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Europe seeks to step up microchip collaboration

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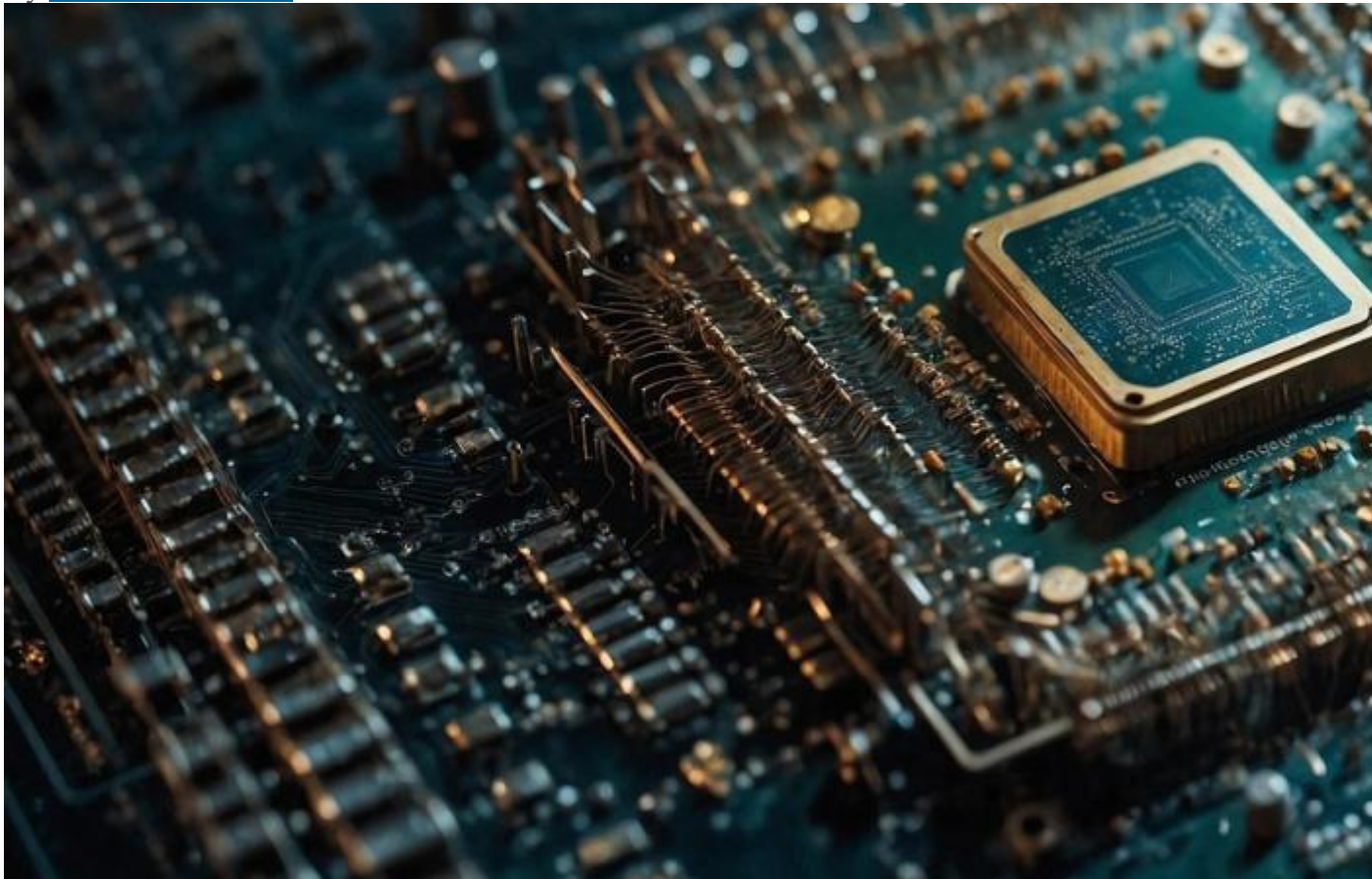
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The EU is forging more international partnerships around microchip research, design, production and packaging

By [Brandon Mitchener](#)



The European Union's official motto is "United in Diversity." In the case of the global chips market, it might just as well be "United in Adversity." Against a backdrop of geopolitical

tensions and potential trade disruptions, Europe is pursuing greater international cooperation on chip research, design, production and packaging.

“We’ve been able to build a defence alliance with NATO,” says Jean-Luc di Paola-Galloni, global external affairs and chief sustainability officer at Valeo, a French automotive supplier, and chair of the private members board of Europe’s Chips Joint Undertaking. “Now we need to build intelligent and diversified alliances with other partners” around the world, he said.

Following the massive trade disruptions that the COVID-19 pandemic caused, the EU Chips Act created a mandate to develop international partnerships with “like-minded” countries and territories in a range of areas from research and development to capacity building. Potential partners include Japan, South Korea, Singapore, India, Taiwan and the United States. The Group of Seven (G7) industrialised countries are also discussing how to protect semiconductor value chains from external shocks including those related to climate change.

The Chips JU seeks to position Europe as a leader in semiconductor technology globally, build digital capacity and reduce the sector’s carbon footprint. To further those goals, it has been researching the industrial ecosystems of potential partners, looking at strengths and weaknesses at both a national level and the level of individual institutions, such as universities and research institutes. As well as mapping the status quo, it attempts to anticipate future needs, both for the EU and for its foreign partners.

“For some areas for which we have a potentially very important market in the future we may have some weaknesses and want to collaborate,” says Francis Balestra, director of research at France’s CNRS and head of the Horizon Europe-funded International Cooperation on Semiconductors (ICOS), a consortium of EU industry and academic interests in the sector. He cites collaboration with the United States on AI and with Taiwan on advanced packaging as potential areas to explore. While underlining Europe’s strengths in energy management, advanced functionalities and photonics, Balestra notes all countries are scrambling to attract and train people with the scientific and technical expertise the industry needs.

Forging research partnerships with Asia

The Chips JU has already launched a strategic collaboration with South Korea to advance semiconductor research, development and innovation. The collaboration encompasses four specific projects, including the development of brain-like circuits to create energy-efficient AI systems and of photonic brain-like chips that efficiently process AI tasks and can adapt to new functions. ICOS is also exploring a potential joint research call with Japan next year.

Balestra says the next steps for the Chips JU are organising workshops and matchmaking events and exploring joint projects—from joint master’s degrees and PhDs right up to joint investments—with other partner countries, including Japan, Singapore, India, Canada and Malaysia.

The global chips market has always had interdependencies. Taiwan Semiconductor Manufacturing Company (TSMC) makes more than 60% of the world’s chips and more than 90% of the most advanced chips. China is a leading producer of mature technology chips for general logic, memory and power management functions. At the same time, ASML, a Dutch company, supplies the highly specialised lithography equipment on which about 90% of the

world's chips are manufactured, and Imec, based in Belgium, is the world's largest independent research centre for nanoelectronics.

Rebuilding knowledge and production

But Adela Granholm, programme manager digital transformation at Vinnova, the Swedish Innovation Agency, says Europe is now paying the price for having outsourced too much industrial production to other countries, particularly China. She cited the example of chips “packaging”, the special cases in which highly sensitive chips are protected from moisture, heat and dust. “Most of that industry moved from Europe to Asia,” she notes. “Now we need to do more to do our best to build up both knowledge and production facilities.” Europe still has a good research capability in the space, she adds.

Twenty years ago the situation was very different. Then, Granholm worked for a Swedish company that was bought by Powerwave and which made telecom equipment for mobile operators and system integrators, for example power amplifiers for Nokia's telecommunications base stations. “We did everything” from system design to production, she recalls, saying it was great “having the supplier close to us for serious production,” even if the company also bought components from Japan and the United States. “Back in the day, everybody was friends with everybody. We knew the rules of the game,” she says.

Now, “the rules are changing every week” and international cooperation has become a necessity for European companies, Granholm notes, citing recent announcements about an Ericsson R&D commitment in Japan, international sales by Mycronic, a Swedish supplier of advanced photomasks (photographic patterns used in the manufacture of semiconductors), and large investments in new electronics manufacturing plants by TLT in Vilnius, Lithuania.

Granholm is ultimately optimistic about the potential of international cooperation to help both Europe and its trading partners become more resilient against external shocks. Europe has a strong research base and strong industrial demand, including from the automotive sector, that help drive innovation in chip design. “For the sake of our future it's important to still talk, cooperate and find opportunities to work together,” she says. “I don't think closing all the borders is the solution.”