

Strategy for Smart Specialisation in Flanders: First draft document

Introduction

Smart specialisation aims to **focus government support** for innovation on **regional priorities** to achieve an efficient match with regional strengths resulting in a better translation of research results to valorisation and implementation.

The smart specialisation evolution in Flanders is driven from two angles.

At the policy level in Flanders, it is recognized that clusters play an important role in a globalised world to support competitiveness. Active collaboration between companies and with other actors such as knowledge centres is essential to establish such clusters. Hereby, appropriate choices that build on regional strengths make it possible to make a difference at the international level for a small region.

At the European level, the European regional policy (ERDF) has stimulated the regions of Europe to adopt smart specialisation to achieve more efficient use of the Interreg and ERDF funds. For the programme period 2014-2020 the concept of smart specialisation was put forward to the regions by European Commission (DG Region) and became a prerequisite for the approval for operational programmes. The situation at the European level has accelerated the implementation of an operational programme, embedded in an evolution that was already ongoing in Flanders.

Evolution

The Flemish innovation landscape is characterized by a **bottom up approach** rather than a top down approach with thematically defined programmes. In this bottom up environment, the adoption of a smart specialisation strategy is based on a long tradition in which steps were taken to focus government support to acquire critical mass.

In the eighties and nineties Flanders has been pioneering a third industrial revolution in Flanders with a focus on emerging technologies such as biotechnology, micro-electronics, new materials, sustainable environmental research. The focus was largely knowledge-based with a push approach to acquire a strong foothold in new emerging technologies. As a consequence, the eighties and nineties were characterized by the foundation of a number of strategic research centres and the launch of thematically defined impulse programmes.

Later, in **2006**, the **VRWI** (Flemish Science and Innovation Council) conducted a SWOT analysis of the scientific and technological potential of Flanders in comparison with the EU (assessing the scientific, technological, innovative and economic characteristics of the Flemish region), combined with a European foresight study of 15 key areas. By means of a wide expert consultation, **six thematic clusters** were identified that would be prioritised for further STI support by “spearhead initiatives”.

These clusters were:

- logis-tech (transport, logistics, services and supply management);
- i-health-tech (ICT and services in health);
- medi-tech (Healthcare, food, prevention and treatment);
- nano-tech (new materials, nanotechnology, manufacturing industry);
- socio-tech (ICT for socio-economic innovation);
- eco-tech (energy and environment for services and industry).

During **2012-2013**, the **VRWI** conducted a foresight study with a time horizon up to 2025. This study -building on its 2006 foresight study- aimed at establishing scientific, technological and innovation priorities to help address grand societal challenges, such as energy, mobility, ageing population, health, environment and climate change.

An inventory was made of both (1) national and international societal trends and (2) trends regarding Science, Technology and Innovation (STI). Subsequently, a matching exercise was performed based on a foresight workshop to link (1) and (2), resulting in a model with different areas of transition.

Running parallel with this, a strengths/weaknesses analysis of the current situation in Flanders was performed regarding scientific research, technological development, innovation, economic activity and societal developments.

Based on the results of the transition areas and the strengths/weakness analysis, a steering committee including Captains of Industry and Captains of Society set **seven priority transition areas** for Flanders.

Consequently, this resulted in a transition model consisting of:

- **one horizontal transition area:** Society 2.0;
- **six vertical transition areas:**
 - o (a) E-Society,
 - o (b) Food,
 - o (c) Health - Well-being,
 - o (d) Smart Resources Management & Manufacturing Industries,
 - o (e) Urban Planning, Mobility Dynamics & Logistics,
 - o (f) New Energy Demand and Delivery.

The evolution towards a smart specialisation approach in Flanders was also catalysed by the participation in the **OECD project** on the 'design of smart specialisation strategies' in the period 2011-2012. Flemish case studies illustrated mismatches between traditional economic strengths and the science basis for the industrial transition in Flanders.

Smart specialisation has been adopted by the Flemish Government as a guiding strategic policy principle for innovation and industrial policies in the **Concept Note 'Smart Specialisation Strategy for a Targeted Cluster Policy'** (8 March 2013).

At the **European level, in 2012**, following the Communication '*Regional Policy contributing to smart growth in Europe 2020*', the EC set up its **S3 Platform** to assist EU countries and regions to develop, implement and review their Research and Innovation Strategies for Smart Specialisation (**RIS3**).

The EC's **Joint Research Centre** maps the profiles forwarded by various authorities in Europe.

In total, the Flanders' profile consists of seventeen priorities that are part of a smaller group of specialisation domains. These focus on various target markets (e.g. "Manufacturing & industry"; "Computer, electronic & optical products"), correspond with different capabilities (e.g. "manufacturing and industry; "Energy production & distribution"), and are in line with the major EU priorities such as the KETs, Digital Agenda etc. The complete overview of all priorities and corresponding targets and capabilities for Flanders is available online at the S3 platform <http://s3platform.jrc.ec.europa.eu/regions/be2>.

In 2013, the European Commission conferred the EU member-states to include in their Operational Plans 2014-2020 for the **European Structural and Investment Funds (ESIF)** a few specialisation domains, to become focus of a "**Smart Specialisation Strategy**" or **S3**. These domains would be the focus of initiatives and budgetary allocations for the European Regional Development Fund (ERDF).

This vision on smart specialisation in Flanders was then translated into an operational approach in the **ERDF programme 2014-2020 with 8 cluster domains** that remains embedded in the basic philosophy that collaboration and joining forces are essential and that smart specialisation can best be achieved by a cluster approach. An overview of the activities in Flanders in the past period is given in the enclosed operational document '*Smart specialisation in Flanders: overview of initiatives in 8 priority domains*'

Strategic Research Centres

As mentioned above one of the first steps in focussing government support to acquire critical mass was the foundation of strategic research centres. This started in the eighties with the foundation of IMEC, but was continued in the following years with the most recent one, Flanders' Make, in 2014. Such institutes receive a dotation from the government and participate in different programmes for support to research institutes on a competitive basis. They are all involved in tech transfer and have an active interaction with industry. All strategic research centres are involved in triple helix collaborations.

- **IMEC (1984)**, a fusion between the former IMEC (1984) with a focus on nano-electronics and iMinds (2004) with a focus on broadband technology. IMEC is a large research institute, its staff counts more than 3,500 people including industrial residents and guest researchers. Imec has a strong track record for conducting research with major international companies through which it has established a high level of self-sustained financing. Its turnover is approximately 500 million euro (2016) with 73% contributed by industry.
- **VITO (1991)**, a research centre with 784 people mainly focuses its research and development activities on sustainable development and cleantech. Companies can turn to VITO for expertise, test facilities, joint ventures, joint project proposals, and more. The knowledge of VITO is valorised through contract research, venturing, and internationalisation. VITO offers new and sustainable technologies and processes that are demonstrated on the institute's own test facilities, through living labs or in external set ups

from clients. VITO has a focus on grand societal challenges such as climate change, food security, scarcity of raw materials, sustainable energy, aging, etc...

- **VIB (1995)** (Flemish institute in Biotechnology) is a virtual centre combining 75 research groups embedded within 5 main universities. VIB conducts front-line research in life sciences and translates the results into societal and economic value, with a particular strong valorisation record through the creation spin off biotech companies. The main topics are on oncology, brain and disease research, inflammation, neuro-genetics, microbiology, plant systems biology, structural biology and medical biotechnology.
- **Flanders' Make (2014)** was established through the cooperation of different existing organisations like Agoria, Sirris, Flanders' DRIVE, Flanders Mechatronics Technology Centre and the five Flemish universities with the mission to strengthen the long-term international competitiveness of the Flemish manufacturing industry by performing excellent, industry-driven, pre-competitive research in the domains of mechatronics, product development methods and advanced manufacturing technologies'. Flanders' make acts partially as a virtual research centres but, in contrast to VIB, has a focus on joint R&D projects with equal partnership between knowledge institutes and existing enterprises.

In 2018 the four strategic research centres receive from the Department of Economy, Science and Innovation the following **grants** (million €):

imec	110,2
vib	60,5
vito	48,9
Flanders Make	18,7

Demand driven cluster policy

In addition to the foundation of the strategic research centres, several initiatives were taken to foster the collaboration between industry and non-economic actors, with continued support to clustered activities in several forms. Based on these experiences, the Flemish Government adopted smart specialisation as a guiding strategic policy principle for innovation and industrial policies in **2013** (Concept Note 'Smart Specialisation Strategy for a Targeted Cluster Policy').

This policy principle was translated in the **2014-2019 new governing agreement** into a dedicated cluster policy in **2015** with an operational implementation in the following year in which several cluster organisations were selected and funded.

This cluster policy is based on **entrepreneurial discovery** as a driving principle to accelerate the transformation of the industrial networks and to strengthen the knowledge based character of the economy.

Clusters are characterized by an active involvement of enterprises and a sustainable collaboration, both mutually between enterprises as between enterprises and knowledge institutes. The clusters create an environment to foster the process from discovery to market introduction. By making the link between knowledge creation and valorisation of the results, the clusters contribute to reduce the innovation paradox.

Two types of clusters are introduced: small-scaled initiatives called “**innovative business networks**” (**IBN**) and large-scaled initiatives for “**spearhead clusters**”.

The **innovative business networks (IBN)** are being shaped on a smaller scale, are bottom-up initiatives, have a future potential and come from emerging markets or the bundling of various small initiatives. During a 3-year period, a 50% public support (max. 150.000 €/year) part will be available.

As a result of a call **14 IBN's** were approved:

- Euka vzw (topic: drones)
- Innovatieve Coatings (coatings)
- Flanders' Bike Valley vzw (bicycle industry)
- Platform Power to Gas (hydrogen)
- Offshore Energy
- Flemish Aerospace Group (aerospace)
- Digitising Manufacturing (Industry 4.0, manufacturing, digitalisation)
- IBN Composieten (composites)
- Groen Licht Vlaanderen (lightening, digitalisation)
- BIM (Bouw Informatie Modellen) (construction teams, digitalisation)
- Off-Site Construction – bouwindustrialisatie (building)
- Air Cargo Cluster (air freight)
- Smart Digital Farming (agriculture, ICT)
- Eggsplore (financial technology, internet of things).

The introduction of the new cluster programme consequently lead to a phasing-out of the support for Lichte Structuren (Innovation Platforms) and the various VIS-initiatives.

Spearhead clusters must be focused on the long term (10 year), large-scaled, limited in number, strictly selected, require a triple helix model, and in future make a difference from economic point of view. A choice was made for clusters and sectors that match with the regional strengths of the Flemish industry and knowledge base to make a difference at the international level. Spearhead clusters act in triple helix collaboration, develop strategic roadmaps, have a central role in the innovation ecosystem and provide a leverage to international collaboration. All spearhead clusters will therefore develop an international orientation. In the selection process, the domains defined in the ERDF programme 2014-2020 were used as an indicative groups of domains.

Spearhead clusters

As a direct result of the recent calls for proposals, **six spearhead clusters** have been selected. Spearhead clusters have a budget for organisational working costs which are funded half by the government (max. 500.000 €/year) and half by the enterprises. In addition, they act as a coordinator for their members that have access to all programmes available for support for R&D&I in Flanders on a competitive basis. Depending on the nature of the members, this can include state aid or aid for non-economic activities. Activities range from basic research to dissemination and implementation. The clusters stimulate and assist their members to participate in international programmes for R&D&I.

Following clusters were selected:

- **Catalisti** in the domain of sustainable chemistry. The cluster has four main innovation programmes: “Renewable Chemicals”, “Sidestream Valorisation”, “Process Intensification and Optimisation” and “Advanced Sustainable Products”.
- **Flanders’ Food** in the domain of agro-food. The cluster has two knowledge-driven strategic objectives (lead in knowledge and lead to knowledge) and two business-driven strategic objectives (accelerate efficient & effective innovation and cross/create value chains). The knowledge-driven strategic goals will focus on (1) World Class Food Production, (2) Resilient & Sustainable Agrifood Systems and (3) Personalized Food Products & Healthy Diets.
- **SIM** in the domain of advanced materials. SIM aims to further strengthen the favourable position of the Flanders Materials related eco-system, with strengths such as materials for 3D printing, nanoparticle production, handling and encapsulation.
- **Flanders Logistics cluster (VIL)** in the domain of specialise logistics. Its programming is centred around four main themes: (1) digitization with three sub-themes: smart technology, business models and data management, (2) sustainability themes like CO₂ reduction and energy efficiency objectives for logistics in smart cities, circular and sharing economy, infrastructure (3) ambition 'Flanders gateways', i.e. Flanders as a global connected trading partner and (4) omni-channel distribution systems for various application.
- **Flux50** in the domain of energy (smart grids). 5 innovator zones have been selected: energy harbours, micro grids, multi-energy solutions for districts, energy cloud platforms, intelligent renovation
- **Blue cluster** with an emphasis on sustainable economic activities related to the North Sea and beyond. The cluster is active in (1) coastal protection and mineral resources, (2) renewable energy and fresh water production, (3) maritime connectivity, (4) sustainable food production and marine biotechnology, (5) blue tourism and (6) ocean pollution.

In 2017 more than **45 million €** from VLAIO (Hermes fund) is allocated to projects with spearhead clusters in 90 projects. More than **2000 companies** in Flanders payed a membership contribution to a spearhead cluster (1196) or an innovative business network (825).

Priority domains

The evolution in Flanders with the strategic research centres and the cluster policy has resulted in a landscape characterised by a combination **of bottom up programmes** complemented **with 10 focal points (4 strategic research centres and 6 spearhead clusters)** in which triple helix collaborations are stimulated.

For each of the focal points the government of Flanders has taken a decision to grant support to a strategic research centre or a spearhead clusters thereby marking the area as a priority for Flanders. **This choice equals a specialisation strategy with 10 priority domains.**

The spearhead clusters or strategic research centres are a point of reference to mark a larger domain in which other organisations can also be active.

The 10 domains are priority domains in a smart specialisation strategy. These domains are:

1. Sustainable chemistry (Catalisti)
2. Advanced materials (SIM)
3. Smart manufacturing (Flanders Make)
4. Health and life sciences (vib)
5. Specialised logistics (VIL)
6. Agro-Food (Flanders Food)
7. Electronic systems, lot and photonic systems (imec)
8. Energy (Flux 50)
9. Environment & cleantech (Vito)
10. Blue economy (Blue Cluster)

Features of smart specialisation in Flanders

The approach with a focus on strategic research centres and spearhead clusters provides a **gradually grown specialisation strategy** driven by triple helix collaboration. The focus is **not to select** a number of topics in which support of research will be concentrated, but to create an environment to foster the evolution from discovery to market introduction through collaboration.

A strong institutional basis is required to make this possible, hence the investment in strategic research institutes and clusters. This requires to make choices, which were based on a match of technological capacity and economic activities within the regional strengths rather than on top down imposed thematically defined topics.

In this system, entrepreneurial discovery remains the central hallmark, but is organized around a number of focal points in which forces are joined to achieve a **critical mass** that allows to make a difference.

The focus on domains in which strategic research centres and spearhead clusters have been defined implies a **dynamic structure**. When new spearhead clusters are selected based on the regional strengths of the Flemish industry and knowledge basis, new priority domains will be added in the smart specialisation strategy. Likewise, the priority domains can be reduced accordingly.

Relation with bottom up support

In the present smart specialisation, the focal points operate in an innovation system that is mainly based on bottom up programmes. This allows to combine the **best of two worlds**. The focal points and the **dedicated financing** provide the possibility to create critical mass by joining forces, but the **bottom approach** allows several initiatives in unexpected topics, R&D project from companies of a particular strategic nature which makes them unsuited for open innovation and emerging new topics that are not included in the strategy. It is important to avoid that specialisation would result in a rigid discipline-based compartmentalisation of funds and research activities. **Cross links** do exist and are important since it is well recognized that innovation often happens at the edges and cross sections of disciplines. The Flemish system of smart specialisation aims to provide an intensification

and strengthening around a number of centres and clusters within an **open and flexible system** that allows, and even encourages, cross-links and remains open for bottom up initiatives that complement the focused approach.

For example, from the domain on smart electronic systems several initiatives are taken in the health sector, in collaboration with organisations from the life science domain. It is of no importance in which domain such activities are categorized, it is important that they happen, and that the intensification of focal points has created sufficient critical mass in both focal points to contribute to such developments.

Several interactions exist between the bottom up approach and the targeted intensification. The centres within priority domains receive **support from the government**, but still largely rely on **project-based income** through participation in several programmes. The surrounding environment makes it possible to create collaborative projects with excellent knowledge creation and translation of the knowledge to economic valorisation. This gives the project a strong starting point in most innovation-based programmes. In some instances, allocated budgets are provided to foster and accelerate project working, but the members of the centres also have access to several bottom up programmes, in particular those concerning direct state aid to companies. As such a large proportion of the bottom up budget will contribute to the intensification in priority topics, but based on competence and performance of the players, not on top down allocations.

Consistency with the ERDF listing

As mentioned in the introduction, **a smart specialisation strategy is mandatory in ERDF** and 8 priority domains have been defined in the ERDF operational programme 2014-2010. When the 10 present priority domains are considered, a clear consistency is evident with the domains defined in the ERDF programme 2014-2020. In many cases there is a direct match. Two domains that were broadly defined in 2014, were further split up in two domains each. In addition, a 10th domain with a focus on blue economy was added, related to the regional strength in Flanders in economic activities related to the North Sea.

An overview is given in the table below:

Present Smart Specialisation Priority Domains	ERDF programme 2014-2020
1. Sustainable chemistry	1. Sustainable chemistry
2. Advanced materials	2. Manufacturing industry and materials
3. Smart manufacturing	
4. Health and life sciences	3. Healthcare
5. Specialised logistics	4. Specialised logistics
6. Agro-Food	5. Agro-Food
7. Electronic systems, lot and photonic systems	6. Electronic and photonic systems
8. Energy	7. Energy, environment and construction
9. Environment & cleantech	
10. Blue economy	8. Creative industries

In addition to the increase with 3 domains, the list in the ERDF programme did contain a domain on **creative industries and services** which is not included in the present strategy. In this domain, many initiatives are active, but no formal decision has been taken by the Flemish government for the launch of a spearhead cluster or a strategic research centre. Therefore, at present, it does not have the same formally approved status as a priority domain.

The present policy note is based on 10 domains for which a decision has been taken. However, the Flemish government is advised to continue the attention to the field of creative industries and services with the possibility to consider a new domain in the future, within the quality standards and criteria used for the selection of the present spearhead clusters.

Impact of smart specialisation strategy and future actions

The main impact of the smart specialisation strategy is, of course, the existence of institutes and clusters that can foster the evolution **from discovery to market introduction** through **triple helix** collaboration with a focus on valorisation.

These organisations receive a dedicated budget, but, as mentioned above, there is no need to organise the existing R&D&I funding in general along such priorities. On the contrary, the Flemish system of smart specialisation provides an intensification and strengthening around a number of centres and clusters in an innovation ecosystem **that aims to remain an open and flexible system** and will continue to contain important bottom up aspects.

However, if smart specialisation remains restricted to a **dedicated budget** in priority domains for the action of clusters and strategic institutes with **project support** for R&D&I activities similar to the activities in the bottom up programmes without any further action, **the impact will be limited**.

For the future following activities are favoured:

1. Attention to strategic aspects in the funding given to the initiatives in the priority domains.
2. Alignment of internationalisation initiatives in the Flemish innovation landscape with smart specialisation priorities.
3. Continued participation in initiatives that stimulate collaboration between regions in different member states within a smart specialisation approach.
4. Policy mix to facilitate the support of demonstration activities, pilot plant etc...

1. *Strategic accents in funding*

A driving principle of the clusters is the aim to accelerate the transformation of the industrial network and to strengthen the knowledge based character of the economy. For the future emphasis should be put on the contribution of the spearhead clusters, strategic research centres and other initiatives within the priority domains in such goals. Within an approach based on smart specialisation, **more emphasis** should be given to:

- dissemination of generic technologies in several economic segments to modernize the industry,
- diversification through traditional knowhow applied in new sectors
- transition
- emphasis on breakthrough innovations

2. *Alignment with international collaboration*

The centres within the priority domains provide a leverage to international collaboration but operate in a landscape in which several initiatives exist with different priorities and accents.

A major approach for international collaboration is the **integration of the Flemish funding programmes in different international networks** such as Eureka clusters, JTIs, Art 185 and ERA-Net initiatives. Choosing the networks in which to participate remains a difficult exercise with many different angles. The portfolio of networks in which Flanders participates could be inspired and based on the priorities of the Flemish innovation policy based on the smart specialisation strategy and strengths of the R&I system. This will support internationalisation by the organisations within the priority domain, but will also add to an overall smart specialisation strategy.

ESIF- European Structural Investment Funds remain important financing schemes.

ERDF regional funds help to provide the necessary hardware and infrastructure to be able to adopt a long term smart specialisation logic.

Interreg funding supports the integration and sharing of networks and infrastructures across EU regions as well as an accelerated diffusion of knowledge and models between different EU initiatives. Interreg also offers the space to experiment and test new and unexpected cross-overs between domains.

Finally, also **ESF funds** can help to support the development of the necessary human capital and workforce in a context of smart specialisation.

ESIF funds and especially ERDF have played a central role in the elaboration of the smart specialisation. Therefore, there is certainly a match with the priority domains. In the future, attention should be given in further alignment of the selection of proposals with the existing priority domain in both ERDF and Interreg.

Participation in **H2020 programme** is an important way for international collaboration. Obviously the accents are not identical, but for the Flemish priorities several opportunities exist within the societal challenges and industrial leadership priorities of H2020. This offers an opportunity for international collaboration for which they can rely on support from the Flemish government through the NCP team to access the H2020 programmes. Clearly, all activities in Flanders that fit in de European activities can count on the NCP services. But the centres in the priority domains can provide an important leverage by establishing a collaboration and information flow with the NCP services to facilitate access to international collaboration.

The relation between the Flemish domains, priorities and H2020 societal challenges and priorities in industrial leadership are show below:

Flanders Domains	H2020 Societal challenges	H2020 Industrial leadership
Sustainable chemistry	Climate	
Advanced materials		NMBP
Smart manufacturing		NMBP
Health and life sciences	Health	NMBP
Specialised logistics	Transport	
Agro-Food	Agro-Food	

Electronic systems, lot and photonic systems		ICT
Energy	Energy	
Environment & cleantech	Climate	
Blue Economy		

In the support granted to spearhead clusters, a **cluster pact** is made between the clusters and the government in which the contribution in internationalisation is included. As such the activities above will result in an alignment of smart specialisation, international policy and cluster policy.

It is also important **to look at the successor of Horizon 2020**, the 9th framework programme. In the most recent document (i.e. Decision, final Partial General Agreement 3 April 2019, COREPER) we can find the following **'integrated clusters of activities'** in the **new pillar II** 'Global Challenges and European Industrial Competitiveness' with corresponding **'areas of intervention'**:

Six 'integrated clusters of activities' and corresponding 'areas of intervention'					
Health	Culture, Creativity and Inclusive Society	Civil Security for Society	Digital, Industry and Space	Climate, Energy and Mobility	Food, Bioeconomy, Natural Resources, Agriculture and Environment
Health throughout the life course	Democracy and Governance	Disaster-resilient societies	Manufacturing technologies	Climate science and solutions	Environmental observation
Environmental and social health determinants	Cultural heritage	Protection and security	Key digital technologies	Energy supply	Biodiversity and natural resources
Non-communicable and rare diseases	Social and economic transformations	Cybersecurity	Emerging enabling technologies	Energy systems and grids	Agriculture, forestry and rural areas
Infectious diseases, including poverty-related and neglected diseases			Advanced materials	Buildings and industrial facilities in energy transition	Sea, Oceans and inland waters
Tools, technologies and digital solutions for health and care, including			Artificial intelligence and robotics	Communities and cities	Food systems

personalized medicine					
Health care systems	Cybersecurity		Next generation internet	Industrial competitiveness in transport	Bio-based innovation systems in the EU bioeconomy
			Advanced computing and big data	Clean, safe and accessible transport and mobility	Circular systems
			Circular industries	Smart mobility	
			Low-carbon and clean industries	Energy storage	
			Space, including earth observation		

3. Participation in initiatives that stimulate interregional collaboration in smart specialisation

Besides the implementation of a smart specialisation at the regional level, Flanders has also contributed to the concept of smart specialisation by initiating the vanguard Initiative '**New Growth through Smart Specialisation**' in November 2013, that has grown to include 30 regions from 13 EU member states.

This political initiative aims to strengthen the role of the regions in the European innovation and industrial policy through a commitment of the regions to use a smart specialisation strategy to stimulate growth through bottom-up entrepreneur-driven innovative and industrial innovation in priority domains.

In the future, participation in such initiatives should be continued and strengthened to further explore the potential of smart specialisation from a policy preparation point of view.

Within the Vanguard Initiative, Flanders will contribute to the improvement of efficiency and innovation performance at EU level by linking up demonstration facilities across the EU. First, the Vanguard Initiative identifies missing links, competences or resources within 'value chains' of demonstration activities. Next, it mobilizes companies, research organisations and public authorities to exploit these synergies and to pool financial resources for interregional investments in demonstration infrastructure.

In the European Commission communication '*Strengthening innovation in Europe's regions: strategies for resilient, inclusive and sustainable growth*' (COM(2017)376final), the Commission sets up **thematic platforms on industrial modernisation, energy and agri-food** to help regions to work

together on their smart specialisation priorities. From December 2017 Flanders is lead partner in 3D-printing and bio-economy and participates in de- and re-manufacturing for circular economy, high tech farming and marine renewable energy.

4. *Adjustment to the instruments to achieve an optimal policy mix*

Test and demonstration activities (Technological Readiness Level 6 – 8) are crucial to the innovation process. Demonstration activities allow technical research and basic prototypes to be translated into operational and verified applications. In order to perform these activities, companies need access to pilot/demonstration infrastructures, certification/validation systems, and qualified labour.

Demonstration activities are an essential part of smart specialisation strategies because they accelerate innovation and market uptake. They also indirectly contribute to smart specialisation via their positive effect on cluster development. By developing *open* demonstration activities in a cluster network, a number of positive effects occur:

- improving marketing of clusters towards international stakeholders and companies;
- gaining new projects, clients and a sustainable revenue stream for the cluster organisation;
- strengthening innovation and value chains within and across cluster domains;
- fostering collaboration and synergies within the cluster ecosystem.

At present, no structural funding schemes exists for demonstration activities in Flanders. The Flemish Government is in the process of revising R&D&I subsidies to companies. In this revision, **support in the later stages of innovation will be facilitated** in the existing schemes for R&D&I subsidies to companies. This includes upscaling, demonstration activities, pilot facilities etc... Although this is certainly a major step forward, for optimal effectiveness an approach is required that encompasses a wider range of actions and activities.

The possibility to support pilot facilities and demonstration activities is important for the implementation of smart specialisation at the regional level in which such activities and facilities have a major role, but also to for the effectiveness of interregional collaboration stimulated within the Vanguard initiative. As mentioned above, this initiative contributes to the improvement of efficiency and innovation performance at EU level by linking up demonstration facilities across the EU. As a founding member, Flanders remains committed to contribute financially to the development of cross-regional demonstration activities for the benefit of Flemish companies. Therefore, attention, will be given to establish **an appropriate mix of financing solutions** including European, regional and private means and different instruments to realize cross-border, industry-driven demonstration activities in a structural way.

Industry 4.0, transitions and missions

In addition to the innovation smart specialisation landscape with 10 focal points based on triple helix collaboration, the Flemish government has defined **7 transition priorities** in '**Vision 2050: a long term strategy for Flanders**', to stimulate and accelerate several societal and economic evolutions.

These priorities have a focus on transition and run horizontally through the smart specialisation domains. These priorities go beyond innovation and aim to make the foundations for tomorrow's society.

They include **circular economy, smart living, lifelong learning, care and well-being, energy, mobility and industry 4.0**. These transformations will affect many aspect of society and run horizontally through the focal points defined in the smarty specialisation.

Of particular interest is **industry 4.0**, which concerns the adaptation of the existing industry to the new technologies, in particular digitization. Big data processing capacity and strong connectivity, also with the client, create revolutionary changes on the working flour and in the entire value chain. Industry 4.0 has several obvious links with the innovation strategy and will be prominently interconnected with the domains electronic systems and smart manufacturing but will also be part of many other domains, mainly through supporting products and services provided by the digital business industry in different applications.

Within the larger priority domains and the cross sections with transitions, missions can be launched by the Flemish government for additional attention to specific subjects. As an example, specific attention was recently given to artificial intelligence, cybersecurity, autonomous driving, personalised medicine and augmented reality. Such missions are part of an overall smart specialisation strategy.

Conclusion

A smart specialisation strategy is proposed based on the selection of strategic research centres and spearhead clusters. The essence is to provide an environment to foster the process from to discovery to market introduction.

The domains in which the spearhead clusters and strategic research centres have been selected are considered **priority domains** in a smart specialisation strategy. Hereby, the spearhead clusters or strategic research centres are a point of reference to mark a larger domain in which other organisations can also be active.

In this system, entrepreneurial discovery remains the central hallmark, but is organized around a number of focal points that build on the regional strengths to create a **critical mass** that makes it possible to make a difference at the international level for a small region.

The specialisation strategy is not based on a set of stringent thematic top down programmes but on a landscape characterised by a combination of **bottom up programmes** complemented with a number of **focal points** in which triple helix collaborations are stimulated with a particular focus on valorisation.

At present, 10 priority domains have been identified, but the portfolio should be reviewed on a regular basis with the possibility to increase or decrease the number of domains in accordance with the selection of strategic research centres and spearhead clusters by the Flemish government based on the regional strengths of the Flemish industry and knowledge basis.

In addition to the priority domains, attention will be given to transition priorities that run horizontally through the different domains. Furthermore, within the broader priorities, missions will be launched by the Flemish government for additional attention to specific subjects.

The priority domains are very similar to the domains in the ERDF programme 2014-2020 and will be used as a smart specialisation strategy within ERDF.

In the future **emphasis should be given to:**

1. Attention to strategic aspects in the funding given to the priority domains.
2. Alignment of internationalisation initiatives in the Flemish innovation landscape with smart specialisation priorities.
3. Participation in initiatives that stimulate collaboration between regions in different member states within a smart specialisation approach.
4. Policy mix of different instruments to facilitate the support of demonstration activities, pilot plant etc... within the smart specialisation priorities.

Enclosure: Smart specialisation in Flanders: overview of initiatives in 8 priority domains