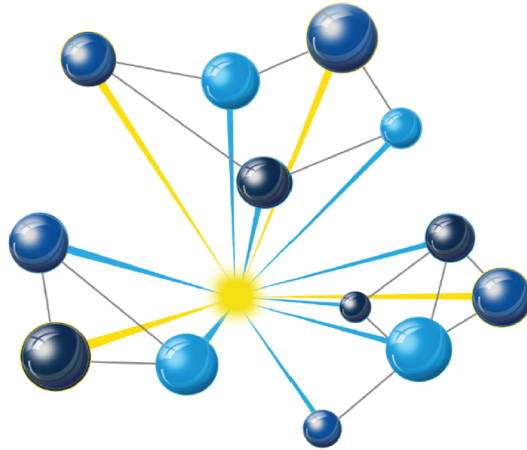


**RESULTS &
IMPACT**



VANGUARD INITIATIVE
New growth through smart specialisation

Vanguard Initiative

Network, Goals and Pilot Projects

Funding & Investment Needs

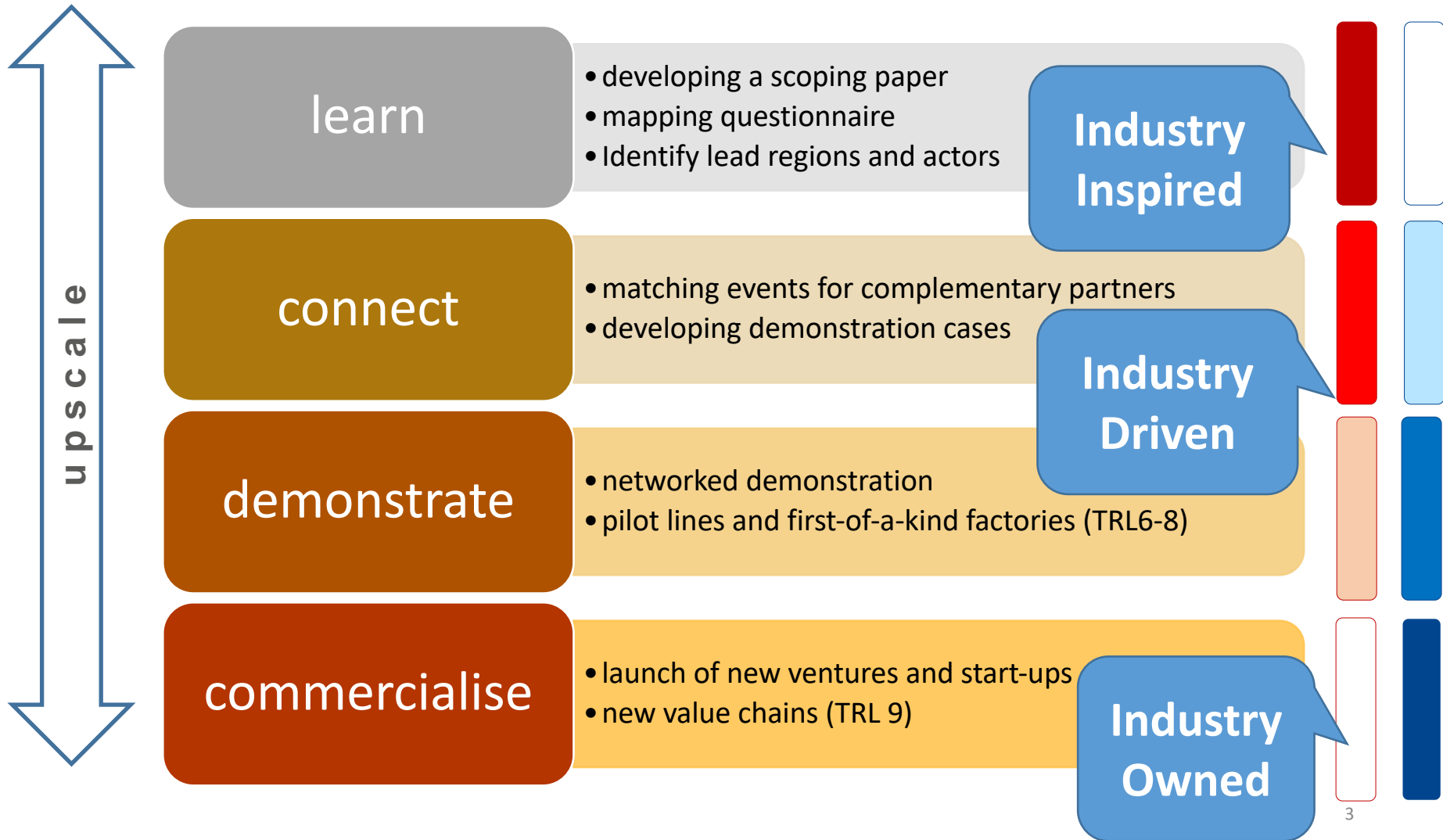


VI – network of many regions



- ❖ region
- ❖ industry based S3
- ❖ ambition
- ❖ political commitment (Milan Declaration)
- ❖ mobilizing and organizing industrial stakeholders in the region
- ❖ active participation in the network structure
- ❖ active participation in core activities

VI Methodology – 4 step approach





VI Pilot Projects

Key features

- New industrial value chains
- accelerate market development
- industry-led cross-regional demonstration projects
- global competitiveness

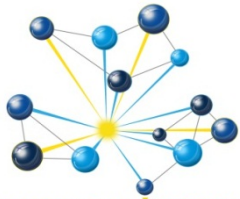
5 Pilots (testbeds for systemic change)

- **Efficient and Sustainable Manufacturing** (Catalonia + Lombardy)
- **High Performance Production through 3D Printing**
(Flanders + Norte + South Netherlands)
- **ADMA for Energy related Applications in Harsh Environments**
(Basque Country + Scotland)
- **New Nano-enabled Products** (Skane + Tampere)
- **BioEconomy** (Lombardy + Randstad)

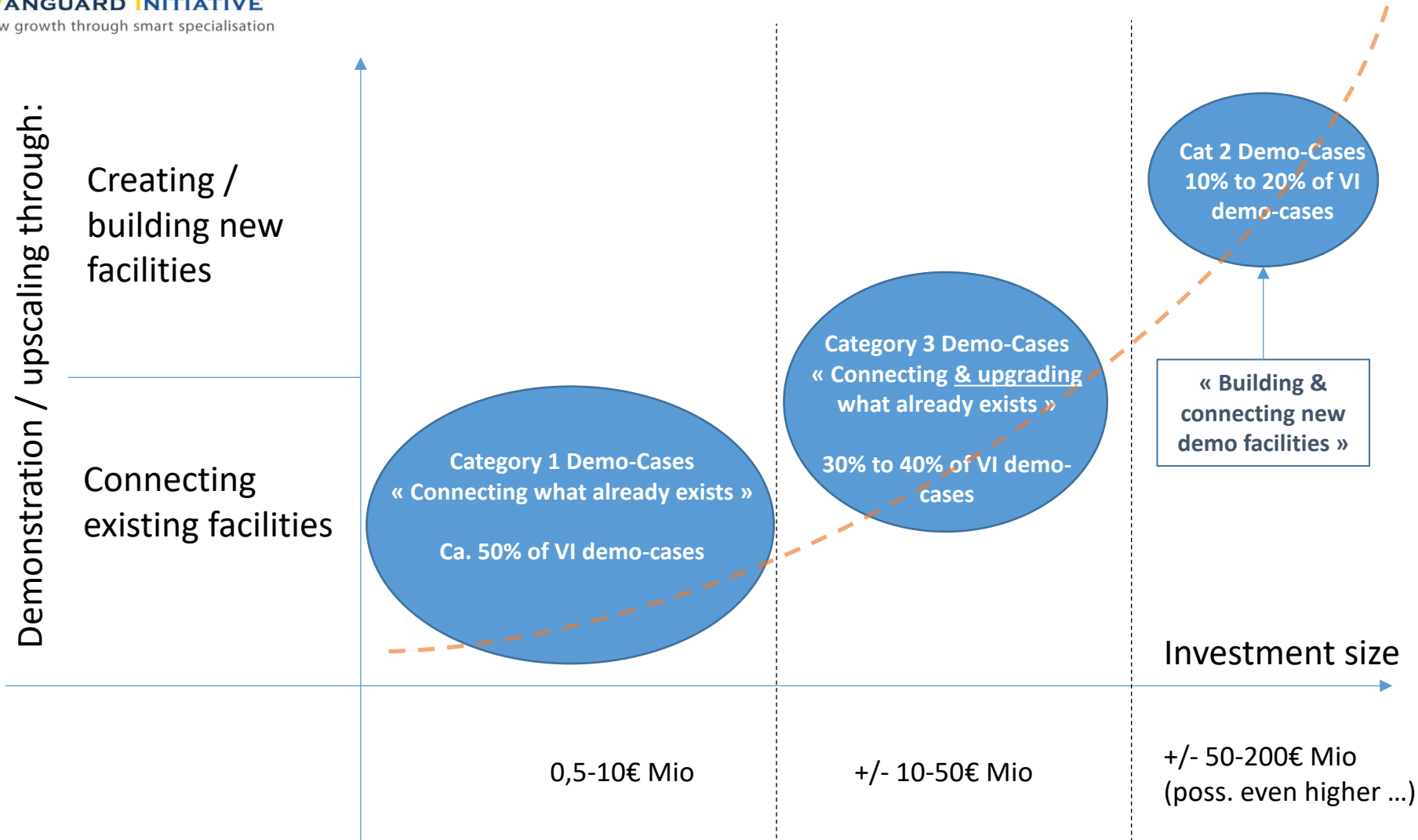


Funding & Investment Needs

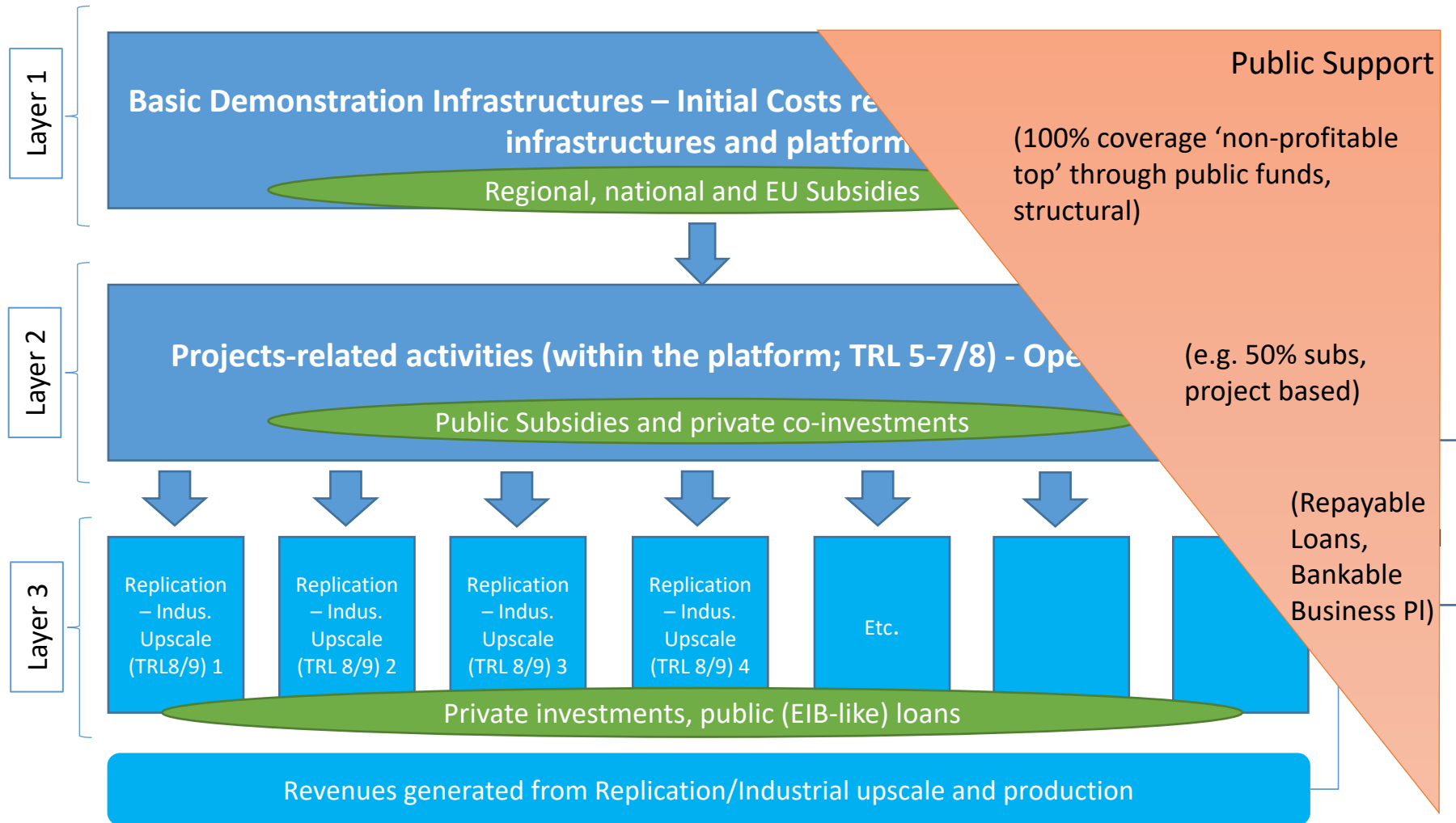
- **VI Demo Cases common objectives**
 - establish (shared) facilities for demonstration of new technologies
 - facilitate access to (shared) facilities
 - lower technology uncertainty, risks and costs
 - stimulate industrial replication & upscale (hence market uptake)
- **Each Demo Case =**
 - combination of complementary demonstration facilities
 - group(s) of companies accessing infrastructure (TRL6-8)
 - industrial replication & upscale (if the above is successful) (TRL8-9)
- **3 types of Demo Cases**
 - Challenge driven or technology driven
 - connecting existing infrastructures
 - building brand new demonstration infrastructure
 - connect & upgrade existing infrastructure (hybrid format)



Different Investment Needs

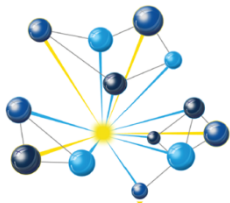


General Financial Structure – three layers



Notes:

- Layer 1 (to some extent Layer 2 as well) contains « non-profitable top » (hence the subsidies)
- Layers 2 & 3 can't be functioning if « top » not financially secured (→ no bankable plan !)
- Layers inter-dependent; smooth flow between them key !



VANGUARD INITIATIVE

Bio-Based industries: Context

Smart Pilot action: interregional partnerships for innovative projects



Technology Readiness Levels

- TRL 0: Idea.** Unproven concept, no testing has been performed.
- TRL 1: Basic research.** Principles postulated and observed but no experimental proof available.
- TRL 2: Technology formulation.** Concept and application have been formulated.
- TRL 3: Applied research.** First laboratory tests completed; proof of concept.
- TRL 4: Small scale prototype** built in a laboratory environment ("ugly" prototype).
- TRL 5: Large scale prototype** tested in intended environment.
- TRL 6: Prototype system** tested in intended environment close to expected performance.
- TRL 7: Demonstration system** operating in operational environment at pre-commercial scale.
- TRL 8: First of a kind commercial system.** Manufacturing issues solved.
- TRL 9: Full commercial application,** technology available for consumers.

Bio-based aromatics

Gas fermentation

→ Large investment size for BBI +- 124 million EURO (study EIB June 2017)



BIC and Vanguard Initiative sign Bioeconomy MoU

- Based on the Mou, the Pilot and BIC have agreed to work together on **communication and awareness** raising activities for mobilizing key stakeholders and promoting the importance of bio economy and bio-based industries.
- They have agreed to work together as **equal partners on improving access to financial instruments and strengthening synergies between different funding schemes towards the creation of a more favourable investment environment.**
- Lastly the Pilot and BIC have agreed to **connect actors across regions and sectors along new value chains** and to explore how the combination of different strengths can lead to a faster deployment of new technologies. Moreover, exchange of information related to BBI topics and Pilot cases will be promoted in order potential synergies to be exploited.

2.1 Use-cases (or industrial applications) addressed in the demo-case

The Pilot Network is seen as a *One-stop-shop* for delivering innovation services to the industrial end-users with a multi-regional approach.

Industrial Innovation Service Portfolio

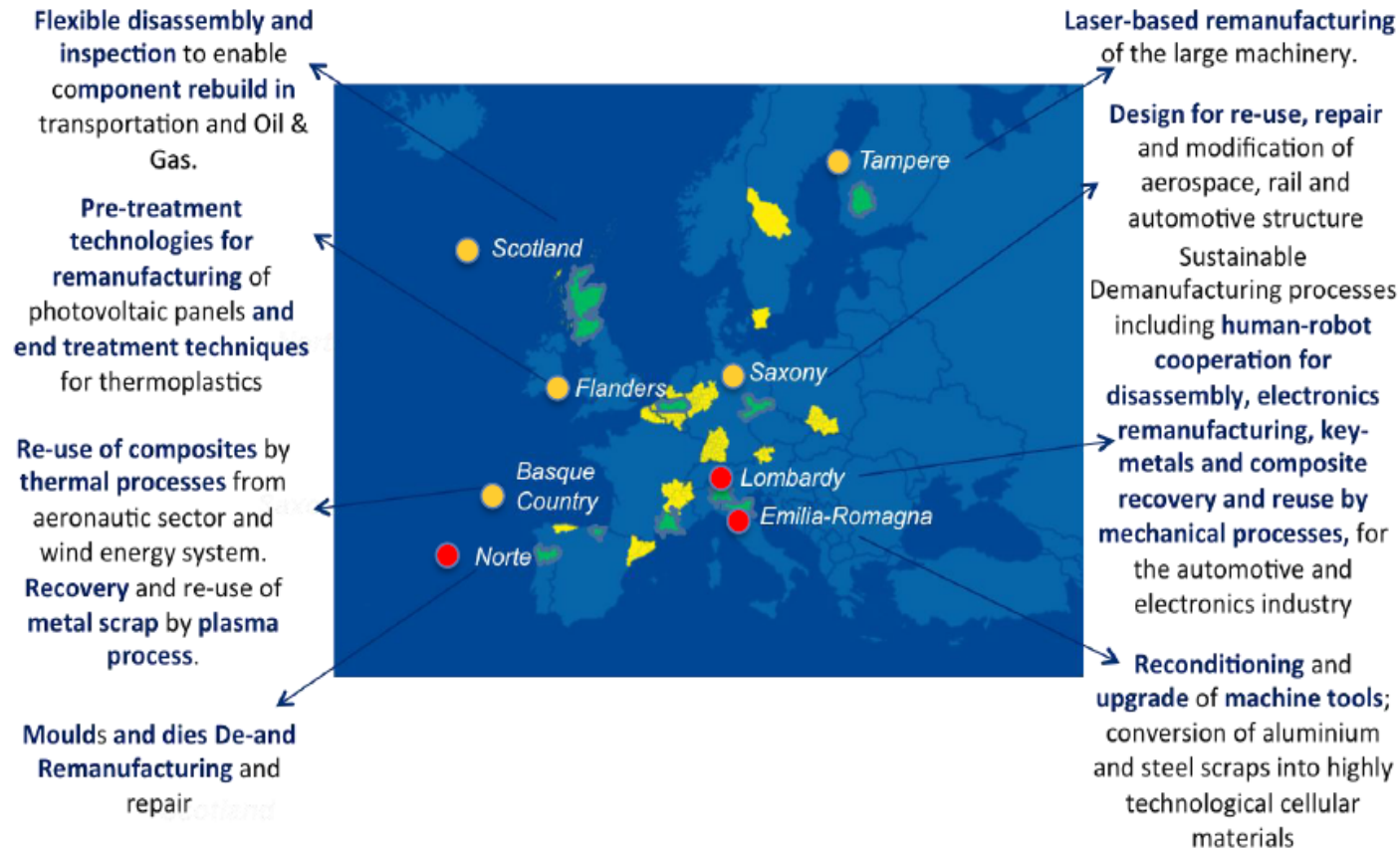
Reverse logistics optimization.	Technical feasibility assessment.
Product Life-cycle information management.	De-and Remanufacturing Process-chain design and demonstration.
Environmental sustainability assessment and LCA.	System integration and control.
Patent and technology IPR searches.	Product design/re-design for circular economy.
Market analysis and business models.	Prototyping and product testing.
Legislation review and innovation deals.	Production of pre-series.
Product and process certification.	Process chain optimization, simulation, and analytics.
Business case validation and scenario analysis.	Value-chain integration.
Circular economy training.	Support to Environmental Technology Verification (ETV) applications.

2.1 Use-cases (or industrial applications) addressed in the demo-case

A detailed analysis of identified *sectorial Use Cases*, with industrial partners associated, has been performed, where more regions are involved. For each Use Case, a business case has been detailed including a *business plan* for the industrial take-up of the solutions.

Regional/Cross-Regional Use Case	Involved Regions
Composite Recovery from Wind Energy System	<u>Basque Countries</u> , Saxony, Lombardy, Tampere, Scotland
Heavy machinery components remanufacturing	<u>Tampere</u> , Basque Countries, Lombardy, Saxony
Automotive parts remanufacturing	<u>Scotland</u> , Lombardy, Saxony, Norte
High-value TLC systems and Electronics Recovery	<u>Lombardy</u> , Tampere
Metal components reprocessing	<u>Saxony</u> , Tampere, Lombardy
Remanufacturing of e-motors	<u>Saxony</u> , Lombardy, Norte
Plastics recycling from WEEE	<u>Flanders</u> , Lombardy
E- mobility batteries remanufacturing for re-use	<u>Lombardy</u> , Saxony
Photovoltaic panels de-manufacturing	<u>Flanders</u> , Lombardy
Remanufacturing and retrofit of machine tools	<u>Emilia Romagna</u> , Lombardy

3 – Envisaged inter-regional nodes configuration



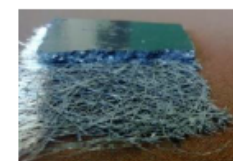
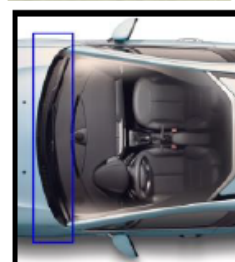
- Totally new pilot site (or connection)
- Upgraded existing pilot site (or connection)
- Existing pilot site (or connection)

Key Issue: integrated pilot plant solutions, needed by industry to *validate high-risk investments* in circular economy businesses before the industrial implementation.

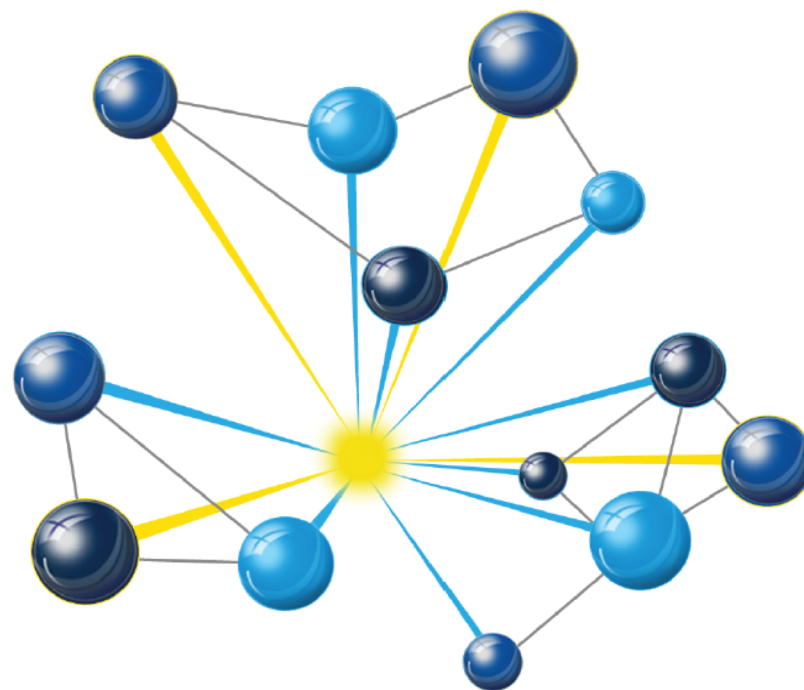
2.2 Who is working at the use cases?

More than 60 European companies, with a cumulative *turnover of 32 B€* and with some *175,000 employees*, and 69 universities and RTOs distributed among the involved regions are involved.

TECforce	Filartex Spa	Gamesa Siemens
Candy	Gafitex	Xnext
Italtel	Pass Maglia	Lot Quantum Design
CEG	Samatex	MH Systems
Barco	PTMT PANTER	Holonix
Worldilne	Rivierasca	Idealtech
Turner Aviation	Brianza Plastica S.p.A.	Cosberg
Cargotec Finland Oy	Sintostamp S.r.l.	Vibram
Sandvik Mining and Construction Oy	Magniplast S.p.A.	AERNNOVA
Metso Minerals Oy	OCV Owenscorning	ITP
Valmet Power Oy	Covestro	Galloo
John Deere Forestry Oy	Campine	Van Gansewinkel
Bronto Skylift Oy Ab	Galloo Plastics	TKM TTT Finland Oy
Avant Tecno Oy	Kokkola LCC Oy	IRIZAR
Hambleside Danelaw	A2A Ambiente	Meleghy Automotive
Arup	Relight	GKN
Fastems	Fincoat OY	Enginsoft
Tenova	Telatek Oy	MCT Reman
Maier	Siae	Cobat
Indeva	Batz	ASPIRE Eng.
DMG Mori	Ki-lab	
	Weir Group	



The stakeholders have signed *Letters of Intent* to participate to the definition of this Pilot Network and, in the case of future end-users, to access the pilot network and to carry on industrial take-up, in case of positive evaluation of the developed solution.



VANGUARD INITIATIVE

New growth through smart specialisation



@VI_Brussels #Vanguardinitiative

www.s3vanguardinitiative.eu



Investment Needs across Layers: Mismatches and proposals (1/3)



- **Layer 1 - Initial costs – establishing the shared demo-infrastructure:**
 - Centrally managed **EU fund** to support the creation of innovation infrastructure (industry commons) with **grants**
 - Where no single party is able or willing to bear costs and risks
 - Mainly cover **funding gap at layer 1** (partly at layer 2 also)
 - Avoiding complexity of multi-level government and multi-programme collaboration, as well as **state aid issue** (similar to H2020).
- **Proposed time-table:**
 - a) **Post 2020: Dedicated « EU Joint Innovation & Demonstration Fund »**
 - ❖ Via FP9
 - ❖ Via ESIF (fall-back):
 - Expanded Interreg B
 - Interreg Europe + investment support mechanism ('revised' Regions of Knowledge 2.0)
 - Demonstration Initiative such as the Urban Innovative Actions initiative
 - b) **2017-2020 = Joint & aligned call of Interreg B programmes**



Investment Needs accross Layers: Mismatches and proposals (2/3)

VI Regions
+ EC

- Layer 2 - Operating costs of the interregional demonstration platform:
 1. Easily accessible interregional vouchers' system for SMEs, in order to fund feasibility studies and scale-up work in shared facilities, or
 2. Combining regional (non-EU) subsidies to compensate for costs incurred to visits to demonstration facilities in other regions, or
 3. A specific Vanguard Initiative "ERA-Net Co-Fund" (but for higher TRLs: demonstration + end-users) or
 4. A reinforced and expanded MANUNET (for ADMA, higher TRLs), i.e.:
 - MANUNET III (2016-2021) to be expanded towards 'Joint Programme Art 185 TFEU' (dedicated budget for 'research valorisation') ?

● Short- to medium-term

● Medium-term

● Post-2022



Investment Needs accross Layers: Mismatches and proposals (3/3)

- Layer 3 - Industrial upscale and replication:

1. **Expanding scope and domains of application of the so-called “InnovFin Energy Demo Projects instrument”** to cover broader industrial modernisation activities (“InnovFin ADMA”)

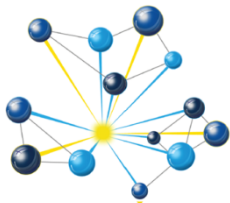
e.g. Energy Demo Pilot =

- loans or loan guarantees between €7,5M and €75M
- « first-of-a-kind commercial scale demonstration projects in the fields of renewable energy, hydrogen and fuel cells »

2. **‘Fund-of-Funds’ for Industrial Upscale** = multi-layered fund with input from e.g. regions, EIB/EIF, private investors etc.



VI Regions
+ EC + EIB



Investment Needs across Layers: Mismatches and proposals

	Assessment existing solutions	Potential solutions	Gap Analysis
Layer 1 Initial costs – establishing the demo infrastructure	No suitable instrument so far in cross-regional, pan-European setting. New solution(s) needed <u>→ Critical financing gap remains</u>	EU Joint Innovation and Demonstration Fund (e.g. under FP9 or expanded Interreg B)	Critical
Layer 2 operating costs of the interregional demonstration platform	Some EU solutions in place under H2020 (I4MS, ActPhast, INNOSUP, Fast Track to Innovation, NMBP Pilot Production Network etc) <u>but with uncertain access no structural solution</u>	EU Joint Innovation and Demonstration Fund Combined regional (non-EU) subsidies (e.g. interregional vouchers' system), or specific "ERA-Net" (>TRL5) (e.g. expanded MANUNET)	Moderate
Layer 3 industrial replication	New instruments (e.g. Energy Demo Pilot under InnovFin) but too restricted scope /application	Expanded InnovFin (i.e. expanding the scope and domains of applications of the Energy Demo Pilot) 'Fund of Funds' for industrial upscale (multi-layered: regions, EIB/EIF, private investors)	Moderate



Ongoing Initiatives

- Thematic S3 Platforms:
 - ✓ Inspired by the Vanguard Initiative
 - ✓ Involvement of VI Pilots
 - ✓ On-going discussions about financing needs
- Reflection paper on Harnessing Globalisation
- Upcoming S3 communication
- Mid-term Review Horizon 2020 & WP 2018-2020
Post-2020 reflection
Future of Europe process
- VI Annual Political Meeting 20-22 November 2017 (tbc)
+ on going Dialogue at political level with EC
(Cabinet Juncker, Katainen, REGIO, GROW, RTD, EDUC, CONNECT)



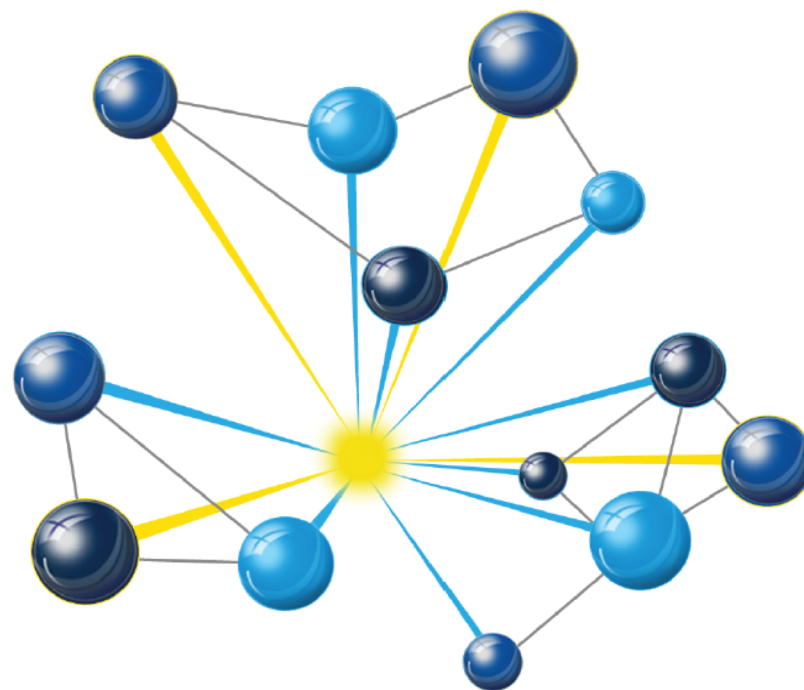
Perspectives

- Exploring co-investment possibilities / blending of instruments
- FP9 and its industrial pillar / Strategy on Key Enabling Technologies
- An EU Joint Innovation & Demonstration Fund?
- An InnovFin ADMA?
- An interregional voucher system?
- A reinforced and expanded MANUNET? / A Vanguard Initiative/Industrial Modernisation ERA-net co-fund?
- State aid harmonisation

Pilots & DemoCases (3/3)

BioEconomy

- Bio-based aromatics
- Lignocellulose refinery
- Turning (waste) gas into value
- Biogas beyond energy production
- Aviation biofuel
- Food and feed ingredients from agro-food waste
- Food and feed ingredients from algae



VANGUARD INITIATIVE

New growth through smart specialisation



@VI_Brussels #Vanguardinitiative

www.s3vanguardinitiative.eu