

## Challenges



**Power Electronics** is a set of techniques associated with the efficient conversion, control and conditioning of electric energy from the source to the load.

**GaN technology** delivers features that offer the perfect match to serve the challenges of future power systems with its **high efficiency and fast switching**, thanks to excellent physical characteristics in terms of breakdown electric field, as well as saturation electron velocity and mobility.

## GaN4AP project details

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

**Funding scheme:** ECSEL Innovation Action

**Grant Agreement ID:** 101007310

**Duration:** 36 months, June 1, 2021 to May 31, 2024

**Total Cost:** € 64 021 545,82

**EU Contribution:** € 15 320 914,36

**Project Coordinator:** L. Liggio (DTSMNS)

**Scientific Coordinator:** G. Meneghesso (IUNET)

## The Consortium

36 Partners + 9 linked third parties

6 European Countries



**GaN for Advanced Power Applications**

...a collaborative project onto the 2020 ECSEL IA Call

[www.gan4ap-project.org](http://www.gan4ap-project.org)



This project has received funding from the Electronic Component Systems for European Leadership Joint Undertaking (ECSEL JU), under grant agreement No.101007310. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme, and Italy, Germany, France, Poland, Czech Republic, Netherlands.

## Ambition and Objectives

**GaN4AP project** has the ambitious target of making the GaN-based electronics to become the main driving power technology in all energy converter systems.

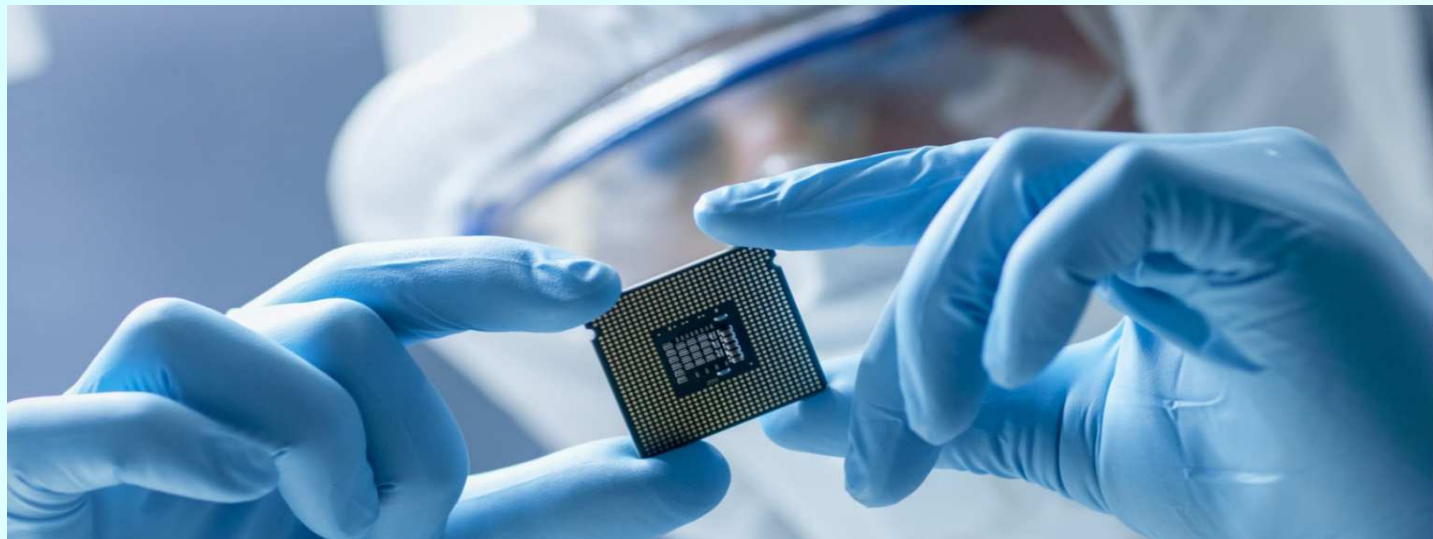
### GaN4AP project will develop...

... **innovative Power Electronic Systems** for power conversion and management with advanced architecture and circuit topology based on state-of-the-art GaN-based High Electron Mobility Transistors (HEMTs).

... **an innovative material** (Aluminium Scandium Nitride, AlScN) that combined with advanced growth and process solutions can provide outstanding physical properties for highly efficient power transistors.

... **a new generation of vertical power GaN-based devices** on MOSFET architecture with vertical p-GaN inversion channel for safe power switching up to 1200V.

... **new intelligent and integrated GaN solutions** (STi2GaN) both in System-in-Package (SiP) and Monolithic variants, which will allow a large-scale deployment of E-Mobility power converters.



### Application Fields

The project mainly addresses the markets of:

**Automotive** (efficient power electronics for EV/EHV).

**Renewable energy** (power converters and inverters for solar energy).

**Consumer electronics** (AC/DC DC/DC converters).

**Industrial electronics** (Motor drivers and power conversions).



### Expected Impact

The project covers the whole GaN supply chain, i.e. from material growth to device processing, testing and implementation in complex circuits design and applications.

### GaN4AP project is expected to...

... **create a strong and resilient European competence network** with regard to the development of the full chain of the GaN-based devices

... **strongly support the European industry** in its research and development activities for increasing the reliability and yield of production processes for GaN-based power devices.

... **create a virtuous cycle also in terms of new and dedicated academic curricula**, to attract our students and help compete on a par with global rivals.