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# A smart specialisation platform for advanced manufacturing

# Scoping paper

Prepared at the request of the European Commission, Directorate General for Regional and Urban Policy  
(Contract number 2014CE160AT020)



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# Introduction

The 'Vanguard Initiative New Growth through Smart Specialisation' is a coalition that places the European Union's (EU) Smart Specialisation (S3) agenda at its core. Following a high level political meeting of the Vanguard Initiative regions on 30 January 2014, this commitment was formalised in a letter to the European Council. The Vanguard Initiative partners seek to 'lead by example' and to drive and support new efforts to generate the scale and capacity for the EU to compete on an international level in a number of key domains.

In parallel, in January 2014, the Commission Communication 'For a European Industrial Renaissance' proposed "... to create *Smart Specialisation Platforms* to help regions roll out smart specialisation programmes by facilitating contacts between firms and clusters, enabling access to the innovative technologies and market opportunities". Seizing this opportunity, the Vanguard Initiative regions decided to:

- Foster an action-oriented discussion on how to develop a Smart Specialisation Platform (SSP) for Advanced Manufacturing (SSP-AM)
- Generate, agree and commit to a series of actions to establish a clear roadmap and set of proposals for the establishment of a SSP-AM.

The Vanguard Initiative partners are committed to the creation of a platform which gives an impetus to the advanced manufacturing 'community' to generate bottom-up ideas, support synergies and alignment at inter-regional level and create a 'new space' for industry engagement. It will build on and go beyond existing efforts to support this ambition by a focus on the smart specialisation priorities of the partner regions.

The European Commission, Directorate General for Regional and Urban Policy agreed to provide funding for an expert to 'Support to scoping out the potential for developing a pilot smart specialisation platform in advanced manufacturing'. In line with the terms of reference, the objective of this scoping paper is three fold:

- To undertake a preliminary analysis of the main regional platforms/clusters/partnerships in the domain of advanced manufacturing in the 17 Vanguard Initiative regions
- To compile relevant information on the wider EU landscape in this domain, focusing on key elements of the EU, MS and regional 'architecture' for advanced manufacturing;
- to identify opportunities for synergies through cooperation and differentiation.

The scoping paper was expected give a specific focus to private sector actors and engagement and address the following questions:

- What projects, initiatives, networks, programmes and policy developments have taken shape with the key purpose of bringing together associated actors in the EU advanced manufacturing domain, and with the purpose of improving regional, national and EU competitive advantage? (e.g. within the wider KETs environment; relevant EIPs, JPs, PPPs, ERA-NETs, KICs (raw materials), Manufuture, EFRA...)
- Which of these are private-sector led or contain key private sector presence?
- Where and what are the clearly defined and emerging value chains in this domain?
- Where is there evidence of duplication of effort? Where do gaps exist?
- Is there evidence of added-value / effectiveness / impact in any of the above?
- Is there evidence of barriers to achieving sufficient scale / mass to compete internationally? (within EU regions, across EU regions / Member States)?

- Where could activity be better aligned (at regional, MS and EU levels)? How?

This final scoping paper is based on three main sources of information:

- A review of available literature at European level, notably making use of parallel work undertaken by the European Commission (Task Force on Advanced Manufacturing, S3 platform, etc.) and the Regional Innovation Monitor platform;
- A questionnaire addressed to each of the Vanguard Initiative region (Appendix A)
- A number of meetings with Brussels based representatives of the Vanguard Initiative regions to discuss options and opportunities for co-operation;

In addition, two workshops, co-organised with the Vanguard Initiative secretariat, brought together experts (from public, research and technology and business sectors) from the Vanguard initiative regions. Following the first workshop (held on 18 March), each VI region was asked to complete a short questionnaire addressing the following:

- Current strengths and emerging advanced manufacturing niche in each region;
- Identification of key regional research infrastructures, industrial technology/training bodies, clusters and large/innovative companies and their positioning on the European 'playing-field' / value chains
- Key challenges and priorities of the regional advanced manufacturing sector
- Preferences with respect to a possible list of activities for the SSP

In early May 2014, 14 Vanguard Initiative regions submitted a completed questionnaire: Asturias, Baden-Württemberg, Catalonia, Basque Country, Flanders, Lombardia, Malopolska, Norte, Scotland, Skane, South Netherlands, Tampere, Upper Austria and Wallonia. The level of detail provided varied and did not allow for a complete analysis of all questions. Nevertheless, the information collected provides a first 'snapshot' that may serve as a basis for future developments.

Based on the replies, a draft scoping paper was drawn up and discussed at the second workshop held in Brussels on 15 May. The workshop conclusions and written comments from a number of regions have been taken into account in this final version of the scoping paper.

## 1. A baseline mapping of advanced manufacturing in the Vanguard Initiative regions

## 1.1 Current and emerging strengths in advanced manufacturing

Rather than impose a precise definition or categorisation of advanced manufacturing, the regions were asked to list the main advanced manufacturing sub-sectors, technology areas (robotics, mechatronics, sensors, etc.) and application areas (textile machinery, 3D printing, etc.) in which they have a competitive advantage. The aim was to allow the regions to map out the scope and breadth of activities that form the broad advanced manufacturing field.

Figure 1 : Word cloud of advanced manufacturing capabilities



Source: Technopolis Group, based on regional questionnaire responses

The word cloud provides a graphical representation of the key words that the regions used to describe their capacity. Looking more closely at the replies, a number of 'blocks' of advanced manufacturing activities emerge. The table below provides a number of illustrative examples for this 'top-layer' of common regional capabilities.

Figure 2 : Illustrative common fields of advanced manufacturing expertise

<b>Sector / technology / application area</b>	<b>Specific focus</b>	<b>Regions reporting competitive advantage</b>
<b>Additive manufacturing / 3D printing</b>	Mechanical parts, smart electronic systems packaging, laser based and hybrid methods, manufacturing of high end and personalised products	Baden-Württemberg, Catalonia, Flanders, Lombary, South Netherlands, Tampere, Wallonia
<b>Aerospace</b>	Forming & forging of metal components and structure, aerostructures, maintenance and repair operations including composites, manufacturing for military aeronautics	Basque Country Lombardy, Scotland, Wallonia
<b>Automotive industry &amp; suppliers</b>	Smart Mobility, automotive supplies, notably drivetrain, powertrain and body & chassis, agricultural vehicles, vehicle components,	Asturias, Baden-Württemberg, Basque Country, Catalonia, Lombardy, South Netherlands, Tampere, Upper Austria, Wallonia
<b>Automation, mechatronics &amp; robotics</b>	Including production control very advanced mechanics/mechatronics for ultimate accuracy performance, software, sensors, leading edge factory and process automation,	Baden-Württemberg, Catalonia, Flanders, Lombardy, Scotland, South Netherlands, Tampere, Upper Austria, Wallonia

Sector / technology / application area	Specific focus	Regions reporting competitive advantage
	advanced manufacturing technologies for healthcare	
<b>Energy</b>	Marine renewable energy, fabrication of structures and systems, pumps, valves & turbines for onshore and offshore applications, energy efficiency & cleantech, generation, distribution of electric power, wind turbines and components, smart grids, renewable energy - PV	Asturias, Basque Country, Lombardy, Norte, Scotland, Skåne, South Netherlands, Tampere, Upper Austria, Wallonia
<b>Machinery, machine parts, components &amp; tools</b>	Machinery and industrial systems and components for manufacturing processes	Asturias, Baden-Württemberg, Catalonia, Basque Country, Flanders, Lombardy, South Netherlands, Upper Austria
<b>Textiles</b>	Textile and leather, textile machinery, circular knitted fabrics, medical, coated fabrics & protective clothing, high end textiles	Catalonia, Flanders, Lombardy, Tampere, Scotland
<b>Other transport systems and equipment</b>	Low carbon transport, remote underwater vehicles, motorcycles, boats, trains and railway equipment	Basque Country, Flanders, Lombardy, Scotland, South Netherlands, Tampere, Upper Austria

Source: replies to question 1.1 of survey

To provide an indicative view of the competitive position of the key sectors, technologies and application areas, the regions were asked to rank the competitive position of the identified capabilities. Not all regions attempted this exercise, but those that did gave a relatively high average ranking of 4.2 out of 5 (5 being world class). This relatively high ranking may, however, point more to the difficult to judge the competitive position of regional ADMA sector and further analysis is required to position more precisely the regions' competitive advantage.

Based on the replies, it proved difficult to distinguish clearly between:

- Sectors (sub-sectors, niche, clusters)
- Technology development areas, e.g. robotics, mechatronics, sensors
- Technology application areas, e.g. textile machinery, 3D printing.

Illustratively, from the above table, additive manufacturing is a main technology development theme as is automation, mechatronics and robotics. However, it is clear that further assessment is required to better understand the relative potential for joint technology development and application actions between the regions as well as the 'market demand' potential for such technologies given the sectoral composition of the ADMA sector in each region.

In this respect, the regions were also asked to consider the position of the main existing and emerging capabilities selected from a value chain perspective and identify specific capacities or needs with respect to three broad stages in the value chain. Again not all regions completed this question and the degree of detail varied. A good example is provided on the next page for the Basque Country. This initial mapping of the value chain for one region, underlines the potential for a more detailed mapping to enable a matching of needs and expertise on an inter-regional basis.

Figure 3 Regional capabilities by stage of value chain – example of the Basque Country: strengths (S) vs needs (N)

<b>Regional advanced manufacturing capabilities</b>		<b>Pre-production stages</b>	<b>Production stage</b>	<b>Post-production stage</b>
Energy	Electrical equipment manufacturing for T&D/Smart grids	<ul style="list-style-type: none"> <li>(S) Significant participation in the infrastructures' design.</li> <li>(S) Close collaboration with some innovative utilities.</li> <li>(N) Evolution from the integration of components to their development.</li> <li>(S) Long experience in onshore with great potential to be extended in offshore.</li> <li>(N) Design of cost-effective wind turbines (whole sector's need).</li> <li>(S) Participation in components' design along with OEMs.</li> <li>(N) Design and development of complete systems and modules.</li> </ul>	<ul style="list-style-type: none"> <li>(S) Complete value chain in the region.</li> <li>(N) Certain demonstration infrastructures for testing.</li> </ul>	<ul style="list-style-type: none"> <li>(S) Turnkey installations.</li> <li>(N) Smart grid-related services.</li> </ul>
Transport	Stamped, mechanised and casted components manufacturing for automobiles		<ul style="list-style-type: none"> <li>(S) Complete value chain in the region.</li> <li>(N) Cost reduction of wind turbine manufacturing (whole sector's need).</li> <li>(N) Certain demonstration infrastructures for industrial scaling-up.</li> <li>(S) Excellent skills and capabilities in manufacturing processes (competitive advantage of Basque automotive sector).</li> <li>(S) Large variety of very competitive suppliers covering all processes to manufacture all vehicle components.</li> <li>(N) Extend their skills to new materials (light alloys and composites).</li> <li>(S) Excellent skills and capabilities in manufacturing processes (competitive advantage of Basque aerospace sector)</li> <li>(N) Demonstration infrastructures for industrial scaling-up.</li> </ul>	<ul style="list-style-type: none"> <li>(N) O&amp;M services (whole sector's need).</li> </ul>
	Aerostructures and turbines manufacturing	<ul style="list-style-type: none"> <li>(S) Participation in components' design along with OEMs.</li> <li>(N) Design and development of complete systems and modules.</li> </ul>		<ul style="list-style-type: none"> <li>(N) Identify new opportunities within replacement market.</li> <li>(N) Adapt business models.</li> </ul>
	Trains and railway equipment manufacturing for metro/trams and commuter and high-speed trains			<ul style="list-style-type: none"> <li>(S) High and recognised skills in railway network management services and products.</li> <li>(N) Gain experience in this incipient and promising area in which results have been achieved.</li> <li>(S) Long experience in after-sale service</li> <li>(N) Improvement of leverage on the manufacturing sector.</li> </ul>
<b>Machine tool</b>	Machinery manufacturing for stamping and machining of large metallic pieces in small series	<ul style="list-style-type: none"> <li>(N) Improvement of machine tools' intelligence and precision.</li> <li>(N) Wider vision to integrate machine tools into smart factories.</li> <li>(N) Development of new solutions for corrosion performance.</li> <li>(N) Taking advantage of properties associated to nanotechnologies and nanomaterials.</li> <li>(N) Development of new solutions for corrosion performance.</li> </ul>		
Metallurgy	Steel production		<ul style="list-style-type: none"> <li>(S) Highly competitive manufacturers.</li> <li>(S) Cutting-edge facilities</li> <li>(N) Improve energy efficiency.</li> </ul>	
	Seamless steel tubular products manufacturing for special purpose (e.g. oil & gas, chemical industry and power generation)		<ul style="list-style-type: none"> <li>(S) Highly competitive manufacturers.</li> <li>(S) Cutting-edge facilities</li> <li>(N) Improve energy efficiency.</li> </ul>	

### **1.2 Key challenges and priorities for the advanced manufacturing sector**

### **1.2.1 Main challenges for advanced manufacturing**

Each region was asked to identify up to 10 challenges for advanced manufacturing related to upgrading industry, developing new or diffusing existing technologies, integrating advanced manufacturing in global value chains, etc.

Figure 4 : Word cloud of regional advanced manufacturing challenges



Source: replies to question 2.1 of the questionnaire

The regional responses were relatively heterodox as illustrated by the word cloud. A number of regions (e.g. Lombardia, Malopolska) listed more ‘generic’ regional industrial or innovation system challenges; while others (e.g. Asturias and Flanders) listed more specific challenges. Nevertheless, a number of common themes emerge:

- Rapid deployment and up-scaling of advanced manufacturing technologies. This broad challenges captures the application of a range of technologies and processes and the means by which it can drive the growth of new start-ups and the regeneration of existing manufacturing sectors
  - The challenge of shifting to digital factories (also capturing the Industry 4.0 concept) is widely shared and covers a range of issues around digitalisation of production, complex production systems, networked manufacturing, transformation of factories into factories of the future, etc.
  - The need to adopt clean technologies and enhance resource and energy efficiency are a recurring theme and there is a marked emphasis on both reduction and re-use of materials as well reducing high levels of energy consumption or using the challenges posed by global ‘megatrends’ to develop new competitive processes. A sub-theme here is the need to reduce transportation costs and improve logistics.
  - A fourth stylised challenge is visible around the theme of new business models (including service innovation), production customisation, individualism, etc. in manufacturing. A number of regions pointed to the need to adopt new business models with a higher service content in order to foster structural change; while others noted that product customisation and individualism offered opportunities but also challenges related to smarter product design methods, shorter production runs and the adopting of improved manufacturing strategies
  - Internationalisation and supply chain management in the global economy constitute the fifth most common challenge with issues related to reshoring and organising total value chains for OEMs highlighted; as well as the need to improve poor internationalisation strategies of manufacturing SMEs.

- Training and skills for advanced manufacturing are a concern in at least half the regions responding, with the need to develop industrial training methods that allow adaptability of the workforce and faster knowledge transfer highlighted. Creating the demand for innovative skills and developing novel curricula are viewed as critical elements in an advanced manufacturing strategy.
- Science-business co-operation & improving research & innovation infrastructure are related factors view as an important ‘foundation’ for future advanced manufacturing development. A common theme under this broad heading is the need to develop and make pilot lines and laboratories more accessible to companies, in particular SMEs along the full value chain. Rather than bilateral contract research type activities, the need for the development of ‘wider manufacturing communities’ is called for in order to shorten the time from research to application of technologies.
- Finally a minority of regions point to access to finance and participation to EU programmes as a challenge.

In a second step, the regions were asked to consider their specific strengths and weaknesses with respect to the technologies and enablers identified in the Factories of the Future roadmap. Not all regions completed this question but the scores point to quite significant inter-regional variations, notably in terms of knowledge workers and mechatronics for advanced manufacturing systems.

Figure 5 : Factories of the Future Technology and Enablers - SWOT

Region	Advanced Manufacturing Processes	Mechatronics for advanced manufacturing systems	ICT	Manufacturing Strategies	Modelling, simulating & forecasting methods & tools	Knowledge workers
Baden-Württemberg	4	5	4	5	4	5
Basque Country	5	3.5	2	2.5	3	5
Catalonia	4	2	3	2	3	5
Flanders	4	4	4	3	3	5
Lazio/Liguria	5	5	4	4	4	5
Norte	3	3	4	3	4	2
Scotland	3	2	3	2	3	1
South Netherlands	4	5	4	3.5	3.5	4
Tampere	4	3	4	3	3	4
Upper Austria	4	5	5	5	5	5
Average	4.00	3.75	3.70	3.40	3.75	3.30

Source: replies to question 2.2.2 of the questionnaire. Regional position from 1 main weakness/gap to 5 main strength/advantage

Most regions reported strengths in advanced manufacturing processes. However, in some cases, the strength is limited to only a few core processes, such as in Scotland where current investments focus on advanced forming and continuous manufacturing and crystallisation. In Catalonia where advanced manufacturing processes are world class in core sectors such as automotive but can still be improved in other sectors. Similarly, the Basque Country notes that there is a need to extend excellent scientific, technological and industrial capabilities beyond metal-mechanic manufacturing (e.g. mechanical processes for non-metallic materials, chemical processes).

At the other extreme, the responses point to weaker capacity to develop manufacturing strategies. The Basque Country notes that the challenge is to evolve from a process industry to a solution-oriented approach through high value added services. Similarly, Tampere region reports on-going efforts to develop a strategic capability index and support tools for manufacturing companies for the development and management of manufacturing strategies. Scotland notes that innovation is a particular issue for manufacturing strategies, which is likely to be the case in other countries.

### 1.3 Key regional advanced manufacturing infrastructures

The majority of regions replied to the question concerning the most important regional infrastructures to support the development and application of advanced manufacturing, such as pilot facilities, demonstrators, clean rooms, etc. The compilation of infrastructures in the table below underlines that across the Vanguard Initiative regions there exists a range of infrastructure across diverse fields such as steel, electronics, additive manufacturing, renewable energy, etc. and from testing and small production run facilities to nanolabs and clean rooms.

Figure 6 : advanced manufacturing infrastructures – selected regions

Region	Infrastructure – description	Location/host organisation
<b>Asturias</b>	Roll to Roll pilot line for printing electronics	Prodintec
	Pilot Plants (13) - Arcelor	Arcelor - Avilés
	Additive Manufacturing Centre	Prodintec
<b>Baden-Württemberg</b>	Arena 2036, research centres & graduate School for Advanced Manufacturing Engineering (GSaME)	University Stuttgart
	University Karlsruhe (KIT)	
	Universities (Fachhochschulen)	Reutlingen, Esslingen, Heilbronn, Karlsruhe, etc
	Fraunhofer	Stuttgart, Freiburg, Karlsruhe
<b>Catalonia</b>	innBW - Innovationsallianz Baden-Württemberg	Stuttgart, Villingen-Schwenningen, Denkendorf, Ulm
	Plastic processing pilot plant	Cerdanyola del Vallès, Ascamm
	Demonstration plant for additive manufacturing	Barcelona, UPC-CIM
<b>Basque Country</b>	High precision micro-electronics manufacturing hub	Bellaterra, CSIC
	Biscay Marine Energy Platform – technology test infrastructure for marine energy, both for wave & current, and offshore wind energy to validate the performance of new prototypes in a representative environment	Armintza/EVE – Basque Energy Agency
	CIC marGUNE, the High Performance Manufacturing CIC, is specialised on production means and processes, primarily from metal-mechanic approach.	Eibar / CIC marGUNE and R&D&I partners
<b>Flanders</b>	The Advanced Manufacturing Centre for wind power is an infrastructure in which advanced facilities and knowledge are available for firms to validate and demonstrate the manufacturing feasibility of novel wind power-related prototypes in a relevant environment without having to make large investments	Located in Eibar and hosted by IK4-Tekniker applied research centre
	Advanced manufacturing technologies equipment, climate chamber	Sirris sites
	Advanced manufacturing equipment	Flemish universities
	Mechatronic demonstrators and test beds	FMTC
	Research & test facilities e.g. for battery testing, durability testing, environmental & vibration testing with focus on vehicles and components	Flander's Drive
	Nano-electronics technology design & prototyping / clean rooms	Imec
<b>Lombardy</b>	Photonics innovation prototyping / clean room	B-PHOT:
	Pilot installations	Competence centres Flanders Food, VKC, etc.
	Automated plant for personalized goods production (shoe sector)	CNR-ITIA
<b>Scotland</b>	Mechatronics De-manufacturing pilot plant - ITIA-CNR	CNR-ITIA
	Wind Tunnel	Politecnico di Milano
	Laboratory of unconventional technologies	Politecnico di Milano
	James Watt nanofabrication Centre – pilot and small production runs.	University of Glasgow
	Scottish Microelectronics Centre– pilot and small production runs.	University of Edinburgh
	Advanced Forming Research Centre ~£30m worth of production scale forming and forging equipment, a wide range of mechanical and materials testing and analytical equipment and a team of manufacturing engineers, researchers and technicians.	University of Strathclyde
	European Marine Energy Centre Ltd – testing of marine	Orkney

<b>Region</b>	<b>Infrastructure –description</b>	<b>Location/host organisation</b>
	energy devices in real conditions.	
	Continuous Manufacturing and Crystallisation (CMAC)	University of Strathclyde
	IBioIC (Industrial Biotechnology Innovation Centre)	Innovation Centre
<b>Skane</b>	R&D infrastructure of advanced nanomaterials Maxlab III: synchrotron facility ProMaTen centre for advanced production Medicon village: life science open laboratories Life science incubator: joint instrumentation labs Food processing and production centre	Lund University <a href="http://www.maxlab.lu.se">www.maxlab.lu.se</a> <a href="http://www.iprod.lth.se">www.iprod.lth.se</a>  <a href="http://www.cluk.se">www.cluk.se</a>
<b>South Netherlands</b>	Manufacturing and Process Centre at the Automotive Campus in Helmond	AFB-Automotive Facilities Brainport (Helmond)
	AddLab	Initiative of Brainport Industries and Additive Industries
	Solliance-VDL Pre-pilot production lines on cigs and Organic PV	Located on High Tech Campus Eindhoven
	MiPlaza	Philips facility on High Tech Campus Eindhoven
	NanoLab@TU/e	TU/e
	R2R Pilot Line	Holst Centre
<b>Tampere</b>	TUT's clean room facilities (400m <sup>2</sup> )	TUT/ORC
	BioMediTech research and clean room facilities	FinnMedi/ Kauppi Campus
	Laser Application Laboratory	TUT/MEI
	FMS Training Centre	Fastems Oy Ab
	TUT Campus Arena & Innovation Arena (from 2015)	TUT
	Team centre end-to-end PLM Suite	TUT
	New Factory	Tampere Finlayson area/Hermia Group
	FIMECC Factory	Technopolis/Fimecc

Source: replies to question 2.4.2 of the questionnaire

It is clear that in many of the regions, the intervention of EU funding programmes has enabled the development over time of such infrastructure. For example, in Norte, there are several industrial demonstrators in manufacturing companies in sectors such as metal-working, textile, shoes, etc. These facilities address advanced manufacturing systems and are a result of R&D, innovation and demonstration projects co-funded by the Structural Funds. There are also several pilot lines and clean rooms, mainly in universities and research organisations, in fields such as nanotechnologies, biotechnologies, new materials (e.g. at INL and CENTI).

#### 1.4 Regional advanced manufacturing policy priorities

The regions were asked to describe to what extent advanced manufacturing is an identified priority in the regional smart specialisation strategy (or other similar policy document). Figure 7 summarises the priorities listed, whenever it was possible to extract such information from the questionnaire replies.

Figure 7 : Regional priorities in advanced manufacturing field

<b>Region</b>	<b>Advanced manufacturing related priorities</b>	<b>Strategy/Policy document &amp; year</b>
<b>Asturias</b>	<ul style="list-style-type: none"> <li>• Advanced and sustainable materials</li> <li>• New production models</li> <li>• Supply &amp; network technologies</li> <li>• Steel industry</li> <li>• Agro-food markets</li> <li>• Ageing and quality of life</li> </ul>	RIS3, adopted on 2 <sup>nd</sup> April 2014
<b>Baden-Württemberg</b>	<ul style="list-style-type: none"> <li>• Sustainable mobility, resource efficiency, emerging industries, key enabling technologies, build-up strategic research infrastructures, scientific excellence, technology transfer to SMEs</li> <li>• Additional AM related priorities: manufacturing management, manufacturing automation</li> </ul>	Innovation Strategy (December 2013) – only in German

Region	Advanced manufacturing related priorities	Strategy/Policy document & year
<b>Catalonia</b>	<ul style="list-style-type: none"> <li>• Industrial systems</li> <li>• Advanced manufacturing technologies</li> </ul>	Smart Specialisation Strategy of Catalonia (RIS3CAT)
<b>Basque Country</b>	<ul style="list-style-type: none"> <li>• Eco-efficient and competitive manufacturing</li> <li>• New materials and complex structures</li> <li>• Smart and safe machines and robots</li> <li>• Smart, collaborative and distributed manufacturing</li> <li>• New business models and high-value added services</li> </ul>	RIS3 Strategy & 2020 Advanced Manufacturing Strategy
<b>Flanders</b>	<ul style="list-style-type: none"> <li>• Additive manufacturing for serial production - among the focus areas is 3D printing for health products</li> <li>• Agile &amp; human-centred production and robotic systems</li> <li>• With focus on integration of vision systems and sensor systems</li> <li>• Systems and modelling approach in product and process development, integration of technologies in product and production process development</li> </ul>	The 'White Paper for a New Industrial Policy' and the 'Concept Note for the Innovation Centre Flanders' (May 2011) The approval by the Government of a new Strategic Research Centre for the 'Make industry' (May 2014)
<b>Lombardia</b>	<ul style="list-style-type: none"> <li>• Aerospace</li> <li>• Agri-food</li> <li>• Eco-Industry</li> <li>• Creative and cultural Industries</li> <li>• Health Industry</li> <li>• Advanced Manufacturing</li> <li>• Sustainable mobility</li> </ul>	Research and Innovation Strategies for Smart Specialisation – RIS3 in Regione Lombardia, December 2013
<b>Malopolska</b>	<ul style="list-style-type: none"> <li>• Manufacture of metal products and manufacture of non-metallic mineral products</li> <li>• Electrical and mechanical engineering</li> <li>• Sustainable energy</li> </ul>	Regional Innovation Strategy 2014-20 (draft, due in June 2014)
<b>Norte</b>	<ul style="list-style-type: none"> <li>• Health and life sciences</li> <li>• Marine and maritime technologies</li> <li>• Symbolic capital, technology and tourism</li> <li>• Near-shoring of specialised services</li> <li>• Culture, creativity and fashion industries</li> <li>• Advanced manufacturing technologies</li> <li>• Mobility and environmental industries</li> <li>• Food and environmental systems</li> </ul>	RIS3 Strategy
<b>Scotland</b>	<ul style="list-style-type: none"> <li>• A number of key niche ADMA areas are of value to Scotland, but not a first level priority. The Scottish Government's Economic Strategy (the RIS3) focuses on growth sectors, growth companies and growth markets in following key sectors: <ul style="list-style-type: none"> <li>– Creative industries</li> <li>– Energy: research into technology and engineering, test facilities, manufacture installation and supply chain, and distribution</li> <li>– Financial services</li> <li>– Food and Drink</li> <li>– Life Sciences</li> <li>– Tourism</li> </ul> </li> </ul>	Scottish Government Economic Strategy 2011 Scotland Can Do – Innovation and Entrepreneurship Framework
<b>Skåne</b>	<ul style="list-style-type: none"> <li>• Food &amp; food processing systems</li> <li>• Packaging industry</li> <li>• Clean Tech</li> </ul>	Regional Development Programme, 2009-16

Region	Advanced manufacturing related priorities	Strategy/Policy document & year
	<ul style="list-style-type: none"> <li>• Marine and maritime technologies</li> <li>• ICT as enabler for lean production</li> <li>• Systemic leadership (collaboration as a mean to react to structural change)</li> </ul>	
<b>South Netherlands</b>	<ul style="list-style-type: none"> <li>• Additive Manufacturing</li> <li>• Manufacturing for high mix, low medium volume</li> </ul>	AMT Roadmap 2013
<b>Tampere</b>	<ul style="list-style-type: none"> <li>• True Competitiveness</li> <li>• New Business Models</li> <li>• Industry 2030 (IoT and Industrial Internet)</li> <li>• Industrialisation of personalised bio-production</li> </ul>	INKA – Innovative Cities programme Tampere Regional Strategy TUT Strategy FIMECC Strategy
<b>Upper Austria</b>	<ul style="list-style-type: none"> <li>• Industrial production processes</li> <li>• Industrial Leadership</li> </ul>	Strategic Programme Innovative Upper Austria 2020
<b>Wallonia</b>	<ul style="list-style-type: none"> <li>• Additive manufacturing/3D printing, surface engineering, recycling, reverse metallurgy</li> <li>• Mecatech strategy based on four priority axis: materials and surfaces of the future, comprehensive forming technologies; micro-technologies and mechatronics, and intelligent maintenance.</li> </ul>	Marshall Plan 2.Green (2009-2014); Research strategy “Towards an integrated research policy” (2011-2015);

Source: replies to question 2.3 of survey

The advanced manufacturing priorities in the regions are to a greater or less extent at the heart of the broader economic development agenda. The Asturian RIS3, for instance, seeks to support a recovery in industrial leadership through technology, market-driven diversification and testing of a ‘territorial management model’ focused on a number of societal challenges. The re-industrialisation agenda is also present in the Basque Country, Norte or Tampere. In Norte, the strategy is structured around both upgrading existing/mature sector and developing emerging sectors (with the latter facing challenges to grow a considerable number of university spin-offs). Tampere focuses on new business models, digitalisation and industrialisation of personalised bio-production as part of broader strategy aimed at supporting the re-positioning of the manufacturing sector in 2030 horizon.

The Catalan priorities for advanced manufacturing are inter-linked to a wide range of regional policies: on a first level: industry and enterprise policies and research and innovation; on a second: environment, education and training. The cross-cutting nature of the RIS3CAT means it is also related to domains such as health, agriculture or culture when they include manufacturing activities (e.g.: Food Industry, Medical Devices, ICT for health or Publishing and Edition Industry). Similarly, advanced manufacturing priorities in Lombardy are interlinked to the other RIS3 specialisation areas, since the aim is to provide enabling manufacturing technologies and methods across sectors and applications. Thus, Advanced Manufacturing is a strategic priority not only “per se”, due to the benefits it can provide in terms of economic impact, knowledge and employment, but also for its enabling role for other smart specialisation priorities. In contrast, Scotland has focused on strategies and action plans that tend to be oriented on vertical sectors rather than horizontal capabilities such as manufacturing (e.g. a Sensors Systems Opportunity Action Plan focused on innovation, new product development and market development for the manufacturing companies in this sector). The downside of this approach is that there has been less focus on addressing the modernisation of the actual manufacturing processes and technologies required to deliver the products.

Baden-Württemberg places a strong emphasis on a balance between competitiveness and sustainability in manufacturing, which is also present in other regions (Catalonia, Basque Country, Scotland, etc.). The Basque Country’s advanced manufacturing priorities aim at supporting a “holistic” (environmental, social, etc.) approach to sustainability. In Flanders, “*3D Printing is considered to be a transformative strategy for a sustainable materials management policy*”.

The ‘social sustainability dimension’ is supported via training and placement policies, with Norte’s advanced manufacturing priorities including a programme of industrial PhDs twinned with investments to improve energy efficiency. Malopolska places a strong emphasis on education and training and has developed, in parallel to the RIS3, an intellectual capital and labour market strategy; while in the South Netherlands educational programmes such as ‘Centrum voor Innovatief Vakmanschap’ (vocational) and ‘Centres of Expertise’ (higher education) are supported in order to educate (young) people and ensure employability in (technical) jobs.

In terms of priorities for the first year of the SSP, there was no broad agreement during the workshop on what these should be. However, some suggestions such as: 3D printing; resource efficiency; digital manufacturing, and design-led manufacturing were suggested as possible areas for consideration. There was a clear recognition that the SSP should be closely aligned with ‘Industry 4.0’ principles to ensure ‘fit’ with current and emerging thinking about the future of advanced manufacturing and wider industry for international competitiveness. Connected to this is the enhanced status of advanced manufacturing in the US, reflected by President Obama’s signing in 2011 of the Advanced Manufacturing Partnership Bill.

## 1.5 Main regional advanced manufacturing initiatives

### 1.5.1 Platforms, clusters and public-private partnerships

Each region was invited to identify the main regional clusters, technology platforms, research or training centres, etc. active in the advanced manufacturing field. The replies listed a wide range of organisations with some regions listing more academic/public research and technology organisations (RTOs), others highlighting public-private partnerships (technology platforms, development agencies, innovation centres, etc.) and others giving a stronger emphasis to clusters. An important role for the academic and public research base is evident in several regions that list a series of basic and applied research teams at universities, public research centres and foundations (e.g. Asturias, Catalonia, Malopolska, Norte, Skane, Upper Austria).

The regional responses underlined in a majority of cases the importance of clusters and cluster organisations for advanced manufacturing. The Basque Country profile lists 17 clusters in both supplying (intermediate) and final user (goods) sectors, underlying the long-standing importance of cluster organisations in the region. Similarly, Baden-Württemberg has three main clusters in the field of advanced manufacturing (Manufuture BW, Mechatronic clusters and Future Aerospace Network) as well as a range of manufacturing related clusters in fields ranging from packaging to photonics. Upper Austria is well known for its active cluster policy with four main clusters relevant in the field of advanced manufacturing, most notably the Mechatronics Cluster (<http://www.mechatronikcluster.at>) but also clusters in the plastics (<http://www.kunststoff-cluster.at/>), automotive (<http://www.automobil-cluster.at/>) and IT (<http://www.itcluster.at/>) fields.

Other regions identifying relevant advanced manufacturing clusters are: Asturias (Manufacturias), Catalonia (automotive, machinery, packaging), Lombardy (nine technology clusters in key areas including agri-food, aerospace and the intelligent factory), Norte (production technologies) South Netherlands (high tech software, automotive, food, etc.), Tampere (metal and engineering, imaging, intelligent machines), Wallonia (competitiveness clusters policy and notably the Mecatech cluster).

Beyond clusters, an increasing emphasis on the development of regional public private partnerships (PPP) is evident. The Basque Country has a long tradition of PPPs with the best examples being the research centres TecNALIA and IK4, each employing around 1,500 researchers. Both centres undertake basic and applied research as well as technological services. Similarly, PPPs are emerging as key players in Flanders, South Netherlands, Scotland and Tampere as the emphasis shifts to supporting the

application of new technologies (including via education and training). Examples include:

- The Flemish strategic research centres (SOC) and, in particular, the new SOC ‘Slimme Maakindustrie’ which merges together the Flemish Mechatronics Technology Centre, Flanders’ DRIVE and laboratories of five Flemish universities with the support of Sirris, the collective research centre of Agoria (the federation of the technology industry);
- In Lombardy, the Cluster on Intelligent Factory (AFIL-Associazione Fabbrica Intelligente Lombardia) has been created to represent the regional manufacturing stakeholders (with more than 200 letters of interest received from companies, associations, universities and research centres) and promote their innovation priorities. The objective is to define a strategic region roadmap coherent with the smart specialisation logic.
- In Scotland, a number of new innovation centres combine academic research capacities with industrial domain and application expertise in fields such as sensors and imaging systems (CENSIS) or industrial biotechnology. All projects must be industry led and encourage collaborative skills development. Scottish partners are also involved in the Technology Strategy Board’s Catapult Centres (<https://www.innovateuk.org/-/catapult-centres>) notably in the fields of advanced forming research and offshore energy.
- In South Netherlands, a number of initiatives have been launched to support additive manufacturing including the Additive Manufacturing Academy, a not-for-profit partnership between Fontys, Mikrocentrum and Additive Industries, which ambitions to develop knowledge in the field of 3D printing through a coherent set of training courses, workshops and master classes in the field of industrial printing and additive manufacturing.
- In Tampere, a ‘forum for intelligent machines’, a type of mini-cluster, has been developed. FIMA is a network for mobile work machine manufacturers, specialist companies, system integrators and research institutes. It promotes research and product development in the field in accordance with industry’s needs.

### *1.5.2 Principal policy measures in favour of advanced manufacturing*

Appendix B summarises the information provided in the questionnaires on the main regional initiatives in favour of advanced manufacturing. A range of programmes, advisory services and public-private partnerships are currently being funded which provide a good potential for inter-regional learning and expansion of initiatives such as MANUNET. A mapping of regional programmes supporting advanced manufacturing has also been carried out by the Regional Innovation Monitor+ project as part of on-going activities in support of advanced manufacturing<sup>1</sup>. The European Commission’s Task Force on Advanced Manufacturing<sup>2</sup> report has also highlighted a number of national initiatives (in the UK, Germany, etc.).

In addition, to the existing initiatives in the Vanguard regions, a number of regions mentioned actions planned for the 2014-20 period:

- In Catalonia, the RIS3CAT communities will bring together business and stakeholders to develop action plans for the RIS3 priority fields. Similarly, in

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<sup>1</sup> Policies and Perspectives of Advanced Manufacturing across EU regions. Scoping Paper for the RIM Plus Workshop “Regions, industry and advanced manufacturing” (Brussels, 18 March 2014) <http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/monitor/report/thematic/policies-and-perspectives-advanced-manufacturing-across-eu-regions>

<sup>2</sup> Commission Staff Working Document, 'Advancing Manufacturing - Advancing Europe' - Report of the Task Force on, Advanced Manufacturing for Clean Production. Brussels, 19.3.2014, SWD(2014) 120 final

Lombardy the Advanced Manufacturing Cluster (AFIL) is setting-up working groups composed of companies and research institutions to present to the Region a strategic priority plan for research and innovation.

- In the Basque country, a public and private investment in the Advanced Manufacturing Centre for wind power, hosted in the applied research centre IK4-Tekniker, is an advanced infrastructure to validate and demonstrate the manufacturing feasibility of novel prototypes in a relevant environment without having to make large investments
- In Flanders, the Made Different initiative aims at transforming production facilities of 500 companies into 'Factories of the Future'.
- The Brainport Industries Campus<sup>3</sup> will be developed in the South Netherlands to complement existing support for advanced manufacturing.

The initial mapping of regional advanced manufacturing policy measures, clusters public-private partnerships should be extended and completed during the first phase of the SSP. This could be done in co-operation with existing European level initiatives like MANUNET (see next section) or with support from the Regional Innovation Monitor project of DG Enterprise.

### 1.6 Lessons and options for inter-regional 'smart specialisation' mapping

The pilot mapping process has been limited in scope (14 regions) and undertaken as a voluntary consultative exercise with limited resources for additional data collection or analysis at either regional or inter-regional level. The mapping mobilised key experts in each region who committed time both to completing the questionnaire and to attending the two workshops. Hence, the exercise has shown that it is possible to launch an inter-regional 'smart specialisation' process with relatively limited resources, if there is sufficient ambition and commitment.

Moreover, the participants have recognised the intrinsic value of the process of completing the mapping questionnaire. In several regions, the mapping led to ad hoc working group being constituted to complete the questionnaire; in others it encouraged a specific (and new) focus or reappraisal of ADMA strengths. Finally, it seems to have spurred the stakeholders in the participating regions to think about the specific contribution each can make to think to developing EU value chains.

A more detailed and extensive analysis is required of the potential for inter-regional value chain complementarities since from the current exercise it is difficult to do more than identify some illustrative examples. However, carrying out such a mapping across all possible sectors, technology development or application fields for even the current set of Vanguard Initiative regions will be costly<sup>4</sup> and will not necessarily facilitate joint investment decisions on industrial demonstrators, etc. Hence, it would appear appropriate to focus the mapping of value chains on specific priority fields in which there is sufficient interest (3-4 regions at a minimum) in developing a joint action.

The scope and range of ADMA infrastructure and facilities available suggests that a more detailed and structured mapping of available equipment and facilities would be of value. This could help to inform future investment decisions by regional authorities, notably when using ESIF resources, in order to avoid duplication and to ensure that the available capacity of existing facilities is used optimally. This could be done with a view to setting up an open access network of labs, pilot and testing sites, industrial

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<sup>3</sup> [http://www.brainportindustries.com/en/market\\_value\\_chain/brainport\\_industries\\_park/](http://www.brainportindustries.com/en/market_value_chain/brainport_industries_park/)

<sup>4</sup> The European Competitiveness Report 2013 included an analysis of two specific value chains in emerging industrial technologies. [http://ec.europa.eu/enterprise/policies/industrial-competitiveness/competitiveness-analysis/european-competitiveness-report/index\\_en.htm](http://ec.europa.eu/enterprise/policies/industrial-competitiveness/competitiveness-analysis/european-competitiveness-report/index_en.htm)

scale demonstrators that could be accompanied by an inter-regional funding scheme for SMEs and technologists to travel to and work at the networked facilities.

## 2. A smart specialisation platform for advanced manufacturing : rationale and synergies with existing initiatives

The two workshops organised by the Vanguard Initiative secretariat (18 March and 15 May 2014) led to a number of preliminary conclusions on the rationale and ‘strategic positioning of an SSP. A first observation is that the platform should be based on a clear value proposition for the regional stakeholders. Its organisational design should have a strong service orientation responding to concrete needs that cannot be otherwise addressed by the regional or national level instruments. The platform should develop and deliver concrete services (e.g. advisory services, data and analysis, brokerage) that cannot be effectively delivered at the regional level. A second observation was that the platform should be a vehicle to encourage and support collaboration. A key objective should be to link regional activities and stakeholders with EU level initiatives.

Given the findings of the preliminary mapping of strengths, challenges, initiatives and infrastructures in the Vanguard Initiative regions, this section sets out an intervention logic for the SSP and considers how it should be positioned to ensure coherence (and avoid overlap) with other existing platforms at EU or inter-regional level.

### 2.1 Rationale and intervention logic for an SSP Advanced Manufacturing

A main aim of this scoping paper is to establish whether or not there is a policy rationale for a SSP in advanced manufacturing. The Commission’s industrial renaissance communication proposed the establishment of SSP under the heading of stimulating investment in innovation and new technologies. From an EU perspective, the aim is to combine regional and industrial policy tools to help regions roll out RIS3 by facilitating contacts between firms and clusters, enabling access to the innovative technologies and market opportunities. The Commission also see a potential to encourage the creation of ‘cross-European value chains’.

As with all forms of public intervention, there is a need to ensure that there are one or more market or ‘system’ failures that justify the development of a policy response. The context to the SSP is that Europe has significant areas of competitive advantage in manufacturing but that insufficient investment (in research and innovation but also in application of new industrial technologies) and fragmented and weak demand for industrial technologies is hampering growth (see the Commission Communication on an industrial renaissance, the report of the Task Force on Advanced Manufacturing for Clean Production or the European Competitiveness Report 2013).

The specific problems justifying the creation of an SSP are due to network or information ‘failures’ that are leading to sub-optimal socio-economic outcomes:

- Firstly, insufficient knowledge of inter-regional regional ADMA potential and value chains undermine the potential to leverage and optimise (public and private) investments for the development and industrial application of advanced manufacturing technologies. There is also a significant risk of duplication of investment (at inter-regional level), including ESIF or EIB funds;
- Secondly, the current inter-regional networking is focused technology development (R&D projects funded through FP7, etc.) rather than industrial application. The current measures do not tackle fragmented (public and private) demand for advanced manufacturing technologies that limit the capacity for SMEs to demonstrate and rapidly upscale new manufacturing process and products.

Moreover, the RIS3 appear to be defined in an ‘inward looking’ perspective, i.e. “our regional strengths are” without a clear focus on their international competitive position. Certainly, it is striking that the experts consulted often ranked the regional capacities highly but could not position the regional ADMA specialisations easily on

international value chains. Hence, the SSP could assist policy makers and stakeholders at regional level to add an ‘inter-regional’ dimension to the on-going refinement of their smart specialisation investment priorities for advanced manufacturing.

A final point is that while there are a number of major multinational businesses present across the regions, most of the firms identified as key players in ADMA sectors or technologies are ‘local’ champions with limited capacities to build international linkages. For the SSP ADMA to be industry-led, it may be more effective to build on the cluster (or other industrial network) organisations identified in the mapping. The potential to build ‘meta-clusters’ in specific ADMA niche should be further explored.

Figure 8 : Illustrative rationale for an SSP from perspective of different stakeholders

<b>Function</b>	<b>Industry</b>	<b>Research</b>	<b>Education</b>	<b>Public sector</b>
<b>Learn</b>	<ul style="list-style-type: none"> <li>Identification of new markets for ADMA products or technologies</li> <li>Sourcing new suppliers or technology partners</li> </ul>	<ul style="list-style-type: none"> <li>Expanding existing networks of co-operation</li> <li>Identification of complementary equipment</li> </ul>	<ul style="list-style-type: none"> <li>Identify similar or matching course offerings in other regions and learn from good practice</li> </ul>	<ul style="list-style-type: none"> <li>Policy benchmarking as input to RIS3 implementation</li> <li>Alignment of RIS3 to favour inter-regional specialisation</li> </ul>
<b>Connect</b>	<ul style="list-style-type: none"> <li>Match-making opportunities allowing strengthening of inter-regional supply chains, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Promotion of testing, research and prototyping services at inter-regional level</li> <li>Access to complementary expertise</li> </ul>	<ul style="list-style-type: none"> <li>Co-development of new Masters curricula with industry and other regions’ education institutes</li> </ul>	<ul style="list-style-type: none"> <li>Development of new joint programmes in specific ADMA niche (cost-sharing and expertise pooling)</li> </ul>
<b>Demonstrate</b>	<ul style="list-style-type: none"> <li>Co-investment with inter-regional consortia in ADMA opportunities</li> <li>Access to public funds (EIB, etc.) for pilot plants and demonstrators</li> </ul>	<ul style="list-style-type: none"> <li>Provision of contract research or testing services to industrial demonstrators or pilot plants at inter-regional level</li> </ul>	<ul style="list-style-type: none"> <li>Piloting of e-learning or international Masters courses on cost-sharing basis with other regions</li> </ul>	<ul style="list-style-type: none"> <li>Co-investment with other regions in pilot plants and industrial demonstrators</li> </ul>
<b>Upscale</b>	<ul style="list-style-type: none"> <li>Access to larger inter-regional market for new ADMA products and technologies</li> <li>Learning from exposure to international markets</li> </ul>	<ul style="list-style-type: none"> <li>Increased revenue from licensing of technologies</li> <li>Enhanced scientific specialisation in ADMA technologies</li> </ul>	<ul style="list-style-type: none"> <li>Improved position as specialist training centre in emerging ADMA niche</li> </ul>	<ul style="list-style-type: none"> <li>Optimised use of public funds invested in pilot plants and research &amp; innovation infrastructure</li> </ul>

The table above provides an illustrative rationale for the SSP from the perspective of the different types of stakeholders and with respect to the four main functions that are proposed in section 3 for the future smart specialisation platform. The evidence collected suggests that there are significant benefits to be achieved in deploying at inter-regional level a targeted process of learning, connecting, demonstrating and upscaling (or commercialising) for specific advanced manufacturing applications. There are emerging areas of specialisation across the VI regions and there is some evidence of concentrated efforts and ambition in additive manufacturing / 3D printing. However, this is by no means a clear priority for the majority of the VI regions. Hence, a first step in such the learn-connect-demonstrate-upscale process will be to select a limited number of core priorities in which a majority of SSP regions have capacities to develop and demonstrate new ADMA technologies or an interest to apply and use such technologies.

## 2.2 Alignment with existing EU initiatives for advanced manufacturing

In order to further explore the scope for launching an SPP in advanced manufacturing, there is an obvious need to ensure alignment with the existing EU level ‘architecture’, in terms of the various inter-regional or pan-European projects, platforms and public-private partnerships<sup>5</sup>. The participation of the Vanguard Initiative regions to the main EU wide initiatives in favour of advanced manufacturing is summarised in below.

Figure 9 : Regional participation in EU level platforms

Region	SPIRE	Manufuture	ManuNet	EFFRA
Asturias			X	
Baden-Württemberg		X		X
Basque Country	X	X	X	X
Catalonia	X	X	X	X
Flanders	X	X	X	X
Lombardy	X	X		X
Mazowiecka				
Nord		X	X	X
Scotland	X	X		
Spain				
South Netherlands	X			X
Tampere	X	X		X
Upper Austria				
Wallonia	X	X	X	

Source: replies to the questionnaire

Based on the replies to the questionnaire, the MANUNET<sup>6</sup> initiative is viewed as a strong foundation, and future partner, for developing the actions of the SSP in Advanced Manufacturing. The MANUNET initiative has operated for a decade via three different projects.

- MANUNET SSA, launched in 2004 by the Basque Country in partnership with Lombardy, to identify EU regions and countries with an important manufacturing sector and funding programmes to support R&D projects in this field.
- MANUNET: based on the positive results of the SSA, an application for an ERANET was made and the project started in 2006 and lasted nearly five years.
- MANUNET II: started in 2011 and will end in March 2015. However, there is a willingness to continue cooperating as a sustainable network (and probably as an ERA-NET COFUND) beyond 2015.

In addition to the leading role of the Basque Country, other Vanguard regions have participated in one or more of the MANUNET phases. The Basque Country considers MANUNET as a crucial element of its policy framework and would continue leading it even without the support of the Commission. According to the MANUNET coordinator, confirmed by the regional questionnaires, the most active Vanguard Initiative regions are Asturias, Catalonia and Wallonia. Catalonia and Wallonia are both on the management board of the ERANET and have indicated an interest to continue co-operation, even in the absence of Commission support. Asturias, although only an associate partner, is one of the most active with up to 10 proposals a year.

Others regions, such as Flanders, Lombardy and Nordrhein-Westfalen have participated in early rounds but have not joined the MANUNET II due, notably, to the

<sup>5</sup> The recent RIM+ workshop paper has summarised the scope and activities of these initiatives and, hence, we avoid repeating this information here.

<sup>6</sup> <http://www.manunet.net/>

lack of a relevant funding programme or proposal (Flanders, Lombardy) or because a national agency took the lead (KIT-PTKA in Germany).

Despite past discussions with regional agencies and stakeholders, Scotland, Skåne and Tampere have not joined the initiative. In the case of the latter, Tampere was an associated member in MANUNET and the national funding agency TEKES participates actively in the network. Silesia is a very active partner in MANUNET but, despite their efforts, they have not been able to get funding to participate in the calls.

The MANUNET co-ordinator notes that for certain regional organisations, the initiative has provided a first experience of a European project. The ERANET gives an opportunity to collaborate internationally and enabling subsequent participation to framework programme projects.

The Basque Country noted that there are significant synergies between the SSP in Advanced Manufacturing and Manunet, for example:

- From SSP in AM to Manunet:
  - SSP in AM would provide a working schedule and a more solid identification of priorities.
  - Moreover, it would also provide different elements which would enhance the impact of Manunet. In particular, an optimised design and enhanced execution (e.g. greater funding, access to demonstration infrastructures, etc.).
- From Manunet to SSP in AM:
  - Manunet could better connect governments' and public agencies' policy priorities with the industrial reality thanks to the interaction with private companies.
  - Furthermore, it would provide R&D projects (e.g. demonstrations, pilot lines for SMEs, etc.) that could be used as tests for the priorities of the SSP in AM.

Moreover, a number of regions insisted on the need to coordinate with and build on the experience of the European Technology Platform (ETP) ManuFuture<sup>7</sup> and, in particular, to work closely with the national/regional technological platforms (NRTPs). This would be logical given the NRTPs' role to coordinate national and regional activities with EU funding programmes in the framework of the ManuFuture Vision 2020 and Manufuture Strategic Research Agenda.

Equally, there are clearly opportunities for the SSP ADMA to link into the technology development being funded through the Factories of the Future (FoF) programme (FP7/Horizon 2020). The European Factories of the Future Research Association (EFFRA)<sup>8</sup> secretariat has developed an Innovation Portal via which all FoF consortia projects are invited to describe their project. This includes:

- mapping of the project to the FoF 2020 Roadmap.
- describing (expected) project results and demonstrators.

For each result and demonstrator, the consortia are encouraged to describe the application areas as specifically as possible by indicating which sub-sectors the technology could be applied in (using the NACE-code structure).

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<sup>7</sup> <http://www.manufuture.org>

<sup>8</sup> EFFRA is a non-for-profit, industry-driven association promoting the development of new and innovative production technologies. <http://www.effra.eu>

A more ‘private sector’ strategic perspective could be provided by building links to SPIRE<sup>9</sup>, in which a number of the Vanguard Regions are also represented. SPIRE members include regionally based research organisations such as Tecnalia and Funcion Tekniker from the Basque Country, Eindhoven University or TNO for South Netherlands, the University of Porto for Norte, etc. The SPIRE members in each region could act as an interface to ensure the priorities set out in the SPIRE roadmap<sup>10</sup> are taken into account in the process of developing the SSP ADMA activities.

A number of other regions underlined the importance of building on bilateral co-operation and existing inter-regional networks supported, for instance, via INTERREG IV. Wallonia pointed to two existing projects in the Euroregio Meuse-Rhine and “Grande Region”: the TTC Top-Techology Cluster<sup>11</sup> which regroups 19 partners in advanced materials; and the INTERMAT GR<sup>12</sup> with nine partners, notably three cluster organisations) working on materials engineering. The creation of meta-clusters, such as INTERMAT provide an example of how future co-operation could be developed based on grouping cluster competence inter-regionally.

The European PPPs (FoF, EFFRA, Manunet) have clearly reinforced knowledge of R&D partnering opportunities and created a platform for discussing broad strategic orientations for advanced manufacturing. However, there is still a significant information gap at a more detailed level in terms of specific value chains, technology development and application potential, etc. across regions. Hence, there is ‘a missing link’ between the pan-European initiatives and the regional level that a SSP ADMA could help plug. Findings from the questionnaires clearly point to the need for a value chain focus, this goes beyond the boundaries of regional strengths and signals the importance of inter-regional ‘scale’ in improving the EU’s global competitiveness.

## 2.3 Future activities of the SSP: options and priorities

### 2.3.1 Priority actions for an SSP in advanced manufacturing

Each region was asked to rank a list of possible activities for the SSP (from 1 low priority to 5 top priority). As can be seen from Figure 10, the highest priority was given to joint financing of emerging advanced manufacturing niche, co-investment in large- to small scale demonstrators (SME support), pilot lines, etc. and the development of a network of open access advanced manufacturing infrastructures.

A number of possible actions were identified in the regional questionnaires:

- Industry 4.0 (Baden-Württemberg, Upper Austria)
- Pilot Plant for Electric Vehicle Batteries (Catalonia)
- Manufacturing of personalised, fashion and high-end products (Lombardy)
- Interdisciplinary training network on business and engineering in ADMA - KIC type actions (Baden-Württemberg, Catalonia)
- Large Demonstration Programme on Additive Manufacturing / Pilot Plant additive Manufacturing (3D Printing) (Catalonia)
- Integrated technologies for Advanced Manufacturing Production Cells (Catalonia)

<sup>9</sup> A.SPIRE aisbl is an international non-profit association formed to represent the private sector as a partner in the Sustainable Process Industry through Resource and Energy Efficiency (SPIRE) Public-Private Partnership (PPP) launched as part of the Horizon2020 framework programme. See: <http://www.spire2030.eu>

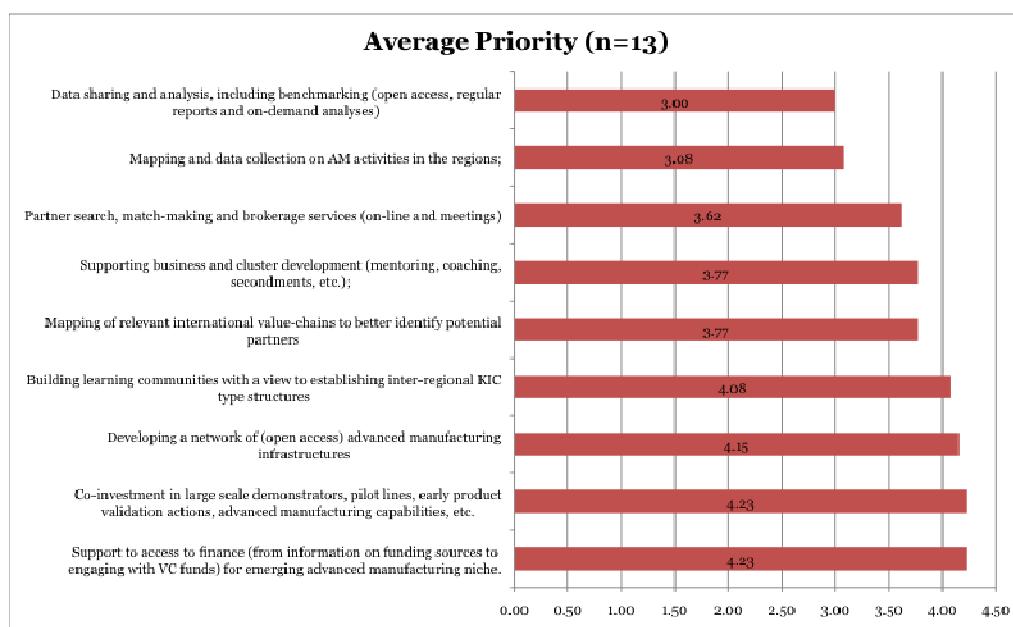
<sup>10</sup> [http://www.spire2030.eu/uploads/Modules/Publications/spire-roadmap\\_december\\_2013\\_pbp.pdf](http://www.spire2030.eu/uploads/Modules/Publications/spire-roadmap_december_2013_pbp.pdf)

<sup>11</sup> <http://www.ttc-innovation.eu/>

<sup>12</sup> <http://intermat-gr.eu/en/welcome/>

- Developing a network of (open access) advanced manufacturing infrastructures, mid and large scale demonstrators and pilot lines (Basque Country, Lombardy, Tampere)
- Co-investments in large scale demonstrators, pilot lines, early product validation actions, advanced manufacturing capabilities, etc. (Catalonia, Tampere)
- Cooperation with Manufuture NRTPs (Lombardy, Tampere)
- Co-organise specific events such as for European value chains in 3D-printing, additive manufacturing (Flanders, South Netherlands)
- Pilots for High Mix Medium Volume Integrated Electronic Components and (sub-)systems (South Netherlands)
- Pilot plant for zero-defect manufacturing (including a focus on energy efficiency and global processes) / advanced manufacturing for clean production (Catalonia).
- Integrated supply networks (connected factories) (South Netherlands)

Figure 10 Priority ranking of types of activities



Source: replies to question 3.1 of the questionnaire

With a view to further developing ideas for such joint actions, a number of regions indicated their willingness to host match-making events.

Figure 11 : proposals for match-making events

Region	Match-making themes
<b>Baden-Württemberg</b>	Strategies and Methodologies for Manufacturing; ICT for Manufacturing including Simulation technologies; Changeable Manufacturing Systems; Sustainable manufacturing
<b>Basque Country</b>	In all sub-domains of any of the following FoF domains : advanced manufacturing processes; adaptive and smart manufacturing systems
<b>Catalonia</b>	Automotive; Engineering, Manufacturing and Maintenance of Machinery Equipment; Additive Manufacturing
<b>Flanders</b>	Matchmaking for cooperation of industrial ecosystems – including different sub-levels. The platforms that represent local eco-systems should be in charge and identify the players that can benefit/contribute the most.
<b>Lombardy</b>	A matchmaking event could be organised within the European Emerging Industries Conference 2014, that will take place in Milan in November with the presence of about 450 international participants having a leading role in the industrial, research/academic, financial and social fields.
<b>Scotland</b>	Manufacture of high integrity components for offshore energy applications. Scottish Enterprise and the Advanced Forming Research Centre at University of Strathclyde

<b>South Netherlands</b>	Supporting Business and Cluster Development. Possible useful events: Bits&Chips Smart Systems Event, AM Roadmap sessions, HTS 2014
<b>Tampere</b>	In regional strengths - use events such as Hannover Messe for matchmaking (with the RIGHT people (experts) and NOT political level)

Source: replies to the regional questionnaire

The discussions at the two workshops underlined that there is a need to take forward the development of the SSP (and supporting policy) in a way which is attractive and engaging to industry. The SSP needs be led and driven by industry if there is to be any real sense of industry ‘ownership’ of the activity which underpins it. Connected to the point above, the SSP needs to demonstrate the rationale for co-investment. Collaboration within the SSP must go further than the activity of many existing EU platforms (i.e. beyond practice sharing and creating a ‘space’ for matching-making events). Indeed, it was also noted that the SSP could seek to get more mileage from investments already made (e.g. in existing infrastructure)

Hence, the selection and focus of a first round of match-making event should be based on a more detailed consultation with key industrial players in each region. This could be done through consulting with RIS3 working groups or cluster organisations in regions interested in specific topics (e.g. digital manufacturing, resource efficiency, advanced manufacturing for the energy sector, 3D printing/additive manufacturing, etc.) order to further refine the proposed priority themes. The discussions at the match-making events should be resourced based on a theme specific scoping or background paper that would seek to pre-identify value chains or complementary industrial technology infrastructure, etc. in the participating regions. If theme specific events are held in 3-4 regions before November, then Lombardy could host an event, in parallel to the European Emerging Industries Conference, to validate and select the first set of actions to be launched under the umbrella of the platform.

### **2.3.2 Inter-regional financing for advanced manufacturing**

The regions were invited to expand on the potential scope of financial engineering actions that could be better developed on an inter-regional basis than through standard regional investment funding, etc.

- Synergies between funding instruments (European, national, regional)
- ‘Fund of Funds’ for interregional investments
- Access to the EIB instruments to support KETs

Several regions (Basque Country, Scotland) felt it was premature to examine such options as it requires further exploratory discussion to understand what works best for the different partners / stakeholders involved. In particular, funding needs to take account of shared responsibilities, joint incentives and shared risk.

A number of regions (Catalonia, Flander, Skåne) argued that the SSP should mobilise pan European financial instruments to support both manufacturing SMEs and public facilities and labs for research and education (KIC) and demonstration centres for technology transfer. For instance, Catalonia would be keen to access EIB instruments to support large inter-regional co-investments such as a pilot plant for electric vehicle batteries. Similarly, Tampere considers the SSP should facilitate the utilisation of both EU-level and regional platforms, funding instruments and resources (H2020, Structural Funds, EIB, etc.) notably for concrete demonstrators and pilot lines (notably for SMEs).

Flanders pointed to potential to leverage EIB/EIF funding investment (such as the TINA fund that invests in transformation projects) for co-investment in regional and cross-border projects. The South Netherlands similarly underlined the potential to improve synergies and access a critical mass of funding on a cross-border level. The need to ensure simplification and alignment of procedures in order exploit such synergies was underlined (Flanders, Norte, South Netherlands) in order to overcome difficulties in using national funding across borders.

### 3. An outline plan for the SSP ADMA

#### 3.1 Governance and membership of the SSP

##### 3.1.1 Regional views on governance models

The regions were asked to comment on three possible (not mutually exclusive) options for the future development of the SSP:

- Option 1: Establish a legal entity (e.g. EEIG, AISBL, etc.) as a permanent structure in which VI regions provide initial ‘working capital’ - aim being to develop a series of (paying) services to member regions
- Option 2: VI regions co-finance an operational team to run platform who then develop specific activities through leveraging funding from interested partners/applications to EU programmes H2020/COSME/INTERREG
- Option 3: SSP focuses only on mapping and match-making and helping to organise participating regions, which then bid into EU programmes/co-fund projects on an ad hoc basis

A number of regions did not express an opinion (Asturias, Lombardia, Skane) or indicated that the financing and governance modalities will depend on the activities of the SSP (Catalonia, Malopolska, Wallonia).

The respondents tended to consider **option 3** as a first stage of the SSP (Baden-Württemberg, Basque Country) but not sufficient in itself. Flanders noted that adopting this option should not exclude any other activities that may be deemed necessary. Hence, this model is only considered adequate as a means of completing the background analysis of needs and challenges and in order to confirm the interest of the regions to take part in specific actions.

Most respondents expressed an unfavourable opinion about **option 1**, with the exception of Upper Austria who felt it might be a means to ensure the required commitments from stakeholders and thus separate “the wheat from the chaff”. However, even in this case, the regional representative noted it was too early to be sure if the Regional authorities would be willing to commit funds. Other regions (e.g. South Netherlands, Basque Country, Malopolska) ruled out this option (at least for the time being) and in general there is a noted preference for ‘light structures’ that ensure flexibility and fast partnership processes. Moreover, Malopolska was concerned that the first option where a legal entity would provide services to member regions might run afoul of procurement law.

Hence, the preferred option appears to be for the Vanguard Initiative regions to co-finance an operational team to run the SSP and develop specific activities. The Basque Country, Scotland and Tampere all expressed support for this model, which brings the ‘most value added’. Basque Country considers this option as the second stage, once the analysis stage is completed and the activities and services of the platform are selected. Scotland noted that it would be helpful to have a “genuine EU commitment” in support of an industrial renaissance. This implies that regional co-funding would be matched by core/seed funding from the Commission to support SSP activities.

Only South Netherlands indicated that the region would not be willing to co-fund an operational team. The region prefers to keep a light structure and pragmatic approach, using the expertise and support of the actors concerned, and the capacity of the Brussels based regional offices.

The Catalan ACCIÓ agency noted that is willing to explore the use of financial resources of the ERDF Operational Programme to finance future SSP actions and joint initiatives of the participating regions. However, in general, few regions mentioned a willingness to pool European Regional Development Funds by making a provision to

use Article 70 of the ESIF Regulation (under which up to 15% of ERDF funds can be used outside of the operational programme zone). The Vanguard Initiative regions could show a lead on this topic by ensuring that all regional operational programmes explicitly mention the use of Article 70 to fund inter-regional actions promoted by smart specialisation platforms.

### *3.1.2 Extending membership of the SSP*

Although the Vanguard Initiative region are coordinating the development of the pilot SSP for advanced manufacturing, the intention is that the platform will be open to other regions that have specific expertise in the field. The questionnaire responses confirmed this principle that the SSP will not be a ‘exclusive club’, but should adopt an open and flexible membership policy. The Scottish response noted that, rather than the secretariat inviting applications from regions, an open application procedure should be established allowing new regions to apply whenever it is relevant. Hence, different regions will seek to engage in different ways, depending on their focus / concentration on ADMA in regional policies.

Tampere region suggested that in enlarging the SSP and attracting additional regions a corridor or zone approach could be considered. That is, a set of regions could form together with their neighbours a larger corridor or zone where regional strategies could be jointly planned so as to form an attractive macro-regional infrastructure for the advanced manufacturing sector (logistics/transport, education, research, communication, energy, services, etc.). The BSR Manufacturing Belt initiative<sup>13</sup> is an example of such an approach. Baden-Württemberg suggested that associating the Danube macro-region (EU Strategy for the Danube Region, EUSDR) could be important in terms of linking into value chains and regional specialisation in medium-tech manufacturing of high-quality goods. Similarly, Lombardy underlined the importance of extending invitations to the regions involved in developing the Alpine region strategy.

Figure 12 : possible additional partner regions for the SSP

Region	Advanced manufacturing expertise
<b>Bayern</b>	Additive Manufacturing and Micro-manufacturing Strong in INDUSTRIE 4.0 (Advanced Manufacturing Technologies)
<b>Centro (PT)</b>	Moulds and Tooling, Process Industries (glass, ceramics, paper, etc.), Critical Systems
<b>East Midlands</b>	Institute for Advanced Manufacturing / LUMINATE (Loughborough University) Manufacturing Innovation in Advanced Transport Engineering The Nuclear Advanced Manufacturing Research Centre
<b>Galicia</b>	Automotive, Food, Textile
<b>Vorarlberg</b>	Small region but nonetheless strong in production industries
<b>Yorkshire</b>	Advanced Manufacturing Research Centre - Design, Prototyping and Testing Centre Advanced Manufacturing Research Centre - Hub Revenue Advanced Manufacturing Institute – Training Centre Advanced Materials Centre at the Advanced Manufacturing Park

Source: Regional profile questionnaire responses

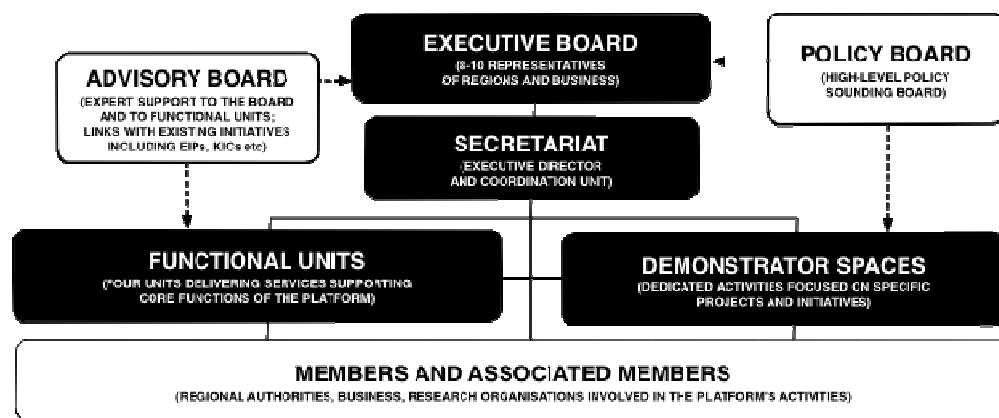
A number of other regions or countries were mentioned, in the questionnaire responses, including Serbia and the need for more participation from French regions. In addition, it is likely that by extending the first broad mapping additional potential partners for specific actions or as core members of the platform could be identified. For instance, the S3 Platform of the European Commission has identified a series of regions that have advanced manufacturing systems as a priority within their RIS3 (appendix C.2

<sup>13</sup> [http://www.manufuture2013.eu/images/MF/presentations\\_PDF/Tuokko-P4.pdf](http://www.manufuture2013.eu/images/MF/presentations_PDF/Tuokko-P4.pdf)

### 3.1.3 A possible governance model

Taking into account the preferred option for a partnership based governance model, the figure below sets out a possible governance structure for the SSP. The governance structure makes no assumption about legal forms, given the initial preference for an institutionally light and flexible approach. The SSP could be given a formal structure without initially creating a legal entity by the Vanguard Initiative regions agreeing a memorandum of understanding or forming a consortium to bid for funds in response to an Interreg, H2020 or COSME call. Catalonia suggested that the Vanguard Initiative regions agree to subcontract the management the SSP. This could be co-funded by a grant from the Commission to allow the operations to begin rapidly.

Figure 13 : proposed organisational structure of the platform



Source: Technopolis Group

At a minimum, the model assumes that a ‘core budget’ (seed funding) would be made available to support the functioning of the SSP secretariat, executive, policy and advisory boards. These structures would be responsible for the strategic development and selection of the priorities for the SSP. The ‘functional units’ and ‘demonstrator spaces’ could be funded by the core/seed funding and/or through specific projects using either co-funding of the member regions (including Article 70 of the ERDF) or applications to EU level programmes (e.g. Interreg, H2020, COSME, etc.).

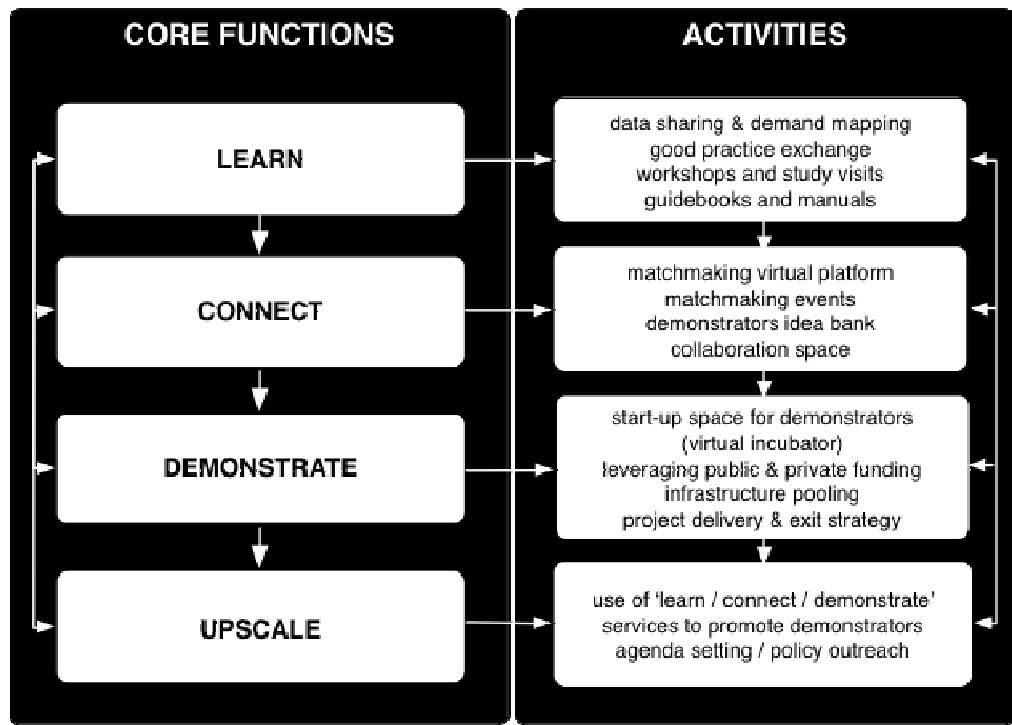
Initial staffing of the SSP could be by the secondment of regional experts so that funding could be ‘in-kind’ (Catalonia indicated willingness to support the SSP in this manner). This would allow a flexible operating model where experts could be seconded to manage specific activities for a fixed duration.

The role of the executive board would be to decide on the thematic priorities of highest relevance for the member regions, given the advanced manufacturing capabilities and needs identified during the full mapping exercise. A specific attention should be given to the potential for synergies between RIS3 priorities in each region and to inter-regional ‘value chains’.

### 3.2 Future functions and activities of the SSP Advanced Manufacturing

To structure the future activities of the SSP, four core functions and a set of related activities are proposed. This generic model could be applied to SSP in other fields.

Figure 14 : Proposed core functions and activities

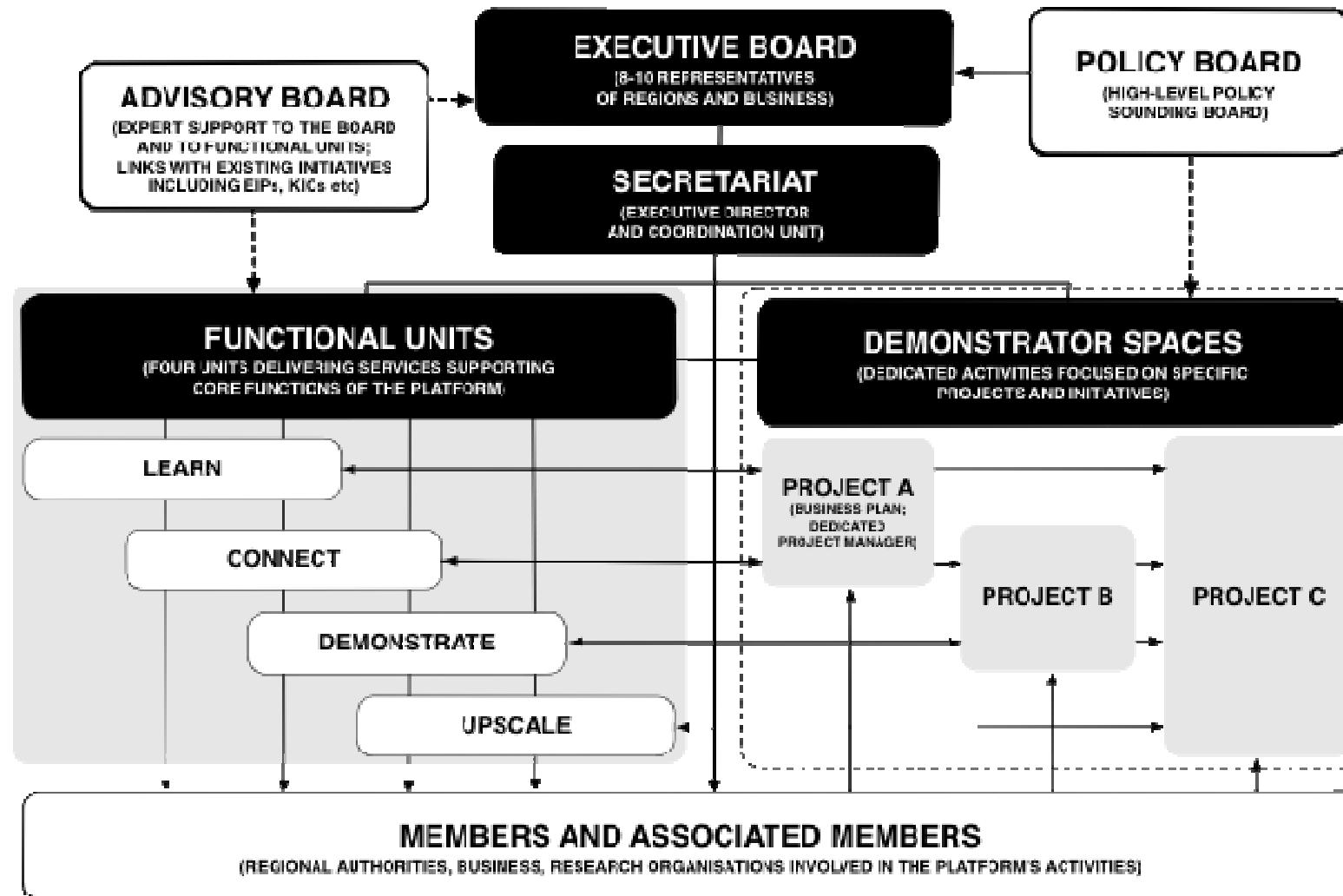


Source: Technopolis Group

The first two core functions would be the main initial focus of the SSP platform and would be coordinated centrally by the SSP secretariat. The diagram on the next page outlines in more detail how the platform could operate, with the governance structure serving to coordinate and prioritise specific thematic topics that would then be developed through projects that could cover one or more of the four core functions.

Given the priorities established by the executive board, taking account of complementarities with other EU level initiatives (e.g. MANUNET), the SSP could work through an internal call for projects. The selected projects could then be funded either through a joint programming, through the creation of an inter-regional fund (e.g. application of Article 70), through applications to either Commission programmes as a “priority SSP project” (if the Commission would accept such a concept), or from EIB/EIF or public-private partnership financing.

Figure 15 : overall management structure for services and projects



### 3.3 Conclusions and overall recommendations

#### 3.3.1 Conclusions

The scoping paper and consultation exercise undertaken with the support of the Vanguard Initiative secretariat and regional authorities and experts has proven to be a rich process leading to a high-quality debate. The level of resources and time available to carry out the exercise clearly mean that the findings presented in the scoping paper should be regarded as a foundation for future work and not a definitive or comprehensive analysis of advanced manufacturing potential and challenges. A number of suggestions have been made in the scoping paper on the further deepening and refinement of the mapping.

A number of main conclusions can be drawn:

- There is a good basis for believing that a SSP could help to fill a gap in the European ‘architecture’ supporting the deployment of advanced manufacturing technologies and that it would respond to a series of information and network failures that lead to a sub-optimal level of and return on investment.
- The focus of the SSP should be on industrial application of advanced manufacturing technologies and it should be ‘downstream’ from the current set of actions which are more focused on technology development. The types of actions that can be foreseen include joint-investment in industrial demonstrators, pilot plants or large-scale testing facilities, pooling and ensuring open access to research and innovation infrastructures, mobilising investment funds on an inter-regional basis for advanced manufacturing SMEs, etc.
- The SSP should extend and open up the strategic reflection carried out at regional level through RIS3 or other similar initiatives and seek to align and match skills, infrastructure, technologies and markets. The pooling of knowledge and information on advanced manufacturing needs and capacities provides, in itself, a significant European value added for the participating regions. The extension of the RIS3 entrepreneurial discovery process to an inter-regional level is, therefore, a core mission of the SSP.

#### 3.3.2 Recommendations

##### 3.3.2.1 To the European Commission

- Consider providing a grant (on a co-funding basis) to support the initial start-up and operation of the SSP (for a 12-24 month period),
- Commission a more in-depth study of the potential for developing inter-regional value chains in specific advanced manufacturing technologies or markets,
- Explore how existing benchmarking platforms (S3 platform, RIM+, Cluster Observatory, Business Innovation Observatory, etc.) or service network (EEN) could complement and support the SSP activities.
- Identify which planned calls under COSME, H2020, Interreg, etc. could be used to fund future actions developed under the umbrella of the SSP and include a specific reference to prioritising funding for projects that have been developed through the SSP type process
- Foresee a specific action line and funding under the future European Cluster initiatives for ‘meta-clusters’ in the advanced manufacturing field.

##### 3.3.2.2 To the Vanguard Initiative regions

- Organise regional working groups on advanced manufacturing or associate RIS3 committees or existing regional Manufuture/Manunet structures to assist in the

further deepening of the mapping exercise (in specific topics/fields) and to define regional priorities with a view to participating in the inter-regional SSP activities.

- All regions should make a specific commitment in their ERDF operational programme to the use of Article 70 to pool ERDF funds for supporting activities of the SSP Advanced Manufacturing (or other future thematic SSP).
- Organise a series of working meetings with representatives of the EU PPP in the advanced manufacturing field in order to explore in more depth how the SSP could complement the existing activities.

A provisional time line for the next steps in developing the SSP Advanced Manufacturing is proposed below:

- Agreement by the Vanguard Initiative regions on the broad thematic priorities and management structure for the future SSP (June 2014)
- Secure funding from one or more regional authorities and possibly the Commission services through a specific grant for the initial 12 months operation of the SSP secretariat (by September 2014)
- Organise of 3-4 thematic match-making meetings in September-October with a wrap up event in November to agree on priorities for the first learn-connect-demonstrate-upscale actions.
- Agree on a business/operational plan for the SSP (December 2014)
- Commitment of the executive board (December 2014)
- Engagement of members of the policy and advisory board (December 2014)
- Official establishment of the Platform (January-March 2015)
- Secretariat and basic organisational structure in place (January 2015)
- Functional support units established and first 'learn-connect' services launched (March-June 2015)
- First demonstrator projects launched (September-December 2015)
- First results from 'learn-connect' projects (2016)
- First results from demonstrators (2018)



## Appendix A Regional profile questionnaire

### A Smart Specialisation Platform for Advanced Manufacturing Regional profile questionnaire<sup>14</sup>

Region: **Insert name**

Person responsible for the questionnaire: **Insert name and email**

This questionnaire is the basis for a scoping paper that will set out options and priorities for a ‘Smart Specialisation Platform for Advanced Manufacturing’ (SPP ADMA). The Vanguard Initiative regions committed, in the January 2014 Letter of Engagement for a European Industrial Renaissance, to supporting the development of a pilot SPP. The SSP for Advanced Manufacturing will:

- Map and support the structuring of inter-regional industrial research, innovation and training capabilities in the participating regions
- Develop an inter-regional brokerage and match-making service with a view to joint programming, to co-investment in large-scale demonstration projects (e.g. based on FFF projects) and accelerating the internationalisation of advanced manufacturing regional businesses and clusters.

The outcome of the SSP should be to optimise the return on investment of regional, national and EU funds through the emergence of new inter-regional value chains and trans-regional, world-class clusters.

In order to design the pilot SPP for Advanced Manufacturing, it is essential that the VI regions contribute to an initial mapping of capabilities, challenges, existing initiatives and future priorities for advanced manufacturing. The aim is to ensure that the SPP ADMA builds on rather than duplicates existing activities. This implies ‘drilling down’ to identify sub-themes and opportunities relevant to advanced manufacturing identified in regional innovation or “smart specialisation” strategies.

Therefore, the VI regions are encouraged to contribute to differentiating and profiling their specific strengths and capabilities and to highlight gaps in their regional advanced manufacturing systems and, hence, needs for interregional cooperation.

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<sup>14</sup> to be completed by **April 30th** and sent to [alasdair.reid@technopolis-group.com](mailto:alasdair.reid@technopolis-group.com) (consultant) and [jan.larosse@ewi.vlaanderen.be](mailto:jan.larosse@ewi.vlaanderen.be) (secretariat VI)

## A.1 Regional advanced manufacturing potential and capabilities

Current and emerging capabilities in advanced manufacturing

Please list the main sub-sectors/technology areas/application areas in which your region has a specific competitive advantage in the advanced manufacturing field. Where possible list the leading regional companies for each area.

- Sectors – please be as specific as possible in describing sub-sectors or niche
- Technology development areas may include: robotics, mechatronics, sensors, etc.
- Technology application areas may include: textile machinery, 3D printing, etc.

Description of sub-sector/technology area/application area	Rank level of development from 1 emerging potential to 5 world class	Leading companies located in region
<b>Describe briefly the capability</b>		Name of companies and weblink if possible

Nb: You can add more lines as required.

Main regional clusters and centres of expertise (basic/industrial research, education, training, etc.) in advanced manufacturing

Please list the main regional organisations that are involved in supporting advanced manufacturing technology development, education and training and industrial R&D/innovation.

Name of organisation	Type of organisation:	Website
	e.g. cluster/technology platform/research centre/technology consultancy /etc	

Nb: You can add more lines as required.

Regional position in European and global value chains

*According to the recent European Commission 'Advancing Manufacturing - Advancing Europe' - Report of the Task Force on Advanced Manufacturing for Clean Production, support for experiments and partnerships along the value chain should be considered as a key element of future initiatives.*

As the 2013 UK Government report on the Future of Manufacturing noted: Manufacturing has traditionally been understood as the production process in which raw materials are transformed into physical products through processes involving people and other resources. It is now clear that physical production is at the centre of a wider manufacturing value chain.



Note: Within this value chain some elements are repeated many times, for example as components come together to build a complex product. There are also feedback loops which may vary for different sub-sectors.

Please consider the position of the main regional current and emerging capabilities identified in 1.1 above from a value chain perspective and identify specific capabilities or needs with respect to three broad stages in the value chain

Regional advanced manufacturing capabilities (see 1.1.)	Pre-production stages	Production stage	Post-production stage
<b>As in table 1.1</b>	Describe specific regional strengths or needs	Describe specific regional strengths or needs	Describe specific regional strengths or needs

Nb: You can add more lines as required.

## A.2 Regional priorities and policies

Regional challenges for advanced manufacturing

What are the main challenges for advanced manufacturing to contribute to the future of industry in your region? Please list and describe up to 10 main challenges for upgrading industry, developing new or diffusing existing technologies, integrating advanced manufacturing in global value chains, etc.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Regional positioning with respect to Factories of Future roadmap

The Factories of the Future (FoF) Roadmap<sup>15</sup> identified a set research and innovation priority domains. Please consider the relative importance of these domains for your region (e.g. the extent to which regional firms and organisations are specialised in the domains). For each domain, please be as precise as possible by listing the specific sub-domains that are of the highest relevance for your region.

FoF Roadmap domain	Specific sub-domains of high relevance for your region	Comment on the current extent of activity in this domain in your region
<b>Advanced manufacturing</b>		

<sup>15</sup>

<http://www.effra.eu/attachments/article/129/Factories%20of%20the%20Future%202020%20Roadmap.pdf>

processes		
<b>Adaptive and smart manufacturing systems</b>		
<b>Digital, virtual and resource-efficient factories</b>		
<b>Collaborative and mobile enterprises</b>		
<b>Human-centred manufacturing</b>		
<b>Customer-focused manufacturing.</b>		

Please consider the specific gaps or strengths your region has with respect to the Factories of the Future technologies and enablers:

Key technologies and enablers	Regional position from 1 main weakness/gap to 5 main strength/advantage	Comment
<b>Advanced manufacturing processes</b>		
<b>Mechatronics for advanced manufacturing systems</b>		
<b>Information and communication technologies</b>		
<b>Manufacturing strategies</b>		
<b>Modelling, simulation and forecasting methods and tools</b>		
<b>Knowledge-workers</b>		

#### Regional priorities

To what extent are priorities for advanced manufacturing identified in the regional smart specialisation strategy (or other similar policy documents).

List the relevant priorities (and if possible provide a link to a policy documents)

Advanced manufacturing related priorities	Strategy/Policy document & year	Web link for document if available

Nb: You can add more lines as required.

Please explain briefly to what extent the regional priorities for advanced manufacturing are embedded in other policies (e.g. education and training, environment, etc.)?:

Do these priorities take account of:

- Economic sustainability of manufacturing
- Social sustainability of manufacturing
- Environmental sustainability of manufacturing

If so, to what extent are such priorities reflected in the policy objectives/targets or types of policy support or public-private partnerships developed or planned?

Regional policies and initiatives in support of advanced manufacturing

Please list up to five main initiatives in the field of advanced manufacturing

Name of initiative	Year launched	Type of initiative	Annual funding	Website
		Grant funding / financial engineering/ PPP / technology-innovation advisory service/others		

You may also check the measures already listed for your region on Regional Innovation Monitor website

(<http://ec.europa.eu/enterprise/policies/innovation/policy/regional-innovation/monitor/>). As part of the on-going mapping, it may be useful to complete the fuller template available on that site for the specific measures targeting advanced manufacturing!

Please list the most important regional (open access) infrastructures to support development and application of advanced manufacturing, such as pilot facilities, demonstrators, clean rooms, etc.

Type of infrastructure – short description	Location/host organisation	Web site (if relevant)

If there are future public or public-private initiatives planned to be launched in the 2014-20 period, please describe them briefly.

Are there specific gaps or strengths in the public or public-private partnership initiatives supporting advanced manufacturing in your region. If so, please shortly describe them.

### Inter-regional partnerships for Advanced Manufacturing:

In which European (EFFRA, Manufuture, Manunet, SPIRE, etc.), inter-regional (including national in larger countries) or macro-region (Baltic Sea, etc.) initiatives is your region (or regionally based organisations) involved? Is the regional involvement in these initiatives undertaken with a view to supporting specific technology development or application domains?

National / inter-regional/macro-regional/European initiative	Regional organisation involved	Specific focus (where applicable)
Name of initiative	Name of organisation	

Nb: You can add more lines as required.

If your region is involved in the Manunet ERANET:

- To what extent has Manunet been successful in supporting regional firms to become involved in transnational, collaborative R&D with a significant degree of innovation &/or the application and practical use of manufacturing technologies?
- What role/value added do you see for a future SPP on Advanced Manufacturing in supporting ‘inter-regional joint programming’ initiatives such as Manunet ?

Given your region’s involvement in specific inter-regional or European initiatives listed above, to what extent are regional clusters, technology platforms and other advanced manufacturing organisations able to access the type of support required to support international linkages and promote the Advanced Manufacturing priorities in your region? Are there additional support mechanisms required to support inter-regional co-operation and partnerships?

### A.3 Regional priorities for a SPP for Advanced Manufacturing

Please rank possible activities of a future SPP from 1 low priority to 5 top priority and where relevant comment on your ranking.

Type of activity	Ranking	Comment
<b>Data sharing and analysis, including benchmarking (open access, regular reports and on-demand analyses)</b>		
<b>Mapping and data collection on AM activities in the regions;</b>		
<b>Mapping of relevant international value-chains to better identify potential partners</b>		
<b>Partner search, match-making and brokerage services (on-line and meetings)</b>		
<b>Building learning communities (working groups, projects etc) - with a view to establishing inter-regional KIC type structures ?</b>		
<b>Developing a network of (open access) advanced manufacturing infrastructures</b>		
<b>Co-investment in large scale demonstrators, pilot lines, early product validation actions, advanced manufacturing capabilities, etc.</b>		
<b>Supporting business and cluster development (mentoring, coaching, secondments, etc.);</b>		
<b>Support to access to finance (from information on funding sources to engaging with VC funds) for emerging advanced manufacturing niche.</b>		
<b>Others (please add details):</b>		

Nb: You can add more lines as required.

Please indicate whether your region would be interested in leading specific actions or activities within a future SPP for Advanced Manufacturing.

In what specific domain would your region (possibly) be a candidate to host a ‘match-making’ exercise? In your opinion, at what level should such events be aimed and what types of organisations should be in charge of such matchmaking events? (e.g. industry bodies at EU, national regional levels; public-private partnerships, technology platforms, etc.)

Should the SSP focus on specific financing issues? Such as:

- Synergies between funding instruments (European, national, regional)
- ‘Fund of Funds’ for interregional investments
- Access to the EIB instruments to support KETs

- Others:

If yes, please give some details or examples on the type of financial engineering actions that could be better developed on an inter-regional basis than through standard regional investment funding, etc.

--

Governance, structure and membership of the future SPP

**Membership**

Would you recommend that additional regions, other than the 17 Vanguard Initiative regions, should be invited to join the SPP ? If so, please list them and indicate why (e.g. existing co-operation partners in advanced manufacturing field, specific advanced manufacturing expertise located in the region, etc.).

Region	Advanced manufacturing expertise

Nb: You can add more lines as required.

**Future governance structure of the SPP**

At the March workshop, three possible options for the future governance structure of the SPP were set out. Please comment on the suggested approaches and add other options you may consider useful to consider.

Possible governance structure	Comment/preference
<b>Establish a legal entity (e.g. EEIG, AISBL, etc.), for which VI regions provide initial ‘working capital’, to develop a series of (paying) services to member regions</b>	
<b>The VI regions co-finance an operational team to run the platform and develop specific activities through leveraging funding from interested partners/applications to EU programmes H2020/COSME/INTERREG</b>	
<b>The SPP focuses only on mapping and match-making for the participating regions - who then bid into EU programmes/co-fund projects on an ad hoc basis</b>	
<b>Other options : please describe</b>	

## Appendix B Main regional initiatives in advanced manufacturing

Region	Name of initiative	Year launched	Type of initiative	Annual funding (€m)	Comments
Asturias	MANUNET ERANET Funding Programme: MANUNET, M-ERA.NET, OCEANERA.NET Technology Centre for Advanced Manufacturing PRODINTEC	2010 2013 2004	Grant Funding Grant Funding PPP	0.5 1 1	
Baden-Württemberg	Robotics lab (FhG-IPA) Clean manufacturing Surface technology labs Learning Factory Virtual Engineering labs Battery Research Production (FPL, hard case) Battery Research Production (competence-e, pouch) Leichtbau Agentur - Landesagentur e-mobility Support Cluster-Initiative Mechatronik -bw	1990 1995 1995 2005 2009 2014 2013 2011-2013			
Catalonia	Technological Innovation Nuclei Technological Innovation Nuclei support via ERA-net MANUNET and ERA-net PHOTONICS and ERA-net OLAE+ Groups connect-EU TECNIO Technological Centres - Production technologies RIS3Cat communities	2007 2007-14 2011 2008-14 2014-2020	Grant funding Grant funding Grant funding Advisory service Grant funding	1.9 0.5 1.5 10	in 2014 in 2014  Factories of the Future group  €180m for entire period

Region	Name of initiative	Year launched	Type of initiative	Annual funding (€m)	Comments
Basque Country	Etortek basic oriented research programme	2002	Grant funding	16	in 2013 (manufacturing 55%)
	Etorgai industrial R&D programme	2008	Grant funding	29	in 2014 (manufacturing 55%)
	Gaitek product development R&D programme	2008	Grant funding	36	in 2014 (manufacturing 90%)
	NETs start-ups/spin-offs creation programme	2008	Grant funding	3.7	manufacturing 30%
	Basque sectoral clusters	1990s	PPP	2.4	
	Cooperative Research Centre for high performance manufacturing (CIC marGUNE)	2002	Science-Industry cooperation	0.8	
	Advanced Manufacturing Centre for wind power and BIMEP technology test infrastructures	2012-2014	Infrastructure		Advanced Manufacturing Centre: €4.5 millions of investment + €350,000 of annual budget BIMEP: €20 millions of investment and €3 millions in programme aid for demonstration & validation.
Flanders	SOC Maakindustrie (FMTC, Flander's Drive)	2014			
	MadeDifferent	2013	Grant funding		
Lombardy	Convenzione CNR-Regione Lombardia	2013	Grant funding	20	<a href="http://www.attivitaproduttive.regione.lombardia.it">http://www.attivitaproduttive.regione.lombardia.it</a>
	Regional Cluster on Intelligent Factory (AFIL-Associazione Fabbrica Intelligente Lombardia	2013	Cluster		
	Agreement Fondazione Cariplo – Regione Lombardia	2013	Grant funding	9	<a href="http://www.attivitaproduttive.regione.lombardia.it">http://www.attivitaproduttive.regione.lombardia.it</a>
	Agreement MIUR – Regione Lombardia	2010	Grant funding	120.65	<a href="http://www.attivitaproduttive.regione.lombardia.it">http://www.attivitaproduttive.regione.lombardia.it</a>
	Pre-commercial procurement	2013		1	<a href="http://www.attivitaproduttive.regione.lombardia.it">http://www.attivitaproduttive.regione.lombardia.it</a>
Malopolska	KIC InnoEnergy Poland Plus - clean coal technologies and sustainable energy	2010			Total budget for the KIC: €700m from 2011-15
	FOUNDRYMET: Knowledge Alliance For Foundry And Metallurgy - development of new		Science-Industry cooperation		

Region	Name of initiative	Year launched	Type of initiative	Annual funding (€m)	Comments
	materials and manufacturing technologies from metals and alloys Special Economic Zone Economic Activity Zones, and Industrial Parks Business in Malopolska Centre (CeBiM) Malopolska Innovation Fair	1997 on-going 2009 2008	Business infrastructure Business infrastructure Business promotion Business promotion		
Norte	PRODUTECH – production technologies cluster	2009	Cluster		~€20m for a three-year action plan
Scotland	Scottish Manufacturing Advisory Service - Practical hands-on support delivering tailored solutions to create a culture of continuous improvement Advanced Forming Research Centre - Research and Development Centre – including production facilities for metal forming and forging	2006 2009	Advisory service Science-industry co-operation		£1.5million p.a. running costs , delivering 200 improvement projects and £25 million value add p.a. £4m (UK govt funding) and £2m SE funding last year
South Netherlands	TU/e High Tech Systems Centre Brainport Industries Penrose - joint research programme (TNO-ITRI) Holst Centre Solliance - research cluster Fontys Additive Manufacturing Academy LimburgMakers programme	2014 2011 2013 2007 2011 2014 2013	Research institute Private Public-private partnership Partnership - cluster Cluster Public-private partnership Grant funding	20 16 3	Knowledge voucher, innovation feasibility study, innovation manager grant, innovation grant, performance advice, innovation Assistance
Tampere	INKA Programme FIMECC Programmes	2014 2008	Grant funding PPP	1	Plus project funding Total of €50m for the entire country

Region	Name of initiative	Year launched	Type of initiative	Annual funding (€m)	Comments
	FIMA -Forum for Intelligent Machines Photonics Finland BioMediTech	2006 2012 2010	Cluster Grant funding Grant funding	1.5 0.15 1	Plus project funding

## Appendix C Additional information on advanced manufacturing activities or priorities in EU regions

### C.1 Manunet funded organisations in the Vanguard regions:

<b>Region</b>	<b>Organisations</b>
<b>Nordrhein-Westfalen:</b>	Hulvershorn Eisengießerei GmbH & Co. KG, WZL, LBBZ, RWP, MYRENNE, CemeCon, Lauscher, FRAISA, MV Engineering, SimuForm GmbH, ProLas GmbH, Plasmateat, Dr.-Ing. K. Brankamp System Prozeßautomation GmbH, Rheinische Westfalia Technische Hochschule, TEMAFA Maschinenfabrik GmbH, Access e.V., TITAL, Dohlen & Krott GbR.
<b>Flanders:</b>	Devan, University College Ghent, O.J. Van Maele, Centexbel, SNOX Belgium NV, ELASTA, Newson Engineering nv, BLS - Benelux Laser Systems, Denderland-Martin N.V.
<b>Wallonia:</b>	Optim test centre sa, Sirris, Beaulieu Technical Textiles, DN&T, Université de Liège, Chantier naval Meuse & Sambre, Rovitech s.a., AFMECH SA, CITIUS ENGINEERING SA, ARCELORMITTAL BELGIUM LIEGE, BELSIM, Zentech, Matrio, CRIBC, DELTATEC, GeonX SA, it4ip SA.
<b>Asturias:</b>	Dropsens, METRIA DIGITAL S.L., INGEAS, TREELOGIC, Robotics Special Applications, MicruX Fluidic, S.L, Sinerco, Nanoker research, NOGUERASA, Grupo Intermark 96, S.L., INTEGRA DESARROLLO, Tuinsa Norte, S.A.
<b>Catalonia:</b>	LEITAT, QUALITAT TEXTIL PERSONALIZADA, TINTS QUADRADA, Trama TecnoAmbiental, S.L., Digiproces, S.A., Unió Corporació Alimentària, URPINAS, emplanter, TEXTIL PLANAS OLIVERAS, S.A., TrueCosmetics S.L, Desaut SL, JasVisio S.L., Pretransa, GUTMAR SA, MOLDES CASMAR s.l., TECNICAS PARA LA FIJACION DEL CARBONIO S.L., Innoavcio i Recerca Industrial i Sostenible, TECALEX, TECALUM, SOFTWARE TÈCNIC TECNOCIM, S.L., Ceramica Elias, Steelceram, Manufacturas Serviplast, ASCAMM, UPC.
<b>Basque Country:</b>	Research centres such as Tecnalia R&I and Azti-Tecnalia (both are part of Tecnalia Corporation) and IK4-Tekniker, IK4-Ideko, IK4-Lortek, IK4-Ikerlan and CEIT-IK4 (all of which are manufacturing-related centres of IK4 Research Alliance), the University of the Basque Country and Mondragon University, and more than 50 companies.

Source: MANUNET co-ordinator, May 2014

## C.2 Regions with advanced manufacturing systems as an S3 priority

<b>Region/Country Name</b>	<b>Description</b>	<b>Capability</b>	<b>Capability(Sub)</b>
Etelä-Karjala	Waste utilisation in composite based products. Production processes and composite materials technologies (BOM and shape of material).	Manufacturing and industry	Machinery and equipment n.e.c.
Etelä-Karjala	Local small scale CHP and water power plants. CHP utilising renewable sources and municipality waste.	Energy production and distribution	Power generation/renewable sources
Etelä-Karjala	Technologies required in conversion from traditional drive trains into electric or hybrid electric in power range of 30-500 kW and special marine electric machines up to 1,6 MW in mobile work machine, marine vessel and bus applications.	Manufacturing and industry	Motor vehicles and other transport equipments
Etelä-Karjala	Solutions based on special know how in real-time simulation of dynamics, multitechnical systems and virtual engineering.	Research and development within manufacturing and industry	Machinery and equipment n.e.c.
Pohjois-Savo	Mechanical industry and energy technology	Manufacturing and industry	Machinery and equipment n.e.c.
Pohjois-Pohjanmaa	ICT and software applications for industry.	Information and communication technologies (ICT)	Information service activities
Lappi	Traditional process industry	Manufacturing and industry	
Haute-Normandie	Optimisation of production processes	Research and development within manufacturing and industry	Machinery and equipment n.e.c.
Czech Republic	ICT, automatization and electronics.	Information and communication technologies (ICT)	Telecommunications
Lorraine	Improvement of the industrial productive machinery in order to gain productivity, competitiveness and quality	Research and development within manufacturing and industry	
Pays de la Loire	Automotives	Manufacturing and industry	Motor vehicles and other transport equipments
Bretagne	Food Factory of the Future	Manufacturing and industry	Machinery and equipment n.e.c.
Bretagne	Advanced production technologies	Information and communication technologies (ICT)	

<b>Region/Country Name</b>	<b>Description</b>	<b>Capability</b>	<b>Capability(Sub)</b>
Limousin	Mechanics	Research and development within manufacturing and industry	Machinery and equipment n.e.c.
Puglia	Advance manufacturing	Manufacturing and industry	Machinery and equipment n.e.c.
Puglia	Mechatronics	Manufacturing and industry	Machinery and equipment n.e.c.
Emilia-Romagna	Mechatronics	Research and development within manufacturing and industry	Computer, electronic and optical products
Toscana	Advanced manufacturing	Information and communication technologies (ICT)	
Marche	Furniture	Manufacturing and industry	Furniture
Malta	High value-added manufacturing with a focus on processes and design	Services	Other professional, scientific and technical activities
Rogaland	Future technologies	Research and development within manufacturing and industry	
Sør-Trøndelag	User technology	Research and development within manufacturing and industry	
Nord-Trøndelag	User technology	Research and development within manufacturing and industry	
Nordland	Industry processes, services and products	Research and development within manufacturing and industry	
Zachodniopomorskie	Metal-machine industry	Research and development within manufacturing and industry	Basic metals and of fabricated metal products
Kujawsko-Pomorskie	Tools, molds and plastic products	Manufacturing and industry	Basic metals and of fabricated metal products
Kujawsko-Pomorskie	Automotive, technical transportation means, industrial automation	Manufacturing and industry	Motor vehicles and other transport equipments
Kujawsko-Pomorskie	Plastic products	Manufacturing and industry	Rubber and plastic products

<b>Region/Country Name</b>	<b>Description</b>	<b>Capability</b>	<b>Capability(Sub)</b>
Gävleborgs län	Steel & Shop	Research and development within manufacturing and industry	Basic metals and of fabricated metal products
Västernorrlands län	Hydraulics	Research and development within manufacturing and industry	Machinery and equipment n.e.c.
Slovenia	Intelligent manufacturing	Research and development within manufacturing and industry	
Greater Manchester	Advanced manufacturing	Manufacturing and industry	
Northamptonshire	Automotives	Manufacturing and industry	Motor vehicles and other transport equipments
Northern Ireland	Packaging and software	Manufacturing and industry	Wood and paper (except for furniture)
Piemonte	Aerospace	Research and development within manufacturing and industry	Motor vehicles and other transport equipments
Piemonte	Mechatronic	Research and development within manufacturing and industry	Machinery and equipment n.e.c.
Flemish Region	Advanced production technologies and additive manufacturing, part of 'Specialised manufacturing solutions' smart specialisation domain.	Research and development within manufacturing and industry	Other manufacturing
Wallonia	Aeronautics & space	Research and development within manufacturing and industry	Motor vehicles and other transport equipments
Moravskoslezsko	Special machines, facilities and technological procedures of industrial automation for production and testing	Research and development within manufacturing and industry	Machinery and equipment n.e.c.
Moravskoslezsko	Mechatronic systems and facilities (incl. connected modelling and simulations)	Manufacturing and industry	Machinery and equipment n.e.c.
Berlin	Production & automation technology	Research and development within manufacturing and industry	
Sachsen	Advanced production technologies	Information and communication technologies (ICT)	
Estonia	Use of ICT in industry (automation and robotics)	Information and communication technologies (ICT)	

<b>Region/Country Name</b>	<b>Description</b>	<b>Capability</b>	<b>Capability(Sub)</b>
Principado de Asturias	Advanced manufacturing	Manufacturing and industry	
País Vasco	Advanced manufacturing	Manufacturing and industry	Other manufacturing
Comunidad Foral de Navarra	Mechatronics	Research and development within manufacturing and industry	Machinery and equipment n.e.c.
Aragón	Automotive	Manufacturing and industry	Motor vehicles and other transport equipments
Comunidad de Madrid	Development of instrumentation, microsystems and sensors Industrial Technologies (includes processes with less environmental impact) and robotics	Research and development within manufacturing and industry	
Comunidad Valenciana	Advanced Manufacturing Processes for Capital Goods	Research and development within manufacturing and industry	Machinery and equipment n.e.c.

Source: EYE@RIS3, <http://s3platform.jrc.ec.europa.eu/map>, data extracted on 14/3/14

## Appendix D Vanguard Initiative: 18 March Workshop Report

### D.1 Agenda

**Venue: Scotland House (Rond-Point Schuman 6), 18 March 2014**

#### **8.45-9.15: Registration and coffee**

#### **9.15-10.00: Welcome and scene setting - the building of a new ambition for Advanced Manufacturing:**

9.15-9.25: Welcome to Scotland House; an overview of the Smart Specialisation Vanguard Initiative

Sarah English – Head of Office, Scotland Europa

9.25-9.35: Introduction to the event and related scoping study

Alasdair Reid – Technopolis Group

9.35-9.55: The vision and ambition for the pilot Smart Specialisation Platform in Advanced Manufacturing

Eliana Garces-Tolon - European Commission

9.55-10.00: Questions and clarifications

Alasdair Reid – Technopolis Group

#### **10.00-11.45: Facilitated discussion with representatives of Vanguard Initiative regions**

Underlying theme: What opportunities and challenges exist for EU Advanced Manufacturing and how could a ‘Smart Specialisation Platform for Advanced Manufacturing’ support / address these, with a particular focus on scale opportunities/synergies, industry leadership and on the EU added-value of the Smart Specialisation Platform?

The session will be structured around an opening plenary (30 minutes) during which participants will be given an opportunity for an initial round-table exchange of views on the proposed SPP for advanced manufacturing. The participants will then be split into three-to-four (1 hour) break-out sessions and a rapporteur will be asked to report back during a follow-up 30 minute plenary session. Each group will address the following five questions:

- The current regional context of Advanced Manufacturing: To what extent are priorities for advanced manufacturing identified at regional level in each of the VI regions? What is the scope of the relevant platforms or clusters in the regions (technology or application oriented; multi-KET; integrated in other domains)?
- The inter-regional context for Advanced Manufacturing: In how far are regional clusters and platforms already involved in the European roadmaps for Advanced Manufacturing, such as Manufuture (and possibly SPIRE)? How does the work programme of the Task Force on Advanced Manufacturing connect to what is taking place in and across the regions?
- Scope for improvement: What is the potential to generate enhanced forms of international competitiveness through improved interregional collaboration in advanced manufacturing? What are the key common value-chains and lead-

markets? What are the possible common themes, complementary sub-platforms, linked value chain initiatives, cluster internationalisation?

- Support mechanisms: What is the best method to support interregional matchmaking, pilots and large-scale demonstration actions, targeted investment in complementary assets - driven by the private sector - in favour of advanced manufacturing? What are the sources of financing or other means to support these synergies?
- Creating the foundations for an SSP in advanced manufacturing: What is the specific scope of a 'Smart Specialisation Platform for advanced manufacturing' (e.g. in matchmaking), building on the current architecture and not duplicating existing activity? What is a practical set-up for this Platform that is coherent with other EU level, macro-region or inter-regional initiatives that already exist?

#### **11.45-12.15: Comments and reactions from the European Commission:**

- Bonifacio Garcia-Porras - DG Enterprise
- Marek Przeor – DG Regio
- Manuel Palazuelos-Martinez – DG JRC
- Octavio Quintana-Trias – DG Research and Innovation (TBC)

#### **12.15-12.30: Next steps**

- Jan Larosse – Vanguard Initiative NGSS

#### **12.30-1.30: Networking lunch**

#### **D.2 Context and objective of the workshop**

The 'Vanguard Initiative New Growth through Smart Specialisation' is a coalition that places the European Union's (EU) Smart Specialisation (S3) agenda at its core. Following a high level political meeting of the Vanguard Initiative regions on 30 January 2014, this commitment was formalised in a letter to the European Council. The Vanguard Initiative partners seek to 'lead by example' and to drive and support new efforts to generate the scale and capacity for the EU to compete on an international level in a number of key domains.

In parallel, in January 2014, the Commission Communication 'For a European Industrial Renaissance' proposed "... to create Smart Specialisation Platforms to help regions roll out smart specialisation programmes by facilitating contacts between firms and clusters, enabling access to the innovative technologies and market opportunities". Seizing this opportunity, the Vanguard Initiative regions decided to:

- Foster an action-oriented discussion on how to develop a Smart Specialisation Platform (SSP) for Advanced Manufacturing (SSP-AM)
- Generate, agree and commit to a series of actions to establish a clear roadmap and set of proposals for the establishment of a SSP-AM.

The Vanguard Initiative partners are committed to the creation of a platform which gives an impetus to the advanced manufacturing 'community' to generate bottom-up ideas, support synergies and alignment at inter-regional level and create a 'new space' for industry engagement. It will build on and go beyond existing efforts to support this ambition by a focus on the smart specialisation priorities of the partner regions.

The workshop, held on 18 March 2014, provided a first opportunity to discuss the rationale for and objectives for the SSP in the Advanced Manufacturing domain and its role in creating new growth through stronger regional co-operation and alignment of efforts. The event also reflected in how such a SSP could fit into or reinforce the

existing and planned EU policy and funding ‘architecture’. The event sought to launch and foster an action-oriented discussion and process to develop a SSP for Advanced Manufacturing. Experts from the S3 Vanguard Initiative regions were invited to discuss, generate, agree and commit to a series of actions to establish a clear pathway and set of proposals for the set-up of the platform.

The Vanguard Initiative regions nominated experts with a senior policy or management position in the advanced manufacturing sector and related stakeholders (cluster managers, research and technological organisations, regional governments and agencies). The event was also attended by European Commission officials responsible for smart specialisation, research and innovation and industrial policies for advanced manufacturing (DG Enterprise, DG Research and Innovation, DG REGIO, DG JRC).

### D.3 Plenary

Opening the workshop on behalf of the Vanguard Regions, **Sarah English** (head of office, Scotland Europa) underlined that the S3 VI regions of the are committed to ‘leading by example’ – to demonstrate that, through new heightened forms of inter-regional co-operation, that we can enhance the EU’s positioning on an international playing field which would be impossible to achieve alone. In this respect, we are committed to taking the S3 agenda beyond the ‘conditionality’ laid down by the Commission for the new programming period. We are also focused on achieving what our political leaders have signed up to – working together through S3 to make our contribution to EU growth much greater than the sum of our parts.

The moderator, **Alasdair Reid** (Technopolis Group), introduced the objective and format of the meeting. He underlined that the Vanguard Initiative SPP would be a pilot thematic platform that could serve as a model for other future SPP in other sectors or technology fields. He set out five main questions to structure the discussion:

- Regional priorities and potential for advanced manufacturing
- How can we build on existing inter-regional linkages and networks
- How can the SPP complement existing EU level initiatives?
- What are the preferred options for future support for advanced manufacturing through the SPP ?
- The scope and architecture of a future SSP for advanced manufacturing

A starting point is to understand what specific challenges can advanced manufacturing help solve in each region. This involves scoping and mapping the potential for co-operation and synergies. Advanced manufacturing (AM) is rather broadly defined, it is not confined to specific sectors, to high tech or low tech sectors, a broad range of skills are required, etc. Hence, it could be useful to adopt existing roadmaps, such as the Factories of the Future (FFF) to help structure the discussion. The scoping and mapping should covered regional priorities, information on regional organisations specialised in AM, involvement in European initiatives (e.g. EFFRA database of FP7 FFF projects), regional PPP initiatives and a strengths and gaps analysis. The aim should be to focus on areas where the most value added is created through inter-regional co-operation. Ideally, the SPP should go beyond an analysis of ‘where we are currently strong’ and adopt a future (to 2030 ?) driven perspective, for instance by adopting a lead markets or transition pathways approach.

**Eliana Garces-Tolon** (DG Enterprise) underlined the growing links between industrial and regional policy, with a significant share of industrial development happening at regional level. She underlined that there is a need for business to be ‘plugged into’ smart specialisation and help drive large-scale projects as they are best placed to identify future industrial opportunities. The evidence from discussions with European business representative bodies towards the end of 2013 underlined that they were currently disconnected from or not interested in the S3 concept. Accordingly, DG

Enterprise is organising an event on 7 April to communicate on S3 and improve understanding amongst the business community.

At the same time, there is a need to do more ‘upstream’ work on the coordination of policies (across Commission DGs, etc.). The focus should be on linking policies to best help new markets develop, make new ideas become feasible and help address societal challenges. The Commission’s role is not to decide what to specialise in but rather to provide a framework for strategic and policy coordination and to help people connect.

DG Enterprise is currently setting out to map the various clusters and specialisation projects as well as financing instruments. The upcoming report of the Advanced Manufacturing Task-Force will be a first step in developing a comprehensive list of instruments that could support advanced manufacturing.

Accordingly, the SPP for Advanced Manufacturing could help create a place where people could have an overview of advanced manufacturing potential and initiatives in Europe: what are regional specialisms, what are companies and clusters focusing their efforts on, etc. Ms Garces-Tolon noted that a range of mapping exercises and ‘observatories’ exist but that they do not always ‘talk to each other’. The SPP could seek to combine or link these and add greater detail on advanced manufacturing topics. Crucially, this should not be just another web-platform but should be more flexible, dynamic and user driven. The aim should be to link existing networks, information sources etc. in a way that is relevant to regions which have identified gaps and opportunities for co-operation; or companies to support matchmaking, linking people and facilitating access to markets.

In a follow up remark, Bonifacio Garcia-Porres, chairman of the internal Commission task force on advanced manufacturing noted that the Task Force would be shortly publishing its Clean Production Report. The report, published on 19 March<sup>16</sup>, aims at providing information about existing measures relevant to advanced manufacturing that have already been implemented and upcoming actions endorsed by the Commission to support advanced manufacturing technologies. The task force has focused on identifying transversal connections between initiatives that contribute to:

- accelerating the commercialisation of advanced manufacturing technologies.
- Removing obstacles to demand for advanced manufacturing technologies.
- Reducing skills shortages and competence deficits.

Following the initial presentations, an initial round table discussion took place on how the SPP could build on and complement both existing regional, inter-regional and EU level initiatives in favour of advanced manufacturing. The key points arising included:

- A greater effort to **promote industrial demonstrators** through public-private partnerships was championed by a number of interventions.

Erastos Filos of DG RTD pointed out that the first Horizon 2020 calls for the Factory of the Future required applicants to plan for industrial demonstrators and applications. He felt this would improve scope for connections to other programmes and initiatives, e.g. helping to mobilise ESI funds to implement large-scale demonstrators or focusing EIB financial engineering support on promising new niche.

Chris Decubber, Agoria, pointed to the increased involvement of industry in European research programmes thanks to public-private partnerships (PPPs) such as EFFRA. PPPs help to reduce risks for industry, including SMEs, to invest in a longer-term perspective. Other speakers underlined the success of the MANUNET (an ERANET project) that has had a significant leverage effect by combining national and regional programmes (i.e. NRTFs model)

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<sup>16</sup> <http://ec.europa.eu/DocsRoom/documents/4766/attachments/1/translations/en/renditions/native>

- Adopting a **value chain perspective**, matching the value chain contribution of each region and searching for complementarities.

Arun Junai (TNO) argued that the SPP could usefully build on the experience of the Manufuture ETP in order to focus on how to develop value chains. A value chain approach means that technology development is driven by a consistent market vision (from material to the market). Inigo Felgueroso (Asturias), suggested that the SPP could help in identifying complementarities between regions by mapping the capabilities of research centre and companies in each region. By concentrating on 3 to 4 value chains and identifying regional strengths, the SPP could build stronger inter-regional value chains and link to larger initiatives (e.g. Manunet).

- However, there is still a significant effort required to **map the matchmaking potential between regional priorities**. How best to map and match the capabilities of different regions and build value chains based on this mapping?

Reijo Tuokko (Tampere) pointed to existing inter-regional or macro-regional experience in planning the use of Structural Funds in support of advanced manufacturing. In the Baltic Sea Region, there has been an attempt to work on a 'corridor' or belt approach in order to map and join up regional manufacturing strengths. Daniel Kronman (Skane) noted that the region was working on smart advanced materials and had started by mapping the infrastructure available to the research sector. The next step is to consider how it complements that of other regions.

- A core challenge is to focus and think of needs starting from regional level in a cross-sectoral way. The SPP should help connect and link instruments that can accelerate the development of inter-regional advanced manufacturing networks.

Jean Severijns (Limburg) agreed that there was a need for an exchange of experience or information brokerage but this need to be focused on cross-sectoral ideas linking services to manufacturing. The SPP must focus on issues that are important for European manufacturing, this could include launching a Europa brand TM (Made in Europe) awarded to strong inter-regional value chains. It was suggested by the Commission that the SPP could be a one stop shop for information about value chains.

Tullio Tolio (Lombardy) underlined the importance of the intelligent factories cluster in his region. He argued that concrete innovations are achieved mostly in the regions but that there is a need to connect research at European level to local innovation systems. There is also a need to reconcile or align sources of funding.

Jan Larosse (Flanders) argued that the new road to success will be through co-investment by regions in lead markets where Europe can gain an advantage. This could be done through a matrix assessing: thematic focus (types of advanced manufacturing); and type of leverage or investment needed to make this strategy come true. The SPP should help build from research to the market, to co-create European scale investments between public and private partners and accelerate internationalisation of regional advanced manufacturing potential.

Finally, several experts underlined the importance of education and training as a foundation for advanced manufacturing. There is a need to identify and map specific skills needs and trends. This implies a much greater alignment between European, national and regional level policies.

#### D.4 Breakout groups – summary of discussions

Each breakout group was asked to address the following four points:

1. The current regional context of Advanced Manufacturing: To what extent are priorities for advanced manufacturing identified at regional level in each of the VI regions? What is the scope of the relevant platforms or clusters in the regions (technology or application oriented; multi-KET; integrated in other domains)?
2. The inter-regional context for Advanced Manufacturing: In how far are regional clusters and platforms already involved in the European roadmaps for Advanced

Manufacturing, such as Manufuture, SPIRE, etc.? How does the work programme of the Task Force on Advanced Manufacturing connect to what is taking place in and across the regions?

3. Scope for improvement: What is the potential to generate enhanced forms of international competitiveness through improved interregional collaboration in advanced manufacturing? What are the key common value-chains and lead-markets? What are the possible common themes, complementary sub-platforms, linked value chain initiatives, cluster internationalisation?
4. Support mechanisms: What is the best method to support interregional matchmaking, pilots and large-scale demonstration actions, targeted investment in complementary assets - driven by the private sector - in favour of advanced manufacturing? What are the sources of financing or other means to support these synergies?

Mapping and matching regional priorities and capacities

Strategies and programmes in most of the VI regions represented explicitly or implicitly address advanced manufacturing. The approach, scope and type of specificity of public support, however, differ substantially between the regions. Several speakers pointed out that it is very difficult to identify from standard regional statistics and analysis the specific advanced manufacturing capabilities. Moreover, S3 is an ongoing process and the SPP will need to track evolving priorities (including during implementation as broader priorities are translated into operational initiatives) to understand where are the matches.

**Catalonia** addresses AM within their support to ‘critical mass’ sectors (e.g. advanced materials, photonics, etc. The region supports RIS3CAT communities (grouping business, academia and educational organisations) including one in the advanced manufacturing field, with an explicit link to the Factories of the Future roadmap. The role of these groups is to empower companies to become involved in and benefit from EU projects. A key challenge is connecting the RIS3CAT communities with relevant partners on the EU level.

In **Scotland**, the focus is on providing support for advanced manufacturing applications to key priorities, e.g. marine energy. Scotland is also benefiting from and strongly involved in the new UK wide network of catapult centres, e.g. in sensors technologies. One of the challenges is connecting Scottish players with European and global markets.

**Wallonia** supports AM mainly in the framework of its competitiveness clusters programme, notably in the area of mechanical engineering. The clusters follow a bottom-up approach and focus on the areas such as new materials, including nano-materials, intelligent manufacturing and maintenance, micro-manufacturing, additive manufacturing, surface treatment and coating. The focus is on generating concrete projects focusing on end products and final applications. One of the key challenges is addressing issues spanning value chains.

**Norte** (Portugal) is focused on AM since 2006 and recently reconfirmed this priority in its S3 strategy. The recent developments include investments in nanotechnology and exploring links between AM and agriculture. Regional R&I communities are being built and engaged in working towards greater prioritisation of objectives. A general challenge is further improving the collaboration within the regional innovation system. The policy focus was initially on cluster development and clusters have started playing an active role and defining their own more specific priorities.

**Lombardia** has a long history of supporting AM. The focus was initially on sectors, notably mechanical sector, capital goods, textile, chemicals (paints), plastic and rubber. In recent years there has been a shift in policy to focus on clusters and address topics such as intelligent factories and enabling technologies. Clusters were important actors in developing research roadmaps and S3 strategy.

In **Malopolska**, AM is not a key priority of the regional strategy but it is considered one of the enabling technology areas driving key regional sectors. The main priorities are in chemistry, sustainable energy, ICT including digital with two key clusters operating. Amongst the key challenges are supporting the internationalisation of SMEs and overcoming difficulties to commercialise research.

**Flanders** is recently intensifying its efforts for research, innovation and industrial transformation in the field of advanced manufacturing substantially. The Flemish Government will launch a new strategic research center for the manufacturing industry that will merge three existing competence centres and integrate the work programmes of the most important university research groups in this domain. One of the priorities is additive manufacturing. In addition, the existing platform 'Made Different' for the diffusion of new process technologies for the factory of the future will be extended to an industry-wide platform of the 3 largest industrial federations with the objective to modernise 500 factories.

**The Basque Country** has a strong focus on advanced manufacturing related to maritime, automotive and rail transport, etc. and advanced manufacturing is a priority domain. The industrial and research strength of the Basque Country in advanced manufacturing are underlined by their strong involvement in FP7 FFF projects with Basque participants in 57 out of a 151 projects. Despite this, the share of industry in GDP fell from 26% in 2005 to 19% in 2012, the region is now making a tremendous effort to raise that again. The focus is shifting to higher value added services, energy systems, etc. There are existing and developing links with Scotland in energy related advanced manufacturing.

For **Baden-Württemberg** resource efficiency and sustainable growth were highlighted as priorities. There is a need to decouple advanced manufacturing from material usage and support four types of 'turnaround': energy turn around (smart grids); material turnaround (re-use, etc.); personnel turnaround (skills gaps, etc.); capital turnaround (decouple finance markets from the real economy).

**Limburg** has prioritised nine sectors with an emphasis on high tech systems, material and energy, KETS materials, photonics, etc.. The ELAT experience can be built on and there is scope for improvement in c-operation in specific fields like additives, nanotech, applications in solar & lighting. One issue for this sort of region is that ERDF funding is rather small, so it might be more interesting to focus on prioritising the use of EIB funds.

**Tampere** region is focusing on an Innovative City Programme - INKA – driving industrial renewal through smart cities as well as on health technologies. In addition, the region is involved in a national PPP programme with a focus on bio-production.

**Skåne** has two flagship projects: Max-lab and EU Spallation Centre and the primary thematic focus is on materials. Smart materials is one of the priority areas identified in the Skåne S3. There is a particular interest in areas with low technology readiness level using a factories of the future approach to create high tech production capacities.

**Asturias is focused on** company growth and sector development by building on old strengths, focusing on enablers and process innovation. Existing centres relevant to ADMA are in pharmaceutical and forming and forging. A key question is how to facilitate the process of joining the forces together.

In terms of overall conclusions, the working group discussions suggest that:

- The SPP should invest resources in defining in more detail the areas of interest to a majority of regions. All the regions have priority areas, but there is need to focus on at a more detailed definition: a technological or market (sectoral) point of view.
- It will take time and effort to identify these priorities. There is a need to have criteria to select priority areas. A set of indicators could be developed to allow the Vanguard Initiative regions to identify and choose priorities.

- It is important that each region goes back to their stakeholders and organises a process of grouping and focusing of regional priorities in terms of sectors and technologies, with a view to inter-regional co-operation.
- The SPP should identify the specific value chains and where the regions are positioned within these chains globally. A key issue is finding niches for competitive advantage (extending the entrepreneurial discovery process at an inter-regional level).

#### Building on existing inter-regional cooperation

Several speakers (Basque Country, Wallonia) stressed the need to use clusters as a means of supporting the internationalisation. Smaller firms often find it easier to be involved in the regional calls (partly for language reasons) and so helping them ‘communicate’ inter-regionally would be a first step. It was suggested that not enough use was made of existing networks (e.g. helping SMEs to ‘piggyback’ on academic research networks).

Similarly, it was felt that large companies can also help to make the early contacts for sophisticated products from smaller companies, a sort of pre-commercial matchmaking. The SPP should start from the principle that businesses cooperate across borders and knowledge already exists within different networks. In this context, Catalonia is supporting clusters that are creating work-places where larger and smaller companies work together.

Some speakers felt that cluster internationalisation tends to be more commercially (export) orientated so there is a need to support them to focus more on mapping technology potential. It was noted that while FP7/H2020 is related to large companies – manufacturing is a specific case where there are a lot of smaller companies developing components

The Commission (DG RTD) pointed to the need for to support entrepreneurial skillsets for engineers, people with knowledge of both local-national-EU industrial and policy architecture. The SPP could establish dedicated training structures to this end.

#### How can the SPP focus efforts to complement existing EU initiatives?

The majority of regions appear to be involved directly or through projects in existing EU level initiatives such as Manunet, EFFRA, SPIRE, ‘Clepa’ (automotive), etc. Manunet is considered as having been a successful means of aligning inter-regionally funding for advanced manufacturing. Catalunya, for instance, noted that they had secured 20 projects under the last call and consider the experience as a success. Using such existing co-operation to identify inter-regional value-chains is an important opportunity.

The discussion centred on what is the specific defining characteristic of the Vanguard Initiative. Participants underlined the need to incorporate and find a place for Vanguard within the existing platforms and initiatives. A differentiating characteristic of the Vanguard Initiative is that it starts from the regional level and regional priorities. Given the political commitment it should be easier to transform ideas into co-investment plans and more operational ‘products’. However, this is still a big challenge! There was an agreement that the SPP had to go beyond match-making or the definition of roadmaps. The Vanguard Initiatives is a good tool to do something more operational, otherwise it is the same as other initiatives. The importance of adopting an approach based on new business models was stressed.

The Commission (DG RTD) pointed to a growing interest of regions to capitalise on past FP7, etc. funding. The SPP could assist regions to map the involvement of their actors in the various EU programmes and then develop demonstration and pilots that can apply the knowledge developed. It was stressed that is important to match the research outputs of FP7/H2020 projects to the regional competences and complementarities identified through a mapping exercise. If the SPP is to support the development of pilot / demonstration infrastructures that trigger more private

investment then there is a need to also act as a broker with respect to matching such investments with EU level financial instruments (EIB-EIF, etc.).

A Basque representative underlined the need to connect the Brussels agenda with the real world. A key role for the Vanguard regions is to overcome fragmentation as there is still a tendency when we talk about S3 to look at ‘our region’ and forget the external context. Hence, pilot activities should be in areas with higher levels of technology readiness (focus on close to final products). The challenge is to identify those SMEs that want to do more (value chain mapping) through contacts with regions, clusters and Enterprise Europe network. This requires the SPP to listen to industry needs, identify the individuals in each region with insight into AM and develop a mechanism for capturing informal strategic information. This could be done by establish sub-groups, comparing findings and obtaining more detailed information from the regions

Preferred options in terms of support mechanisms and activities

In terms of future co-operation, it was suggested that there are four main objectives :

- Value chains at the EU level (sectors / trade: who is working with whom)
- Researchers (who is cooperating with whom): important distinction to be made between advanced technologies, horizontal / KETs and uptake of technologies
- Skills (which regions have specific skills gaps or know-how, etc.)
- Aligning various programmes (to optimise funding possibilities in the AM area)

A range of options were discussed by the four groups, including:

- Data sharing and analysis, including benchmarking (open access, regular reports and on-demand analyses);
- Mapping and data collection on AM activities in the regions;
- Developing a network of (open access) advanced manufacturing infrastructures
- Partner search, match-making and brokerage services (on-line and meetings)
- Exchanging experience through demonstrator actions
- Building learning communities (working groups, projects etc);
- Supporting business development (mentoring and coaching);
- Support to access to finance (from information on funding sources to engaging with VC funds) for emerging advanced manufacturing niche.

Rather than a more traditional approach to match-making, it may be more effective for the Vanguard Initiative regions to identify specific niche with the highest potential value added and that are high on the agenda for all regions. On this basis, it will be easier to define preferred options for investment in pilots. A number of examples were discussed with additive manufacturing/3D printing a potentially good example as new products are emerging and it covers an entire value chain.

## D.5 Overall conclusions and next steps

Summary conclusions

The key observation shared by most participants is that the platform needs to be built with a clear value proposition for the regional stakeholders. Its organisational design should have a strong service orientation responding to the concrete needs that cannot be otherwise addressed by the regional or national level instruments. The platform should develop and deliver concrete services (e.g. advisory services, data and analysis, brokerage) that cannot be effectively delivered at the regional level.

The platform should be a vehicle to encourage and support collaboration. One of the key objectives would be to link regional activities and stakeholders with the EU level

PPP initiatives. Support to internationalisation of companies in the field of advanced manufacturing was mentioned as one of the possible areas of activity.

The focus of the platform needs to be selective and respond to demand from the regions. The definition of a specific focus and priorities need to be based on the transparent selection criteria. The design and strategic positioning of the platform need to be based on mapping of existing initiatives. Mapping can reveal varying approaches to and applications of AM in different regions and cities e.g. main technological applications (e.g. additive manufacturing), sectoral applications (e.g. AM in construction), challenges (e.g. how to use AM to make products more durable?) or functional uses (e.g. AM for mobility).

The various approaches to mapping suggest different approaches to focusing the activities of the platform. It may focus on a specific technology (e.g. additive manufacturing) or on a problem or a challenge that is most relevant for the regions. Another choice to be made would be to choose a product or technology orientation (with an objective to support joint development or commercialisation) or rather focus on the community building and inter-regional learning without immediate market results.

Several regional representatives likened the approach to developing the platform to building a new business model. They mentioned the need to develop a shared vision for the platform that would be basis for its value proposition for customers (regional customers). A value chain focus on value chain was considered as a key dimension for the platform.

#### Next steps

On behalf of the Vanguard Initiative regions, Jan Larosse (Flanders) set out some final thoughts. He noted that the VI will continue by taking stock of the upcoming EU Industry Council conclusions. Although it is a new approach, smart specialisation is shifting already into the mainstream programming. The SPP can support this process by providing inter-regional coordination to help match regional priorities and provide a stronger outward dimension and achieving ‘multi-level’ alignment. This is particularly important in a macro-economic context where we need to do ‘more with less’.

Leading by example means that the VI region take seriously their role in promoting the regional dimension and not waiting for others to do so. It is our ambition to pilot this initiative and to do this in a practical way to demonstrate how it may work and be applied to other topics. Today’s discussion was a good starting point and will be followed up by a scoping paper by end April. On this basis, we will organise a follow-up meeting for discussing and validating this report.

