of nanoelectronics activities towards software as well.

Meanwhile, ARTEMIS-IA is focusing on cyber-physical systems. In these systems, there is built-in intelligence that can decide between various strategies and is now even capable of communicating with other smart systems. These other smart systems have better, other or different information, and by combining knowledge from the various smart systems we are creating something that is really larger than just the sum of the individual systems. Therefore from ARTEMIS-IA's perspective, it has been necessary to seek knowledge from hardware experts.

The different communities need to work together in a better way. This will lead to an improved approach where we will no longer have three separate roadmaps for embedded systems, micro/nanoelectronics and smart systems. To this end, we are trying to harmonise the approach so that everyone is benefiting from the cooperation between these three domains. We are talking with our expert groups, running a lot of workshops, and developing new and more advanced solutions that will require less overall effort and hopefully lead to faster times to market.

How is ECSEL JU structured?

There is a JU Office which is managed by Dr Andreas Wild, the Executive Director. He is responsible for the operational and day-to-day business of the JU. The Governing Board meets a few times each year in order to align the views of its members and set guidelines. I am Chair of the Governing Board meetings, and lend a helping hand by overseeing these activities.

How does ECSEL JU formulate its funding calls?

The private members develop roadmaps that are submitted to the Governing Board. The members, being the funding institutions and industry associations involved, discuss these roadmaps and in the end decide priorities, and out of these priorities the call for proposals is formulated.

Which priorities formed the basis for ECSEL JU's recently launched first call for project proposals?

Five areas of strategic application have emerged:

• Smart mobility

• Smart society (especially the interconnected society)

• Smart energy

• Smart health

• Smart production
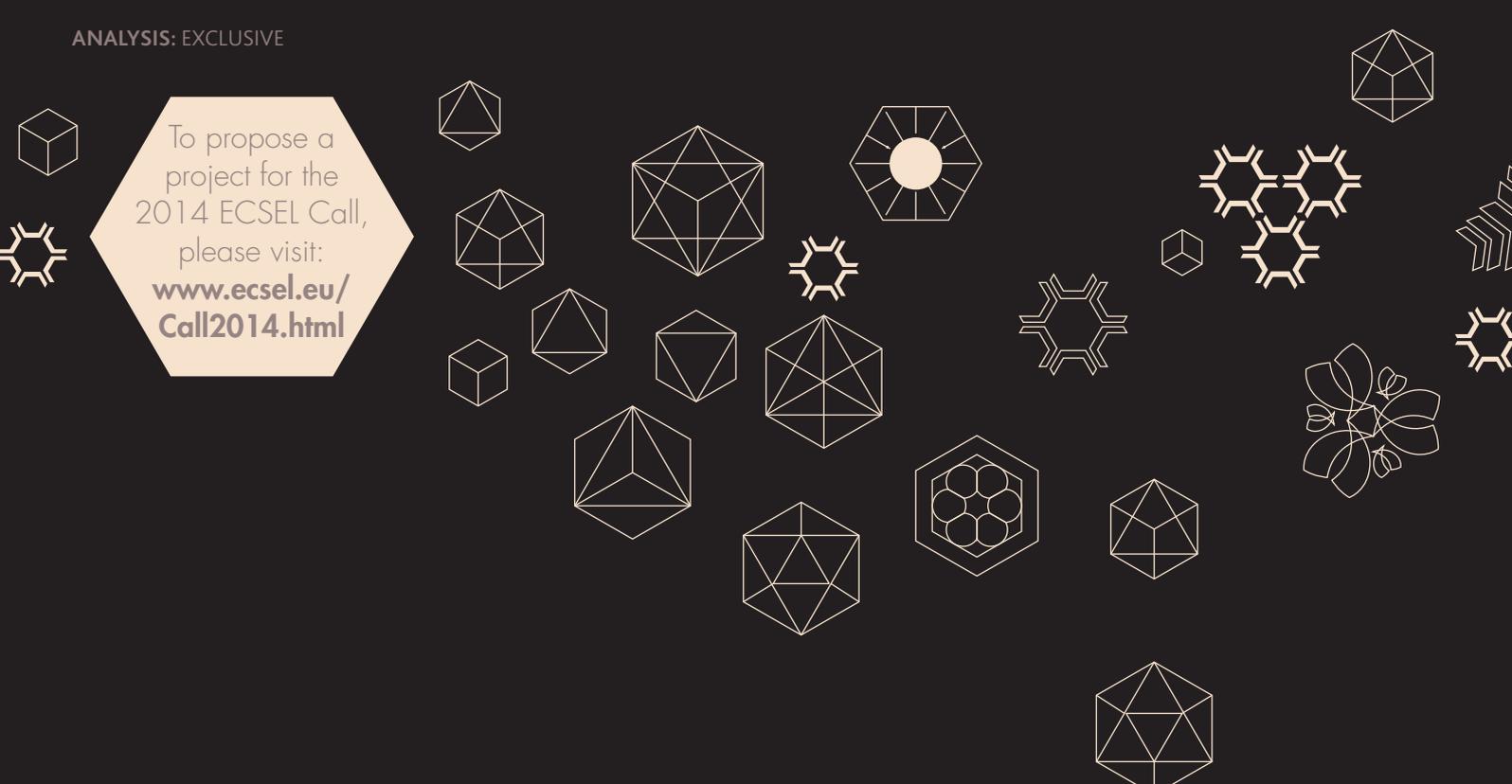
To propose a project for the 2014 ECSEL Call, please visit: **www.ecsel.eu/Call2014.html**

Four areas of essential technologies also arose:

- Semiconductor processes, equipment, materials

- Design technologies

- Cyber-physical systems

- Smart systems integration

We are addressing these areas via smart electronics, or built-in intelligence. It is not that we are manufacturing cars in order to promote mobility, we are providing new electronics helping the car industry to build more competitive, fuel efficient and environmentally compatible cars, for instance. So that means we are contributing the advanced technologies, processes, methods and components necessary to facilitate the creation of the final products.

The first call is split into two sub-calls. First, we have normal research and innovation activities (RIA) for the different domains (although it is not necessary to focus on only one domain; indeed, many projects will span several). The second class of calls deals with very big projects which transform research results into innovations/applications (IA).

The first call was issued on 9 July and the submission deadline will be 17 September. There will then be an evaluation by reviewers and experts, who will rank proposals according to performance and eligibility criteria. The best will be brought to the attention of the EC and the different Member States. In the end, there will be a priority list for awarding contracts to the consortia. We estimate that the first projects will start in the spring of next year. Thereafter, there will be two new calls every year.

So far, we have received more than 70 expressions of interest. Several of these are in identical domains or propose work concerning exactly the same topic. The JU Office may therefore talk to the relevant parties and propose that they join forces to form a stronger consortium. Typically, a merged proposal has a better chance of acceptance.

How do you see ECSEL JU developing over the coming years?

ECSEL JU will launch calls for seven years, with the last contracts awarded running for an additional three, bringing the total ECSEL JU lifespan to 10 years. The overall funding budget coming from the EC over the seven-year core period has already been fixed at roughly €1.2 billion and will not grow. It is expected that the participating Member States at least mirror this funding amount.

In addition, although we still have three different and separate communities behind ECSEL at the moment, as we begin to intensify discussions with each other, this should lead to closer cooperation between the private members. Perhaps further down the line we'll see a partial or even total merger of activities. This is not the intention, but it could potentially be a consequence.

In what ways do you hope ECSEL JU will impact Europe in the long term?

I hope that through the efforts and harmonised activities of ECSEL, we will make better use of resources to come up with better products, faster. With respect to economic impact, all this should lead to more employment in Europe and enhance the competitiveness of European industry on the worldwide market.

In terms of social impact, new technologies emerging out of ECSEL will enable completely new possibilities for improving our lives: ease of communication, better health, much better compatibility with the environment, reduction of energy waste and so on. In the future, we will see built-in electronics enter into products we can hardly imagine at the moment: clothing, furniture or even food. I really expect ECSEL JU to have a strong impact on societal progress itself.

Of course, we are not going to be operating seamlessly within the first month; a lot of effort will be put into alignment over the first couple of years. I'm convinced, however, that operating as a partnership, in a well-balanced manner, will lead to significantly increased cooperation and better use of all the knowledge that is available in Europe.

THE ECSEL JU PARTNERSHIP

The JU is a partnership between three different entities:

- **Participating Member States** – which committed to be a member the JU and contributing research funding

- **The EC** – which is also contributing research funding. In principle, the funding should be balanced equally between the EC and Member States

- **Private members** – ARTEMIS-IA, AENEAS and EPoSS. These three industrial associations have their own seats and voting rights in the Governing Board

ECSEL JU OBJECTIVES

- To contribute to the implementation of Horizon 2020

- To develop a strong and globally competitive electronics components and systems industry in the EU

- To ensure the availability of electronic components and systems for key markets and for addressing societal challenges, keeping Europe at the forefront of technology development, bridging the gap between research and exploitation, strengthening innovation capabilities, and creating economic and employment growth in the EU

- To align strategies with Member States to attract private investment

- To maintain and grow semiconductor and smart system manufacturing capability in Europe

- To secure and strengthen a commanding position in design and systems engineering

- To provide access for all stakeholders to a world-class design and manufacturing infrastructure

- To build a dynamic ecosystem involving SMEs, strengthening existing clusters and creating new clusters

THE ECSEL PRIVATE MEMBERS
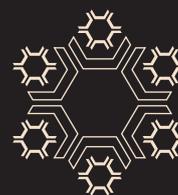
Embedded and cyber-physical systems
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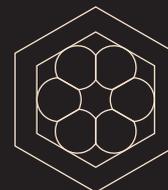
Micro/nanoelectronics
Represented in AENEAS
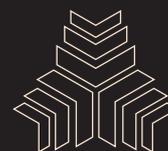
Smart integrated systems
Represented in EPoSS

www.ecsel-ju.eu