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**Abstract**

The report offers an analysis of the R&I system in Belgium for 2014, including relevant policies and funding, with particular focus on topics critical for two EU policies: the European Research Area and the Innovation Union. The report was prepared according to a set of guidelines for collecting and analysing a range of materials, including policy documents, statistics, evaluation reports, websites etc. The report identifies the structural challenges of the Belgian research and innovation system and assesses the match between the national priorities and those challenges, highlighting the latest policy developments, their dynamics and impact in the overall national context.

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## **Executive summary:**

This report provides an up-to-date overview of the Belgian Research and Innovation (R&I) systems (including funding), with a focus on the recent developments observable in the country related to the European Research Area and the Innovation Union. The report was prepared according to a set of guidelines for collecting and analysing a range of materials, including policy documents, statistics, evaluation reports, websites etc. The quantitative and qualitative information is, whenever possible, comparable across all EU Member States reports.

Belgium's research system is highly devolved due to the federalisation process of the last 25 years that has gradually split competencies and transferred them from the federal level to the regions and communities. Therefore, the main responsibility for research and innovation policy lies with the three regions and the three communities, even though the federal state still holds responsibility for R&D tax credits, a major R&D instrument in Belgium. Such a devolved system enables each community and region to pursue diversified strategies that respond to specific socio-economic challenges, while interministerial commissions are entitled to ensure coordination between authorities.

All Belgian authorities are committed to the 3% target, both at the federal level and the regional or community levels. Equally agreed upon is the target to finance 1% of this R&D from public sources; i.e. government and higher education. These objectives have been repeated in the July 2014 Regional and Community Government Agreements and in the October 2014 Federal Government Agreement. Therefore, major cutbacks are not planned in the field of R&D. Given the budget constraints and the political will to arrive at a balanced budget in 2015 or 2016, it is remarkable that e.g. R&D fiscal incentives are continued under the new Federal Government. The Flemish Government also continues to increase its annual public budget for R&D and innovation and its focus towards more market-driven support and demand-driven initiatives, also in the field of grand challenges, as well as a further effort towards more rationalized and simplified instruments' portfolio. The Governments of Wallonia and of the Wallonie-Brussels Federation (the French Community) are continuing their efforts to intensify investment in R&D and in innovation and to improve the effectiveness of policies, with a focus on industrial valorisation linked to European guidelines, in particular, the flagship initiative "Innovation-Union". The Brussels Capital Region continues to focus on regional R&D strategic platforms, clusters and targeted actions plans to increase regional R&D capacities up to the 3% target. The upward trend in the Belgian R&D intensity illustrates the serious involvement of Belgium in innovation as the country manages to maintain the growth of its R&D efforts over GDP growth.

The share of competitive funding (both competitively allocated institutional funding and project-funding) has increased significantly over the past 10-20 years in Belgium as compared to (non-competitive) 'block funding'. However, this shift occurred mainly towards competitively allocated institutional funding, and much less towards project-funding. The rationale behind this shift was the wish to increase competition in the Belgian research fabrics while guaranteeing minimum budgets for small institutions and predictable budgets for everyone.

Another noticeable trend in all policies and regions of the country concerns the increased integration of research and innovation policy with industrial policy. While in the 1990s research policies got more and more integrated with innovation policy and entrepreneurship, since a couple of years there is a trend towards more integration of the 'research and innovation fabric' into industrial policy. This is demonstrated by the shift towards more close-to-market policies and more attention for 'technology deployment' and demand-side policies (focusing on living labs, pilot plants, lead users platforms, market uptake, technology transfer etc).

Policy tools and funding instruments for innovation tend to cover a larger part of the innovation trajectory in Belgium than before, with an increasing focus over the past 5 years on the downstream part of the cycle, closer-to-market. Since 2010, various new instruments have been put in place in the country such as demonstrators, living labs, lead users platforms, pilot plants ... The idea is to go beyond prototyping and to support the further nurturing and upscaling of new technologies or applications. The rationale for public intervention here is that there remains a market failure: the distance-to-market is smaller, but in most cases, investment size is much bigger. However, the size of the local market and the high relative dependence on foreign FDI and MNEs remains a challenge for the country to reap the benefits of demand-activated innovation.

Besides, efforts have been made to expand and open the venture capital market as supplementary access to finance, and the communities have increased efforts in terms of improving the supply and career prospects of highly skilled human resources. Finally, the larger recourse to fiscal incentives has not occurred at the expense of direct or indirect funding support for innovation, on the contrary. The trend in these various categories of funding instruments shows a net reinforcement of the policy mix, overall.

An important challenge for Belgium and its authorities remains complementing the rationalization process of the broad and highly diverse portfolios of measures with a view on enhancing effectiveness. Demand- and supply-side policies tend to co-exist without strong systemic evaluation or steering ... Belgium has gradually developed its portfolio of instruments, adding to direct and indirect support (supply-side policies) demand-side policies, fiscal incentives. The whole portfolio is impressive but in a next stage the various governance levels should evolve together towards further cooperation. This should happen in the context of the current rationalisation process announced in almost every region.

Strong indicators where Belgium is performing well above the average EU performance include international scientific co-publications, innovative SMEs collaborating with others and public-private co-publications. Relatively weak indicators include sales share of new innovations, non-EU doctorate students and new doctorate graduates. Performance has improved most in Community trademarks and international scientific co-publications. Performance has worsened in non-R&D innovation expenditures and to a lesser extent also in venture capital investments, SMEs with marketing and/or organisational innovations and fast-growing innovative firms. While Belgium's labour force skills are reasonably strong, the demand for engineers exceeds the number of graduates in certain areas. It remains clear that the shortage of human resources in S&T, partly due to the low levels of new doctorate graduates and the weak inflow of foreign doctorate students (despite a high level of tertiary educated population), is one of Belgium's key challenges for the near future.

Despite the high research outputs in quantitative and qualitative sense and relatively high investments in research centres and R&D measures, the take up by Belgian companies appears to be sub-optimal. Belgian STI activities are well-integrated internationally, but attracting foreign investment in R&D and innovation remains a high priority in the country. The main challenge is to better link the accumulated research capacities and results to the economic eco-system. Several measures are in place in each region aimed at economic exploitation of research, but it seems that research outputs are not (yet) aligned with the absorptive capacity of SMEs.



# **1. Overview of the R&I system**

## ***1.1 Belgium in the European RDI landscape***

Belgium is a small densely populated federal State (11.162m inhabitants in 2013, about 2.21% of the EU28 population). It is divided into three regions: Flanders (6.37m inhabitants in 2012), Wallonia (3.56m) and Brussels-Capital (1.16m); and three communities: the Flemish (7.1m speakers), the French (4.3m) and the German-speaking (75,000). Total gross domestic product (GDP) was €375.9b (at market prices) in 2012 (2.9% of EU28). Per capita GDP in 2012 was €30, 400. This is 18.75% above EU28 average (i.e. €25,600). There are significant regional differences in the GDP per capita: Wallonia lies just below EU27 average (98.3% in 2010), Flanders lies well above (132.7%) and Brussels-Capital lies extremely high above (250.2%). The dispersion of regional GDP per inhabitant was 26.8 in 2010, which puts Belgium amongst the highest countries in Western-Europe.

The Belgian research system is highly “devolved” due to the federalisation process of the last 25 years that has gradually split competencies and transferred them from the federal level to the regions and communities. The main responsibility for research policy and funding lies with the three regions and the three communities. It is however important to point out that R&D tax credits, a major R&D instrument in Belgium, is a competence of the federal state and is not devolved to the regions or communities. Belgium’s R&D intensity has been increasing over the past years from 1.97% in 2009 to 2.28% in 2013 (provisional – 2.24% in 2012<sup>1</sup>), which is above the EU-28 average of 2.01% (2012). This demonstrates, given the modest but positive GDP growth in real terms in 2009-2012, a strong commitment to R&D support and investment in the country. More than 60% of this R&D effort is funded by the business enterprise sector (against 54% at EU-28 level), and the part of R&D investment funded by the business sector has been increasing over the past years from 58.6% in 2009 up to 60.2% in 2011. All Belgian authorities are committed to the 3% target, both at the federal level and the regional or community levels. Equally agreed upon is the target to finance 1% of this R&D from public sources; i.e. government and higher education. These objectives have been repeated in the July 2014 Regional and Community Government Agreements and in the October 2014 Federal Government Agreement. Total expenditures in innovation (as % of total turnover) amounted to 12.4% in 2010, which is slightly lower than the EU-27 average (13.4% in 2010) (Eurostat, Feb 2015).

## ***1.2. Main features of the R&I system***

The various Belgian authorities are fully autonomous. Constitutionally there are seven Belgian authorities, in practice there are five active entities when it comes to science, technology and innovation (STI) policy as a) the Flemish Region and the Flemish community merged their institutions since the start in 1980 and b) the German-speaking Community does not have a research policy.

The Federal Government has competence for the federal scientific institutes, intellectual property (IP) law, standardisation, fundamental metrology, nuclear research, corporate

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<sup>1</sup> Estimated.

taxation, employment legislation and social security. The R&D tax credit, a major policy instrument in Belgium, is therefore a competence of the federal state. The Communities are competent for matters related to individuals including scientific research and (higher) education, and the Community Scientific Institutes; the regions are competent for territorial matters such as energy, environment, and economic support, thus including innovation, applied and industrial research, research centres, science parks, and technology transfer (see Ziarko, Reid & Bruno (2012) and BELSPO (2013) for a more detailed overview of the system).

Belgium is unique amongst the EU Member States and in the world in that it is the only country where, since the early 1990s, most of the research policies (instruments and budgets) have been devolved across several defederalised governments, each enjoying complete autonomy of decision-making power in these matters. The law(s) on the reform of the institutions (state reform) states that the primary jurisdiction for research policy lies within the three regions and the three communities, while the federal State retains some competences as an exception to this rule. Governmental responsibilities are arranged as follows: The regions have authority on research policy for economic development purposes, thus encompassing technological development and applied research (see Figure 1 in the Annex for an overview of the responsible governments and a full overview of the STI governance system).

The communities (French Community, Flemish Community and German-speaking Community) are responsible for education and fundamental research at universities and higher education establishments (see Figure 1 for an overview of the responsible governments and a full overview of the STI governance system).

The federal state retains the responsibility for research areas requiring homogenous execution at the national level, and research in execution of international agreements (e.g. space research, defence research).

This institutional context has a profound influence on the governance of research policy. There are formally seven independent Belgian authorities carrying out their own policy in the wider field of science, research, technology and innovation. In practice, there are only five active entities, since the region of Flanders and the Flemish community's governments have merged into one since their establishment in 1980 and, due to its small size and absence of research-performing higher education institutes, the German-speaking community does not carry out any policy in the research area. All the other entities have their own policies. This has created a complex system and means e.g. that HEI (university and university colleges) policy in the Brussels Capital Region is governed by the Flemish Community and the Wallonia-Brussels Federation, while the Brussels Capital Region has no competence. The Brussels Institute for Research and Innovation (Innoviris) provides several programmes, targeted to universities, such as Attract, Anticipate, Doctiris or Bridge<sup>2</sup>.

The logic behind the division of competences is however quite strict and clear (mutually exclusive as well) and does not lead to disputes over competences very often. There is no hierarchy of powers between the federal government and the other authorities.

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<sup>2</sup> See <http://www.innoviris.be/fr/soutien-financier-aux-organismes-de-recherche/programmes-bruxellois> (last consulted in 02/2015).

Policy making is driven by the normal election cycles for all authorities (elections at federal level did coincide with regional elections in 2014) as well as by the annual budget cycles. In Flanders a structured process, including heavy stakeholder involvement (employees' federations, trade unions, universities, etc), was set up a number of years ago to address the Lisbon Agenda and its successor, the EU2020 strategy. The effects of the resulting actions are monitored annually.

All authorities commit to the target of 3% of GDP invested in R&D (2% financed from the private sector and 1% from the public sector). This is reflected in the policy documents relevant for R&D policy of all entities (Marshall Plan 2.Green 2010-2014 in Wallonia which will be updated in the spring 2015 by Marshall Plan 4.0, Brussels Regional Innovation Plan 2007-2013 and its actualisation in November 2012 and the 2014-2019 Government of the Brussels Government (July 2014), the new Government declaration 2014-2019 of the Federation Wallonia-Brussels / French Community (July 2014), the Flemish Policy Note 2009-2014 on Scientific Research and Innovation, the 2014-2019 Government Declaration of the Flemish Government (July 2014), the Flemish policy note 2014-2019 on Work, Economy, Science and Innovation (October 2014), the Flanders' Pact 2020, Declarations of regional and community policies in Wallonia and in the French Community (2014)). The federal Government Agreement of 1 December 2011 suggested an "inter-federal plan for research and innovation" to coordinate efforts of all entities towards this objective. The new Federal Government of October 2014<sup>3</sup> aims at reinforcing policy coordination with all other federated entities of the country. In this regard, it announces the establishment of a repository of all federal measures (grants, subsidies, fiscal measures) of relevance for all governance levels.

### ***1.3. Structure of the national research and innovation system and its governance***

The [Federal Science Policy Office](#) (BELSPO) (i.e. the Programmatory Public Service for Science Policy) is responsible for coordinating science policy at federal level, the design and implementation of research programmes and networks; the management of Belgium's participation in European and international organisations and the supervision of ten federal scientific establishments. BELSPO also offers the government reliable, validated data, allowing it to take decisions with full knowledge of the facts in areas such as sustainable development, the fight against climate change, biodiversity, energy, health, mobility and the information society. It also managed the Belgian contribution to the European Space Agency and BELNET, the Belgian national research network, provides high-speed internet access to Belgian universities, colleges, research centres and public services. The Federal Science Policy BELSPO also co-ordinates the research effort led by all the country's authorities and is responsible for introducing Belgian researchers into international research networks.

It is important to point out that the latest Federal Government Agreement of 1 October 2014 announces the suppression of BELSPO as distinctive Federal Science Policy Office

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<sup>3</sup> See [http://www.premier.be/sites/default/files/articles/Accord\\_de\\_Gouvernement\\_-\\_Regeerakkoord.pdf](http://www.premier.be/sites/default/files/articles/Accord_de_Gouvernement_-_Regeerakkoord.pdf) (last consulted on 02/2015)

(Federal Government Agreement 2014, p. 105), in the context of the rationalisation of Federal Public Services. BELSPO is expected to be integrated as directorate within another Public Service (probably Public Service for Economic Policy), but the detailed operationalization of this integration is still to be organized.

In the Brussels-Capital Region, [The Brussels Institute for Research and Innovation](#) (INNOVIRIS) manages the implementation of research and innovation funding. Innoviris funds scientific research and technological innovation. Businesses, research organisations and non-profit sector in the Brussels-Capital Region can apply for financial support for research with and without an economic purpose.

Innoviris provides a number of services:

- Grants and subsidies for industrial research and precompetitive development at SMEs and large businesses;
- Supporting the diffusion of the results of academic research on the Brussels economy;
- Providing assistance to spin-offs from scientific research (e.g. programme “Launch”<sup>4</sup>);
- Providing research organizations and non-profit sector with tools aimed at facilitating development of the projects (e.g. the program “co-create”: living labs where organizations can test their project in collaboration with final users<sup>5</sup>, etc.).
- Providing research organizations with grants and subsidies for research under e.g. the “Attract” (previously “Brains (Back) to Brussels”) “Anticipate” (previously “Prospective Research for Brussels”) or “Bridge” programmes<sup>6</sup>, as well as studies on specific themes.

Innoviris promotes financing tools applicable to scientific research on various relevant forums. It manages databases and databanks on Brussels R&D. Innoviris also represents the Brussels-Capital Region at various scientific research coordination bodies. It also maintains international relations in this field. Finally, Innoviris generates the economic indicators needed to develop effective research policy and has launched an own regional Scoreboard on Research and Innovation in the Brussels-Capital Region since 2012. It also runs the secretariat of the Conseil de la politique scientifique (scientific policy council) of the Brussels-Capital Region.

Flanders has various competencies as well as types of institutes in the field of science, research and innovation in practice (Geerts et al.; 2013):

- Direct support for R&D and innovation in broad sense (grants, fees, PhD fellowships and subsidies or other support channels for basic, fundamental, cutting-edge, and applied research that is conducted by researchers at universities, institutes, companies, networks of knowledge and businesses); all business-oriented support

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<sup>4</sup> See <http://www.innoviris.be/nl/financiele-steun-aan-onderzoeksinstellingen/brusselse-programmas/launch-brussels-spin-off> (last consulted in 02/2015).

<sup>5</sup> See <http://www.innoviris.be/fr/soutien-financier-au-secteur-non-marchand> (last consulted in 02/2015).

<sup>6</sup> See <http://www.innoviris.be/nl/financiele-steun-aan-onderzoeksinstellingen/brusselse-programmas> (last consulted in 02/2015).

(e.g. technology transfer, technology advice, technology scans, networking, dissemination of innovation, knowledge and technology, valorisation or research results, feasibility studies, knowledge vouchers, etc.; various forms of collective research (joint industry-science research, innovative networks, clustering); the promotion and popularisation of STI (in education, society, business, science centres), mobility of researchers.

- All research related to the community (= person-related) and the regional (= territorial related) competencies: broad innovation policy as well as the scientific research policy (fundamental, applied and strategic basic research); (research at) higher education institutes (university colleges, universities); (research at) public research organisations (PROs); (research at) Community scientific institutes and policy research centres; (research at) various institutes that generate knowledge or scientific output; infrastructure in the field of research and innovation (small, medium-scale and large-scale research infrastructure; science parks, technology parks, incubator sites, etc.
- Access to finance: support for start-ups, spin-offs, participations, seed capital, risk capital, guarantees, fast-growing or technology-oriented businesses, business angels, loans.

In Flanders, the field of science and fundamental research (= community competencies), as well as of innovation and applied research (= regional competencies) are being dealt with in one specific commission of the Flemish Parliament and by a single minister in the government (Geerts et al., 2013). From August 2014, Minister Muyters has the portfolio for Science and Innovation, which he combines with Work, Economy and Sports. Furthermore, there is one advisory council (VRWI)<sup>7</sup>, and a single administration (department) responsible for preparing and monitoring policy within the policy domain. At the implementing level, the Agency for Innovation by Science and Technology (IWT) is responsible for innovation (a regional competence)<sup>8</sup>; while for the community competencies, specific funding agencies (notably, the Research Foundation Flanders (FWO), Hercules Foundation (for research infrastructure) and initiatives such as the Special Research Fund (BOF), support universities, university colleges, scientific institutes, research centres and companies of the Flemish Community which are located in both the Flemish Region and the bilingual Brussels-Capital Region. The Flanders Holding Company (PMV), supports (innovative) companies<sup>9</sup> with guarantees, loans, risk capital, participations in the capital, etc.

As regards Wallonia and the French Community, in the legislative session 2009-2014, a single Minister-president was chairing the two governments and several other ministers had portfolios both for regional and community affairs. Since September 2014, the two governments are chaired by two distinct Minister-presidents and only two ministers have both regional and community affairs. However, regarding R&I policy, the current allocation of ministerial portfolios might imply a stronger coherence in policy implementation. During the past legislation, two ministers were sharing R&I competences (Minister Nollet was having the community competences for Higher Education -and so also research at

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<sup>7</sup> There is an ongoing reform of the advisory councils with a possible suppression of the VRWI

<sup>8</sup> It has been decided that IWT will be merged in the course of 2015 partly with FWO and partly with the Enterprise Agency (Agentschap Ondernemen).

<sup>9</sup> See <http://www.pmv.eu/nl/ondernemers> (last consulted in 02/2015).

universities; Minister Marcourt was dealing with regional competences on industrial research, entrepreneurship and industrial policy). From September 2014 on, Minister Marcourt has now the portfolios related to R&I at both the regional and community levels:

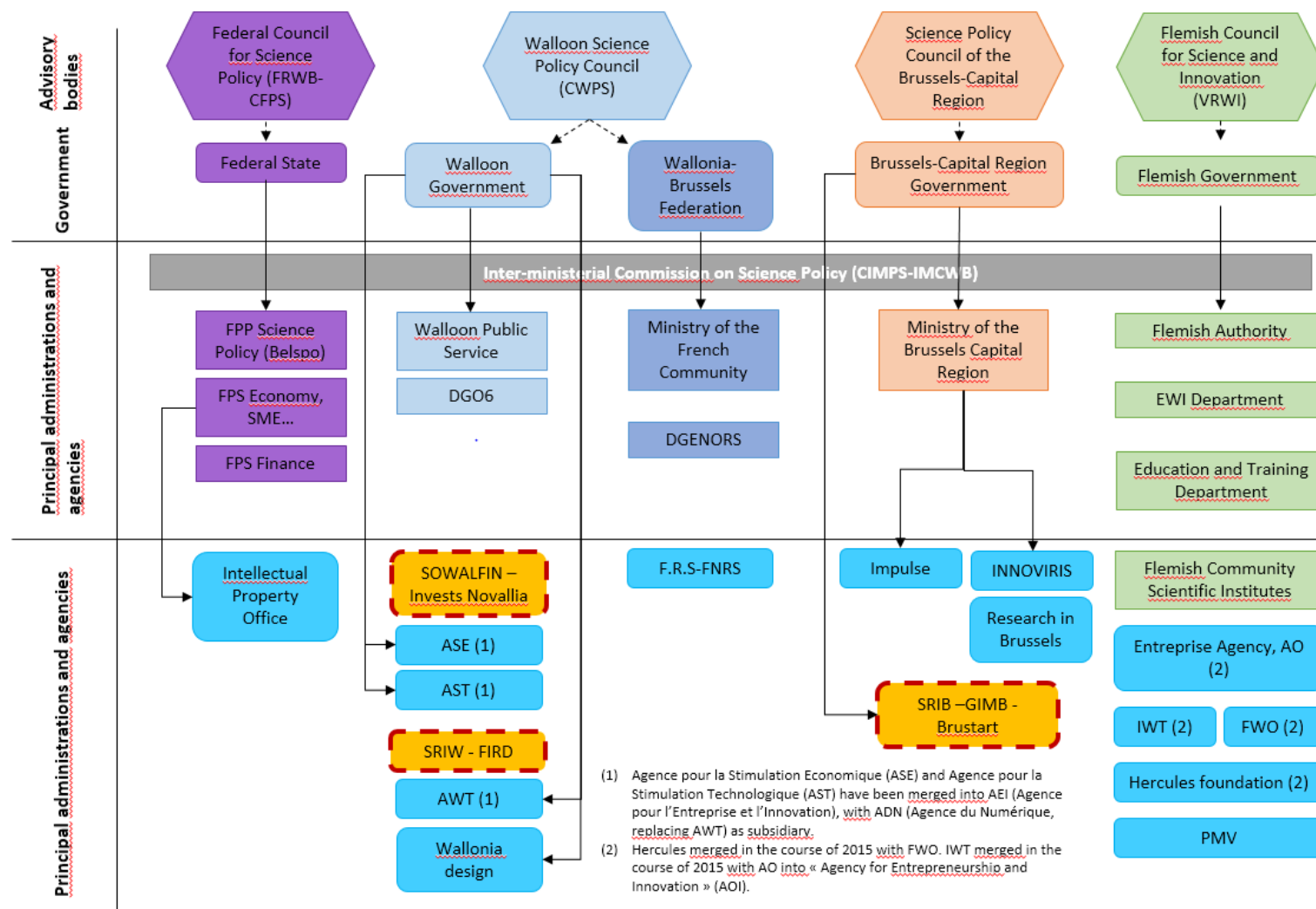
- Economy , Industry , Innovation and Digital at the regional level
- Higher education, research and medial at the community level

The avowed aim is to enhance the level of coherence of government action between education, research and economic policies. Other individual ministers, from either government are autonomously responsible for funding research in their specific fields of competence (agriculture, environment, energy, health).

The Ministerial cabinets, more or less in consultation with the administrations, are responsible for policy development. Science policy councils at Federal level (FRWB-CFPS: Federal Science Policy Council) and in the three regions (the Science Policy Council of the Brussels-Capital Region, [Flemish Council for Science and Innovation](#) (VRWI), [Walloon Science Policy Council](#) (CWPS) advise their respective governments on science policy strategies and on funding mechanisms (design and evaluation).

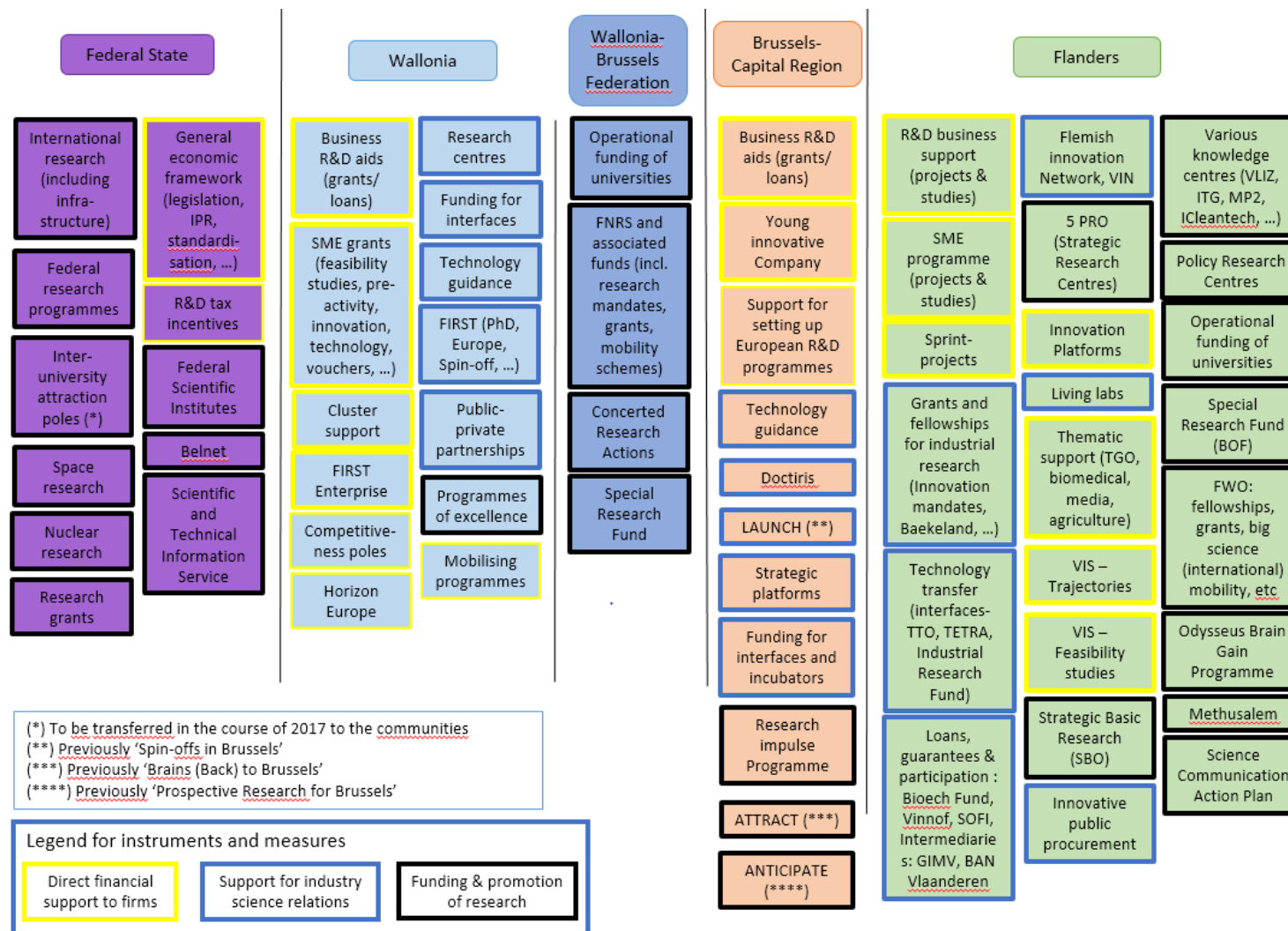
Cooperation between the various governments takes place in the Inter-Ministerial Conference for Science Policy (CIMPS/IMCWB) that occasionally meets, and two permanent sub-committees CIS (International Co-operation) and CFS (Federal co-operation) that meet on a regular basis. As regards the CFS, coordination tends to focus on practical issues such as carrying out harmonised statistical surveys (R&D, Community Innovation Survey (CIS), etc.) and submission to the European Commission, Eurostat, OECD, etc. of statistics or policy surveys.

**Figure 1. Policy governance of the Belgian Innovation System (a): Main actors**



Source: Adapted from Reid and Bruno (2012) and (BELSPO 2013)

**Figure 2: Policy governance of the Belgian Innovation System (b): Main Programmes**



Source: Adapted from Reid and Bruno (2012) and (BELSPO 2013)



## **2. Recent Developments in Research and Innovation Policy and systems**

### ***2.1 National economic and political context***

On the 25<sup>th</sup> of May 2014, Belgium had elections for all of its governance levels (except the local level), i.e. for the federal, regional, community and European parliaments. The previous Federal government had been formed after the longest political crisis in Belgium's history (541 days of negotiations after the elections of June 2010 before the creation of a Federal government in December 2011) and after it reached a political agreement on the 6<sup>th</sup> State Reform of the country. Between December 2011 and October 2014, the Federal Government ('Di Rupo I') subsequently organised and prepared the actual implementation of the 6<sup>th</sup> State Reform, which involves a substantial transfer of competences from the Federal State to the Regions and Communities. From 2014 onwards, this transfer of competences has been implemented by organizing the actual take-over by Regions and Communities. This reform is an important extension of the regional and community competences. A whole range of responsibilities is transferred, some of them completely, others partly. In the field of Research and Innovation policies, most competences had already been transferred after 1988 and in the course of the 1990s, so the impact of the 6<sup>th</sup> State Reform is rather limited. The main change concerns the transfer in 2017 from the federal to the Community level of policies regarding the so-called 'inter-university attraction poles' (IUAP, networks of excellence organised over the language borders and re-grouping the best teams from all Belgian universities across language Communities). These poles were one of the very few initiatives fostering collaboration in basic research between the institutions of the Flemish and the French Communities (i.c. the universities). The responsibility over the botanic garden of Meise (now: the Agency Botanic Garden Meise of the Flemish Government) was also transferred from the federal to the regional level, following an agreement on the 5<sup>th</sup> State Reform in 2001.

The different Government agreements of July (Communities, regions) and October 2014 (federal authority) present broad political orientations (some of them regarding R&I policies) and the translation into detailed or operational propositions took place thereafter (these new orientations are described in the sections below, with regards to the previous strategies and the recent policy changes). The policy notes or 'policy action plans' were submitted by the new governments to their respective parliaments for discussion, amendments and approval after the Summer of 2014. An important operational consequence of the Federal Government Agreement of October 2014, however, is that most probably the federal services for science policy (Belgian Science Policy Office – Belspo) will no longer exist as such, but will be integrated in other federal services (probably the federal ministry for economy)<sup>10</sup>.

The previous Federal Government was constituted by three political parties from each language community (Christian-Democrats, Socialists, Liberals). The new Federal Government put in place in October 2014 now consists of the French speaking Liberals (MR), and the Flemish Christian Democrats (CD&V), Flemish Liberals (Open VLD) and Flemish Nationalists (NV-A). The federal government Agreement of 1 October 2014 sets

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<sup>10</sup> <http://www.premier.be/fr/accord-de-gouvernement> , p. 105 (last consulted in 02/2015)

out a range of measures to tackle the financial crisis and contains a number of austerity measures. Some substantial savings are expected to occur by limiting the public administrations' expenses (at Federal level but also in the Regions and Communities) and by e.g. postponing by one year the automatic wage indexation. On the other hand, the planned savings are aimed to generate some room for manoeuvre to reduce labour costs for companies (which are considered to be relatively high in Belgium and therefore hampering the competitive position of domestic companies).

In the field of R&D, major cutbacks are not planned except when considering the Federal Scientific Institutions, which will most probably be granted a lower budget on the period 2014-2019. The Federal Government's Coalition agreement points to a need for more coordination between the communities, the regions and the Federal Government in order to achieve the 3% target. Noteworthy though is the plan to end the federally-organised and supported inter-university 'attraction poles' (IUAP) and to transfer them to the Communities as of 2017. These poles are the last initiative fostering collaboration in basic research across regions and language communities within Belgium. Their transfer from the federal to the regional and community levels are a consequence of the 5<sup>th</sup> State Reform which was agreed upon already in 2001 but took a long time to be translated into legislative acts (to be in place from January and July 2014 on).

While the remit of the Federal Government to fund 'nation' wide (cross-community) research programmes will be further diminished, there is a clear (financial at a minimum) rationale for organising joint programming, sharing certain research infrastructures or 'pooling' research efforts (e.g. the Scottish example of research pools could be applied) between Flemish (community and region), Brussels-capital, Walloon and French Community based research teams in certain fields. This has already been possible for coordinating Belgium's participation into research infrastructures of the ESFRI roadmap.

## **2.2 National R&I strategies and policies**

All governments

Although there is no national strategy, each region/community has its own multi-annual plan that covers research and innovation (either as a sub-element of an overall plan or as a specific strategy). As already mentioned, in each region / community a new strategy is actually being re-defined following the Government Agreements of the summer and autumn 2014. The current multi-annual plans that are currently running in 2014 are : the Flanders in Action initiative (VIA)<sup>11</sup> (that will be replaced by a new long-term vision and strategy towards 2050); the Brussels-Capital Regional Innovation Plan (PRI 2006) that has been updated in 2012<sup>12</sup>; the Walloon "Marshall Plan 2.Green"<sup>13</sup> (that will be replaced and continued by the Marshall Plan 4.0) completed recently by the Research Strategy 2011-

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<sup>11</sup> See <http://www.vlaandereninactie.be/> (last consulted in 02/2015).

<sup>12</sup> See <http://www.innovativebrussels.irisnet.be/fr/accueil/plan-regional/mise-a-jour-du-plan-regional-pour-l-innovation-1> (last consulted in 02/2015).

<sup>13</sup> See [http://www.investinwallonia.be/wp-content/uploads/2012/03/PM2vert\\_EN\\_9dec2010.ppt](http://www.investinwallonia.be/wp-content/uploads/2012/03/PM2vert_EN_9dec2010.ppt) (last consulted in 02/2015).

2015<sup>14</sup> (a new research & innovation strategy is in preparation, first reading on 2/04/15) and the Wallonia-Brussels partnership for researchers, both adopted by the Wallonia-Brussels Federation (the French Community) and the Walloon Region in 2011. Moreover, the 2011 Federal Government Agreement foresaw the drafting of an overarching inter-regional STI-strategy in order to reach the 3% GERD/GDP target and meet the goals of the National Reform Plan and the EU 2020 Strategy. The inter-regional/community plan would aim to improve the coordination and efficiency of STI policy. The new Federal Government of October 2014 aims at reinforcing policy coordination with all other federated entities of the country. In this regard, it announces the establishment of a repository of all federal measures (grants, subsidies, fiscal measures) of relevance for all governance levels.

We briefly present below these multi-annual plans and their key orientations and then discuss the expected changes on the basis of the broad orientations included in the government Agreements of 2014.

Given the problematic financial situation and the political will to arrive at a balanced budget in 2015 or 2016, several austerity measures were already taken. But in that context it is remarkable that tax deductions and other fiscal measures to support R&D are continued under the new Federal Government. More in particular, the Federal Government Agreement of October 2014 foresees to perpetuate the tax exemption for researchers' wages, and it even considers the expansion of the tax deduction for patents' incomes to revenues from software licenses (provided this can occur 'in budgetary neutral terms', i.e. without major impact on the State's budget)<sup>15</sup>. The Flemish Government continues to increase its annual public budget for R&D and innovation and its focus towards more market-driven support and demand-driven initiatives, also in the field of grand challenges, as well as a further effort towards more rationalized and simplified instruments' portfolio. The move towards more 'downstream-instruments' closer to the market (e.g. demonstration activities, pilots, living labs, proof-of-concept) is continued. The new Flemish Government Agreement 2014-19 also states that a growth path towards the 3% R&D-intensity target is maintained, whereby the government strives towards a goal of 1% public R&D-outlays for 2020<sup>16</sup>. The legal and budgetary basis of institutes was strengthened by modifications in the Flemish Parliament Act on Science and Innovation (Wetenschaps- & Innovatiedecreet), with the integration of all R&D&I actors (Hercules Foundation, policy on Science communication, the 5 provincial innovation centres,...) into a single framework Act (published in the Belgian State Gazette August 2014). Also, the regulation on the Special Research Fund (Besluit Industrieel Onderzoeksfonds) was altered with clarifications in the definition of valorisation-oriented parameters (spin-off companies). The Governments of Wallonia and of the Wallonie-Brussels Federation (the French Community) are continuing their efforts to intensify investment in R&D and in innovation and to improve the effectiveness of policies linked to European guidelines, in particular, the flagship initiative "Innovation-Union". The R&I policy will be more closely linked to regional industrial policy (and Competitiveness poles policy), in the framework of the regional smart specialisation policy. The research decree has been reviewed, with a

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<sup>14</sup> See <http://recherche-technologie.wallonie.be/fr/particulier/menu/sciences-et-techniques/strategie-recherche-2011-2015/colloque-politique-scientifique-17-01-2012.html?TEXT=strat%C3%A9gie+pluriannuelle>

<sup>15</sup> See <http://www.premier.be/fr/accord-de-gouvernement> , p. 103 (last consulted in 02/2015).

<sup>16</sup> See <http://www.vlaanderen.be/nl/publicaties/detail/het-regeerakkoord-van-de-vlaamse-regering-2014-2019> , p. 21-31 (last consulted in 02/2015).

view to simplify the calls, and concentrate means on most structuring and collaborative projects. It is firstly a matter of supporting excellence in scientific research and making Wallonia's active participation in the European Research Area more robust. Secondly, emphasis is placed on the distribution and development of results of research and innovation in the widest sense within the economic fabric, as well as on improving the functioning of the regional innovation system in all its elements<sup>17</sup>. In this perspective, the implementation of the 2011-2015 Integrated Research Strategy and the "Creative Wallonia" Plan has been continued, and a new revised Integrated Research Strategy 2015-2019 "towards a regional sustainable industrial innovation policy" (smart specialisation strategy) was adopted in 1<sup>st</sup> reading by the Government (the strategy will now be submitted to the Walloon scientific policy council)<sup>18</sup>. The Government of the Wallonia-Brussels Federation, by decree, recently consolidated the legal and budgetary basis of all Funds associated with Scientific Research Funds (FRS/FNRS). That allows financial efforts made by public powers to be continued, as well as the jobs of the researchers<sup>19</sup>. Also in terms of research infrastructures, current involvements are under review such as the Belgian investments in the Antarctic, including the maintenance of the Princess Elisabeth station.

Societal challenges are increasingly targeted by research policy since the community and the regional elections in 2009. The main evolution is the focus put on broad societal needs and challenges in Flanders<sup>20</sup> and on environmental and health concerns in all regions / communities. Besides, there is also the willingness to improve collaborations between research actors in the academic and industrial sectors. This is pursued either through the continuation of now well-established policies (excellence centres in Flanders that are, as of 2012, so-called "Lichte Structuren" or demand-driven innovation platforms, competitiveness poles in Wallonia, mobilising programmes) or the launch of new ones (technological innovation partnerships in Wallonia, strategic platforms in Brussels-Capital, new research centres focused on environmental or health issues). In Wallonia, priority themes are aligned with competitiveness poles priorities. In Flanders, several initiatives exist that respond to the aims of the grand challenges (e.g. innovation in health (CMI<sup>21</sup>, Flanders' Care<sup>22</sup>), energy (Energyville<sup>23</sup>, ICleantech<sup>24</sup>), environment (MIP3.0<sup>25</sup>), social innovation (social innovation factory), etc.).

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<sup>17</sup> "Innovation" is one of the three main pillars (besides "simplification" and "to assemble") of the Walloon 2014-2019 Government Declaration. Efforts towards more innovation will be built up around the continuation of the Marshall Plan (Marshall Plan 2022) (see <http://gouvernement.wallonie.be/d-claration-de-politique-r-gionale-2014-2019-oser-innover-rassembler>, p. 5, last consulted in 02/2015)

<sup>18</sup> Ibidem, p. 23 (integration and perpetuation of the Creative Wallonia Programme within the new 'Agency for Enterprise and Innovation'); Ibidem, p. 32 (announcement evaluation leading to revision of the 'integrated research strategy').

<sup>19</sup> See <http://gouvernement.cfwb.be/d-claration-de-politique-communautaire-2014-2019-f-d-rer-pour-r-ussir>, p. 36-38 (last consulted in 02/2015).

<sup>20</sup> Identified in the aforementioned ViA process.

<sup>21</sup> See <http://www.cmi-vzw.be/> (last consulted in 02/2015).

<sup>22</sup> See <http://www.flanderscare.be/> (last consulted in 02/2015).

<sup>23</sup> See <http://www.energyville.be/> (last consulted in 02/2015).

<sup>24</sup> See <http://www.icleantech.com/> (last consulted in 02/2015).

<sup>25</sup> See <http://www.mipvlaanderen.be/nl-nl/webpage/1/homepage.aspx> (last consulted in 02/2015).

Another noticeable trend in all policies and regions of the country concerns the increased integration of research and innovation policy with industrial policy. While in the 1990s research policies got more and more integrated with innovation policy and entrepreneurship, since a couple of years there is a trend towards more integration of the 'research and innovation fabric' into industrial policy. This is demonstrated by the shift towards more close-to-market policies and public intervention and more attention for demand-side policies (focusing on technology deployment, living labs, pilot plants, lead users platforms, etc). In Flanders, for instance, research and innovation is increasingly seen as a key ingredient of the "New Industrial Policy"; in Wallonia, all competences regarding higher education, scientific research, industrial research, innovation, entrepreneurship, economy and trade have been regrouped within on single minister portfolio (Minister J.-Cl. Marcourt), which is another indication of the need and wish to further integrate the whole innovation trajectory within industrial and economic policy.

While a further expansion and integration of the innovation cycle is a common trend in all regions, the weak coordination of policies between regions / communities and across governance levels (regional and communities versus federal) remains a point of attention in Belgium (see section on "Country specific Council Recommendations").

#### Federal Government

Since the early nineties, the centre of gravity of scientific and innovation policy has been transferred in Belgium from the federal to the regional and community levels. Direct support to innovation by enterprises or universities (subsidies, grants etc) are now in the hands of regions and communities. However, the federal government remains the main actor in terms of fiscal incentives for R&D and has introduced several of these incentives over the past years (mainly tax exemption for researchers' wages and tax deduction for patents' incomes). Over the last years there has been a move to improve and optimise the fiscal incentives it can allocate to both scientific and industrial research. This effort has made some in-roads into reducing the competitiveness gap for undertaking research in Belgium due to high wages and social charges. Also there were efforts to better align and integrate the federal fiscal instruments with the direct support offered by e.g. the regions (e.g. 'MIDAS' database developed by Wallonia integrating all measures regardless of governance level<sup>26</sup>). Another important change is the intention to suppress the Belgian federal office for Science policy (BELSPO) as separate services and its integration into another federal ministry<sup>27</sup>.

Over the last years, the trends in the priorities of the policy-mix in each of the three Belgian regions have tended to display some distinctive features, reflecting their specific institutional and economic environments. At the same time, a number of measures are similar in their objectives yet differ in the approach to implementation. A common feature of both the Flemish and Walloon systems is the emphasis on measures aimed at encouraging increased co-operation between the research base and enterprises. There is a

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<sup>26</sup> See <http://www.aides-entreprises.be/WD190AWP/WD190Awp.exe/CONNECT/Midas> (last consulted in 02/2015).

<sup>27</sup> See [http://www.premier.be/sites/default/files/articles/Accord\\_de\\_Gouvernement\\_-\\_Regeerakkoord.pdf p.103-105](http://www.premier.be/sites/default/files/articles/Accord_de_Gouvernement_-_Regeerakkoord.pdf_p.103-105) (last consulted in 02/2015).

strong focus in Wallonia on schemes aimed at encouraging knowledge diffusion through the exchange or temporary assignment of skilled researchers or innovation specialists from the university/research centres to enterprises (and vice versa), the FIRST<sup>28</sup> family of measures. In Flanders, this type of action is subsumed mostly within the IWT schemes of the Innovation Mandates (previously Research mandates) and the Baekeland mandates. In addition, the Flemish and the French Communities each have a system of support for TTO's active at their respective universities. The regions and communities have all made commitments The regions and communities have all made commitments to invest more in R&D and there is concerted effort to focus this funding on either thematic or sectoral approaches such as the Flemish strategic research centres (IMEC, VIB, etc.)<sup>29</sup> and excellence centres, or the Walloon competitiveness poles<sup>30</sup> and the Brussels' clusters and strategic platforms. An interesting recent evolution is the strong focus on the coordination/opening of programmes (cf. competitiveness poles, S&T awareness raising campaigns) between the Walloon and the Brussels-Capital regions, accelerated since 2011 and the strong coordination of policies between Wallonia and the Wallonia-Brussels Federation.

### Wallonia and Wallonia Brussels Federation

Following the regional elections of 2009, the formation of the Walloon and the Wallonia-Brussels Federation governments was based on a common political strategy. This strategy has been translated into an operational plan called the Marshall Plan 2.Green<sup>31</sup> (Plan Marshall 2.Vert, budget of €1.6b over five years (2010-14)), which endorses the 3% Objective and aims to improve competitiveness of firms by improving the performance and integration of research with industry. This plan is a continuation and a reinforcement of the previous plan implemented during the period 2006-09. The addition of 'Green' underlines the new orientations to better integrate 'sustainable development' as a crosscutting priority. The third priority area of the new plan 'Strengthen scientific research as an engine of the future' incorporates the main actions to be pursued during the 2009-14 period as regards STI policy. Funds from both authorities were sought to be invested in the implementation of a joint research strategy, which also involves the Brussels-Capital Region, and focuses on strategic crosscutting themes e.g. sustainable development, renewable energy, new technologies, longer life, etc.

As a part of it, a Framework Policy was published in November 2011 entitled Research Strategy 2011-2015 "Towards an Integrated Research Policy"<sup>32</sup>. This document sets out eight strategic objectives (including reiterating the 3% objective), identifies five priority thematic areas and includes a detailed plan of action for meeting the objectives. The five

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<sup>28</sup> See <http://recherche-technologie.wallonie.be/fr/menu/acteurs-institutionnels/service-public-de-wallonie-services-en-charge-de-la-recherche-et-des-technologies/departement-des-programmes-de-recherche/direction-des-programmes-regionaux/les-programmes-first/index.html> (last consulted in 02/2015).

<sup>29</sup> See <http://www.investinlanders.be/en/flavor/Why-Flanders/page/State-of-the-art-research-centers-> (last consulted in 02/2015).

<sup>30</sup> See <http://clusters.wallonie.be/federateur-fr/les-poles-de-competitivite-wallons.html?IDC=341> (last consulted in 02/2015).

<sup>31</sup> <http://www.wallonie.be/fr/actualites/plan-marshall-2vert-162-actions-pour-tous-les-wallons>

<sup>32</sup> « Stratégie Recherche 2011-2015. Vers une politique intégrée de la Recherche », (Cabinet Minitier Nollet), December 2011 (see <http://nollet.wallonie.be/strategie-recherche-2011-2015-vers-une-politique-integree-de-la-recherche>, last consulted in 02/2015)

thematic fields identified are: sustainable development, energy, research in technological fields, health and ageing and quality of life. A first new measure was launched to support public-private partnership working on these thematic fields (PPP-2012). Although technically a policy statement of the Walloon - Wallonia-Brussels Federation governments, an additional aim of the Strategy is to develop a joint action plan with the Brussels-Capital region.

In addition, the Wallonia-Brussels Partnership for Researchers was also adopted in 2011. It is the contribution of the Wallonia-Brussels Federation to the implementation of the European Charter for Researchers, the European Code of Conduct, the European Commission Partnership for Researchers, the recommendations of the Helsinki Group on Women and Science and the human resources strategy of the “Innovation Union” of the European Union. It is worked out in twenty-five actions divided into six chapters, where public authorities undertake, alongside the actors in research, to place researchers at the centre of the priorities given to the consolidation of research as a driver of the future.

The Action Plan “Creative Wallonia” is another important component of the innovation policy in the Walloon region<sup>33</sup>. This Plan brings together a number of measures based on a common philosophy: innovation, in a broad sense (products, services, etc.), must be based on the understanding and the development of non-restricted innovation processes that support creativity and brings together all actors involved in the process. As indicated above, a new multi-annual plan will be soon developed for both the regional and the community level. The last government Agreements that followed the election in May 2014 specified some broad orientations that are confirming or are moving away from the key orientation included in the strategy for 2009-2014. The new expected orientations are:

- The strategy will rely on the priorities of the “Plan Marshall 4.0” that replaces The Walloon “Marshall Plan 2.Green”
- The new strategy will be an attempt to further link Research, industrial policy, economic policy and education policy at the different levels of competencies
- A focus will be put on simplification

The strategy will further rely on the “Pôles de compétitivité” (Competitiveness Poles), for which new transversal axes will be added (“Creative economy”, ICT, etc.).

Furthermore, the government has decided, in the broader context of rationalisation, simplification and alignment of support programmes, to merge AST (Agency for Technological Support), ASE (Agency for Economic Support) and AWT (Walloon Agency for Telecommunications) into one single agency called Agency for Enterprise and Innovation (AEI). The merger will be operational in 2015.

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<sup>33</sup> See <http://www.creativewallonia.be/home/c-est-quoi/le-plan-creative-wallonia/introduction.htm?lng=en> (last consulted in 02/2015).

## Brussels Capital Region

The Regional Innovation Plan of the Brussels Capital Region (2006) covering the period 2007–2013 focuses on regional R&D strategic platforms, clusters and plans to increase regional R&D capacities up to the 3% target. This plan is the result of the agreement between regional government, universities, entrepreneurs and other regional stakeholders. It aimed at implementing a set of measures to improve the regional innovation capacity. It pursues six strategic objectives:

1. Promote the three most innovative sectors: ICT, Life Sciences and environment
2. Increase the rate of innovation through the implementation of specific programmes;
3. Stimulate the use of innovation through marketing research results and assistance to SMEs so that they assimilate and use innovations;
4. Foster the internationalisation of innovation;
5. Attract and anchor innovative activities;
6. Create an environment that favours innovation.

These objectives were made operational through the introduction of new support instruments and the consolidation of existing ones. The sectors were selected because of the identified potential as regards research, innovative content, growth and job creation in Brussels. In 2012, the plan has been updated in line with the EU 2020 strategy and the regional policy orientations<sup>34</sup>. The objective is to elaborate a “smart specialisation strategy” for the region by identifying the sectors in which the region will invest, in order to reshape and adapt the financial measures and instruments, rethink a governance model and align the priorities with future EU funding (ERDF, HORIZON 2020). More specifically, the main objectives of the updated Regional Innovation Plan of the Brussels Capital Region (November 2012) are the following:

1. Develop a “Smart specialisation strategy” that will benefit the overall economy and employment
2. Create a favourable environment for innovative companies
3. Increase the attractiveness of Brussels as a “hub” of European knowledge;
4. Increase participation in the Brussels European programs;
5. Strengthen the governance of innovation.

The government Agreement of October 2014 confirms this orientation towards the creation of a “Smart City”, through i.a. the creation of a new platform (in ICT cluster) in order to develop technological and training partnerships between educational, public and private actors<sup>35</sup>. The Region intends to rely much more on the European Regional Development Fund 2014–2020 to develop innovation. As indicated in the official summary of the 2014–2020 OP of the Brussels Capital Region, 19% of the overall budget is allocated to research and innovation<sup>36</sup>.

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<sup>34</sup> See <http://www.innovativebrussels.irisnet.be/fr/accueil/plan-regional/mise-a-jour-du-plan-regional-pour-l-innovation> (last consulted in 02/2015).

<sup>35</sup> <http://www.parlbruparl.irisnet.be/2014/07/declaration-de-politique-generale-du-gouvernement/>, p. 25-26 (last consulted in 02/2015).

<sup>36</sup> See [http://ec.europa.eu/regional\\_policy/index.cfm/EN/atlas/programmes/2014-2020/belgium/2014be16rfop001](http://ec.europa.eu/regional_policy/index.cfm/EN/atlas/programmes/2014-2020/belgium/2014be16rfop001) (last consulted in 02/2015).



## Flanders

The Government of Flanders is aware of the importance of STI as a necessary condition for maintaining wealth and well-being in Flanders. Already since the mid-1990s it has started to develop a broad-based strategy on STI policy and consistently increased the public budget for STI. This STI-strategy is developed through a number of agreements, initiatives and statements, including the government agreement with the policy priorities for the five-yearly parliamentary term, the policy note of the minister charged with scientific research and innovation and the annual policy letters, a number of multi-annual strategic plans, concept papers and targets. These include the Flemish Reform Programme for the Europe 2020 strategy, the Government Declaration of the Flemish Government (July 2014), and the Policy Note 2014-2019 on Work, Economy, Science and Innovation (October 2014).

Vlaanderen in Actie (Flanders in Action (ViA)) was the central statement of the Flemish Government that was setup in 2006 and revised in 2009. It was based on an agreement between the social partners, stakeholders and the government and it was aimed at making Flanders one of the top five EU regions by 2020 in terms of economic performance. The ViA plan included a number of goals related to research and innovation policies, but it is currently under revision. It is foreseen to develop a new joint strategy on key cross-cutting themes that will take the form of a transversal policy note with a long-term vision and strategy towards 2050. The initiatives and actions that were taken in the various policy domains and categorised under the ViA goals, do continue to exist and are further elaborated. The VRWI clusters that were defined in the foresight study and European benchmark exercise from 2006 have been updated in 2013-14 during a foresight 2025 exercise. On March 8, 2013, the Flemish Government approved the Concept Paper 'A smart specialisation strategy for oriented cluster policy'. Within the new EU Regional Policy period 2014-2020 (the structural funds), the regions have to document their smart specialisation strategy, before they can receive EU financial support through the Structural Funds. The Flanders' Operation Programme listed a set of 8 priority domains to this aim and was approved by the EC in December 2014.

The long-term policies of the ministers are updated and elaborated on a yearly base. The annual policy letter on innovation until 2013-2014 listed 5 strategic targets that each consists of a number of operational targets (Geerts et al., 2013). These strategic targets were determined by the objectives of the policy note for the governing period 2009-2014 and were:

- Focused innovation strategies;
- More innovative strength for the Flemish economy;
- Flanders as an innovation-friendly top region;
- Strengthen the fundamentals of science policy;
- Benefits from the research and innovation system through better impact, higher efficiency and increasing resources and R&D budget.

These objectives, based on an interaction of research and innovation with other specific policy domains and with overall socio-economic objectives, clearly demonstrates the relative importance of STI in the Flemish policy-agenda. These must take into account the significant societal as well as economic challenges, and be in line with a number of major EU initiatives, such as the EU 2020 strategy, the Commission's Flagship initiative on "Innovation Union", the objectives of the European Research Area (ERA), and the principles in the EU's Horizon 2020 programme on R&D and innovation.

After the elections from May 2014, the EWI-domain has become the responsibility of a single minister again, similar to the situation in 2006-2009<sup>37</sup>. Thereby, also a change of the policy notes related to a policy domain was executed at the same time. Thereby, four separate notes (for respectively Innovation, Economy, Public Companies, Work) that existed until 2013-14 were integrated into one single policy note for 2014-2019 on Work, Economy, Science and Innovation. This falls under the responsibility of the Flemish minister for Work, Economy, Innovation and Sports. The new Policy notes 2014-19 of the Flemish Government have been under discussion in the inter-cabinets working group and in the relevant committees of the Flemish Parliament in Autumn 2014. In particular, the Policy Note Work, Economy, Research and Innovation 2014-2019 of the Flemish Government has been submitted to the Parliament on October 24th and discussed in the relevant committee until December the 6<sup>th</sup>. It was approved in a plenary session of the Parliament<sup>38</sup> and is available on-line<sup>39</sup>.

In recent years, the Flemish government has further elaborated and shifted its STI strategy in various ways, namely through various measures to widen the support to the innovation trajectory, to stimulate diffusion of innovation esp. among SMEs, to better facilitate the access to finance, to further stimulate demand-driven initiatives as well as initiatives in the field of grand challenges, and to continue the net increase of the available public budget for STI, etc. Examples of these measures include:

- the setup of the TINA fund<sup>40</sup> for transformation the economy by innovation;
- the SOFI and SOFI2<sup>41</sup> fund for the setup of spin-off companies from research results at universities and PROs;
- 4 'proeftuinen' (living laboratories on the topics of social innovation, electric vehicle, care innovation space Flanders, construction renovation)<sup>42</sup>;
- SPRINT-projects for innovation projects in large companies<sup>43</sup> (see also description under "2.3 National Reform Programme 2014");
- VIS IV-trajectories for so-called "innovation follower" companies;
- A campaign "ikinnoveer" to increase the innovation capacity of SMEs;
- a call for proposals for themes of the EU KET-roadmap;
- the call for projects on social innovation;
- the establishment of a new strategic research centre on smart manufacturing ("Flanders Make")<sup>44</sup>;
- the establishment of a new initiative on innovative sustainable chemistry (FISCH)<sup>45</sup>;
- a new programme on transformative medical research (TGO)<sup>46</sup>;

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<sup>37</sup> See <http://www.vlaanderen.be/nl/publicaties/detail/het-regeerakkoord-van-de-vlaamse-regering-2014-2019> (last consulted in 02/2015).

<sup>38</sup> <http://www.vlaamsparlament.be/Proteus5/showParlInitiatief.action?id=934670>

<sup>39</sup> See <http://www.vlaanderen.be/nl/publicaties/detail/beleidsnota-2014-2019-werk-economie-wetenschap-en-innovatie> (last consulted in 02/2015).

<sup>40</sup> See <http://www.vlaandereninactie.be/projecten/tina-fonds> (last consulted in 02/2015).

<sup>41</sup> See <http://www.pmv.eu/nl/diensten/sofi> (last consulted in 02/2015).

<sup>42</sup> See <http://www.ond.vlaanderen.be/proeftuinen/> (last consulted in 02/2015).

<sup>43</sup> See <http://www.vlaanderen.be/nl/ondernemen/groeien-en-investeren/subsidie-voor-eeen-sprint-project> (last consulted in 02/2015).

<sup>44</sup> See <http://www.flandersmake.be/> (last consulted in 02/2015).

<sup>45</sup> See <http://www.fi-sch.be/nl/> (last consulted in 02/2015).

- the re-orientation of the excellence centres into innovation platforms (Lichte Structuren)<sup>47</sup> with a minimal overhead structure, etc.

In 2014, a first edition was published of a publication in English, “STI in Flanders”, which describes the Flanders’ R&D&I public authorities, institutes, (new) policy priorities, international linkages, as well as a large set of key data and indicators<sup>48</sup>.

As stated earlier, the public budget for R&D&I experienced a net-increase even during difficult budgetary periods, whereby the R&D-intensity reached its highest level ever: 2.42% in 2012 (final data). In 2014, the public budget for science increased net by 73.9 million euro, of which 67.3 million euro for R&D. Total science and innovation budget of the Flemish authority reaches €2,176 billion, of which €1,354 billion for R&D (2014). For 2015, an additional 20 million euro is budgeted for Hermesfonds and an additional million for the Special Research Fund (BOF). Moreover, the Flemish Ministry of Education and Training budgeted an additional 10.250 million euro for R&D in the context of the integration of the higher education. For 2014-19, the Government Agreement states that for economy and innovation, 3 focal points are a priority (p.21 Flemish Government agreement 2014-19):

- a demand-driven and market-oriented public policy in the field of economy and innovation;
- a simplification and rationalisation of structures and instruments with faster and easier procedures, more transparency and client-friendly-ness and a clear one-stop-shop function;
- a higher focus on business-oriented innovation and valorisation, strong knowledge organisations with excellent research and a growth path for the 3%-target for R&D whereby public outlays strive towards 1% by 2020.

The parts on STI are enlisted in these topics:

- New industrial entrepreneurship and cluster policy;
- SME-oriented innovation policy;
- Invest in an excellent knowledge basis.

Furthermore, under the topic “an enterprise-friendly authority”, it is stated that the innovation agency IWT will be merged with Enterprise Flanders into an Agentschap voor Ondernemen en Innovatie (AOI) (Agency for Entrepreneurship and Innovation) that will act as a one-stop-shop for all business support measures. The Hercules Foundation will be merged with the Flanders Research Council, FWO, and it will be considered which tasks from IWT can better be integrated into the FWO. The new minister for Work, Economy and Innovation also puts a strong emphasis on strengthening cooperation among companies as well as between companies and knowledge institutes. Specifically for projects from large companies and from large companies and other R&D-knowledge intensive businesses it is assumed that cooperation with other companies – and especially SME’s – and knowledge institutes in a Flemish or an international context is common practice rather than an exception. In this framework there is also the renewed clustering policy that aims to

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<sup>46</sup> See <http://www.iwt.be/subsidies/tgo> (last consulted in 02/2015).

<sup>47</sup> See <http://www.iwt.be/subsidies/innovatieplatformen> (last consulted in 02/2015).

<sup>48</sup> See updated version of January 2015: <http://www.vlaanderen.be/nl/publicaties/detail/sti-in-flanders-science-technology-and-innovation-policy-and-key-figures-2014-1> (last consulted in 02/2015).

encourage enterprises to establish effective (demand-driven) partnerships with clear engagements from each participant.

### **2.3 National Reform Programme 2014**

The key R&I relevant aspects of Belgium's NRP 2014 can be summarized as follows.

#### Increasing cross-regional cooperation

For the purpose of strengthening cooperation between the Regions, Brussels-Capital participated in a joint call with the Flemish Region under the programme "ZorginnovatieRuimte Vlaanderen" (Care Innovation Space Flanders)<sup>49</sup>. This programme was organised as Living Labs and aims at boosting innovation in healthcare for elderly people by supporting innovative projects on all related aspects. Moreover, the programme ICON<sup>50</sup> of iMinds has been opened for companies located in the Brussels Region and the programme WB Move has also been opened for Brussels research organizations. Furthermore, in the framework of the transversal technology intelligence platform initiated in the Federal Government economic stimulus plan, it was decided to create an online database on innovation in order to pool information. This database is managed by the planning office and is available since January 2015.

#### Increased fiscal support for R&D

The fiscal support policy for R&D was intensified in 2013, particularly with regard to the payroll tax exemption for researchers (an increase from 75% to 80% as from 1 July 2013).

#### Unitary Patent Protection

The European Agreement of 19 February 2013 on the Unified Patent Court (UPC) was ratified by the Federal Parliament. The UPC Agreement constitutes a crucial step in the development of the European patent with unitary effect, as intended in regulation 1257/2012 of 7 December 2012 implementing enhanced cooperation in the area of the creation of unitary patent protection.

#### Strengthening and diversifying funding schemes

Under Wallonia's Marshall Plan 2.Green, 61 million EUR has been allocated to: competitive clusters, with additional support for public/private partnerships (5 million EUR), specific programmes focusing on SMEs, particularly as regards cooperation with research centres and knowledge transfer (10 million EUR) and "green support" to young innovative enterprises (5 million EUR); to R&D programmes on thematic priorities of the Research Strategy, particularly for ICT, sustainable development, energy, health; and to a programme of excellence on industrial redeployment towards an ecological transition (14 million EUR). A call for social innovation has also been launched, as well as a new arrangement for

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<sup>49</sup> See <http://www.iwt.be/subsidies/proeftuinzorg> (last consulted in 02/2015).

<sup>50</sup> <http://www.iminds.be/en/succeed-with-digital-research/co-operative-research/icon-research-program>

researchers' mobility. The decree on scientific research funds allowing the related financial efforts (yearly more than 100 million EUR) to be sustained has been adopted. Moreover, the financing of the Fund for strategic fundamental research is sustained for its two strategic pillars: research on sustainable development (5 million EUR/year) and life sciences (6 million EUR/year). Finally, the decree on research and innovation support has been amended to introduce maturation funds and new subsidies for the purchase of exceptional equipment, to group registered research centres together in research institutes and to open innovation partnerships to non-technological innovation and to international partners in the research consortium.

In implementing its strategy for Research, Development and Innovation, the Brussels-Capital Region supported various projects in the priority domains of ICT, life sciences and sustainable development for a total amount of 33 million EUR in 2013. In 2014, the Region's R&D budget will reach 46 million EUR in commitment appropriations. The recent 2014 Government declaration foresees to at least maintain overall budgets for R&D and new programmes have been launched (see e.g. the programme "Co-create" living labs<sup>51</sup>).

Flanders also plans to allocate additional funds to R&D and innovation again in 2014. An additional 45 million budget is planned following the agreement on the competitiveness pact in December 2013. Moreover, 18.9 million EUR has been released for the integration of higher education within the Flemish Community<sup>52</sup>. In the beginning of 2014, an additional 10 million EUR was allocated to the spin-offs funding instrument fund (SOFI) of the Flanders Holding Company (PMV) to support innovative spin-offs. During Summer 2013, the Flemish Government decided to set up a strategic research centre (SOC) for the manufacturing sector within which companies, research centres and universities cooperate to do high-level research for the manufacturing industry. It bundles forces of the Flanders' Mechatronics Technology Centre (FMTC), Flanders' DRIVE, and laboratories from five Flemish universities, to support manufacturing companies with pre-competitive research in order to strengthen international competitiveness. Aim is to steer technological research and innovation (mechatronics, product development and production technologies) to the industry needs to reach higher added value for a competitive international manufacturing industry in Flanders. In October 2014, the new Flanders' Make centre was officially opened. Under the strategic action plan for Limburg (SALK), several initiatives in the field of research have been taken in addition to economic initiatives. For instance, a research group of VIB (biotechnology) on immune diseases, a Careville Limburg lab dedicated to innovations in healthcare for elderly people, the Digital Health Innovation (DHI) expertise centre and an incubator (iMinds) on ICT and digital media for technological enterprises will be set up in Limburg. In 2012, social innovation developed around three pillars: innovation in the workplace (Flanders' Synergy); social entrepreneurship (Sociale Innovatiefabriek (SIF), which started its activities in October 2013 and support for social innovation in general (through a call for social innovation roadmaps in 2013). Different initiatives in healthcare innovation were also supported in 2013. The Sprint projects, which are a new aid channel for innovative companies, were launched as from 2013. A Sprint project is especially aimed

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<sup>51</sup> See [http://www.innoviris.be/fr/soutien-financier-entreprises/programmes-bruxellois/co-create-living-labs?set\\_language=fr](http://www.innoviris.be/fr/soutien-financier-entreprises/programmes-bruxellois/co-create-living-labs?set_language=fr) (last consulted in 02/2015).

<sup>52</sup> In 2013-2014, the further integration of the higher education sector into bigger 'university associations' has been continued. This rationalization process has led to scale effects and substantial savings (though mutualisation of services for instance).

at large companies with a development project with limited scope, allowing them to develop or gather and apply new knowledge for an important innovation. In 2013, some 19 projects were approved for a total aid amount of 3.2 million EUR. That same year, a specific (pilot) call was launched for Flemish innovation partnership roadmaps dedicated to innovation followers (VIS trajectIV). These roadmaps or paths aim at speeding up the transition from innovation to market for companies that are not proactive as regards innovation and do not develop new products, processes or services themselves, but implement or use them. Sixteen projects have been selected for financial aid for a total amount of around 4.6 million EUR.

### Reindustrialisation, KETs and technology deployment

To support re-industrialisation, the Belgian authorities also aims at strengthening the ecosystem around innovative large companies and SMEs to improve the competitive position of the indigenous industry in global value chains.

In Wallonia, this target is pursued by developing competitiveness clusters and by the Plan Creative Wallonia, which is aimed at boosting the development of a creative economy. In 2013, different projects were started, among others a call for “living labs” projects (e-health and Open domain)<sup>53</sup>, a mobile fast prototyping lab, a premium for guidance in the creative economy, a call for “creative hubs”, “digital cities” and digital school projects, and several projects on training and creativity. A “Wallonia Big data” platform for competitiveness clusters is due to be set up in 2015 and the start-up accelerator Nest’Up<sup>54</sup> will be developed with hosting, finance and guidance services.

The phased plan of the concept note ‘a strategy of smart specialisation for a well-targeted cluster policy’, adopted on 8 March 2013 by the Flemish Government, includes a pre-roadmap for a policy of advanced clusters during the legislative period 2014-2019. Since November 2013, pilot trajectories have been started in the fields of sustainable chemistry, additive manufacturing and critical metals to develop a partnership to design a roadmap for clusters. These pilots for developing new cluster policies explored the conditions for strategic cooperation between government services and cluster organisations on the wide range of policies (innovation, training, trade, regulation needed to accomplish the transformation objectives with roadmaps for concrete cases. As a result the pre-conditions for such strategic cooperation on the side of cluster management and government are better understood (the need for specific competences and planning priorities). Under “innovative procurement”, several projects in fields such as agriculture, education, mobility, labour market, etc. are in a pre-commercial phase. In order to support the Flemish global approach for the six key technologies (KET), a call for roadmaps was issued in 2013. The KET roadmaps have been completed in 2014 and will be presented for conclusions early 2015. In October 2013, a new campaign, “ikinnover!”, was launched to increase the innovation potential of Flemish SMEs and promote innovation in general among SMEs. This initiative was repeated at the end of 2014.

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<sup>53</sup> See <http://www.thelabs.be/well> (last consulted in 02/2015).

<sup>54</sup> See <http://www.creativewallonia.be/projets/creative-business/nest-up.htm?lng=fr> (last consulted in 02/2015).

In the Brussels-Capital Region, a strategic platform with a budget of 8.2 million EUR in e-health was set up at the end of 2013, allowing ICT solutions in the health sector to be developed. Supplementing similar arrangements dedicated to the environment and encouraging academic and industrial collaborations, it aims at shortening the transition between research and economic development. Similarly, a pilot programme of "innovation cheques" (programme "BOOST")<sup>55</sup> was created at the end of 2013 to allow SMEs to receive strategic advice on innovation and technological guidance services given by regional research centres. In 2014, a strategic platform focused on information security was set up<sup>56</sup>. The allocated budget amounted to around 6 million EUR.

## **2.4 Policy developments related to Council Country Specific Recommendations**

With regard to research and innovation, the Council of the European Union recommended in July 2014 Belgium to "(...) restore competitiveness by (...) promoting innovation through streamlined incentive schemes and reduced administrative barriers (...)". Innovation support was considered "well developed and covers the full innovation cycle but has become complex and is fragmented" (Recommendations of the Council to Belgium, 8 July 2014, Official Journal of the European Union C247/4-5).

In this regard, the federal Government Agreement of 1 December 2011 had already suggested an "inter-federal plan for research and innovation" to coordinate efforts of all entities towards this objective. The new Federal Government of October 2014 aims at reinforcing policy coordination with all other federated entities of the country. In this regard, it announces the establishment of a repertory of all federal measures (grants, subsidies, fiscal measures) of relevance for all governance levels. All regions and the Federal Government also foresee the extension of programmes dealing with administrative simplification, often (but not exclusively) in the context of the further implementation of the SBA.

The simplification of the institutional landscape and improved coherence and efficiency of public actions were also a major objective of the Belgian authorities. In Wallonia, for instance, the decree on setting up an agency for entrepreneurship and innovation was adopted at the beginning of 2014 and an optimisation process for R&D support management is in progress, and the simplification and rationalization of the instruments' portfolio is a key pillar of the new, 2014 Governmental Agreement<sup>57</sup>. The landscape of support to R&D will also be deeply simplified, notably by reducing the variety of calls (see new research and innovation decree and R&I strategy). The Government declaration 2014-2019 of the Flemish Government states that innovation agency IWT will be merged with Enterprise Flanders agency into an Agentschap voor Ondernemen en Innovatie (AOI) (Agency for Entrepreneurship and Innovation) that will act as a one-stop-shop for all

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<sup>55</sup> See <http://www.innoviris.be/fr/guidance-et-reseautage/guidance/boost-innovation-vouchers> (last consulted in 02/2015).

<sup>56</sup> See <http://www.innoviris.be/fr/soutien-financier-aux-organismes-de-recherche/programmes-bruxellois/bridge-strategic-platforms> (last consulted in 02/2015).

<sup>57</sup> <http://gouvernement.wallonie.be/sites/default/files/nodes/story/6371-dpr2014-2019.pdf>, p. 33-34 (last consulted in 02/2015).

business support measures. The Hercules Foundation will be merged with the Flanders Research Council, FWO, and it will be considered which tasks from IWT can better be integrated into the FWO. For the implementation of its Regional Plan for Innovation, the Brussels-Capital Region has increased its support to RDI regional players wishing to take part in European programmes and partnerships<sup>58</sup>.

## **2.5 Funding trends**

### **2.5.1 Funding flows**

Overall

All Belgian authorities are committed to the 3% target, both at the federal level and the regional or community levels. Equally agreed upon is the target to finance 1% of this R&D from public sources; i.e. government and higher education. These objectives have been repeated in the July 2014 Regional Government Agreements and in the October 2014 Federal Government Agreement.

The latest provisional figures for research and development indicate that Belgium has in 2013 invested 2.28% (provisional) of its GDP in R&D. This is a historical record for the country and a trend that is in line with the EU target of 3% for 2020.

As part of its science policy, the federal government financially supports the Belgian actors involved in the innovation effort of the country to enable Belgium to be an economy increasingly oriented towards knowledge. Besides fiscal incentives, the Federal level still plays an important role in funding and coordinating international cooperation agreements at national level (e.g. coordinating participation in ESA programmes, CERN research effort, etc). This policy is part of the EU 2020 Strategy to promote smart, sustainable and inclusive growth in member countries to establish conditions conducive to competitiveness and higher employment rates. In particular, one of the five objectives of this strategy is to achieve a level of investment in R&D of 3% of European GDP.

In this context, the Federal Science Policy Office, in consultation with the Belgian federated entities, has released the final figures for R&D based on data collected in 2013 for the period 2011-2012. These figures indicate an investment in R&D which corresponds to 2.15% of Belgian GDP in 2011 and 2.24% in 2012. This R&D intensity decreased after 2001 to reach a level of 1.83% of GDP in 2005, and was followed by a systematic annual increase from 2006 to reach a record for Belgium of 2.24% of GDP in 2012 or €8.7b. Provisional data for 2013 reveal an R&D intensity of 2.28%.

In comparison with its European neighbours, Belgium is behind Germany (2.92%) and France (2.26%), but ahead of the Netherlands (2.16%) and the United Kingdom (1.72%).

The upward trend in the Belgian R&D intensity illustrates the serious involvement of Belgium in innovation as the country manages to maintain the growth of its R&D efforts over GDP growth. These figures are encouraging for Belgium because R&D is one key indicator (but not only) of the efforts made by Belgium in relation to its innovation system.

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<sup>58</sup> <http://www.innovativebrussels.irisnet.be/fr/accueil/plan-regional/mise-a-jour-du-plan-regional-pour-l-innovation-1>, p. 23-24 (last consulted in 02/2015).



The upward trend of R&D in Belgium for the period 2011-2012 is largely explained by the R&D performed by firms, which account for 69%<sup>59</sup> of spending in Belgium (2012). The private component of R&D, strongly linked to the economic situation, saw its growth fall in 2009 before a strong recovery in 2010, 2011 and 2012. This recovery is supported by some of the major private players in the Belgian technological landscape, but the trend is also positive for the rest of the companies.

Public actors (government and higher education) also contribute significantly to the increase of the Belgian high R&D growth. The annual growth rate of R&D in the government sector from 2011 to 2012 was 4.2% and in the higher education sector 6.6% (against 1.5% in the private sector).

Total public funding of R&D in Belgium amounted to €3.5 billion. Government budgetary appropriations for R&D (GBAORD) in Belgium were €2.4 billion in 2012, a slight increase from 2009. The latest provisional figure for 2013 indicates the GBAORD amounted to €2.5 billion in 2013. In absolute terms, although all regional authorities have succeeded to increase the GBAORD, this increase is lower than GDP growth rate, so public R&D intensity is stable at around 0.7% of GDP. Furthermore, forgone revenues, due to the various fiscal measures to stimulate R&D activities, steadily increased to reach almost one third of total public funding (€1.1 billion) in 2010. The latest available data regarding RDI tax incentives show a substantial increase of foregone revenues for the treasury. Withholding tax exemptions increased from 651 million € in 2012 up to 696 million € in 2013 (an increase of 14%). Between 2011 and 2012 (latest figures available) the patent income deductions increased from 113 million € to 193 million €. The investment tax deductions related to R&D increased just slightly (from 346 up to 352 million €).

In 2012, 69% of intramural R&D expenditure was performed in the business sector (EU28: 63.5%) and 21.8% in the higher education sector (EU28: 23.4%). The share of research performed in the government sector in 2012 (8.8%) is below the EU28 average (12.2%).

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<sup>59</sup> Estimated.

**Table 1: Basic indicators for R&D investments\* (please provide this data up until the last available year)**

	2009	2010	2011	2012	2013	EU28 (2013)**
GDP growth rate	-2.8	2.3	1.8	-0.1	0.2	0.1
GERD (% of GDP)	1.97	2.05	2.15	2.24e	2.28p	2.02e
GERD (euro per capita)	642.1	690.7	742.8	784.8p	807.6e	539.2e
GBAORD - Total R&D appropriations (€ million)	2 289.37	2 375.04 6	2 395.55 1	2 489.55 2	2 537.71 8p	90 505.611
R&D funded by Business Enterprise Sector (% of GDP)	1.16%	1.18%	1.29%	N/A	N/A	1.08% (2011)
R&D funded by Private non-profit	0.02%	0.01%	0.01%	N/A	N/A	0.03% <sup>e</sup> (2012)
R&D funded from abroad	0.24%	0.27%	0.28%	n.a	n.a	0.18% (2011)
R&D performed by HEIs (% of GERD)	23.8%	23.5%	22.3%	21.8% <sup>e</sup>	21.7% <sup>p</sup>	23.4% <sup>e</sup> (2012) and 23.2% <sup>p</sup> (2013)
R&D performed by Government Sector (% of GERD)	8.9%	8.4%	8.1%	8.8% <sup>e</sup>	8.8% <sup>p</sup>	12.2% <sup>e</sup> (2012) and 12.2% <sup>p</sup> (2013)
R&D performed by Business Enterprise Sector (% of GERD)	66.3%	67.1%	68.7%	69.0% <sup>e</sup>	69.1% <sup>p</sup>	63.5% <sup>e</sup> (2012) and 63.8% <sup>p</sup> (2013)
Share of competitive vs. institutional public funding for R&D	N/A	N/A	N/A	N/A	N/A	N/A
Employment in high- and medium-high-technology manufacturing sectors as share of total employment	5.2%	5.3%	5.2%	5.0%	4.7%	5.6%
Employment in knowledge-intensive service sectors as share of total employment	46.1%	46.1%	46.2%	47.6%	46.7%	39.2%
Turnover from Innovation as % of total turnover	9.5%	12.4%				13.4% (EU-27, 2010)

Source: Eurostat

In 2012, Belgium employed 110,031 people in the R&D sector, including 65,979 researchers. 50% of researchers are employed in private companies and 43% in higher education institutions. The figures for researchers are characterised by a continuous rise in recent years, with a particularly sharp increase in the number of researchers employed by private companies in 2010, 2011 and 2012. This increase is supported by the significant efforts of the government in recent years in relation to the R&D tax credits via an exemption of 80% (75% before 2013) of withholding tax for researcher' salaries (also valid in other sectors, particularly universities). In addition to these tax incentives for researchers, benefits also exist for companies that file patents and those that invest in research infrastructure.

Belgian academic researchers are relatively productive with a share of 1.1% of the total world publication output in 2011 (BELSPO, 2013). On average in 2011, Belgium produces 22.63 publications per 10,000 inhabitants, well above the EU-28 average (13.69). They are also internationally oriented with 50.66% of publications internationally co-published. In terms of public-private co-publications per million publication, Belgium scores 97.1 in 2013 against 52.8 for the EU27 (European Commission, 2014). In 2011, Belgium had about 1300 international scientific co-publications per million population (compared to 350 for the EU27) (Deloitte, 2013). In 2008, nearly 14% of Belgian scientific publications were in the top 10% most cited publications worldwide in comparison with 11% of top scientific publications produced in the EU27 (Deloitte, 2013). PCT patent applications (per billion GDP) amount to 3.73 in 2013. This performance is slightly lower than the EU27 average of 3.9 (European Commission, 2014). Licence and patent revenues from abroad represent 0.5% of GDP in Belgium in 2013 against 0.58% for the EU27 average. The relative performance of Belgium to the EU28 in terms of SMEs with product and/or process innovations is 131 in 2013 (European Commission, 2014). For SMEs with marketing and/or organizational innovation, Belgium scores 104. The same figure is observed for the share of fast growing firms in the economy.

The structure of Belgium's SME sector is very similar to that of the EU28. This is reflected in, for example, the similar distribution of SMEs and large companies in the business economy. In 2012, there were 511,726 SMEs (99.8%) and 840 large enterprises (0.2%) totalling 68.9% and 31.1% of total employment. According to the SBA Factsheet Belgium (2013), Belgium's SMEs have weathered the crisis much better than those of most other Member States. Employment in Belgian SMEs increased by 4% between 2008 and 2012, while in many other Member States this period was associated with considerable job losses in SMEs.

The total entrepreneurial activity (TEA) is particularly low compared to innovation-driven economies in the EU. The diffusion power of the Belgian innovation system is in general considered to be low, the R&D and innovation efforts have yet to bring sufficient new activities capable of ensuring economic development of the country. Even if manufacturing industries and services with high technological content, such as pharmaceuticals or ICT activities, have a strong importance in Belgium the added value is indeed rather low. Gross value-added of the industry in 2010 was 12.8%.<sup>60</sup> Furthermore if one considers the lower level in Belgium as compared to the EU-28 of the community trademarks and designs (performance of 90 relatively to the EU28 (=100)), European Commission, 2014), the R&D and innovation efforts do not seem to lead to significant economic outputs.

Funding from the European level is an important source of research funding in Belgium, for instance, under FP6, Belgian researchers secured funding of close to €700m. As reported in the 2013 Belgian annual report on STI indicators (BELSPO, 2013b), for Belgium, the most popular FP7 thematic areas are "Information and Communication Technologies" and "People", followed by "Transport (including Aeronautics)", "Health" and "Research for the Benefit of the SMEs". This is also reflected by a high percentage (>12.5%) of Belgian project partners with a role as coordinator for the thematic areas "Information and Communication Technologies" and "Health", which is less the case for "Transport (including Aeronautics)" and "Research for the Benefit of the SMEs". Another feature is the high

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<sup>60</sup> Own calculations based on <http://www.nbb.be/belgostat/>

percentage (almost 15%) of Belgian project coordinators in the thematic area “Space”. This means that Belgium has a significant amount of very good and experienced researchers in this domain, a statement that is supported by one of the highest success ratios. In contrast, the thematic area “Nanosciences, Nanotechnologies, Materials and new Production Technologies” has also a very high percentage of Belgian project partners with a role as coordinator, but the success ratio of this group is much lower than that of the thematic area in general (19.2% vs. 34.7%). This suggests that Belgian project coordinators would benefit from some support. The same conclusion can be drawn for the thematic area “Research Infrastructures”, with a significant difference between the rates of success of projects with at least one Belgian partner involved (39%) and the ones led by a Belgian partner (15.79%). On the other hand, the success rate for a project increases considerably when the Belgian project partner is taking the lead of a project in the thematic area “Security” (23.2% vs. 36.8%).

In the European context, Belgium’s performance is above average (BELSPO, 2013b). In terms of total number of applicants, Belgium is positioned at an eight place when comparing EU-27. This is slightly better as one would expect based on the number of habitants (tenth place). Because it is difficult to compare a high variety of countries in Europe, it is ‘fairer’ to compare the total number of applicants to the number of inhabitants in a country. Also for this indicator Belgium is holding the eighth position, but doing much better than the European mean. Belgium is best in class when it comes to overall success rate.

**Table 2. Funding through FP6/FP7 projects**

Funding through FP6 projects			Funding through FP7 projects		
no of projects	no of participants	EC financial contribution to partners from country (Euros)	no of projects	no of participants	EC financial contribution to partners from country (Euros)
1,983	3,126	723,156,856	3,915	5,876	1,943,437,875

Source: BELSPO (2013b), p. 70-73.

The financial allocations of regional policy for Belgium over the new period 2014-2020 amount to €2.28b. Almost half of this budget (€1.04b) concerns transition regions all based in Wallonia<sup>61</sup>.

According to the Ernst & Young’s 2013 Barometer on Belgium’s Attractiveness<sup>62</sup>, in 2012, 169 new foreign investment projects were launched in Belgium. This is a 10.5% increase from the previous year and is the country’s best figure since 2007. Meanwhile, Europe has witnessed an overall decrease in the number of foreign investments by 2.8%, underlining that Belgium is among the top destinations for foreign investment on the continent. Belgium has an open economy, and foreign investment plays a critical role in it. The latest data reveal strong levels of investment across all three of Belgium’s regions. Although Flanders remains the first destination for foreign investment, with a total of 80 new

<sup>61</sup> <http://www.internationalentrepreneurship.com/total-entrepreneurial-activity/> (last consulted in 02/2015).

<sup>62</sup> [http://www.ey.com/Publication/vwLUAssets/Belgium\\_Attractiveness\\_Survey\\_2013\\_FR/\\$FILE/Belgium-Attractiveness-Survey-2013\\_FR.pdf](http://www.ey.com/Publication/vwLUAssets/Belgium_Attractiveness_Survey_2013_FR/$FILE/Belgium-Attractiveness-Survey-2013_FR.pdf) (last consulted in 02/2015).

investments in 2012, Wallonia made a significant comeback in 2012, with new investments rising from 39 to 52. Additionally, there were 37 investments in the Brussels Capital region.

### Thematic versus Generic Funding

The share of the total GBAORD (Total civil R&D appropriations) allocated for specific thematic priorities amounts in 2012 to 57.1%. Compared to the EU28 (47.1%), this share is relatively high. The table below shows the distribution (in %) of GBAORD by socio economic objectives (2012).

**Table 3: Distribution (in %) of GBAORD by socio economic objectives (2012)**

	Belgium	EU28
Exploration & exploitation of the earth	0.5	1.8
Environment	2.3	2.6
Exploration & exploitation of the space	8.7	4.9
Transport, telecom, etc.	2.1	2.9
Energy	2.2	4.1
Industrial production & technology	33.1	9.1
Health	1.9	8.6
Agriculture	1.5	3.6
Education	0.3	1.1
Culture, mass media	1.9	1.1
Political & social systems	3.5	3.1
GUF	16.5	34.1
General advance of technology	25.4	18.0
Defence	0.2	5.0

### 2.5.2 Project vs. institutional allocation of public funding

The main public bodies responsible for allocating research and innovation funds are, given the strongly “devolved” character of the Belgian research and innovation system, different between the federal level, the regions and the communities<sup>63</sup>.

The Flemish Parliament Act on financing the universities and HEIs in Flanders of 2009<sup>64</sup>, describes the mechanism for the allocation of institutional funding in Flanders. The Flemish Parliament Act on the organisation and budgeting of Science and Innovation policy of 2009<sup>65</sup> (adapted afterwards and for the last time in 2014, see above) sets the framework for the organisation and the budgeting of Flemish RTD policy and FWO (fundamental research), IWT (industrial and strategic research) and Hercules Foundation (research

<sup>63</sup> See section 1.3 ‘structure and governance of the research system’.

<sup>64</sup> Flemish Parliament Act on financing the universities and HEIs, 26/06/2008:

<http://www.ond.vlaanderen.be/edulex/database/document/document.asp?docid=13988> (last consulted in 02/2015).

<sup>65</sup> The Flemish Parliament Act on the organisation and budgeting of Science and Innovation policy, 30/04/2009: <http://www.ond.vlaanderen.be/edulex/database/document/document.asp?docid=14104> (last consulted in 02/2015).

infrastructure), and a number of institutes that receive funding<sup>66</sup>. In Flanders, the Flemish Government defines policy orientations and provides institutional funding to HEIs. Its main funding instrument is the Special Research Fund (BOF) allocated depending on defined criteria (the so-called 'BOF-key', see below).

The Decree covering research, development and innovation activities in Wallonia of 2008<sup>67</sup> provides the legal basis for the regional measures covering research and innovation. It has been reviewed in 2015 (3<sup>rd</sup> reading on the 2/04/15).

The Brussels-Capital 2009 Ordinance aiming at promoting research, development and innovation<sup>68</sup> provides the legal basis for the regional measures covering research and innovation. In the French Community, the National Scientific Research Fund (F.R.S-FNRS) aims at stimulating new scientific knowledge in all scientific areas. It supports projects following a bottom-up approach. Its experts assess projects proposed by individual researchers and research teams (competitive project funding).

This “devolved” governance system makes all the more complex (if not impossible) to make a statement regarding the institutional versus competitive shares in RDI funding in Belgium, since there may be differences between levels of governance and regions/communities in the way funding is attributed. Moreover, in Belgium (as in many other countries) universities benefit from a large autonomy to allocated funds as they wish (either top-down according to predefined research agendas and strategies or fully bottom-up and competitively; in some cases mixed systems co-exist as well). Therefore, there are no precise statistics on the share of institutional versus competitive public funding. The only useable and available data are the ones provided by BELSPO (Belgian Science Policy Office) that regroup all Government budget appropriations or outlays for R&D (GBAORD) (all levels: federal, regions, communities) according to their ‘purpose’ (i.e. ‘institutional’ or ‘functional’)<sup>69</sup>.

GBAORD statistics are deduced from the ex-ante data based on the budgets of the competent authorities. These statistics give an overview of the estimation of R&D expenditure by the public authorities and are consequently less precise. However, they have the advantage of being available quite rapidly. Here, appropriations are classified according to their purpose, whatever the budget (such as the federal, regional and community authorities) from which these appropriations arise. For this purpose, the “Belgian nomenclature for the analysis and comparison of estimations for the R&D budget appropriations or outlays of the Belgian authorities”, also called CFS/STAT nomenclature, has been used. It presents broad categories and statistical series that take into account the means attributed to every function. Hence, the classification used is aimed at systematically presenting the intentions of the authorities rather than the detailed contents of the R&D activities financed. The purpose can be:

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<sup>66</sup> It has been decided that IWT will be merged in the course of 2015 partly with FWO and partly with the Enterprise Agency (Agentschap Ondernemen) (see above section 1.3).

<sup>67</sup> Decree covering research, development and innovation activities in Wallonia, 3/07/2008: <http://wallex.wallonie.be/index.php?doc=11217> (last consulted in 02/2015).

<sup>68</sup> Ordinance aiming at promoting research, development and innovation, 26/03/2009: [http://www.innoviris.be/site/wp-content/documents/legal\\_documents/nouvelle\\_oronnance.pdf](http://www.innoviris.be/site/wp-content/documents/legal_documents/nouvelle_oronnance.pdf) (last consulted in 02/2015).

<sup>69</sup> See tables and statistics under “GBAORD: overview 1989–2013 per institutional or functional purpose” at [http://www.stis.belspo.be/en/stat\\_stat.asp](http://www.stis.belspo.be/en/stat_stat.asp) (last consulted in 02/2015).

- Institutional: higher education; scientific institutions; etc.
- Functional: R&D action programmes; funds for university, basic, industrial or applied research, etc.

This classification between ‘institutional’ and ‘functional’ does not correspond to the abovementioned distinction proposed by the OECD between (non-competitively allocated institutional) ‘block funding’, ‘competitively allocated institutional funding’ and ‘competitively-allocated project-funding’.

In the context of this report, we consider ‘institutional purpose’ as largely non-competitive block funding. Typical institutional ‘block funding’ is e.g. budget line 110 “Functioning of the universities stricto sensu” or 210 “Scientific Institutions”. These budgets largely correspond to ‘non-competitive block funding’ or are allocated based on the evolution of staff or numbers of students. ‘Functional purpose’ largely (but not exclusively) corresponds to competitive allocation of funding, through either competitive institutional funding or project-funding. Typical examples are the ‘inter-university attraction poles’ (IUAP, line 430), which funds networks of excellence at Belgian level following competitive calls for proposals every five years, or the Funds for Scientific Research (line 510, FNRS in the Brussels-Wallonia Federation / French Community or FWO in the Flemish Community), which allocates grants to Belgium’s best researchers following competitive calls each year. IUAP funding is rather competitive institutional funding as it offers competitive long-term support to networks, regardless of the projects carried out in the context of their programming (they can combine federal PAI support with community-level FWO or FNRS grants)<sup>70</sup>. FWO- or FNRS-grants are competitive project-funding<sup>71</sup>. But for some other, large parts of the so-called ‘institutional funding’ there may be a mix of (non-competitively allocated) ‘block funding’ and competitively allocated institutional funding (because of the large autonomy given to universities – see supra). Similarly (as shown above), within ‘functional funding’ there is a mix of competitively allocated institutional funding and project-funding.

According to this distinction, the share of competitive funding (i.e. ‘functional funding’) versus ‘institutional funding’ is almost the same in Belgium: about 52% appears ‘institutional funding’ and 48% is classified as ‘competitive funding’ (provisional figures for 2013). However, it is noticeable that the share of ‘competitive funding’ has been increasing significantly over the past 25 years: at the beginning of the nineties it represented around one-third of total public funding, against almost half of it nowadays. Over the past three years it has been stagnating or even slightly decreasing (from 51% in 2010 down to 48%

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<sup>70</sup> It should be born in mind that PAI funding will be transferred to the communities in the course of this legislative period (2014-2019) as decide by the last, eight State Reform (see section 2.1 and 2.2).

<sup>71</sup> FWO and FNRS have both a large spectrum of ‘competitive funding instruments’ going from PhD- and postdoc-grants to mobility grants (with or without specific thematic focus), research projects grants (with or without specific thematic focus), to working costs grants, scientific prizes, credits from foundations etc. A PhD-grant usually guarantees a 2- or 4-years (+ possible extension by another 2 years) of salary amounting about 1800€ netto, with a possible additional lump sum for working costs of about 3500€ per year. Research projects grants usually cover a 2 to 4 years period (with a possible extension by another 2 years) and amount up to 40000€ to 130000€ personnel costs (gross wage + social costs) per year, with a possible additional lump sum up to 150000€ as ‘matching fund’ (equipment cost). See <http://www.fwo.be/en/fellowships-funding/> and <http://www.fnrs.be/index.php/financements> (both last consulted Feb 2015).

in 2013). In the long run, however, competitive funding seems to be increasingly used in Belgium.

These figures, however, should be interpreted and used with the greatest caution, for at least two reasons. Firstly, a non-negligible part of the 'institutional funding' is used by universities following their own priorities to fund research within their walls. The way of allocating these funds can vary between the universities, with some budgets being allocated in full, open competition ('project-funding') while other parts of the budget being allocated following the shares of PhD students or numbers of publications per faculty for instance ('competitive institutional funding'). Secondly, even the most competitive, project-based programmes for R&D (such as the inter-university attraction poles funded at federal level through BELSPO, funding for research infrastructures (through the Hercules Foundation), research grants for fundamental research at universities through the FNRS or special research funds in Flanders, or funds for industrial research) are in reality not fully competitive as it is common practice in Belgium to use so-called 'ex-ante allocation keys' to share *on beforehand* research funding between universities (i.e. before the calls are released thus). This mechanism is wide spread in the Belgian research system and can be described by the practice in Flanders.

In Flanders three main pre-allocation keys for competitive project-funding are used:

- The so-called 'BOF-key': BOF [Bijzonder Onderzoeksfonds – Special Research Fund] is next to the funds from the Research Foundation – Flanders (FWO), Flanders' main competitive funding scheme for fundamental research;
- The so-called 'IOF-key': IOF [Industrieel Onderzoeksfonds – Industrial Research Fund] is Flanders' main competitive funding for industrial research;
- The so-called 'Hercules-key': Hercules Foundation is Flanders's agency for funding research infrastructures at universities and Strategic Research Centers.

The 'Special Research Fund' (BOF) provides funding for fundamental research at universities allowing them to define their own research policy, and hence using these funds to fund research within the university; it is a secondary funding flow from the regional government to universities. The funding a university gets is competitive, but allocated depending on the so-called 'BOF-key'. Since 2012 (Decision Flemish Government dd. 21.12.2012), the BOF allocation formula takes into account five key indicators:

1. masters;
2. doctorates;
3. diversity;
4. publications, and
5. citations.

At micro-level, the universities are responsible for allocation of the BOF funding. BOF was put in place to allow universities allocating longer term funding to their best researchers, in order for them to reinforce excellence policy.

The 'Industrial Research Fund' (IOF) is one of the two main programmes in Flanders for the support of Strategic basic research. Whereas the 'Strategic Basic Research Fund' (SBO) is aiming at cooperative research between universities and research institutes and the subsidy is awarded by a specific government agency (IWT) after an open competition (with



external expert judgment), the IOF is divided over the Flemish universities every year, based on an allocation key using several criteria. Every university then has an intra-university competition to award the IOF-funding to projects. Since 2010, the distribution of IOF-resources over the different university associations is based on 6 parameters<sup>72</sup>:

1. Number of PhD degrees;
2. Number of publications and citations;
3. Revenues from industrial research contracts;
4. Revenues from participation into the EU Framework programmes;
5. Number of patents;
6. Number of spin-off companies.

For the allocation of subsidies for medium-scale research infrastructure projects, Hercules uses a (weighted) average of both allocation keys (weighted according to the level of budget)<sup>73</sup>. Since BOF represents a much larger budget than IOF (i.e. ca. 90% of the joint BOF-IOF budget), the weighted average is consequently substantially skewed towards BOF. All three allocation keys are updated each year.

One may discuss the use and relevance of ‘allocation keys’ defined on beforehand. But while in an international context distribution of competitive funds usually occurs through open competition based on excellence of individual researchers, the use of ex-ante allocation keys is a rather common practice in part of the Belgian science and technology policy, especially for funds that are distributed on an intra-university base. These allocation keys take into account the accumulated level of excellence of an institution and are based on transparent parameters (see above), even though competition occurs in the first place *within* the university association (rather than *between* (research groups from different) university associations. Such keys also ‘protect’ the smallest institutions by guaranteeing a minimum share in budget, while it gives the university associations a stable framework for the respective future investments. In particular this last point (long-term predictability of funding) appears to be a strong asset of the Belgian research systems, especially in periods of economic downturn.

In summary, one can conclude that the share of competitive funding (both competitively allocated institutional funding and project-funding) has very probably increased significantly over the past 10-20 years in Belgium as compared to ‘block funding’. However, this shift occurred mainly towards competitively allocated institutional funding, and much less towards project-funding. The rationale behind this shift was the wish to increase competition in the Belgian research fabrics while guaranteeing minimum budgets for small institutions and predictable budgets for everyone.

Competitively allocated institutional funding uses, as already said, pre-established ‘pre-allocation keys’ which are recalculated every year and published in the Belgian State’s official legislative documents (Moniteur Belge – Belgisch Staatsblad). The allocation of

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<sup>72</sup> In broad terms, for the specifics of these parameters (for instance the time window to be used for the annual calculation) we refer to the corresponding IOF and Interface services Directive (of 2009).

<sup>73</sup> For large-scale research infrastructure projects (>€1.5mio), Hercules funds and subsidies are allocated based on a system of full open competition across all Flemish university associations and other research institutes. For the medium-scale research infrastructure projects (‘Hercules 1’ –between €150,000 and €600,000, and ‘Hercules 2’ –between €600,000 and €1.5mio), however, subsidies are distributed according to a financial allocation key defined on beforehand and known as the so-called “Hercules allocation key”.

competitive project-funding (e.g. FWO, FNRS, IWT, Hercules Foundation – large infrastructure etc) follows strict peer-review evaluation procedures (according to international and European standards and submitted to regular evaluations, see infra). Usually, the procedure is as follows<sup>74</sup>:

1. Publication calls for proposals
2. Remote evaluation by external, foreign peer-reviewers (applicants are usually given the opportunity to propose and refuse some peer-reviewers)
3. Central evaluation by thematic panels: 2 or 3 experts per proposal, starting from input by external referees (which are not allowed to be part of the panel, panels consist of scientists affiliated to BE universities), present their assessment to the panel. The panel collectively decides on the score of the proposal. Experts are then responsible for the ‘feedback letter’, which is written and sent to all applicants
4. Ranking and selection, based on available budget
5. List and structure of panels has been revised regularly (e.g. FWO in 2010) to better match e.g. ERC’s list of expert panels.

### **2.5.3 R&I funding**

Government funding of R&I in the business sector runs through two distinct channels: indirect and direct funding. Measures such as subsidies, grants, loans and contracts are direct measures that apply to cover costs incurred in specific R&D projects. Indirect measures for R&D have a looser relation to R&D activities.

Two thirds of public aid (€2.4b) is funded through R&D budgets covering all forms of subsidies -- be it through competitive funding or through institutional block funding. Foregone revenues, due to the various fiscal measures to stimulate R&D activities, steadily increased to reach in 2010 almost one third of total public funding (1.1 billion €) (BELSPO, 2013). The latest available data regarding RDI tax incentives show a further substantial increase of foregone revenues for the treasury between 2010 and 2013 (withholding tax exemptions, patent income deductions, investment tax deductions related to R&D)<sup>75</sup>.

Based on an opinion poll that looks into the mix between the use of direct and indirect measures by firms, the Federal Office for Science Policy (BELSPO, 2013) reports that about one third (32%) of firms exclusively relies on direct fiscal measures; whereas a minority of 3% only uses subsidies. Two thirds of the firms (65%) use a mix of both fiscal measure and subsidies.

Looking at the latest policy developments and long-term trends, policy tools and funding instruments for innovation tend to cover a larger part of the innovation trajectory in Belgium, with an increasing focus over the past 5 years on the downstream part of the cycle, closer-to-market. Since 2010, various new instruments have been put in place (first in Flanders, then in Wallonia, more recently in the Brussels Capital Region) such as demonstrators, living labs, lead users platforms, pilot plants ... which all tend to focus on the so-called ‘Technology Readiness Levels 5-8’, i.e. beyond prototyping and demonstration

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<sup>74</sup> IDEA Consult (2012), “Assessment revised structure and operations of FWO evaluation panels”, (Confidential Briefing Note), Feb 2012; IDEA Consult (2013), “Onderzoekersbevraging FWO dienstverlening” [Researchers’ Survey on FWO activities], (Confidential Briefing Note), Feb 2013.

<sup>75</sup> See 2.5.1 Funding flows.

activities. The idea is to go beyond prototyping and to support the further nurturing and upscaling of new technologies or applications. The rationale for public intervention here is that, even though the activities are closer to the market, there remains a market failure. The distance-to-market is smaller, but in most cases, investment size is much bigger. Therefore, there too there is a need for public support to leverage additional, private investment. In this context, regional authorities, mainly in Flanders, have had increasingly recourse to financing solutions such as Public-Private-Partnerships. Elsewhere in Belgium indirect funding (e.g. through the funding of cluster associations, TTOs or other intermediaries) was also increasingly used.

However, despite this trend, there is still a lack of ‘funding coverage’ in these sub-segments of the innovation trajectory (i.e. beyond TRL 5). The reason for that is two-fold. On the one hand the EU State Aid Framework, even though it has been eased in 2014 and allows now for more funding support for activities closer-to-market, remains restrictive compared to legal framework outside the EU. This, however, is not specific to Belgium but is a restriction for the whole EU. On the other hand and specific for Belgium, the country and its regions lack critical mass and market size to develop large activities for technological market uptake. Some joint efforts between regions (such as the creation of the joint Pôle de Compétitivité on Agro-technologies between Champagne and Ardennes in France) may be a solution to overcome this, as well as the participation to some Horizon2020 programmes such as the INNOSUP-programme<sup>76</sup>.

Finally, there has been an increased and continued use of fiscal incentives in Belgium over the past 10 years. The larger recourse to fiscal incentives, however, has not occurred at the expense of direct or indirect funding support for R&D and innovation, on the contrary. The trend in these various categories of funding instruments shows a net reinforcement of the policy mix, overall. Besides this reinforcement, the complementarity between these instruments should be reinforced, however (i.e. generic, non-targeted support via fiscal incentives versus focused, prioritised support possible through direct funding). The fragmented governance of these instruments (fiscal incentives are a competence of the federal state; most direct and indirect funding for innovation is a competence of the regions, mainly) calls for an increased coordination of funding instruments.

## **2.6 Smart Specialisation (RIS3)**

### **A. Description**

It should be noted that many of the regional aspects are covered in other sections, due to the specificities of the Belgian research and innovation system. e.g. there are explicit regional smart specialisation strategies, as described before, even if they are not labelled explicitly that way.

According to the IEG (cfr. section 1.6), a joint strategy between Brussels and Flanders in the framework of smart specialisation, clearly provides added value as both regions would reinforce each other’s strengths, and synergies can be created. The main actors that can benefit from a joint strategy are industry, knowledge centres (including the federal

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<sup>76</sup> For instance: <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-innosup-2015-1.html> (last consulted Feb 2015).

research institutes in Brussels), universities (particular attention should be given to the community-dependent universities located in the Brussels Capital Region and hence not in the regions of Wallonia and Flanders) and citizens.

A comparative study of sectoral strengths in science, technology and economy, the so-called “specialisation profiles”, was performed within the smart specialisation study of the OECD Working Group on Innovation and Technology Policy (ECCOM & EWI department, 2011). This study analysed the relative performance of Belgium, focusing on scientific development (based on the analysis of publications<sup>77</sup>), technology development (based on patent analysis) and economic development (based on labour market data). Belgium has a relatively high activity compared to the reference countries<sup>78</sup> in the major science fields of: biology, clinical and experimental medicine and neuroscience and behaviour. The top three technology specialisation profiles, with the highest share of patents, are: macromolecular chemistry & polymers, textile & paper machinery and other special machinery. The top three economic specialisations are manufacture of chemicals & chemical products, post & telecoms and manufacture of basic materials. The analysis highlights a mismatch between knowledge production and the technological and economic fabric of the country and more particularly in the Southern part of the country, as the strengths in science do not correspond with the technological and economical strengths.<sup>79</sup>

Belgium focuses on key enabling technologies as well as on specific sectors. Flanders increased its focus on the set-up of cluster initiatives and Strategic Research Centres. In December 2011 after an evaluation, the Management Agreements of three Strategic Research Centres were revised and new ones signed for five years (one year later, the same happened with VITO), and in 2010 the Strategic Initiative Materials (SIM) and CMI were launched. The basic ambition is to strengthen the economic position of industry in Flanders in the medium-to-long-term, by executing and transferring accumulated knowledge through strategic research. End 2011 the Flanders Innovation Hub for Sustainable Chemistry (FISCH) excellence centre was established on sustainable chemistry (now an innovation platform). In 2014, the new strategic research centre on smart manufacturing was setup. Flanders’ Make bundles FMTC, Flanders’ DRIVE and laboratories of five Flemish universities to support manufacturing companies with pre-competitive research in order to strengthen international competitiveness. In its Operational Programme 2014-2020 for ERDF, which was approved by the EU Commission in December 2014, Flanders submitted 8 specialisation domains in the framework of a smart specialisation strategy (ex-ante condition from the Commission).

Wallonia’s cluster policy (clusters and competitiveness poles) has been pursued and intensified over the past years with an increased focus on ‘integrated innovation’<sup>80</sup>. Wallonia’s ‘smart specialisation strategy’ is rooted in its cluster policy designed to stimulate the development of business niches in regional areas of specialization based on

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<sup>77</sup> Analysis of the so-called Activity Index.

<sup>78</sup> Australia, Austria, Czech Republic, Finland, Germany, Netherlands, Poland, South Korea, Spain, Sweden, Turkey and the UK.

<sup>79</sup> This mismatch has already been identified in Capron and Cincera (2002).

<sup>80</sup> Cfr. new R&I strategy for 2015-2019, which complete the S3 synthesis document submitted to the Commission

(<http://economie.wallonie.be/sites/default/files/Strat%C3%A9gie%20de%20Sp%C3%A9cialisation%20Intelligente%20de%20la%20Wallonie%20dec2014.pdf> )

the dynamics of collaboration and innovation. This cluster policy are supplemented by more horizontal approaches to stimulate research and innovation, creativity and entrepreneurship in the Walloon economy. Wallonia puts a stronger focus on environmental issues. Following the adoption of the Marshall Plan 2.Green in 2009 (period 2009-2014), specific initiatives were launched in the field of the environment with the creation of a 6<sup>th</sup> competitiveness pole dedicated to green technologies in 2011 (GreenWin). A new strategic axis on 'industrial ecology' was put in place with specific actions on green technologies and eco-efficiency. In Wallonia the smart specialisation process is dynamic and continuous since ca 2009. In 2013 – 2014 it resulted in a revised innovation strategy called 'Marshall Plan 2022' (Marshall Plan 4.0) which confirms that the cluster policy and the competitiveness poles remain at the core of the regional R&I and industrial policy.

Currently, 7 clusters are supported by the Walloon Government in the areas of sustainable construction, eco-construction, environmental technology, energy and sustainable development, photonics, plastic, technology image, sound and text, and ICT. Up to now, six competitiveness poles have been created in the areas of logistics, aerospace, health, agro-food, mechatronics and green technologies. For their specific support, the Government has developed a policy mix for investment, R&I, exportation and FDI, training and networking. The animation of structure is funded on a public-private partnership basis (50% - 50%).

One can summarize the main priority areas of specialization of Wallonia as a result of the continuous entrepreneurial discovery process at stake within the clusters and competitiveness poles. The smart specialization strategy of Wallonia is also increasingly based on value chains approaches. Specific analysis will be developed in collaboration with the poles, either for the main value chain or for emerging niches. Besides the specialized fields of the poles, it is important to mention the sectors of creative and cultural industries, as well as high knowledge-intensity services, as essential supports of innovation and value creations. These will be considered as transversal axis; in conjunction with the Creative Wallonia program and the Agency for Enterprise and Innovation (AEI). Moreover, the specialisation areas of the poles and clusters correspond largely the a number of Key Enabling Technologies (KETs) and ICT. Therefore, they are therefore likely to play a central role for the distribution and deployment of these technologies in the regional economy, notably via the activation of cross-fertilization between the poles and the clusters.

The Brussels Capital region has launched in 2010 its first ICT strategic platform followed by the strategic platforms in Health: Expertise platform specialised in the toxicology of nano materials (NANO- IRIS) and platform for clinical research common to the three hospitals in Brussels (CLINiCOBRU). In 2012 this programme will be extended to the environment sector (renovation of buildings) and a new strategic platform will be set up in this sector. In 2014, a new strategic platform related to information security was set up.

## B. Assessment

Overall, the RIS<sup>3</sup> process has been an intensive and difficult process for many European regions. On the one hand, the EC has probably over-estimated the capacity of a region and its administration to position itself 'smartly' against other regions and to identify relative strengths (and weaknesses) as well as specific specialisation niches that make the difference for a region in an international context. Many activities were launched (especially by JRC-IPTS) to support intelligent benchmarking and positioning (through e.g. peer-reviews between regions). On the other hand, in many regions different

administrations and cabinets were responsible for the regional innovation strategy (RIS<sup>3</sup>) and the regional development strategy (Structural funds), which has largely contributed to 'disconnect' the elaborated RIS<sup>3</sup> from its effective, operational implementation through the Operational Programmes. This was partly true in Belgium too (particularly in Brussels). In Wallonia and in Flanders, shared initiatives were taken between the administration (via joint task forces) to avoid this as much as possible. In Wallonia, the RIS<sup>3</sup> built exclusively on the competitiveness poles policy which is Wallonia's main instrument for innovation and industrial policy. The new R&I policy that emerged from that exercise is now the common framework for both regional policies and structural funds.

Finally, most RIS<sup>3</sup> foresee monitoring and evaluation mechanisms, but to different degrees. There were evaluation practices are well-established (e.g. Flanders), the RIS<sup>3</sup> did integrate adequate and well-developed monitoring tools and procedures. In other regions (especially in Brussels) where evaluation and monitoring practices (specifically for innovation) is a very recent phenomenon, it remained largely undeveloped. In general, regions tend to limit the monitoring to outcomes and the programme-level. A more systemic, integrating evaluation system is still lacking (but this is not specific to Belgium).

## ***2.7 Evaluations, consultations, foresight exercises***

Evaluation of research and innovation policy is not entirely systematic practice but all the authorities seek to evaluate specific measures or initiatives or organisations on a periodic basis. For example, in 2011, according to its management contract, the Walloon Technology Promotion Agency (AST) was evaluated and Wallonia invited the OECD to review its regional innovation system. In the ERAC, a peer review was conducted on Belgium in 2010 and previously in 2005.

Regarding the Walloon "Marshall Plan 2.Green", all measures implemented are subject to monitoring by a unit especially set up for this purpose within the General Secretariat of the Public Service of Wallonia and a program of thematic assessments was developed by the Walloon government.

The same applies to the programs co-financed by Structural Funds. A thematic evaluation of actions for development and exploitation of innovation potential in Wallonia was carried out in 2012.

The implementation of a strategic approach for the management of programs to support RDI in the Walloon region was introduced in the legal texts in 2008 (Decree of 3 July 2008 to support Research, Development and Innovation). This initiative has become concrete with the adoption of the Strategy for an integrated research 2011-2015. This Decree provides for an external evaluation of the implementation of this strategy at the end of five years of its implementation as well as the organization of a systematic collection of data on the outcomes and impacts of all projects financed under the Decree.

Peer assessment of the Walloon regional innovation system, produced by the OECD, was finalised in 2012 and publicly presented at the start of 2013. This analysis has already guided the Government in several areas of reform, in particular with regard to the re-organisation of the innovation landscape in Wallonia: creation of WALTECH and creation of the Enterprise and Innovation Agency. Following the regional elections of 2014, the regional government Agreement confirmed the creation of the Enterprise and Innovation Agency. Regarding WALTECH, no further information appeared. The peer assessment

furthermore backs up the Government concerning consolidation of different policies, in particular the poles of competitiveness, the integrated Research Strategy and the Creative Wallonia Plan. In the government Agreement of 2014, these policies are still at the core of the general orientations and should therefore gain in importance in the legislation 2015-2019. The Government Agreement foresees a whole series of evaluations in the coming legislative period.

In Flanders, the EWI department set up a dedicated unit for policy monitoring and evaluation in 2009. The influential 2007 Soete review recommended simplification and a more “customer friendly set of instruments in Flanders”. The Flemish research and innovation system has been reviewed for the second time by Luc Soete (UNU-Merit, The Netherlands) in 2012 and a Soete2-report was finalised in 2013. Evaluation needs are defined in the programming documents of specific measures and performance indicators are set out in the management agreement for implementing organisations with the Government, which enables a clear and transparent evaluation process. Evaluations at programme level are often assigned to external experts. These are usually published in a complete or summarised version or are available on demand. Besides, the IWT also funds the execution of evaluation studies such as (not exhaustive)<sup>81</sup>:

- Effects of collaboration in IWT-funded industrial R&D projects (study nr 78)
- New microeconomic evidence on public R&D grants in Flanders (study nr 75)
- Monitoring and evaluation of the competence research centres (study nr 69)
- Analysis of R&D subsidy applicants and beneficiaries (study nr 64)
- Behavioural additionality of IWT R&D grants (study nr 56)

In the Brussels Capital Region, even if evaluation practices have been up to very recently very limited, during the preparation of the updated R&D strategy in 2011, the regional R&D system has been assessed (financing, governance, policy mix). At the same time, the region has elaborated a “R&D scoreboard” a tool which should allow monitoring the regional R&D policy at programme and projects level. The R&D scoreboard has been implemented in 2012. Furthermore Innoviris has set up a specific unit dedicated to the task of monitoring R&D evolution in the region and ensuring a “strategic R&D intelligence”.

However, in Wallonia a broad evaluation of the research centres will be launched in end 2014 / begin 2015, in order to assess whether the criteria that determine the allocation of funds are still respected in the different research centres. This evaluation will also feed into the decisions for allocating the European Structural Funds.

In Flanders, an evaluation culture has been emerging strongly in the last decade, e.g. all Strategic Research Centres have been evaluated in the last five years (Imec, VIB and iMinds in 2011 and in 2013, VITO in 2012).

A tendency is that the quality of research at HEIs is under pressure in Belgium, as in several other EU countries, due to the strong increase of students while funding is lagging behind this trend.

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<sup>81</sup> Studies can be consulted on <http://www.iwt.be/english/iwt-content/IWT-study> (last consulted Feb 2015)

Belgium has quite a number of Public-Private partnerships (notably the former excellence centres in Flanders, now demand-driven innovation platforms, and the competitiveness poles in Wallonia). In Wallonia, competitiveness poles have been assessed. The evaluation results have been taken into account for defining new priorities and policy orientations. In Flanders the instrument has been subject to change: the excellence centres were re-oriented as of 2012 into “innovation platforms” (whereby an evaluation took place for most of these) with little overhead and no more direct research funding which should enhance synergies between public and private partners and enable more transparent governance. In this light, the performance of the new innovation platform is measured via Key Performance Indicators (KPIs) and funding depends on these KPIs. A final challenge remaining may be the integration and search for synergies at Belgium level, as innovation platforms in Flanders and competence poles in Wallonia have a relatively high regional character. Particularly noteworthy is the recent opening of Walloon competitiveness poles to Brussels stakeholders.



### **3. National progress towards realisation of ERA**

#### **3.1 ERA priority 2: Optimal transnational co-operation and competition**

##### Efforts taken to implement joint research agendas addressing grand societal challenges

Belgium is very active in joint research agendas initiatives at EU level. Belgium is involved in 4 Article169/185 initiatives (Ambient Assisted Living, European and Developing Countries Clinical Trials Partnership, EMRP and Eurostars), in 8 of the 10 joint programming initiatives and in 30 ERAnet and ERAnet+ covering a diversity of societal challenges.

Several bilateral agreements reinforce cooperation. These agreements are signed at Federal level or Community level. At Federal level, agreements exist with Bulgaria, China, Poland, Russia, Vietnam. The Wallonia-Brussels Federation (French Community) signed agreements with Argentina. Bilateral cooperation of academic researchers in the Flemish Community is setup through the FWO<sup>82</sup> (Research Foundation Flanders, operating primarily via two separate channels: a) bilateral research cooperation: Vietnam, Québec (Canada), Ecuador, China, South-Africa; and b) cooperation projects for researchers: China, France, Taiwan, South Korea, Japan, Bulgaria, Poland, Brazil, Argentina, Turkey. The FWO likewise works together with its European and international sister organizations in various networks and with other European research organizations or similar institutions; for example, the European Science Foundation (ESF), Science Europe, CECAM and the ECT. In addition, the FWO supports access to the research facilities of important international or multilateral initiatives, such as the EMBO (Heidelberg) or the ESO (Munich, Santiago). This applies equally to the so-called “Big Science” projects: CERN-CMS and CERN-ISOLDE (Genève); ESRF-DUBBLE (Grenoble); the Mercator telescope (La Palma, Spain), Spiral2 (Caen), and Ice Cube (the Arctic area). The strategic research centres (Imec, Vito, etc.) or other knowledge centres also cooperate with counterparts abroad through networks, establishments, treaties etc., often in domains that are related to the grand challenges.

In August 2013, Belgium was involved in 125 joint calls related to EU joint research agendas. Moreover, bilateral agreements are also implemented by yearly joint calls.

##### Mutual recognition of evaluations that conform to international peer review standards

The main mutual recognition mechanism in Belgium is implemented at Community level by Flanders through the Lead Agency process. It is regulated by bilateral agreements signed with Luxembourg, Austria, Netherlands and Slovenia set-up lead agency system with these countries.

The key features of the Lead Agency system in are:

The support to joint projects for a maximum duration of 3 year.

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<sup>82</sup> See <http://www.fwo.be/en/> (last consulted in 02/2015).

Thematic areas are defined by the agreements.

The objective of these agreements is to enhance the cooperation between the scientists of signatory countries.

The proposal is evaluated by the Lead Agency only, according to national rules. The partner funding organisation accepts the evaluation results as a basis for its decision process.

#### Cross-border interoperability of national programmes

There is no specific National policy on cross-border interoperability as such. However, Belgium and its Communities develop co-operations with other EU and non EU countries to facilitate cross border interoperability. The implementation guides of these agreements apply to each bilateral call for proposal and set the common priorities. The cross-border interoperability is facilitated in the case of Lead Agency process implemented in Flanders with Grand Duchy of Luxembourg (FNR), Netherlands (NOW), Austria (FWF) and Slovenia (ARRS).

#### Policies to support construction and operation of ESFRI, global, national and regional Research Infrastructures (RIs)

There is currently no roadmap either at national or at community level. However, it is indicated as planned on the ESFRI website<sup>83</sup>. The Federal authorities coordinate the identification of a list of priorities, with a list of 31 international research infrastructures<sup>84</sup>.

Financial commitments to support construction and operation of infrastructures

Confirm financial commitments for the construction and operation of ESFRI, global, national and regional RIs of pan-European interest, particularly when developing national roadmaps and the Structural Fund programmes 2014-2020.

The Belgian authorities are strongly committed to and participate in ESFRI programme on research infrastructure. However, a national approach is debated to ensure a clear division of responsibilities and guiding rules between Federal authorities and Communities. A roadmap at the Belgian level for ESFRI is being developed in 2015.

#### Access to Research Infrastructures

Whilst Belgian research infrastructures are considered opened to external researchers and have a clear European dimension and added value, no specific financial support was identified. The information available in the MERIL database indicates that 46,7% of the

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<sup>83</sup> ESFRI webpage on europa.eu: [http://ec.europa.eu/research/infrastructures/index\\_en.cfm?pg=esfri-other-roadmaps](http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri-other-roadmaps) (last consulted in 02/2015).

<sup>84</sup> Erawatch Belgian report 2012, p. 37 and 38: [http://erawatch.jrc.ec.europa.eu/erawatch/export/sites/default/galleries/generic\\_files/file\\_0299.pdf](http://erawatch.jrc.ec.europa.eu/erawatch/export/sites/default/galleries/generic_files/file_0299.pdf) (last consulted in 02/2015).

researchers working in the Belgian research infrastructures providing the data are non-national, which is a high rate showing a clear openness of Belgian research infrastructures.

### **3.2 ERA priority 3: An open labour market for researchers. Facilitating mobility, supporting training and ensuring attractive careers**

#### **3.2.1 Introduction**

The Belgian market(s) for researchers and scientifically educated people is characterised by a strong autonomy of the universities. At the same time, the increased efforts and investment in research and innovation (as % of GDP) over recent years went together with stronger policy attention for human resources in all regions and communities. Consequently, each year the number of doctoral degrees awarded increases in Belgium. This phenomenon applies to all scientific disciplines and it is not matched with a rising number of vacant academic positions. Therefore, the extra investments in doctoral education were intended as a deliberate attempt to revitalise the economy with more highly-educated staff, innovation-ready and equipped with wide-ranging knowledge. Analysing recent figures and evidence, one can conclude that the envisioned spill-over effects did in fact take place. A majority of doctorate holders make a successful transition from an academic environment to a diversity of employment sectors in all types of professions (BELSPO 2013b).

Compared to the rest of the EU, Belgium has a higher-than-average level of researchers, R&D personnel, Human Resources in Science and Technology (HRST) or tertiary educated people (as % of population or labour force). According to the latest CDH survey (2010), 68.6% of the 4445 respondents have been employed at least once in another sector outside the university since the time of their graduation, while 31.4% reported they were still employed at the university. Industry, especially, succeeds in attracting a large pole of the outflow of doctorate holders from the university, and this group has been continuously increasing over recent years: in a period of ten years 6% more doctorate holders have made a career turn from academics to industry. The third most important employer of doctorate graduates is government. Government employs on average 10% of all doctorate holders and this percentages is not influenced by important fluctuations. Other employment sectors, such as hospitals, institutes of higher education outside the university and the private non-profit sector provide fewer career opportunities for professionals with a doctoral degree (van Rossem and Derycke, 2013).

#### **3.2.2 Open, transparent and merit-based recruitment of researchers**

In Belgium, the principle is the autonomy of the Higher Education Institutions and Public Research Organizations. However, orientations are provided by the Federal level to encourage an open recruitment and certain rules for the public service at federal level and specific rules at the level of the Communities have to be followed.

The designation of a panel for the recruitment of permanent positions is an obligation for all HEIs and PROs, following public service rules at federal level and IWT at a regional Flemish level and F.R.S.-FNRS at the level of the French Community.

On other aspects, different requirements exist between the Federal level and each Community. For example, rules on the rights to receive a feedback and to appeal provided to applicants exist at Federal level and for the Flemish community, but not for the French Community.

Beyond these requirements, Belgian institutions have a wide autonomy. They apply in general open and transparent recruitment processes, e.g. by publishing job vacancies including selection criteria, but the information is often difficult to find for an external user. Vacancies for researchers or open academic positions are published by the universities themselves, so there is a variety of publication channels and methods. No central repository of vacancies per region has been set up, as gradually Belgian universities are adopting the practice of publishing vacancies on the Euraxess portal. A more open diffusion would help attracting more researchers from outside the university institution or from abroad. Language barriers, in particular at the Dutch speaking universities, e.g. the fact that professors should be able to teach courses or take examinations in Dutch, limit also the brain gain from abroad.

The Belgian country profile of the researchers' report 2012 indicates that Belgian institutions apply all the principles of an open and merit-based recruitment system, except to the burden of proof on the employer. However, this judgment is widely based on the practices of Belgian institutions, as mandatory rules are limited to the points mentioned above.

### **3.2.3 Access to and portability of grants**

Policies related to cross-border and portability of grants is the competence of the Communities. The Flemish Community and the Wallonia-Brussels Federation (previously the French Community) allow the cross-border grants for foreigners, residents and non-residents, with requirements that differ depending on the Community, but which don't constitute major obstacles<sup>85</sup>.

The portability of grants is allowed for grants of the Flemish Community. It is also allowed for the Federal grants "Back to Belgium"<sup>86</sup>, for a limited period of three months. It does not apply for grants from the Wallonia-Brussels Federation.

### **3.2.4 EURAXESS**

The Belgian Euraxess portal corresponds in fact to three portals: for the Federal, level and both Communities. Each one provides clear information on job opportunities, social security, pension contributions, accommodation and administrative assistance, adapted to each structure.

About job vacancies published on the Euraxess jobs portal, the Researchers Report 2012 indicates that the Federal level and the Flemish Community systematically use it to advertise researchers' positions, and that the French Community aims to do it systematically too. Thanks to these recent measures, Researcher posts advertised through

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<sup>85</sup> <http://www.fwo.be/>; <http://www.fnrs.be/>

<sup>86</sup> See [https://www.belspo.be/belspo/organisation/call\\_grants\\_retour\\_en\\_stm](https://www.belspo.be/belspo/organisation/call_grants_retour_en_stm) (last consulted in 02/2015).

the EURAXESS Jobs portal per thousand researchers in the public sector increased from 37.3 to 53.3, which positions Belgium among the better ranked of EU and Associated countries.

There are 11 Belgian EURAXESS Services Centres and 6 Belgian EURAXESS Local Information Points. These centres are located in Antwerp, Brussels, Gembloux, Ghent, Hasselt, Liège, Leuven, Louvain-la-Neuve, Mol, Mons and Namur. Several cities have more than one Centre to cover linguistic needs and be located in the main organisations.

### **3.2.5 Doctoral training**

Doctoral training is a competence of the Communities (Flemish Community and Brussels-Wallonia Federation). However, at Federal level Centres of Excellence called Federal Scientific Institutes have been established in partnerships with Belgian universities to enhance the training of human resources, in particular with Doctoral schools.

The French Community (now 'Brussels-Wallonia Federation') created doctoral schools in 2004. The Flemish Community launched in 2011 the Support Programme for Young Researchers with a budget of 4 million euros per year to provide to PhD students and young researchers training (doctoral schools), career development incentives, support attendance in international events and job fairs, and cooperate within the Flemish Community. It covers several items of the innovative doctoral training principles. In 2013, a first evaluation carried out by the Expertise Centre on R&D monitoring showed that the budget had been used by the universities to reinforce their HR policy for young researchers and create more opportunities for training and career development outside of academia for them. In 2013, this programme became a permanent funding programme for the universities. In the Wallonia-Brussels Federation, several of the Wallonia-Brussels Partnership points encourage interdisciplinary research and international networking.

### **3.2.6 HR strategy for researchers incorporating the Charter and Code**

Main institutions such as the Belgian Science Policy Office (BELSPO), F.R.S-FNRS, FWO and IWT endorsed the 'Charter & Code' and implement it. In the Wallonia-Brussels Federation, a communication plan for the implementation of the 'Charter & Code' is under preparation.

17 Belgian organisations endorsed the Charter and Code: Belgian Science Policy Office, Facultés Universitaires Catholique de Mons, Facultés Universitaires Notre-Dame de la Paix (Namur), Facultés Universitaires Saint-Louis (Brussels), Institute of Tropical Medicine (Antwerp), Vrije Universiteit Brussel (VUB), The National Funds for Scientific Research for the French Community (FNRS), The Rectors' Conference of the Wallonia-Brussels Federation, The Research Foundation Flanders (FWO, Ghent University (UGent), University of Hasselt (UHasselt), University of Leuven (KULeuven), University of Antwerp (UA), Université Catholique de Louvain (UCL), Université de Liège (Ulg), Université de Mons, Université libre de Bruxelles (ULB).

### **3.2.7 Education and training systems**

In international perspective, Belgium has strengths in terms of openness and international exchange (mobility) of human resources, and a well educated population. However, Belgium still needs to strengthen its human resource base in science and technology as

well as its policies to improve the comparatively poor working conditions for researchers (salary, career prospects, financing for projects), to increase the numbers choosing to enter the profession (e.g. awareness and image-improving campaigns), to improve the number of graduates in the S&T domains and to create easier access to the labour market for an increased number of foreign graduates. The latter point is a specific point of attention for Flanders, where language barriers still need to be overcome to a larger extent than in the French-speaking part of the country to attract more students from abroad (teaching in Dutch is the common practice in Flanders).

In this regard, a number of programmes have been recently setup in communities and regions, and partnerships for researchers have been created, such as the Wallonia-Brussels Partnership for Researchers which was set up in 2011, where public authorities undertake, alongside the research stakeholders, to place researchers at the centre of the agenda for the consolidation of research as a driver of the future.

**Table 4. Human Resources Key Indicators**

	2009	2010	2011	2012	EU-27 average 2012
R&D performed by HEIs as % of GERD	24	24	22	23	24 <sup>s</sup>
New doctorate graduates (ISCED 6) per 1,000 population aged 25-34				1.5	1.5
Share of the population aged 25-64 having completed tertiary education	33.4	35	34.6	35.3	27.6
Employment in Knowledge-intensive service sectors as share of total employment	4.67 <sup>r</sup>		-		4.4 <sup>r</sup>
HRST as a share of total labour force (%)	48.2	49.3	49.6	50.3	42.9
Total R&D personnel and researchers, as % of total labour force	1.85	1.81	1.94		1.64 <sup>**</sup>

Source: EUROSTAT

p: Provisional value

s: Eurostat estimate

\*: 2007 average; \*\*: 2011 average

The level of education of the population is relatively high with in 2012, 35.3% of the employed population aged 25-64 having a tertiary education level (EU-27: 27.6%). Belgium demonstrates a slowly increasing absolute number of HRST. As a share of the labour force for the 25-64 age group, Belgium increased its share continually. In 2012, the share reached 50.3% (EU 42.9%). The total number of researchers is growing steadily over time (30500 FTE researchers in 2000; 40500 FTE in 2011). Most researchers (in Full Time Equivalent, 2011) work in the business enterprise sector (46.0%) and the Higher Education sector (46.0%); the government sector plays a marginal role (7.3%). Both business and HEI sector are thus relatively more important in Belgium than in the average EU27. Researchers are employed at universities, which are independent institutions. Both temporary contracts as well as fellowships are subject to social and health taxes and also enjoy social accompanying social security.

National bodies do not monitor inward and outward flows of researchers in Belgium, so no reliable data are available on transnational mobility. However, in 2009, 9% of the HRST was non-national. A recent survey of junior researchers (doctorates) in Flanders showed

that 16.8% of the researchers are foreigners; half of which comes from an EU country. The personnel records of the Flemish universities and research institutes give a similar picture (17%). The share of foreign researchers declines with increased seniority: only 5% of the professors is foreign, against about 30% of the postdocs.

Several measures have been taken to attract Belgian researchers who settled abroad: return mandates from the federal level, scientific impulse mandates - ULYSSE<sup>87</sup> from the French Community (F.R.S-FNRS) as well as a measure in the Brussels-Capital region ("Attract").

Flanders (Flemish Community) offers brain gain programmes (Odysseus<sup>88</sup> and visiting postdoctoral fellowship grants) as well as brain drain prevention (Methusalem<sup>89</sup>). These brain gain instruments become increasingly important in Flanders. Until recently, instruments boosting researcher mobility in Flanders are primarily aimed at providing research budgets. From 2011 onwards, Flanders is investing substantially in setting up tenure tracks (€3,5mln), and graduate schools (€4mln). There is also a Pegasus programme for foreign postdoctoral researchers who want to stay either one or three years at a university, co-funded by the EU's Marie Curie Fund.

The F.R.S-FNRS also proposes short-term (3 years) positions and grants to non-national PhD holders coming into a university lab within the French Community<sup>90</sup>. Another way of attracting researchers is setting up top class research (infrastructures); especially the Strategic Research Centres (IMEC, VIB, VITO, iMinds) in Flanders are internationally renowned. In this light, Wallonia-Brussels International (WBI) allowed the competitiveness clusters designated by the Marshall plan to allow universities to host students from institutions of excellence abroad. An identical programme exists for graduates from Wallonia and the French Community institutes in Brussels who wish to study in a university of excellence abroad.

Moreover, a practical guide for mobile researchers coming to Belgium has been published on the Belgian EURAXESS portal. It contains information to mobile researchers on visa and residence permit, social security, taxes and bringing along family members.

Furthermore, inward mobility is being promoted at federal level by the scientific visa since 2007, which is implemented by law and which improves framework conditions for foreign researchers. The procedure to obtain a visa and a residence permit for any researcher from a third country hosted by a chartered organisation in Belgium is simplified.

A main challenge as regards the labour market for researchers is the relatively low remuneration of researchers compared to the private sector (even though Belgian researchers are relatively well-paid compared to their counterparts in other countries) as well as a low participation of women in research. To a certain extent also a mismatch may be identified in the supply and demand for high-skilled researchers and engineers: there are indications that there is a shortage of highly skilled engineers and scientists in the field

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<sup>87</sup> See <http://www.fnrs.be/index.php/financements/mandats> (last consulted in 02/2015).

<sup>88</sup> See <http://www.fwo.be/nl/actueel/oproepen/odysseusprogramma/> (last consulted in 02/2015).

<sup>89</sup> See <http://www.ewi-vlaanderen.be/ewi/wat-doen-we/programmas-subsidies/financiering-van-onderzoek/methusalemprogramma> (last consulted in 02/2015).

<sup>90</sup> See <http://www.fnrs.be/index.php/mobilite-internationale> (last consulted in 02/2015).

of physics, chemistry and IT. Lastly, in an EU perspective, community regulations prescribe the use of the official language at HEIs, which can be a barrier to foreign researchers.

The level of salaries of academic staff in research organisations are established by law for the federal scientific institutes (FPS Justice 1998), for the F.R.S-FNRS and for the Flemish research institutions. According to the Researchers' report 2013 (Deloitte, 2013), Belgium is amongst the best paying countries for First stage researchers (i.e. researchers up to the point of PhD) According to the same source, PhD stipends (in PPPs) were about the double as the EU28 average.

Several measures exist to attract Belgian researchers who settled abroad: return mandates from the federal level, scientific impulse mandates - ULYSSE from the French Community (F.R.S-FNRS) and the FWO's Odysseus and Pegasus programmes of the Flemish Community as well as measures in the Brussels-Capital region ('Attract', 'Research in Brussels'<sup>91</sup>). One can nonetheless highlight that this co-existence of mobility schemes in all Belgian entities might play against the external visibility of the country for foreign researchers. This might be one of the entrance points where a coordinated approach between Belgian entities could have large added value.

The FWO's Odysseus programme is a brain gain initiative which offers both high potentials and senior PI's the necessary means to start up a new research group at a Flemish university. These can either be foreign researchers or Belgian researchers that have worked abroad for the last couple of years. The engagement is double: on the one hand the university ensures a fixed appointment with a competitive salary, while the FWO on the other hand provides the researcher with substantial start-up funding (up to 150,000 EUR per year for senior researchers and up to 200,000 EUR per year for high potentials). Moreover, the Pegasus programme (Marie Curie COFUND) was set up to attract non-national PhD's for one or three years to Flemish institutes. As becomes clear from the large amount of applications, external visibility is definitely ensured.

The F.R.S-FNRS also proposes short-term (three years) positions and grants to non-national PhD holders coming into a university lab within the French Community. In 2008, a new grant programme has been set up by WBI, which sets out to reflect the themes of the competitiveness clusters. It is designed to allow universities of the region to host university students from institutions of excellence abroad, whatever countries. A similar programme exists for graduates from Wallonia and French Community institutes in Brussels who wish to study in a university of excellence abroad.

In Wallonia, the scheme FIRST International allows Walloon companies and research centres to collaborate with foreign research organisations, which host a researcher for a minimum of six months. Nonetheless most of the Walloon programmes remain open to Walloon stakeholders only. Only recently, some programmes were opened to partners of other Belgian regions, most notably the competitiveness poles. A member of Enterprise Europe Network, "Enterprise Wallonia Europe" is a consortium launched in 2008 that brings together ten local organisations dedicated to helping regional business get information and advice, to compete effectively in Europe.

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<sup>91</sup> See <http://www.innovativebrussels.irisnet.be/nl/rib> (last consulted in 02/2015).



Moreover, there is a range of smaller instruments that promote exchange and (temporary) outward mobility in a context of learning. In Flanders, the rather ad-hoc strategy is developed in the Action Plan for researchers (EWI, 2010).

In Wallonia-Brussels, the Action Plan adopted in May 2011 under the name ‘Wallonia-Brussels Partnership for Researchers’ is composed of 25 actions organised in six chapters, where public authorities undertake, alongside the actors in research, to place researchers at the centre of the priorities given to the consolidation of research as a driver of the future: Open recruitment and portability of subsidies; Social security, tax system, visas and other matters falling under federal authority; Employment and working conditions; Training of researchers; Gender equality; and Access to Job Market for PhD Holders.

The F.R.S.-FNRS is amongst the participating organisations of the initiative EUROHORCS. In order to remove mobility barriers for European researchers, EUROHORCS partners agreed on authorising researchers moving into partnering countries to take with them the remainder of a current grant.

In Flanders, the FWO has underwritten the Science Europe roadmap, which is the result of an update of the former EUROHORCS roadmap. FWO fellowships are therefore open to all nationalities, except for the pre-doctoral grants where a Master’s degree from a university of a European member state is required. Moreover, FWO fellows are free to perform parts of their research abroad while maintaining both their salary and bench fee. Grants of the IWT cannot be footloose: as it is the goal of IWT to strengthen innovation performance of Flanders, the research is principally executed in Flanders or gears results towards Flemish actors. Only EU inhabitants and companies (active inside and outside Belgium) are eligible for IWT grants. In Wallonia, only companies with an establishment in Wallonia are eligible to regional grants whereas all French-speaking universities can apply.

### **3.3 ERA priority 5: Optimal circulation and access to scientific knowledge**

#### **3.3.1 e-Infrastructures and researchers electronic identity**

The main initiative is at Federal level. BELSPO has established an operational unit named BELNET<sup>92</sup> responsible for the design and network management and research education in Belgium. Nearly 200 institutions representing more than 650.000 users are connected to BELNET. It provides on request services such as a platform for e-collaboration or video conferencing. At Community level, Flanders developed Virtual labs in the areas of medicine and new materials. In the context of BELNET measures have been taken (at national level) to address issues such as personal data security, identity validation and tracking.

#### **3.3.2. Open Access to publications and data**

Belgium has a proactive policy on open access to scientific publication:

- In 2007, Belgian public funding organisations signed the Berlin Declaration on Open Access.

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<sup>92</sup> See <http://www.belnet.be/nl> (last consulted in 02/2015).

- In 2012, the ministers of Science and Research at federal level and from each Community signed in October 2012 a Declaration on Open Access in Brussels in which they agreed to make Open Access the default for all Belgian research output. T
- The main funding agencies (FWO and F.R.S.-FNRS) oblige to self-archive all articles coming from research funded by them.

By signing the Berlin Declaration on Open Access in 2007, Belgian research institutions and research funders agreed to support the dissemination of publicly funded scientific research through Open Access. Open Access to scientific research offers stakeholders an alternative for traditional ways of disseminating scientific research results, which do not always meet the demands of stakeholders. Free, online access is the most effective way to ensure widespread and democratic consultation and usage of publicly funded research results. During the last years, research results available in Open Access gained considerable visibility internationally, which proves beneficial to individual authors, institutions and funders. In October 2012, the ministers of Science and Research at federal level and from each Community signed a Declaration on Open Access in Brussels in which they agreed to make Open Access the default for all Belgian research output. The main funding agencies (FWO and F.R.S.-FNRS) oblige to self-archive all articles coming from research funded by them. The DRIVER project led by the Ghent University (UGent) played an important role to promote Open Access awareness in the scientific community and among repository managers. It was followed by other initiatives, in particular from the University of Liege. According to Archambault et al. (2014), Belgium was between 2008 and 2013 ranked in the top-7 of the EU-28 in terms of share of Open Access Papers (as % of total scientific production)<sup>93</sup>.

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<sup>93</sup> Archambault, E., Amyot, D., Deschamps, Ph., Nicol, A., Provencher, Fr., Rebout, L. and Roberge, G. (2014), "Proportion of Open Access Papers Published in Peer-Reviewed Journals at the European and World Levels—1996–2013, Science Metrix, (RTD-B6-PP-2011-2: Study to develop a set of indicators to measure open access), Brussels, available at [http://science-metrix.com/files/science-metrix/publications/d\\_1.8\\_sm\\_ec\\_dg-rt\\_d\\_proportion\\_oa\\_1996-2013\\_v11p.pdf](http://science-metrix.com/files/science-metrix/publications/d_1.8_sm_ec_dg-rt_d_proportion_oa_1996-2013_v11p.pdf) (last consulted March 2015).

## 4. Innovation Union

### 4.1 Framework conditions

Most of the framework conditions are touched upon or analysed in detail in other sections of this report; for the sake of clarity we summarize the most important in this short paragraph.

In recent years, the various Belgian authorities have sought to develop (or reinforce) most of the framework conditions conducive to business R&D and innovation. At the supply-side, direct support (funding) for RDI has been supplemented by the increasing use of tax incentives which allowed reducing the labour cost of researchers and established a tax reduction for incomes from patents. The October 2014 Federal Government Declaration consolidates the federal portfolio of tax incentives and even foresees some expansion thereof (expansion of the latter tax reduction to incomes from software licences)<sup>94</sup>. While in the late nineties, there was a gradual shift towards more tax incentives (substitution-effect), since 2004 the increasing recourse to fiscal incentives represent a net reinforcement of the portfolio (since public direct funding has been maintained or even increased as well). Besides, efforts have been made to expand and open the venture capital market as supplementary access to finance (see below section 4.5). Nowadays and according to Eurostat data, Belgium has one of the highest venture capital intensity in the EU<sup>95</sup>. Belgium, and in particular its communities, have also increased efforts in terms of improving the supply and career prospects of highly skilled human resources. Finally, Belgium was during the Belgian EU Presidency in the second half of 2010 the leading actor for the launch of the Community Patent. Its implementation is currently leading to an important harmonisation at EU level with lower patenting costs as expected results.

The various Belgian authorities have also gradually reinforced or expanded demand-side policies and policy tools. While public procurement is not yet widely spread and used to foster innovation, some important new initiatives were recently taken in this regard (see section 4.6 below). Especially the regions, responsible for industrial research and innovation, have gradually developed new demand-driven tools such as lead-users platforms, living labs or innovation platforms (see section on knowledge transfer 4.3). However, the size of the local market and the high relative dependence on foreign FDI and MNEs remains a challenge for the country to reap the benefits of demand-activated innovation.

Belgium, and in particular its regions have finally intensified their efforts to simplify and improve the regulatory environment conducive to more entrepreneurship and business innovation. Wallonia and Flanders, and later on the Brussels Capital Region as well, have implemented large parts of the Small Business Act since late 2008.

An important challenge for Belgium remains the rationalization of the broad and highly diverse portfolios of measures. This governance complexity and lack of co-ordination has

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<sup>94</sup> <http://www.premier.be/fr/accord-de-gouvernement> , p. 103 (last consulted in 02/2015).

<sup>95</sup> Belgium ranks third behind Luxembourg and Switzerland in terms of Venture Capital (early stage, seed and start-up) per thousand of GDP and third behind UK and Sweden in terms of Venture Capital (expansion and replacement) per thousand of GDP, European Commission (2011) Innovation Union Competitiveness Report 2011, p. 333-334.

been recognized many times and is one of the main concerns of the recent, October 2014 federal Government Declaration<sup>96</sup>. In particular, there is a need to better exploit synergies and complementarities between the regions, e.g. between Brussels (strong academic eco-system, highly concentrated demand and tertiary activities, weak industrial base) and Flanders/Wallonia (strong eco-system of industrial actors and technology suppliers). A stronger coordination between these regions should be sought and reinforced. Recent initiatives such as the E-Health platform between Brussels and Flanders (Brussels e-Health and Flanders' Care) demonstrate the strong benefits of such a coordination (Brussels concentrates university hospitals and elderly population, Flanders supplies technological solutions and prototypes, so that both can build up a lead users platforms for testing e.g. e-monitoring applications, electronic patients' registry etc).

Besides, demand- and supply side policies tend to co-exist without strong systemic evaluation or steering ... Belgium has gradually developed its portfolio of instruments, adding to direct and indirect support (supply-side policies) demand-side policies, fiscal incentives. The whole portfolio is impressive but in a next stage the various governance levels should evolve together towards further cooperation. This should happen in the context of the current rationalisation process announced in almost every region.

## **4.2 Science-based entrepreneurship**

'Science-based entrepreneurship' as defined here (university spin-offs) is the exclusive competence of the regions and communities. Wallonia, Brussels Capital and Flanders established over recent years specific funding programmes to support spin-offs: Venture cap for spin-off and FIRST Spin-off in Wallonia; Spin-off in Brussels (now replaced by programme "Launch"); and the Flemish schemes at the PMV such as SOFI, SOFI2, Innovation Mezzanine, ARKimedea, Vinnof. All these instruments have been described in previous sections of this report, and are further analysed under sections 4.4 ('Technology Transfer') and 4.6. ('Venture Capital Markets').

## **4.3 Knowledge markets**

According to international standards IPR protection in Belgium corresponds to the highest quality standards possible, thanks to both the institutional set up (national patent office) and the presence of specialized companies for IPR support. The limited size of the Belgian market, however, implies that large companies will primarily seek for a protection either in a bigger market (such as France or Germany) or through the EPO in Munich. Over the past years the Regions and the Communities have developed a whole set of initiatives to expand (subsidized) IPR support to small and micro companies, either within existing structures (such as within TTOs located on university campuses) or as new initiatives (such as the non-profit organisation PICARRE launched in 2012 in Wallonia<sup>97</sup>).

The Flemish and French Communities fund knowledge transfer offices (the so-called interface structures) at their respective universities and other HEIs under their

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<sup>96</sup> <http://www.premier.be/fr/accord-de-gouvernement> , p. 103 (last consulted in 02/2015).

<sup>97</sup> <http://www.picarre.be/> (last consulted in 12/2014).

competencies, the so-called TTO's. Interface structures have the mission of stimulating external contacts at the universities and have thus received gradually additional competencies with regard to IPR support.

Besides direct support for IPR protection (targeted advice, raising awareness, training, patent searches and pre-filing, other initiatives aiming at triggering IPR-'markets' such as trading platforms matching IP supply and demand are not yet in place.

#### **4.4 Knowledge transfer and open innovation**

**Table 5. Some key indicators for Knowledge Transfer in Belgium**

Indicator	Belgium	EU-28
Share of public R&D (HERD+GOVERD) funded by Business enterprise sector (BES) in 2011 (2001) (1)	10% (12%)	7% (6%)
Number of Public-Private co-publications (per million publications) (2013) (2)	97.1	52.8
Share of Doctorate holders employed in Business enterprise sector (2010) (3)	33.4%	na
Share of innovating companies (large companies) collaborating on innovation with higher education or public research institutions (2008-2010) (4)	44%	na
Share of number of EPO patents in the country citing 'non-patent literature' in total number of EPO patents of the country (2007-2012) (5)	35%	25%

Sources: (1) OECD (2013), Science, Technology and Industry Scoreboard 2013, p. 123; (2) BELSPO (2013), Annual Report on Science and Technology Indicators for Belgium 2012, Brussels, p. 18; (3) OECD, UNESCO, Eurostat, Careers of Doctorate Holders Survey 2010 (cited in 'Vlaams Indicatorenboek 2013, p. 65); (4) OECD (2013), Ibid. p. 127 (based on CIS2010 data); (5) OECD (2013), Ibid. p. 138.

The table above summarizes a few key indicators on 'Knowledge Transfer' for Belgium, for the latest year available and with a comparison (where possible) with the EU average. In Belgium, a relatively high share of public R&D is funded by the business enterprise sector and that share (around 10%) has shown a noticeable stability over the past fifteen years. Compared to the EU average this demonstrates a relatively strong collaboration pattern between academic research and industry. This pattern is confirmed by the high share of public-private co-publications as well, which is almost twice as high as the EU-average. Belgium has also a relatively high share of PhD holders working in the business sector. Data from the CDH survey are not available for the EU average, but for this indicator Belgium is ranked within the top-3 of the countries surveyed (under Denmark and The Netherlands, but before the USA). Belgium ranks also amongst the top of OECD countries with regard to the share of firms collaborating on innovation activities, especially with regard to large companies. This high position is confirmed when one looks at the share of innovative companies (large firms) collaborating on innovation with higher education institutes and public research centres (44%). In this context, universities appear to be the second most important innovation partner for innovating companies in Belgium. The strong position of Belgium, however, slightly deteriorates when one considers SMEs only, instead

of large companies<sup>98</sup>. Another proxy for 'knowledge transfer' is the extent at which patented inventions (EPO patents) cite 'non-patent literature'<sup>99</sup>, or, in other words, the extent at which inventions are science-based. In this regard again, Belgium has a clear above-average performance when it comes to the share of EPO patents in the country citing 'non patent literature'.

### Cooperation between the public research base and industry

All regions and communities tend to further stimulate collaborations between research actors in the academic and industrial sectors through the continuation of now well-established policies (excellence centres (now innovation platforms) in Flanders, competitiveness poles in Wallonia, mobilising programmes) and the launch of new ones (technological innovation partnerships in Wallonia, strategic platforms in Brussels-Capital) and the opening of new research centres focused on environmental or health issues. The innovation hubs defined in the Concept Note Innovation Centre Flanders (2011) are all oriented towards societal challenges as well<sup>100</sup>. The future will learn if the concept that defines these innovation hubs remains in place after 2014, but the initiatives and institutes that respond to the topics do continue to exist (e.g. social innovation factory, MIP3.0, energyville, Flanders' Care, Icleantech).

A common feature of both the Flemish and Walloon systems is the emphasis on measures aimed at encouraging increased co-operation between the research base and enterprises. There is a strong focus in Wallonia on schemes aimed at encouraging knowledge diffusion through the exchange or temporary assignment of skilled researchers or innovation specialists from the university/research centres to enterprises (and vice versa), the FIRST family of measures<sup>101</sup>. In Flanders, this type of action is subsumed mostly within the IWT schemes of the Innovation Mandates (previously Research mandates) and the Baekeland mandates aimed at stimulating industry-academia linkages (see subsidies and grants from IWT<sup>102</sup>). Since 2006 and the establishment of competitiveness poles in Wallonia, measures stimulating researchers' mobility have been reinforced by research and technology grants stimulating collaborative projects between companies and universities.

In addition, the Flemish and the French Communities each have a system of support for TTO's that are active at their respective universities. The regions (applied R&D) and the communities (fundamental and basic research) have all made commitments to invest more in R&D and there is concerted effort to focus this funding on either thematic or sectoral approaches such as the Flemish strategic research centres (IMEC, VIB, etc.) and excellence

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<sup>98</sup> OECD (2013), Science, Technology and Industry Scoreboard 2013, p. 125-129; ECOOM (2013), 'Vlaams Indicatorenboek 2013, p. 152-153.

<sup>99</sup> Non-patent literature refers to backward citations to peer-reviewed scientific papers, conference proceedings, databases (e.g. DNA structures, gene sequences, chemical compounds, etc.) and other relevant literature, with the exception of patent abstracts and commercial patent databases (OECD (2013), p. 138).

<sup>100</sup> EWI (2011b), Een verdere invulling van de ViA Doorbraak - 'Innovatiecentrum Vlaanderen'. Conceptnota over de stroomlijning van het gericht innovatiebeleid (<http://www.ewi-vlaanderen.be/ewi/beleid/beleidsdocumentatie> )

<sup>101</sup> Cfr. <http://recherche-technologie.wallonie.be/fr/menu/acteurs-institutionnels/service-public-de-wallonie-services-en-charge-de-la-recherche-et-des-technologies/departement-des-programmes-de-recherche/direction-des-programmes-regionaux/les-programmes-first/index.html> (last consulted in 02/2015).

<sup>102</sup> [www.iwt.be](http://www.iwt.be) (last consulted in 02/2015).

centres (now innovation platforms), or the Walloon competitiveness poles and the Brussels' clusters and strategic platforms. An interesting recent evolution is the strong focus on the coordination/opening of programmes (cf. competitiveness poles, S&T awareness raising campaigns) between the Walloon and the Brussels-Capital regions, accelerated since 2011 and the strong coordination of policies between Wallonia and the Wallonia-Brussels Federation (previously French Community). This resulted, for instance, in the inter-regional agreement between Wallonia and Brussels to allow Brussels companies participating in programmes and projects launched and funded by the Walloon competitiveness poles.

When analysing the database of policy measures by broad categories of objectives, instruments and organizations related to innovation policies, one can see that globally, Belgian authorities set their priorities on the creative and transfer capacities (respectively 57% and 36% of all implemented policy measures). Regarding the transfer capacity, a strong focus is set on knowledge networking (17%), more than on knowledge transfer (6%) and knowledge exchanges (4%). This can be explained by a public willingness to create network of innovation actors such as clusters (all regions), competitiveness poles (Wallonia) or innovation platforms (Flanders). This can be linked to the results obtained for the sub-dimensions of the STI Diffusion measures. The instruments aiming at the stimulation of collaboration, partnerships and synergies account for 18% of all policy measures.

#### Exchange and mobility of human resources as channel of knowledge transfer

Several programmes are implemented to facilitate knowledge transfer between public and private sector through temporarily human resources mobility or exchange. However, distinct measures are established by each Community, and an item can be covered by one and not by the other, as described below.

The French Community PRODOC programme promotes exchanges between researchers and private sector via events such as job forums. In Flanders, IWT Innovation mandates are set up with the objective of connecting the academic and the industrial world. In Wallonia, the programme FIRST Entreprise provides support to companies to train young researchers. In Flanders, the Baekeland programme funds doctoral projects carried out at a Flemish university in close cooperation with a company.

Both Communities support knowledge transfer offices that have this role to stimulate contact with the private sector. Moreover, Flanders and Wallonia also competence poles to stimulate cooperation between public research and industry. In Wallonia, a main action to strengthen relations between public research and academia is the establishment of public-private partnerships (PPPs) for R&D. It supports projects financed by the region, private sector and public research organisations on strategic research for companies. The aim is to foster synergies between private and public research. In Wallonia, financial support to patent is provided to public research organisations since they can demonstrate the potential economic value of the patent.

#### Overall Assessment

Overall, and besides unavoidable differences between the regions, the Belgian 'knowledge transfer eco-system' is composed of a very dense and diverse population of intermediary agents with as main categories of actors:

- Technology transfer offices (interfaces) usually located on university campuses, and grafted on the solid knowledge base of Belgian academic research;
- Public (collective and/or sector-driven) research and technical centres, strategic research centres and high-tech infrastructure (e.g. SOCs / PROs in Flanders);
- Cluster organisations, poles of competitiveness (Wallonia), excellence centres (Flanders, now ‘innovation platforms’);
- Science parks, technology parks and incubation centres located in each of the 3 regions;
- (increasingly) specialized service companies with marketed services for high-tech HRM, IPR management etc;
- R&D-intensive companies: mainly large companies and spin-offs, to some extent also SMEs.

This eco-system is supplemented by specific KT-programmes for human resources mobility, university-industry collaborative RDI, spin-off creation etc. in the various public actors: FWO, FNRS, IWT, Innoviris, DGO6, PMV, etc. Over recent years, two main trends are noticeable however:

- On the one hand, a trend towards further densification and professionalization of the variety of services offered;
- On the other hand, the willingness to support more technology ‘deployment’ than technology ‘transfer’. This corresponds to a general trend to support innovation trajectories further downstream, closer to technology upscaling and market uptake, and also to a general revision of the instruments’ portfolio. This explains for instance the emergence of new instruments such as pilot plants, living labs, shared fablabs, industrial demonstrators, lead-users platforms. On top of impacting the traditional set of instruments, this also impacts the whole governance model of ‘knowledge transfer’ (deployment): while universities remain a central actor in knowledge/technology deployment, the eco-system is now encompassing a much wider spectrum of activities and actors, far beyond the boundaries of university campuses.

However, there is a variety of ‘knowledge transfer models’ prevailing at (and around) Belgian universities. Some models are much more elaborated than others (“Leuven R&D” is often referenced as good practice in an international context) but some strong differences emerge that are also linked to endogenous characteristics of the university or the strategic research centre such as technology focus (i.e. one cannot nurture a biotech spin-off the same way as an ICT one ...). Besides, models can also vary because of the ‘strategy’ chosen that often relates to contingency planning of public means (nurturing a few spin-offs with high potential versus supporting the largest number possible). Finally, a major hampering factor for tech transfer and industry-university collaboration still relates to the rewarding system in use in universities. Bibliometric track record and the ‘publish or perish strategy’ may reduce the incentive to carry out research with/for private companies.

#### ***4.5. Innovation framework for SMEs***

Since Belgium is a federal state, the regional administrations of the Brussels Capital Region, Flanders and Wallonia are responsible for most of the competences involved. The



three administrative bodies actively promote SME-friendly policies at all levels. Federal and regional SME envoys help implement the SBA.

Flanders and Wallonia have put regional entrepreneurship/SME strategies in place, implemented in collaboration with local stakeholders. The European Commission has recognised the Walloon SBA strategy as an example of good practice for its unique regional design. The Flanders Region has been awarded the European Entrepreneurial Region Award by the Committee of the Regions for her innovative actions in the field of promoting entrepreneurship<sup>103</sup>.

The improvement of the innovation framework for SMEs is strongly related to the progress in implementing the Small Business Act (SBA). Overall, the Belgian SBA profile presents quite a positive picture. Assessing the progress per governance level reveals differences in priority choices. The Federal government focused mainly on three priorities of the SBA: entrepreneurship (stimulation), access to finance and administrative simplification. Furthermore, as an outcome of the 6<sup>th</sup> State Reform, more competencies are being regionalized like for instance the financing instruments of the federal participation fund. Policy making in the Brussels Capital region was perhaps not so much focused on the SBA principles, but articulated around a triangle of intervention fields: coaching, training and financing. The Walloon government has been particularly active in the entrepreneurship field (with specific focus on the stimulation and training/education of entrepreneurship and female entrepreneurship in particular), the category “skills and innovation” (with f.e. subsidies for consultancy and creative industries) and “internationalization”. Also at the Flemish level, the government and the public administration have been quite active as well over recent years.

#### **4.6 Venture capital markets**

Several agencies and measures have been implemented to support financing innovation, venture capital, guarantees, loans and shaping demand for innovative products and services.

For instance, the Flanders Holding Company, PMV (ParticipatieMaatschappij Vlaanderen), provides financial leverage to projects, acting as an ‘entrepreneur’ and as a facilitator that creates, structures and manages co-operation with private partners. Its goals are to support innovative starters, facilitate growth of Flemish companies, stimulate ‘spearhead’ sectors, support specific sectors and solve temporary liquidity problems of creditworthy companies. PMV invests in companies, projects and sustainable development. PMV’s activities mainly consist of three pillars: risk capital, loans and mezzanine finance. It has developed a wide range of instruments aimed at different purposes, at various target groups, and ranging from the pre-start phase to the international growth phase. Innovative companies are eligible for support through these instruments, while complementary incubation support is managed through IWT. The total value of the amounts managed in the different PMV instruments exceeds €1bn.

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<sup>103</sup> See The SBA fact sheet of 2014 is available at URL: [http://ec.europa.eu/growth/smes/business-friendly-environment/performance-review/files/countries-sheets/2014/belgium\\_en.pdf](http://ec.europa.eu/growth/smes/business-friendly-environment/performance-review/files/countries-sheets/2014/belgium_en.pdf) (last consulted in 02/2015).

Among its instruments there are several innovation-oriented initiatives. The “Vlaams Innovatiefonds” (Vinnof, Flemish Innovation Fund) is specifically aimed at innovative start-up companies. It provides risk capital for the early stage of a company, with the expectation that entrepreneurs will find it easier to call upon private investors in later phases. Vinnof invests seed capital during three stages: pre-start, start and initial growth. PMV also manages the TINA-fund, a €200m fund aimed at supporting innovative projects. The SOFI-fund has been established to support spin-off companies setup from research results in one of the four Flemish PROs (imec, VIB, VITO, iMinds) or the universities (SOFI2-fund). Another example is Flanders’ Care Invest, designed to invest in innovative companies in the care sector. Finally, the Innovatiemezzanine scheme is a subordinate loan for starting companies that have already received a grant from the IWT.

BAN Vlaanderen, the business angels network in Flanders, is a platform in which starting or growing entrepreneurs seeking risk capital are matched with informal private investors, so-called ‘Business Angels’. The latter offer not only money but also their proper know-how, experience and contacts. BAN Vlaanderen is a market place where demand and supply meet, rather than an investment fund.

GIMV (Flanders Investment Company) is Belgium’s most important private equity and venture capital provider and a major European and international market player. It makes venture capital investments in promising high-tech companies and also focuses on buyouts and growth financing, to support companies’ development and growth. Initially it was set up by the Flemish Government that still holds a minority stake in the company. GIMV manages for example the Biotech Fonds Vlaanderen that was set up in 1994 to provide venture capital to existing and starting medium and large sized companies in the Flemish biotechnology sector.

In Wallonia, three instruments were set up in order to provide risk capital to innovative companies’ creation: the seed funds within the Investis, Novallia (subsidiary SOWALFIN) specifically dedicated to supporting innovative projects, and SOFIPOLE created by the Marshall Plan in support to projects of the clusters.

In Wallonia, the Investis host since 2003 seed funds to support the launch of spin offs. The aim was to have a more proactive investment policy against spin offs and to lay the foundation for ongoing collaboration with universities. It was decided subsequently to develop this policy as part of the Marshall Plan 2006-2009 and to adapt the criteria and modalities. Thus the measure has been extended to start-ups whose main business is to develop, implement, exploit or market a product, service or innovative process technologically. The Marshall Plan 2.Vert extended this action from 2014 on: amongst other things to finance also spin offs in the field of environmental technologies, and to increase from 5 to 8 years the age limit of spin offs funded (CWPS 2014). Initially, only Investis in connection with a university were affected by this measure (IBC Meusinvest, Nivelinvest, Namur Invest, Sambrinvest). Subsequently, in view of the enlargement of the support to spin outs and innovative companies, two other Investis were associated (Hocinvest, Investsud). Each Invest has established a specific support instrument dedicated to this measure.

In 2009, the Government entrusted SOWALFIN with an additional mission to promote (the funding of) innovative projects in SMEs. A new subsidiary, Novallia, was created for this purpose. An initial allocation of €46 million was made available by the regional government, complemented by funding from the European Regional Development Fund

(12.5 million under the 'Regional Competitiveness and Employment "and 33.5 million under the 'Convergence'). In late 2013, an additional allocation of € 4 million was decided by the Walloon Government. Novallia takes the form of subordinated fixed-rate loans with a duration of up to 10 years. The maximum amount of aid per project is € 500,000 and the loan covers up to 40% of the expenses generated by the project. When combined with other public financing tools such as the Investis, the SRIW, the Participation Fund or another aid from the Walloon Region, a minimum of 25% private contribution is required. A preferential rate is granted to SMEs that meet the criteria of "Young Innovative Company" as defined by the decree of July 3, 2008.

The assessment made by ADE<sup>104</sup> points out that Novallia has a real success because of its good match to the needs of SMEs and the modalities of its implementation, such as its 'revolving' character (can be maintained beyond the program period). This has had an important impact on creating or improving products and, to a lesser extent on creating and improving services. The funding granted impacted positively the development and sustainability of the job creation in the beneficiary companies. The impact on the overall regional SME population remained limited however, given the limited number of companies affected.

Sofipôle, finally, is a subsidiary of SRIW created as part of the Marshall Plan. It mainly finances investment in infrastructure and equipment for projects of competitiveness clusters. It is also responsible for the regional participation in incubators, investment funds and other companies aiming at the development of new technologies. The total budget amounted to € 49.6 million in the first Marshall Plan and € 26.3 million under the Plan Marshall 2.Vert.

#### **4.7 Innovative public procurement**

Finally, in terms of demand side innovation policies, although the Belgian authorities (collectively) have sought to use investment in space research (through the European Space Agency) as a form of pre-competitive public procurement, the use of public procurement to stimulate research and innovation is not yet widespread. Innovation-driven public procurement initiatives in Belgium have been mostly implemented in Flanders and managed by IWT. Since 2009, 12 Innovation Procurement Platforms have been launched in 10 domains such as Culture, Sustainable building, Public Works, Agriculture, Environment, Social Innovation, Education, Geographical Services, Healthcare, and Economy. Using ICT as enabling technology is an important element in many of them (ex. Culture, Education, Geographical Services...). IWT also participates in cross-national joint procurement initiatives (Smart@Fire)<sup>105</sup>.

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<sup>104</sup> ADE, « Evaluation des actions en matière de développement et d'exploitation du potentiel d'innovation en Wallonie, cofinancées dans le cadre des PO FEDER 2007-2013 Convergence et Compétitivité régionale et Emploi », Décembre 2012, p. 112.

<sup>105</sup> <http://www.innovatiefaanbesteden.be/> (last consulted in 02/2015).

## **5. Performance of the National Research and Innovation System**

### **5.1 Performance of the National Research and Innovation system**

On average in 2012, Belgium produced 23.67 publications per 10,000 inhabitants, well above the EU-28 average (13.8). They are also internationally orientated with 58.31% of publications internationally co-published. In 2012, Belgium had about 1380 international scientific co-publications per million population, which is above all the EU member states except Denmark, Finland, Luxembourg, Netherlands and Sweden. In the period 2002-2012, around 14% of the Belgian scientific publications were in the top 10% most cited publications worldwide in comparison with 11% of top scientific publications produced in the EU28 (Science Metrix, 2014)<sup>106</sup>. The share of public-private co-publications in Belgium is 3.3% in the period 2008-2013 against 2.8% for the EU28<sup>107</sup>.

Belgium is ranked seventh in the EU-28 by the 2014 Innovation Union Scoreboard and is amongst the group of “innovation followers” (third after Luxembourg and The Netherlands). With regard to the ‘enablers’ of innovation, Belgium scores well in terms of tertiary educated population and in terms of quality and openness of the scientific output. Conversely, Belgium has relatively low numbers of new doctorate graduates and a low intensity of public R&D expenditure.

When it comes to the firms activities, Belgium scores well in terms of business R&D (intensity) and venture capital (intensity) as well as in terms of public-private co-publications (proxy for industry-academia collaborative linkages). Conversely, Belgium’s performance in patenting is relatively lower compared to the EU average.

Similarly, Belgium’s output position is mitigated as well. While the country demonstrates above-average performance in terms of the medium-tech and high-tech content of its product exports, it scores slightly below EU average in terms of knowledge-intensive service exports and in licence and patent revenues from abroad.

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<sup>106</sup> These publication data are based on Elsevier’s Scopus database. ScienceMetrix, Analysis and Regular Update of Bibliometric Indicators, study conducted for DG RTD. They represent an update of the data displayed in the table below. See also [http://ec.europa.eu/research/innovation-union/index\\_en.cfm?pg=other-studies](http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=other-studies).

<sup>107</sup> Scopus based publication indicators derived from Elsevier’s SciVal platform, www.scival.com last accessed December 2014.

**Table 6. Assessment of the Performance of the National Research and Innovation System.**

<b>1. ENABLERS</b>	Year	BE	EU
<b>Human resources</b>			
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	2011	1.50	1.70
Percentage population aged 30-34 having completed tertiary education	2012	43.90	35.80
<b>Open, excellent and attractive research systems</b>			
International scientific co-publications per million population	2012	1,313.40	343.15
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	2009	13.39	10.95
<b>Finance and support</b>			
R&D expenditure in the public sector as % of GDP	2012	0.70	0.75
Venture capital (early stage, expansion and replacement) as % of GDP	2012	0.09	0.08
<b>2. FIRM ACTIVITIES</b>			
R&D expenditure in the business sector as % of GDP	2012	1.52	1.31
<b>Linkages and entrepreneurship</b>			
Public-private co-publications per million population	2011	97.13	52.84
<b>Intellectual assets</b>			
PCT patent applications per billion GDP (in PPS€)	2010	3.93	3.92
PCT patent applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health)	2010	0.75	0.85
<b>3. OUTPUTS</b>			
<b>Economic effects</b>			
Contribution of medium and high-tech product exports to trade balance	2012	2.27	1.27
Knowledge-intensive services exports as % total service exports	2011	42.28	45.26
License and patent revenues from abroad as % of GDP	2012	0.56	0.59

Source: European Commission, IUS Database (2014)

## ***5.2 Structural challenges of the national R&I system***

The policy priorities and the mix of measures implemented by the Belgian authorities have not changed significantly over the last five years. Wallonia and the Wallonia-Brussels Federation (previously French Community) have published their first multi-annual strategy Research 2011-2015 "Towards an integrated research policy", the second one has been adopted in 1<sup>st</sup> reading by the government. The creative Wallonia Plan is thought a new impulse for all forms of innovation and the development of creative economy. For the rest, the emphasis has rather been on consolidating and expanding existing policy initiatives (for instance, strategic research centres in Flanders, Competitiveness clusters in Wallonia, Impulse programmes and Strategic Platforms in the Brussels-Capital Region reinforcing the financing and restructuring of university researchers). At the same time, the three Belgian regions have continued to adapt and focus their policy effort to their specific institutional and economic environments. In Flanders, several initiatives have been taken in recent years in the field of renewable energy e.g. with the setup of Icleantech / MIP3.0 (Milieu-Innovatieplatform), Energyville, a testing ground or living lab on Electric Vehicles and the VEB (Flemish Energy Company).

After all, there remain a number of challenges of the Belgian NIS including an overall governance challenge and two main structural challenges. The latter differ in intensity between the regions.

### **Challenge 1: Increasing co-ordination and synergies within the governance system**

The multi-level governance of the Belgian system creates specific challenges (Boekholt & Georghiou, 2011) such as a risk of sub-optimal scale of public-private investments that may create disincentives for co-operation between the main research performers and businesses at an inter-regional level. Given the trend to further empowerment of the communities and the regions, policy making in scientific research and innovation happens essentially at community and regional level, but several important policy areas that influence the effectiveness of research and innovation policies, such as the tax system, remain at the Federal level. While co-operation and coordination mechanisms exist essentially at operational level regarding international issues, co-operation and coordination regarding national issues is much more sporadic. Co-ordination happens through bodies like the CIS and the CFS (dealing with research and innovation) and the Interministerial Economic Commission (IEC) (dealing mainly with the economy and non-research related innovation). Intra-regional co-operation is increasing with neighbouring countries (for example, the Eindhoven-Leuven-Aachen triangle or ELAt). At the same time, the transfer or devolution of research and innovation policy competences to the communities and regions enables each community and region to pursue diversified strategies that respond to specific socio-economic challenges or to further boost specialisations. The Federal government acknowledges such advantages of communitarisation and regionalisation while seeking to limit any 'negative externalities' by proposing, in the Government Agreement that "there should be an inter-federal plan for research and innovation" that "will make technological innovation more efficient", "while respecting each entities' competences" (Belgian Federal Government, 2011). At the same time, over recent years there has been a trend towards a stronger alignment of priorities and programmes between various regions. For instance, since 2010 Brussels companies are allowed to participate in projects from the 'pôles de compétitivité' Wallonia.

The issue of fragmentation also exists at regional level with several studies in both Flanders and Wallonia pointing to the drawbacks of sub-regionalism and an institutionally heavy system of intermediaries and sub-critical research centres. Initiatives such as the strategic research centres and excellence centres (now innovation platforms) in Flanders and the Competitiveness Poles in Wallonia are an attempt to structure the R&D capacity in specific fields and sectors. However, a rationalisation of intermediary structures and a centralisation and professionalization of business advisory networks and financing structures would provide more cost-effective support to business innovation. The OECD STI Outlook (2014) pointed also to the institutional overlap and / or redundancy in choice of targets and priority sectors in the various regions and federal level<sup>108</sup>.

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<sup>108</sup> OECD (2014):276.

## **Challenge 2: Addressing the expected shortage of human resources in S&T**

Belgium, although not among the innovation leaders in the EU, is placed third in the second tier of 'innovation followers' in the Innovation Union Scoreboard 2014 (European Commission, 2014) and over the last five years has achieved moderate growth in innovation performance. According to the Scoreboard, the increase in the country's performance has been below that of the EU which resulted in Belgium's relative performance declining from almost 20% above average in 2006 to 14% above average in 2013.

Strong indicators where Belgium is performing well above the average EU performance include international scientific co-publications, innovative SMEs collaborating with others and public-private co-publications. Relatively weak indicators include sales share of new innovations, non-EU doctorate students and new doctorate graduates. Performance has improved most in Community trademarks and international scientific co-publications. Performance has worsened in non-R&D innovation expenditures and to a lesser extent also in venture capital investments, SMEs with marketing and/or organisational innovations and fast-growing innovative firms.

While Belgium's labour force skills are reasonably strong, the demand for engineers exceeds the number of graduates in certain areas. It remains clear that the shortage of human resources in S&T, partly due to the low levels of new doctorate graduates and the weak inflow of foreign doctorate students (despite a high level of tertiary educated population), is one of Belgium's key challenges for the near future (OECD 2014).

## **Challenge 3: Matching knowledge production with the economic fabric**

Despite the high research outputs in quantitative and qualitative sense and relatively high investments in research centres and R&D measures, the take up by Belgian companies appears to be sub-optimal (Bruno & Van Til, 2010, 2011; ECOOM, 2013). While the number of patent applications per million GDP is the same as the EU average (European Commission, 2014), community trademarks and designs are below (90 and 91 respectively compared to the EU average of 100). Belgium appears also to underperform in knowledge-intensive services exports (93) and the share of new innovations in total sales (86). Belgian STI activities are well-integrated internationally, but attracting foreign investment in R&D and innovation remains a high priority in the country (OECD 2014).

The main challenge is to link the accumulated research capacities and results to the economic eco-system. Several measures are in place in each region aimed at economic exploitation of research, but it seems that research outputs are not aligned with the absorptive capacity of SMEs. In Flanders, strategic research centres offer high-class and knowledge intensive services, but these are often only used to a limited extent by players from Belgium. IMEC, for instance, is considered to be a world-class research institute, but although it attracts a lot of industrial players from all over the globe, it struggles to link to Flemish companies, as this sector is marginally represented in Flanders. From a business perspective, the limited public support to an economically important sector like the chemical industry (including Pharma) (in Flanders: 40% of BERD and 27% R&D personnel)

is striking (Van Til, 2011)<sup>109</sup>. This is one of the reasons why the FISCH excellence centre (now innovation platform) has been setup by the Flemish Government as of 2012. A recent review of the science production (publications), the technology production (patents) and the economic specialisation (employment) by ECOOM & EWI Department (2011) further substantiates a certain mismatch between knowledge production and the economy in Flanders. As already emphasised, this mismatch is also present in the other Belgian regions.

### **5.3 Meeting structural challenges**

Broadly speaking when assessing the policy mix, there is a need to keep in mind that while the Belgian research and innovation performance could be higher, in overall terms the country is firmly located in the top half of the 'league table'. Equally, despite concerns expressed in various reviews about 'co-ordination and synergies' due to the multi-level governance context, there are clear signs that the Belgian authorities have understood the need to optimise (if not rationalise) the public support provided via various governments and their agencies and to seek, where relevant, enhanced synergies.

As noted above, the policy mix and focus of policy effort has not changed dramatically over the last five years (and it could be argued over a decade). A considerable policy effort and corresponding investment has been made in reinvesting in scientific research (via the Federal Government and the Communities) and on enhancing the attractiveness of Belgium as a place to conduct both scientific research (the communities) and science-industry collaboration and commercialisation (the regions). At the same time, the targeting or strategic orientation of this investment has been subtly changing through a mix of competitive funding programmes and investments into thematically specialised research facilities and centres. The driving forces behind this specialisation are both economic (ensuring that the business sectors are assisted to reconfigure towards new competitive products or that new higher value added sectors emerge) and societal (e.g. dealing with environmental degradation nationally and contributing to tackling climate change globally).

The Belgian policy mix (at all levels) is sophisticated and the various authorities have put in place or further improved a mix of policy advisory and strategic intelligence actions that provide a stronger basis for policy decisions than existed a decade ago. Equally, the evaluation of policy outcomes has become an increasingly, if not systematically, applied tool to assist in improving policy effectiveness.

This said, the trends in research and innovation performance discussed above, and the evidence from benchmarking exercises such as the IUS, tend to suggest that the rate of improvement both in terms of increasing investment intensity and in terms of innovation performance are insufficient to meet the targets set in policy strategies. In particular, the following observations can be made.

- There is little chance of Belgium meeting the 3% GERD/GDP target even by 2020, even if the various Belgian authorities have confirmed the 3%-target. The tax credits as well as other broader tax measures are adding funds to the research

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<sup>109</sup> An initiative on sustainable chemistry has been taken, which resulted end 2011 in the establishment of a new Excellence Centre (now innovation platform), the FISCH initiative on sustainable chemistry.



system, but are not counted in the calculations. Public investment is on slightly upward trend but even, for instance, the doubling of public investment in Wallonia over the last decade has only inched the region up to 2% GERD/GDP intensity. Even if the public investment gap with the EU-28 average has been surpassed, this still leaves a considerable gap of more than half a percentage point to be met by the business sector. Given current industrial structures, this is unlikely to happen.

- There is a need to be wary of hasty conclusions that the current policy mix is not working due to the lack of significant progress. Given the economic crisis over the last five years, the Belgium economy and research and innovation system appears to have ‘weathered’ the storm better than most other neighbouring countries and EU Member States. The introduction and extension of R&D tax reductions on researchers salaries (in both the higher education and business sectors) may very well have acted as an ‘automatic stabiliser’ without which R&D intensity would have declined rather than remaining relatively stable. Similarly, tax incentives for business such as the notional interest<sup>110</sup> measure may have contributed to maintaining the relative attractiveness of Belgium as a place to do research. This type of hypothesis requires validating and it would be timely to see an evaluation of the R&D tax measures to understand if they are maintaining current or inducing additional R&D spending by the beneficiaries.
- The structuring of the higher education system (in both Communities) into larger institutions (‘associations’ or ‘academies’ bringing together several third level education institutes such as the university colleges) should foster, if the correct policy incentives are in place, a corresponding realignment of research potential (e.g. greater scope for inter-disciplinary work or merging or pooling of research teams across formally autonomous institutes). This is one element that would help to reduce fragmentation of the overall Belgian research system and further improve its performance. At the same time, the balance between institutional and competitive funding of the system would merit further review in order to further focus and concentrate efforts. Finally, while the remit of the Federal Government to fund ‘nation’ wide research programmes has been further diminished (with the intended transfer of the inter-Community programmes Inter-University Attraction Poles (IUAP) and the Technology Attraction Poles to the Communities and the Regions), there is a clear (financial at a minimum) rationale for organising joint programming, sharing certain research infrastructures or ‘pooling’ research efforts (e.g. the Scottish example of research pools could be applied) between Flemish, Brussels, Walloon and French Community (Wallonia-Brussels Federation) networks. This has already been possible for coordinating Belgium’s participation into

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<sup>110</sup> The “notional interest deduction” enables all companies subject to Belgian corporate tax to deduct from their taxable income a fictitious interest calculated on the basis of their shareholder’s equity (net assets). The main purpose is to reduce the tax discrimination between debt financing and equity financing. Indeed, in the case of loan capital, the interest paid is deductible from the taxable base, while with equity capital the dividends are taxable. These rules are intended to have the following positive effects: a general reduction of the effective corporate tax rate for all companies, and a higher return after tax on investment and the promotion of capital-intensive investments in Belgium; and an incentive for multinationals to examine the possibility of allocating such activities as intra-group financing, central procurement and factoring to a Belgian group entity.

research infrastructures of the ESFRI roadmap. Finally, the proposed Inter-Federal Plan for Research and Innovation has led to concrete initiatives.

- The efforts to structure and develop major thematically, sector-specific or technologies-specific ‘clusters’ of R&D and innovation over the last decade (and in the case of Flanders several decades) through strategic research centres, excellence centres, competitiveness poles, clusters and targeted research programmes is an important inflexion of policy strategy; it needs to be pursued and further consolidated. The evidence from the Flemish strategic research centres (IMEC, or VIB for instance) suggests that it may take over a decade before such initiatives become fully operational and realise their objectives, achieve ‘critical mass’ and attain international recognition. The Walloon competitiveness clusters and the research and technology centres created over the last decade will need sustained funding, regular evaluation and expert management if they are to begin to contribute effectively to structural adjustment of the economy. The realignment of research and innovation policies to contribute to tackling the structural adjustment of the economy or for taking on societal (grand) challenges such as the environment and climate change, will require better orientation and focus of the limited amounts of public funding available in the coming years with the need to possibly cut funding from non-priority centres or sectors. This implies the need for a political will to close or merge structures created over the previous decades.
- Aside from the Federal R&D tax measures, business R&D and innovation is supported via a range of measures managed by the regional authorities. The innovation policy mix has evolved over recent years but remains essentially based on grants (or reimbursable loans) for individual firms to undertake R&D. The IUS 2010 suggests (based on Community Innovation Survey (CIS) data) that the intensity of business innovation activity, notably non-technological innovation, is not improving and that the impact of such activity is not as positive as would be hoped in terms of boosting turnover from new products. Despite initiatives such as the VIS (Flemish Innovation Co-operation network) programme in Flanders or new coordinating agencies such as the Walloon Technological Stimulation Agency (AST, in 2014 merged with AWT and ASE into the ‘Agency for Enterprise and Innovation’) aimed at identifying and supporting firms with a potential to innovate more intensively, the situation has not evolved positively. There is a need for a further re-assessment of the effectiveness of the direct support measures and of intermediary support structures that are often over-complex and fragmented that would lead to a more radical ‘pruning’ of the system to ensure value for money. In 2011, an update started of the report drafted by the Soete-commission in 2006 on the Flemish STI-landscape. The results were published in May 2012<sup>111</sup>. At the current time, there is limited recent evaluation evidence on the effectiveness of the measures in place and a wide-ranging evaluation and review would be beneficial in each region in order to focus regional support on initiatives best able to contribute to raising the intensity of industrial R&D and innovation (including service sector and non-technological forms of innovation). The new Flemish Governing agreement 2014-2019 has announced the merger of the Enterprise Flanders with the IWT

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<sup>111</sup> <http://www.ewi-vlaanderen.be/ewi/nieuws/tweede-rapport-soete-over-innovatie-vlaanderen-17-aanbevelingen> (last consulted Feb 2015).

(agency for Innovation by Science and Technology) into a new agency for Enterprise and Innovation, and the integration of the Hercules Foundation into the Research Foundation Flanders (FWO). This may help in streamlining support and increase administrative simplification.

- Finally, the issue of public sector innovation is given a remarkably low priority in policy declarations or strategies, except for e-practices in all entities and public procurement for innovation in Flanders. Many observers would consider that the potential to increase the efficiency of public expenditure in Belgium and the effectiveness of services provided to the population is significant.

The table below summarises the policy response to the challenges identified in section 3.2 of this report.

**Table 7. Challenges, Policy measures and assessment of appropriateness, efficiency and effectiveness**

Challenges	Policy measures/actions addressing the challenge <sup>112</sup>	Assessment in terms of appropriateness, efficiency and effectiveness
1. Increasing co-ordination and synergies within the governance system	December 2011 Federal Government Agreement foresees an inter-federal research and innovation plan Strategy 2011-2015 (Framework note) on an Integrated Research policy for the Walloon-Brussels Federation, Wallonia (and Brussels-Capital) The (national) interministerial council for science policy (uniting all ministers in charge of research) is addressing issues concerning improving national co-ordination as well as issues regarding a better co-ordinated approach towards Europe.	Recent assessments (e.g. ERAC peer review 2011) concluded that fragmentation hampers the effectiveness and efficiency of the Belgian STI system. The transfer of the Interuniversity Attraction Poles (IAP) and Technological Attraction Poles (TAP) Federal measures further reduces inter-federal funding. Increasing integration and co-ordination of Walloon- Wallonia-Brussels Federation-Brussels-Capital policies with further actions foreseen by March 2011 action plan
2. Addressing expected shortage of human resources in S&T	Federal R&D wage tax reduction measures Range of measures at Federal, community and regional levels to support international mobility, industrial PhDs, recruitment of innovation managers, S&T studies	No robust data (yet) or evidence to allow a judgement as to whether the policy measures are paying off in terms of reversing brain drain or attracting more people to work in research or innovation careers.
3. Matching knowledge production with the economic fabric	Instruments include: Flemish strategic research centres and excellence centres (innovation platforms), Walloon Competitiveness clusters, support for business angels, regional risk capital measures, incubators and funding for university technology transfer centres.	There is quite a comprehensive set of measures in place, targeted at interfaces between research institutions (incl. universities) and companies. Assessing the efficiency and effectiveness of these measures is out of scope of this report. However, there seems to be a certain mismatch between knowledge production and the economy from a sector viewpoint.

<sup>112</sup> Changes in the legislation and other initiatives not necessarily related with funding are also included.

## Annex 1. References

- Archambault, E., Amyot, D., Deschamps, Ph., Nicol, A., Provencher, Fr., Rebout, L. and Roberge, G. (2014), "Proportion of Open Access Papers Published in Peer-Reviewed Journals at the European and World Levels—1996–2013, Science Metrix, (RTD-B6-PP-2011-2: Study to develop a set of indicators to measure open access), Brussels, October 2014 (available at [http://science-metrix.com/files/science-metrix/publications/d\\_1.8\\_sm\\_ec\\_dg-rtd\\_proportion\\_oa\\_1996-2013\\_v11p.pdf](http://science-metrix.com/files/science-metrix/publications/d_1.8_sm_ec_dg-rtd_proportion_oa_1996-2013_v11p.pdf)) (last consulted March 2015).
- Belgian Federal Government (2011), Accord du Gouvernement / Regeerakkoord 1.12.2011, available at:  
[http://www.belgium.be/en/about\\_belgium/government/federal\\_authorities/federal\\_government/policy/government\\_agreement/](http://www.belgium.be/en/about_belgium/government/federal_authorities/federal_government/policy/government_agreement/) (in French and Dutch only)
- Belgian Federal Government (2014), Accord du Gouvernement / Regeerakkoord 09.10.2014, available at:  
[http://www.premier.be/sites/default/files/articles/Accord\\_de\\_Gouvernement\\_-\\_Regeerakkoord.pdf](http://www.premier.be/sites/default/files/articles/Accord_de_Gouvernement_-_Regeerakkoord.pdf) (in French and Dutch only)
- Belgian Federal Government, regional governments and community governments (2014), National Reform Programme 2013, available at:  
[http://ec.europa.eu/europe2020/pdf/nd/nrp2013\\_belgium\\_en.pdf](http://ec.europa.eu/europe2020/pdf/nd/nrp2013_belgium_en.pdf)
- Belgian Federal Government, regional governments and community governments (2014), National Reform Programme 2014, available at:  
[http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014\\_belgium\\_en.pdf](http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014_belgium_en.pdf)
- BELSP0, (2013a). R&D Statistics, available at:  
[http://www.belspo.be/belspo/stat/index\\_nl.stm](http://www.belspo.be/belspo/stat/index_nl.stm) (available in Dutch or French only)
- BELSP0, (2013b). The Annual Report on Science and Technology Indicators for Belgium, Nov 2013.  
R&D Statistics, available at: [http://www.belspo.be/belspo/stat/index\\_nl.stm](http://www.belspo.be/belspo/stat/index_nl.stm) (available in Dutch or French only)
- Boekholt, P., & Georghiou, L., (Rapporteurs) (2011), 2011 Policy Mix Peer Review Belgium Final Report. Download at: <http://www.belspo.be/stat/>
- Bruno N., Van Til, J., Van der Veen G. (2009): ERAWATCH Country Report 2009, Analysis of policy mixes to foster R&D investment and to contribute to the ERA: Belgium, JRC Scientific and Technical Reports.
- Bruno, N., Van Til, J. (2010), ERAWATCH Country Reports 2010: Belgium. ERAWATCH Network – Technopolis Group.
- Bruno, N., Van Til, J. (2011), Mini Country Report: Belgium. Dec. 2011. [http://www.proinno-europe.eu/sites/default/files/repository\\_files/12/03/Belgium\\_TC\\_final.pdf](http://www.proinno-europe.eu/sites/default/files/repository_files/12/03/Belgium_TC_final.pdf)
- Bureau Fédéral du Plan (2010): Le système d'innovation en Wallonie.
- Bureau Fédéral du Plan, Tableau de Bord de la Recherche et de l'Innovation en Wallonie, <http://indicators.plan.be/>

- Capron, H., M. Cincera (2002): The Participation of Belgium to the European R&D Programmes, in Belgian Report on Science, Technology and Innovation – Volume II, M. Cincera and B. Clarysse (eds.), Brussels: OSTC, pp. 221-240.
- Cincera, M. (2014), ERAWATCH Country Reports 2013: Belgium. ERAWATCH Network – Technopolis Group, Brussels, June 2014.
- Commissie federale samenwerking van de Interministeriële Conferentie voor Wetenschapsbeleid / Commission cooperation fédérale de la Conférence interministérielle de la Politique Scientifique (2010): Budgettaire kredieten voor O&O van de overheden in België in de periode 1999-2009.
- Conseil Wallon de la Politique Scientifique (2010), Evaluation de la Politique Scientifique de la Région Wallonne et de la Communauté Française en 2008 et 2009, 2010, Liège.
- Conseil Wallon de la Politique Scientifique (2014), Evaluation de la Politique Scientifique de la Région Wallonne et de la Communauté Française en 2012 et 2013, 2014, Liège. (<http://www.cesw.be/index.php?mact=publications,cntnt01,default,0&cntnt01what=publication&cntnt01alias=Rapport-du-CPS&cntnt01returnid=57> ) (last consulted Feb 2015)
- CREF (2010): Website Council of Rectors of the French-speaking universities of Belgium, [www.cref.be](http://www.cref.be). Brussels.
- DGR&I, Forthcoming. “Overview of International Science, Technology and Innovation cooperation between Member States and countries outside the EU and the development of a future monitoring mechanism”.
- De Rynck, S., Dezeure, K. (2006), Policy convergence and divergence in Belgium: Education and health care, *West European Politics* 29/5, pp 1018-1033.
- De Standaard (2010), Jonge bollebozen nemen de benen, 28 September 2010.
- Deloitte (2013), Researchers’ report 2013, report prepared by Deloitte Consulting as a part of a three year monitoring study commissioned by DG Research and Innovation: Monitor human resources policies and practices in research.
- ECOOM (2013), Vlaams Indicatorenboek 2013.
- ECOOM & EWI Department (2011): OECD Smart Specialisation Project. Presentation at the OECD TIP meeting on smart specialisation, 23 November 2011.
- ERAWATCH Network (2009): Research inventory Belgium.
- Ernst & Young (2013), Le Baromètre de l’Attractivité belge 2013.
- European Commission (2011a), Innovation Union Competitiveness Report: Belgium. [http://ec.europa.eu/research/innovation-union/index\\_en.cfm?pg=country-profiles&section=competitiveness-report&year=2011](http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=country-profiles&section=competitiveness-report&year=2011)
- European Commission (2011b), Innovation Union Competitiveness 2011, [http://ec.europa.eu/research/innovation-union/pdf/competitiveness-report/2011/chapters/part\\_iii\\_chapter\\_2.pdf](http://ec.europa.eu/research/innovation-union/pdf/competitiveness-report/2011/chapters/part_iii_chapter_2.pdf)
- European Commission (2012), DG Enterprise and Industry, “SBA Fact Sheet 2012 – Belgium”.

European Commission (2013a), Annual growth survey 2014, available at:  
[http://ec.europa.eu/europe2020/pdf/2014/ags2014\\_en.pdf](http://ec.europa.eu/europe2020/pdf/2014/ags2014_en.pdf) (SWD(800) final)

European Commission (2013b), Commission staff working document overview of progress in implementing country-specific recommendations by member state accompanying the communication from the commission “Annual Growth Survey 2014”, available at: [http://ec.europa.eu/europe2020/pdf/2014/csimpl2014\\_swd\\_en.pdf](http://ec.europa.eu/europe2020/pdf/2014/csimpl2014_swd_en.pdf) (COM(2013) 800 final)

European Commission (2014a), Innovation Union Scoreboard 2014.  
[http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014\\_en.pdf](http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014_en.pdf)

European Commission (2014b), State of the Innovation Union - Taking Stock 2010-2014, available at: [http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2013/state\\_of\\_the\\_innovation\\_union\\_report\\_2013.pdf](http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2013/state_of_the_innovation_union_report_2013.pdf) (COM(2014) 339)

European Commission (2014c), European Research Area Progress Report 2014, available at:  
[http://ec.europa.eu/research/era/pdf/era\\_progress\\_report2014/era\\_progress\\_report\\_2014\\_communication.pdf](http://ec.europa.eu/research/era/pdf/era_progress_report2014/era_progress_report_2014_communication.pdf). {SWD(2014) 280 final}

European Commission (2014d), European Research Area Facts and Figures,  
[http://ec.europa.eu/research/era/pdf/era\\_progress\\_report2014/era\\_facts&figures\\_2014.pdf](http://ec.europa.eu/research/era/pdf/era_progress_report2014/era_facts&figures_2014.pdf) (COM(2014) 575 final)

European Commission (2014d), Research and innovation as sources of renewed growth, available at: <http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2013/research-and-innovation-as-sources-of-renewed-growth-com-2014-339-final.pdf> (COM(2014) 339 final)

Eurostat data

EWI (2010), Daar zit beweging in. Een Vlaams Actieplan voor onderzoekers, EWI: Brussels.

EWI (2010b), 2010 EWI-Speurgids, Het Vlaamse overheidsbudget voor Economie, Wetenschap en Innovatie. Available in English as “budget browser”.

EWI (2011), 2011 EWI-Speurgids, Het Vlaamse overheidsbudget voor Economie, Wetenschap en Innovatie. Available in English as “budget browser”.

EWI (2011b), Een verdere invulling van de ViA Doorbraak - ‘Innovatiecentrum Vlaanderen’. Conceptnota over de stroomlijning van het gericht innovatiebeleid (<http://www.ewi-vlaanderen.be/ewi/beleid/beleidsdocumentatie> )

Federal Planning Office, indicators website, <http://www.indicators.plan.be>

Flemish Government (2014) Flanders Outlook 2014 – A benchmarking of Flanders amongst the European regions.

Flemish Parliament, (2010), The 2010-2011 Policy Letter for Innovation.

Geerts N., M. Van Langenhoeve, P. Viane, P. Dengis (2013) STI in Flanders : Science, Technology and Innovation Policy and Key Figure – 2013, Flemish Government, Department Economy, Science and innovation.

Gouvernement de la Région de Bruxelles-Capitale (2012), Mise à jour du Plan Régional pour l’Innovation 2006-2013 de la Région de Bruxelles-Capitale (<http://www.innoviris.be/fr/politique-rdi/plan-regional-dinnovation> et

<http://www.innoviris.be/fr/politique-rdi/plan-regional-dinnovation/mise-a-jour-du-plan-regional-pour-linnovation>).

Gouvernement Wallon (2009): Plan Marshall 2.Vert.

Gouvernement Wallon et Fédération Wallonie-Bruxelles (2011), Partenariat Wallonie-Bruxelles pour les chercheurs et les chercheuses.

Gouvernement Wallon et Fédération Wallonie-Bruxelles (2011): Stratégie Recherche 2011-2015.

Gouvernement Wallon (2014), Déclaration de politique régionale (DPR) 2014-2019, Available in French only, at :  
[http://www.wallonie.be/sites/wallonie/files/actualites/fichiers/dpr\\_2014-2019.pdf](http://www.wallonie.be/sites/wallonie/files/actualites/fichiers/dpr_2014-2019.pdf)

Gouvernement de la Fédération Wallonie-Bruxelles (2014), Déclaration de Politique Communautaire 2014-2019 : Fédérer pour réussir, Available in French only, at :  
<http://gouvernement.cfwb.be/sites/default/files/nodes/story/6373-dpc2014-2019.pdf>

Guy, K., et al., (2009), Designing Policy Mixes. The Policy Mix Project, Methodology Deliverable, Task 3.  
[http://www.belspo.be/belspo/stat/papers/pdf/ERAC\\_OMC\\_Belg\\_PeerReview\\_Ann\\_2011\\_en.pdf](http://www.belspo.be/belspo/stat/papers/pdf/ERAC_OMC_Belg_PeerReview_Ann_2011_en.pdf)

IDEA Consult (2012), "Assessment revised structure and operations of FWO evaluation panels", (Confidential Briefing Note), Feb 2012.

IDEA Consult (2013), "Onderzoekersbevraging FWO dienstverlening" [Researchers' Survey on FWO activities], (Confidential Briefing Note), Feb 2013.

KU Leuven and Bocconi University, "Patents and Licensing study" for DG RTD (2014).

Maghe, V., H. Capron, M. Cincera (2014), Institutional set-up of innovation policies: methodology for a systemic point of view, iCite WP N°2014-11.

Mangez, E. (2010), Global knowledge-based policy in fragmented societies: The case of curriculum reform in French-speaking Belgium. European Journal of Education, 45/1, pp. 60-73.

OECD (2007), OECD Economic Surveys: Greece, Volume 2007/5, May 2007.

OECD (2013), Science, Technology and Industry Scoreboard 2013, Paris, 2013.

OECD (2014), Science, Technology and Industry Outlook 2014, Paris, 2014.

SBA Factsheet Belgium (2013): [http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/files/countries-sheets/2013/belgium\\_en.pdf](http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/files/countries-sheets/2013/belgium_en.pdf)

Science Connections (2013), Ontmoeting met Philippe Courard, Staatssecretaris voor Wetenschapsbeleid.

Seiler, D.-L. (1997), Un système consociatif exemplaire: la Belgique, Revue Internationale de Politique Comparée, 4, pp. 601-624.

Soete, L. (2007), Flanders: Scan of the innovation policy instruments (Soete Rapport).



- Soete, L. (2012), Rapport van de Expertgroep voor de Doorlichting van het Vlaams Innovatie-Instrumentarium (SoeteRapport II)..2Tijssen, R., et al., (2010). Wetenschaps- en technologieindicatoren 2010, NOWT, Leiden.
- The Council of the European Union (2014), Council recommendation of 8 July 2014 on the National Reform Programme 2014 of Belgium and delivering a Council opinion on the Stability Programme of Belgium, 2014, available at : [http://ec.europa.eu/europe2020/pdf/csr2014/csr2014\\_council\\_belgium\\_en.pdf](http://ec.europa.eu/europe2020/pdf/csr2014/csr2014_council_belgium_en.pdf). (2014/C 247/01))
- Union Wallonne des Entreprises (2010): L'entreprise je veux savoir, Edition 2010.
- Van Rossem, R. and Derycke (2013), "The careers of Ph.D. students and doctorate holders", University of Ghent, 2013 (<http://hdl.handle.net/1854/LU-4183267>)
- Van Til, J. (2011), Regional Innovation Report: Flanders. Regional Innovation Monitor.
- Verbeek A. (2007): OMC Policy-Mix report.
- Vlaams Regering (2014), Regeerakkoord van de Vlaamse Regering 2014-2019, Available, in Dutch only, at: <http://ebl.vlaanderen.be/publications/documents/60797>
- VLIR (2008), Equality Guide, VLIR, Brussels.
- VLIR (2009), Statistische gegevens betreffende het personeel aan de Vlaamse universiteiten, VLIR, Brussels.
- VRWI (2013), Advisory report 186: Smart Specialisation Strategy Concept Paper, 25-04-13.
- Ziarko W., Reid A., Bruno N. (Ed) (2010), Belgian Report on Science Technology and Innovation 2010, Belgian Science Policy Office.

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