

Advanced modelling and characterization for power semiconductor materials and technologies



The AddMorePower project aims to increase EU shares in GaN and SiC production, enabling a more resilient European power electronics industry.

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Semiconductors are the key to increasingly efficient automotive and industrial electronics. As silicon electronics gradually reach their physical limits with the ever-increasing power density, it is necessary to tap into new materials for power electronics. This in turn requires new characterization and modelling methods that allow the transition to new semiconductor materials, such as silicon carbide (SiC) and gallium nitride (GaN), as well as novel 3D stack integration concepts with metal layers.

The goal of the recently launched EU project “AddMorePower” is therefore to further develop characterization methods of nano-analytics as well as correlated modelling techniques for power semiconductor technology. Among other things, this is intended to characterize crucial defects in the crystal lattice of SiC and GaN in detail and to understand their influence on the system properties.

AddMorePower is a four-year **European Union (EU)** funded 5.9-million-euro project that started in January 2023. Its main goal is to advance X-ray and electron-probe related characterization techniques of power semiconductor technology as well as correlated modelling techniques to overcome the crucial crystal defects characterization constrain that is currently limiting the semiconductors manufactures and the whole power electronics industry.

Throughout the duration of the project open access publications and FAIR open data for materials science will be provided as well as documented characterization and modelling workflows for industrial and academic use. On a bigger picture, AddMorePower will create a pathway to impact and achieve a resilient and sustainable value chain for EU industrial ecosystems.

The AddMorePower consortium includes high **innovative research centers** (Fraunhofer, European Synchrotron Radiation Facility, Centre national de la recherche scientifique, Akademie Ved Ceske republiky), **large industry partner** for material- and component producer (Infineon), industrial competence center (KAI), two large **research-based universities** (KU Leuven and Université de Lorraine) and two highly skilled multicultural **SMEs** (deepXscan and Technikon).

The consortium is coordinated by **Fraunhofer**, a world’s leading organization for applied research based in Germany. In AddMorePower, Fraunhofer will strongly contribute to the lab-based X-ray work and guide the dissemination activities. As a leading institute in nano-analysis, focusing especially on lab-based TXM/nano XCT, Fraunhofer will bring its experience in advanced and innovative in-situ and correlative testing in all microscopy techniques.

For more information about the AddMorePower project, contact the project coordinator directly:

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