Flanders:

Strategy for Smart Specialisation 2.0

Introduction

The Flanders R&I policy provides a mix of policy instruments combining top down priority settings with a variety of bottom up support programmes (eg R&D projects, growth subsidies, cooperation programs, etc that are open for different technologies and sectors.)

In the previous programme period 2014-2020, European Regional Policy (ESIF) stimulated the EU regions of Europe to adopt smart specialisation strategies aiming at a more efficient and use of the ERDF and Interreg programs. DG Regio put forward the concept of smart specialisation as an ex ante condition for the approval for operational programmes. As a result, Flanders' smart specialisation strategy has been validated in 2019 and was laid down into a **S3 note**. The S3 has been built upon the existing Flanders R&I policy framework of strategic research centres (SRC's) and spearhead clusters (SPC's).

For the new (ongoing) ERDF programme 2021-2027, main focus for the operational programs was on governance aspects necessary for the implementation and monitoring of this established smart specialization strategy: thematic enabling conditions for smart specialisation were defined.

This note gives, complementary to the enabling conditions, an update of the initial RIS3 strategy (version of 5 April 2019), given changes in Flanders policy context.

Key features of smart specialisation in Flanders

In the S3 methodology, entrepreneurial discovery is a key feature of the process of defining regional strengths: VLAIO, department EWI and Flemish knowledge actors, identified through large bottom up consultation processes (foresight studies realized with large expert stakeholder involvement) the thematic priorities for a Flemish R&I strategy for smart specialization (more details cfr. RIS3 note 05/04/2019).

This strategy for the Flanders ERDF program 2014-2020 coincides with the 6 Flemish spearhead clusters and 4 strategic research centres (since 2019).

This smart specialization strategy is also the backbone for the Flemish innovation landscape and R&I policy in general, as ERDF money represents in Flanders only a small part of the total public R&I budget of roughly 8, 9 billion€ in 2022.

The R&I policy approach in Flanders with a focus on strategic research centres and spearhead clusters provides its **gradually grown specialisation strategy** and stimulates research and innovation valorisation, driven by cooperating in a multiple helix model. The purpose is to create a dynamic innovative and entrepreneurial environment to foster collaboration and strengthen **innovation ecosystems** in the region and across the borders for developing competitive, sustainable and resilient EU value chains based on regions' (or place-based, local) knowledge initiatives: First, a strong institutional basis is required to make this possible. Hence, Flanders government concentrated public resources through providing structural funding to strategic research institutes and clusters: especially cluster organisations have the objective to play an

important role to help valorise excellent research outcomes through cooperation along the value chains in a global world to support its industrial competitiveness and digital, sustainable transition in the regional economy. Active collaboration between companies, all kind of other actors such as knowledge centres is essential.

Overview Update Flanders S3 strategy

The policy framework in which Flanders strategic research centres and spearhead clusters have been defined implies a **dynamic approach**. The Flemish Government is open to bottom-up grown initiatives that could lead to the creation of new SPC's or new priority domains. Since 2022, the Flemish government funds a new 7th spearhead cluster MEDVIA, active in the area of smart health tech.

At the start of the ERDF programme 2021-2027, the ten priority domains are still valid for the Flanders Smart specialisation strategy, as the new SPC MEDVIA is part of the S3 domain Health and life sciences. These areas are seen as investment areas where there is potential in Flanders to build a competitive advantage.

The S3 document for the ERDF programme 2014-2020 contained an additional (crosscutting) domain on **creative industries** which was not officially included in the general Flanders S3 strategy note of 2019. Although many initiatives are active in this domain, no formal decision has been taken insofar by the Flemish government for the launch of an initiative with status of spearhead cluster or a strategic research centre. Therefore, at present, it does not yet have the same formally approved status as an official S3 priority domain.

Present Smart Specialisation Priority Domains ERDF-programme 2021-2027	***ERDF programme 2014-2020 (original 8 priority domains of the strategy of 2014)***
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, Iot and photonic systems	*6. Electronic and photonic systems*
8. Energy	*7. Energy, environment and construction*
9. Environment & cleantech	
10. Blue economy	
	8. Creative industries

Flanders S3 main actors

For each of the Flanders S3 domains, a summary is given of each of the SRC and/or SPC as key knowledge actor funded by the Flemish government and active in the main priority domain.

1. Sustainable chemistry

SPC Catalisti actively contributes to sustainable and competitive chemical and plastic industries and related sectors in Flanders, by working on new emerging transition based value chains, improving innovation capacities, clustering knowledge, and a sustainable economy. Catalisti has four main innovation programmes: "Renewable Chemicals", "Sidestream Valorization", "Process Intensification and Optimization" and "Advanced Sustainable Products".

2. Advanced materials

SPC Strategic Initiative 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. The Flam3D cluster organisation has become part of SIM.

3. Smart manufacturing

SRC Flanders' Make (2014) was established through activity bundling 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 advanced manufacturing industry by performing excellent, industry-driven, pre-competitive research in the domains of mechatronics, product development methods and advanced manufacturing technologies.
Flanders' Make actually operates in a cooperation model virtually integrating research groups and centres. Flanders Make has a focus on joint R&D projects with equal partnership between knowledge institutes and existing enterprises, in contrast to VIB where more focus is given to start up creation.

4. Health and Life Sciences

SRC VIB (1995) (Flemish Biotech institute) operates in a virtual model combining 75 research groups embedded in the 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.
Neuro-electronics Research Flanders (NERF) is a basic research initiative and a collaborative venture between imec, VIB and KU Leuven. It aims to unravel the neuronal circuitry of the human brain through research that combines nano-electronics and neurobiology.

SPC MEDVIA (2022) is an industry driven network set up as a public private partnership with the Flemish government, stimulating innovations in healthcare. MEDVIA facilitates and supports collaborations between companies, knowledge centres, universities, hospitals and other healthcare institutions. All the members of MEDVIA are committed to jointly support innovation for better health at the crossroads of medical biotechnology, medical technology, and digital technology. In July 2021, Flanders.health Tech (Medvia since May 2022) was recognized by the Flemish Government as a new spearhead cluster.

5. Specialised logistics

SPC **Flanders Logistics Cluster** *(the former VIL, Vlaams instituut voor Logistiek)* centers its activities 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) the 'Flanders gateways' ambition, i.e. Flanders as a global connected trading partner and (4) omni-channel distribution systems for various applications

6. Agro food

SPC Flanders' Food (2005) focuses on the economic growth of the Flemish agri-food industry and enables innovation creating a trust zone of open innovation with all stakeholders in the agri-food system ensure that also the next generations can enjoy tasty food for a healthy lifestyle. Flanders Food has two knowledge-driven strategic objectives (lead in knowledge and lead to knowledge) and two business-driven strategic objectives (accelerating efficient & effective innovation and creating 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.

Flanders' FOOD has about 300 company members (+/-70% SMEs) and collaborates with the relevant RTOs and innovation actors in Flanders, it initiates and facilitates collaboration not only between research institutions, government and companies, but also across sectors, across borders and between all actors of the value chain. (supra)

7. Electronic systems, Iot and photonic systems

SRC imec (1984) is the result of a merger between the Leuven based imec (1984) that focuses on nano-electronics, and iMinds (2004) located in Ghent that focuses on digital research.
IMEC now performs research and innovation in both nanoelectronics and digital technologies. Leveraging the combination of leadership in microchip technology with profound software and ICT expertise, imec is mainly active in breakthrough innovations in application domains such as healthcare, smart cities and mobility, logistics and manufacturing, energy and education.

8. Energy

SPC Flux50 (active in energy /smart grids) helps Flanders to gain international recognition as a Smart Energy Region. Flux50 facilitates cross sector collaboration between energy, IT and building companies to enhance the competitiveness of the Flemish smart energy industry in the transition towards low carbon systems. To bring innovative and fully integrated energy products and services to the international market, Flux50 sets up and coordinates living labs in five 'innovator zones': energy harbors, micro-grids, multi-energy solutions for districts, energy cloud platforms, intelligent renovation.

9. Environment & cleantech

SRC VITO (1991) is an independent research centre in the area of cleantech and sustainable development to accelerate the transition to a sustainable world, providing knowledge and technological innovations that facilitate this transition to a more sustainable society. VITO is nowadays globally active in five research areas to accelerate cleantech and sustainable development through cooperation for the development of the innovation ecosystem, research valorisation by means of contract research for companies and public authorities, knowledge transfer to both existing companies and spinoffs and its internationalization. VITO's offices in Mol, Berchem, Genk (EnergyVille part), Ostend, Kortrijk as well as many offices outside Europe are active in sustainable technologies in the field of chemistry, land use, health, energy and materials.

VITO merged with the Kortrijk-based Flanders knowledge centre Vlakwa, active in water solutions and Cleantech Flanders (ICTV) and is the driving force behind the Genk based foundation Energyville, a consortium between VITO, imec, KULeuven and Uhasselt and provides knowledge, innovative processes and business models for an sustainable energy transition, ao in field of battery management systems, etc

10. Blue economy

SPC Blue Cluster is a cluster with an emphasis on sustainable blue economy 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 order to provide optimal support to the members and partners and to achieve sustainable blue growth, Blue Custer focuses on three pillars, namely networking, innovation and strategy.

11. Cultural and Creative industries (without formal S3 status)

Flanders District of Creativity is the single point of contact for entrepreneurs in the creative industries in Flanders. It is a non-profit organization supported by the Flemish Government that recently focussed its mission towards informing and coaching creative designers and fashion sector to build or grow their businesses.

Other S3 actors

Of course, besides the spearhead clusters and SRCs mentioned as pivotal actors, the Flanders innovation landscape also includes an additional large number of place-based networking initiatives, active in the identified S3 areas.

The Flanders Cluster Policy funded by VLAIO not only supports spearhead/specialisation clusters but also launched **two bottom up calls for 'innovative business networks'**, IBN or smaller scale clusters (modalities see S3 note 2019). A second ibn call resulted in funding of 6 new IBN networks. In 2022 50 million € have been allocated to 50 collaboration projects. More than 200 organisations are member of one of several clusters. 1800 companies are SPC or IBN cluster members.

In October 2022, the Flemish Government launched the **'Flanders Technology and Innovation' initiative** where government entities, companies and knowledge centres will work together on

five major challenges: energy and climate, health and nutrition, lifelong learning, data, media and entertainment.

During 2023, five thematic symposia will be organized around these themes.

These five FTI themes Energy and climate, health and nutrition and data largely correspond with the priority domains Health and life sciences, agro-food, electronic systems & Internet of Things, energy and environment and cleantech. Only the theme 'media and entertainment' cannot be linked to an official priority domain but the Flemish Government continues to give attention to the creative industries and will now also provides initiatives for this.

Other examples of Flanders place-based initiatives, are thematic ones covering more than 1 S3 domain. A crosscutting thematic approach is taken by initiatives such as for example

- *Ghent Bio-Energy Valley* and Bio Based Pilot Plant Europe in **Ghent, active in bio-based industry**
- *FlandersBio* network (active in life sciences – biopharmaceuticals, medical technologies as well as in agricultural and industrial biotech)
- Waterstofnet vzw active in hydrogen for mobility, energy and chemical sectors (funded by Flanders-Dutch interreg)

Alignment with international collaboration

1.Synergies with other EU programmes

The S3 note of 2019 concluded to focus on emphasis on:

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.

To implement these elements, synergies are stimulated for each of the S3 domains between ERDF and other EU programmes, mostly with the Horizon EU programme to enable to build upon these research and build critical mass of funding for the S3 investments. Synergies should mainly be sought in the second Horizon EU pillar of societal challenges and industrial competitiveness where the new generation of EU partnerships and EU missions is related to each of 6 Horizon EU clusters and provides useful perspectives for networking around new emerging technologies for transformative R&I policy and related ecosystems. Alignment with activities in the third pillar in HEU on the innovation ecosystems and European Innovation Council will help to realise objectives of the New European Innovation Agenda.

Flanders S3 Domains	Horizon EU Societal challenges	EU Partnerships, EU missions,...
Sustainable chemistry	Cluster 5 'Climate, energy and mobility' and 6	*Circular Bioeconomy partnerhsip*
Advanced materials	Cluster 6 'Food, Bioeconomy, Natural resources, Agriculture and Environment'	*EIT KIC*
Smart manufacturing	All clusters	
Health and life sciences	Cluster 1 'health'	*Mission Cancer*
Specialised logistics	Cluster 5 for mobility	*CCAM, 2ZERO partnership , cities mission*
Agro-Food	Cluster 6	
Electronic systems, Iot and photonic systems	Cluster 4 (Digital, Industry and Space'	
Energy	Cluster 5	*Hydrogen partnership*
Environment & cleantech	Cluster 5	*EIT KICs*
Blue Economy	Cluster 5-6	*Mission Oceanand Waters* Sustainable Blue Economy Partnership *Water4All Partnership*
Creative industries (tbd)	Cluster 2 'Culture, Creativity and Inclusive Society'	

2. *Vanguard Initiative pilots*

The outward looking dimension is an important feature in S3 : this implies ambition beyond the regional, technological, and/or disciplinary borders. The Vanguard Initiative facilitates this cross border element through providing excellent opportunities to connect regional strengths and set up interregional initiatives (pilot and demo actions) for innovative ecosystem building for EU based value chains.

EWI Department has been one of the founders of the Vanguard Initiative (see s3vanguardinitiative.eu). In November 2013, the initiative started with 10 innovative regions and has actually grown to 39 regions in 14 EU countries. The Vanguard Initiative aims to strengthen the Smart specialisation role of the regions in European innovation and industrial policy and stimulate economic growth through a bottom-up dynamic from industrial regions to stimulate entrepreneurial innovation.

The core of the Vanguard Initiative actually consists of 8 pilot actions that connect the strengths or specializations of the different participating regions to develop and strengthen European knowledge value chains for scale up in the EU market. Flanders participates in all S3 pilot actions and is co-lead of Smart Health' and ' 3D Printing'. Other vanguard pilots are situated in the fields of artificial intelligence, advanced production technologies for energy, nanotechnology, efficient and sustainable products, bio-economy and recently also hydrogen.

A study 'VI Members Smart Specialisation Strategies 2.0' conducted by IDEA Consult (December 2021) for the Vanguard Initiative, highlighted the integration in Interreg projects and synergies with Horizon EU programme initiatives as an important attention point for Flanders: the study provided useful insights in the matching of Flanders S3 priorities with other regions' Flanders is active in the Vanguard pilots Efficient and Sustainable Manufacturing, 3DP , Advanced Manufacturing for Energy Related Applications in Harsh Environments, New Nano-enabled Products and Artificial Intelligence. The overview of main Flanders participants is given in the table.

VI Pilot projects	Flanders participating actors in pilot
High performance production through 3D-printing	SPC SIM (initiative Flam3D has been merged in SIM) Collective centre Sirris
Bio-economy: Interregional cooperation on innovative use of non-food biomass	VITO
Energy related applications in harsh environments	OWI-lab/Sirris
New nano-enabled products	IMEC
Efficient and sustainable manufacturing	Agoria (national technological sectors' federation) KuLeuven
Artificial Intelligence	Flanders Make
Smart Health	IMEC, VITO, VIB

Source : EWI

The VI is also active in European Thematic S3 Platforms (TSSP). In this context, Flanders participated with regions of the Vanguard Initiative in a pilot action of DG REGIO that helped prepare the current I3 instrument (the 'interregional innovation investments' part of the ERDF programme). Flanders has been active in the thematic S3 partnerships (TSSP) bio economy, 3DPrinting and agri-food as well as in the TSSP platform personalised health and batteries. Actually Flanders participates in two I3 projects on 3D Printing and Smartsensors for Agrifood. Flanders' policy recently stimulates the Spearhead Clusters to participate in I3 projects.

Conclusion

Flanders' updated smart specialisation strategy 2.0 maintains to be centred around 10 priority investment domains that correspond with the four Flanders' Strategic Research Centres (SRC's) and with the newly MEDVIA, actually 7 Spearhead clusters (SPC's). Main actors are IMEC (microelectronics and digitalisation), VITO (cleantech and energy), VIB (biotech and life sciences) and Flanders Make (advanced and smart manufacturing), as well as Flanders specialisation clusters active in sustainable chemistry, agri-food, advanced materials, smart transport and logistics, blue economy, health and life science, and energy. These will continue to play an facilitator role for

cooperation in the perspective of triple (digital, sustainable and resilient) transition goals in the identified S3 areas where they join forces with other triple helix actors from the Flanders research and innovation landscape (and also abroad) for future investment in EU value chains. The new FTI initiative will further boost together with recovery fund smart investments in these S3 areas.

The S3 domains are grouped in crosscutting thematic initiatives (eg bioeconomy) where also regional strengths are matched and connected in interregional cooperations for developing value chains (cfr pilot actions of vanguard initiative). Synergies between regional funding instruments and other EU programs are an important element to leverage.