



DRIVING INNOVATION IN MANUFACTURING

"CONDITIONS FOR A SUCCESSFUL AND COMMERCIAL  
BENEFIT DELIVERING BUSINESS VS. SCIENCE  
COOPERATION" - THE BELGIUM/ FLANDERS CASE

DR.IR. DIRK TORFS, CEO FLANDERS MAKE

4<sup>TH</sup> ANNUAL ECONOMIC FORUM,  
VILNIUS NOV 6<sup>TH</sup>, 2018



## OUR DESTINY



**Grow Fast or Die Slow**



## AGENDA

1. Flanders Status & Smart Specialization
2. Ecosystem innovation
3. Flanders Make ecosystem innovation
4. Instruments for Innovation
5. Results of Ecosystem innovation
6. Conclusion

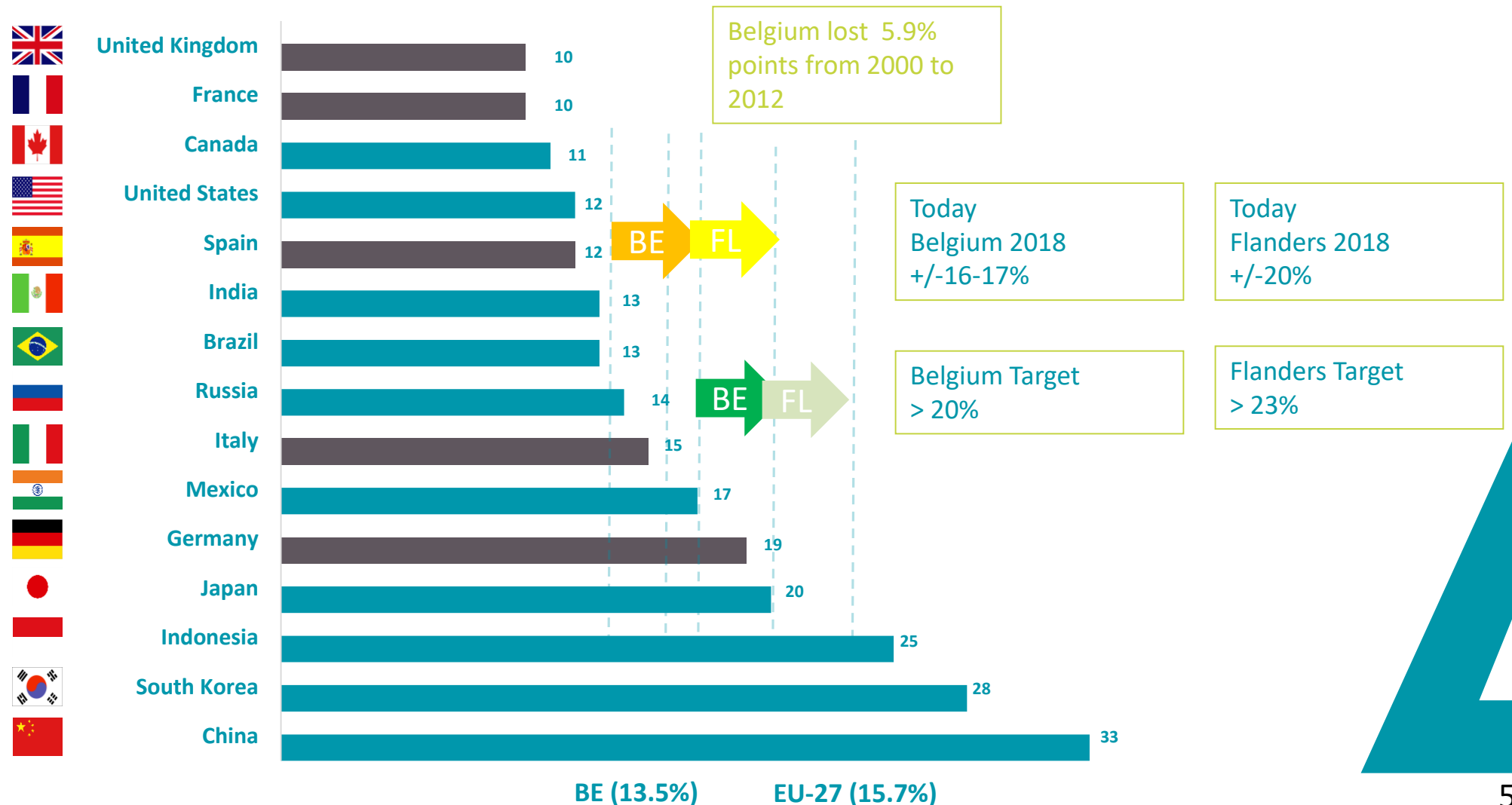


# FLANDERS STATUS & SMART SPECIALISATION

The future of the industry in Belgium/Flanders



# The share of the manufacturing industry in the GDP of the top-15 manufacturing nations ranges between 10 and 33 %

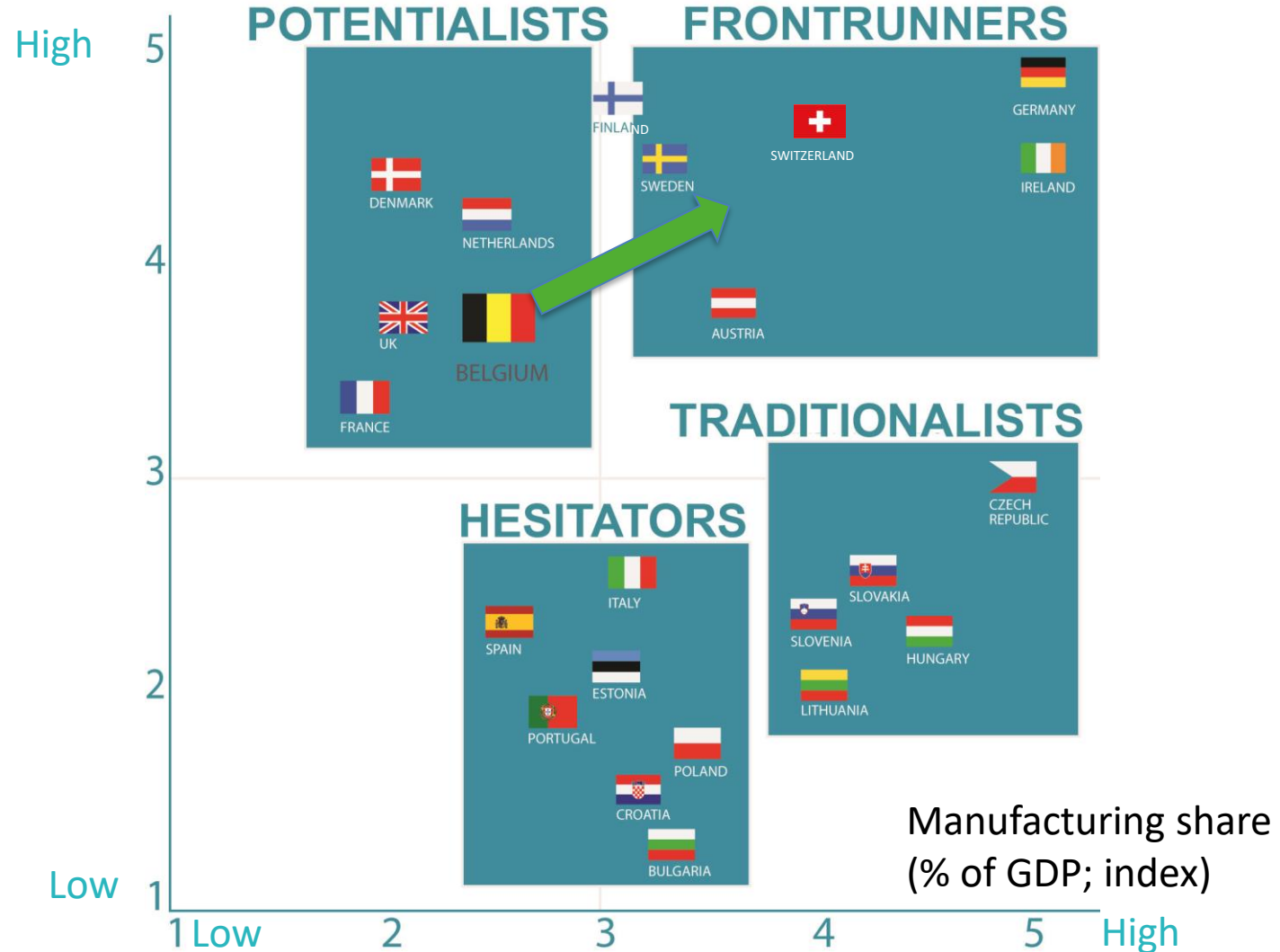


SOURCE: United Nations Statistics Division; US Bureau of Economic Analysis (BEA); McKinsey Global Institute Analysis



# TOWARDS A EUROPE WITH MORE MANUFACTURING

Industry 4.0 Readiness Index (=manufacturing excellence + value network)



Source: Roland Berger, 2015

# HOW FLANDERS' 4 STRATEGIC RESEARCH CENTERS KICK-START YOUR R&D SUCCESS



Flanders Make

- >500 full-time researchers
- product and production technology and processes

VITO



- 750 experts
- the **world's largest** multidisciplinary research center
- energy, materials, environment



VIB

- 1,470 scientists from 60+ countries
- biotechnology
- life sciences

imec

imec

- 3,500 international researchers
- micro- and nanotechnology
- digital technology

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# ECOSYSTEM INNOVATION

The future of the industry in Belgium/Flanders

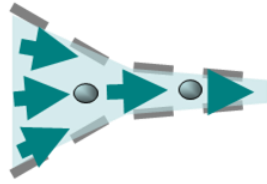






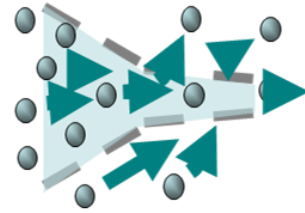
## TYPES OF INNOVATION

**Breaking boundaries for moving to genuine mash-up!**



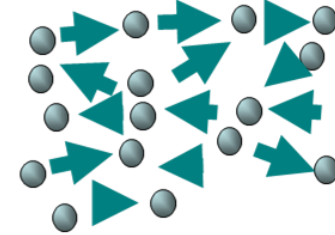
**Centralized  
inward looking  
innovation**

*Closed Innovation*



**Externally  
focused,  
collaborative  
innovation**

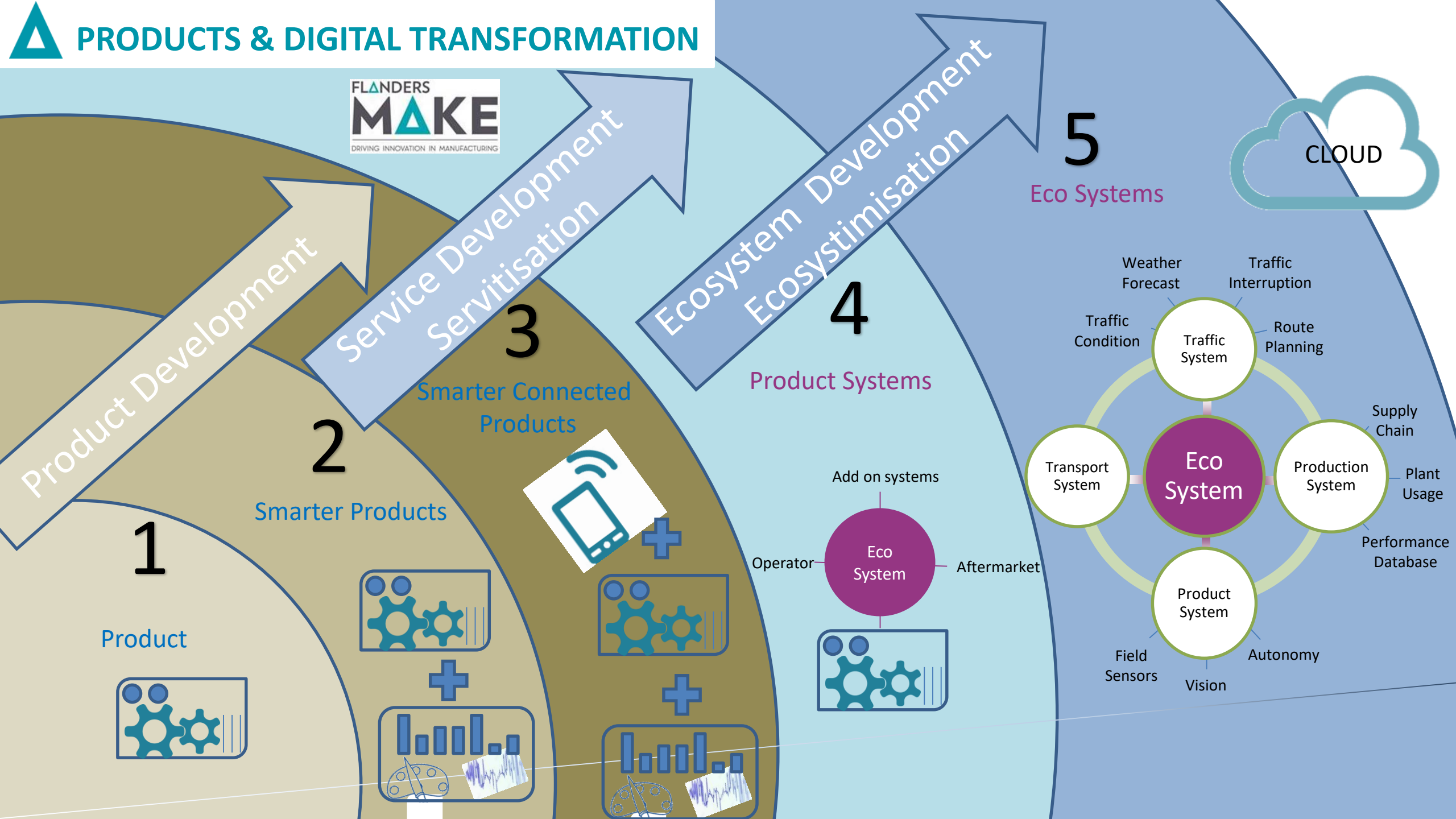
*Open Innovation*



**Ecosystem centric,  
cross-  
organizational  
innovation**

*Innovation Networks*

Sources: From a presentation by Bror Salmelin 2013 based on Chesbrough 2003, Forrester 2004, von Hippel 2005



Product Development

Service Development  
Servitisation

Ecosystem Development  
Ecosystemisation

5  
Eco Systems

4  
Product Systems

2  
Smarter Products

3  
Smarter Connected  
Products

1  
Product

CLOUD

Eco System

Transport System

Traffic System

Production System

Product System

Weather Forecast

Traffic Condition

Traffic Interruption

Route Planning

Supply Chain

Plant Usage

Performance Database

Add on systems

Operator

Eco System

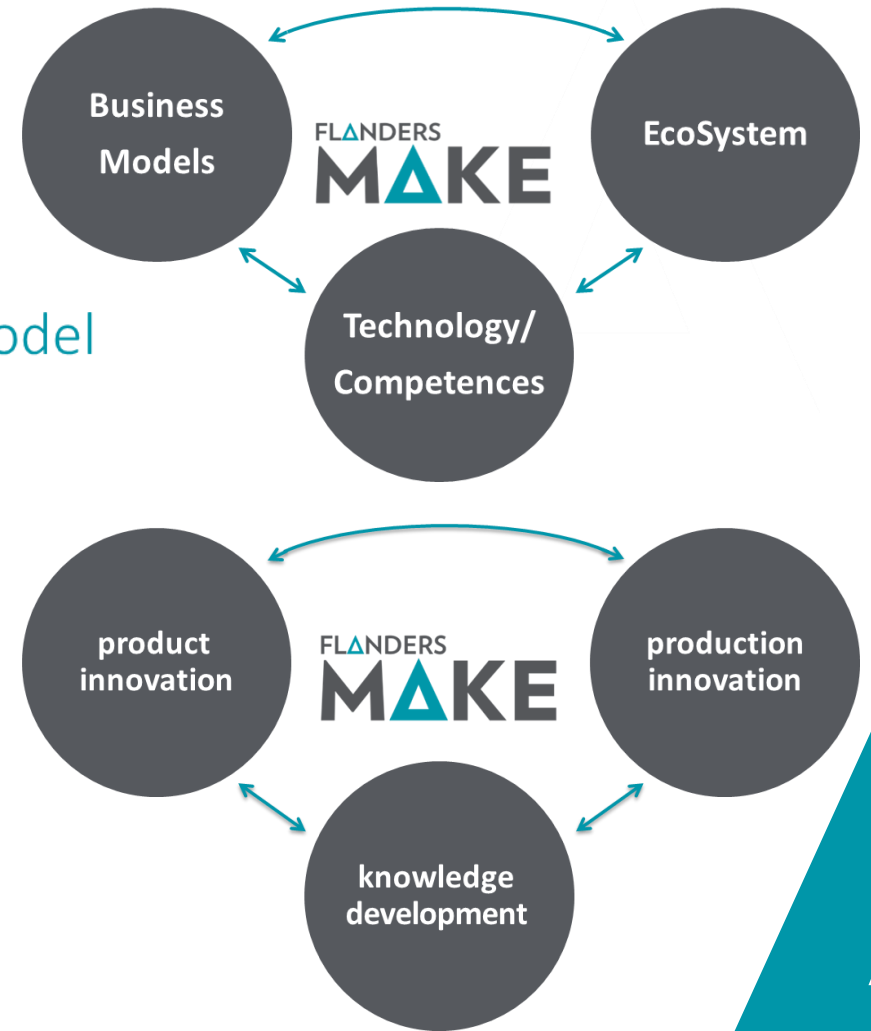
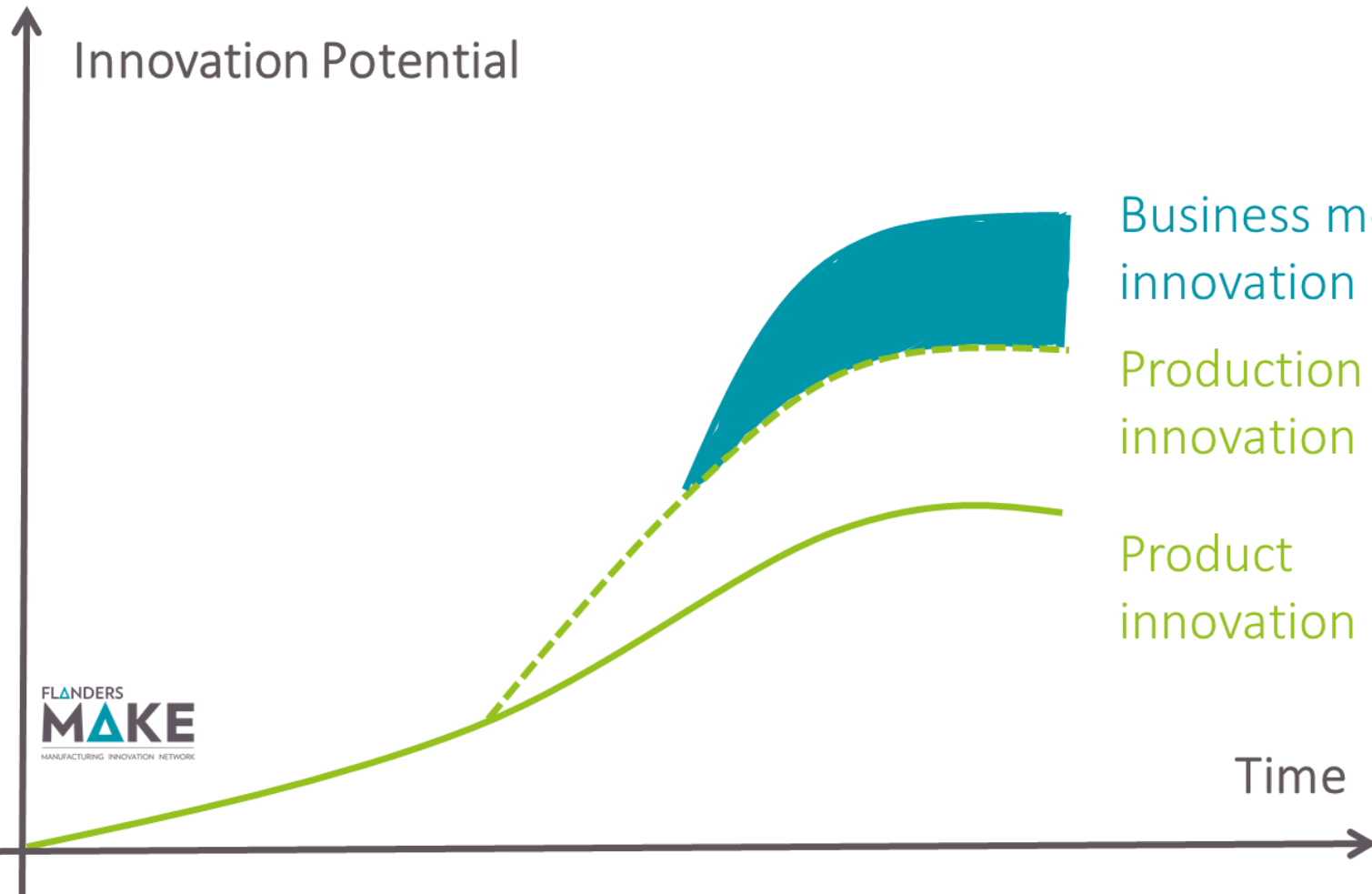
Aftermarket

Field Sensors

Vision

Autonomy

# Innovation potential





# FLANDERS MAKE ECOSYSTEM INNOVATION

The future of the industry in Belgium/Flanders



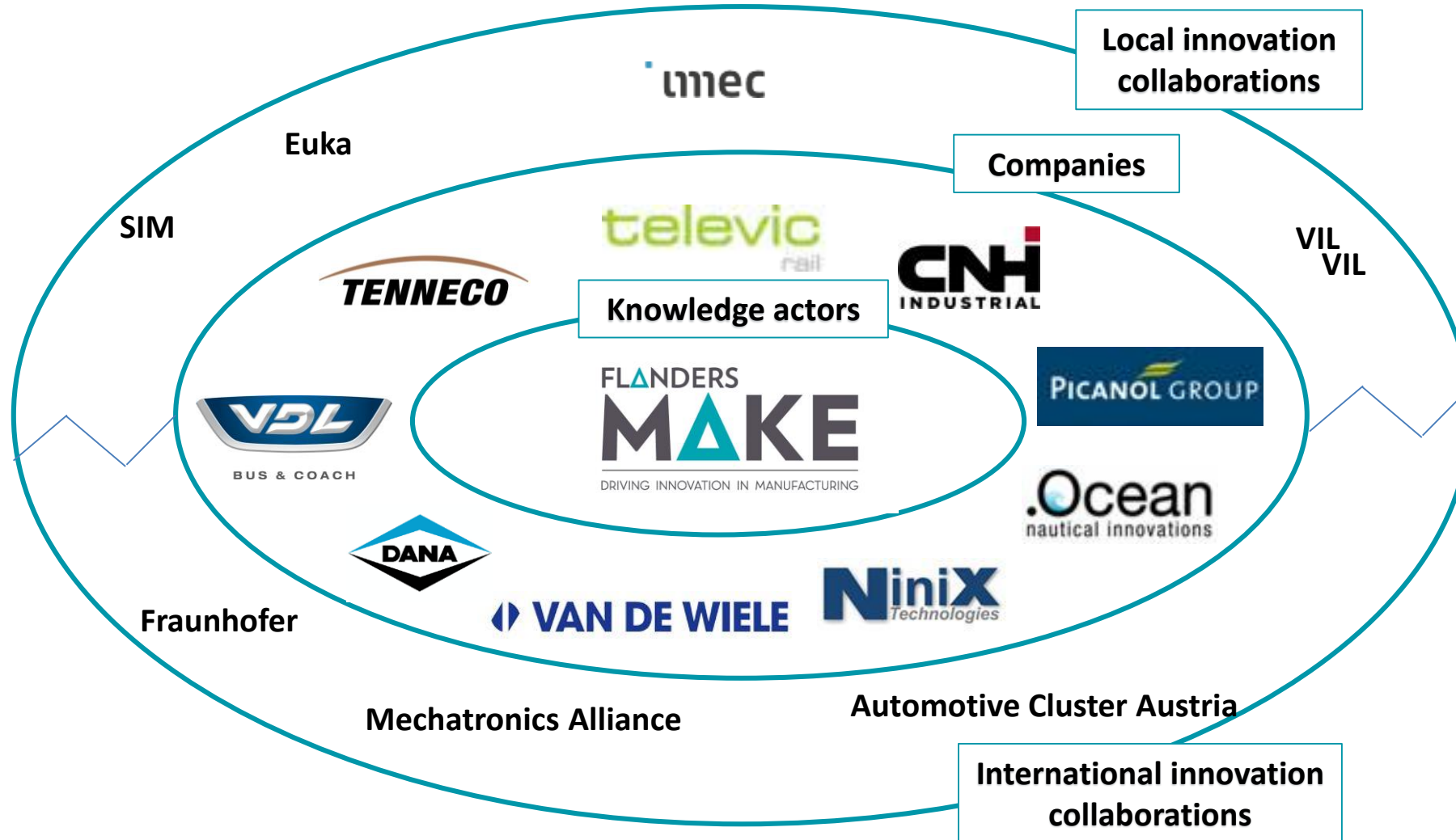
# Flanders Make's Ecosystem for collaboration on innovation



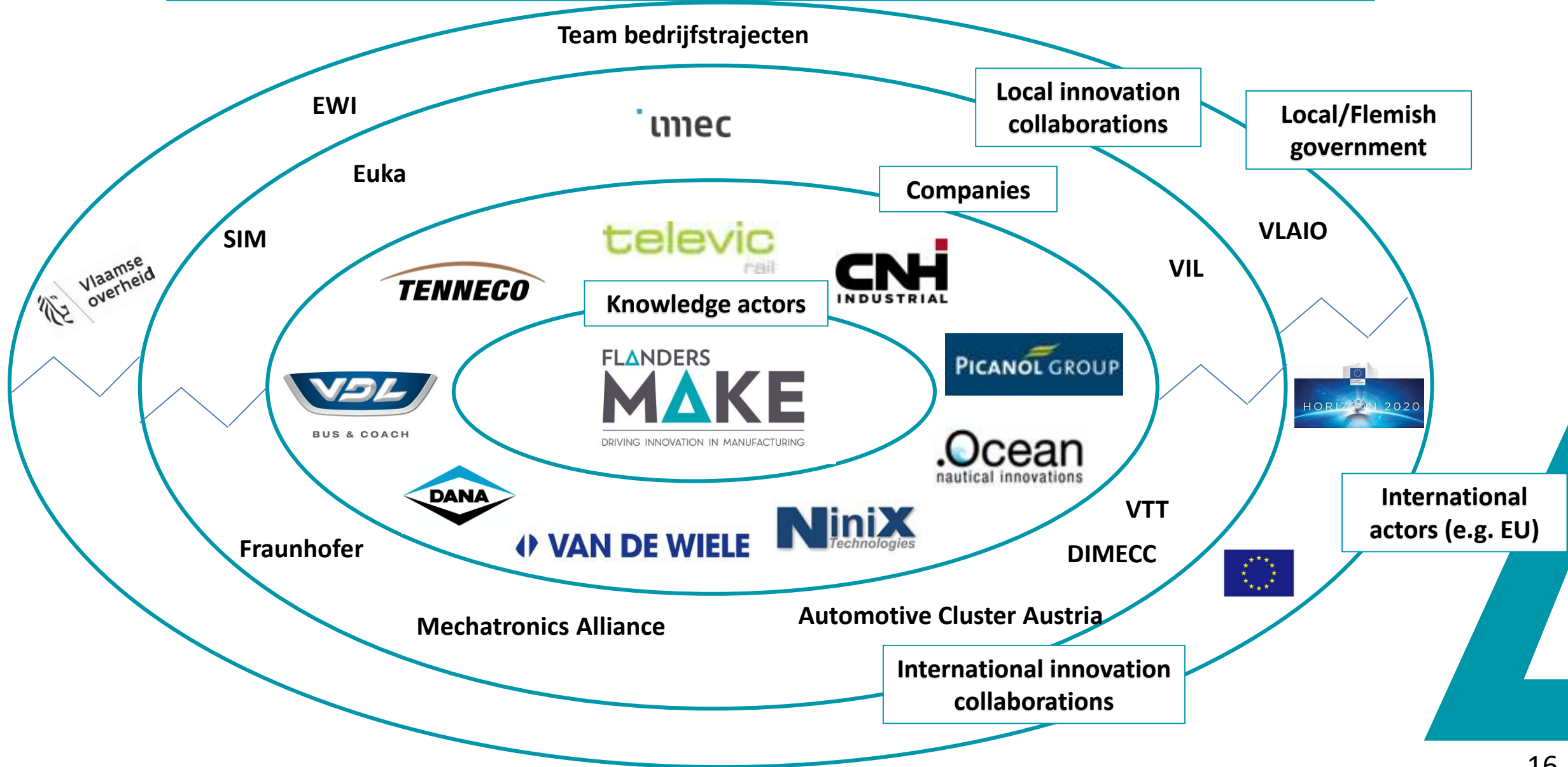
# Flanders Make's Ecosystem for collaboration on innovation



# Flanders Make's Ecosystem for collaboration on innovation



# Flanders Make's Ecosystem for collaboration on innovation





# Large companies and SME's (> 130)





# MANUFACTURING INDUSTRY



## Our role

- ▲ Anticipate, (help) formulate and tackle challenges and opportunities
- ▲ Create and transfer knowledge
- ▲ Strengthen companies' competences through a dynamic, collaborative ecosystem

**To provide an answer to the 3 driving market forces of Industry 4.0**

1. Smart, interconnected products and production systems
2. Customized products at the cost of series production
3. Human centered & sustainable manufacturing

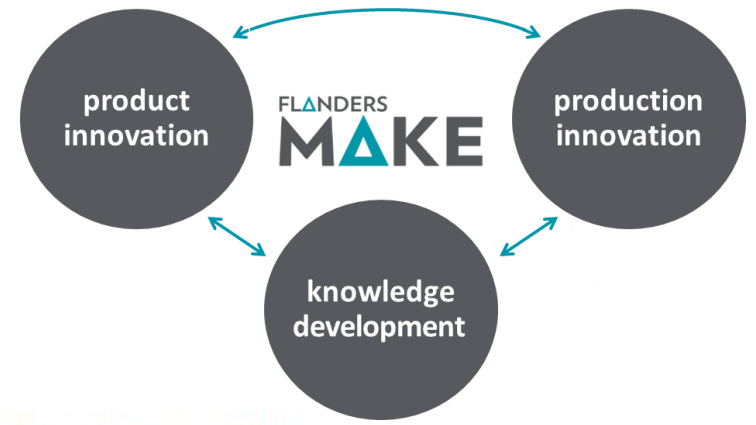


# Added value growth

Product & business model innovation

- Smart, connected products
- Product competitiveness
- Servitization

## TARGET GROWTH



# Manufacturing share growth

Production innovation

- Lot size one production
- Single flow production
- Increased product & production quality

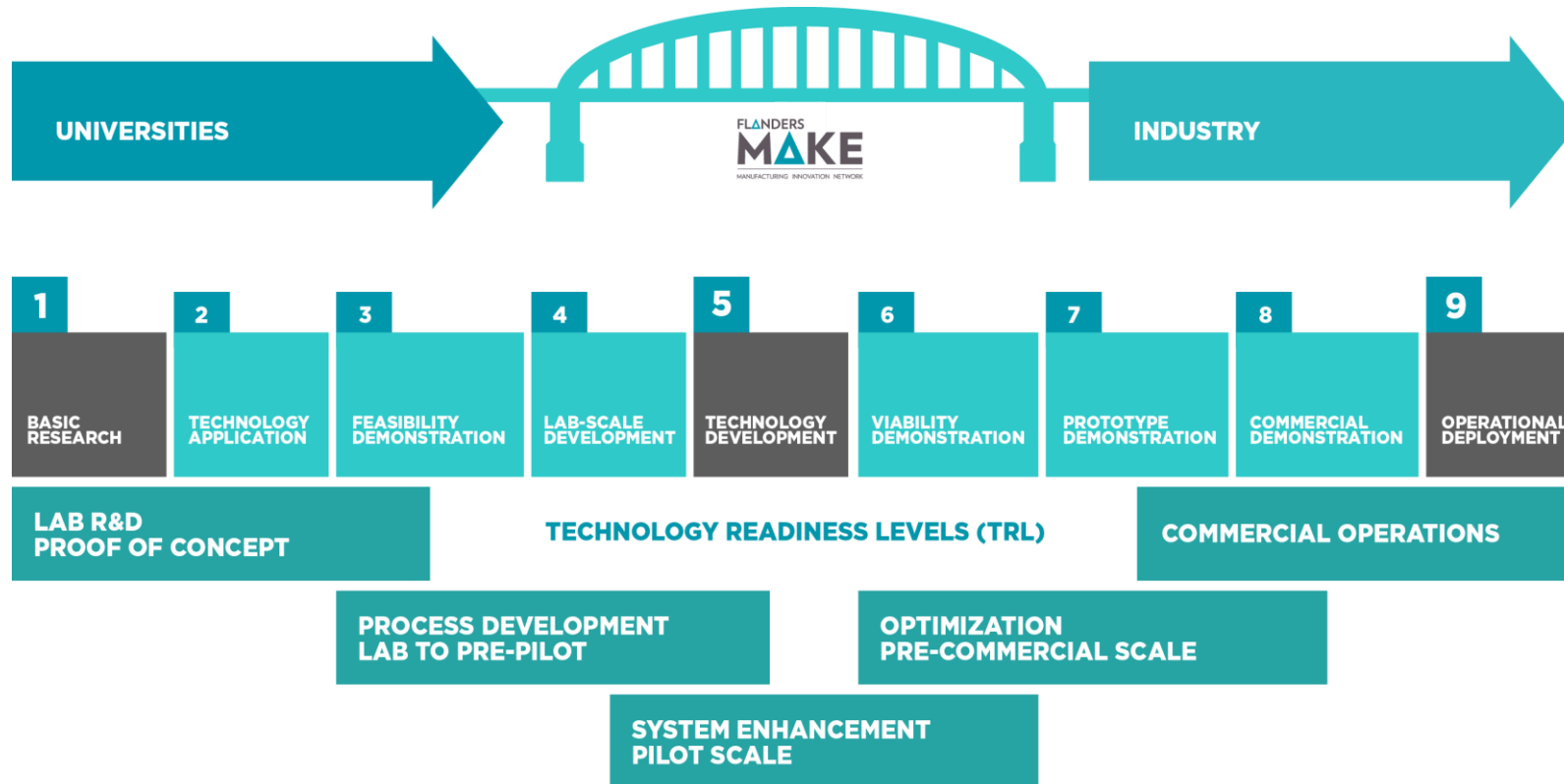


# INSTRUMENTS FOR INNOVATION

The future of the industry in Belgium/Flanders



# Innovation through collaboration





# OUR SERVICES TO COMPANIES



SMEs



Large Companies



## STATE-OF-THE-ART INFRASTRUCTURE

### FLANDERS MAKE : 3 CO-CREATION COMPETENCE SITES



Competence center  
**Vehicle developments**

Lommel  
4000 m<sup>2</sup>



Competence center  
**Machine development**

Leuven  
4000 m<sup>2</sup>



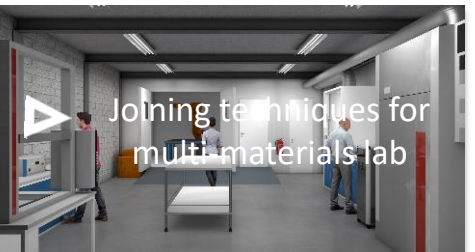
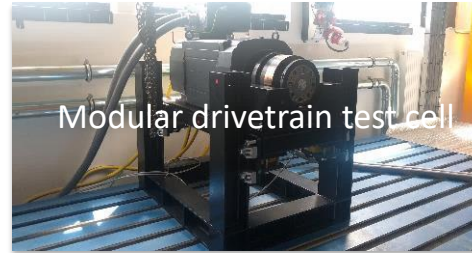
Competence center  
**Ind. 4.0, Lotsize 1-production**

Kortrijk  
6000 m<sup>2</sup>





# OUR RESEARCH INFRASTRUCTURE



# STATE OF ART MOBILE MAKE LAB

## Paperless Work instructions

▲ By projection on work space, tablet, smart glasses

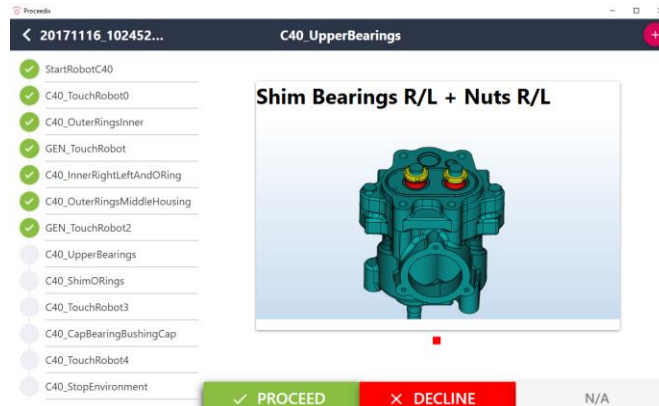
## Orderpicking by AR

## Operator training by VR

## Collaborative workcell robot – operator

▲ Assembly of a screw compressor from Atlas Copco

▲ Assembly of various wireless NIKO switches

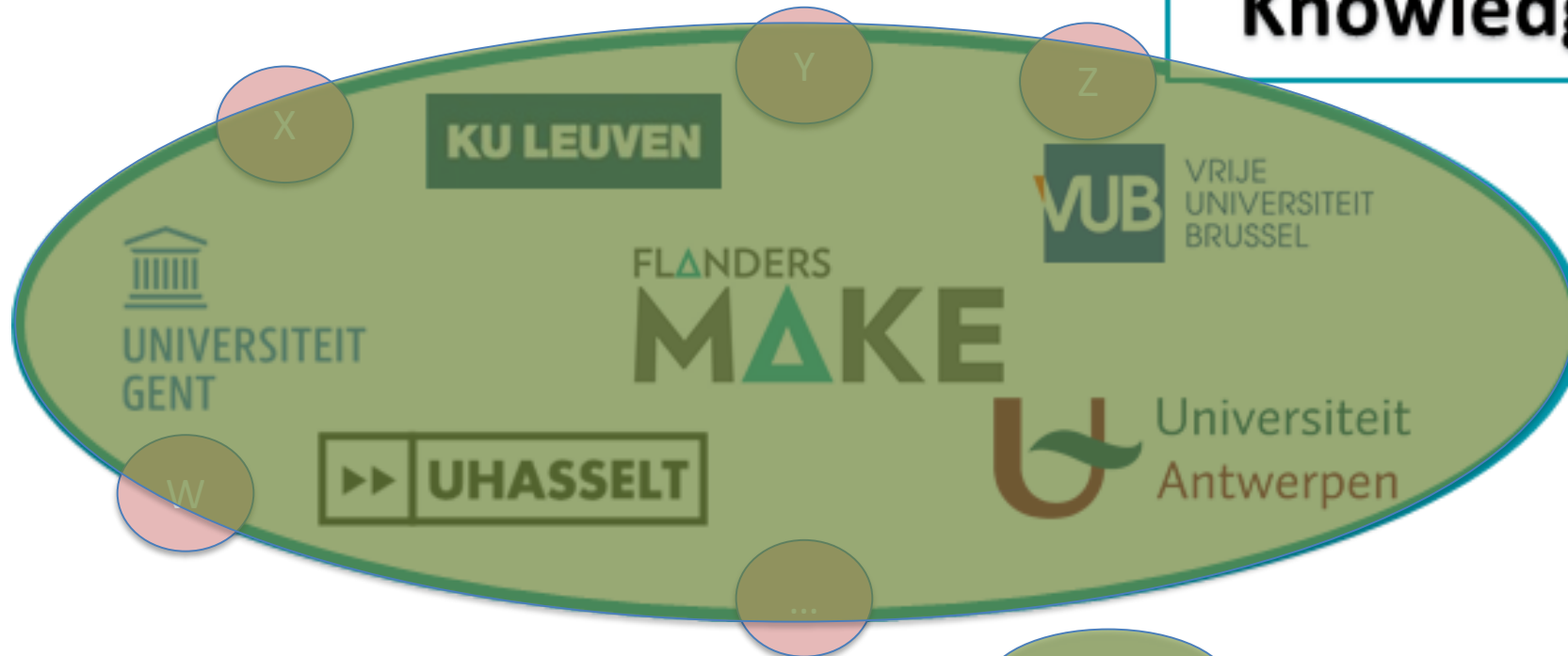





## STRATEGIC BASIC RESEARCH (SBR)

- 4 year project,
- pre-competitive long term research
- IP owned by knowledge actors

**Knowledge actors**



 Small validation cases from companies

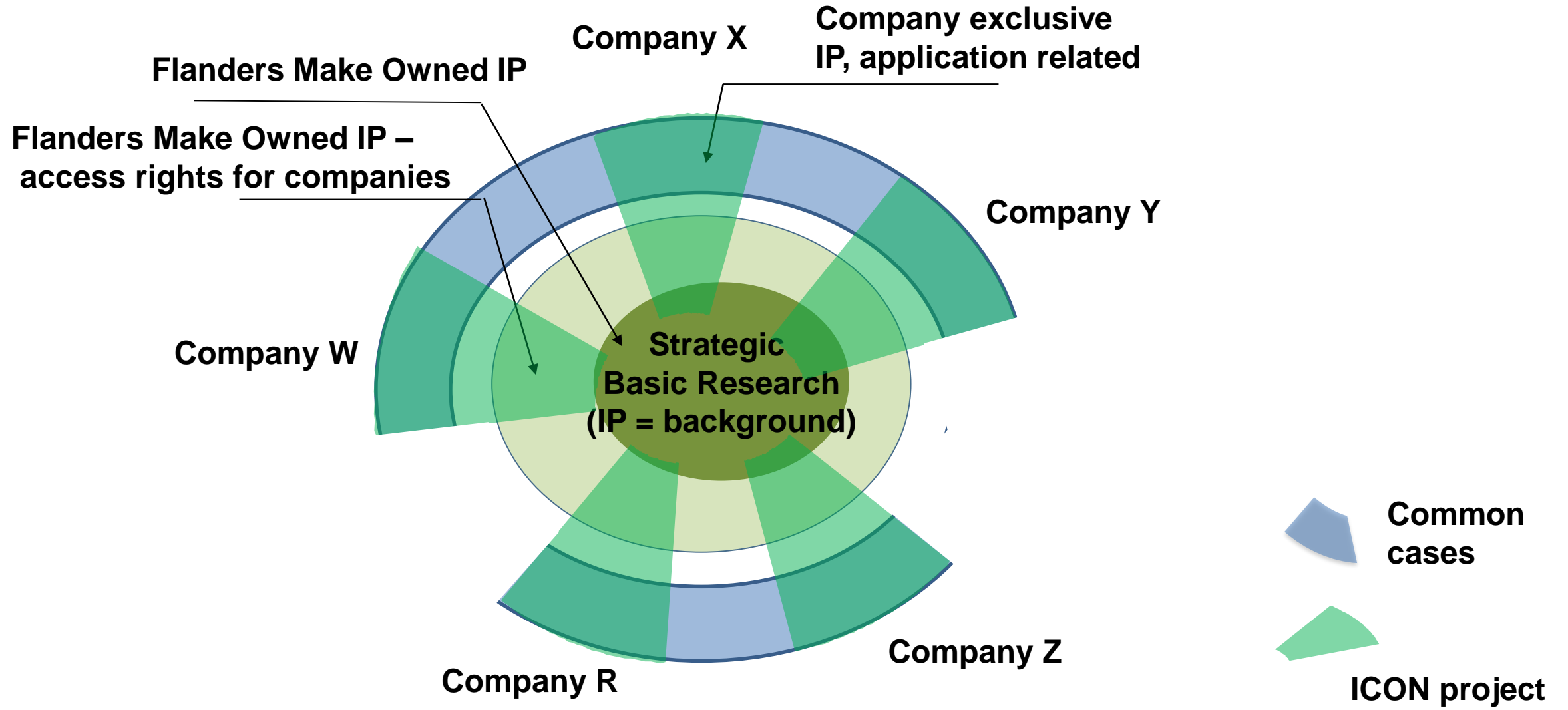
 Strategic Basic research



# INDUSTRIAL COLLABORATIVE RESEARCH (ICON)



# INDUSTRIAL COLLABORATIVE RESEARCH (ICON)





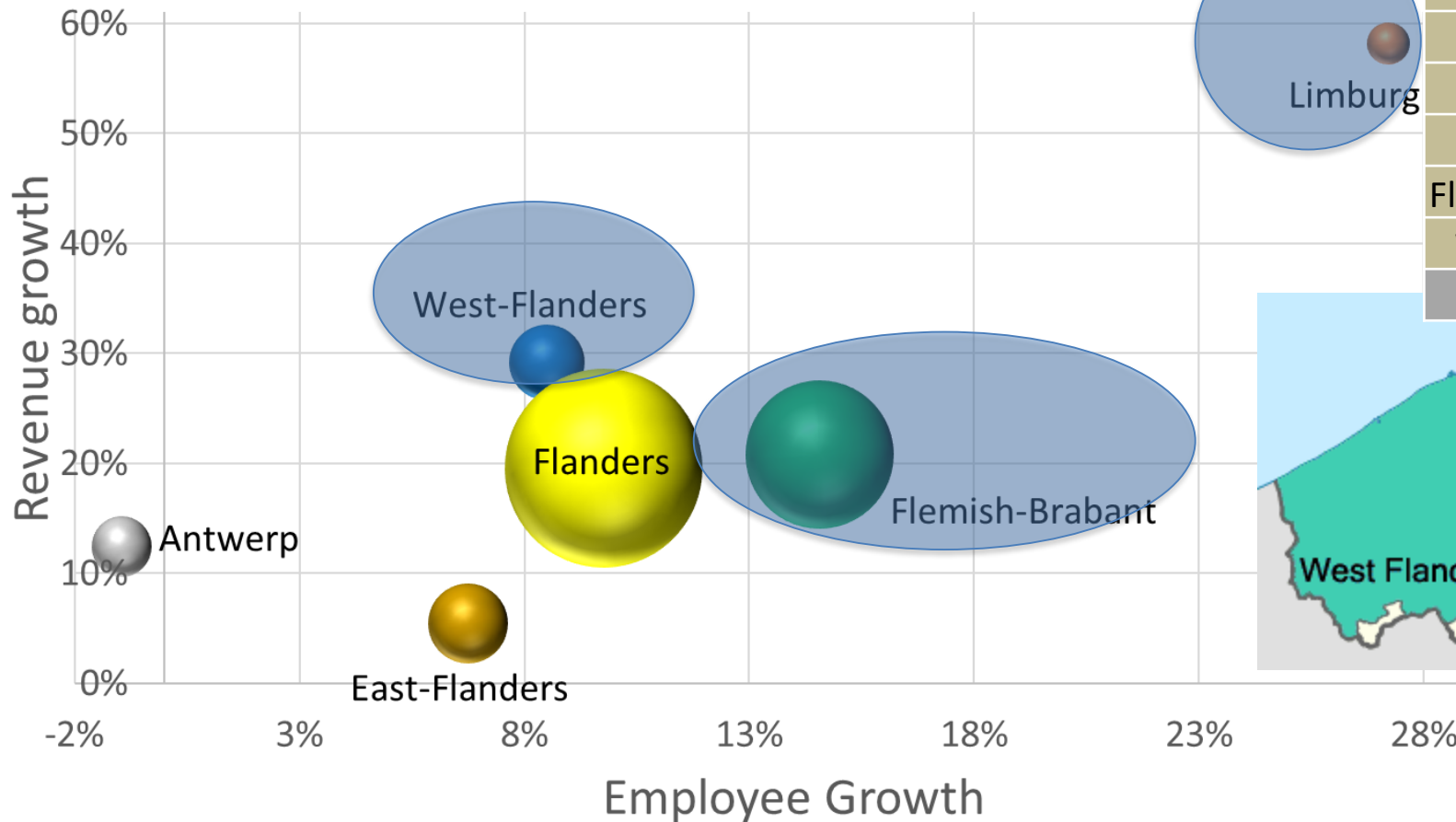
# RESULTS OF ECOSYSTEM INNOVATION

The future of the industry in Belgium/Flanders



# Our ecosystem and region results from member companies

Members : Employe Growth versus Revenue Growth (period 2014 => 2017)  
 Size of budget = revenue of region



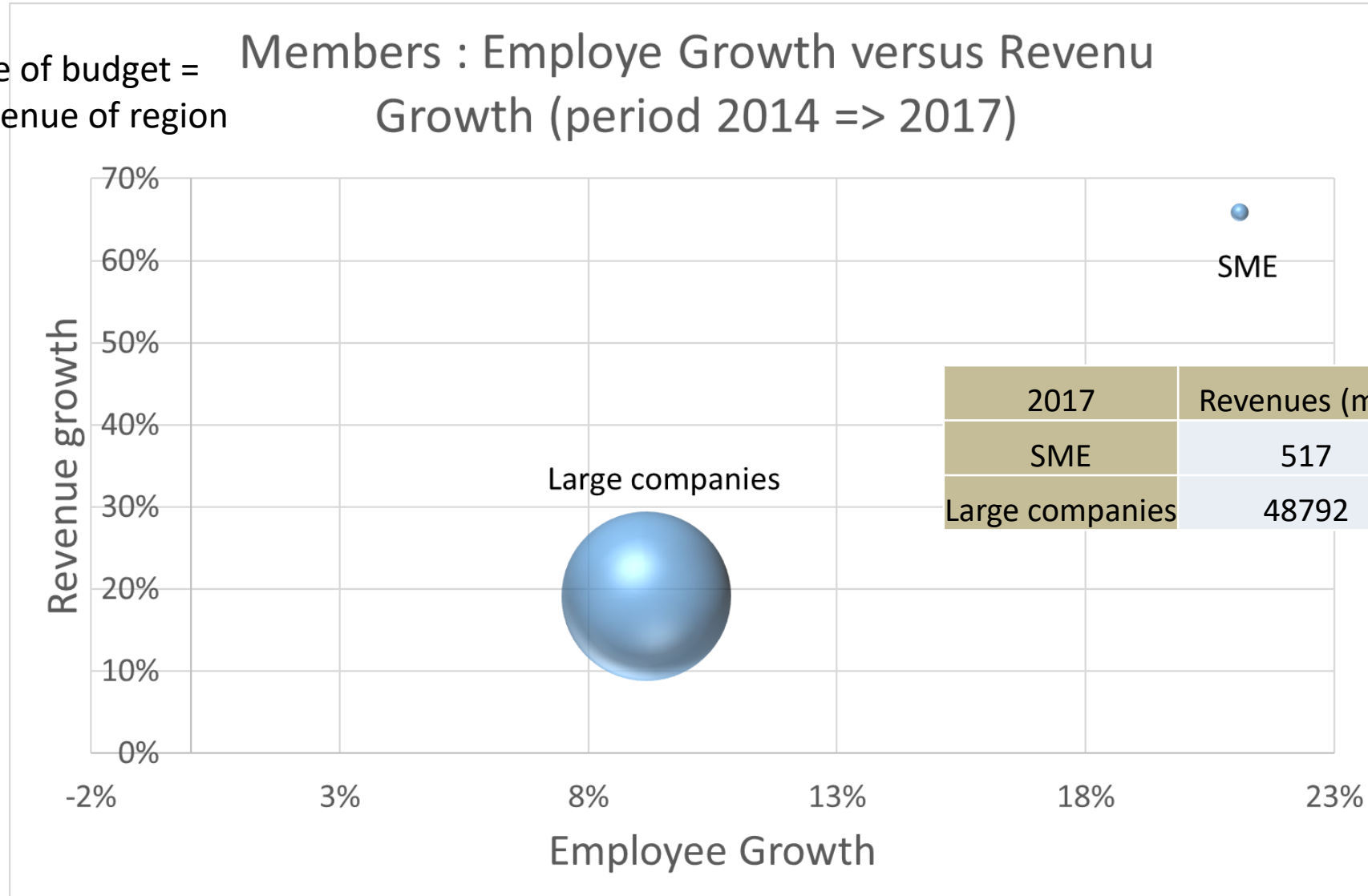
**Most active regions**

2017	Revenues (mln)	Employees
Limburg	2237	5125
Antwerp	4482	6503
East-Flanders	7962	9718
Flemish- Brabant	27655	10741
West-Flanders	6970	14934
<b>Flanders</b>	<b>49306</b>	<b>47021</b>



# Our ecosystem and company results (SME, LC)

Size of budget = Members : Employee Growth versus Revenue Growth (period 2014 => 2017)



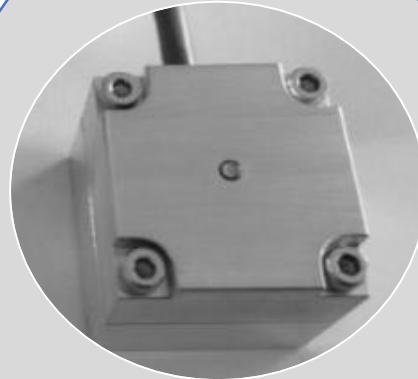


# Predictive maintenance with vibration monitoring system

## Building blocks



**Smart algorithms**



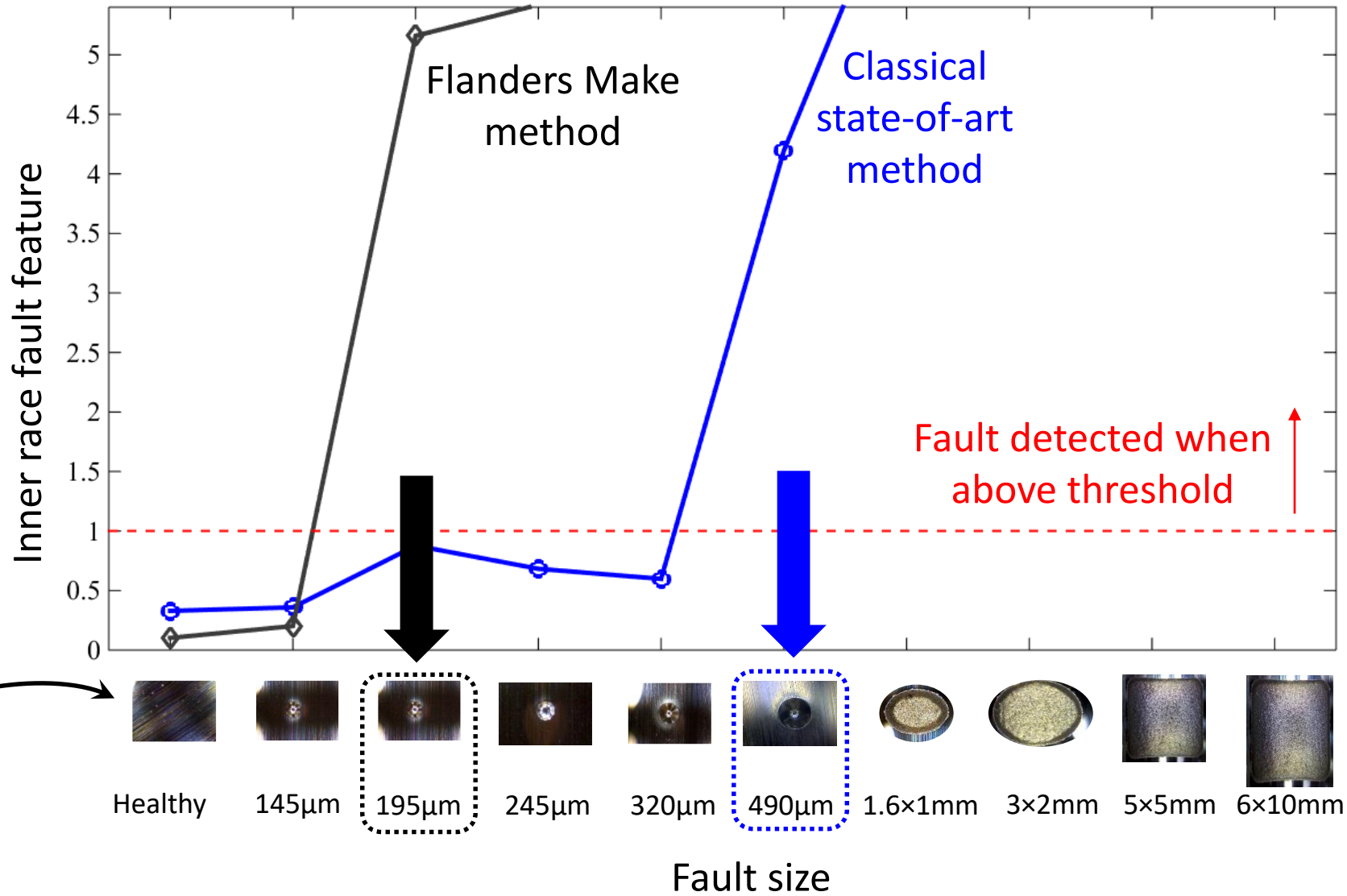
**MEMS accelerometer**



**Flexible platform**



# ALGORITHM DIAGNOSTIC PERFORMANCE





## VIBMON PROJECT





# CONCLUSION

The future of the industry in Belgium/Flanders



## Conclusion

- **The Discrete Manufacturing Industry in Flanders Is reporting strong results**
- **Innovation pays off**
- **Internal and external collaboration is key**
- **Government support enables innovation, derisks digital transformation and stimulates collaboration**



**Let's MAKE it happen**



# FLANDERS MAKE

DRIVING INNOVATION IN MANUFACTURING



**SYMPOSIUM: DISCOVER THE FUTURE OF THE  
MANUFACTURING INDUSTRY**

**November 27th, Antwerp, Belgium**