



Project Title: GaN for Advanced Power Applications "GaN4AP"

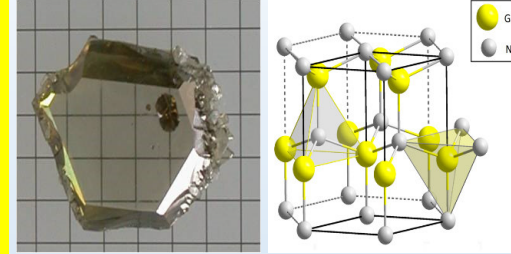
Main Goal: GaN4AP project has the ambitious goal of making the GaN-based electronics become the main power active device present in all power converter systems, with the possibility of developing close-to-zero energy loss power electronic systems.

The project is structured in four major «clusters» of partners working towards the following **integrated objectives:**

- Cluster 1 – is dedicated to the development of innovative power conversion/management
- Cluster 2 – is focused on the development of advanced lateral transistors leading the development of better performing systems for power conversion/management
- Cluster 3 – will develop Vertical GaN devices on free-standing GaN substrates for very high-power applications
- Cluster 4 – is dedicated to the development of a fully integrated GaN technology (System in Package or monolithic GaN integrated)

GaN Technology: Gallium nitride (GaN) is a very hard, mechanically stable wide bandgap semiconductor material for which the market is expected to grow exponentially over the next couple of years. The material properties, in fact, enable it significantly outperform silicon-based devices in terms of:

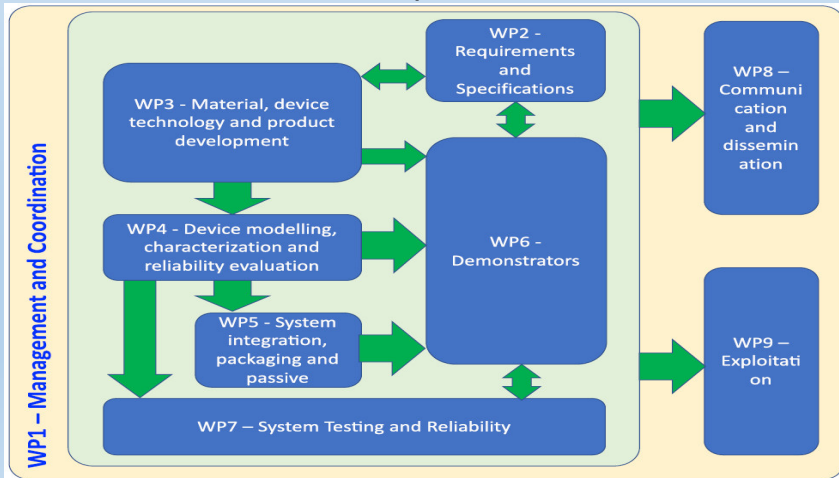
- lower switching losses;
- faster switching speed
- higher breakdown strength
- higher power density;
- higher operating frequency
- enabling system miniaturization;
- higher thermal conductivity
- lower on-resistance



Project partners

1. DISTRETTO TECNOLOGICO SICILIA MICROE NANO SISTEMI SCARL (COORDINATOR, ITALY)
2. CONSORZIO NAZIONALE INTERUNIVERSITARIO PER LA NANOELETRONICA (IT)
3. ADVANTEST EUROPE GMBH (DE)
4. AIXTRON SE (DE)
5. APSI3D (FR)
6. AUTOMATISIERUNGSTECHNIK VOIGT GMBH (DE)
7. COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (FR)
8. CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS (FR)
9. DOCKWEILER CHEMICALS GMBH (DE)
10. EDA INDUSTRIES SPA (IT)
11. ELDOR CORPORATION SPA (IT)
12. ENEL X SRL (IT)
13. FRIEDRICH-ALEXANDER-UNIVERSITAET ERLANGEN-NUERNBERG (DE)
14. FORSCHUNGSVERBUND BERLIN EV (DE)
15. FREIBERGER COMPOUND MATERIALS GMBH (DE)
16. FERRARI-SOCIETA' PER AZIONI ESERCIZIO FABBRICHE AUTOMOBILI E CORSE (IT)
17. HOCHSCHULE FUR ANGEWANDTE WISSENSCHAFTEN WURZBURGSCHWEINFURT (DE)
18. FINEPOWER GMBH(DE)
19. FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. (DE)
20. INSTYTUT WYSOKICH CISNIEN POLSKIEJ AKADEMII NAUK (PL)
21. INSTITUT MIKROELEKTRONICKYCH APLIKACI S.R.O. (CZ)
22. GOTTFRIED WILHELM LEIBNIZ UNIVERSITAET HANNOVER (DE)
23. MECAPROM TECHNOLOGIES CORPORATION ITALIA SRL (IT)
24. NXP SEMICONDUCTORS NETHERLANDS BV (NL)
25. NEXTNANO GMBH (DE)
26. SCHNEIDER ELECTRIC AUTOMATION GMBH (DE)
27. SCHNEIDER ELECTRIC INDUSTRIES SAS (FR)
28. EMPA SYSTEMS GMBH (DE)
29. SAINT-GOBAIN LUMILOG (FR)
30. STMICROELECTRONICS DESIGN AND APPLICATION SRO (CZ)
31. STMICROELECTRONICS SRL (IT)
32. STMICROELECTRONICS ROUSSET SAS (FR)
33. STMICROELECTRONICS (TOURS) SAS (FR)
34. SYNERGIE CAD INSTRUMENTS SRL (IT)
35. TECHNISCHE UNIVERSITEIT EINDHOVEN (NL)
36. CESKE VYSOKE UCENI TECHNICKE V PRAZE (CZ)
37. UNIVERSITE DE TOURS (FR)
38. VALEO SYSTEMES DE CONTROLE MOTEUR SAS (FR)
39. VALEO SIEMENS EAUTOMOTIVE GERMANY GMBH (DE)
40. VALEO SIEMENS EAUTOMOTIVE FRANCE SAS (FR)
41. WURTH ELEKTRONIK EISOS GMBH & CO KG (DE)

Work plan



UNICAL takes part in the project through the Consorzio Nazionale Interuniversitario per la Nanoelettronica «IU.NET», of which are members 12 Italian universities carrying out first class research in Electronics

Programme: H2020-EU.2.1.1.7. - ECSEL

Topic: ECSEL-2020-1-IA - ECSEL-IA

Call for proposal: H2020-ECSEL-2020-1-IA-two-stage

Funding Scheme: ECSEL-IA - ECSEL Innovation Action

Proposal number: 101007310-2 **Grant agreement ID:** 101007310

Total Project Budget: € 64.021.545,82 **EU contribution:** € 15 320 914,36

Budget Unical: € 300.000

Start date: 1 June 2021 **End date:** 31 May 2024

Unical Contact Person: Prof. Felice Crupi (DIMES) felice.crupi@unical.it

This project has received funding from the European Union's Horizon 2020 research and innovation programme (via ECSEL) under Grant Agreement ID: 101007310

