Leading-edge semiconductor technology would not exist without Europe.

On the Chips Act, the importance of working together, and the semiconductor industry. Interview with Mr. Ralf Bornefeld.
Dipl.-Ing. Ralf Bornefeld is the first Chair of the Key Digital Technologies Joint Undertaking (KDT JU). With more than 30 years of experience in the semiconductor field (from SME to large enterprises), he is currently a Senior Vice President of Automotive Electronics division at Robert Bosch GmbH.

Before he held various management positions at Infineon Technologies AG: senior director of technology in frontend production from 2005-2008, senior director of engineering of automotive sensors until 2011, and finally vice president and general manager of the business line automotive sensors.

Ralf started his career at Elmos Semiconductor in 1992 as a technology development engineer. Afterward, he took several management positions until the end of 2004, mostly serving as vice president of R&D and eventually as vice president of business line Microsystems. Ralf Bornefeld was born in Schalksmuehle, Germany, in 1964. He graduated with a degree in Electrical Engineering from the Technical University of Dortmund in 1992.

This interview was conducted as part of the KDT JU interview series in view of the European Commission in early 2022. The interview was taken by Mr. Luciano Gaudio, acting Head of Communications at the KDT JU.

GAUDIO Luciano (KDT JU)

The Key Digital Technologies Joint Undertaking (KDT JU), as European partnership between public and private sector, is based on a tripartite model: European Commission, Industry Associations and Participating States. Could you please explain, as Chairman of the KDT JU Governing Board, why working together is so important?

Ralf BORNEFELD (Chairman KDT JU GB)

We live in the digital age. Everything that surrounds us becomes more and more digital. Some world’s regions are advancing very fast in digitalisation. And their governments are giving clear instructions how different parties should cooperate together. This is where we need to gain pace in Europe.

The KDT JU model allows both public and private sector and the Commission to sit around the same table and orchestrate an alignment of priorities and actions to undertake. Given the different interests at stakes, this model may look complex and challenging. However, once an agreement is reached, the implementation of such agreed plans and actions can move very fast.

This is the only way we can compete with the fast-moving and pacesetting regions of the world.

GAUDIO Luciano (KDT JU)

KDT JU’s mission is to transform research and innovation results into actual societal benefits. Could you please give some examples of the industrial applications of KDT JU’s projects?

Ralf BORNEFELD (Chairman KDT JU GB)

KDT JU, like its predecessor ECSEL JU, operates in the context of the Electronic Components and Systems (ECS) sector. Semiconductors play a crucial role as every electronic system is empowered by them, with no exception. Let me mention some examples of KDT JU funded projects to explain the importance of the KDT JU programme. If we look behind the production process’s scene, we could easily say that leading-edge semiconductor technology would not exist without Europe.

The first example is the seven to three nanometer technology node development, the leading-edge technology nodes. This technology is mastered by companies like TSMC in Taiwan, but the core elements that enable it comes from Europe. Especially the extreme UV lithography, the mask technology associated to the product, the basic device technology, the single cells that are used in the circuits, they were developed in several ECSEL JU projects. The TAPES3 project enables the production of the 3nm technology nodes, which is the most advanced technology node we have today.

Second example is the radio frequency (RF) technology, used in the communication sector as well as in the automotive sector to develop ADAS (advanced driver-assistance system). The FD SOI technology whose ecosystem has also been developed in the context of ECSEL JU funded projects (OCEAN12 and BEYOND5) is the basis to enable these systems. Such technologies from pilot lines are now migrating to mass production thanks to a substantial ECSEL JU support.
Commission, Industry and Participating States need to set common priorities and allocate the available fundings on focus topics benefiting all Europe.

So, what I would like to emphasise is that through the EC-SEL/KDT JU programmes, very advanced projects have been supported and achieved great results that might not have been implemented otherwise.

GAUDIO Luciano (KDT JU)

Market needs and dynamics evolve quite rapidly in the ECS sector. Should we, as Europe, establish a new ECS business model to compete with other geographies?

Ralf BORNEFELD (Chairman KDT JU GB)

To support the European ECS sector we must keep two things in mind. First, Europe needs to support this sector through a proper funding just as much as other world regions do. In particular, the level of funding in countries like Korea, China, US and Japan is very significant. And this puts Europe in a position of competitive disadvantage.

Second, the ECS community in Europe needs to reflect on how we worked in the past: very long research and innovation phase followed by an even longer industrialization phase. Is this methodology still optimal? Perhaps these two long phases could be combined to speed up the entire process from idea to product. Of course, there are several issues related to the intellectual property (IP) rights that need to be resolved. However, being fast in market counts more than just preserving IP for a single entity.

Making now a specific mention to the KDT JU approach, I think we need to get public and private stakeholders fully involved and aligned. We need to agree on common goals and how to achieve them. Commission, Industry and Participating States need to set common priorities and allocate the available fundings on focus topics benefitting all Europe. A more top-down approach is the answer, in my opinion. Otherwise, we risk being not so impactful.

Taking the programme further

How can a communication and dissemination strategy help achieve the overall KDT JU targets?

Ralf BORNEFELD (Chairman KDT JU GB)

The above-mentioned successful projects show that if we combine the right competences from Participating States, Industry, and the European Commission, then achievements can be reached with an exponential factor. This is the type of message we need to convey across Europe.

Second, it’s a fact that the industry in Europe is dependent on small and medium enterprises. We need to further communicate the openness of our programme to encourage, stimulate and increase the level of SME participation in all our projects.

Last but not least, we should try to keep the attention of national and European policy makers at the highest possible level on the crucial importance of the ECS sector.

GAUDIO Luciano (KDT JU)

As Chair of the KDT JU Governing Board, would you like to convey a message to both public authorities and private members of this strategic partnership?
In Europe we have a lot of competencies and capabilities. We just need to use them in the right way for the right things. This is the first task of the KDT JU’s Governing Board: align all members of this tripartite partnership for an effective collaboration. My message is just about a process’s optimisation. Strategies and priorities need to be directed toward a faster industrialization of innovation. If we speed up this phase, we will be extremely effective and even more successful in future with the Chips JU, as further evolution of the KDT JU programme.

Raif BORNEFELD (Chairman KDT JU GB)