

# RESEARCH TO REALITY

DIGITAL SOLUTIONS TO  
EUROPEAN CHALLENGES



Flanders  
State of the Art



Wallonie  
service public  
SPW

innoviris  
.brussels  
we fund your future



# Chips for Europe Initiative

## ...from the lab to the fab...

Dr Lucilla Sioli

Director for Artificial Intelligence and Digital Industry  
DG CNECT, European Commission

RESEARCH  
TO REALITY

# The EU Chips Act - Rationale for Intervention



# The Three Pillars of the Chips Act

European Chips Act

European Semiconductor Board (Governance)

Pillar 1

## **Chips for Europe Initiative**

- Initiative on infrastructure building in synergy with the EU's research programmes
- Support to start-ups and SMEs

Pillar 2

## **Security of Supply**

- First-of-a-kind semiconductor production facilities

Pillar 3

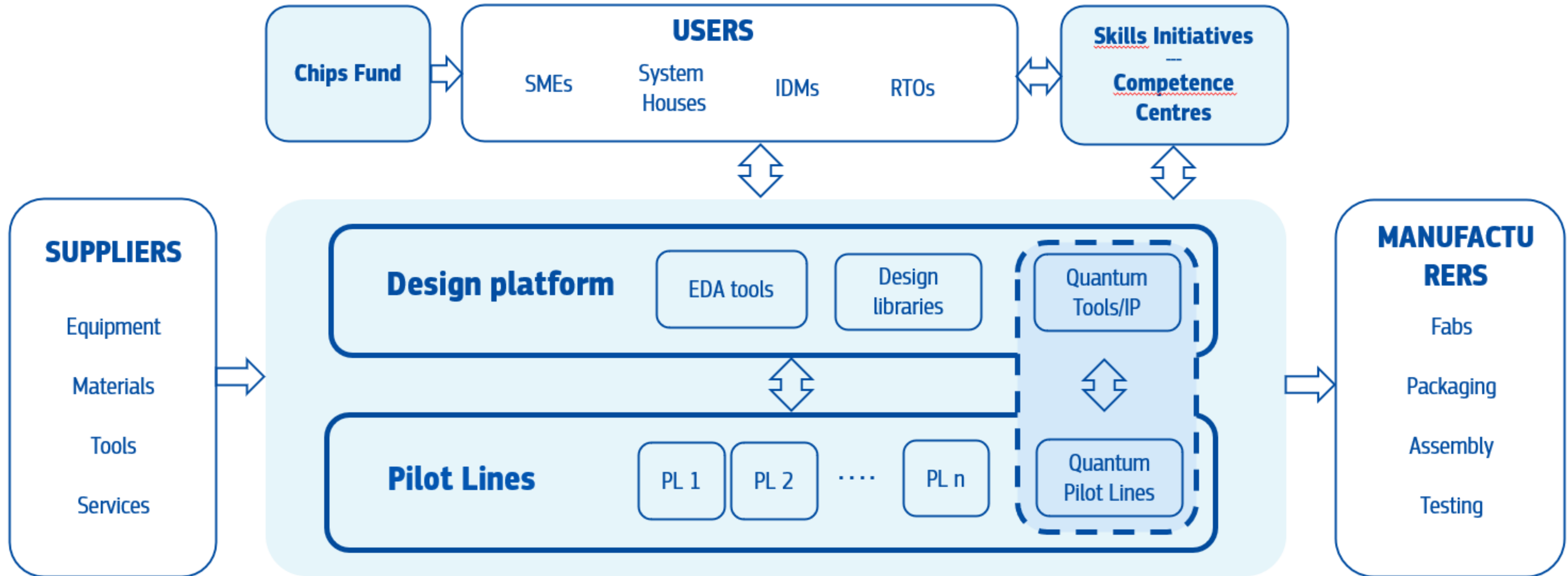
## **Monitoring and Crisis Response**

- Monitoring and alerting
- Crisis coordination mechanism with MS
- Strong Commission powers in times of crisis

# **Chips Act – Pillar 1**

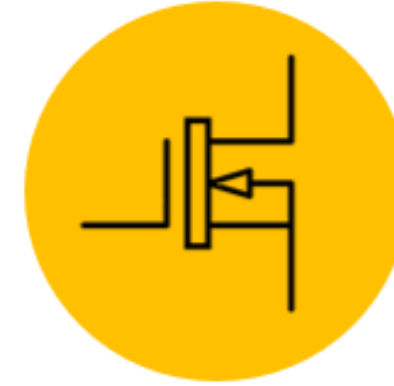
## **The Chips for Europe Initiative**

# Bridging the Gap from the Lab to the Fab



# Call for Pilot Lines

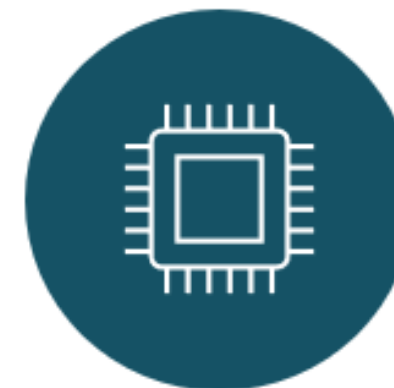
Calls launched **1<sup>st</sup> December 2023**  
closing **29<sup>th</sup> February 2024**



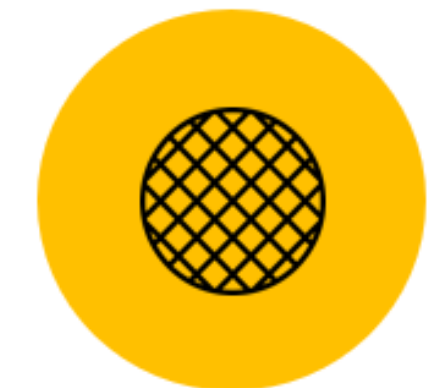
**FD-SOI** scaling towards  
7nm



**Leading-edge nodes**  
below 2nm



**Heterogeneous systems**  
integration and assembly



**Wide-bandgap**  
semiconductors

# Design Platform – Scope

## Main objectives

- **Reduce entry barriers** and admin burden for EU companies in design
- **Facilitate access** to pilot lines and foundries
- Foster **collaboration** among EU stakeholders on new developments
- **Access training** and support to boost design skills



## Instrument



Develop a **virtual design platform**, offering **cloud-based** access to tools, libraries and support services to accelerate development and reduce time-to-market



# Design Platform – Added Value

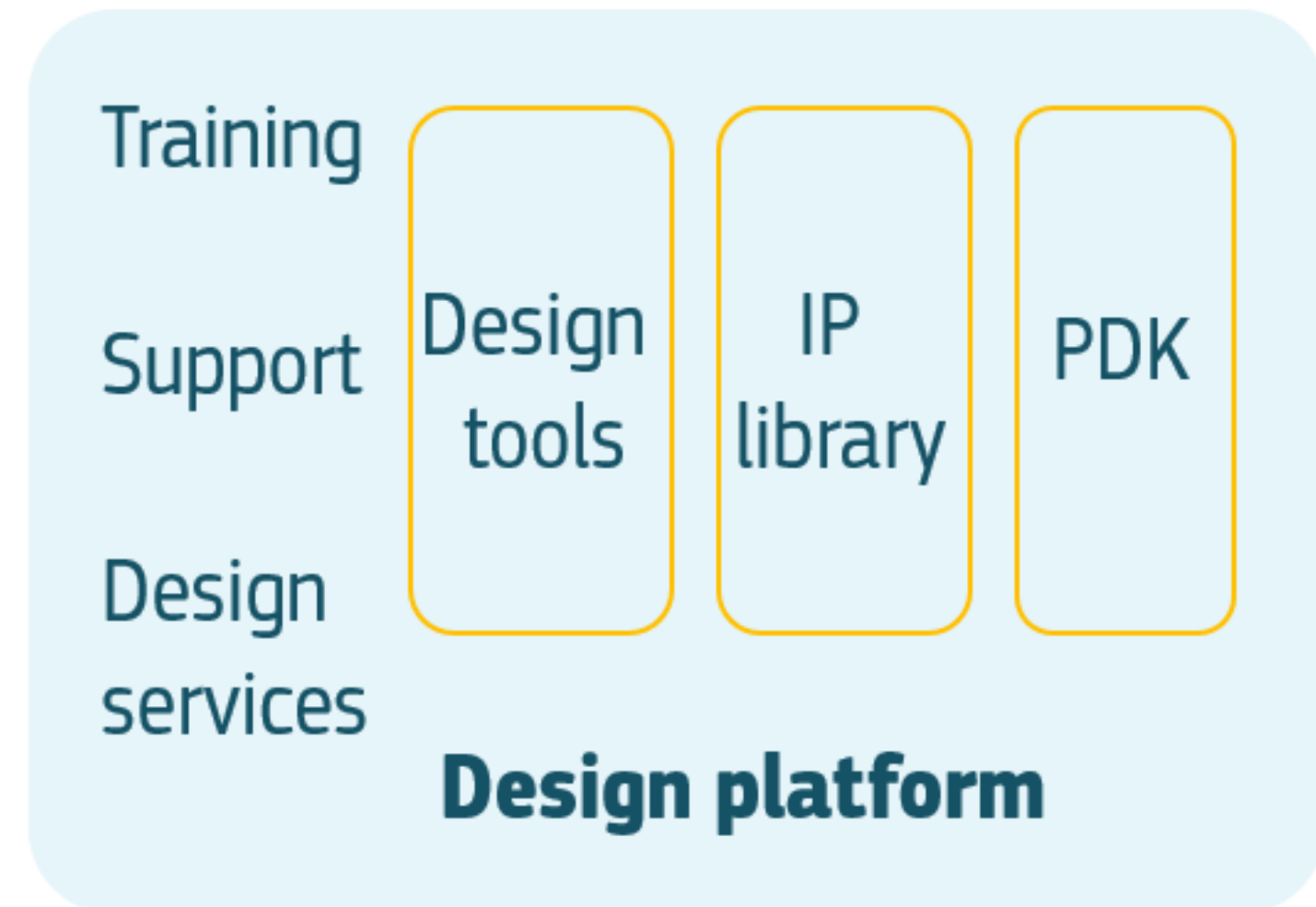


## User Benefits

- Easy access to **tools and IP** in a **secure, scalable** cloud environment
- **Streamlined** licensing process
- **Enablement** support up to tape-out
- Collaborative spaces for new developments
- Training and support

Designers

Suppliers



Fabs

Pilot lines

Design platform

# Competence Centres

## Main objectives

- Have specialised areas of expertise in certain technology, domain, or activities (**specialisation**)
- Facilitate effective use of capacities and facilities, including access to **design platform** and **pilot lines**
- Support interested stakeholders in developing semiconductor solutions (**technology transfer**)
- Address **skills shortage** by offering (access to) **training** on semiconductors, including workforce upskilling and reskilling
- Match user needs with available expertise in network of competence centres and act as **access point to the network**
- **Promote Chips Fund** and facilitate access to venture capital



**Awareness raising, promoting services, promoting success stories**

# Chips for Europe – State of Play

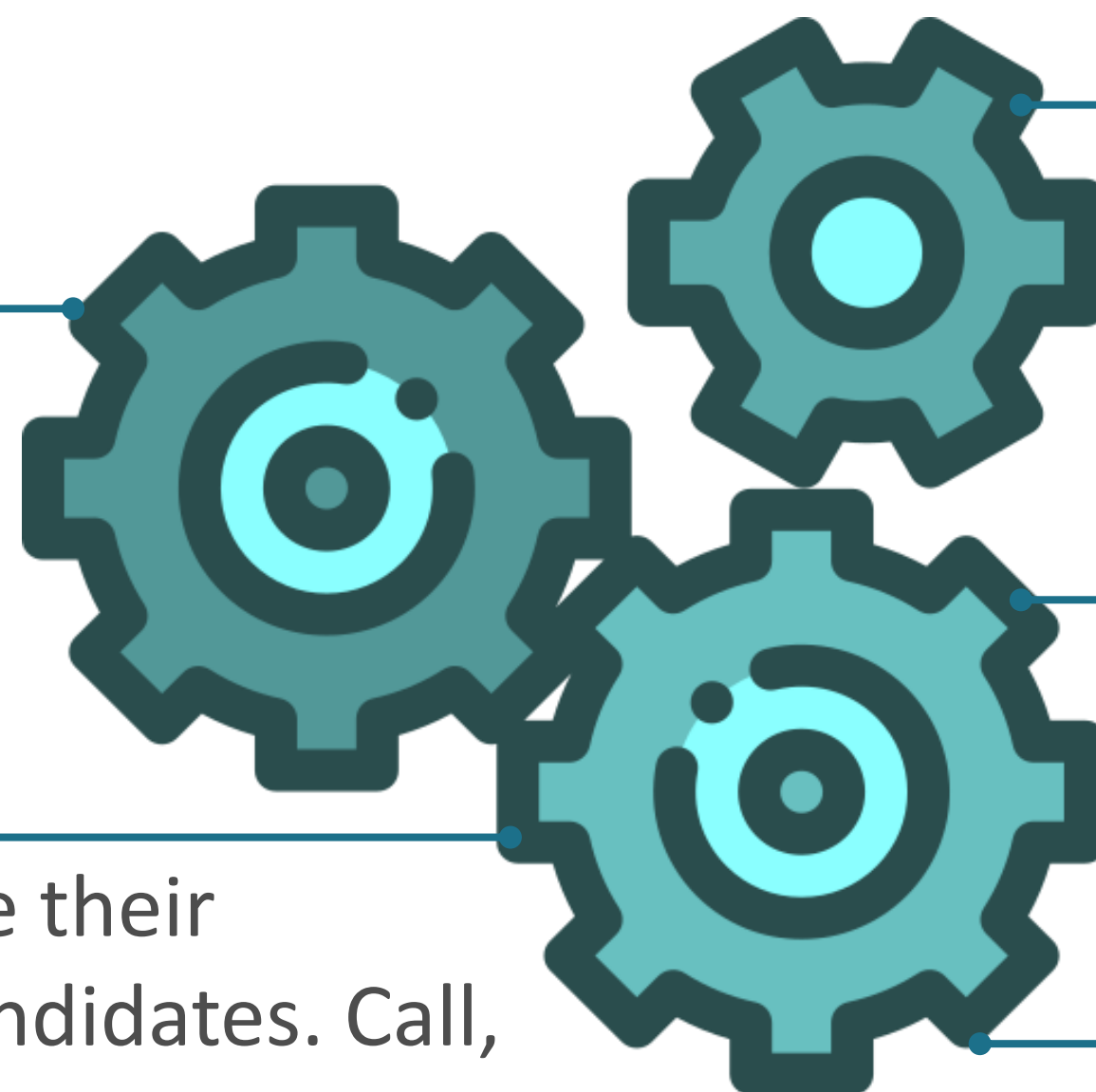
KDT JU has formally become the **Chips JU**.

MSs currently nominate their **Competence Centre** candidates. Call, evaluation, and selection throughout 2024

First calls on **pilot lines** launched on 1st December 2023.

**EUR 5.75 billion EU + MSs** investment in infrastructures expected by 2027.

Call for a cloud-based **Design Platform** expected in summer 2024



# Thank you!

Dr Lucilla Sioli  
Director for Artificial Intelligence and Digital Industry  
DG CNECT, European Commission

RESEARCH  
TO REALITY

**ME** **Mobility**  
**Electronics**  
Bosch Mobility



**BOSCH**

Parkhaus

# About Mobility Electronics

## What we do

### Electronic control units (ECUs)

We develop, industrialize and manufacture automotive ECUs for partner divisions

### Semiconductors & sensors

We are a leading semiconductor supplier for the mobility and consumer goods industries delivering solutions across:

## Our business sectors



Mobility



Industrial Technology



Energy and Building  
Technology



Consumer Goods

# Our Bosch Global Network

Strategic partner at home and abroad

More than  
**40 manufacturing sites** in **17 countries**



**Design capability**  
for SoC-CMOS, RF-CMOS,  
Analog, Mixed Signal, MEMS,  
Power

- Headquarter
- ▲ ECU R&D
- ECU Manufacturing
- ▲ SC R&D
- SC Manufacturing Frontend
- SC Manufacturing Backend

**USA**

Anderson  
Plymouth  
Sunnyvale  
Tempe  
Roseville



**Mexico**

Celaya  
Guadalajara  
Juarez



**Ireland** Limerick



**Netherlands**

Eindhoven  
Enschede



**Germany**

Reutlingen  
Ansbach  
Blaichach  
Munich  
Cottbus  
Dresden  
Erlangen  
Schwieberdingen



**France**

Mondeville  
Sophia Antipolis



**Spain**

Madrid  
Valencia



**Portugal** Braga



**Sweden** Lund



**Finland**

Oulu  
Espoo



**Ukraine** Kyiv



**Romania** Cluj



**Bulgaria** Sofia



**Hungary**

Budapest  
Hatvan



**Austria** Linz



**Italy**

Milano



**India**

Bangalore  
Coimbatore  
Naganathapura



**Australia** Clayton



**China**

Hongkong  
Shanghai  
Suzhou  
Wujin



**Taiwan**

Taipei



**Vietnam**

Ho Chi Minh City



**Malaysia**

Penang



# Example - Semiconductors and ECUs from ME in Automotive

- Electronic Control Units
- Semiconductors & Sensors
- Function

## Electrical Steering

**Integrated Circuits, Sensors, Power SC**

Steering support  
Vibration monitoring

## Power Electronics

**Integrated Circuits, Power SC**

Regulate the flow of energy in electric vehicles

## Airbag Control Unit with Satellite Sensors

**Integrated Circuits, Sensors**

Signal a collusion and trigger the airbags

## Power Train Control Units

**Integrated Circuits, Sensors**

Optimize Engine Control and smooth Power Train Operation

## Door Module

**Integrated Circuits, Sensors**

Controls window lifters and exterior mirrors, detect side impact, key-fob

## Video Camera

**Integrated Circuits**

Detecting obstacles on the road

## Comfort

**Sensors**

Detecting road noise  
Active suspension  
Navigation

## Park Pilot

**Integrated Circuits, Sensors**

Calculate the distance to obstacles

## ABS / ESP

**Integrated Circuits, Sensors**

Controls the brake hydraulics for each wheel



## ADAS & Radar

**Integrated Circuits, Sensors**

Measures distance to other vehicles and localization



Example – MEMS from ME in Space:

# NASA MISSION

Bosch MEMS sensors  
stabilize

**NASA'S INGENUITY  
MARS HELICOPTER**



Source: [www.nasa.gov](http://www.nasa.gov)

#InventedForLife



# ME

Mobility Electronics  
Bosch Mobility

# The European Chips Act:

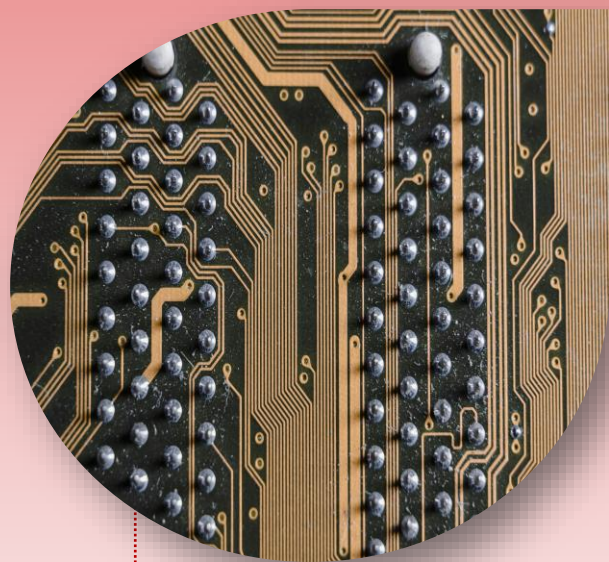
Setting Europe's industrial ambitions in motion

# Bosch and European Chips Act

*“Europe can and must capitalize on its own strengths in the semiconductor industry.”*

Stefan Hartung, Chairman of the Board of Management - Robert Bosch GmbH

## The European Chips Act



**From Lab-to-Fab** Globally  
Competitive R&D  
outcomes with impact to  
industry and society.



**The Green Transition** Catalyze  
sustainability already at the  
component level.



**STEM Skills Boost**  
Turning the tide on talent  
shortages where they matters  
most.



**Bringing investments home**  
Sustaining the political momentum to  
inspire confidence in Europe as global  
semiconductor industry Standort.



Let's innovate in Europe

#LikeABosch



# RESEARCH TO REALITY

DIGITAL SOLUTIONS TO  
EUROPEAN CHALLENGES



Flanders  
State of the Art



Wallonie  
service public  
SPW

innoviris  
.brussels  
we fund your future





**Making the invisible visible**

to contribute to  
the **health & safety**  
of **people & ecosystems**

**Gas emission control**

and **air quality management**

have become major **global public health**  
and **economic challenges**

**Legislation** regarding gas emissions is about to be **repressive**  
e.g., ammonia, nitrogen and methane emissions in Agri-Food,  
Recycling and Chemical



Currently, there is **no easy-to-integrate, reliable** and  
**cost-efficient solutions** for emission monitoring

**Proble**  
**solving**



## “Environmental camera concept”



Our products make the invisible visible, by combining **multiple gas sensing materials** on a **patented transducer array** with **proprietary ASIC and AI-based software**

**A new  
for ga  
meas**

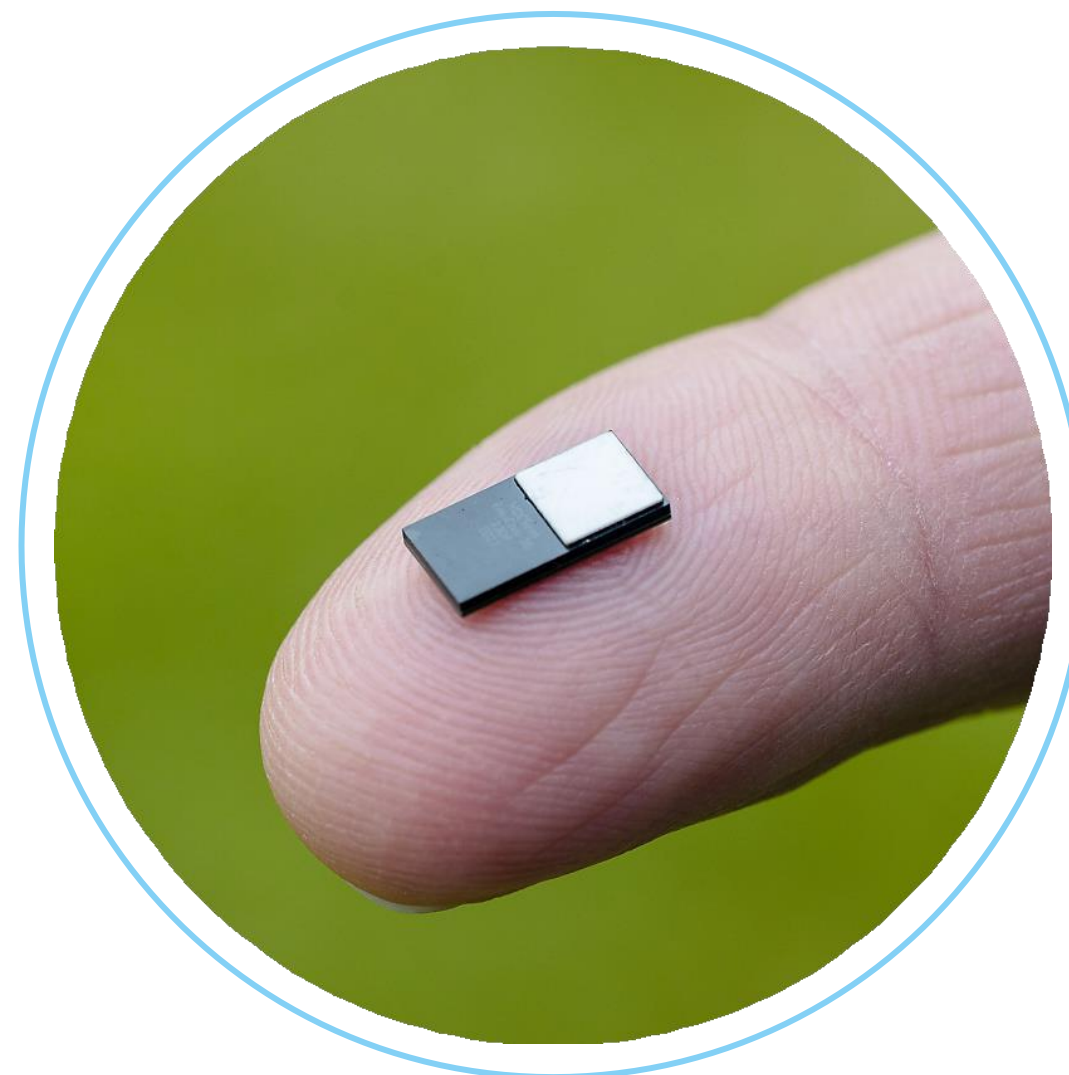
# Multi-gas measurements on a single chip

## Easy of use

- Multi-gas (up to 8) in a 10 x 5 x 1 mm<sup>3</sup> LGA package
- Maintenance free with self-calibration
- Standard SMT assembly

## Robust

- IP64 compliant
- Long lifetime (> 10 years)



EnviCam-3x semiconductor component

Strictly confidential -© VOCSens

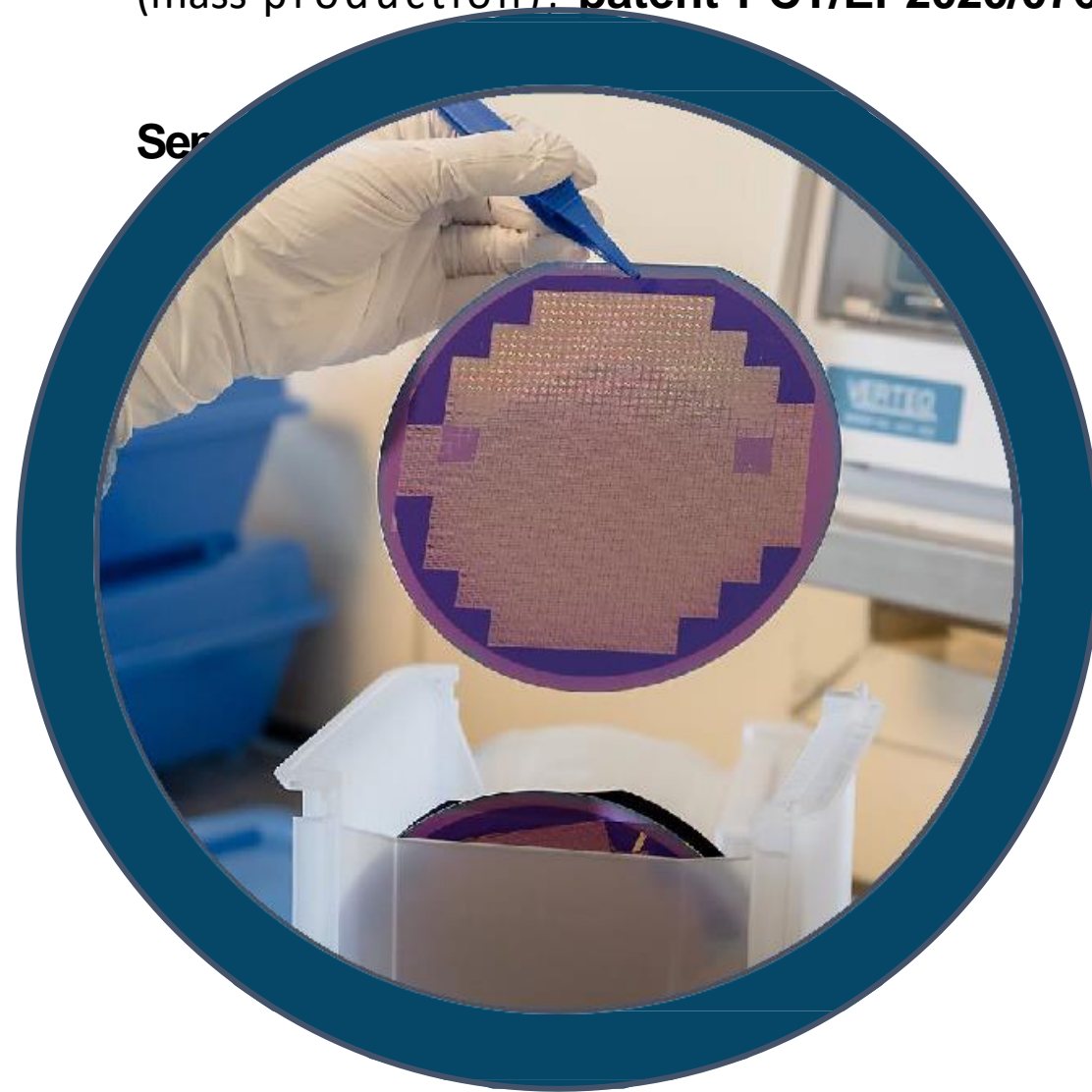
## Affordable

- Long autonomy – Power consumption < 10μW /gas/second
- I<sup>2</sup>C communication with drivers
- Fabless mass production model

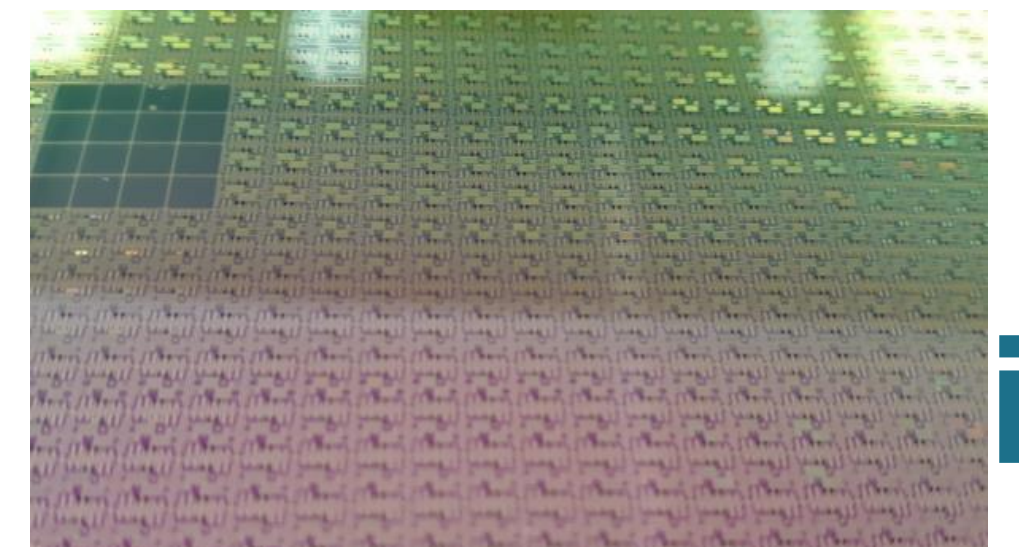
EnviC  
produ  
family

# Patented manufacturing process and associated device

CMOSEnvi technology for semiconductor post-process  
(mass production), patent PCT/EP2020/076048



TM



i-g  
measu  
t on a

## 1 - Agri-Food & Recycling



### EnviCam-3x-AFR

Gases of interest:  
 $\text{NH}_3$ ,  $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{C}_2\text{H}_4$ ,  $\text{H}_2\text{S}$

## 2 - Smart Building



### EnviCam-3x-SMB

Gases of interest:  
 $\text{NH}_3$ ,  $\text{CO}_2$ ,  $\text{NO}_2$ ,  $\text{HCHO}$ ,  $\text{CO}$

## 3 - Chemical and Oil & Gas



### EnviCam-3x-COG

Gases of interest:  
 $\text{NH}_3$ ,  $\text{CH}_4$ ,  $\text{NO}_2$ ,  $\text{CO}$ ,  $\text{H}_2$

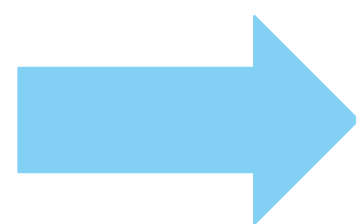
**Target  
market**

## 1 - Agri-Food & Recycling

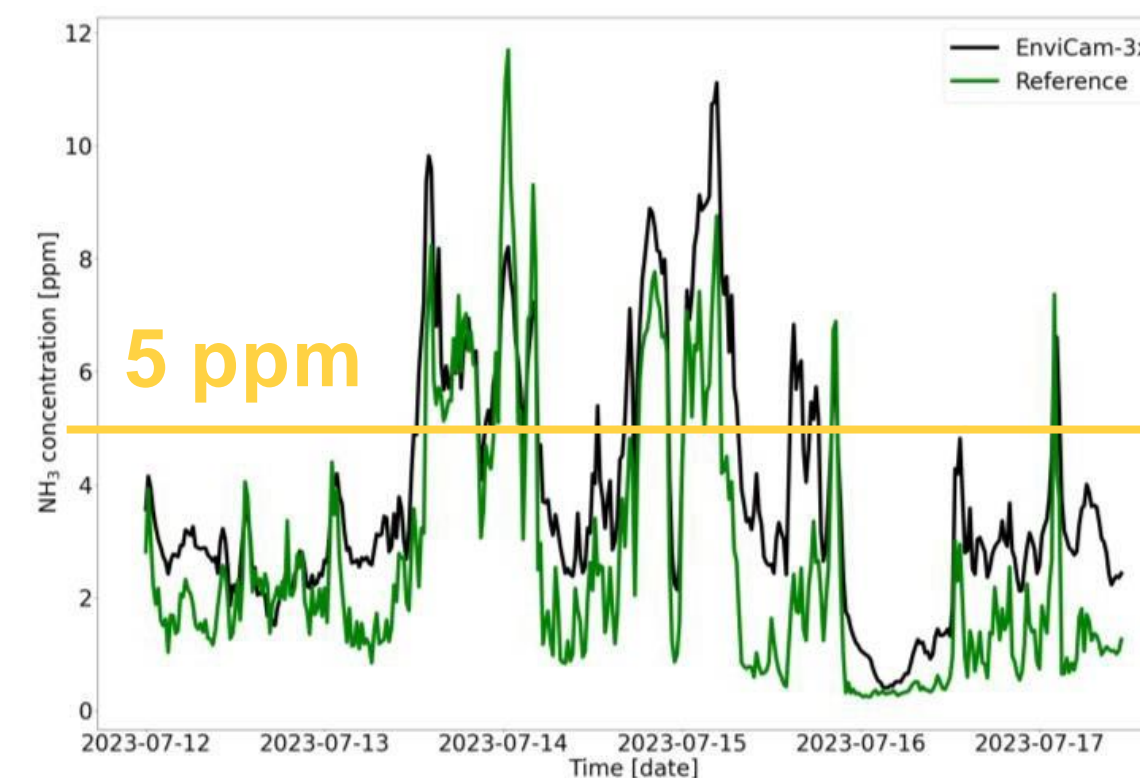
# Nitrogen emissions in agriculture use case

*Decreasing opex by 30%\* while meeting regulations*

Replace bulky and expensive analyzers (> 50 K€) with affordable VOCSens solution (< 200 €)



Provide actionable information  
➤ Trigger fan and/or air scrubber when needed



Strictly confidential -© VOCSens

*\*based on estimated values*

- **Dr. An Verfaillie**, [Flanders Research Institute for Agriculture, Fisheries and Food](#)

ILVO



“We test various sensors and the one from VOCsSens is interesting because it is **simple** and cheap. The innovation lies in the combination of new sensor technology and artificial intelligence. If you can teach such a **robust** sensor to distinguish ammonia in the gas mixture that comes from an industrial farm, then you are very close to a **reliable** and **affordable** monitoring tool for livestock farming. That would make a big difference for the sector.”

Testin  
S

## Fruit logistics



- ✓ Less loss
- ✓ Better yield during transport

## Fire detection



- ✓ Less false positive
- ✓ Earlier detection – less damage

## HVAC control



- ✓ Optimization of energy consumption
- ✓ Air cleaner maintenance

## Facility



- ✓ Optimization of operational costs

## Safety



- ✓ Avoid incident / accident
- ✓ Safe human life

## Process



- ✓ Optimization of operational costs
- ✓ Improved yield

level of other use cases



# Facts and Figures

## Origins

UCLouvain spin-off in 2019

6.4M€ financing (30% non dilutive)



## Ecosystem

Academic & Research partners:

UCLouvain, Certech, UNamur, CeREF, LIST, UMONS, Materia Nova, ENEA, IMT Bucharest, LIST

## Team

20 employees (to February 2024)

50% PhD

50% MSc

## Strong IP

- Patented microfabrication process and transducer array
- Proprietary sensing materials
- Proprietary ASIC
- Proprietary IP64 package
- 3 patents under preparation

## Sales

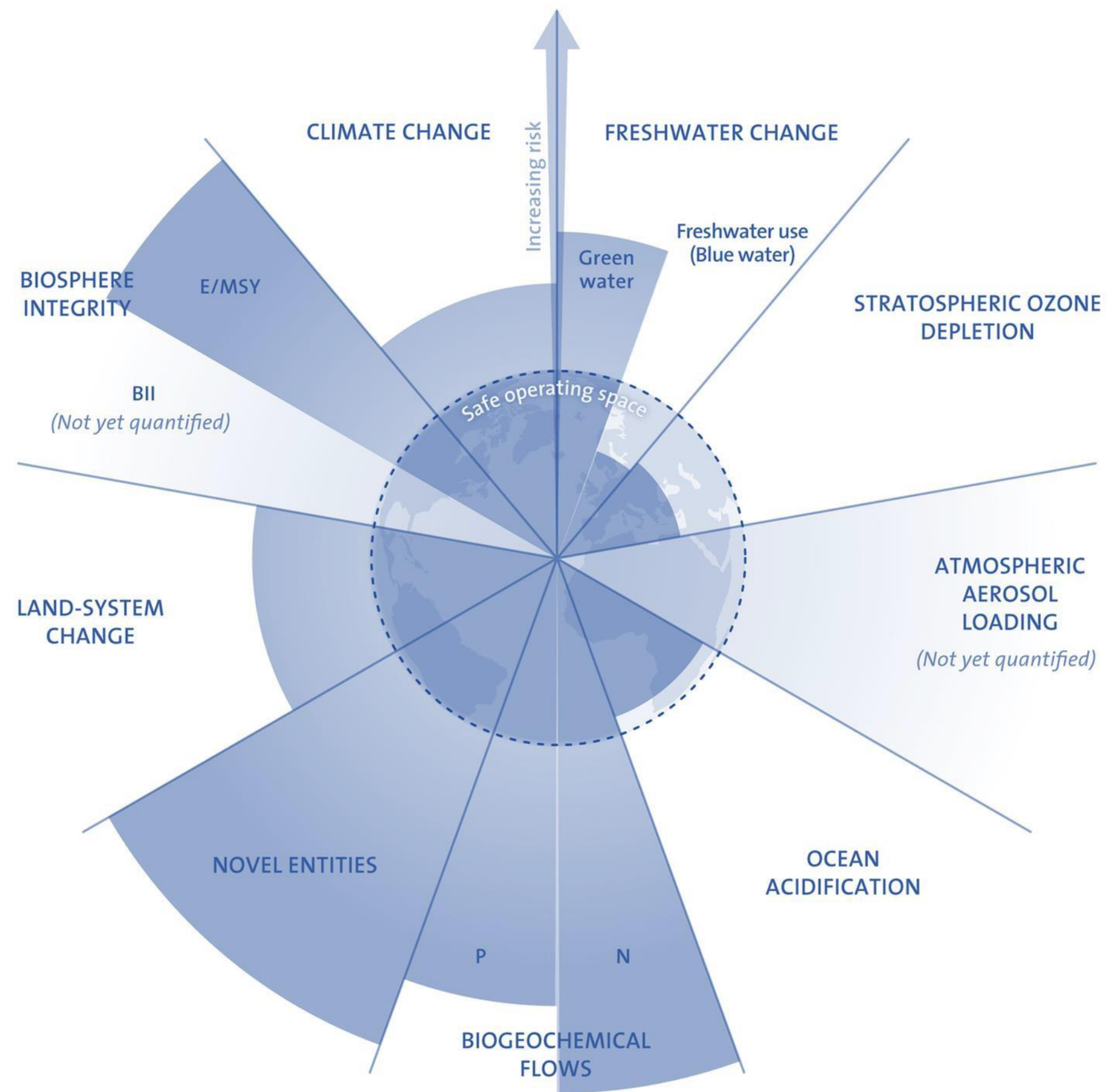
- **Measurement campaign** with system integrators for about 100K€ in 2023, 200K€ expected in 2024
- **Collaboration contract** with RHEA and ESA for 375 K€ in 2024 – 2025
- Collaboration contract under negotiation with **main industry player**
- **Sales ops**: 2 ongoing design-in, volume target > 100.000 units, 5 ongoing evaluations



# Helping the world become more sustainable

**VOCSENS technology can support industry on 4 out of those 9 criteria:**

- 1 Chemical pollution (novel entities)**
- 2 Atmospheric aerosol loading**
- 3 Land-system change**
- 4 Climate change**



*Johan Rockström (Stockholm Resilience Centre)  
& Will Steffen (Australian National University)*

Strictly confidential -© VOCSENS

## Contact:

Thomas Walewyns,  
*Co-Founder & CBO*

+32 479 54 23 52

[thomas.walewyns@vocsens.com](mailto:thomas.walewyns@vocsens.com)



# RESEARCH TO REALITY

DIGITAL SOLUTIONS TO  
EUROPEAN CHALLENGES



Flanders  
State of the Art



Wallonie  
service public  
SPW

innoviris  
.brussels  
we fund your future



**ME** **Mobility**  
**Electronics**  
Bosch Mobility



**BOSCH**

Parkhaus

# About Mobility Electronics

## What we do

### Electronic control units (ECUs)

We develop, industrialize and manufacture automotive ECUs for partner divisions

### Semiconductors & sensors

We are a leading semiconductor supplier for the mobility and consumer goods industries delivering solutions across:

## Our business sectors



Mobility



Industrial Technology



Energy and Building  
Technology



Consumer Goods

# Our Bosch Global Network

Strategic partner at home and abroad

More than  
**40 manufacturing sites** in **17 countries**



**Design capability**  
for SoC-CMOS, RF-CMOS,  
Analog, Mixed Signal, MEMS,  
Power

- Headquarter
- ▲ ECU R&D
- ECU Manufacturing
- ▲ SC R&D
- SC Manufacturing Frontend
- SC Manufacturing Backend

## USA

Anderson ■  
Plymouth ▲  
Sunnyvale ▲  
Tempe ▲  
Roseville ▲

## Mexico

Celaya ■  
Guadalajara ▲  
Juarez ▲

**Ireland** Limerick ▲

## Netherlands

Eindhoven ▲  
Enschede ▲

## Germany

Reutlingen ■  
Ansbach ▲  
Blaichach ■  
Bühl/Bühlertal ▲  
Munich ■  
Cottbus ▲  
Dresden ▲  
Erlangen ▲  
Schwieberdingen ▲

## France

Mondeville ■  
Sophia Antipolis ▲

## Spain

Madrid ■  
Valencia ▲

**Portugal** Braga ▲

**Sweden** Lund ▲

## Finland

Oulu ▲  
Espoo ▲

**Ukraine** Kyiv ▲

**Romania** Cluj ▲

**Bulgaria** Sofia ▲

## Hungary

Budapest ▲  
Hatvan ▲

**Austria** Linz ▲

**Italy** Milano ▲

## India

Bangalore ▲  
Coimbatore ▲  
Naganathapura ■

**Australia** Clayton ▲

## China

Hongkong ▲  
Shanghai ▲  
Suzhou ▲  
Wujin ■

## Taiwan

Taipei ▲

## Vietnam

Ho Chi Minh City ▲

## Malaysia

Penang ■

# Example - Semiconductors and ECUs from ME in Automotive

**Electronic Control Units**  
 **Semiconductors & Sensors**  
 **Function**

**Electrical Steering**  
**Integrated Circuits, Sensors, Power SC**  
 Steering support  
 Vibration monitoring

**Power Electronics**  
**Integrated Circuits, Power SC**  
 Regulate the flow of energy in electric vehicles

**Airbag Control Unit with Satellite Sensors**  
**Integrated Circuits, Sensors**  
 Signal a collusion and trigger the airbags

**Power Train Control Units**  
**Integrated Circuits, Sensors**  
 Optimize Engine Control and smooth Power Train Operation

**Door Module**  
**Integrated Circuits, Sensors**  
 Controls window lifters and exterior mirrors, detect side impact, key-fob

**Video Camera**  
**Integrated Circuits**  
 Detecting obstacles on the road

**Comfort Sensors**  
 Detecting road noise  
 Active suspension  
 Navigation

**ADAS & Radar**  
**Integrated Circuits, Sensors**  
 Measures distance to other vehicles and localization



**Park Pilot**  
**Integrated Circuits, Sensors**  
 Calculate the distance to obstacles

**ABS / ESP**  
**Integrated Circuits, Sensors**  
 Controls the brake hydraulics for each wheel

Example – MEMS from ME in Space:

# NASA MISSION

Bosch MEMS sensors  
stabilize

**NASA'S INGENUITY  
MARS HELICOPTER**



#InventedForLife

Source: [www.nasa.gov](http://www.nasa.gov)





# ME

Mobility Electronics  
Bosch Mobility

# The European Chips Act:

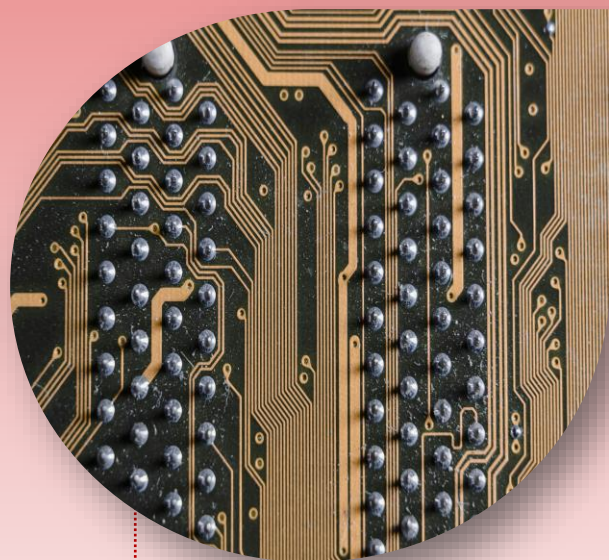
Setting Europe's industrial ambitions in motion

# Bosch and European Chips Act

*“Europe can and must capitalize on its own strengths in the semiconductor industry.”*

Stefan Hartung, Chairman of the Board of Management - Robert Bosch GmbH

## The European Chips Act



**From Lab-to-Fab** Globally  
Competitive R&D  
outcomes with impact to  
industry and society.



**The Green Transition** Catalyze  
sustainability already at the  
component level.



**STEM Skills Boost**  
Turning the tide on talent  
shortages where they matters  
most.



**Bringing investments home**  
Sustaining the political momentum to  
inspire confidence in Europe as global  
semiconductor industry Standort.



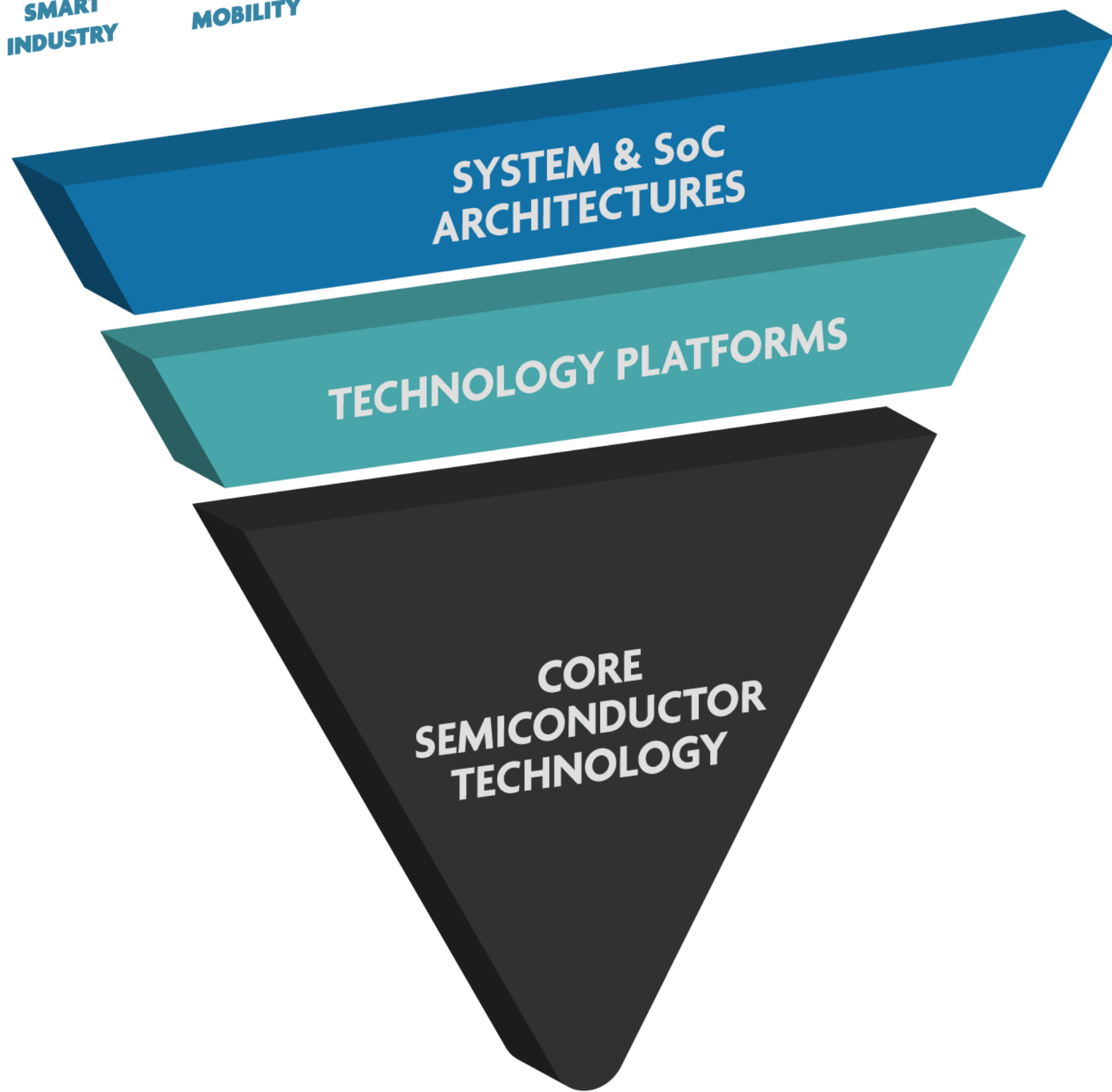
Let's innovate in Europe

#LikeABosch



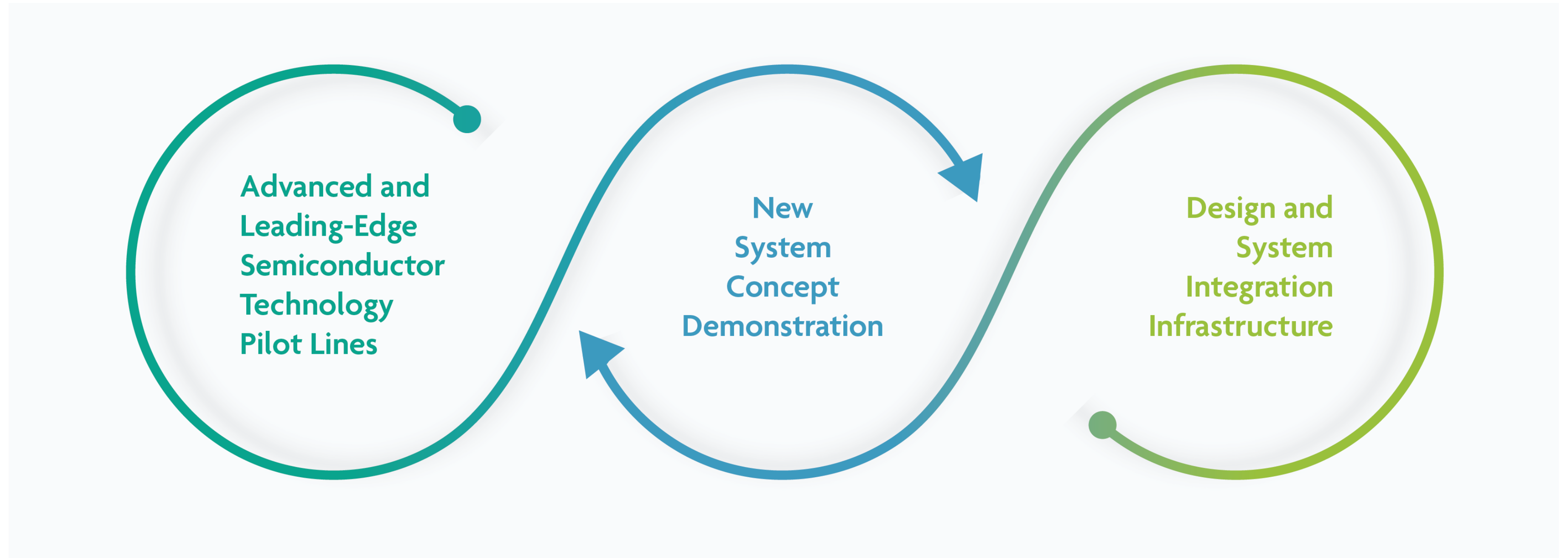
The image shows the flag of the European Union, which is a blue field with twelve five-pointed gold stars arranged in a circle. The flag is waving on a white pole against a clear blue sky. The text "TECHNOLOGY AND INNOVATION LEADERSHIP" is centered on the flag in white, bold, uppercase letters.

**TECHNOLOGY  
AND INNOVATION  
LEADERSHIP**



# Chips for Europe Initiative

A combination of technology leadership and design platform



# SUPPORTING COMPANIES' INNOVATION LIFECYCLE

idea

design

prototyping

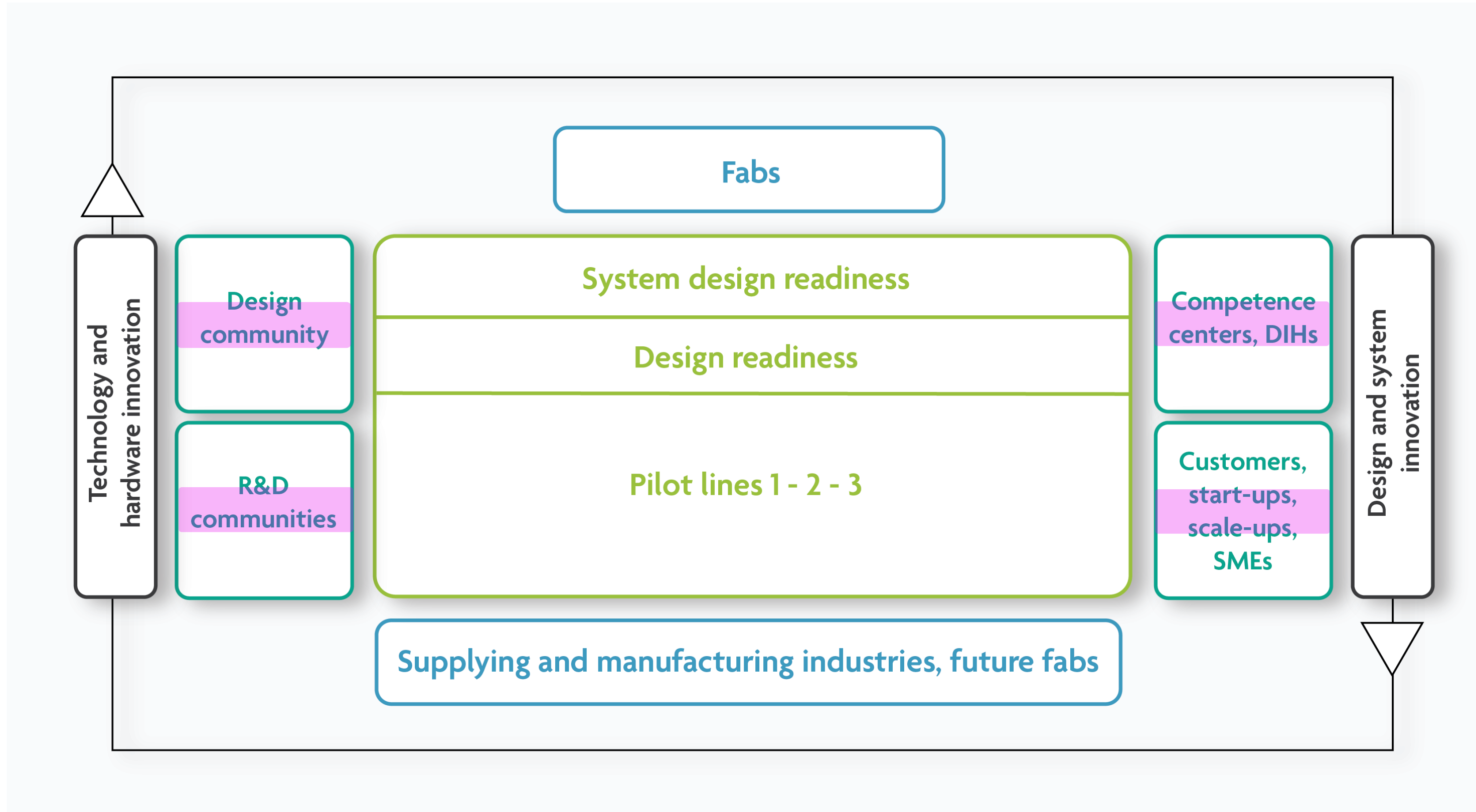
testing

production

growth

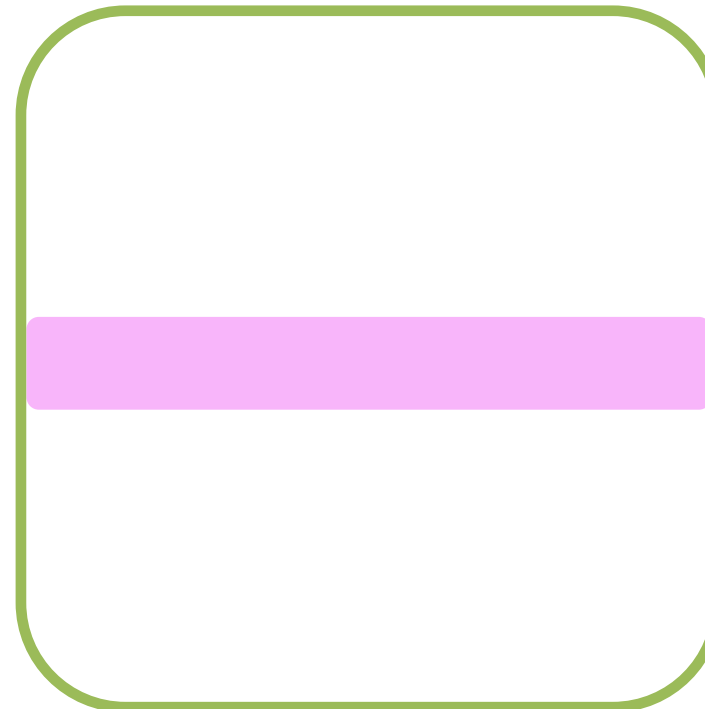
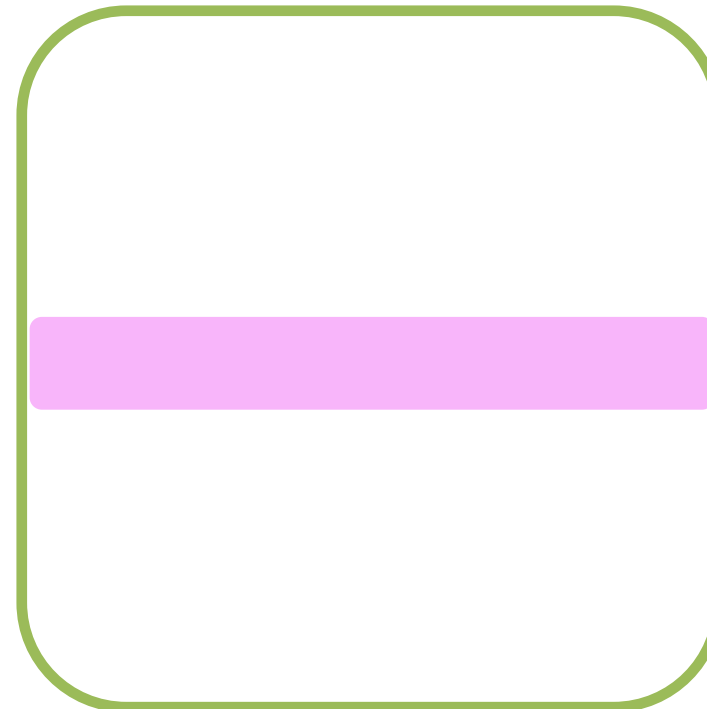
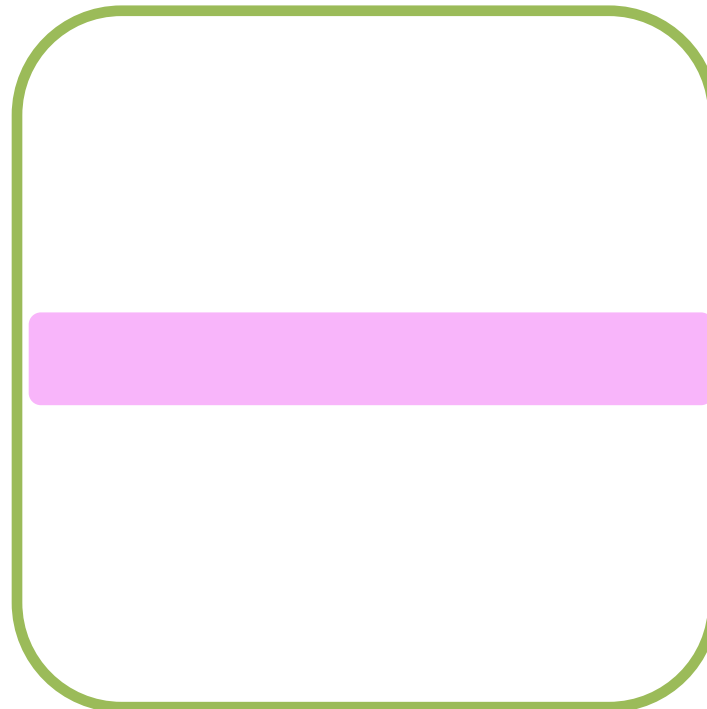
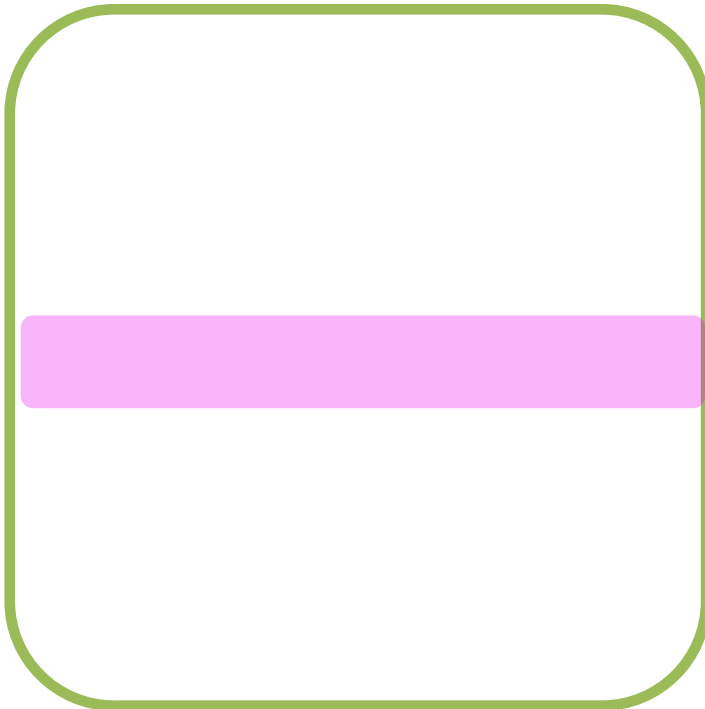
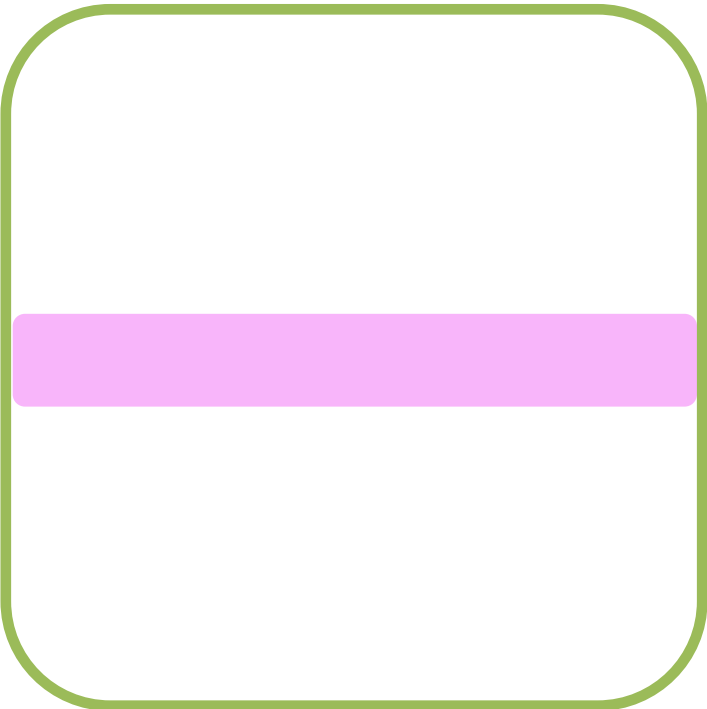
# Chips for Europe Initiative

A combination of technology leadership and design platform





# OPPORTUNITIES FOR INNOVATION



# RESEARCH TO REALITY

DIGITAL SOLUTIONS TO  
EUROPEAN CHALLENGES



Flanders  
State of the Art



Wallonie  
service public  
SPW

innoviris  
.brussels  
we fund your future

