


Smart & Adaptive Production Systems



16 – 17 November, Barcelona Kick-off event and stakeholder workshop



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 Institute for Sustainable Technologies
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 **TECOS** – Slovenian Tool and Die
Development Centre

Why are we doing this



INSTEAD OF LEARNING TO SURF, CONVENTIONAL ORGANISATIONS TRY TO CONTROL THE WAVES! THIS ALMOST NEVER WORKS (ALEN WARD)

Key bullets

- **How** we started and **where** we are
- **Who** we are
- **What** is our action about
- **What** comes next



**Leading Regions:
Mazowieckie (PL) and Slovenia (SI)**

How THE partnership started

April 2016

We met Brussels at the start of Smart Specialisation Platform

Each of us presented their own initiative: “Smart Tooling” and “Mechanical and Precision Engineering”

May/June 2016

At Smart Regions conference in Brussels we joined forces to come up with the topic: “Smart Engineering and Tooling”

September 2016 -

After getting business coaching support from Ideaconsult we proceed in specifying the topic, which again was renamed: “Smart & Adaptive Production Systems”

A lot of company visits

Institute for Sustainable Technologies – National Research Institute (ITeE-PIB)



Established in **1986**

Employs **230** staff

Founding Member of **Radom Metal Cluster**
that facilitates sci-biz co-operation

The only **National Research Institute** functioning under
the auspices of the Ministry of Development

Completed approx. **300** industrial research
projects nationally

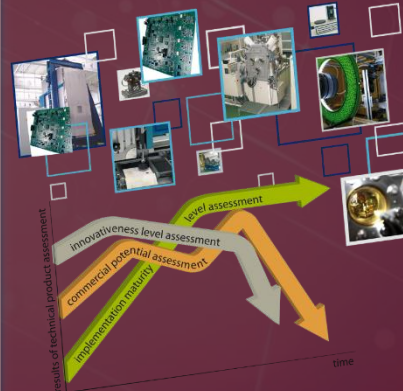
Aiming to strengthen the activities of the region in the European Research Area
for **2017 – 2020** period and beyond

What we do

DEVELOPMENT,
TESTING OF
PRODUCT &
PROCESS
INNOVATIONS



DEVELOPMENT
OF LABORATORY
RESEARCH DEVICES



EDUCATION
AND TRAINING



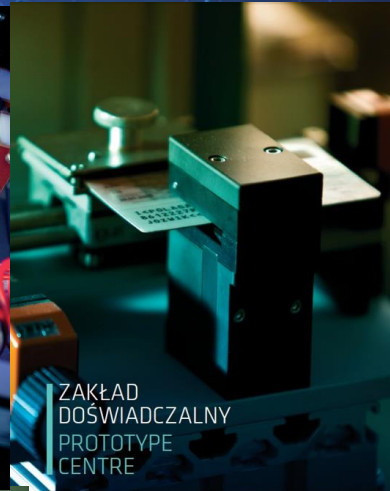
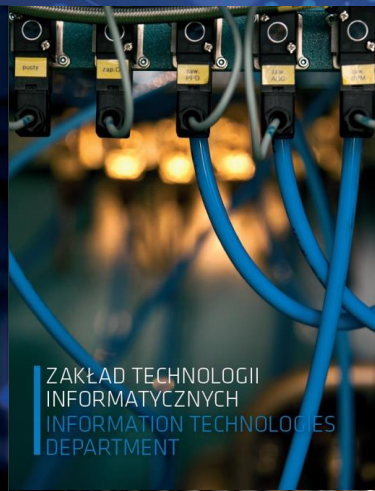
BUSINESS
ACADEMIA
GOVERNMENT
CITIZENS

FORESIGHT

Projects and capacity building activities to support internal decision making processes in research and development, to help co-operating entities to re-visit business strategies or to develop public policies at local, regional, national and European levels.

What we do

OPTO-MECHATRONICS IT & CONTROL SYSTEMS PROTOTYPING & TESTING



VOCATIONAL
EDUCATION



INNOVATION
MANAGEMENT

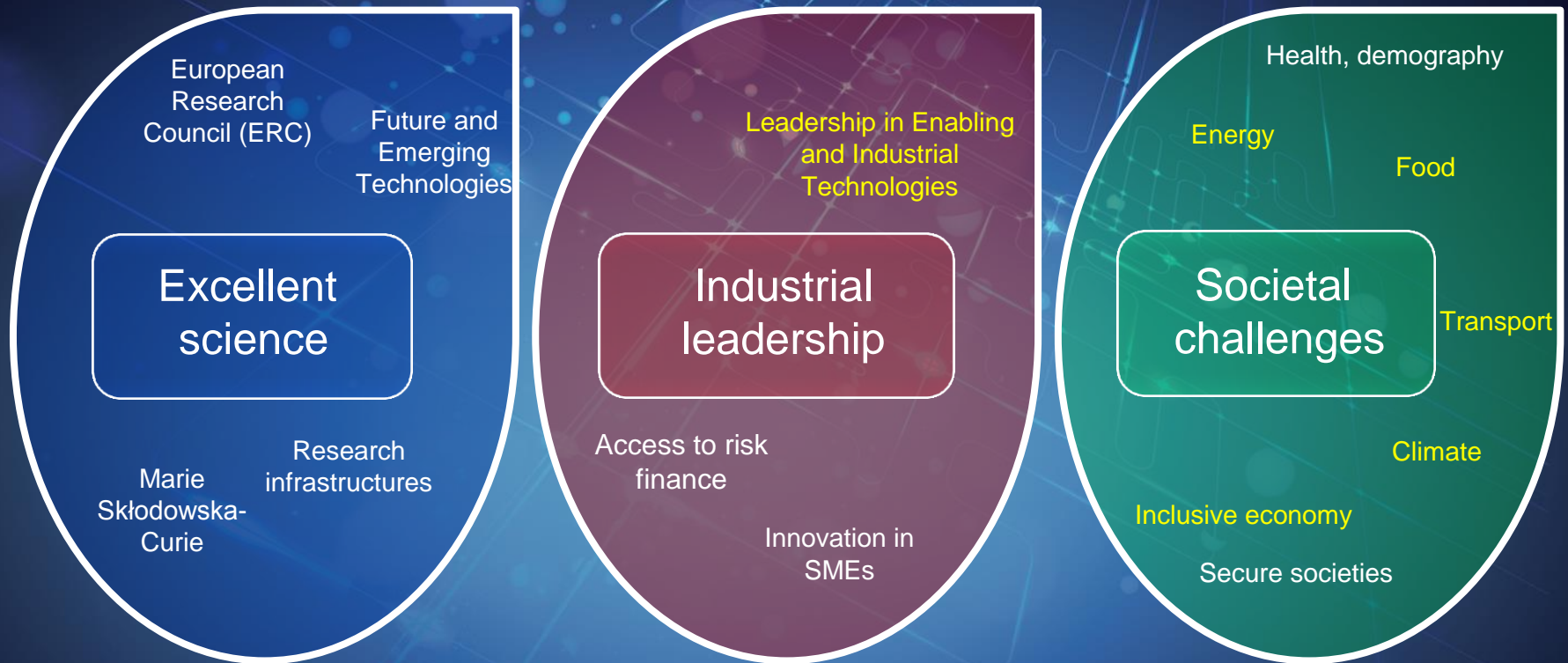
INDUSTRIAL
BIOTECHNOLOGIES

ENVIRONMENTAL
TECHNOLOGIES

MATERIALS

SURFACE
ENGINEERING

What is our H2020 orientation



Cross-cutting activities

Spreading excellence
and widening participation

Science with and
for society

EIT

JRC

Key facts about Mazovia – S3



Mazovia S3 priorities:

- ❖ Safe food,
- ❖ High quality of life,
- ❖ Professional services for business,
- ❖ Intelligent management systems.



Warsaw – central institutions, R&D institutes, the majority of the most innovative companies, well developed market services

Peripheries – 5 subregions, low wages, brain drain, low level of social capital

Rudnicka M., Mazovia: Towards a RIS3 strategy, Potsdam, 2013

Key facts about sub-region

radom
power in precision

The motto highlights that Radom is the center of new technologies and industries, especially **metal machining**.

TOOLS & MACHINERY

METAL MACHINING

FOOTWEAR

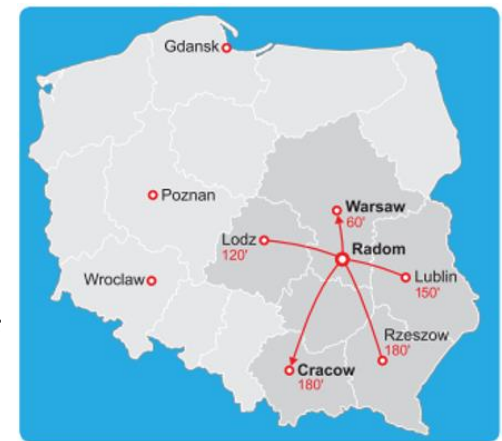
CLOTHING

FOOD & BEVERAGES

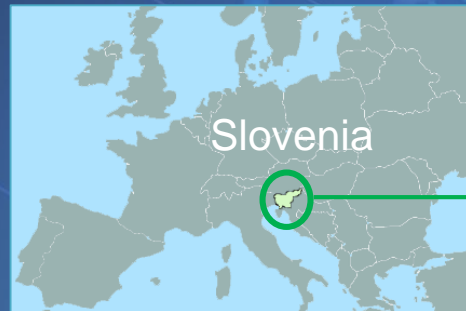
CONSTRUCTION

- Domestic and foreign enterprises operating in dominant industry: **metal machining**
- **Radom Metal Cluster** incl. Institute for Sustainable Technologies – National Research Institute
- Work in progress: centre of **additive manufacturing technologies**

200 000 inhabitants
25 000 business entities
3rd largest **special economic zone**



TECOS – Slovenian Tool and Die Development Centre



- Private non for profit research & technology centre founded in 1994 on the initiative of Slovenian Toolmakers & Processing Companies
- TECOS's Founders:
 - ❖ Government of Republic of Slovenia
 - ❖ Municipality of Celje
 - ❖ Chamber of Commerce and Industry of Slovenia
- TECOS today operates on three dimensional assets as **International Business Cluster, R&D Centre & VET Institution**, providing top level services not only for Tool, Die & Mould-making industry but also to other Slovenian companies related to the manufacturing sector

TECOS – Slovenian Tool and Die Development Centre

KEY FIGURES:

- ❖ Turnover - 1.4 million €
- ❖ Employees - 17
- ❖ Market - Plastic & Metal Processing Industry
- ❖ Products - Services
- ❖ Slovenian & EU market



R&D Department:

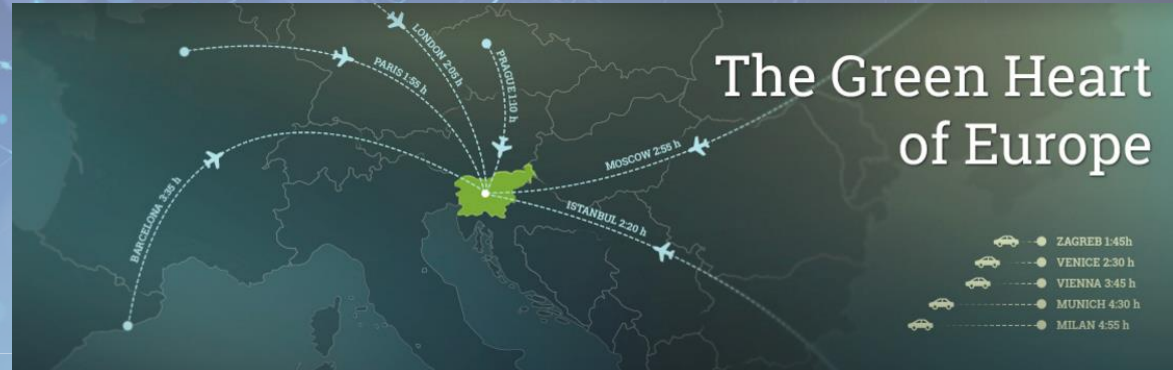
- ❖ Industrial Projects (50 %)
- ❖ National projects (10 %)
- ❖ International projects (40 %)



Industrial Network:

- ❖ 67 members of which 41 are SMEs and 18 large companies

Key facts about Slovenia – S4



- ❖ Area: 20.273 km²
- ❖ Capital city: Ljubljana
- ❖ Population: 2 million
- ❖ GDP per Capita (PPP): €38,543 billion
- ❖ Slovenia's GDP is 91% of the EU average,
- ❖ ranking it 16th out of 28 countries
- ❖ Inflation (annual average rate): 1.8 %
- ❖ Registered unemployment rate: 8,2%

Key facts about Slovenia – S4



MAIN SECTORS OF THE SLOVENIAN ECONOMY (STATED IN 2014):

- ❖ **Services** (wholesale & retail trade, accommodation & food services) accounting for 64% of total GDP
- ❖ **Manufacturing** (including steel & metals, the car industry, white goods, wood & textiles, pharmaceuticals & chemicals, and machinery) accounting for approximately 26% of total GDP
- ❖ **Construction** for 8% and **Agriculture** for 2% of total GDP

Key facts about Slovenia – S4

SLOVENIAN SMART SPECIALISATION STRATEGY – S4 PRIORITY AREAS:

◎ **(S)INDUSTRY 4.0**

- ❖ **Factories of the Future (FoF)**
- ❖ Health – medicine
- ❖ Mobility
- ❖ **Development of materials as an end products**

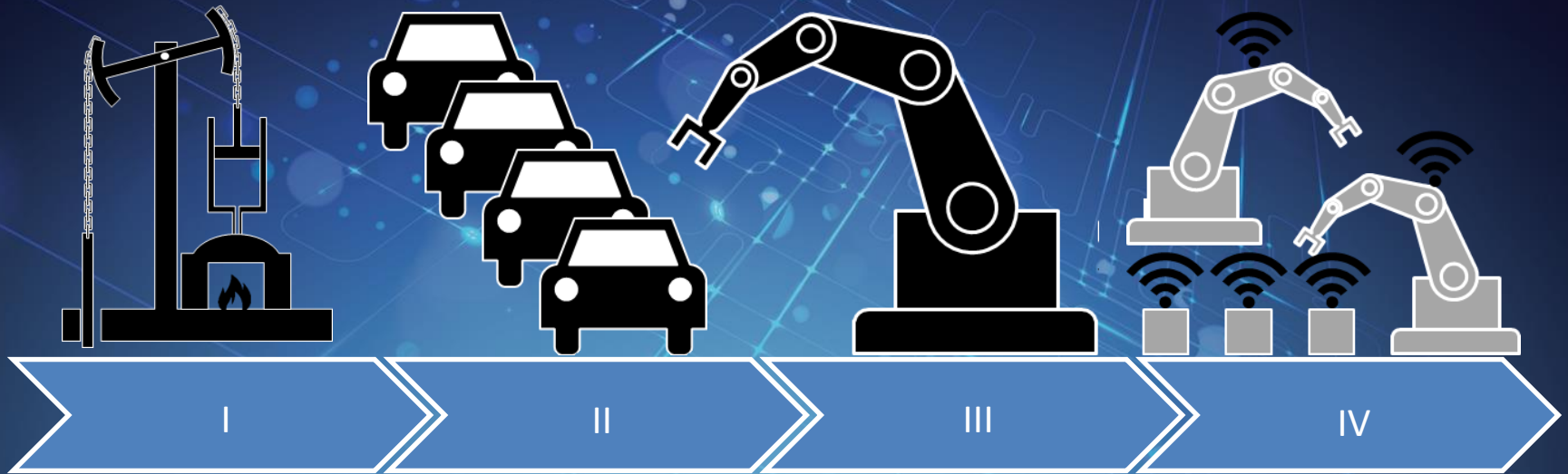
◎ **NATURAL AND TRADITIONAL RESOURCES FOR THE FUTURE**

- ❖ Networks for the transition to circular economy
- ❖ Sustainable food production
- ❖ Sustainable tourism

◎ **HEALTHY WORKING & LIVING ENVIRONMENT**

- ❖ Smart cities and communities
- ❖ Smart buildings and homes, including wood chain

What is our action about



Working on the fundamental principle of “**Connected, smart and adaptive production**”, the joint alliance of the *cross-regional industrial modernization partnership* aims **to consolidate and boost the production processes** and the associated production machinery, devices and equipments along with the corresponding metrology and high-tech materials, by interconnecting all of the system components with one another.

What are our topics of interest



Linking the existing and growing infrastructures amongst the partners will provide technological and know-how capabilities covering the following sub-topics in the area of Smart Adaptive Production Systems:

- ❖ Smart moulding;
- ❖ Smart machinery and process design for efficient use of resources and ecological manufacturing;
- ❖ Adaptive and reconfigurable machinery and robots for flexible production lines;
- ❖ Optomechatronic technologies for process monitoring and quality assurance;
- ❖ Guiding systems technologies;
- ❖ Advanced metallic & smart multicomponent materials for demanding product applications.

Demonstration activities - ideas

- ❖ **Machine tuning** for smart connectivity adaptation (robotisation, optical & sensorical inspection);
- ❖ **Investigating existing technologies capabilities** (in terms of self-adaptiveness and self-moderating);
- ❖ **Demonstration for smart technology/materials integration** in industry, using experience built up with lead users to demonstrate the benefits to SME's;
- ❖ **Testing and validation of technology/products solutions** produced by smart automation of manufacturing;



Demonstration activities - ideas



- ❖ **Developing and testing new metal/polymer materials;**
- ❖ **Testing/validating new software design/concepts for high performance of machines and tooling parts;**
- ❖ Testing different in-line post-process sensors and tools to check and characterize product specifications;
- ❖ **Training for automated production line design** adapted along the entire value chain in the manufacturing fields of processes;
- ❖ **Improving test methods / certification processes.....**

Invitation pending

- to our workshop at the kick-off meeting and to further collaboration..



....and to provide knowledge base
for action


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