



AddMorePower

Advanced modelling and characterization

for power semiconductor materials
and technologies



Funded by
the European Union

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About

AddMorePower aims to advance X-ray and electron-probe related characterization techniques as well as modelling approaches for new wide bandgap power semiconductor materials and 3D integrated power technologies. The wide impact of AddMorePower will broaden and accelerate market penetration, promote material integration and development for European power semiconductor technologies and provide new opportunities for other mono- and polycrystalline based industries.

A major challenge that AddMorePower will overcome is to better support the rapid and massive spread of the power electronics and power semiconductors industry. This will be achieved by:

- **Filling-in the gap** of missing characterization workflows on crystal defects, which currently causes the main limitation of new semiconductor materials and its transition
- **Mastering 3D-stacking integration** by understanding and using advanced characterization and predictive modelling
- **Accumulating FAIR data** (findable, accessible, interoperable and reusable) at all stages of production and development

Having the biggest European power semiconductor company being part of the consortium, the use-cases Power GaN and Power Cu as demonstrators for novel X-ray and electron-probe based characterization will provide the clearest pathway to **impact**, targeting a **resilient** and **sustainable** value chain for EU industrial ecosystems in support of the twin green and digital transformations.



Vision

At AddMorePower we see the opportunity to advance power semiconductor technology and increase the share of wide bandgap power devices that are supplied by European manufacturers as a main vision of the project. We are aware that in order to better develop processes on significantly larger market scale, semiconductor manufacturers urgently need to find better ways of efficiently analyzing

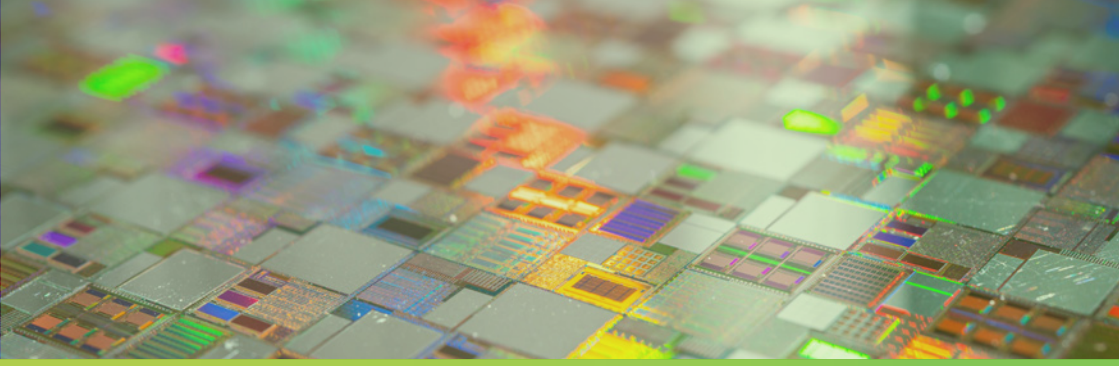
and classifying lattice defects as well as the degradation dynamics of Cu power metallization. This is where AddMorePower will step in to help fill-in the gap, boost the development and integration of the technology and accumulate FAIR data and know-how for the further use and application in various industries.



Motivation

Power semiconductor devices are key enablers for the whole power electronics industry, e.g., for electric mobility and renewable energy solutions. This industry is expected to massively grow to \$26 billion by 2026. Major reason for the shift is the requirements of the European Green Deal. Europe's future depends on a

healthy planet. Meaning, EU countries are committed to achieving the ultimate goal of climate neutrality by 2050. Aligned with the new EU strategy, AddMorePower aims to add to the transformation of the EU into a fair and prosperous society with a modern and competitive economy.



Mission & Objectives

AddMorePower's mission is to overcome the limitations currently present in the power GaN, SiC, and related Cu metallization technologies, increase EU shares in power semiconductor production and enabling a more resilient European power electronics industry that will provide a solution to the emerging area of wide bandgap power semiconductors.

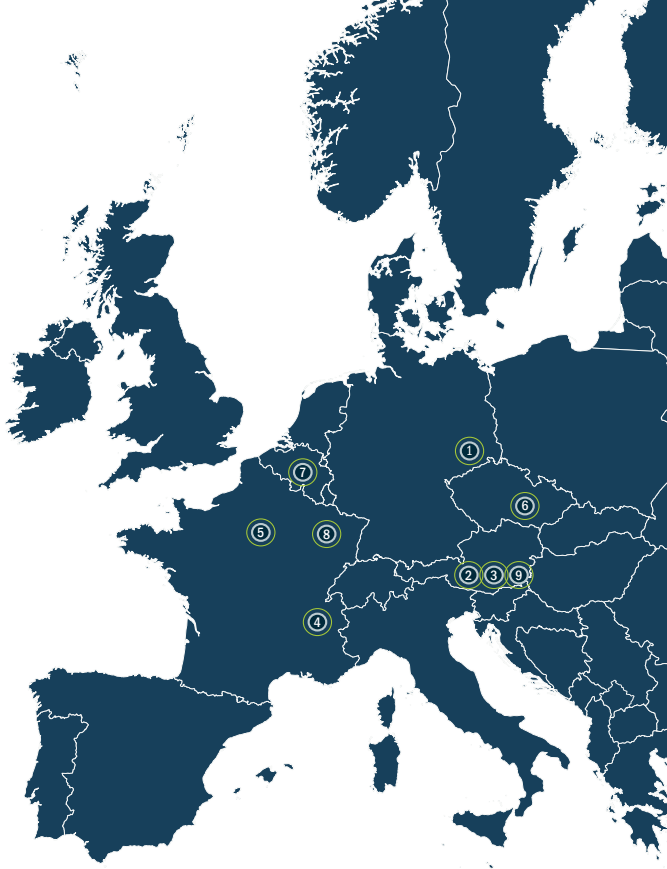
In particular, AddMorePower will focus on the following objectives:

Objectives

- Novel X-ray and electron-probe based characterisation workflows and protocols for power semiconductor materials
- Modelling concepts for better characterization and lifetime prediction of power semiconductor interconnect materials
- Establish FAIR and open data practices to enable efficient data workflows between characterization and modelling techniques

Partners

The AddMorePower consortium consists of nine highly qualified partners from five countries (Germany, Austria, France, Czech Republic and Belgium). Among them are four highly innovative research centers, a large internationally recognized industry partner for material- and component production, industrial competence center, two large research-based universities and two highly skilled multicultural SMEs.



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Fraunhofer Institute for Ceramic Technologies and Systems IKTS
GERMANY [Dresden]

2



KAI Kompetenzzentrum Automobil- und Industrieelektronik GmbH
AUSTRIA [Villach]

3



Infineon Technologies Austria AG
AUSTRIA [Villach]

4



European Synchrotron Radiation Facility
FRANCE [Grenoble]

5



Centre National de la Recherche Scientifique
FRANCE [Paris]

6



Institute of Physics of Materials (IPM), Czech Academy of Science
CZECH REPUBLIC [Brno]

7

KU LEUVEN

Katholieke Universiteit Leuven
BELGIUM [Leuven]

8



Université de Lorraine
FRANCE [Nancy]

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TECHNIKON

Technikon Forschungs- und Planungsgesellschaft mbH
AUSTRIA [Villach]

Facts



Budget

€ 5.9 Million
100% EU-funded



Consortium

10 Partners
5 countries



Duration

48 Months
01/2023 - 12/2026

Contact

Project Coordinator

Dr. André Clausner

Fraunhofer Institute for Ceramic
Technologies and Systems IKTS
GERMANY

Maria-Reiche-Straße 2
01109 Dresden
Germany

andre.clausner@ikts.fraunhofer.de

Coordination Support

Teja Koren

Technikon Forschungs- und
Planungsgesellschaft mbH

Burgplatz 3a
9500 Villach
Austria

support@addmorepower.eu



Find out more about this Project:
<https://addmorepower.eu/>