

*Speech given by Jean-Marc Chéry
President of AENEAS
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Thank you, and good afternoon ladies and gentlemen.

I am addressing you today as President of one of the three Industry Associations, AENEAS, on behalf of the European electronics components and systems community.

Dear Khalil (*Rouhana, previous speaker*): Yes, you can rely on us. You can count on us, above and beyond our course of duty.

I am sure we share a common belief in the **significant long-term benefits of a stronger European industry**, and my call for action is to **think, propose, and act together** to make a strategic difference. This is why I would like to share with you today our proposal to **leverage the immense opportunity represented by Europe's leadership position in key professional markets**.

I believe we can achieve this by:

- First adopting a **concerted approach**, like some countries have already established in strategic areas. I guess everyone understands perfectly which countries I am thinking about;

We must achieve it by:

- focusing on those **markets where Europe is already strong**;
- Identifying the **areas of improvement** in our strategic value chains
- **Strengthening these strategic value chains**, to improve Europe's competitiveness and our autonomy, leveraging:
 - o Our strong culture of public-private partnerships
 - o Our R&D ecosystems, which are among the best in the world,
 - o Our industrial and manufacturing base
 - o And because they are making a difference, a strong focus on attracting more talents and building the next generation of employees.

At the end the goal is to make our ECS community **even stronger**, more aligned with the collective societal needs we need to fulfill, and to build more competitive companies in the global landscape.

It is important today to act, and to act fast. We are facing both challenges and opportunities.

First, the trend **towards a less euro-centric world**, driven by the rise of non-European global population and economies. Forecasts estimate that only 1 European country will remain part of the 8 largest economies in 2050!

Second, the "nice" part of globalization is over, with **renewed trade conflicts** and with increased global uncertainty, resulting in more complexity for R&D and supply chains. This will not last a few months: it will maybe last ten years.

And third – and this is both a challenge and an opportunity - the **race for leadership across a broad range of technologies which will shape our collective future**. In other parts of the

world, very large, holistic programs are being deployed to support aspirations to technology leadership, autonomy or even dominance.

From this brief list, we can already identify some key challenges to manage and overcome in the next 10 years and beyond. This will in part be the responsibility of the new Commission, the governments of the Member States, with the support of the technology funding framework currently in the last steps of definition.

But it will also be our responsibility – **the ECS community has a key role to play.**

Let me now go through the key elements of our proposal.

First, we should adopt a **concerted approach**, among all of us, as partners. This concerted approach should consider the relevant programs and commitments to cover all needs and challenges identified – at European and Member State level. This means **more coherence for a truly global European strategy**. Others have done it in strategic areas, so it must be possible here as well. We could also think about the **evolution of a governance system to manage this concerted approach**. The success factor here is that we would have to work on a governance system that **works for all stakeholders**.

The second point is about **focusing on those markets where Europe is already strong**.

The European Electronic value chain in embedded and professional electronic systems is strong, with a production share of 23% versus the rest of the world. It is at the same level as our European GDP share of 21%.

Europe is a leader in several key domains where the ECS community is a core enabler. These include automotive & smart mobility, industrial and healthcare. All of these domains rely on the semiconductor value chain, the embedded software and the complex systems that we build.

Let me remind you of our leadership positions in a few strategic value chains and highlight some of the key challenges and opportunities they meet nowadays.

First, **Automotive and smart mobility**.

Europe produces 27% of the global automotive electronics, ahead of China (21%) and North America (17%). The European automotive industry is the largest private investor in R&D in Europe and provides jobs for 12 million people in Europe. This industry is going through a difficult transition as it shifts many of cars' mechanical and/or analog systems to digital, connected, electric systems. The near future is assisted driving and more environmental-friendly cars. The same trends are driving the growth of smart mobility platforms and services.

Second, **Industrial markets and applications**.

The European manufacturing sector accounts for 15% of the European GDP and around 33 million jobs. Europe is a frontrunner in manufacturing excellence, with the vision of smart and connected factories quickly becoming a reality. Here as well, a deep transformation is ongoing, with more automation, better integration and collaboration between workers and machines, and a progression towards the lowest possible energy consumption and environmental impact. One estimate from McKinsey gives an idea of the scale of the challenge: the on-going digitization of industrial applications will add up to 1 trillion euros to the GDP of Europe.

Third, **healthcare and wellbeing**. Healthcare and long-term care expenditure will reach 16% of GDP by 2020 in OECD countries. The health sector accounts for 10% of all employment in Europe and is expected to grow by additional 1.8 million jobs by 2025. In 2017, we had three major European actors among the worldwide top 10 in the med tech field. The pervasion of personal

health and wellbeing applications, and the ageing population have a significant impact on public budgets.

Public and private institutions and stakeholders will need to deploy new digital solutions throughout the healthcare ecosystem.

And that's not all. Transformation, driven by societal and technology trends, is also ongoing, on other domains where Europe holds leadership positions: power grids, rail transportation, space, smart farming... all are changing at their core.

The best way to manage the deep transformation of all these strategic industries is to **clearly identify the value chain for each**, and focus specifically on **the key missing elements**.

On this we have already made progress over the past couple of years. The launch of new IPCEI programs, such as the one on batteries supporting the automotive sector, right after the first IPCEI on microelectronics, is a good example. We can imagine more related to the topics I mentioned.

This work must continue for each value chain that Europe considers as strategic. Strategic value chains are networks of interdependent and interlinked economic actors, creating together added value around a product, a process or a service, and will play an increasingly crucial role in fostering the transformation of the European industry. The recent publication of the Strategic forum's report **is strongly appreciated by our ECS community**: its recommendations towards a common vision for the EU's industrial future are of great relevance. Now, we have to implement them as much as possible.

So, **how can we strengthen these strategic value chains?** As I have mentioned in my introduction, by leveraging, in a concerted way, a number of actions.

First, **all these strategic value chains will be stronger if we have a strong ECS community.** In the next decade, our collective ability to develop and implement ECS technologies will be at the heart of the choices we make as a society – if we are in a position to choose. This strategic ability will influence economic and societal choices in the long-term. It will be the core of the strategic independence -or sovereignty- of Europe.

The question is: how do we define technology autonomy or sovereignty, and what does it require?

Electronics sovereignty first means excellence and leadership in all the global markets that we serve. You cannot be a sovereign company, country or industry player with poor products and services. So excellence and leadership are key for all the market you intend to serve. We can extend or reach this excellence and leadership by collaborating through strategic value chains, particularly in the ECS domain, through open and collaborative R&D.

Independence is not a purpose in itself but is a mix between dreams and reality. Europe's reliance on foreign components and technology is increasing: in 2017, the EU's overall trade deficit for high tech products stood at 23 billion euros. Clearly, full strategic independence in all domains of the ECS is neither realistic nor achievable. However, maintaining strongholds in key domains is essential. So which level of independence do we want?

Here we need to start from the foundations. This means a strong technological base with long-term goals supporting our ambitions. We need to look further out to identify which embryonic, emerging and disruptive technologies at the lowest TRL today will determine the future of the ECS domain tomorrow.

Our annual work on our Strategic Research Agenda - or SRA - established by the three associations AENEAS, ARTEMISIA and EPOSS is key to give directions to our community and to determine Europe's strategy and position beyond 2030.

In addition to the priorities identified in the SRA, new **transversal R&D approaches** are required across our Strategic Value Chains. The goal is to ensure our future competitiveness in AI – core and edge -- and data science, cybersecurity, and edge computing notably. The European level of resilience in data-critical infrastructure will be one of the measures of our level of autonomy. Distributed intelligence will be the mainstay of the data-driven economy and Europe needs to master the essential hardware, software and systems integration to guarantee privacy, security and integrity of the data, and drive innovation in existing and future market segments. We will move definitely to a new paradigm of data processing, with the connected digital platforms that are progressively being deployed. The measure of our success will be how much we are able to protect data integrity and mitigate cyber threats.

The same transversal approach should also be applied to other topics which are relevant to our society and leadership on the global markets, like energy efficiency with wide band gap materials and power components, connectivity with 5G and Ultra-Wide Band, embedded and complex systems with heterogeneous integration of power, digital, galvanic isolation... and many others. **This is also valid for dual-use technologies.**

All of this is of high importance for the EU, because these technologies will determine future success in embedded applications. But to reap the benefit of these opportunities, they first need to be identified and addressed efficiently within our **cooperation framework of public-private partnerships, with the alignment of academic, institutional and industrial stakeholders.**

This is an area where Europe already excels, at a regional, national and European level.

Specifically, the public-private partnership. It has proven a unique capability to speed up innovation through the close collaboration of all stakeholders across the entire value chain: start-ups, SMEs, large companies, Research labs and RTOs. The programs can cover everything, from new applications to silicon, and should push for pre-standardization activities of platforms, in particular through Lighthouse initiatives.

ECSEL should reach 6 billion euros of expenses at its end in 2020 – it is a huge effort – and has already demonstrated its impact: the pilot lines are a real success. This is proof of its success, with the large projects called “pilot lines” enabling high leverage. The challenge here is to renew this type of public-private partnerships for the next decade, and incrementally enhance it.

To achieve our ambitions in the changing macroeconomic, political and technology context I described earlier, the next phase of the program should reach a minimum of 10 billion euros of expenses. I know discussions on this are progressing well, and I am convinced we will succeed in getting a relevant partnership for our ECS community in the coming months.

The **EUREKA** clusters like PENTA, ITEA and EURIPIDES are another important instrument of public-private partnership, to better support smaller actors. With the current chair, we should define an improved mechanism to support small to medium size projects where the industry and the governments share common strategic priorities. This is something we must push in the future.

A second area of clear European strength is **our R&D ecosystems.**

Based on the three pillars: “R&D – Education – production”, they are recognized globally and regroup all the required stakeholders to make innovation possible: R&D with research labs, RTO, start-ups, SMEs and Large Enterprises. R&D ecosystems maintain and develop strong ECS leadership through differentiated technologies enabling to offer differentiated state of the art products.

These ecosystems must be kept and strengthened through the support of all the stakeholders: large enterprises, RTOs and public bodies. This is obvious, but it needs to be said and maintained.

In these ecosystems, one of the pain points has always been the unrealized potential of **Small and Medium Sized Enterprises** and how we support them to scale up. We need to encourage transnational collaborations involving SMEs, to support their development beyond their borders of origin and help them scale faster. A funding instrument like EUREKA seems fully relevant to assume this mission. We all agree that the renewal of Eureka is necessary. It is agile and focused and favors speed towards the implementation of innovation. It involves fewer countries while being open to SMEs, who can take the leadership of projects. **The EUREKA funding instrument is vital for our R&D ecosystems and fully complementary with the new Joint Undertaking.**

Within our R&D ecosystems in Europe, we have very competitive **research and technology organizations** including three focused on microelectronics – all well recognized internationally: CEA-LETI in France, Fraunhofer in Germany, and IMEC in Belgium. We welcome the proposal to build a strong technological alliance with these 3 organizations, combining their strong expertise, infrastructure and talents. The industry is willing to support such alliance to maximize its benefits for Europe, for instance by creating an industrial advisory board involving all relevant stakeholders. In this way, their combined efforts on key projects could also provide the scale required to address those many different challenges I mentioned. We would be at scale to compete with the efforts of large countries, especially if these efforts are closely linked to the European strengths in embedded and professional applications.

Last key area for R&D focus: **manufacturing science**, which is key for the future of the European industry. Here as well we need to address a large number of technology challenges, looking at the sustainability of manufacturing in Europe. The list is long... advanced manufacturing processes and technologies, design capabilities and methodologies, advanced manufacturing systems including robotics, information and communication technologies, manufacturing strategies, knowledge-workers and modelling, simulation and forecasting methods and tools. All driven by efficiency and sustainability.

A strong technological base cannot exist without a **strong industrial base**. This has to be a key area of improvement. We are all aware that Europe's share of global electronic devices and systems production level is below the European share of worldwide GDP.

Independent access to semiconductor technology for the manufacturing of function-critical Electronic Components and Systems (ECS), and their development and manufacturing in Europe are indispensable to meet the challenges we face – for society, for increased sovereignty, and for competitiveness in global markets.

ECS manufacturing in Europe requires access to advanced materials and equipment, and competitive manufacturing techniques. The latter is a self-sustaining sector of European importance and forms the basis of the ECS manufacturing value chain.

Consequently, the **European position must be reinforced** through leadership in all relevant technologies including semiconductor equipment, materials, manufacturing, integration, test and packaging solutions, system-in-packages, modules etc.

The first IPCEI on microelectronics enabled us to make a first step towards the goal to increase the EU footprint – **and we must continue in this direction.**

The extensive framework I have been talking about today would have, as a result, a reinforcement at least, or possibly an expansion, of the overall electronic devices manufacturing footprint in Europe, involving all the stakeholders of the ECS value chain. There have been several announcements related to 300mm wafer manufacturing in Europe recently, and we should all be proud about it.

This “Valley of Death” between R&D and mass production has been identified in many competitor countries, including the USA, China and Taiwan. All have established coordinated programs in strategically important areas that cover the full innovation chain addressing basic and applied research, demonstrators, standardization measures, deployment and market access... All at the same time and in a logical joint framework.

It would be wise to follow the same general principle, bearing in mind the constraints of worldwide trade agreements. **Understanding that all ecosystems we are in competition with are not only targeting leadership in technology and products, they are targeting dominance in verticals.**

Finally, my last point, very important for our future success. We need new skills and talents. We’re all facing difficulties to hire the right talents to accelerate our innovation, our R&D and our business. The challenge here is to both **attract** and **prepare** the next generation of employees, mainly for Key Enabling Technologies which are mostly classified as B2B. It’s always more difficult to attract talent when you are not doing B2C.

The goal of the European ECS value chain will be to maintain and build up skills across a much larger set of disciplines – from research, to industrial exploitation and business development, including the six transversal key enabling technologies: micro- and nano-electronics, nanotechnology, industrial biotechnology, advanced materials, photonics, and advanced manufacturing technologies.

In order to reach this goal, we have to make the ECS community **more attractive as a potential employer of choice for young Europeans** – and therefore make them choose and prefer Science, Technology, Engineering and Mathematics. Attracting more young people is a priority to minimize potential skills shortages, increase recruitment diversity, prepare for tomorrow’s innovations and support the future of technology development and applications in Europe. **Our commitment to sustainability is a key parameter to attract younger generations, as a complement to the attractiveness of our industry.**

Today, as we all know, the numbers are not good. There are large gaps between the number of specialists needed compared to the existing workforce. We need significant action to alter the trajectory.

We, the ECS community, have a role to play in inspiring, attracting and retaining the next generation – well-balanced between our core activities and our commitment to sustainability. All the stakeholders must be involved in this critical collective action.

Takeaways

Our call for action is to **think, propose, and act together** to make a strategic difference.

Digital and power technologies are transforming the world at an unprecedented speed. Digitalization and electrification of applications are the key transformations we have to manage. It is unprecedented... If we take again the example of the automotive industry, it is something much larger than anything the industry ever had to manage.

We cannot remain on a holding pattern. **Our action – or lack thereof – on all pending topics will be decisive for the next decade of the European ECS community.**

We have no choice, this is our long-term responsibility – we must look out to the next 10-15 years.

Europe is a fantastic base to compete from on the global markets. Why? Because we still have leadership in some of the key verticals. We have to **leverage the immense opportunity represented by Europe's leadership position in key professional markets**, by:

- Adopting an **aligned, concerted approach**, like other countries have already established in strategic areas;
- Focusing on those **markets where Europe is already very strong**;
- Identifying the **opportunities of improvement** in our strategic value chains, and the gaps versus the state-of-the-art competitors;
- **Strengthening these strategic value chains** leveraging our areas of excellence:
 - o Our strong culture of open cooperation between the private and public stakeholders
 - o The best R&D ecosystems in the world
 - o Our industrial and manufacturing base
 - o A strong focus on attracting more talents and building the next generation of employees, balancing the attractiveness of our industry and our commitment to sustainability.

We recognize that the ECS community will be supported and successful only if it can clearly demonstrate its ability to create value for Europe. We are an enabler, at the service of the Strategic Value Chains, and we are committed to make Europe stronger, working towards a common goal with all stakeholders with courage, determination and always with a long-term view. **You can rely on us.**

Thank you very much.

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