



# IPCEI Microelectronics @ Infineon Austria

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# Infineon at a glance



# Infineon is a global leader in power systems and IoT



**~56,200**  
employees<sup>1</sup>

**56** R&D and **20** manufacturing locations<sup>1</sup>

## global leader

in automotive, power management, energy efficient technologies and IoT

## market position

Automotive

**# 1**

Strategy Analytics,  
March 2022

Power

**# 1**

Omdia,  
October 2022

Microcontroller

**# 4**

Omdia,  
August 2022

<sup>1</sup> as of 30 September 2022

# Infineon at a glance

## Long-term high-growth trends

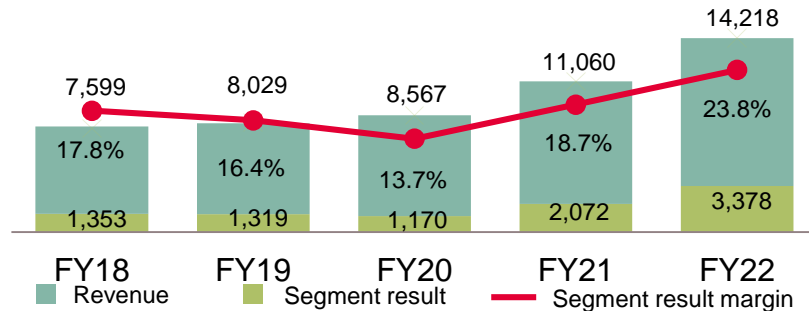
### Decarbonization

- › CO<sub>2</sub> saving
- › Energy efficiency
- › Sustainability

### Digitalization

- › Productivity
- › Comfort
- › New use cases

## Financials



<sup>1</sup> as of 30 September 2022 <sup>2</sup> 2022 Fiscal year (as of 30 September 2022)

## Employees<sup>1</sup>

56,200 employees worldwide

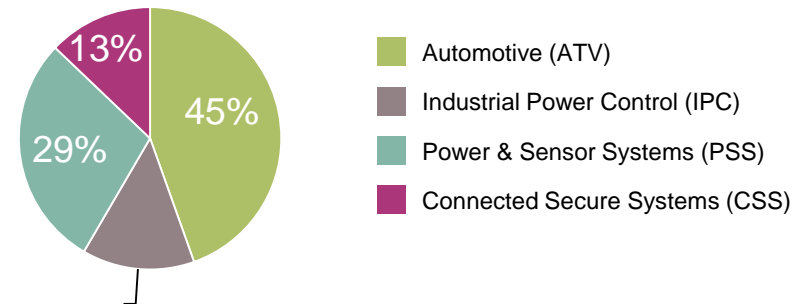
Americas  
5,580

EMEA  
22,590

Asia Pacific  
28,030

56 R&D and  
20 manufacturing locations<sup>1</sup>

## Business segments revenue<sup>2</sup>



For further information: [Infineon Investor Presentation Q4 2022](#).

# Innovative solutions from Infineon can be found...

## Automotive

- > ... in 17 of the world's 25 best-selling full-electric cars and plug-in hybrids in 2021



## Green Industrial Power

- > ... among the top 10\* manufacturers of wind power and solar systems\*\*.



\* Infineon is serving the top-10 but not necessarily as a sole supplier.  
 \*\*by shipped capacity in MW: Wood Mackenzie, Power & Renewables, "Historic wind turbine OEM market share", March 2019 and by shipped capacity in MW: based on or includes content supplied by Informa Tech (former IHS Markit Technology), "PV Inverter Market Tracker – Q3 2019", October 2019

## Power & Sensor Systems

- > ... in over 50% of all data centers worldwide



## Connected Secure Systems

- > .. in 75 % of all national e-passport projects in Europe
- > ... in 60 % of all electronic insurance cards in Europe

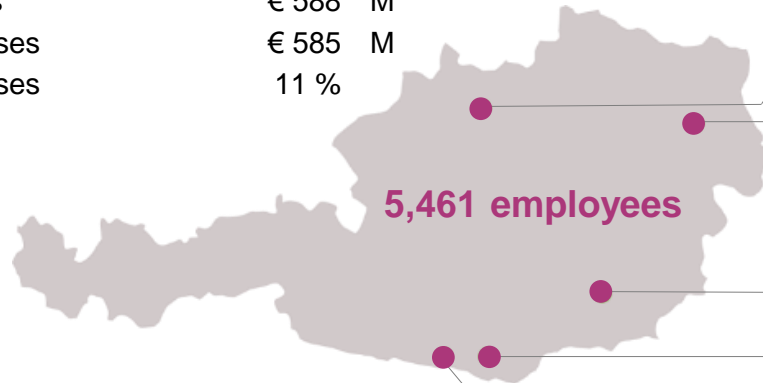




# Infineon Austria – Company overview

## Fiscal year 2022 (as of 30 Sep. 2021)

Turnover	€ 5,240	M
Earnings before taxes	€ 663	M
Investments	€ 588	M
R&D expenses	€ 585	M
R&D expenses in % of turnover	11 %	



Linz (R&D)

Vienna (Sales)

Graz (R&D)

Klagenfurt (IT)  
international Headquarter role

Villach (R&D, P, B, IT)  
international Headquarter roles

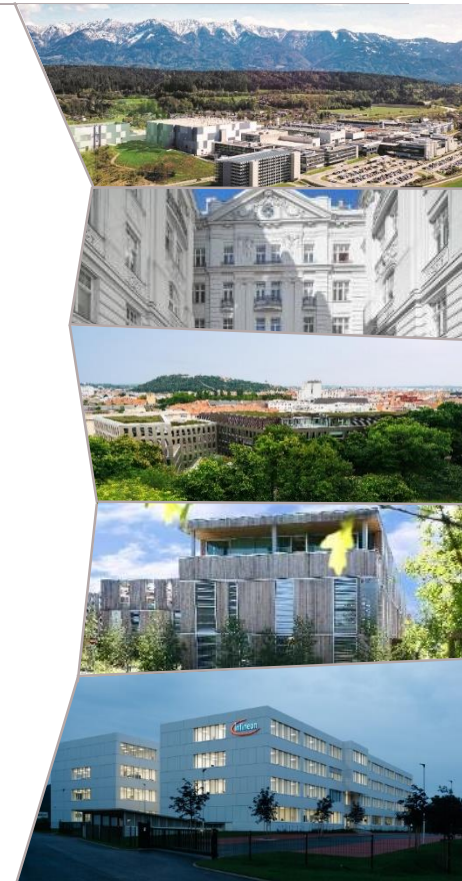
## Subsidiaries in Austria

IT Services, Klagenfurt  
KAI, Villach

## Foreign subsidiaries

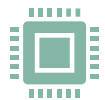
Infineon Technologies Romania SCS (R&D)  
Infineon Technologies (Kulim) Sdn Bhd, Malaysia (P)

**Global Infineon Competence  
Center for power electronics**



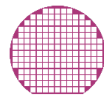
# Innovation Fab Villach

- Competence center for extremely thin (up to 40µm) silicon wafers
- Series production of power semiconductors ("energy-saving chips") in 300-millimeter thin-wafer technology
- Manufacturing expertise for MEMS (microelectromechanical systems), e.g. tire pressure sensors
- Global competence center for silicon carbide (SiC) and gallium nitride (GaN) in the Group
- One virtual fab: Virtual mega-factory for 300-millimeter thin wafers together with Dresden



**8.72 bn.**

**Chips produced  
(FY 20/21)**



**~2,000**

**Product types in process at  
the same time**



**~1,000**

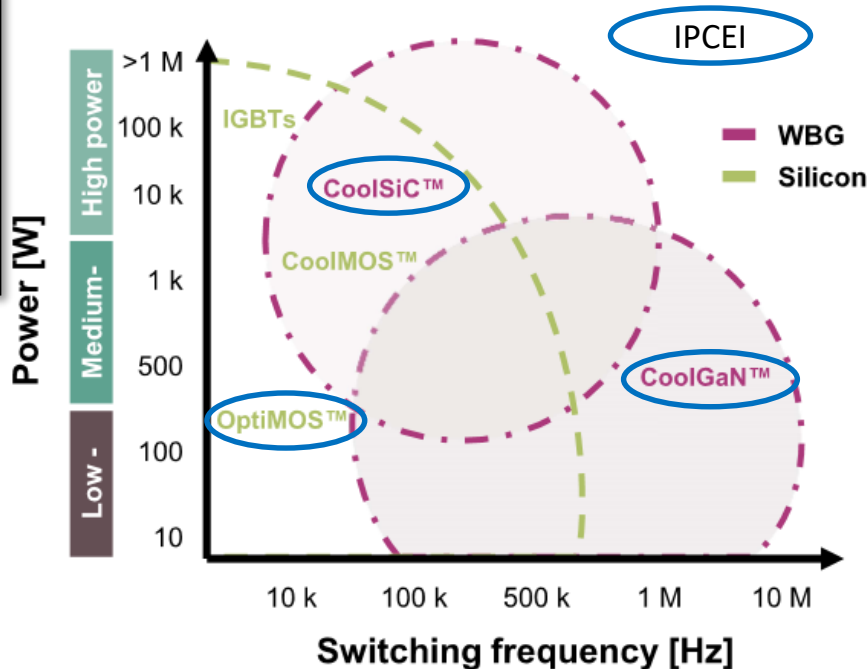
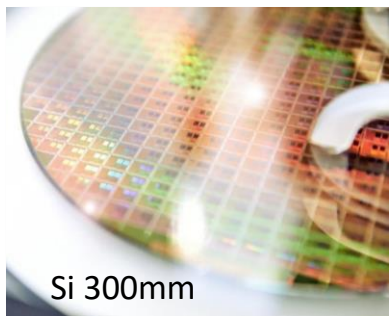
**Individual processing  
steps per wafer**

# IPCEI@IFAT supports development and ramp-up of energy efficient power devices in Si/SiC/GaN

## How are power switches categorized?

### Features

- Reducing Switching Losses
- Increased Energy Efficiency
- Less Cooling effort
- Max. Switching Frequency (GaN)
- Smaller Die Size
- Reduce Package Size
- Higher Reliability







# IPCEI Microelectronics



# Semiconductors are placed high on global geopolitics agenda



*"...There is no digital without chips.... This is not just a matter of our competitiveness. This is also a matter of tech sovereignty."*

Ursula von der Leyen,  
President of the European  
Commission at the State of the  
Union | 15 September 2021

*"These chips, these wafers...  
It's all infrastructure.... We  
need to build the infrastructure  
of today, not repair the one of  
yesterday."*

Joe Biden, President of the  
US at the CEO Summit on  
Semiconductors | 12 April  
2021



- **Growing global demand** for semiconductors due to accelerated pace of digitization and electrification
- The **shortage of semiconductors** has concrete consequences
- Accelerated investment across the world in microelectronics education, research and manufacturing to secure supply security, including the EU Chips Act.

## R&D&I

- Technology Development and First Industrial Deployment in
  - Energy Efficiency (Si, SiC, GaN)
  - Electro Mobility (Charging, Sensing)

**TARGET:**  
Bring innovative technologies  
„Made in Europe“  
**FAST**  
to volume production  
& to market



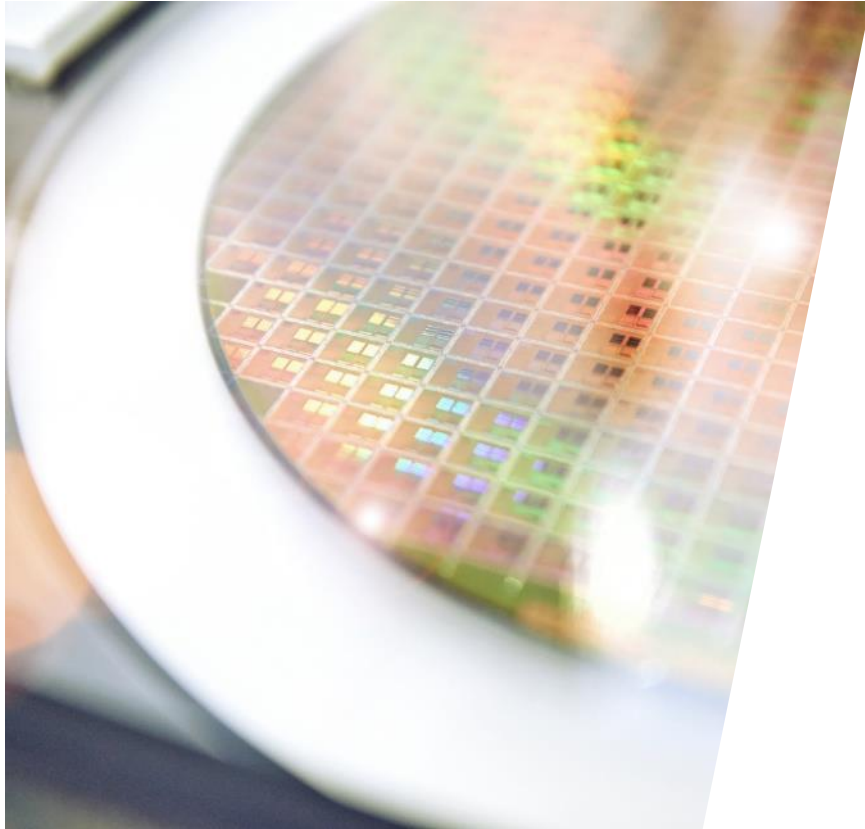
## Collaboration Projects

- With 12 Companies
  - Raw Wafer Engineering
  - Equipment & Process Innovation
  - Chip Embedding & Assembly Packaging

## Spillover Activities

- Dissemination of R&D&I
- New collaborations with universities, STEM Talents and industry
- Focus on Eastern and Southeastern European countries

**TARGET:**  
Strengthen cooperation  
Industry/Industry  
&  
Industry/Academia



- › Silicon (Si)-based Technology in 100V
- › Reliability of up to +75 times longer lifetime depending on the application
- › Less heat production during operation
- › More energy efficient than its predecessors
- › Reduces electricity consumption for telecom applications



# OptiMOS 6™ 100V in your daily life



## OLED TV

Makes watching your favorite TV show more energy efficient.



## Wireless Charging

Cutting cables necessary for charging everything from smartphones and laptops to kitchen appliances and cars.





- › Infineon has expertise in SiC technology for over 20 years
- › System size reduction providing smaller products
  - Reduced “Ron x A”
  - Increased energy efficiency → + 30%
  - Longer operating range of Electric Vehicles
- › Reliability of up to 75 x longer lifetime
- › System size reduction providing smaller products

# CoolSiC™ in your daily life



## Traction

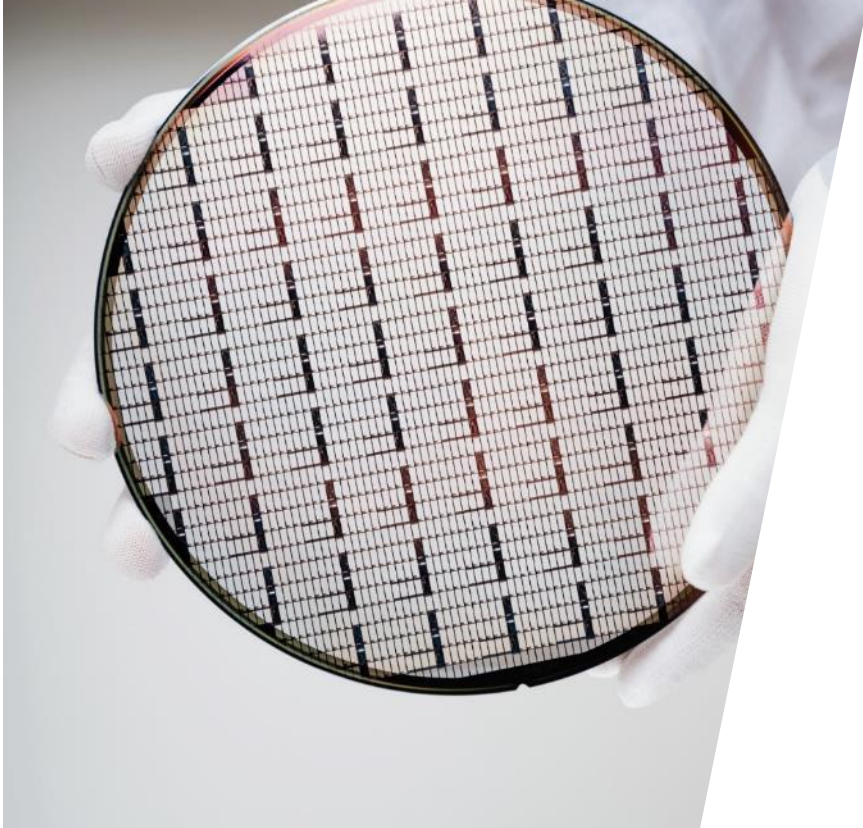
Highly efficient components that reduce energy losses in trains...



## eCars

...as well as in electric cars.  
So you get more comfortable and greener to your destination!





- › Next-generation power semiconductors with increased energy efficiency
- › Operates at higher voltages, temperatures and frequencies
- › System size reduction providing smaller products
- › Infineon's CoolGaN™ chips focus on high performance and robustness with lifetimes beyond 15 years



# CoolGaN™ in your daily life



## Data and server center

CoolGaN™ products lead to:

- › lower power consumption
- › lower temperature while operation  
→ reducing cooling affords of servers
- › environmental friendly digitalization  
Global Internet data traffic grew more than 40%  
in 2020 alone, while the energy consumption  
remains almost the same due to power electronics.

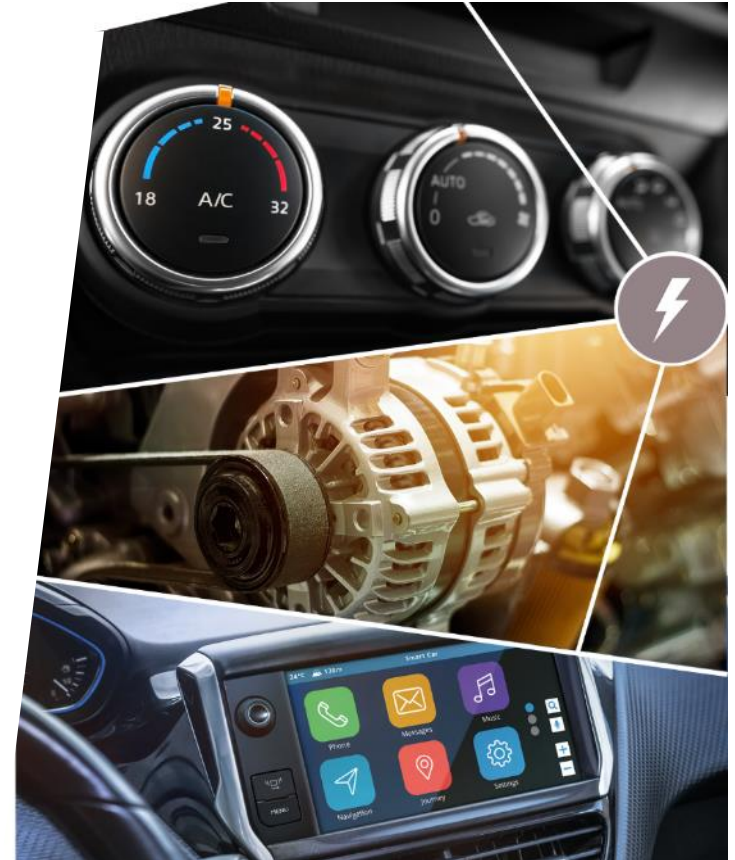


- › Less fuel consumption due to increased generator efficiency up to 8%
- › Qualification as eco-innovations, defined by the European Union
- › CO2 emissions reduction of a car by up to 1.8 g/km



### Light vehicle generators

In a conventional car, the generator produces the electric energy for charging the battery and supplying a growing number of safety and comfort features such as driver assistance systems, air conditioning and infotainment.





## **XENSIV™ tire pressure monitoring system (TPMS)**

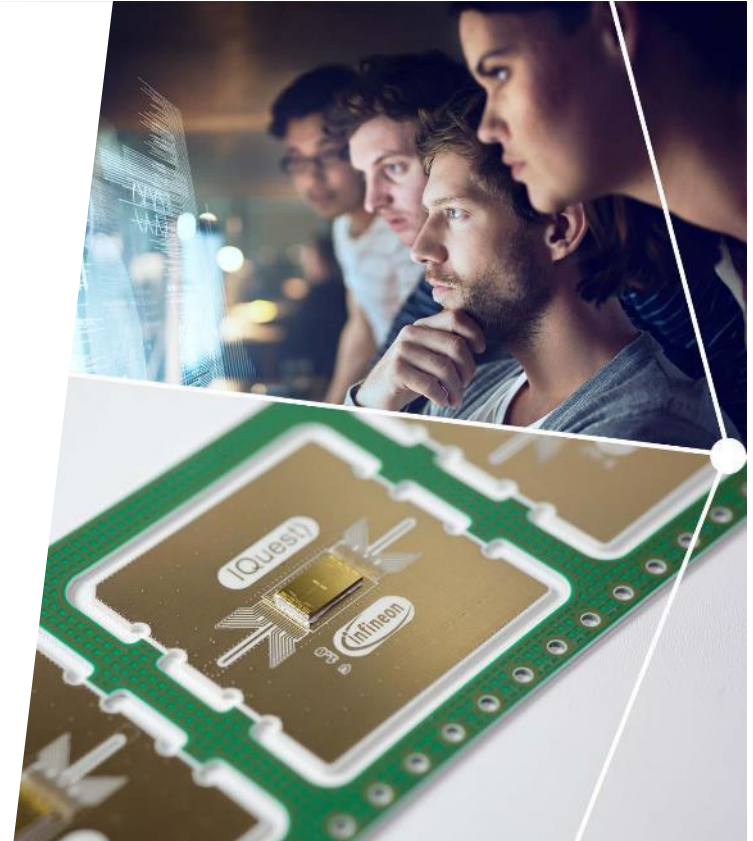
- › Protects from tire failures which are caused by under-inflation and slow leaks
- › Eliminates the need to manually check the air pressure
- › Automatically issues a warning message on the display
- › Correct tire pressure safes you fuel and therefore money
- › Get to your destination, safer, greener and more comfortable
- › Fast growing market: 2-wheelers (e-bikes/e-scooters)

## Trapped ions enabling supercomputers of the future

- › Accelerate the development of quantum computers
- › Solve complex tasks faster and more efficient than today's computers
- › Infineon has leading expertise in this research field, taking ion traps to the next level:

## From prototypes to volume production

- › Founding member of QUTAC, the Quantum Technology & Application Consortium





## Trapped ions enabling supercomputers of the future

- › In future quantum computers can make a significant contribution e.g. to:
  - Chemistry:  
Research and faster development of polymers, a material used in every household
  - Logistics:  
Optimizing route planning
  - Drug development:  
Extensive laboratory experiments may be reduced in the future



- › Energy-efficient functions in as little space as possible
- › Smart switches increasing performance and reliability of your car's control unit, responsible for processing and communicating information



### **Driver assistance systems**

helps to enable CO2 reduction as well as driver assistance systems up to fully autonomous cars. So you feel more safe while driving to your destination.





 **IPCEI**  
on Microelectronics

**Spillover effects**

**Innovation**  
Enabling new R&D collaborations  
with **Academia**  
across Europe



# IPCEI Microelectronics Spillovers

## Spillover activities strengthening semiconductor talents

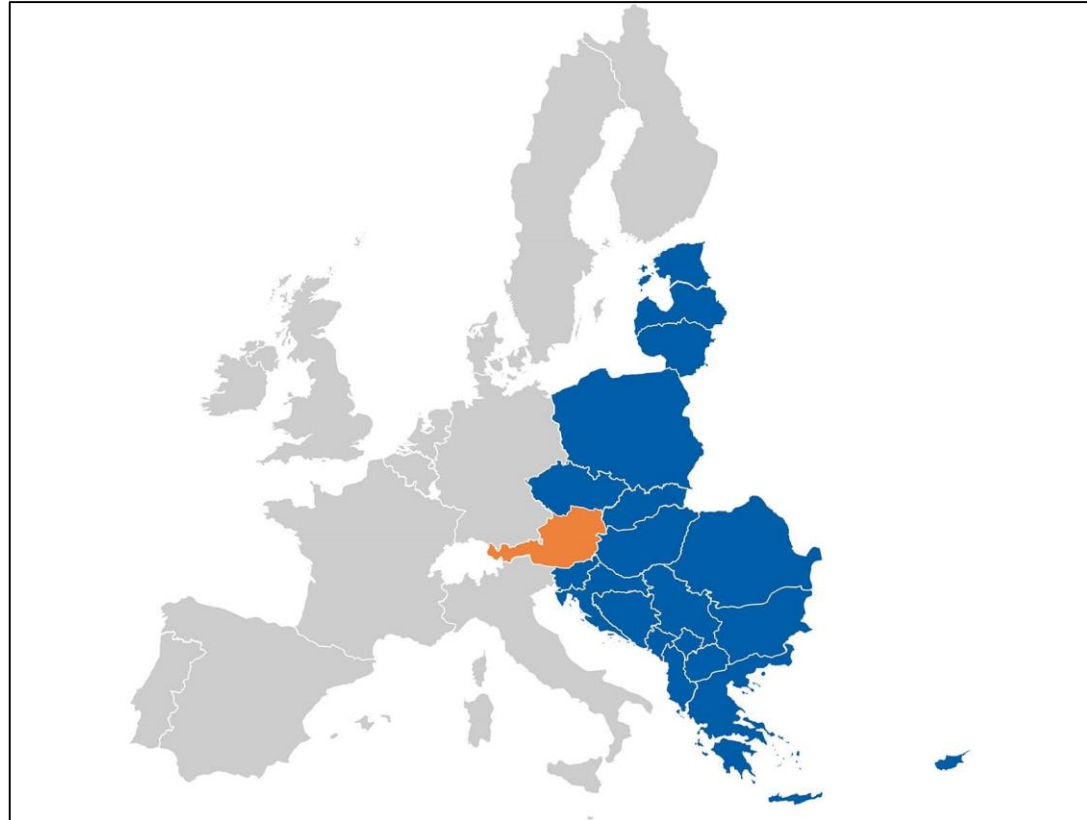
- › Increase University Network across Europe
- › Endowed professorship at Uni Zagreb
- › Supporting PhDs and master students with scholarship
- › BSc and MSc Internships
- › Electronics Awareness Campaign for Students
- › University Lectures and Workshops by Infineon Experts
- › Infineon Summer and Winter Schools
- › HW/SW Kits for educational activities



# Scope of IPCEI EU13 academic cooperations

## New academic network is enabler for:

- › PhDs
- › Master Thesis
- › Internships
- › Research Activities
- › (Funded) Projects
  
- › Lectures & WS
- › Presentations
- › Teaching & Trainings
  
- › Events (Hackathons,...)
- › HW/SW Kit distribution
- › MPW/Shared Reticle
  
- › Talent Pipeline
  
- › Further local contacts  
to SMEs & Start-ups

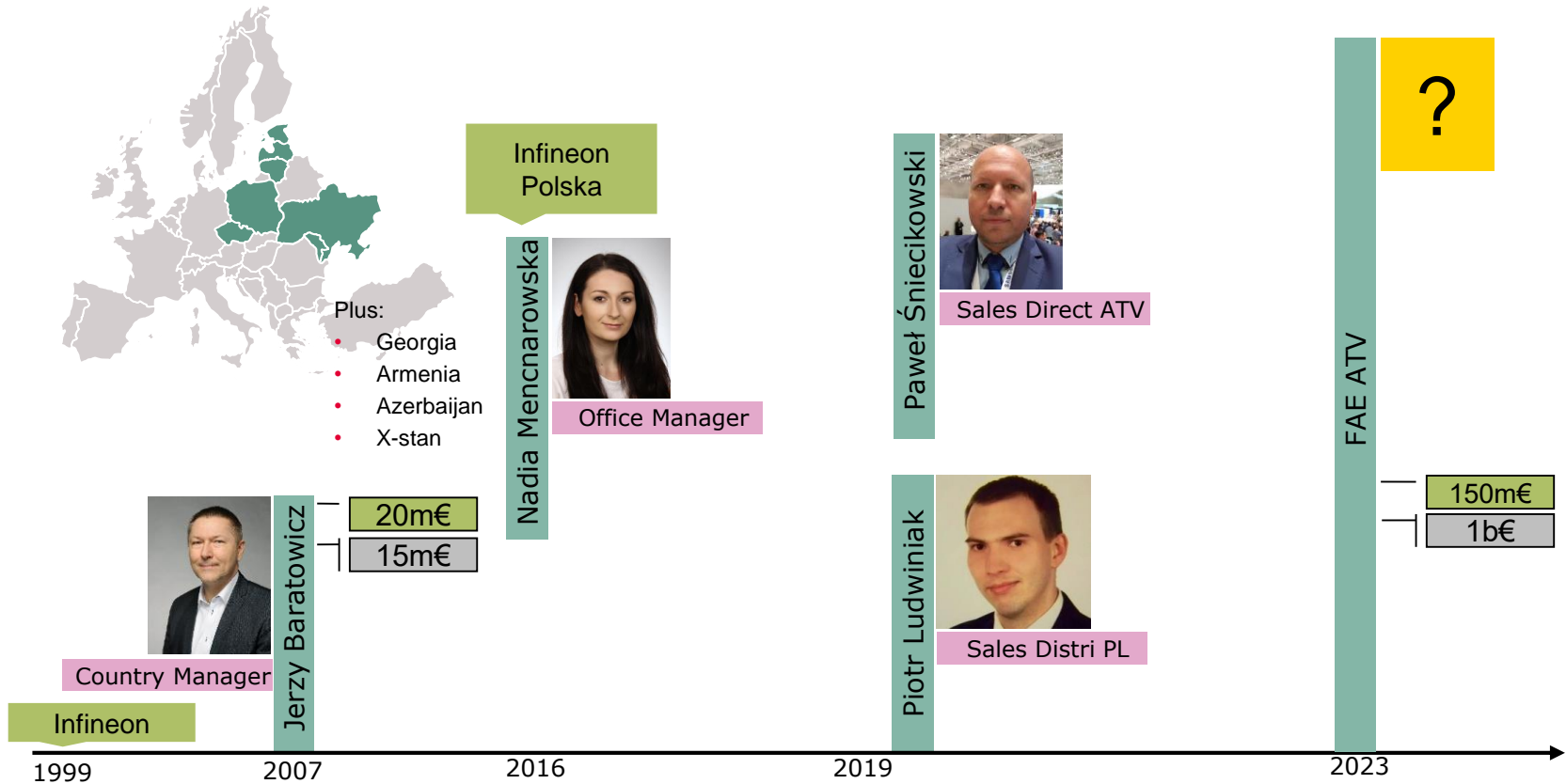




# IPCEI Activities in Poland

PhD	collaboration	Contract with WUT for the PhD scholarship					
PhD	colaboration	Contract with AGH for the PhD scholarship					
workshops	knowledge transfer	ECPE Workshop, <a href="https://www.ecpe.org/events/workshops-tutorials/all/">https://www.ecpe.org/events/workshops-tutorials/all/</a> Steps towards Design Automation and Artificial Intelligence in Power Electronics		03. Dec	virtual due to Covid 19	169	EU (Poland, Hungary) Estonia,..
HR Fair	HR Event/Student Attraction	Infineon @ Warsaw University of Technology	Together with 114 international companies and 34 media partners, Infineon presented its opportunities for students in this year's company catalogue at the Warsaw University of Technology. Interested students were informed about Infineon in general, the IPCEI project and the possibility to join IPCEI as an intern or a PhD student. Link: <a href="https://www.elka.pw.edu.pl/Studenci/Praktyki-staze-praca2/Targi-Pracy-i-Praktyk-WEiTI/XXVIII-Targi-Pracy-i-Praktyk">https://www.elka.pw.edu.pl/Studenci/Praktyki-staze-praca2/Targi-Pracy-i-Praktyk-WEiTI/XXVIII-Targi-Pracy-i-Praktyk</a>	04.Apr	online (Company Catalogue)	x	Poland
Conference	Information about IPCEI, contact building	XIV ELTE Conference <a href="http://elte2023.edu.pl/english-version/">http://elte2023.edu.pl/english-version/</a>		18-21.04.2022			
HR Fair	HR Event/Student Attraction	Job Fair for Electronics and Information Technology Engineers at WUT		17.10.2022	Onsite	800	Poland
workshops	knowledge transfer	Industry Workshop: Intelligent Power Distribution for 12V/24V and 48V Automotive Applications, at AGH University, by Hans Peter Kreuter	Industry Workshop at AGH University	18.01.2023	Onsite	15	Krakow/Poland
workshops	knowledge transfer	STEM Workshop: Intelligent Power Distribution for 12V/24V and 48V Automotive Applications, at AGH University, by Hans Peter Kreuter	STEM Workshop for 2 groups for students	19.01.2023	Onsite	40	Krakow/Poland
workshops	knowledge transfer	STEM Workshop AC; DC, by Gerald Deboy-AGH	1 STEM Workshop at AGH May 17th 23 (Gerald Deboy, Christian Lehner)	17.05.203	Onsite		Krakow/Poland
workshops	knowledge transfer	STEM Workshop AC; DC, by Gerald Deboy-AGH	Workshop for University Staff	17.05.2023	Onsite		Krakow/Poland

# IFPOL organization and history



# Our activity

- › **What we do:**
  - Our corporate strategy is fully aligned with the trends of electrification and digitalization
  - We have established an excellent position to shape these trends and to continue creating sustainable value
- › **How we do:**
  - › Commercial and technical support for customers and distributors
    - Remotely and face to face at customer location
    - Well known names: ZF, Aptive, ABB, PWPW, AC, Satel, Bury, Amica, Apator, Trumpf
    - Comprehensive approach: samples, technical advice, datasheets, simulations, pricing, logistics, quality
  - › Workshops and trainings
  - › Exhibitions/fairs (TEC, Evertiq Expo)
  - › Advertisement in magazines (Elektronik, Elektronika Praktyczna)
  - › Outsourcing services at local companies (SW and HW)
  - › Cooperation with Universities and Science Clubs and...
  - › Promotion of Poland inside Infineon



# Acknowledgement

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in the frame of the

## **Important Project of Common European Interest on Microelectronics (IPCEI on ME).**

*The IPCEI on Microelectronics is also funded by Public Authorities from Germany, France, Italy and U.K.*

-  Federal Ministry  
Republic of Austria  
Climate Action, Environment,  
Energy, Mobility,  
Innovation and Technology
-  Federal Ministry  
Republic of Austria  
Digital and  
Economic Affairs





In case of any questions, please do not hesitate to contact us:

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- › For topics related to Infineon Technologies Poland Sp. z o.o.: [Jerzy.Baratowicz@infineon.com](mailto:Jerzy.Baratowicz@infineon.com)





Part of your life. Part of tomorrow.