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Technology and Innovation in Flanders

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Purpose

Knowledge and innovation are the key factors in ensuring Flanders' future prosperity and welfare. The government, companies and knowledge institutions must join forces to create focus and critical mass in strategic areas that strengthen Flanders' competitive position and offer potentially substantial social benefits. Foresight studies are an excellent means of linking science and technology with innovation in industry and society while at the same time creating a decision-supporting framework for regional innovation policy and its relationship with regional economic developments.

Regional Technology Foresight in Flanders

Flanders, the Flemish region in Belgium, has taken an important commitment to stimulate innovation as part of its Lisbon and Barcelona engagements. Innovation dynamics and their relationship with economic development have stimulated the interest of policy makers in technology foresight exercises at the national and regional level. During the past seven years, the Flemish government has supported a consistent approach to co-develop a variety of relevant case and sector studies and an accompanying methodological framework.

This four-stage methodological framework allows for identifying, exploring, monitoring and supporting the development of scientific and technology domains by defining and implementing supportive actions and instruments from the perspective of stimulating innovation within the region.

Focus on Technology and Innovation

While in the past this framework has been developed to allow policy makers to arrive at well argued choices related to science and technology policies within specific sectors and industries, the Flemish Science Policy Council has applied this methodology for delineating priorities on technology and innovation in Flanders with a view to ensuring Flanders' future prosperity and welfare.

Insights into the current situation regarding scientific research, technological development, innovation and economic activity in Flanders, and into key and relevant trends in the field of research and innovation, as analysed in international foresight studies, have made it possible to set priorities via a broad consultation process.

The following six strategic clusters were identified for Flanders:

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Strategic cluster 1: Transport – Logistics – Services – Supply Chain Management

Strategic cluster 2: ICT and Services in Healthcare

Strategic cluster 3: Healthcare – Food and Agriculture – Prevention and Treatment

Strategic cluster 4: New Materials – Nanotechnology – Manufacturing Industry

Strategic cluster 5: ICT for Socio-economic Innovation

Strategic cluster 6: Energy and Environment for Services and Manufacturing Industry

The prioritisation is the result of an interactive and iterative consultation process involving 130 technical and economic experts, divided into six panels, one for each strategic cluster. Working on the basis of an international trend analysis, the expert panels selected priorities for Flanders based on a positioning and Delphi analysis. Experts were questioned about the feasibility of these trends by 2015, the technological and economic strength of Flanders with respect to these trends, leading countries for these trends, possible bottlenecks in financing, education, regulatory processes, innovation in existing firms and spin-off activity to translate the technological trend into economic activity of significant value.

The following criteria were set to establish priorities within each strategic cluster:

- Which development in technology and innovation has the greatest potential to create wealth in Flanders starting from a technological strength?
- Which development in technology and innovation has the greatest potential to create wealth in Flanders starting from an economic strength?
- Or both?

After two panel sessions, a consensus on priority techno-economic trends was reached by the expert panels for the six strategic clusters.

Across all the strategic clusters, the experts also identified and highlighted a number of focal points, not necessarily relating to a particular field. These more contextual preconditions and critical innovation factors could potentially have a major impact on Flanders' innovative strength. A questionnaire was filled in by 85 respondents across the six strategic clusters regarding these preconditions. It asked:

- How important they were for increasing Flanders' innovative strength?
- What was Flanders'current position with respect to each condition?

Techno-economic Trends and Critical Innovation Factors within the Strategic Clusters

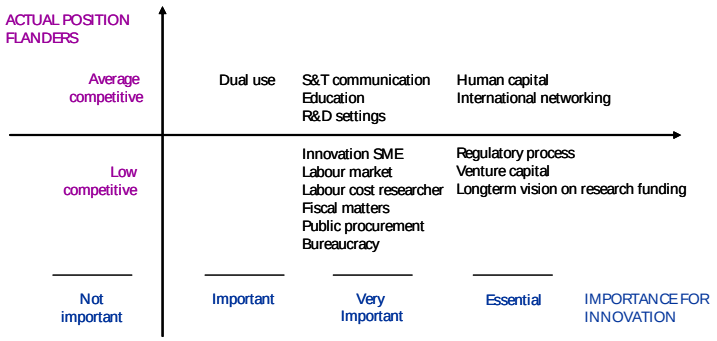
This foresight study – a collaboration between 130 technical and economic experts from industry and knowledge institutions – identifies 30 priorities (Table 1) and 15 preconditions within six clusters of strategic importance to Flanders:

- **Strategic cluster 1: Transport – Logistics – Services – Supply Chain Management**
  Intermodal transport, intelligent supply chain management, intelligent transport systems, virtual design and production
- **Strategic cluster 2: ICT and Services in Healthcare**
  E-health with the emphasis on the electronic medical file and integration of multiple health care information systems, innovative healthcare services and products for (home) based healthcare, medical imaging and processing, multidisciplinarity: bioinformatics, chemoinformatics, neuroinformatics
- **Strategic cluster 3: Healthcare**
  Prevention- Treatment, molecular diagnostics and biomarkers, preventive and therapeutic vaccines, cell therapy, molecular biology research for targeted diagnosis and therapy, translational medicine, interdisciplinarity with applications in health care, food and agriculture, relation between food and health, agricultural biotechnology, industrial biotechnology
- **Strategic cluster 4: New Materials – Nanotechnology – Manufacturing Industry**
  Structured micro- and nanomaterials, materials for nanoelectronics, micro-optics, photonics, micromechanics, unique composites, materials and material systems that interact with the environment, enabling technologies
- **Strategic cluster 5: ICT for Socio-economic Innovation**
  Advanced networks: broadband-mobile-wireless, criteria of advanced networks: ambient intelligence – context awareness – security, converging technologies and application development, e-applications: e-health and e-society
- **Strategic cluster 6: Energy and Environment for Services and Manufacturing Industry**
  Efficient use of energy in industry and buildings, smart grids, power generation, sustainability of production processes and products

The outcome of the questionnaire on the preconditions for Flanders' innovative strength was unambiguous (see Figure 1): all of the preconditions could be considered as 'important', 'very important' or 'essential' for Flanders' innovative strength. Moreover, Flanders' current position with respect to different preconditions was perceived as 'insufficiently' to 'averagely'

competitive. In this way, the experts identified a set of pre-conditions which were then systematically classified based on the questionnaire. Naturally, these preconditions can be further refined based on quantitative economic analyses to gain a more detailed insight into possible policy implications and resulting policy suggestions. However, this was not one of the aims of the present study.

Figure 1: The importance for innovation and Flanders' current position with respect to the 15 preconditions, as perceived by the six expert panels.



Responsibilities of Government and Social Partners

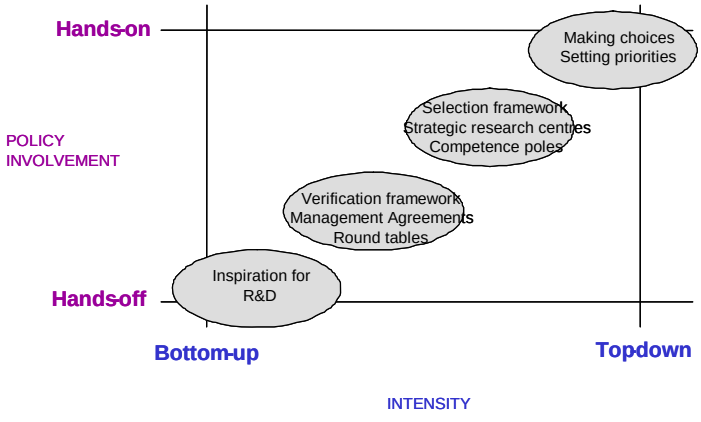
1. Expert-approved prioritisation of technology and innovation in Flanders

To increase Flanders' innovative strength, the Council stresses the need to pay simultaneous and coordinated attention to both priorities (trends) and critical innovation factors (preconditions). The Council emphasises the major responsibility of both the government and social partners in this respect.

2. Valorisation of the prioritisation by government, industry and knowledge institutions

The Council considers this prioritisation of technology and innovation to be a reference framework for all stakeholders in Flanders: the government, industry and knowledge institutions. Valorisation of the reference framework operates in two dimensions: intensity, ranging from active influence to guidance, and policy involvement, ranging from hands-off to hands-on (see Figure 2).

Figure 2: Valorisation of the reference framework



Role of Government

The Council proposes to use this reference framework initially as an assessment framework for existing instruments and initiatives. In recent years the Flemish government has already created a whole array of instruments covering the entire innovation chain, for which the reference framework may provide useful information:

- New applications within the policy framework for strategic research centres (SRCs) and competence poles could be assessed against this reference framework.
- The reference framework could be used when drawing up management agreements/covenants for new and existing SRCs and competence poles. In fact, the existing strategic research centres and the so-called competence poles have a clear link with the six strategic clusters.
- The expert-approved prioritisation may also be a vehicle for further implementing the Round Table concept within a strategic cluster. It will be an innovative and pioneering stimulus with added value for innovation policy in Flanders.
- The reference framework could also serve as a guide for the Flemish Innovation Policy Plan, which aims to integrate innovation-related activities into all policy areas handled by the Flemish government, such as environment, healthcare, logistics and transport.

In the Council's view, the government also has an important role to play as a catalyst in increasing Flanders' innovative strength. During the prioritisation process, the six expert panels identified the following 15 preconditions for increasing Flanders' innovative strength, known as structural innovation (see Figure 1).

Role of Industry

This expert-approved prioritisation will also be submitted to the sector federations for further implementation within their respective sectors, in line with the defined priorities. This will broaden the support base still further.

Role of Knowledge Institutions

This expert-approved prioritisation will also inspire research and development at research institutions and associations.

3. Importance of this foresight study for innovation-related activities in Flanders

A knowledge-intensive society cannot operate without regular, well-founded discussions on the developments taking place in technical and economic fields. Flanders is no exception and requires such discussion exercises on the macro level. A more systematic approach to foresight studies will create a framework for Flemish policymakers that is capable of supporting and justifying strategic policy choices on technology and innovation issues. The foresight study is a lively, dynamic process with a broad support base that dovetails nicely with European initiatives.

With this study, the Flemish Science Policy Council VRWB has succeeded in getting all of the stakeholders significantly involved in innovation-related activities and therefore in the future of Flanders. Expert panels comprising a large number of highly competent and committed experts from industry and knowledge institutions have worked together to develop a vision for the future and in so doing have reached a consensus. These experts have high hopes for the future and are willing to continue to work together on innovation-related activities in Flanders.

Sources and References

1. Debackere K., Veugelers R., Bouwen R., Van Looy B., Zimmerman E., Methodological framework for examining science and technology in Flanders, K. U. Leuven, 2000

2. Key Technologies Cluster Approach, European Commission, 2005 www.cordis.lu/foresight/kte_expert_group_2005.htm

3. Smits E., Van Looy B., Debackere K., Monard E., Five years of regional technology foresight: the Flemish experience, Veille Stratégique Scientifique et Technologique, Lille, 2006

4. Van Looy B., Debackere K., Andries P., Zimmerman E., Callaert J., Verbeek A., Technologies for the future: looking a decade ahead, Incentim K. U. Leuven, 2001