

ECSEL dynamic and success stories

Soitec vision

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Introduction

- › EC – Political guidelines (Ursula von der Leyen)
 - (1) A European Green Deal: “World leader in circular economy and clean technologies”
 - (3) A Europe fit for the digital age: “technological sovereignty in some critical technology areas”

- › Low consumption semiconductors are urgently required to address the Green challenge
 - Energy and material consumption reduction is in our innovation DNA

- › European autonomy on key technologies requires the establishment of a complete value chain starting from the material
 - Soitec engineered substrates: a solid foundation to achieve industrial autonomy

1 Soitec



Soitec – Designer & Manufacturer of Innovative Semiconductor Material



“ We design and deliver innovative substrates & solutions to enable our customers' products shaping everyday life ”



1

Largest manufacturer of engineered substrates
LEADER

2

Unique technologies
SMART CUT™, SMART STACKING

4

High-growth markets
SMARTPHONES, AUTOMOTIVE, CLOUD & INFRASTRUCTURE, IOT

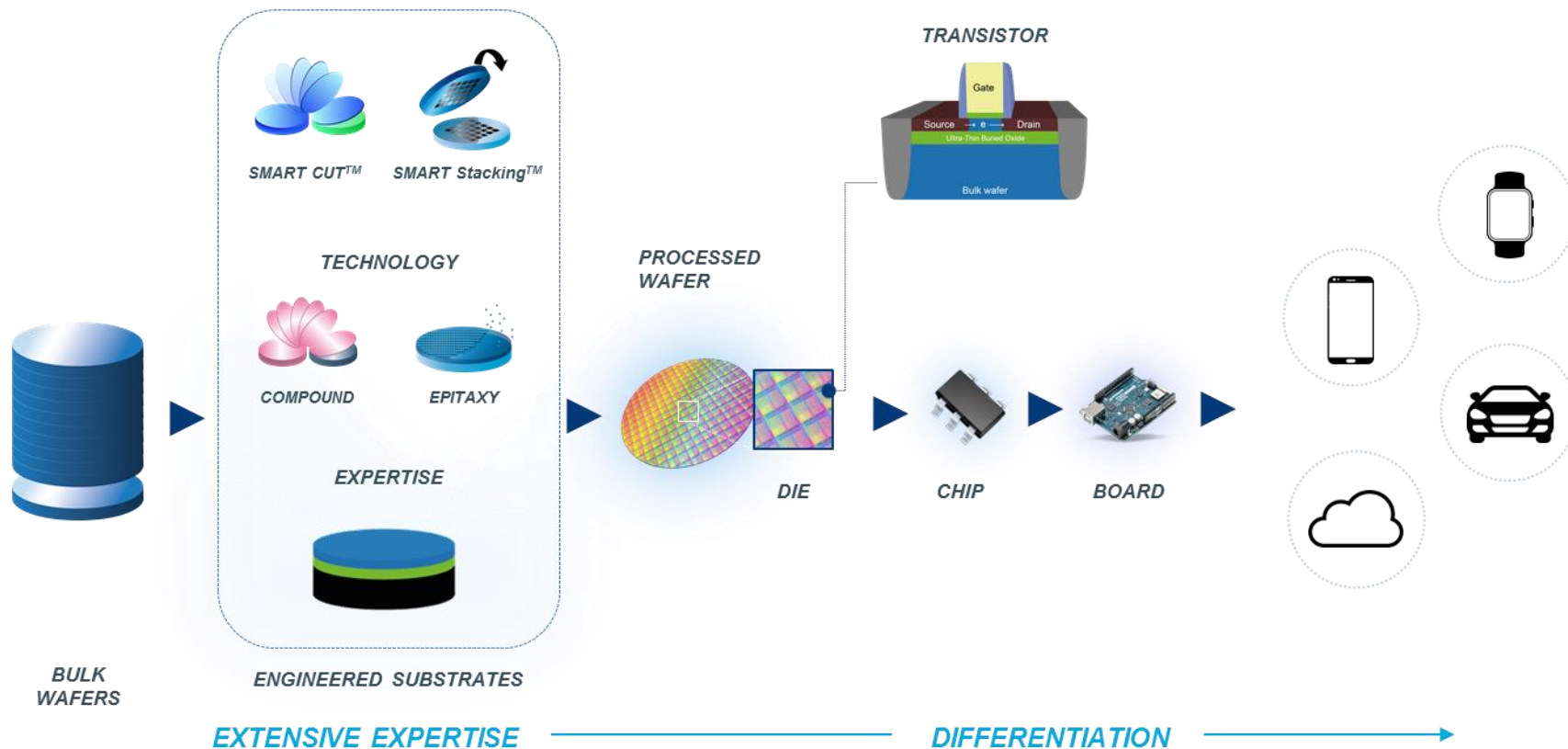
6

Wafer fabs (150, 200 & 300 mm)
FRANCE, BELGIUM, SINGAPORE, CHINA*

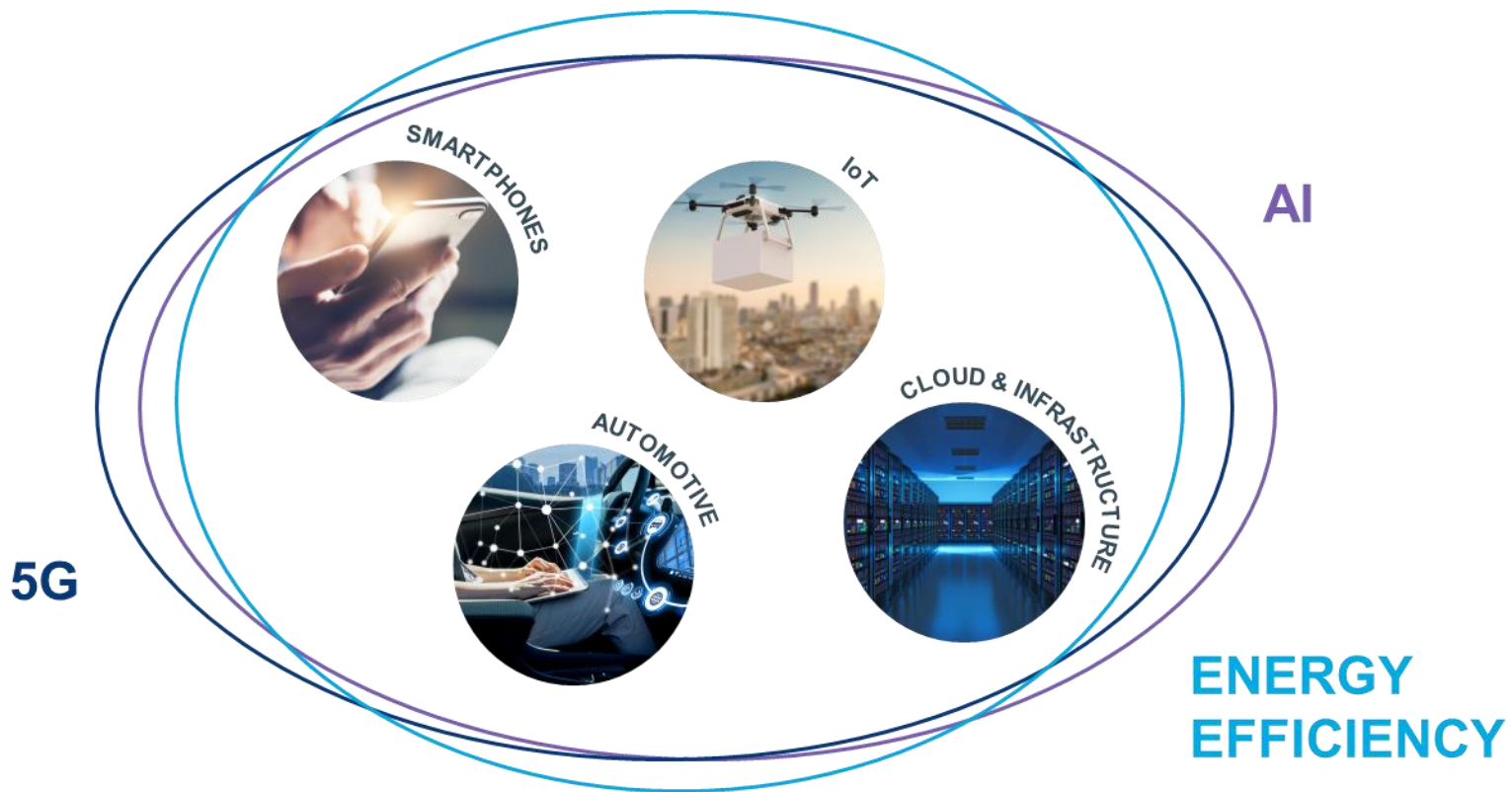
1,450

Employees Worldwide
GLOBAL PRESENCE

Substrates in the value chain



Serving 4 key markets & 3 Mega trends

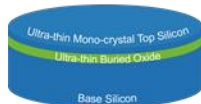


Broad product portfolio addressing market growth

PROCESSOR & CONNECTIVITY SOC

FD-SOI

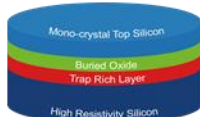
For power-efficient integration of digital/²analog/RF



RF FRONT-END MODULE

RF-SOI

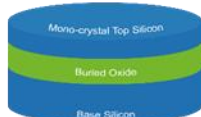
For highly efficient mobile communication



POWER

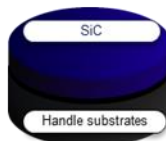
Power-SOI

For high voltage device integration



Power-SiC

For high voltage device integration

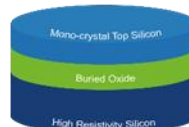


NEW

PHOTONICS

Photonics-SOI

For high perf. photonics device integration into silicon



IMAGERS

Imager-SOI

For improved imager performance in NIR



PIEZO-ON-INSULATOR

POI

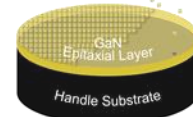
For high performance 5G filters



GaN

GaN

For radio frequency (RF) 5G and power systems





2

Working with ECSEL Dynamic and Success stories



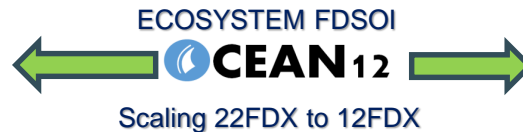
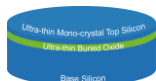
What ECSEL is about:

- › Strategy:
 - Align European Challenges and industrial strategies to maximize impact
- › Ambition:
 - Ambitious funding to share risks, to accelerate R&D
- › Ecosystem:
 - To improve visibility: « Soitec inside »
 - To improve European Market penetration

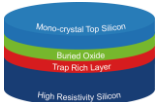
Strategy: ECSEL supports our strategic products

2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023

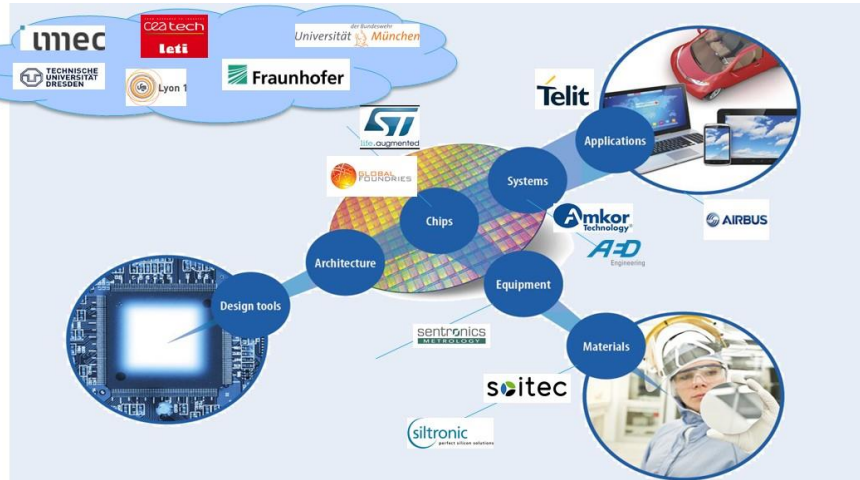
FDSOI: Substrate, Technology, Design platform



RFSOI: Enhancement to RF capabilities

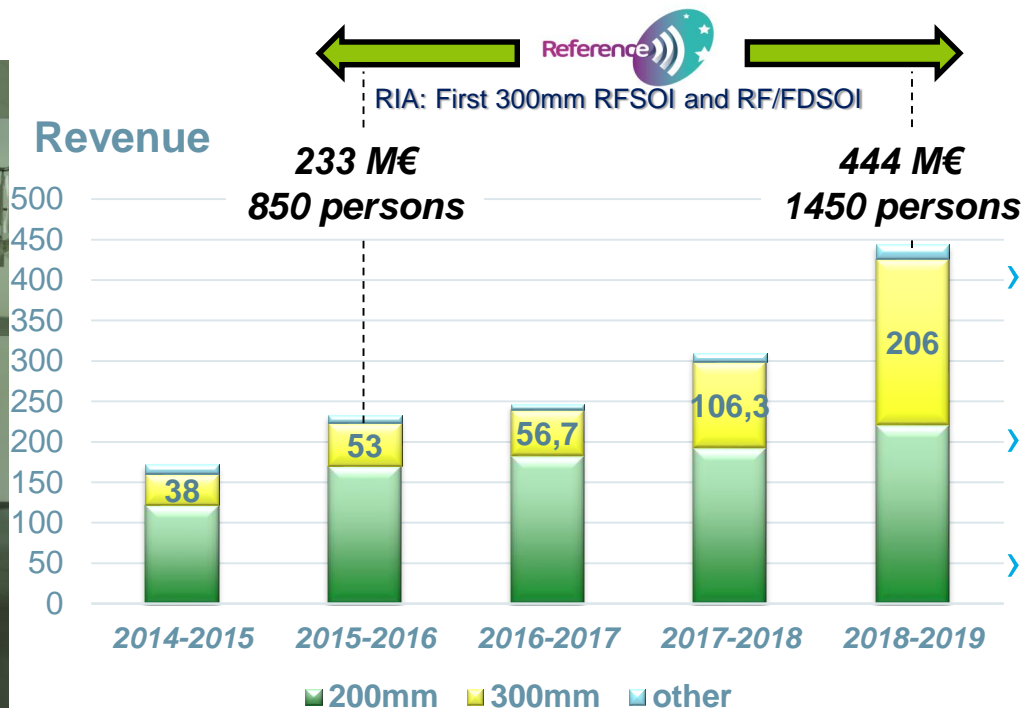


REFERENCE success story (2016-2019)



- › Develop innovative 300mm RF-SOI substrates & technologies
- › Enabling realization of integrated Front End modules, and system level demonstrators for cellular, Aeronautics, automotive, and...
- › ... Paving the way to 5G

REFERENCE Impact: 300mm RF-SOI in production and essential for 5G



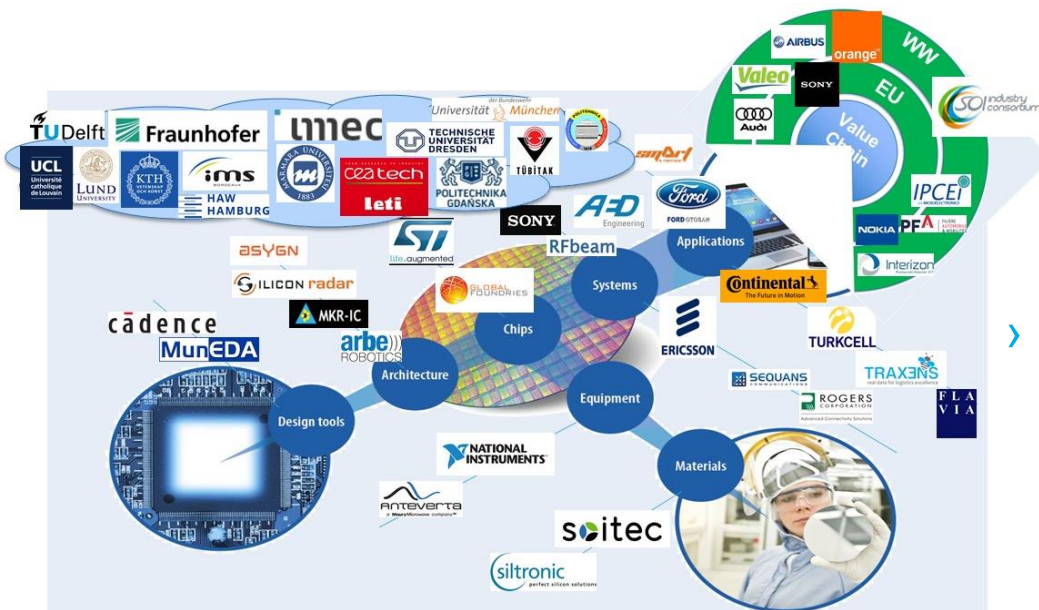
> RFSOI represents >60% of Soitec growth

> Majority is in 300mm

> 300 jobs created in France

BEYOND5: 2020 – 2023

SOI penetration in Edge AI and 5G



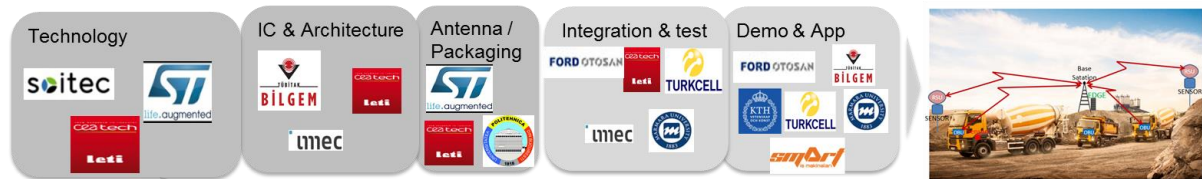
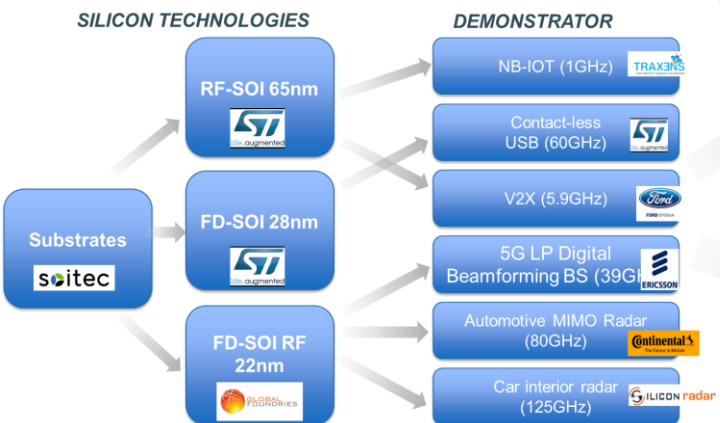
> BEYOND 5 – a follow-up of REFERENCE - aims to demonstrate European technological sovereignty for:

- 5G infrastructure / IoT
- Automotive communications
- Smart sensors including Edge AI

BEYOND5: 2020 – 2023

Turkish partners demonstrators

Ford Otosan – V2X Communication @ Autonomous Construction Site



Massive MIMO system for dense spaces



OCEAN12: 2018-2021

Low power high perf computing



- > OCEAN12 fosters the FDSOI Market penetration for Ultra low power highly performant computing
- > Bosch announced major investments to develop automotive radars on 22FDX



3 Coming challenges

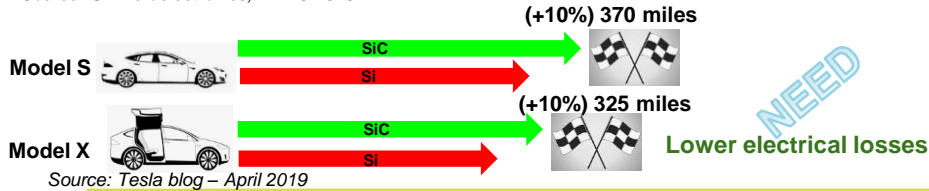
Coming challenges on material: Example of SiC

Automotive Industry needs SiC for EV



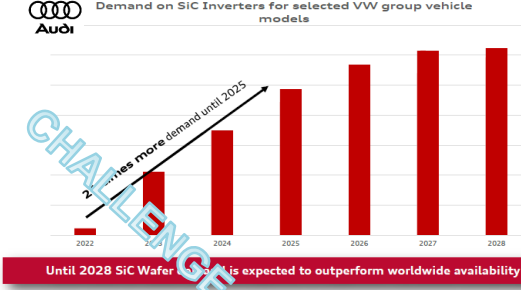
Source: STMicroelectronics, APEC 2019

50% in overall size reduction



SiC supply: a real Challenge for European OEMs

Source: AUDI courtesy, Jan 2020



- USA ~82%
 - Japan / Korea ~ 14%
 - China ~ 3%
 - Europe <1% (captive)
- Single source situation
- Large volumes production
- Risk of delivery shortage (trade wars scenarios)

Soitec target: create a new SiC substrate standard based on Smart Cut technology

Ambition from the application perspectives

- Provide technology solutions for a climate neutral eMobility
- Foster a trusted and secure European supply chain for SiC solutions

4 Take Aways





TAKE AWAYS

- › Innovation in nano-electronics starts at substrate and material level
- › Soitec ecosystem brings green technologies and solutions for European autonomy
 - Low consumption Edge AI and FDSOI technology
 - Climate Neutral e-mobility and SiC technology
- › ECSEL JU is critical to structure the European collaborative ecosystem

THANK YOU !



ECSEL SOI Ekosistemimize hoş geldiniz

TEŞEKKÜR EDERİM

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European
Commission