

Project co-financed by the European Regional Development Fund

Greenomed

Mediterranean Trans-Regional Cooperation for green manufacturing innovation

Zagreb, 10/05/2018



Centrality of Manufacturing

Manufacturing is a fundamental pillar of modern economies

Manufacturing can significantly contribute to sustainability:

- It consumes the 30% of energy produced
- it uses raw materials and other natural resources as input
- It generates environmental emissions



Green manufacturing is a top-priority for Europe





Source: Vanguard ESM Kick-off Meeting, October 2014



STRENGHT	 WEAKNESSES Labor cost Energy dependence Limited capacity to trasform knowledge into industrial practices Fragmentation of available research results and difficult access to them
OPPORTUNITIES	THREATS



EU Energy dependence

(net imports divided by the sum of gross inland energy consumption plus bunkers)



Source: Eurostat 2014

Source: Vanguard ESM Kick-off Meeting, October 2014



OF	PPORTUNITIES	 Price of energy Price of raw materials Access to critical raw materials THREATS 	
	STRENGHT	 WEAKNESSES Labor cost Energy dependence Limited capacity to trasform knowledge into industrial practices Fragmentation of available research results and difficult access to them 	
	CTDENCUT	WEAKNESSES	



Overall cost of energy

Nominal price index: Jan 1980 = 100



Source: McKinsey MGI's Commodity Price Index



Materials price

Nominal price index: Jan 1980 = 100



Source: McKinsey MGI's Commodity Price Index



Access to critical raw materials



Source: Vanguard ESM Kick-off Meeting, October 2014



STRENGHT	WEAKNESSES
	 Labor cost Energy dependence Limited capacity to trasform knowledge into industrial practices Fragmentation of available research results and difficult access to them
 New middle class New markets for societal challenges 	 Price of energy Price of raw materials Access to critical raw materials
OPPORTUNITIES	THREATS





Source: Eurostat 2014



STRENGHT	WEAKNESSES
 Long manufacturing tradition which generated a diffused know-how Major producer of knowledge in advanced manufacturing through outstanding research Global leadership in the machinery and automation sector Advanced environmental culture Regional complementary capabilities 	 Labor cost Energy dependence Limited capacity to trasform knowledge into industrial practices Fragmentation of available research results and difficult access to them
 New middle class New markets for societal challenges 	 Price of energy Price of raw materials Access to critical raw materials
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OPPORTUNITIES	THREATS	Y















Green innovation and pilot plants

Europe is a global leader in knowledge production, also in the field of sustainable manufacturing technologies and methods

Europe has an advanced environmental culture and regulation,

but...

There are historical weaknesses in bringing new knowledge in industry

The **fragmentation and vast number of SMEs** make even more complicated the innovation process







What are pilot plants?

Open Facilities where companies (including SMEs) can find:

- Innovative technologies
- Multi-disciplinary competences (technology, business, innovation)
- A network of innovative technology and service suppliers

To understand, test, set-up and uptake innovative technologies and methods





More precisely...

✓ TRL>7

- Clearly focused on applicative domains in terms of industries and technologies
- Address ambitious industrial applications that are currently not diffused or existing (satisfy industrial needs of the future)
- Motivated and supported by industry
- **Open to companies**: neutral environment in which they can setup and test new products, processes and technologies before implementing them for own commercial purpose
- Playground for cross-sectorial collaboration



More precisely...

- More than facilities: ecosystems for innovation in which companies find multidisciplinary competences and innovation culture
- More than one-time experiment: they should be the engine of multiple industrial implementations in the medium-long term (thus, they will be in continuous adaptation over time



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Envisaged pilot plants: the Vanguard Initiative



Vanguard is a political initiative of 30 European Regions aimed at the implementation of strategic innovation projects in a logic of smart specialization



- 5 Pilot projects:
 - ESM-Efficient and Sustainable Manufacturing
 - 3DPrinting
 - Energy applications in harsh environments
 - Nano-enabled products
 - Bio-economy
- Overall, the pilot projects generated
 20 demo-cases aimed at the establishment and exploitation of a highly specialized European network of regional pilot plants



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Main Project KPIs

Indicator	Minimum Target
Number of operational instruments to favour innovation of SMEs	5 (1 cooperation methodology + 4 services offered by Clusters)
Number of enterprises receiving non-financial support	100
Number of transnational innovation clusters supported	8
Trans-regional projects of pilot plants running at the end of the project	3
Number of Regional Authorities involved	8
Number of living labs at the end of the project	3
Number of platforms at the end of the project	8
General public targeted	3000
Number of targeted SMEs	500
Number of targeted Business Support Organisations	20



The challenge addressed in Greenomed



How to conceive, design and implement Networks of pilot plants in a logic of smart specialisation?

Greenomed goal

Test a trans-regional cooperation methodology to design and build pilot plants supporting green manufacturing in the MED area based on the "Vanguard" experience









Partners

Type of partners	Role in the project
Research Institutes	Methodological approach, technical competence to coordinate methodology design, testing and evaluation
Clusters	Orchestrate methodology testing, nourishing manufacturing community, transferring to other Clusters
Business support organisations	Involve companies and stakeholders,
Regional Authorities	Creating institutional framework supporting manufacturing green innovation





Objectives of Greenomed

- ✓ Establish a Cluster-governed methodology for transregional cooperation in green manufacturing innovation
- Trigger the set-up of trans-regional projects of pilot plants for green manufacturing innovation in the MED Regions
- Establish the institutional environment supporting Clusters-based trans-national cooperation for green manufacturing innovation in the MED Regions





Set of steps, guidelines and supporting methodological tools to:

- Create and manage regional communities of stakeholders engaged in strategic projects for pilot plants
- Allow trans-regional cooperation in the logic of smart specialization
- **Define projects of pilot plants** from conception to implementation and management



The Vanguard cooperation methodology

Regions propose ideas for pilot plants on ESM Identification of synergies and complementarities among proposals

Design of the ESM integrated pilot plants network







Regional Development Fund



Regional Clusters can be the natural orchestrators of the methodology by offering services such as:

- Thematic Regional Working groups setup and animation
 (platforms)
- Trans-regional matchmaking organization
- Identification of synergies at Regional, National and EU level for the development of pilot projects
- **Roadmapping** to indicate priorities to Regional Authorities
- Mapping of pilot plants and regional stakeholders
-



The Vanguard demo-cases in the area of green innovation

De- Remanufacturing demo-case (Lombardy AFIL)

Mechanical remanufacturing and inuse product monitoring in the automotive industry.

💋 GREENOMED

Interreg

Mediterranear

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Pre-treatment technologies for remanufacturing of photovoltaic panels and end treatment techniques for thermoplastics

Re-use of composites by thermal processes from aeronautic sector and wind energy system. Recovery and re-use of metal scrap by plasma process.

Robotics handling systems supporting disassembly and reassembly operations in the automotive industry



Laser-based remanufacturing of the mechanical parts in large machinery

Re-production of steel sheet by Hydroforming and CNCbulk metal forming

Sustainable Demanufacturing processes including humanrobot cooperation for disassembly, electronics remanufacturing, key-metals and composite recovery and reuse by mechanical processes, for the automotive and electronics industry



The Vanguard demo-cases in the area of green innovation

Environmental and Energy Efficiency demo-case (Saxony, Fraunhofer)

Nord-Pas de Calais:

simulation of energy flows and integration of renewable energy sources into the manufacturing environment

Basque Country: Industrial waste heat management (capture, transport, storage and reuse of waste heat)

Norte: energy efficiency assessment methodologies, tools and ICT capabilities



Saxony: optimizing manufacturing processes and resource-efficient manufacturing

 Lombardy: energy and
 environmentally-efficient steel production

Catalonia: industrial Energy Efficiency Plan to tackle challenges in different high-energy consuming sectors Microgrids of distributed energy sources.

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Advanced Sustainable Surface & Coating Manufacturing Technologies on Polymers Materials (Catalonia, Eurecat)





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MARCHE MANUFACTURING Industrial Innovation Cluster









BEC





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Thanks for your attention