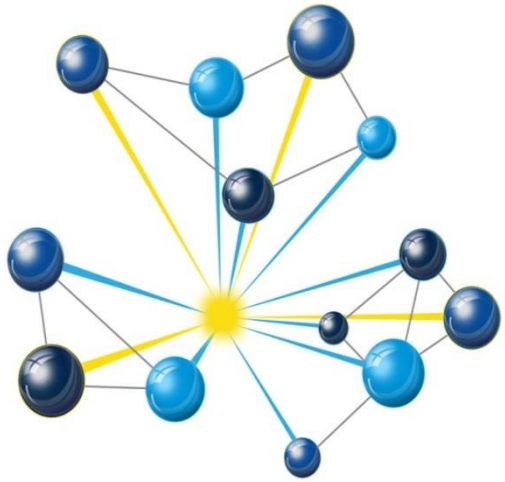


VANGUARD INITIATIVE

New growth through smart specialisation

Testing new opportunities and manufacturing practices with AM

21-9-2017

Topics

- What is the Vanguard Initiative?
- Who is participating?
- How does it work?
- Additive / substractive high precision and high finishing production
- Next steps

What is it?

The Vanguard Initiative for New Growth by Smart Specialisation.

- WHAT – A partnership of European **regions** that want to be frontrunners in the application of **smart specialisation** as a strategic principle in European innovation and industrial policy to promote new growth through a **bottom-up** dynamics in the regions.

- WHY – need to deliver on **jobs and growth** and foster global competitiveness by investments in strategic priority domains for Europe's industrial future (with a focus on new pilot activities).

- WHO – **regions** with strong industrial ambitions and **smart specialisation strategies** for their structural renewal.

- HOW – by sharing information to initiate **bottom-up vanguard initiatives**, developing common roadmaps and **multi-level approaches** to stimulate investment and **enabling local clusters** with global potential to develop into world-class clusters

Participants

29 regions in Europe

Asturias
Auvergne –Rhone-Alpes
Baden - Württemberg
Basque Country
Cantabria
Catalonia
Dalarna
East-Netherlands
Emilia – Romagna
Euskadi
Flanders
Galicia
Lombardy
Malopolska
Navarra
Nord - Pas de Calais
Norte
North Rhine - Westphalia
Ostrobothnia
Pays de la loire
Randstad Region
Saxony
Scotland
Skåne
South - Denmark
South - Netherlands
Tampere Region
Upper – Austria
Wallonia

VANGUARD: BACKGROUND & RATIONALE

Focus on Advanced Manufacturing (ADMA) & deployment of Key Enabling Technologies

5 Pilot Actions

- High Performance Productions with 3D Printing (South-NL, Flanders, Norte)
- Efficient and Sustainable Manufacturing (Lombardy, Catalonia)
- Energy Related Applications in Harsh Environments (Scotland, Basque Country)
- Innovative use of Bio-mass (South Holland / Lombardy)
- New nano-enabled products (Skåne, Tampere)

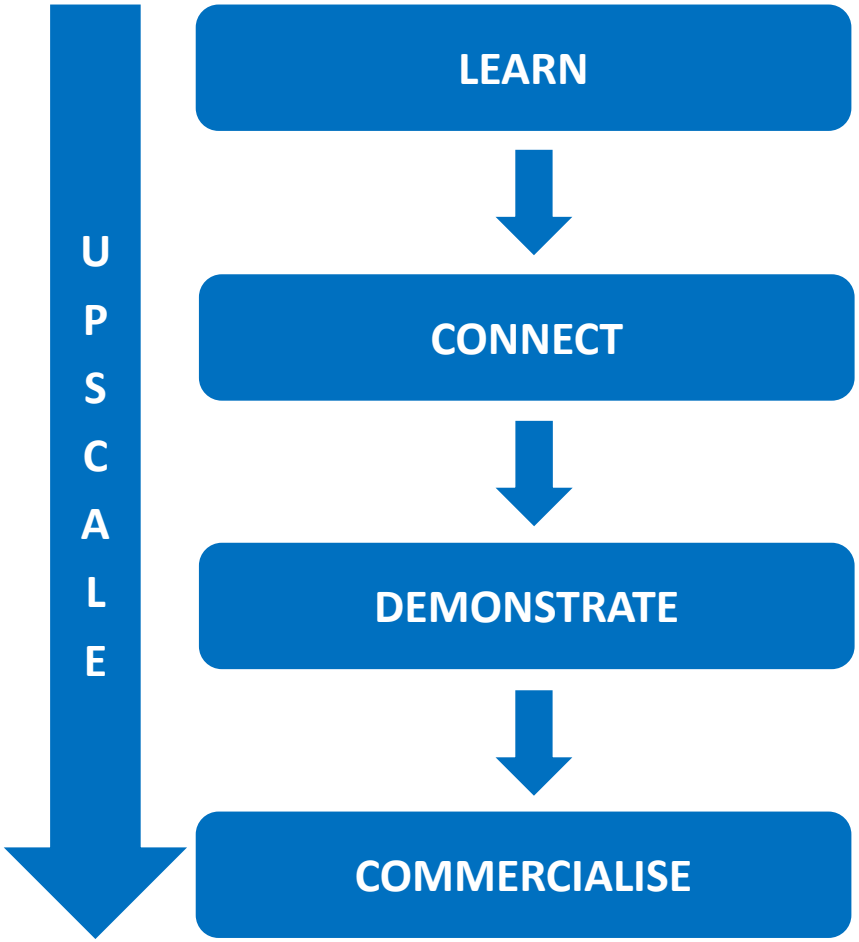
Rationale

- Medium to high Technology Readiness & High Market Potential
- But … still fragmented / incomplete value chains + lack of visibility between supply & demand

➔ Need to connect & upscale regional efforts to speed up deployment, with focus on demonstration activities (>TRL5)

➔ **Objective** ➔ *"to accelerate market uptake of 3DP applications in the EU through industry-led, transregional demonstration platforms"*

VI Methodology for interregional cooperation



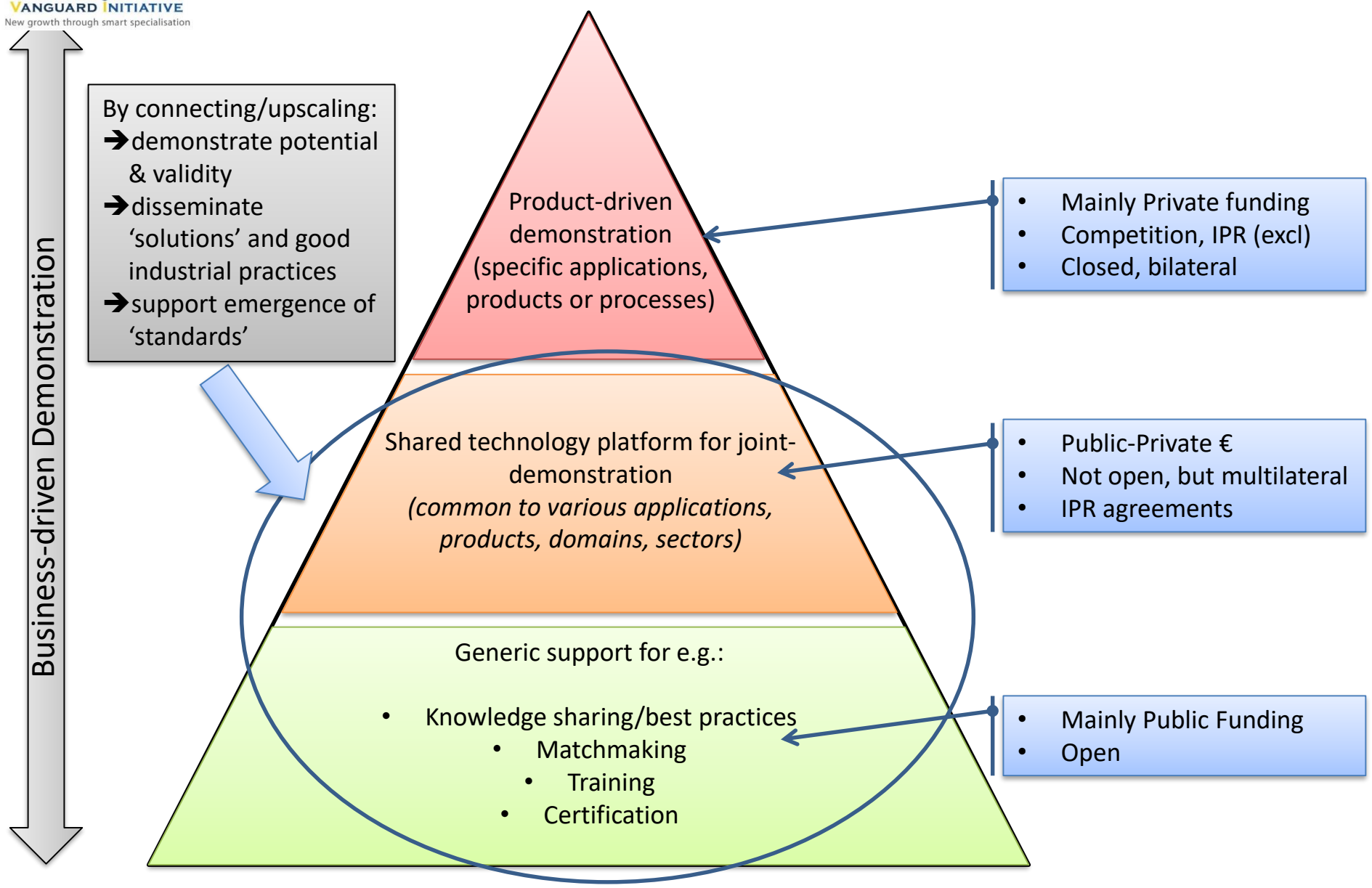
- Scoping paper (common vision)
Identifying lead regions
- Mapping questionnaire (potential/gaps)
Identifying lead-actors

- Matching events for complementary partners
- Project development for new value chain

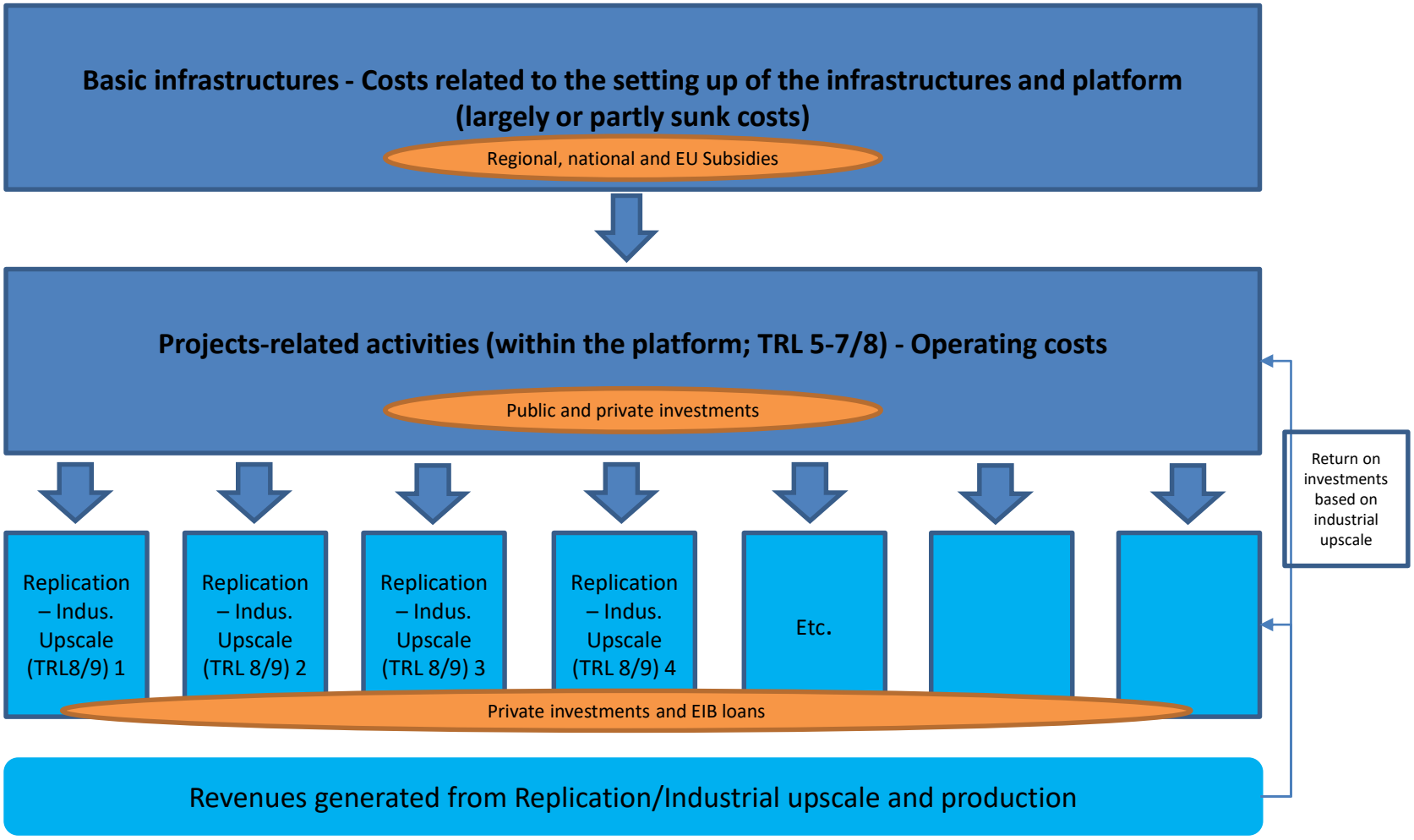
- Networked demonstration (JDI)
- Pilot lines and first of a kind factories
TRL 6 – 7 8

- Launch of new ventures / start - ups
- New value chains
TRL 9

Development of demonstration activities



General Financial Structure
three layers



Organisation

ASBL

- Shared Funding Model

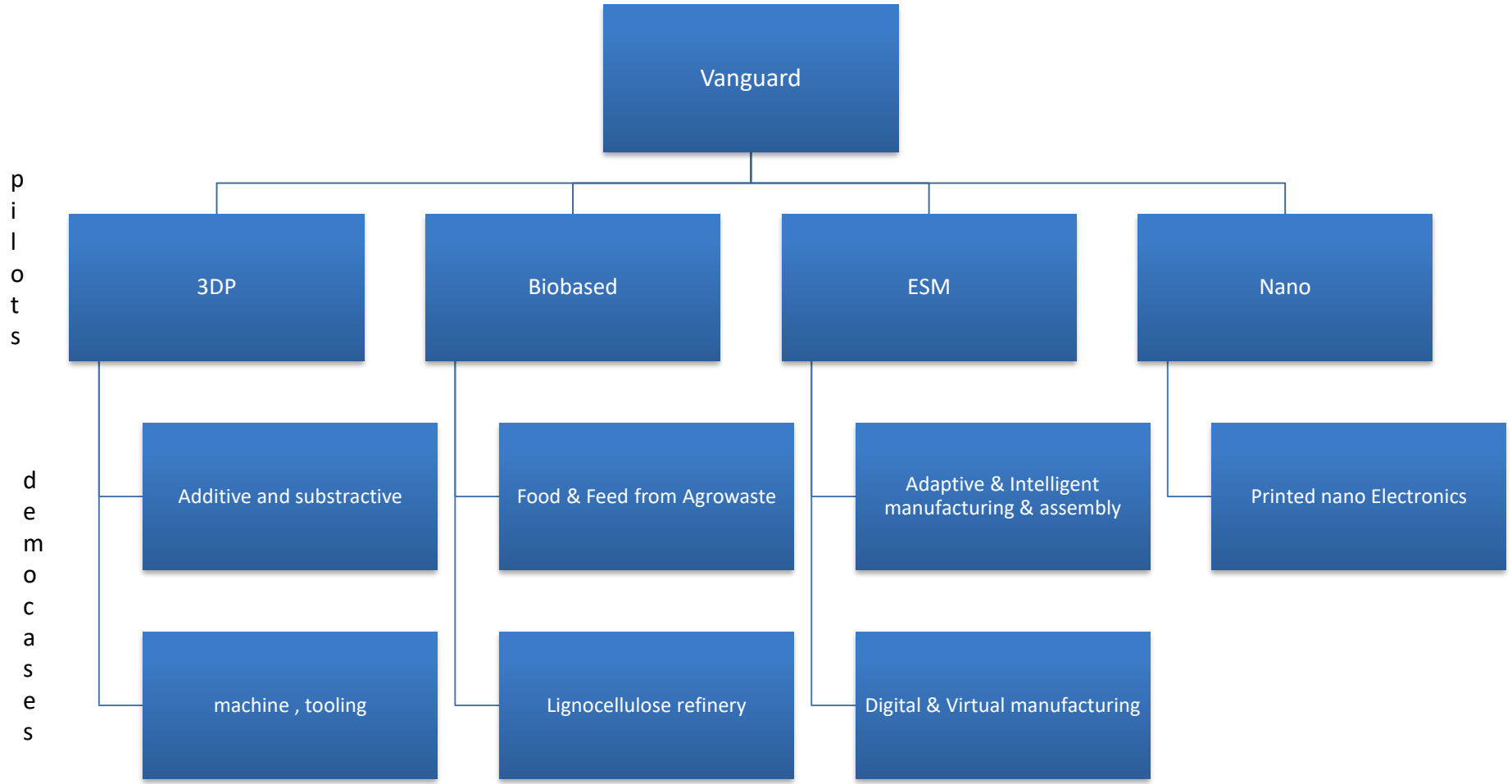
Pilots

- Action Plans

Democases

- Activities

Overview (example)



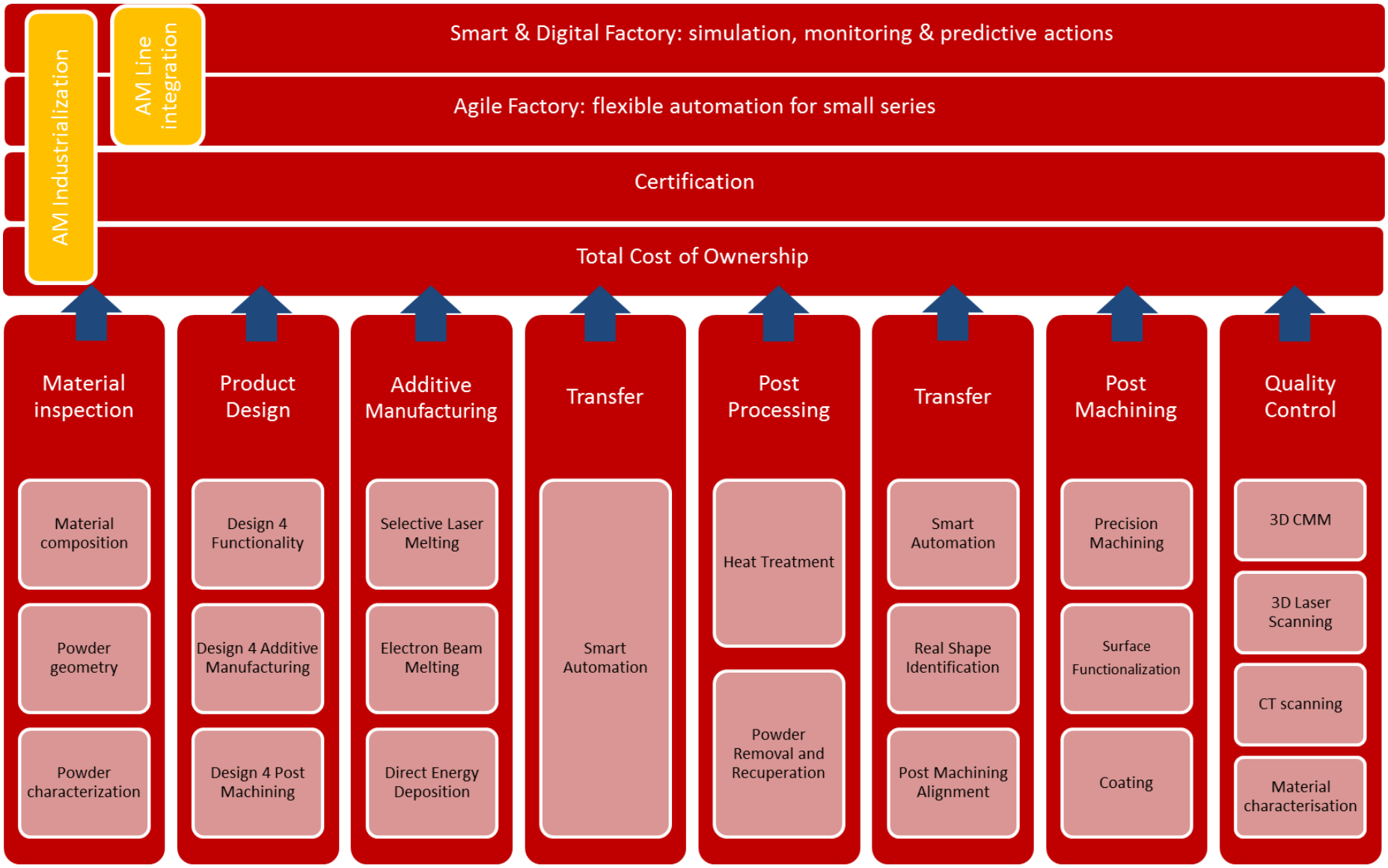
Democase
Additive / substractive high precision & High finishing production

Objective:

The ultimate goal is to realise a (digitally) **networked production platform** able to **produce in a cost effective way** one piece or small product series with an extreme high precision, finish and added value, **combining additive and subtractive technologies** for non-market specific applications.

Partners: Flanders, Wallonia, South-Netherlands, Baden –Württemberg, Norte, Saxony, Lombardy, Emillia Romagna, Trentino

Scope



Role of the democase

Key questions the case should answer(input from industrial companies):

- How to integrate AM in my production environment?
- How will AM interact with other equipment/processes in my manufacturing company?
- How can AM add-substr help reduce the number of components cq. process steps?
- A lot more value could be created when assembly is taken into scope…
- How to certify the integration of the different blocks?
- How to streamline & co-ordinate further research on the different blocks?
- How to efficiently organize a stable hub infrastructure (incl. a network of infrastructures @ companies) that enables
  - testing new technologies (piloting AND first production series)
  - a thorough understanding of what can be produced in mass
- How to set up infrastructures that are useable and replicable for many applications & by many companies?

Possible outcome

Goals:

- Improved product quality by 20%.
- Improve ‘right first time’ capability by 50%.
- Increased robustness of AM-based processes (%)
- Increased resource efficiency (%)
- Increased energy efficiency (%)
- Increased productivity (%)
- High value added component manufacture through multiple net shaping techniques.
- Hybrid machines that include AM processing and multiple quality systems.
- reduce the number of build failures that are currently commonplace.

Possible outcome

Projects will address:

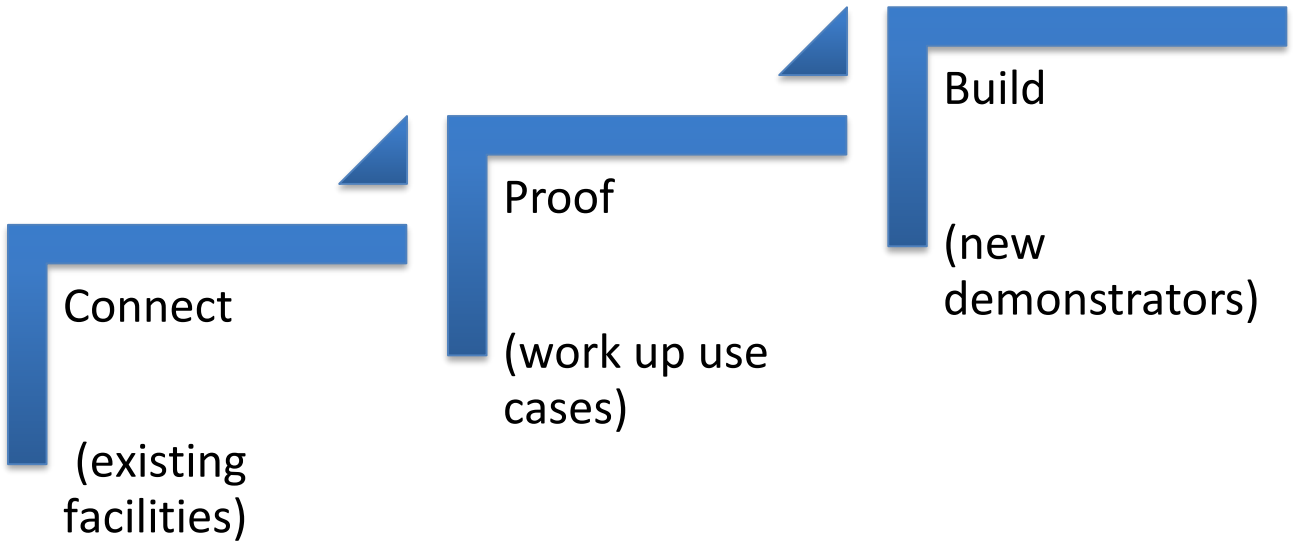
- The quality aspects surrounding AM covering capability, stability and 'right first time manufacturing'.
- Enrichment of existing commercial CAD-CAM Platforms with new plug-ins and add-ons supporting the integration of AM processes and equipment.
- Multi-scale simulation, multi-physics simulation of the AM process, dynamic simulation of the whole AM system to aid optimal manufacturing performance from early design phase and avoiding costly trial and error runs.
- The prediction and minimisation of distortion, facilitating accurate

Key issues to solve:

- Level of quality regarding material, geometry and surface finish where significant challenges still remain.
- Predictable and unpredictable defects to compromise material properties
- Geometrical prediction following post processing steps.

PROJECT PLAN DEMOCASE

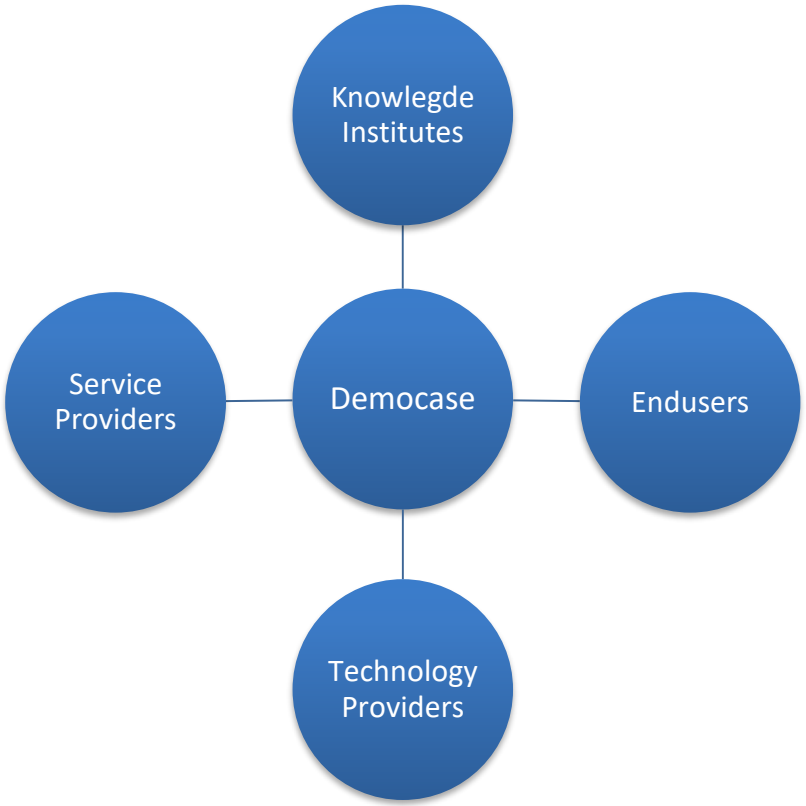
3-phase model



Consortium

Following partners should definitely be included into the project :

- Material (powder, …) suppliers
- Machine builders/suppliers
- Technology providers
- Service providers
- Customers
- Software & simulation providers
- Quality control providers



Results & Perspectives

✧ **Results YtD**

1. Between 25 and 30 Demo Cases identified in five technology fields (pilots)
2. VI Matchmaking event - More than 200 industrial companies from 32 EU regions attended
3. Each business case =
    1. Combination of complementary demonstration facilities / activities / services from various regions
    2. Company (group of companies) accessing / using infrastructure at pre-commercial level (TRL6-8)
    3. Upscaled production [if #2 is succesfull]
4. Three types of business cases:
    1. “Connect smartly and access existing demonstration infrastructures”
    2. “Building brand new demonstration infrastructure”
    3. “Connect existing infrastructure and invest in additional equipment” (hybrid format)

Results & Perspectives

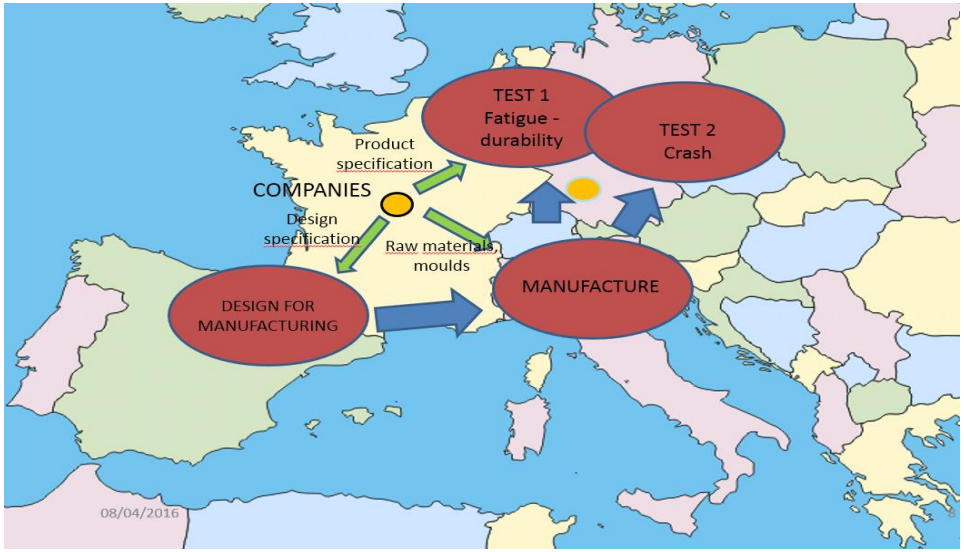
- **What's in it for my company ?**

  - Network: new partners & potential lead-users, within & outside the own value chain
  - Critical mass (joint-upscaling), lowering risks & uncertainty ...
  - Common solutions (IPR, Certification, new funding instruments)
  - Support for access to funding, i.e. :
    - H2020 funding (2-3 calls/y) (e.g. Innosup)
    - EIB/EIF funding
    - Combined regional funding, including structural funds
    - Private co-investment

Next steps

- Connect companies and collect use cases.
- Connect exisiting facilities/fieldlabs to the democases and (if possible) develop new democases.
- Work up use cases and allocate them to the demonstration facilities
- Support search for funding

Example democase



Next steps

Ultimately:

The “Additive Subtractive high precision & high finish production” platform will also be used to perform financial and technical capability studies on specific industrial components.

These study results will provide a clear picture for production companies on :

- New additive design opportunities
- Possibilities and needs to get to the required end product spec’s (post machining operations)
- Realistic production times and related costs
- Practical translation of pilot line idea to own product portfolio

VANGUARD INITIATIVE

Questions?