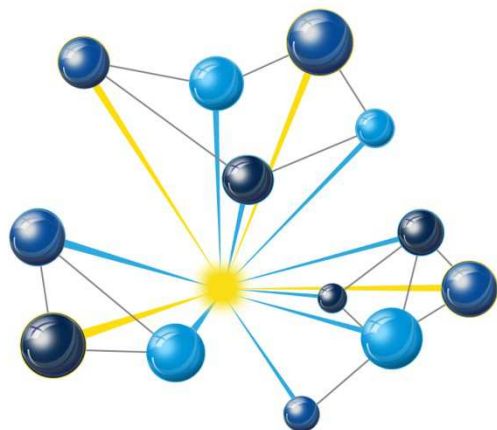


# Annual Report 2015



## VANGUARD INITIATIVE

New growth through smart specialisation

**Asturias**

Auvergne - Rhône-  
Alpes

Baden-  
Württemberg

Basque Country

**Catalonia**

Dalarna

Emilia-Romagna

Flanders

Ile-de-France

Lombardy

**Malopolska**

Navarra

**Nord-Pas de Calais  
- Picardie**

Norte

North Rhine-  
Westphalia

Pays de la Loire

Ostrobothnia

**Randstad Region**

Saxony

**Scotland**

Silesia

**Skåne**

**Southern Denmark**

South-Netherlands

**Tampere Region**

Upper Austria

**Wallonia**





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## Introduction

It has been two years since the Vanguard Initiative for New Growth through Smart Specialisation was launched in November 2013. The initial group of 10 partner regions had expanded to include 27 regions at the end of 2015, and others are in the process of joining.

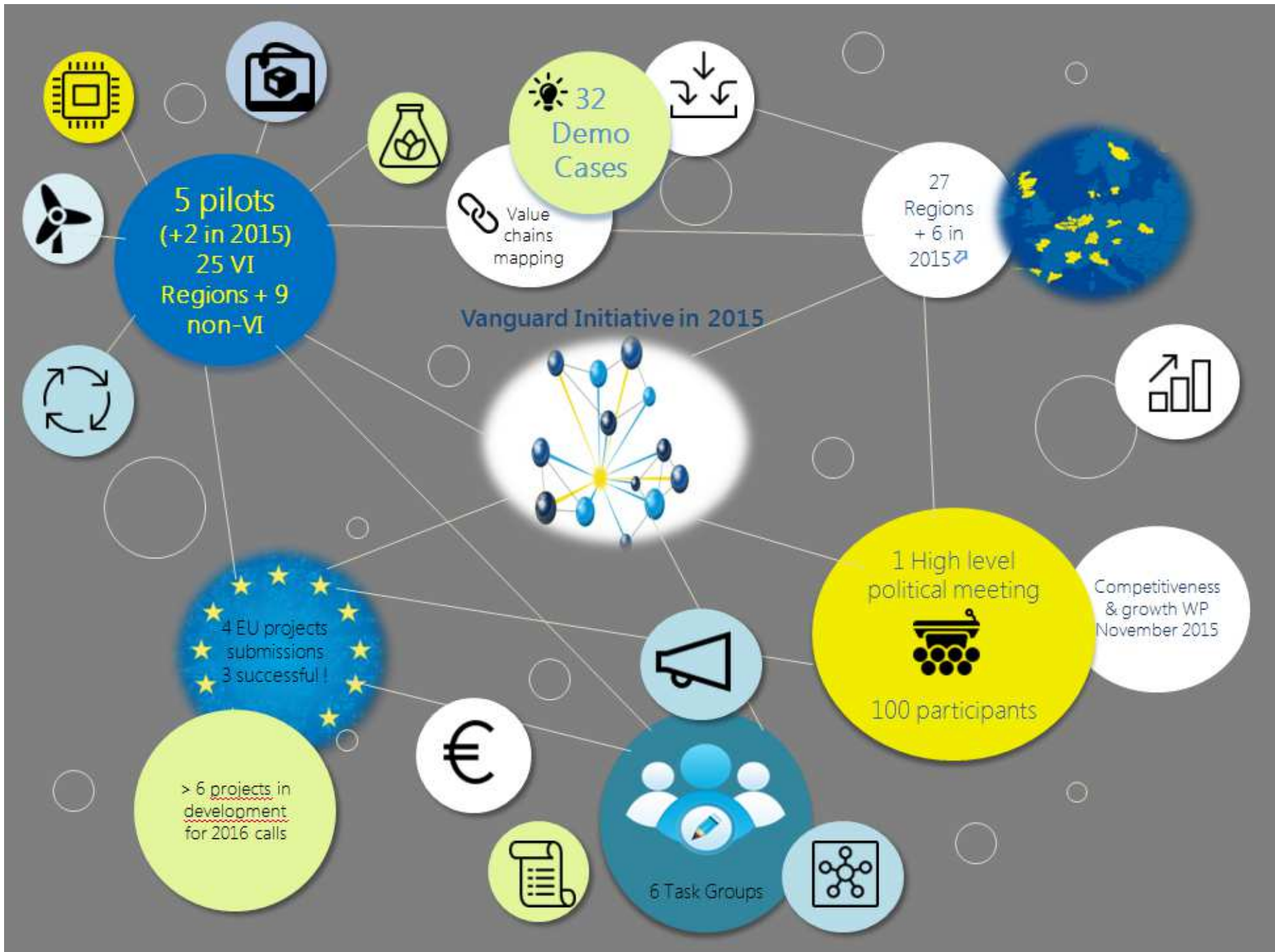
This second annual report takes stock of the progress that has been made in our journey to delivering growth and jobs through industry-led interregional cooperation, co-creation and co-investment and re-states the political commitment of member regions to continue to pursue this shared agenda.

The political message of the Vanguard Initiative, that regional smart specialisation and cluster-based interregional cooperation are key to new industrial growth, has been widely recognised and positively received by a wide range of partners and institutions.

More important than political messages are practical outcomes. Through progressing the Vanguard Initiative pilot projects in key industrial priorities and value chains, as well as generating potential commercial leads, the Vanguard Initiative is also gaining experience and generating an evidence base that will support development of future policy approaches. This will be facilitated by the recently approved Interreg Europe project (see below). The grant awarded by DG REGIO in December 2015 to support the continued development of the Pilot Projects and the organisation of a Vanguard Initiative Matchmaking Event to further progress this work is a recognition of the value the Commission has placed on the Vanguard Initiative approach.

The engagement and collaboration of key partners in the regions has been essential in accomplishing this, whether through companies, clusters organisations and industry representatives, research and financing experts, or regional public authorities.

The Vanguard Initiative is learning by doing. As a result, Vanguard Initiative regions together with companies are identifying and pursuing commercial opportunities that will be of benefit to their own regional economies, but will also have the potential to deliver a competitive advantage for Europe.



## Introducing the Vanguard Initiative

The Vanguard Initiative (VI) is a network of 27 EU regions which are politically committed to revitalising European industrial growth by leading by example in boosting growth, competitiveness and innovation in their regions. This is delivered by aligning regional areas of strength and enabling co-investment, on the basis of regional smart specialisation strategies. The political leaders in every partner region signed a joint declaration, the [Milan Declaration](#), which sets out how this will be accomplished.

The initiative is organised on three levels; the political leaders of the member regions, regional representatives in Brussels coordinating the activities of the network and operational experts engaged in the development of interregional joint demonstration cases and task groups.

The Vanguard Initiative brings together regions engaged in the renaissance of the European industry and seeks to transform regional clusters into world-class clusters, thriving to deliver new growth.



## Implementing the “Milan Declaration”

Activities developed in 2015 by the Vanguard Initiative have been shaped by the commitments in the Milan Declaration. The further development of pilot projects initiated in 2014 and 2015 has been the primary focus of activity, as well as fine tuning the original methodology developed for the European Commission’s smart specialisation platform for advanced manufacturing.

Alongside those activities, the Vanguard Initiative has influenced the European policy debates on smart specialisation, cluster development, industrial policy and interregional collaboration including pursuing opportunities to develop appropriate investment solutions.

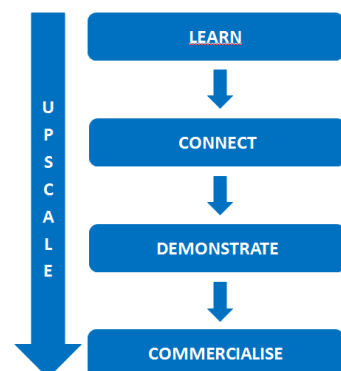
In addition, the Vanguard Initiative has considered what the right constitutional model will be in order to deliver the commitments set out in the Milan Declaration and to support and develop new demonstration activities and projects.



## Establishing Interregional Networks

### AN ORIGINAL METHODOLOGY...

Initially developed in the context of the advanced manufacturing pilot projects, the Vanguard Initiative **common methodology in 4 steps** (Learn, Connect, Demonstrate and Commercialise) has been further tested and improved for application to the new thematic fields explored in 2015. This approach of investigating and matching specialisms, making industry connections to identify new ideas and opportunities and developing these into projects with commercial potential will continue to be the approach that underpins our work and has been reflected by the European Commission in their proposals for Thematic Smart Specialisation Platforms and European Strategic Cluster Partnerships for Smart Specialisation Investments.





### ...TO DEVELOP JOINT DEMONSTRATION CASES

Vanguard Initiative partner regions have organised **industry-led pilot projects and joint demonstration cases** to further explore opportunities to develop EU value chains by co-investment.

There are **five** pilot projects being developed by the Vanguard Initiative. The first three are in advanced manufacturing and were launched in 2014 : ***Advanced Manufacturing for Energy Related Applications in Harsh Environments*** led by Scotland and Basque Country, ***High-performance production with 3D printing*** led by South-Netherlands, Flanders and Norte and ***Efficient and Sustainable Manufacturing*** led by Catalonia and Lombardy. The second generation launched in 2015 are ***Bio- economy*** led by Randstad region and Lombardy and ***New Nano-Enabled Products*** led by Skåne and Tampere Region.

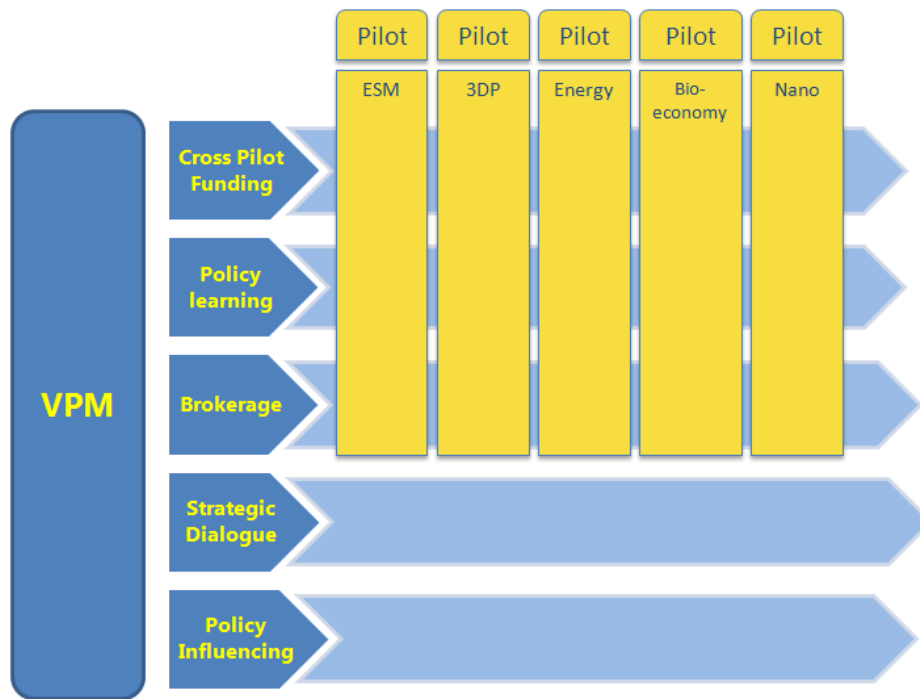
The key objective of the Vanguard's Pilot Projects is to accelerate the development of specific commercial applications within the targeted value chains through the development of industry-led, multi-regional demonstration platforms. With that in mind, the pilots are **focused** at the applied end of the spectrum, and thus not on joint R&D projects. The focus lies also on **cross-regional demonstration for projects which are close to market**, i.e. showing a clear added value compared to what already exists at regional level and scaling up efforts with the aim of impacting on international markets. Finally, it targets activities with high commercial potential, i.e. **industry-led**. Bringing prototypes to production by testing the transfer and replication potential of applications remains a critical success factor for EU industry. This is the unique contribution which the Vanguard Initiative Pilots aim to deliver in supporting and securing EU growth and competitiveness.

Vanguard Initiative's Pilot Projects are **open initiatives**: regions which are not members of the Vanguard Initiative can also participate. As such, today, **25 out of 27 member regions** are participating in at least one of the current Pilot Projects. Additionally, **9 non-member regions** are participating. In total, 34 European regions are actively engaged in the Vanguard Initiative Pilot Projects, covering a substantial geographical area of the EU and, even more importantly, bringing together innovation and industry actors from the respective value chains.

With so many participants working across the 5 pilots there is a need to ensure that the shared experience and learning is not lost and that common challenges can be identified, discussed and overcome. The **Vanguard Initiative Pilot Monitoring Task Group (VPM)** (Chair: South Netherlands) provides this function. This comprises of the regions co-leading



the Vanguard Initiative Pilot Projects, as well as other regional partners with a strong interest. 16 regions are currently participating in this work<sup>1</sup>.



The VPM Group has produced an Action Plan 2015-2016, which is constantly updated with the latest developments. The group has met 7 times in 2015.

This group operates in parallel to the on-going efforts of the individual Pilots, each of which is organised and led on a tailored basis, depending on the nature and stage of development of their work.

The group has both a practical and policy dimension. The form of collaboration being developed through the joint demonstration cases is something where there is little EU policy or context that can be drawn on, since the EU policy landscape relating to industry-led inter-regional collaboration is in development stage and is largely un-tested. The Vanguard Initiative has championed this agenda and continues to lead the way in carving out and shaping EU policy development in this area.

**FROM THE MAPPING TO THE DEMONSTRATION PHASES**

To date, a total of **32 Demonstration Cases** (DemoCases) – more detailed market-led cooperation opportunities have emerged from the 5 Pilot Projects, focusing on a particular technology or application domain. While each Pilot Project is responsible for defining the

<sup>1</sup> Basque Country, Catalonia, Flanders, Lombardy, Navarra, Nord Pas de Calais, Norte, Pays de la Loire, Randstad Region, Saxony, Scotland, Skane, South Denmark, South Netherlands, Tampere, Wallonia.



criteria for selecting the Demonstration Cases, the VPM group discusses and further develops these for the benefit of future cases.

The Vanguard Initiative is about mutually aligning – and reinforcing – regional innovation strategies (smart specialisation strategies), to contribute to Europe’s re-industrialisation, by accelerating the market take up of new technologies and connecting and up scaling demonstration activities (post-prototyping) between participating regions.

The existing Pilot Projects do not cover all potential areas of cooperation between Vanguard Initiative regions. They have arisen as a consequence of ‘entrepreneurial discovery’ whereby regions have sought out and found partners in areas of mutual strength and interest. There are many more potential high value areas that could be explored further, facilitated and developed. However, the establishment of new cases has to be carefully considered to ensure capacity, consistency and a market focus. To address this, in 2015, the VPM developed **a set of criteria** which future Pilot Projects must meet, and corresponding procedures to establish a new Pilot Project.

The ‘Connect’ phase of the Vanguard Initiative’s methodology is crucial in building coalitions between businesses and other innovation actors. With the award by **DG REGIO of a supporting grant** in December 2015, a new impetus has been given to the development of the Pilots. This €400.000 grant is supporting the preparatory processes, the implementation and the follow-up to the **Vanguard Initiative Matchmaking Event**, which will take place on 25 February 2016 in Brussels. The Dutch province of Noord Brabant (South Netherlands) is in charge of managing this grant on behalf of the Vanguard Initiative, and is hosting the Secretariat of this focused event.

The purpose of the matchmaking event is:

- to connect regional business and research actors in each of the five Pilot Projects;
- to identify opportunities and develop commercial opportunities within the joint demonstration cases;
- to develop capacity and potential models for supporting implementation of inter-regional demonstration cases (including e.g. funding/investment models, IPR regimes, certification procedures, training, etc.).

The event, organised by the Vanguard Initiative and DG REGIO, will host 27 parallel sessions focusing on the joint demonstration cases and will bring them a substantial step further in their development. Some are now at the stage of having detailed conversations with company representatives, taking a first important step to shift the balance from industry-inspired ideas to company-led initiatives. In addition, a number of parallel sessions will be organised on topics such as certification, IPR, legal and business coaching, as well as one session on financing devoted to the Vanguard Initiative’s envisaged Innovation Infrastructure

investments (pilot lines, first-of-a-kind factories, etc.) in cooperation with EU institutions and on the alignment of regional funding instruments of the Vanguard Initiative regions to finance demonstration activities.

### *FUNDING THE DEMONSTRATION CASES*

While the Pilot Projects are responsible for their own finances, and for coordinating the financing of the Demonstration Cases within the Pilot, sharing of information between Pilots is essential, and VPM is the channel through which this happens. In addition to project call information that is of potential benefit to individual cases, a number of calls could be commonly used by a number of Pilot Projects (min. 2), to stimulate cross-Pilot activities. Therefore VPM monitors and screens all financial possibilities for cross-Pilot Project activities (screening of programmes and calls both European and other; monitoring of relevant reports influencing programmes and calls).

This has led to the submission of an Interreg Europe project (now approved for funding, see below) and of an **INNOSUP** (1-2015 'Cluster facilitated projects for new industrial value chains') project. While the **INNOSUP** application was unsuccessful it was helpful in establishing a process by which these joint applications can be pursued and this has been helpful in further applications.

At least **6 projects are under development** within the pilots for submission in 2016; and a first success has been secured for the ESM pilot, within the **TREC 2015 Call** (Towards EU Regional Economic Convergence - Pilot Projects to reinforce collaboration among clusters and technology centers), as the ERICA<sup>2</sup> consortium, which includes several Vanguard Regions (Catalonia, Lombardy, Nord-Pas de Calais and South Netherlands) will be launched soon.

This 'bottom-up' approach to Demonstration Cases financing is being combined with a more 'top-down' approach to Vanguard Initiative investment and funding vehicles. This exercise is being explored through the Financial Instruments Task Group (see below), and there is close coordination to align the 'supply' and 'demand' sides of the Vanguard Initiative investment and financing agenda.

Recently part of VPM's work has focussed on considering a solution for the future sustainability of Vanguard Initiative Pilot Projects. Pilot Projects are at the centre of the Vanguard Initiative and their establishment and development requires significant investment. The engaged and active participation by all regions involved is a key condition for a successful Pilot Project. Each participating region (and its organisations) is investing a

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<sup>2</sup> ERICA aims at establishing an interregional cluster partnership strategy lead by the main innovation and transference institutions (both clusters and technology centres) of each participating region (Catalonia, Lombardy, Nord-Pas de Calais and South Netherlands) in order to overcome current industry needs and constrains towards Advanced Manufacturing Smart Specialization Strategy, with a special focus on Efficient and Sustainable Manufacturing (ESM).



lot of time and effort in the Pilot activities and is bearing the associated costs of doing so, however, the bulk of the costs of the Pilots are borne by the co-leads of the Pilots. It is undoubtedly the case that this support has enabled the Pilot Projects to progress to their current stage, but there are limitations to the sustainability of continuing with this approach.

Several co-lead regions have calculated costs so far and whilst they remain fully committed to the Pilot Projects and can see the value of their efforts, a more sustainable model is required.

**The Vanguard Initiative has proposed that a shared cost model should be developed and considered by the regions participating in the Pilot Projects.**

VPM has initiated this discussion and has produced a discussion note that has been circulated to Vanguard Initiative regions for initial views. Once these views have been submitted, a proposal for a common decision will be developed.

## **ADVANCED MANUFACTURING FOR ENERGY RELATED APPLICATIONS IN HARSH ENVIRONMENTS**

**Partner regions (13):** Scotland (co-lead), Basque Country (co-lead), Skåne, Ostrobothnia, Norte, Dalarna, Lombardy, Flanders, Emilia-Romagna, Andalucía, Southern Denmark, Navarra, Asturias.

### **1. Introduction**

In June 2014, Scotland and the Basque Country joined forces to set-up the ‘ADMA for energy related applications in harsh environments’ Vanguard Initiative Pilot and have been joined by a further 11 regions to make the EU the global leader in manufacturing robust high integrity components for marine renewables and offshore energy applications.

The Pilot action is being developed across thirteen of the most advanced EU regions in this area to pool their resources and expertise for the benefit of industry. There is a growing, global market for such technology based on the expertise, high quality and innovation of EU industry. At the same time, the EU’s prosperity and security hinges on a stable and abundant supply of energy.

### **2. Common vision and objectives**

Finding new solutions to access deep sea oil reserves faster and more efficiently and to reduce the lifetime costs of offshore/marine renewables will unlock these energy sources across a number of EU regions. However, developing new technologies capable of operating in the harshest environments, is an expensive, risky and specialised business, beyond the level of investment that a single company, or region can justify. It is challenging for companies to find well-matched partners outside their home regions and few SMEs are able to undertake such large-scale investments, when operating in isolation. There is therefore a compelling case to support industry in harnessing the global market potential of this Pilot Project. The market-orientation of this Pilot has been prevalent from the out-set and will continue to be the key driver of the Pilot’s future direction.

### **3. Approach / methodology**

The ‘ADMA / Energy’ Pilot has followed the Vanguard Initiative’s common methodology for Pilot actions from the outset. The ‘Learn, Connect, Demonstrate, Commercialise’ approach has been a guiding force in the Pilot’s planning, ambition and activity. These are described below.

### **4. Main activities**

**‘Learn’** – In February 2015 the Pilot produced a **mapping exercise** which provided an initial basis on which to understand mutual strengths and capacity. This included a database of relevant companies and organisations across the Pilot regions – which has grown to over 300 entries as a consequence of a Technology Roadmapping exercise (detailed below). The

mapping study also generated an emerging overview of the Pilot's core value chain based on a critical analysis of the related strengths which exist across the regions. Importantly, the study identified a core group of **'pivotal companies'** from across the Pilot regions, who have known capabilities and ambitions to significantly influence the direction of the Pilot and the on-going development of the value chain. This analysis provided insights into the EU's potential to lead in a range of international markets.

This has been followed up by a second phase of evidence gathering through a **Technology Roadmap** exercise to identify the challenges our company base is experiencing. A company survey was launched in October 2015 across all partner regions to collect industry data on: company profiles; the main industrial challenges and key technology fields relevant to advanced manufacturing for energy in harsh conditions; the international collaboration opportunities and interests of companies; and the companies' expectations regarding the activities of the Vanguard Initiative Pilot.

Underpinning this exercise, there are six areas of emerging interest from Pilot regions (three industrial challenges and three technology fields), expected to direct the next phase of the Pilot's activity.

**'Connect'** – Following the above 'Learning' phase, the Pilot moved to connecting stakeholders from across the regions. This has been organised in **three domain groups**, tasked with connecting research and test facilities, engaging and connecting industry stakeholders in the supply chain and connecting partners such as cluster and intermediaries. This connecting process has been facilitated by the Pilot's key experts who are cluster experts and intermediaries from across the 13 regions.

The Technology Roadmapping exercise provided the stimulus for an **industry-focused workshop**, which took place in Brussels on 27 January 2016. (rescheduled following the postponement of original meeting, scheduled for November 30th, due to the security situation in Brussels).

This route to 'connecting' industry explores the opportunities offered through collaboration, to address mutual challenges. The industry-focused workshop in January provided a successful forum, with **120 attendees** and strong industry representation from across the participating regions, with significant discussion among company representatives. Of the 120 attendees, 50 were intermediaries/ innovation actors and 50 companies. This very high percentage of critical players indicates the relevance of the Pilot to EU industry.

The event also included a proposal to develop an **Industry Leadership Committee**, to support the pilot's mission of making the EU the global leader in manufacturing robust high integrity components for marine renewables and offshore energy applications, creating new business opportunities and increased growth for the sectors in participating regions.

The success of the industry-focused workshop will support the progress of the **'Demonstrate'** and **'Commercialise'** phases of the Pilot, through six Pilot 'communities' that are mobilising

across the Pilot regions (based on six emerging areas of interest noted below), each led by a Pilot regional expert:

- Cost Reduction in subsea environments –device design optimisation, operations and maintenance ;
- Corrosion in water ;
- Advanced manufacturing processes ;
- Composites, New Materials, and Materials Testing ;
- Power Transfer and conversion ;
- Sensing, Instrumentation and Monitoring.

It is anticipated that industry-led discussions, commitment and actions will lead to the development of demonstration cases, based on further refining the opportunities identified in the six communities. The 25 February event provides an opportunity to test demand and interest in three specific topics derived from the six communities. The event will provide an opportunity to explore how to develop a ‘pipeline of projects’ through the three test sessions:

- 1) Real condition testing of new Materials for offshore: composites, steel, ductile iron and light metals ;**
- 2) Cost effective power transfer ;**
- 3) Optimised corrosion management - including modelling, sensing, design.**

Other pilot themes will be picked up after the event.

#### **5. Results achieved & expected impact**

The main results so far from the ADMA / Energy Pilot can be described as:

- A continued market orientation of the Pilot’s activities, which has allowed the Pilot to move from a broad (yet unique) evidence base of common industry interests to the generation of specific focus areas for further exploration;
- Strong engagement of Pilot experts and clear leadership in mobilising local actors;
- Database containing around 300 companies;
- Over 80 responses to the Technology Roadmapping survey;
- Significant response from industry at the Roadmapping workshop, identifying clear opportunities and challenges, and scope for inter-regional collaboration (around 50 companies and 50 intermediaries attended);
- Six clear areas of proven interest identified (three industrial challenges and three technology fields) for potential industry-led, inter-regional collaboration;
- Three further areas for testing the viability of a pipeline of projects;

- Clear interest and support from the European Commission (DGs RTD, ENER, JRC, Regio and GROW).

#### **6. Key conclusions and necessary actions**

The outcomes of the Roadmap event have focused on the six key areas that have emerged through the Roadmap exercise, involving companies, innovation actors and technical experts:

- Cost reductions in Harsh Environments: design device optimisation, operation and maintenance ;
- Corrosion in water ;
- Advanced Manufacturing Processes ;
- Composites, New Materials and Materials Testing ;
- Power Transfer and Conversion ;
- Sensing, Instrumentation and Monitoring.

The discussions among companies, innovation actors and technical experts has produced clear consensus of the scale of opportunity, and scope for industry collaboration. The discussions have also highlighted significant challenges that need to be addressed:

- Developing test and demonstration facilities ;
- Engaging regional SMEs in the supply-chains and procurement processes of larger companies ;
- Establishing effective Standards, and ;
- Securing significant new sources of finance and investment.

#### **7. Next steps**

Following the February event, the Technology Roadmap exercise will be completed, with direct participation by companies, which will include working with pilot Experts to identify mechanisms to follow-through on the outcomes of the events in January and February, and to take forward the development of the pilot's Demonstration Cases.

This will be underpinned by:

- Further development of the six 'communities' of interest from across the Pilot regions, with expert moderators (drawn from the core group of experts who have been the key contacts for each of the Pilot regions);
- Developing an Industry Leadership Committee (ILC) to strengthen the industrial ownership of the ADMA / Energy pilot.



## **HIGH PERFORMANCE PRODUCTION THROUGH 3D PRINTING « 3DP PILOT »**

Partner regions (23): Flanders (co-lead), South-Netherlands (co-lead), Norte (co-lead), Asturias, Aragon, Catalonia, Andalusia, Skåne, Örebro Lan, Tampere, Baden-Württemberg, North Rhine-Westphalia, Thüringen, Saxony, Wallonia, Rhône-Alpes, Nord-Pas de Calais, Randstad, Emilia-Romagna, Lombardy, Upper Austria, Malopolska, Silesia.

### **1. Introduction**

Among the most innovative manufacturing solutions of the last decade, additive manufacturing (AM) technologies have been identified as one of the most promising production technologies at global level. They are considered to empower the transition from mass production to mass customization in several leading sectors. AM Technologies are mainly concerned with “High performance manufacturing” and were identified as a segment with “particular high growth potential” and a global market volume of 2.2 billion dollars in 2012 that is expected to grow to 11 billion dollars in 2021<sup>3</sup>. The potential for Smart production and efficient processes opens new perspectives which have very often be associated to a possible new “Industrial Revolution”<sup>4</sup>. AM Technologies correspond to relative high levels of technology maturity or even market maturity already: some applications have reached TRL<sup>5</sup> 9 and are broadly deployed, but many more are at post-prototyping level and should be fully deployed soon, i.e. in a time window of 3 to 5 years<sup>6</sup>.

However, 3DP capabilities and actors still operate in largely disconnected and fragmented value chains in Europe. Many activities are on-going in (almost) every region, but there is lack of visibility of the potential in many application areas. This is partly due to fragmented efforts in technology deployment; it is also due to a lack of connection between AM technology suppliers and aggregated demand, i.e. potential lead-users in various application areas. Therefore, the Vanguard 3DP Pilot aims at connecting and upscaling regional efforts in technology deployment.

### **2. Common vision and objectives**

The key objective of the Vanguard 3DP Pilot is “to accelerate market uptake of 3DP applications in the EU through development of industry-led, transregional demonstration platforms”.

The key objective is to identify opportunities for joint-demonstration between regions, based on a solid mapping exercise and the detected complementarities between existing

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<sup>3</sup> See the Commission Staff Working Document SWD(2014) 120 final entitled “‘Advancing Manufacturing – Advancing Europe’ – Report of the Task Force on Advanced Manufacturing for Clean Production”, 2014.

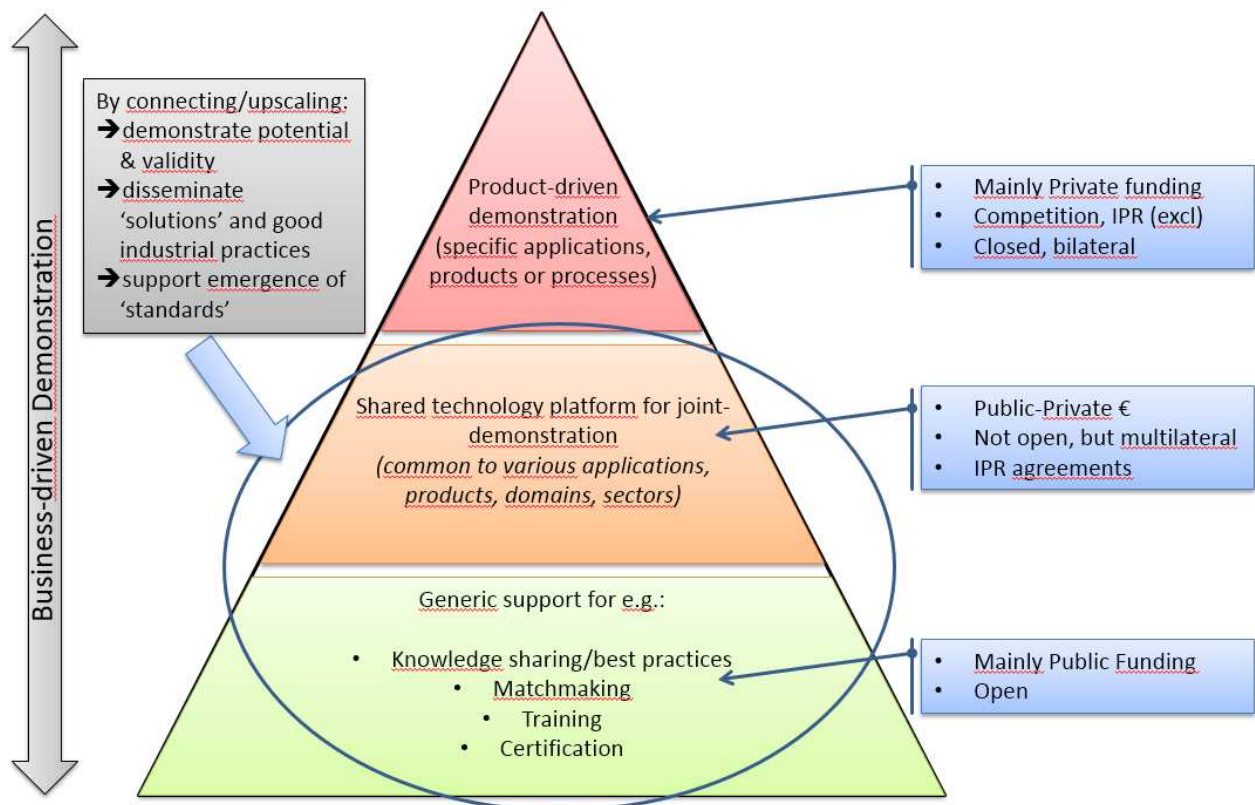
<sup>4</sup> Among many other examples, see <http://www.economist.com/node/21552901> and <http://www.businessinsider.com/the-next-industrial-revolution-is-here-3d-printing-2014-8?IR=T>

<sup>5</sup> Technology Readiness Level

<sup>6</sup> We consider Additive Manufacturing and 3D-Printing here as synonymous.

demonstration facilities and company needs. The pilot targets both the accelerated deployment of new technological applications and the faster uptake by SMEs of 3DP. The focus lies on applications at post-prototyping level (> TRL5), with the potential for full market deployment in a time span of 3 to 5 years. Connected and upscaled demonstration activities should speed up testing, validation and certification of new technologies and new applications (and hence their market uptake).

## Which activities for joint-demonstration ?



Source: IDEA Consult

### 3. Approach / methodology

**'Learn'** – The methodology for developing a European eco-system for 'self-discovery' of entrepreneurial opportunities comprises several interrelated steps. The **first step** is to share a vision on the future of 3D-Printing, to give direction to the joint efforts of regions. A **second step** is the 'mapping' of the emerging value chains, innovation clusters and industries that will put Europe in the lead of this new industrial revolution.

**'Connect'** – The **third step** is the 'matching' in the identified value chains of partners across regions which seek to cooperate on a common roadmap, based on complementarities. The **fourth step**, which is most crucial, is the development of a network of pilots and

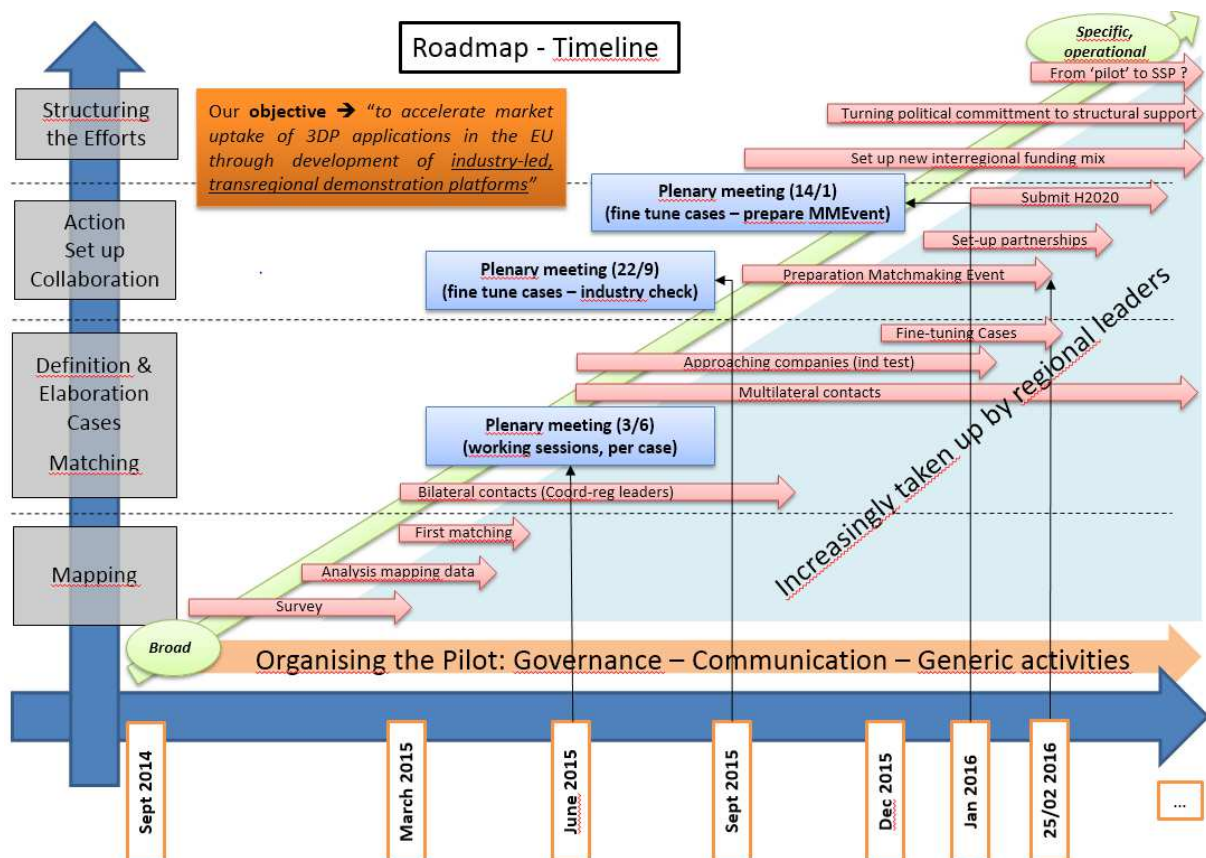
demonstrators for manufacturing (involving users), based on a commitment to ‘co-invest’ by businesses and public authorities through combining funding – ‘Demonstrate’.

‘Commercialise’ – The **final step** is the implementation by business actors of new innovation and industrial investment projects in these new value chains (commercialisation).

#### 4. Main activities

The **first step** was conducted during the first 3 months of the pilot’s life, i.e. between September en December 2014, and it resulted in the concept note “High Performance Production with 3D Printing: developing a European demonstration and piloting network. An action oriented scoping paper”. That ‘scoping paper’ summarizes the rationale and mission statement of the pilot, i.e. focus on joint-demonstration for accelerated market uptake.

For the **second step** (October 2014 – March 2015), a survey was designed and conducted in two stages to map the most relevant actors (companies, RTO’s, clusters, existing demonstrators etc), including their positioning within the corresponding value chain (materials producers, software developer, design companies, 3D printers manufacturer, processing, post-processing, lead-users etc), the materials used, and the specific domains of application (e.g. 3DP applications for the automotive sector). Almost 1.000 actors were mapped from 18 EU-regions, including more than 650 companies. The survey also mapped the regional ambitions and challenges (missing assets).



For the **third step** (February – June 2015), the analysis of the mapping results allowed identifying first ‘matches’ and areas for potential cross-regional, joint-demonstration. Further analysis of these areas (through bilateral and multilateral contacts with regional experts and discussion during plenary meetings) led to the identification of 8 cases. The 8 cases are explicitly designed to be complementary to existing networks and initiatives, by addressing what is generally felt to be a missing link in the innovation value chains - the set-up and support of large scale demonstrators at European level to accelerate market uptake - through interregional collaboration.

Since July 2015 (start of the **fourth step**), concept notes have been written for each case, to be discussed and elaborated by the participating regions, in collaboration with a first set of industrial companies. Genuine industrial interested has been noted to participate (and in some cases even to co-invest), even though three key constraints remain from the side of the private sector: 1) what is the amount of public funding available, able to match industrial investment? 2) Very specific and detailed IPR regimes need to be set up, and 3) Legal issues should be very clear (which legal entity is countersigning?). Solving these three issues will be some of the prerequisites to enter the final, **fifth step**: implementation of new value chains and commercialisation.

### **5. Results achieved & expected impact**

A detailed mapping of capabilities and actors has led to a better understanding of regions of the own landscape of companies within the 3DP domain. This led also to a better understanding of missing elements in the European value chains.

**8 cases for joint-demonstration** are currently being pursued:

- 1) 3D-Printed Hybrid Materials for automotive applications (lead Emilia-Romagna);
- 2) 3D-Printed; fonctionnally graded components for automotive applications (metal, non-critical) (lead Aragon);
- 3) Acceleration Platform for 3DP structural parts with complex shapes in machinery & tooling (lead Wallonia);
- 4) Demonstration platforms for integrated AM and subtractive technologies (Metals) (lead Flanders);
- 5) 3DP applications in the creative industries (Catalonia);
- 6) Customized Insoles and orthoses (lead Emilia-Romagna);
- 7) Open Source platform for 3D-Printed bike (components) (lead Flanders);
- 8) Adding a dimension to 2D textiles (lead Lombardy).

In total about 25 companies have been contacted and reacted to the concept notes. Case nr1 will very probably submit a 'Fast track to Innovation' under the current call. Other H2020 applications are being considered also for the other cases. The 3DP pilot will submit a collective call under the on-going Innosup-01-2016 call. More than **100 companies** have been identified for being invited to the matchmaking event.

#### *6. Key conclusions, necessary actions & next steps*

The 3DP Pilot is entering a critical phase. The preparation and the matchmaking event will be instrumental in further refining industrial interest and joint-demo actions. Many industry-driven (or –inspired) joint-demonstration cases have been identified and the bottom-up dynamics have clearly a very strong potential. But above all the key issue to be solved is the one on the adequate funding mix. Despite progress in H2020 (covering demonstration activities to a much larger extent than FP7) and the mandate from the EC to the EIB to broaden its scope of support towards demonstration activities, much remains to be done, principally at the level of combined regional funding.

The strategy of the 3DP Pilot is to seek funding at case level, starting with H2020 funding. Securing funding for one (a few) project(s) is expected to have a strong 'demonstration effect' on other projects and on the whole funding mix as well. In particular the combination of regional funding streams (ERFD-related or not) for joint-demonstration needs to be further explored.

## **EFFICIENT AND SUSTAINABLE MANUFACTURING – ESM**

Partner regions (13): Lombardy (co-lead), Catalonia (co-lead), Tampere, Emilia Romagna, Norte, Basque Country, Flanders, South Netherlands, Nord-Pas de Calais, Baden-Württemberg, Scotland, Saxony.

### **1. Introduction**

Manufacturing is the engine of multi-sectoral innovation, of social, environmental and economic progress of economies. Current weaknesses of European Manufacturing are labour cost, energy dependence, limited capacity to transform knowledge into industrial practices, fragmentation of available research results and the difficult access to them experienced by companies, especially SMEs.

External threats are price of energy, price of raw materials and the critical access to raw materials. On the other hand, European manufacturing can count on a long manufacturing tradition which generated a diffused know-how, an extensive production of knowledge in advanced manufacturing through outstanding research, a global leadership in the machinery and automation, an advanced environmental culture and complementary capabilities of European Regions. Levering on these strengths, the Vanguard ESM Pilot initiative addresses the development of a European network of pilot plants in the area of manufacturing efficiency and sustainability. Such pilot plants will contribute to face the above mentioned weaknesses and threats in order to catch the opportunities offered by the new middle class and the emerging markets for societal challenges.

The ESM initiative addresses at the same time and in a synergic way the two domains of Manufacturing efficiency, with the goal of increasing throughput, quality and reducing costs, and environmental and social sustainability of Manufacturing, with the goal of reducing energy, materials consumption, emissions and increasing the inclusion of humans in the factories. Targeted enabling technologies are mechatronics; ICT and other technologies/processes for high-efficiency; modelling for the optimization of production systems performance; technologies to increase employees efficiency; technologies for new materials increasing systems efficiency; technologies for optimization of energy and materials consumption; technologies for re-manufacturing and recycling; modelling and simulation techniques for sustainability; mechatronics and digital factory for human-centered manufacturing; strategies and management for sustainable manufacturing.

### **2. Common vision and objectives**

The vision of the future ESM Pilot Plants is below summarized:

- Their **TRL** should be **higher than 7**.

- They should be **clearly focused on applicative domains in terms of industry and technology in order to satisfy industrial and societal needs**. “Efficient and Sustainable Manufacturing” is a too-wide concept for a pilot plant.
- They should address **ambitious industrial applications**: the pilot plants will have to enable at industrial scale **applications that are currently not diffused or existing**.
- They should be **motivated and supported by the demand of the industry**.
- They should be able to **absorb newest technologies**.
- They should be developed according to a “**modular approach**” where the different elements are linked in a system. Different technologies and pilot should be connected and combined.
- They should be **open to companies** and should constitute a **neutral environment in which companies can setup and test new products, processes and technologies** before implementing them for own commercial purpose.
- They should constitute a potential **playground for cross-sectorial collaboration**.
- Companies, also SMEs, should **find in the pilot plants the ingredients they usually lack for implementing innovation**: highly innovative testing and process development facilities, but also multi-disciplinary competences and know how. In this sense, pilot plants should **be more than facilities**. They should create an innovative ecosystem for the valorisation of research and improve industrial competitiveness. Pilot plants should act as the framework where new value chains are created.
- They should **not be a “one time experiment”**, but they should **operate in the medium-long term** in order to generate several results over time for a multitude of different customers.
- The **ownership** up to a single company (or to a restricted group of companies) should be considered taking into account the need to guarantee openness and access rights to a wide number of users.
- They should involve a **significant number of companies as founders and users** in order to have wide industrial impacts.
- They should be **grounded on the already available knowledge, including research and innovation infrastructure**, which is currently not widely accessible.
- They should find a **clear and complementary identity with respect to the other pilot initiatives** that are currently on-going in Vanguard, in Spire and in other relevant European initiatives.

### 3. Approach / methodology

The methodology of the Vanguard ESM Pilot Initiative consists in three main phases:

1. ESM Pilots concepts definition:

Under the main umbrella of “Efficient and Sustainable Manufacturing”, focused concepts of pilot plants are defined with the characteristics described above.

2. Business planning:

A business plan is elaborated for pilot concepts that are significant with respect to ESM and that fulfil the set strategic requirements. The business plan indicates the expected benefits and impacts of the pilot concepts, as well as their implementation steps.

3. Pilots funding and implementation:

Based on business plans, funds will be mobilised and pilot plants will be realized.

The described process is selective. Only the most promising concepts proposed by the Regions will be followed by the business plan and only promising business plans will undergo implementation.

The Vanguard ESM organization will be the generator of pilot ideas and will act as a coach/facilitator in order to support the promising pilots to reach the market. In every phase of the process, Vanguard ESM will coordinate the activities under the overall pilot framework and will offer Regions services based on structured methods and tools for facilitating the cooperation and to support the production of high-quality outputs.

**4. Main activities**

**‘Learn’ & ‘Connect’** – Since its start-up, ESM pilot has defined a structured methodology and governance for the definition and selection of projects for the set-up of a European network of pilot plants. The methodology consists in a mixed bottom-up and top-down process in which regional actors are called to express their priorities in terms of pilot plants in a structured format which guarantees alignment with regional smart specialization and the involvement of companies.

**‘Demonstrate’** – Regional proposals are clustered considering their synergies and complementarities and inter-regional teams of European experts in charge of collaboratively develop pilot plants projects with a European added value are established. The methodology was applied to launch the first set of ESM pilot projects in 2014-2015. A steering Committee composed of members of Vanguard Regions was established to coordinate all the necessary activities.

**5. Results achieved & expected impact**

Out of about sixty regional proposals, **five pilot plants projects** emerged from in the following areas: de- and re-manufacturing; smart and adaptive manufacturing; manufacturing of smart components and materials; digital and virtual factory; energy and



environmental efficiency in manufacturing. Some projects are quite advanced in terms of conceptual definition and business planning (**‘Commercialise’**), while some others are in the exploratory phase and are currently reinforcing interregional industrial participation.

#### **6. Key conclusions and necessary actions**

The ESM pilot generated a committed community of Regions, Clusters, RTOs and industrial companies engaged in the design and implementation of projects finalized to the realization of a European network of pilot plants supporting efficient and sustainable manufacturing. Current projects are the result of the proactive activity of a group of Regions that have set the ground for the implementation of pilot plants. Future necessary actions consist in the reinforcement of industrial interregional participation to the projects through the identification of regional focuses based on smart specialisation strategies. For those projects that are at more advanced definition level, resources should be identified to move towards the implementation phase in order to keep the momentum.

#### **7. Next steps**

Based on the level of advancement of projects, next steps in the ESM pilot will consist in the improvement of the conceptual definition of explorative projects, in the reinforcement of industrial participation of projects that lack of significant European dimension and in the mobilisation of resources for projects that are in a more advanced definition phase. Furthermore, Regions will be involved to identify new eventual thematic areas for pilot plants that are not currently covered within the running projects.

## **NEW NANO-ENABLED PRODUCTS PILOT**

**Partner regions (14):** Skåne (co-lead), Tampere (co-lead), Baden-Württemberg, North Rhine-Westphalia, Flanders, Wallonia, Navarra, Rhône-Alpes, South-Netherlands, Asturias, Wales, Emilia-Romagna, East Netherlands, Norte.

### **1. Introduction**

The global market for nanomaterials is estimated at 11 million tonnes at a market value of €20 billion, while the current direct employment in the nanomaterial sector is estimated at 300 000 to 400 000 in Europe<sup>7</sup>. Nanomaterials is clearly an important area. The Vanguard New Nano-Enabled Products Pilot has the aim to connect regions in order to build an industrial ecosystem in nanotechnology and to create pilot production facilities for products based on nanomaterials. These products can be based on a synthesis of nanomaterials and nanocomponents which can be integrated in corresponding technical applications in areas as broad as clothing, cars, windows, computers, displays, cosmetics and medicine. Products underpinned by nanotechnology are forecast to grow from a global volume of €200 billion in 2009 to €2 trillion by 2015<sup>8</sup>. In addition, the establishment of the new, large-scale international research infrastructures European Spallation Source (ESS) and MAX IV Laboratory in Sweden and Denmark will create a world leading centre for materials science. Also other regions are expanding their innovation system for materials fabrication, creating a momentum for the design of diverse pilot production facilities in a unique cluster of regions, based on existing areas of strength and excellence in materials science.

### **2. Common vision and objectives**

The aim of the Vanguard ‘New Nano-Enabled Products’ Pilot is to establish an interregional infrastructure and ecosystem within nanotechnology which delivers across all parts of the value chain, from basic research, to production and market up-take. Bringing prototypes to production by securing the reproducibility of application remains a critical point for the industry. This is where this pilot aims to make a difference.”

The key objective is to identify opportunities for joint-demonstration between regions, based on a solid mapping exercise and the detected complementarities between existing demonstration facilities and company needs. The pilot targets both the accelerated deployment of new technological applications and the faster uptake by SMEs of nanotechnology. The focus lies on applications at post-prototyping level (> TRL5), with the potential for full market deployment in a time span of 3 to 5 years.

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<sup>7</sup> [http://ec.europa.eu/research/industrial\\_technologies/policy\\_en.html](http://ec.europa.eu/research/industrial_technologies/policy_en.html)

<sup>8</sup> [http://ec.europa.eu/research/industrial\\_technologies/policy\\_en.html](http://ec.europa.eu/research/industrial_technologies/policy_en.html)



### 3. Approach / methodology

**'Learn'** & **'Connect'** – The methodology for developing a European eco-system for 'self-discovery' of entrepreneurial opportunities comprises several interrelated steps. The **first step** is to share a vision on the future of the nanotechnology revolution, to give direction to the joint efforts of regions. A **second step** is the 'mapping' of the emerging value chains, innovation clusters and industries that will put Europe in the lead of this new industrial revolution. The **third step** is the 'matching' in the identified value chains of partners across regions which seek to cooperate on a common roadmap, based on complementarities.

**'Demonstrate'** & **'Commercialise'** – The **fourth step**, which is most crucial, is the development of a network of pilots and demonstrators for manufacturing (involving users), based on a commitment to 'co-invest' by businesses and public authorities through combining funding. The **final step** is the implementation by business actors of new innovation and industrial investment projects in these new value chains (commercialisation).

The **first step** was initiated based on the concept note "Proposal for a European collaboration on creating new value chains based on nanotechnology and pilot production facilities for products based on nanomaterials". For the **second step**, a survey was conducted to map the most relevant actors (companies, RTO's, clusters, existing demonstrators etc), including their positioning within the corresponding value chain (raw materials, modelling, nanomaterials in unprocessed form, nano-enabled intermediary products or components, integrated nano-enabled systems, etc), the materials used, and the specific domains of application (e.g. nanotechnology for medical devices and pharmaceuticals). For the Nano Pilot, ca 950 actors were mapped from 13 EU-regions, including more than 640 companies. The survey also mapped the regional ambitions and challenges (missing assets).

For the **third step**, the analysis of the mapping exercise allowed identifying first 'matches' and areas for potential cross-regional, joint-demonstration. Further analysis of these areas (through bilateral and multilateral contacts with regional experts and discussion during plenary meetings) led to the identification of 5 cases in the New Nano-Enabled Products pilot. The 5 cases are explicitly designed to be complementary to existing networks and initiatives, by addressing what is generally felt to be a missing link in the innovation value chains - the set-up and support of large scale demonstrators at European level to accelerate market uptake - through interregional collaboration. To prepare the **fourth step**, concept notes are being written for each case, to be discussed and elaborated by the participating regions, in collaboration with a first set of companies.

### 4. Main activities

A first kick-off meeting was held in June 2015 in which 12 Vanguard Initiative regions – including their nanotechnology experts – participated. The objective of the first meeting was to learn more about each participating region, about their strengths and focus areas within

the field of nanotechnology. Furthermore, the meeting also discussed the mapping exercise that will be carried out and which will help to identify existing and missing value chains within nanotechnology across Europe. Based on these findings, the purpose of the pilot action is to build concrete joint demonstration cases in which regions can intensify collaboration. Idea Consult was hired to perform the mapping exercise as well as prepare the second plenary meeting which took place on the 22 October 2015.

The objective of the second plenary meeting was twofold, firstly to present and discuss the outcome of the mapping exercise that took place between summer and end September; and secondly to elaborate potential areas for joint demonstration cases. Ten out of twelve regions participated in the meeting. At the meeting Idea Consult presented their analysis, although it was still work in progress some conclusions could be drawn, e.g. in which application domain that regions would like to put emphasis on. Most regions said that they have benefitted a lot from the process of filling in the survey and have today a better understanding of their own nanotechnology structure than they had before. All regions present had the opportunity to give their input to the analysis made and also to complement if needed. The second objective of the meeting of 22 October was to define specific cases that could be further elaborated into joint demonstration collaboration. After long discussions participating regions had identified four, possible six, cases for joint demonstration activities: 1) Nanowires for ICT and Energy applications (lead Skåne), 2) Integrated Nano-Bio Systems (Safety, Health and Environmental Monitoring) (Lead Flanders), 3) Pilot production of Nano-Materials (lead South Netherlands and North Rhine-Westphalia), and 4) Printed Nano-Electronics (lead Baden-Württemberg).

On 16 December 2015, the third plenary meeting was held and was considered as an internal matchmaking event. Compared with the initial two plenary meetings all regions were represented by their cluster organisation within Nanotechnology and in some cases also by their experts. At this meeting a fifth case was added, Nanomedicine (lead Rhône-Alpes). During the 3<sup>rd</sup> plenary meeting each case leader was given time to present the status of their concept note followed by a discussion with the audience. In most cases the outcome was that more regions are participating in each case and input was given to make the concept notes more focused. At the meeting in December, a steering group was established and composed by the two pilot leads (Skåne and Tampere) together with the regions leading the cases mentioned above (Flanders, Rhône-Alpes, South Netherlands, Baden-Württemberg and North Rhine-Westphalia).

#### **5. Results achieved & expected impact**

In the Vanguard Nano Pilot, **5 cases for joint-demonstration** are currently being pursued:

1. **Nanowires for ICT and Energy Applications** (lead Skåne): Nanowires for ICT applications include device integration of nanowire-seeded platelets for high

frequency power devices as well as new generation of sensors based on nanowires. Nanowires for energy harvesting and efficient energy conversion proposal comprises of nanowire transistor structures for modulating the light output of nanowire based LED structures for indoor illumination. Simple logic/driver circuits in nanowires or in their substrates could be used for tuning light/color levels or for communication purposes.

2. **Manufacturing Nano-enabled Microsystems for Food, Biotechnology and Medical Laboratory Analytics** (Lead Flanders): Integration of nano-materials and nano-structuring techniques into state-of-the-art micro-bio-system manufacturing enables new, competitive, customer-specific instrumentation solutions for the food, biotechnology and medical laboratory analytics industry.
3. **Industrial Pilot Production of Nanomaterials – Establishing New Value Chains** (lead South Netherlands and North Rhine-Westphalia): Scalable modular manufacturing and processing technologies for novel nanomaterials, functional supramolecular systems and composites addressing the markets of the future – from Lab to Fab!
4. **Printed Nanoelectronics: Integrated Energy Harvesting/ Cross-Technology Application Platform** (lead Baden-Württemberg): Matchmaking session focusing on (i) integrated solar technology in construction and buildings and (ii) printed electronics (PE) platform comprising combinations of PE technologies such as energy harvesting, sensors, displays, wireless, etc. for applications in, e.g., IoT, health monitoring, and food safety.
5. **Nanomedicine** (lead Rhône-Alpes): Infrastructures and projects to support the efficient implementation of nanotechnologies into innovative and connected healthcare products and their quick and safe translation into the market.

#### 6. *Key conclusions and necessary actions*

The New Nano-Enabled Products pilot has only been active since late spring 2015, although a number of conclusions can already be made:

- The mapping exercise has led to a better understanding of regions own landscape of companies within the nanotechnology domain;
- A better understanding of missing elements in the European value chain in the above mentioned cases.

However, there is still a long way to go before any of the joint demonstration cases mentioned above will be ready as a business case. One of many elements that needs to be more elaborated is how to finance the demonstration activities where discussions with regional authorities and EU institution needs to be carried out on a case specific level. Other elements are IPR issues, involvement of companies, etc.



## 7. *Next steps*

Next steps in the process will be to further discuss the cases with the case leaders leading up to concept notes with more details on each application area.

## VANGUARD INITIATIVE BIOECONOMY PILOT

Partner regions (20): Randstad region (co-lead) & Lombardy (co-lead), Flanders, Wallonia, South Netherlands, East Netherlands, North Rhine-Westphalia, Brandenburg, Baden-Württemberg, Malopolska, Emilia Romagna, Upper Austria, Navarra, Basque Country, Asturias, Scotland, Wales, West Finland, Skåne, Värmland.

### 1. Introduction

The Bioeconomy pilot is one of the two so called 2<sup>nd</sup> generation pilots, and was formally launched in May 2015.

The Pilot concerns the implementation of synergies in new biobased value chains across regions based on smart specialisations of the regions. If Europe is to compete with China, the United-States and Brazil, new integral biobased value chains and new connections between sectors like chemistry, agro, bioenergy, biofuels, and paper should be developed leading to new business opportunities through interregional cooperation and exchange of information and ideas. The focus is not so much on the R&D phase but rather on the demonstration and piloting stage of new value chains. As such, Vanguard aims to tackle the so-called ‘Valley of Death’ problem, which is a metaphor for good basic research results in the EU not often being translated into new commercial products on the market due to problem during the demonstration phase.

### 2. Common vision and objectives

The key objective is to identify opportunities for joint-demonstration between regions, based on a solid mapping exercise and the detected complementarities between existing demonstration facilities and company needs. The pilot targets the accelerated deployment of new biobased applications. The focus lies on applications at post-prototyping level (> TRL5), with the potential for full market deployment in a time span of 3 to 5 years.

### 3. Methodology

The methodology for developing a European eco-system for ‘self-discovery’ of entrepreneurial opportunities comprises several interrelated steps. The **first step** is to share a vision on the future of the biobased economy, to give direction to the joint efforts of regions. A **second step** is the ‘mapping’ of the emerging value chains, innovation clusters and industries that will put Europe in the lead of this new industrial revolution. The **third step** is the ‘matching’ in the identified value chains of partners across regions which seek to cooperate on a common roadmap, based on complementarities. The **fourth step**, which is most crucial, is the development of a network of pilots and demonstrators (involving users), based on a commitment to ‘co-invest’ by businesses and public authorities through

combining funding. The final step is the implementation by business actors of new innovation and industrial investment projects in these new value chains (commercialization).

**'Learn'** – The **first step**, the common vision, was shaped during the first plenary meeting, in which participants could share their vision on the bioeconomy and indicate their expectations about ways in which Vanguard could support that. This discussion was fed by the summary of a survey organized among the participants, outlining the main challenges lying ahead for the regions. The **second step** was also supported by means of a survey, mapping the most relevant actors (companies, RTO's, clusters, existing demonstrators, etc.), including their positioning within the corresponding value chain (raw materials supply, equipment supply, biomass processing, downstream use of biobased products), the feedstock used, and the specific domains of application (e.g. basic chemicals or biofuels) they are involved.

**'Connect'** – For the **third step**, the analysis of the mapping exercise allowed identifying first 'matches' and areas for potential cross-regional, joint-demonstration. Further analysis of these areas (through bilateral and multilateral contacts with regional experts and discussion during plenary meetings) led to the identification of 6 cases in the pilot (2 others are pending). The 6 cases are explicitly designed to be complementary to existing networks and initiatives, by addressing what is generally felt to be a missing link in the innovation value chains - the set-up and support of large scale demonstrators at European level to accelerate market uptake - through interregional collaboration.

**'Demonstrate'** & **'Commercialise'** – To prepare the **fourth step**, concept notes are being written for each case, to be discussed and elaborated by the participating regions, in collaboration with a first set of companies.

In summary, the pilot has set up a bottom-up mapping exercise, based on the Vanguard methodology, in order to destilize a number of so called 'DemoCases' (interregional projects), which are currently being elaborated.

#### 4. Main actions

A first kick-off meeting was held in June 2015 in which the Vanguard Initiative regions – represented by both policy makers and bioeconomy experts – participated. The objective of the first meeting was come to a shared vision about the role of the Vanguard pilot and to learn more about each participating region, about their strengths and focus areas within the field of biobased economy. In this meeting the results of a first scoping survey were discussed. Armed with the conclusions of the first meeting, a strategy was developed to evolve towards concrete cases for joint-demonstration. The first part of this strategy was the design of a second short survey aiming to collect very detailed information about the regional priorities in promoting specific new biobased applications, based on the strengths and interest of regional actors.



This second survey was presented at the second plenary meeting of 29<sup>th</sup> September, and launched on 5<sup>th</sup> October. After results were collected beginning of November, a series of bilateral contacts with participating regions were held in order to promote understanding of the survey answers and to explore already some first links with suggestions from other regions. The result of this second process was presented at the third plenary meeting of 1<sup>st</sup> December.

The objective of this third plenary meeting was not only to present and discuss the outcome of the mapping exercise that had taken place; but also to elaborate potential areas for joint demonstration cases. Following the discussion of the results of the survey and bilateral contacts, a number of potential cases for joint demonstration were identified. For each case, a leader was appointed in charge of drafting a concept note on the main activities of the case. Other regions were then invited to provide feedback on the concept note in order to evolve towards a common vision on the project outline.

Next to the bottom-up mapping exercise, the Bioeconomy clusters of the two co-leading regions have proposed two potential DemoCases; Lignocellulose as Feedstock for the Chemical Industry (Biobased Delta) and Biogas beyond Energy production (Lombardy Green Chemistry Association) which are currently being developed in parallel with the cases that emerged from the mapping exercise.

### **5. Results achieved & expected impact**

As it currently stands (February 2016), there are **8 potential cases for joint-demonstration** identified in the Vanguard bioeconomy pilot. Six of them have a dedicated case leader who has produced a draft concept note on the case, following which other regions interested in the case have added feedback and additional information, allowing to evolve towards a good common understanding and vision for the case. These six cases (listed first below) will be covered in sessions on the Matchmaking Event. Furthermore it is noteworthy that two other cases are in the pipeline: a case on use of algae feedstock very recently launched by Asturias, and a case on bioplastics for food packaging applications (leader yet to be determined).

- 1) Biobased aromatics from lignin (lead: Flanders);
- 2) Bulk/fine chemicals from lignocellulosic/sugar feedstock using fermentation (lead: Biobased Delta/Randstad region);
- 3) Gas fermentation from gaseous waste streams/gasified biomass (lead: Flanders);
- 4) Biogas beyond energy production (lead: Lombardy);
- 5) Food/feed from agro-food waste (lead: Scotland);
- 6) Aviation fuels from lignin (lead: Värmland);

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- 7) Food applications from algae feedstock (lead : Asturias).
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8) Bioplastics for food packaging;

### **6. Key conclusions and necessary actions**

While the pilot on biobased economy has only been active since late spring 2015, a number of conclusions can already be made:

- The mapping exercise has led to a better understanding of regions own landscape of companies within the biobased economy;
- A better understanding of missing elements in the European value chain in the above mentioned cases.

As we have identified key topics of common interest and are bringing together actors across regions to exchange ideas, the next step is to translate this common interest into concrete actions (projects). This will require commitments from all regional actors to overcome the initial time investments to get acquainted with the different expertise and interests present in the network, and to translate this into projects. This will also require active coordination of the pilot in order to promote this collaboration.

In order to let new partnerships take off, it is also important to work on the financing aspect. Vanguard actors can rely on existing public funding channels supporting interregional/national cooperation (Horizon 2020, Interreg), however in the context of the increased interregional cooperation in the Vanguard Initiative, it is very interesting to also think about novel interregional funding options together with representatives from different regions, which could facilitate further interregional demonstration activities. Apart from funding, also issues related to IP protection are important in the context of joint-demonstration projects.

### **7. Next steps**

The matchmaking event on 25 February 2016 will serve to connect actors from different regions to the cases for joint-demonstration. After the matchmaking event, the aim is to evolve towards a number of concrete projects involving actors from different regions, leading to concrete progress in advancing the bioeconomy by building critical mass and exploiting complementarities.

## Policy development and strategic dialogue

Beyond the networking activities developed by the Vanguard Initiative Brussels network, an important challenge of the Initiative is to engage regional administrations in the work of the Initiative and to support exchanges among them, as well as with European institutions. This was one of the aims of the **High Level Policy Forum organised** by Scotland in March 2015. Over 100 senior delegates gathered in between 24 and 26 March 2015 to reflect on the progress that the Vanguard Initiative has made to date and to discuss and agree the actions required at regional, Vanguard and European level to consolidate and build on the early work of the Initiative. The [conclusions of the Forum](#) have helped to translate the Milan Declaration into concrete actions plans and work flows in 2015.



For further developing policy development reflections and pursuing dialogue with the European Institutions, a **Policy Influencing Task Group** was created in 2015 (Chair : Scotland). The objective is to prioritise and focus the Vanguard Initiative's policy influencing activity in those areas of policy that are most important to creating the conditions that enable our pilot projects to flourish (Clusters and Smart Specialisation, Investment and Cohesion Policy).

Alongside the development of its activities, the Vanguard Initiative, notably through the Vanguard Pilot Monitoring Task Group, has developed a **strong dialogue and collaboration with the EC services** as to ensure the transition of information and sharing of experience. This enables the European Commission to use this evidence to shape EU policy and structural support schemes for current and future 'Vanguard inspired' initiatives, aiming at fostering EU-collaboration and investment.

Vanguard Initiative's Pilot Projects have and are being used as a **testing ground for the smart specialisation platforms** as mentioned in the EC's Communication "For a European Industrial Renaissance". The results and experiences so far, in particular the Vanguard Methodology (4-step approach 'learn-connect-demonstrate-commercialise') and the close cooperation with EC services, most notably DG REGIO and DG GROW, have led the latter two to take inspiration from the Vanguard Initiative in the design of the European Commission's new Cluster Policy, in which JRC-IPTS will also play a role.

In that context, the Policy Influencing Task Group has managed, with the support of Wallonia, to ensure an active participation of the Vanguard Initiative (represented by Linda Hanna from Scotland Enterprise) to a thematic discussion dedicated to cluster policy organized by the Luxembourg Presidency at the "**Competitiveness and Growth**" Working



**party of the Council** on the 12<sup>th</sup> of November. The European Commission used this opportunity to share their first insights on future cluster policy developments. Some policy conclusions about cluster policy from this session are drawn in the [Presidency's report on industrial competitiveness mainstreaming](#)<sup>9</sup>.

The Vanguard Initiative is now considered as a key partner by the Commission for the **development of Thematic Smart Specialisation Platforms and European Cluster Partnerships for Smart Specialisation Investment**, to be launched in 2016 and further developed at the occasion of the High level Smart Specialisation Conference scheduled on 1-2 June 2016. This approach will build on the Vanguard Initiative methodology. To help shape this work, Vanguard Initiative representatives participated in an informal discussion with cluster policy experts on a draft Concept Note "Supporting interregional cluster cooperation for S3 investments to boost growth" developed by DG REGIO and DG GROW in November 2015.

The matchmaking event to be held on the 25 February 2016 (see below) is also a clear milestone in those policy developments.

Useful contacts were also pursued with the Commission – DG REGIO, DG GROW, DG RDT, DG CONNECT – as well with the S3 Platform and the EIB.

In particular, the Vanguard Initiative organised a meeting with DG ECFIN on 11 May 2015, in which the large added value of a tool for 'pooled investment projects' was pitched. As such, Vanguard Initiative can proudly claim to have made a significant contribution to the **Thematic Transnational Investment Platforms** to be developed in the context of the EFSI (launch intended February/March 2016). These Platforms have specific interest for Vanguard Initiative demonstration cases which have clear investment potential, but are considered to have 'too low' volume for EFSI financing.

As a symbol of this growing recognition at the EU level, the Vanguard Initiative was highlighted as an important driver for interregional co-investment in European value chains in the [autumn edition of Panorama Magazine](#). The article, entitled "Transforming Regional Economies through Smart Specialisation", provides a substantial case study of the Vanguard Initiative to demonstrate the opportunities related to interregional implementation of smart specialisation strategies.

Finally, a specific Task Group (led by Tampere Region) was created at the end of the year for preparing the **Vanguard Initiative annual political meeting**, scheduled on 24 February 2016, back-to-back with the matchmaking event. It will be a unique occasion for pursuing a constructive policy dialogue with EC high level representatives – and first of all with the Vice-

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<sup>9</sup> See p.19.

President Jyrki Katainen – on key topics such as joint investments, scaling up inter-cluster networks at EU level and barriers to collaboration and co-investment.

## Leveraging public-private investments & access to combined funding

For further exploring options for the financing of interregional activities and pilot activities, a **Financial Instruments Task Group** (Chair: Scotland) has been created in 2015, with two strands of activities, involving financial instruments experts from the Vanguard Initiative regions.

A first subgroup<sup>10</sup> led by Scotland is currently exploring the possibility of establishing a multi-regional financial instrument focused on early-stage risk capital to support the ambitions of the Vanguard Initiative. The main benefits of such an instrument would be substantial leveraging of external finance through the pooling of existing resources, as well as the connection, by the fund manager, of investors and companies across regions thereby encouraging cross-border cooperation and investment. The experts meet quarterly and, as a starting point, have exchanged best practice in facilitating access to finance within their regions.

Secondly, within a subgroup for the pilot investments led by Flanders, 9 regions are currently active<sup>11</sup>. First, a Brussels' representative task force held a preparatory meeting on the 29<sup>th</sup> of October. As a result, a survey was conducted to take forward the pilot investments on an interregional basis either through regional ERDF, voucher schemes and/or other demonstration funding possibilities. Based on the responses of 7 regions (Dalarna, Flanders, Wallonia, South Netherlands, Emilia-Romagna, Rhône-Alpes and Basque Country), representatives and financial experts discussed funding and co-investment options to scale-up pilot activities and to strengthen investors' know how. IDEA Consult actively supports the exploratory and analytical work of the Task Group.

It is intended that the two subgroups of experts will merge into one task group, as their work becomes increasingly linked.

Furthermore, **each pilot is exploring specific funding options** on the basis of the identified project needs. Following the development phase of the projects, relevant Horizon 2020, INTERREG, or other calls are explored (see above).

As already mentioned, the annual political meeting and the matchmaking event scheduled in February 2016 will pay specific attention to the financing issues, both on the policy side as well as on the implementation side.

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<sup>10</sup> Joining Scotland, Emilia-Romagna, Rhône-Alpes, Baden-Württemberg and Skåne.

<sup>11</sup> Basque Country, South Netherlands, Wallonia, Rhône-Alpes, Baden Wurttemberg, Emilia-Romagna, Lombardy, Skåne, and Central Sweden.

## Developing the Vanguard Initiative

The **Brussels Network of representatives** is currently at the heart of the Vanguard Initiative. Its members are responsible for providing the interface between the European agenda and the political, operational and technical contacts in their regions. The network met 5 times in 2015. The work of the Vanguard Initiative Brussels Network is supported by the **Vanguard Initiative Coordination Group** that steers the direction of the Vanguard Initiative and undertakes the preparation for all of the Brussels Network meetings. It held 12 meetings in 2015. Within the Coordination Group, the **Vanguard Initiative Chair** (Tampere Region in the first half of 2015 and Basque Country in the second half) and the **Vanguard Initiative Secretariat** (Flanders) ensure that the political dimension is taken into account and **Vanguard Initiative Task Groups** are set up for a defined period to address particular issues of interest to the Vanguard Initiative members.

Regarding in particular the development of the network, 2 Task Groups have supported the work in 2015. The **Communication Task Group** (Chair: Dalarna) has reviewed the communication strategy of the Initiative: upgrading of the Website, creating a LinkedIn group and a Twitter account and developing common communication material.



The **Future of the Vanguard Initiative Task Group** (Chair: Catalonia) has analysed in depth possible legal options for giving the Vanguard Initiative a legal structure, with the aim of facilitating the further development and financing of its activities. The most suitable option, the creation of a Belgian Law ASBL should be confirmed and implemented in 2016.

**Six new members** have completed the process for joining the Initiative since last year: Emilia -Romagna (IT), Pays-de-la-Loire (FR), Ile-de-France (FR), Ostrobothnia (FI), Randstad Region (NL), Saxony (DE), Southern Denmark (DK).

Finally, an **Interreg Europe project** was submitted for financing in the summer 2015 and [selected in February 2016](#) – S34GROWTH. The lead applicant is the Baltic Institute of Finland (Tampere), and the consortium gathers the 9 pilot lead Regions.



The objective of the project is to develop policy learning activities in the field of interregional development for industrial innovation and smart specialisation. It's aiming at building further policy development on the basis of the Vanguard methodology "Learn, Connect, Demonstrate and Commercialise". The project will commence from 1<sup>st</sup> April, 2016.

## **Perspectives**

The work undergone in 2015 has laid the groundwork for decisive achievements in 2016. Next steps and big challenges in the development and consolidation of the Vanguard Initiative are already in view.

The network has grown in 2015 to 27 regions, and is expected to grow again in 2016, several regions being in the joining process. The first of them are **Cantabria and Galicia**, which joined the network in early 2016 and **East-Netherlands**, which will be joining in February 2016.

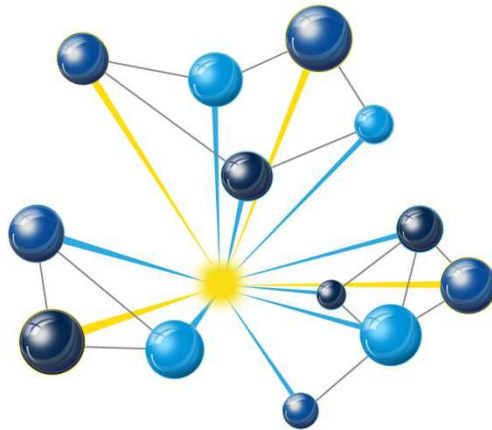
The Annual Political Meeting will take place on 24 February 2016, which will allow further strategic dialogue among Vanguard Initiative regions, and with high level Commission representatives, with a strong focus on financing and investment issues. The matchmaking event that will take place on the next day (25 February), with the support of the European Commission, is aimed at giving a decisive boost in implementing and financing the Vanguard Initiative demonstration cases, with strong engagement from industrial partners and experts expected. These cases have defined ambitious agendas for demonstrating and piloting joint activities, and innovative solutions for the financing of the projects are to be found.

Furthermore, encouraging policy developments at the EU level driven by the Vanguard Initiative example should arise in 2016. This puts light on the value of the Vanguard Initiative approach. The EC High level Smart Specialisation Conference announced for the 1-2 June 2016 will be another important milestone.

**In a short timeframe, the Vanguard Initiative has proven that new paths for building collaborative growth in Europe exist. The Vanguard Initiative has also established itself as a credible source of evidence for European institutions.**

**These efforts will continue in 2016, underpinned by a more concrete structure for the Initiative and for the Pilot Projects that will enable implementation and scaling up of efforts to date resulting in progress towards delivering growth and jobs for Europe.**





# VANGUARD INITIATIVE

New growth through smart specialisation

Asturias	Emilia-Romagna	Ostrobothnia
Auvergne - Rhône-Alpes	Flanders	Randstad Region
Baden-Württemberg	Ile-de-France	Saxony
Basque Country	Lombardy	Scotland
<b>Cantabria</b>	Malopolska	Skåne
Catalonia	Navarra	Southern Denmark
<b>Galicia</b>	Nord-Pas de Calais - Picardie	South-Netherlands
Dalarna	Norte	Tampere Region
<b>East-Netherlands</b>	North Rhine-Westphalia	Upper Austria
	Pays de la Loire	Wallonia