



## **From wafers to power electronic applications: new consortium to create European supply chain for silicon carbide semiconductors**

November 9, 2021

PI 11407 BBM Fi/Bär

- ▶ Silicon carbide semiconductor technology will help bring about a more energy-efficient and sustainable economy.
- ▶ Consortium brings together key European players along the silicon carbide value chain.
- ▶ Bosch is consortium leader of the publicly funded Transform project, with 34 partners from seven countries across Europe.
- ▶ Funding provided by the European Union and national bodies.

Reutlingen, Germany – Many of today's key projects focus on the same objective: to improve energy efficiency and thereby protect the environment. These projects are typically in areas such as electromobility, renewable energy, and edge and cloud computing – including the requisite data centers. Experts agree that silicon carbide (SiC) semiconductors and the electronic components containing them will ensure the most efficient use of the electricity at our disposal. The object of the publicly funded "Transform" project (trusted European SiC value chain for a greener economy) is to establish a resilient European supply chain for this technology, ranging from wafers and other basic materials right up to finished SiC power semiconductor devices and power electronic applications. In a consortium led by Bosch, a total of 34 companies, universities, and research institutes from seven European countries have joined forces to work toward this goal. "The aim of the Transform project is to secure a leading role for Europe in new technologies based on silicon carbide," says Jens Fabrowsky, who holds the position of executive vice-president in the Bosch Automotive Electronics division. Scheduled to run until 2024, the publicly funded project is focusing on five use cases in the automotive, industry, renewable energy, and agriculture sectors.

### **From SiC wafers to hyperefficient power electronic applications**

Power electronic applications are at the heart of numerous electronic systems. They control the switching processes in these systems and keep any power losses to a minimum. The power semiconductor devices in these applications ensure that they operate as efficiently as possible. Conventionally, the chips in these devices are made of ultra-pure silicon. In the future, however, this will increasingly be replaced by silicon carbide, which offers numerous advantages over pure silicon. For example, silicon carbide semiconductors display better electrical conductivity and enables higher switching frequencies while also ensuring that much less energy is dissipated in the form of heat. In addition, power electronic applications with SiC chips can be operated at much higher temperatures, with the result that a simpler cooling system is required, which also saves energy. And finally, silicon carbide has a higher electric field strength, meaning that components made of this material can be smaller in design while nonetheless delivering a higher power conversion efficiency. Compared with conventional silicon chips, experts believe this will result in an energy saving of as much as 30 percent, depending on where the components are used.

### **The objectives of Transform**

The objective of the Transform project is to establish a resilient European supply chain for the production of power electronic applications based on innovative SiC power semiconductor devices. The demand for such technology is set to grow rapidly, especially with respect to energy-intensive applications such as electrical vehicle powertrains, EV charge spots, and power supply infrastructure. A forecast by the market research and consulting company Yole indicates that, between now and 2025, the SiC market as a whole will grow on average by 30 percent a year to over 2.5 billion dollars. The Transform project will therefore also cover the development of new SiC technology along with the requisite production processes and methods. In addition, it will endeavor to secure the availability of machinery and equipment for the production of this technology by European suppliers, ranging from wafers to finished power electronic applications.

This project has a budget of more than 89 million euros and is funded by the European Union as well as national bodies. It brings together key players along the SiC value chain in Austria, the Czech Republic, France, Germany, Italy, Spain, and Sweden. Partner companies include – among others – Aixtron, Danfoss, EV Group, Premo, Saint-Gobain, Semikron, Soitec, STMicroelectronics, and Valeo-Siemens Automotive. The various scientific organizations participating include Brno University of Technology, CEA Leti, Fraunhofer IISB, and University of Sevilla.

**Further information:**

This project receives funding from the ECSEL Joint Undertaking (JU) under grant agreement No 101007237. The JU receives support from the European Union's Horizon 2020 research and innovation program as well as Germany, France, Italy, Sweden, Austria, Czech Republic, and Spain.

Website of the Transform project: <https://sic-transform.eu/>

Inquiries to project office: [office@SiC-transform-project.eu](mailto:office@SiC-transform-project.eu)

**Press photograph:** de5f902d

**Press inquiries:**

Annett Fischer,

Phone: +49 711 811-6286

Twitter: @Annett\_\_Fischer

*Mobility Solutions is the largest Bosch Group business sector. In 2020, its sales came to 42.1 billion euros, or 59 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector pursues a vision of mobility that is safe, sustainable, and exciting, and combines the group's expertise in the domains of personalization, automation, electrification, and connectivity. For its customers, the outcome is integrated mobility solutions. The business sector's main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and automated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.*

*The Bosch Group is a leading global supplier of technology and services. It employs roughly 395,000 associates worldwide (as of December 31, 2020). The company generated sales of 71.5 billion euros in 2020. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. With its more than 400 locations worldwide, the Bosch Group has been carbon neutral since the first quarter of 2020. The basis for the company's future growth is its innovative strength. At 129 locations across the globe, Bosch employs some 73,000 associates in research and development, of which nearly 34,000 are software engineers.*

Additional information is available online at [www.bosch.com](http://www.bosch.com), [www.iot.bosch.com](http://www.iot.bosch.com), [www.bosch-press.com](http://www.bosch-press.com), [www.twitter.com/BoschPresse](http://www.twitter.com/BoschPresse).