



## JRC SCIENCE AND POLICY REPORT

# RIO Country Report Slovenia 2014

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2015



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JRC96370

EUR 27297 EN

ISBN 978-92-79-48953-2 (PDF)

ISSN 1831-9424 (online)

doi:10.2791/453214

Luxembourg: Publications Office of the European Union, 2015

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**Abstract**

The report offers an analysis of the R&I system in Slovenia 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 Slovenian 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.

## **Acknowledgments**

The report draft has benefited from comments and suggestions of Tomaž Boh from the Ministry of Education, Science and Sports of Slovenia and of Hristo Hristov from JRC-IPTS. The contributions and comments from DG RTD and other colleagues from JRC-IPTS are also gratefully acknowledged.

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## Executive summary

With 2 million inhabitants and area of 20,273 km<sup>2</sup>, Slovenia belongs to the group of small EU member states. Relatively stable economic development since the beginning of the transition in the nineties was interrupted by the economic crisis in 2008 and consequent political crises, leading to decline in GDP growth rate. The lack of structural reforms made the recovery very slow. Only by the second half of 2014 signs of positive growth rates had appeared and more optimistic evaluations have been presented by various domestic and international agencies. While initial economic crisis didn't have special impact on the RDI environment in terms of either political or financial support, prolonged crisis had affected especially public R&D institutions. The present report provides an up to date overview of RDI system, including recent policy developments and challenges. It 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 data is, whenever possible, comparable across all EU Member State reports.

In 2014, Slovenia's GDP p.c. amounted up to 17,986 €, presenting an index of 82 (out of 100, which represents the development level of EU-28) (UMAR, 2015).<sup>1</sup> Even though during the past six years the GDP was decreasing or stagnating, the RDI investments have been growing steadily during the same years. A break-through in RDI investments occurred in 2010, when the "ceiling" of 2 % was surpassed. The trend continued in 2011 (2.47 % of GDP per RDI) and in 2012 (2.58 % of GDP per RDI), while it stagnated in 2013 (2.59 % of GDP per RDI) (Eurostat, 2014). Most of the increase has to be attributed to increased private sector investment in R&D, while the share of the government for RDI has been decreasing in recent years. (*cf. infra*) The business enterprise sector thus provided in 2012 €577.6 million or 62% of total expenditure and according to the figures for 2013, the share of business sector is as much as 63.8% (SORS, 2014b). On the other hand, the GBAORD was only slightly higher in 2012 if compared to 2007 (€189 million in 2012 comparing to €180 million in 2007), but further decreased in 2013 to the level of €175 million (0.48 % of GDP). The expected level of GBAORD 2014 is €183 million (SORS, 2014), but some experts already predict that the final amount could be somewhat lower, especially in view of the revised budget for 2014, where the funds of the Ministry of Education, Science and Sports (MESS) were further lowered (Ministry of Finance of RS, 2014).

The economic crisis had dire consequences not only on the national economy, but also on the stability of the political situation in Slovenia. In three years since 2011 Slovenia changed three Governments. The changes of Governments have affected the governing structure and the workload of ministries in charge of RDI, causing thus delays in the implementation of the overall policy on RDI as well as lack of continuity of some of relatively good instruments developed during more favourable times. Even though Slovenia managed in 2011 to adopt a very comprehensive Research and Innovation Strategy (RISS) till 2020, little of planned activities have so far been implemented. If the document stressed the importance of building a national innovation framework, the organisation of the government departments went in a different direction, moving the department for technology and innovation away from MESS to the Ministry of Economic Development and

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<sup>1</sup> More at [http://www.umar.gov.si/fileadmin/user\\_upload/publikacije/eo/2015/eo-0115.pdf](http://www.umar.gov.si/fileadmin/user_upload/publikacije/eo/2015/eo-0115.pdf) (15 February 2015).

Technology. With highly limited in-house support, the innovation section had suffered significant decline, both in terms of financial as well as human resources.

According to the existing system of financing RDI, only broad contours are defined and within them, competitive public calls are issued. Slovenia has not included in its strategic documents priority areas and still on-going preparation of the Smart Specialisation Strategy (RIS3) is looked upon as potentially the key document in this area. Yet the analysis of the preparation of this document reveals one of the major challenges of Slovenian RDI policy: the issue of poor coordination among various government departments and offices further exacerbated by so many shifts and changes in the government. Just as one group seemed to have come to an agreement, people in charge have changed and the elaboration starts anew, often bringing to the forefront vested interests.

The core funding structure of R&D activities through Slovenian Research Agency has not changed much in recent years, with research programmes accounting for the most significant part of SRA budget.<sup>2</sup> While the Agency claims these are competitive funds, several external evaluators have named them semi-institutional due primarily to their stability (nearly all of the programmes continue after each evaluation & consecutive new call). The content of the research programmes is proposed bottom up, limiting to a certain extent the ability of the government to set research priorities. On the other hand, basic and applied projects are funded exclusively on competitive basis, yet again leaving relative freedom to research community in terms of the research topics.

The national progress towards the realisation of ERA develops slowly, but steadily. There are several ERA priorities (such as human resources, peer-review etc.), where Slovenia complies with the ERA requirements, while the progress in some other priorities is significantly slower (e.g. ERA priority 2). This can be partially explained by the problem of institutional segmentation of Slovenian RDI, where different processes have different channels of command. In terms of national innovation system, frequent changes of the government have resulted in weakening of the innovation policy, where support measures introduced during the previous financial perspective 2007-2013 are no longer available and new measures are awaiting the next round of structural funds. Due to the delays first in the preparation of the OP<sup>3</sup> and still unfinished RIS3, it is difficult to assess how the government plans to support business sector research and innovation, besides the tax subsidy. The statistical data doesn't reflect fully the current performance, since the data is still based on the period of extensive support to RDI. Especially in the enablers' indicators, Slovenia is either above or at EU average. Outstanding are the figures on scientific publications per million population and R&D expenditures of business sector. Less favourable are output indicators gathered by the Innovation Union Scoreboard, where Slovenia is (still) grouped among innovation followers (IUS, 2014), yet the Scoreboard also noticed that Slovenia is among the weakest members of this group in terms of more recent performance.

The major challenges include the sustainability of public resources for RDI, coordination and transparency of innovation policies and measures and closing the gap between investing in RDI and economic results at macro level. Yet, if at the time of preparation of

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<sup>2</sup> In 2013, the Slovenian Research Agency funded RGP's in the amount of €52.7 million or more than 36% of total disbursement of research funding (SRA financial report for 2013).

<sup>3</sup> Approved by the European Commission in December 2014.

RISS the overall opinion of the policy-makers was very favourable of RDI and its potential contribution to economic development and growth of competitiveness, the situation changed in the following years. Already by 2013, the RDI investments are rarely understood as an investment in the future, but as expenditures, which should await better economic times. The very low figures planned for RDI in 2015 budget seem to confirm such assessment.

## TABLE OF CONTENTS

Acknowledgments.....	i
Executive summary.....	ii
1. Overview of the R&I system.....	- 1 -
1.1 Slovenia in the European RDI landscape .....	- 1 -
1.2 Main features of the R&I system .....	- 1 -
1.3 Structure of the national research and innovation system and its governance .....	- 3 -
2. Recent Developments in Research and Innovation Policy and systems .....	- 7 -
2.1 National economic and political context.....	- 7 -
2.2 National R&I strategies and policies.....	- 8 -
2.3 National Reform Programmes 2013 and 2014.....	- 11 -
2.4 Policy developments related to Council Country Specific Recommendations.....	- 12 -
2.5 Funding trends.....	- 13 -
2.5.1 Funding flows.....	- 13 -
2.5.2 Project vs. institutional allocation of public funding.....	- 16 -
2.5.3 R&I funding.....	- 19 -
2.6 Smart Specialisation (RIS3) .....	- 20 -
2.7 Evaluations, consultations, foresight exercises.....	- 21 -
3. National progress towards realisation of ERA.....	- 24 -
3.1 ERA priority 2: Optimal transnational co-operation and competition.....	- 24 -
3.2 ERA priority 3: An open labour market for researchers. Facilitating mobility, supporting training and ensuring attractive careers.....	- 26 -
3.2.1 Introduction .....	- 26 -
3.2.2 Open, transparent and merit-based recruitment of researchers .....	- 27 -
3.2.3 Access to and portability of grants .....	- 29 -
3.2.4 EURAXESS.....	- 29 -
3.2.5 Doctoral training.....	- 29 -
3.2.6 HR strategy for researchers (HRS4R) incorporating the Charter and Code.....	- 30 -
3.2.7 Education and training systems .....	- 31 -
3.3 ERA priority 5: Optimal circulation and access to scientific knowledge .....	- 32 -
3.3.1 e-Infrastructures and researchers electronic identity.....	- 33 -
3.3.2 Open Access to publications and data .....	- 33 -
4. Innovation Union .....	- 35 -
4.1 Framework conditions .....	- 35 -

4.2 Science-based entrepreneurship.....	- 35 -
4.3 Knowledge markets .....	- 36 -
4.4 Knowledge transfer and open innovation .....	- 37 -
4.5 Innovation framework for SMEs.....	- 38 -
4.6 Venture capital markets .....	- 39 -
4.7 Innovative public procurement.....	- 39 -
5. Performance of the National Research and Innovation System .....	- 40 -
5.1 Performance of the National Research and Innovation system.....	- 40 -
5.2 Structural challenges of the national R&I system.....	- 42 -
5.3 Meeting structural challenges .....	- 43 -
Annex 1 – References .....	- 44 -
Annex 2 - Abbreviations .....	- 46 -



# 1. Overview of the R&I system

## 1.1 Slovenia in the European RDI landscape

Slovenia is a small EU member state, with 2 million inhabitants (0.4% of total EU-28 population) living on a moderate geographic surface (20,273 km<sup>2</sup>; 0.47 % of EU-28) (Eurostat, 2014). Since 2008 Slovenia has been – because of the economic crisis – facing a strong decrease in GDP performance (-7.8% in 2009; 1.2 % in 2010; 0.6% in 2011; -2.6% in 2012; -1.0% in 2013 and 2.5% in 2014 – provisions) (UMAR, 2015). In 2014 its GDP p.c. amounted up to 17,986 €, presenting an index of 82 (out of 100, which represents the development level of EU-28) (UMAR, 2015)<sup>4</sup>. Even though the GDP was decreasing or stagnating, the RDI investments have been growing in the last six years. A break-through in RDI investments occurred in 2010, when the “ceiling” of 2% was surpassed. The trend continued in 2011 (2.47% of GDP per RDI) and in 2012 (2.58% of GDP per RDI), while it stagnated in 2013 (2.59% of GDP per RDI) (Eurostat, 2014). However it should be noted that the large share of the increase has to be attributed to private expenses, while the share of the state for RDI has been decreasing continuously (*cf. infra*).

The data from the Innovation Union Scoreboard<sup>5</sup> demonstrate that Slovenia had been improving its innovation performance and had been catching up with the EU average up until 2011. In 2012, its innovation performance slightly declined, while Slovenia maintained the place in the group of innovation followers to which it belongs since 2009. However in 2013 its RDI improved. As pointed out by the IUS (2014: 20) “*performance has improved strongest for Estonia at an average annual rate of 3.7%, followed by Cyprus (2.7%), Slovenia (2.7%), Austria (2.2%) and Luxembourg (1.8%). These were the only countries growing at a higher rate than the EU and for these countries the relative performance to the EU has improved*”. When account is made of different dimensions of innovation performance of Slovenia it becomes evident that its relative strengths are in International scientific co-publications, R&D expenditures in the business sector and Public-private scientific co-publications, while relative weaknesses are observed in non-EU doctorate students and Knowledge-intensive services exports (IUS, 2014: 66).

## 1.2 Main features of the R&I system

The economic crisis hit Slovenia dramatically in 2009, when Slovenia faced a decrease of 8% in its GDP. In the following years Slovenia stagnated or had a drop of GDP. However, the RDI expenditures took a totally different path in the last six years. While in 2006 GERD amounted up to 1.5% of GDP, two years later it was at the level of 1.66% of GDP, in 2011 it reached a record high of 2.47% of GDP<sup>6</sup> (Eurostat, 2014 and SORS, 2014).<sup>7</sup> Even more

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<sup>4</sup> More at [http://www.umar.gov.si/fileadmin/user\\_upload/publikacije/eo/2015/eo-0115.pdf](http://www.umar.gov.si/fileadmin/user_upload/publikacije/eo/2015/eo-0115.pdf) (15 February 2015).

<sup>5</sup> More at [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) (24 December 2014).

<sup>6</sup> The survey on R&D activities in the reference year 2011 was based on new administrative sources, which enabled us to further identify R&D companies/organizations to improve the capture of units in the sample. Thus, the higher value of data on total spending on R&D was in addition to investment in this activity also the result of the expanded selection of reporting units, primarily in the business enterprise sector, and moving of some borderline respondents from the government sector to the business enterprise sector. At the same

surprising is the figure for 2012 with 2.58 % of GDP or €928 million.<sup>8</sup> This growth was not only in relative, but also in absolute numbers: in 2007 GERD amounted to €500.5 million to reach €894.2 million € in 2011 ([SORS, 2012](#)), €928 million € in 2012 (SORS, 2014a) and €935 million in 2013.<sup>9</sup>

Increasingly, most of the funds for RDI are provided by the business enterprise sector: in 2012 €577.6 million or 62% of total expenditure, according to the preliminary figures for 2013 the share of business sector is as much as 63.8% (SORS, 2014b). Here it is necessary to point to several reasons for such trends: from the methodological explanation of SORS<sup>10</sup> from 2011 data on, to the fact that in 2012 the government increased the tax subsidy on R&D expenditure to the level of 100%. The latter not only resulted in increased investment, but also in more comprehensive reporting of R&D expenditures. On the other hand, the expenditures of the government sector amounted up to €266.2 million or 29% of total R&D expenditures in 2012, to decline to 26.9% for 2013 (SORS, 2014b).

Most resources for the implementation of R&D were in 2012 intended for the business enterprise sector (€703.1 million or 76% of all resources), followed by the government sector (€121.5 million or 13% of all R&D investment), the higher education sector (€103.3 million or 11%)<sup>11</sup> and the private non-profit sector (€0.4 million). While the total numbers of GERD increased for Slovenia, because of strong austerity measures year-by-year the GBAORD expenditures have decreased. In 2012, GBAORD was slightly higher comparing to 2007 (€189 million in 2012 comparing to €180 million in 2007), but further decreased in 2013 to the level of €175 million (0.48% of GDP). The expected level of GBAORD 2014 is €183 million (SORS, 2014), but some experts already predict that the final amount could be somewhat lower, especially in view of the recently revised budget for 2014, where the funds of the MESS were lowered to the level of €149.2 million (Ministry of Finance of RS, 2014).

In terms of human resources, Slovenia compares relatively well with the EU average, despite the fact that it is lagging behind the top countries like Finland or Sweden. The number of researchers is increasing constantly and reached by 2013 8,707 in FTE (SORS, 2014b). While in the first years after independence the majority of researchers were employed in the public research organisations (PROs) or higher education institutions (HEIs), in 2013 the business-enterprise sector (BES) employed 53.5% of all researchers (4,664 in FTE), comparing with 21% (1,825) in government sector and 25.4% (2,201) in higher education (ibid.).<sup>12</sup> The fact that business R&D units employ also a significant

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time, with the reference year 2011 we improved the analysis of non-response, which also helped increase the value of all published statistics in all sectors.

Data on R&D performers which refer to 2011 are not comparable with previous years. In 2011, there was a break in the time series. More information available at [https://www.stat.si/doc/metod\\_pojasnila/23-086-ME.pdf](https://www.stat.si/doc/metod_pojasnila/23-086-ME.pdf) (15 February 2015).

<sup>7</sup> See more at the Eurostat database (2014) and SORS database (2014). Available at <http://pxweb.stat.si/pxweb/Database/Ekonomsko/Ekonomsko.asp#23> (15 February 2015) and <http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database> (15 February 2015).

<sup>8</sup> More information available at [https://www.stat.si/eng/novica\\_prikazi.aspx?id=5873](https://www.stat.si/eng/novica_prikazi.aspx?id=5873) (15 February 2015).

<sup>9</sup> Preliminary data on SORS (2014b); EUROSTAT (Newsrelease 174/2014; 17 November 2014).

<sup>10</sup> See p.6 of this report for details.

<sup>11</sup> According to preliminary data for 2013, the share of business sector in R&D performance increased to 77%, while HEIs' share declined to 10% (Eurostat, 2014).

<sup>12</sup> This represents a significant increase over the years: in 2008, business employed 3,058 researchers, government sector 2,157 and higher education sector 1,795 – or total 7,033 researchers in FTE (full time equivalent) (SORS, 2009).

number of technical staff can be observed in even higher share of business sector in total employment in R&D, where as many as 64% of all employed in R&D sector are in business sector.

Regarding the structure of Slovenian RDI system it should be noted that the NIS system is centralised and implemented through several agencies, not having a very pronounced divisions of labour. The system of allocation of funds works mostly on a competitive basis, but there are some margins of block-funding (the public research institutes). The funds (GERD) are coming mostly from the business and government sector, but the structure of expenditures in RDI demonstrates that almost all BES funds are spent in the business sector, as a large share of public funds are also spent in the business sector.

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

The National Assembly is the top legislative body, and its two Committees (Committee for Education, Science, Culture, Sport and Youth and Committee for Economy) are in charge of discussing the legal and policy documents related to RDI policy. Once cleared by the committees, the main legal documents (the Law on Research and Development, the national research and innovation programme) are passed to the Assembly for approval.

The Ministry of Education, Science and Sport (MESS; ex-MESCS or MHEST) and the Ministry for Economic Development and Technology (MEDT) are responsible for the preparation of the policy documents in the RDI area, for implementation of RDI policy (that is, implementation of the national research and development programme – named Research and Innovation Strategy of Slovenia for the period 2011–2020 or RISS 2011–2012),<sup>13</sup> the public R&D budget and international cooperation in the area of R&D. An advisory body to the government in the RDI area is the National Science and Technology Council, with members from the research community, higher-education institutions, and the business community. For the execution of RDI policy, two special public agencies were established in accordance with the Law on research and development, 2002<sup>14</sup>: Slovenian Research Agency (SRA)<sup>15</sup> and Slovenian Technology Agency (TIA). The first is responsible for the execution of public research financing, for the professional and independent selection/evaluation process of projects and programmes and the monitoring of research programmes and projects implementation. The Slovenian Technology Agency had been in charge of programmes promoting technology development and of business RDI co-financing, after the establishment of SPIRIT<sup>16</sup>, the Slovenian Technology Agency had been merged into the new agency (called SPIRIT)<sup>17</sup> on January 2013. For promotion of business RDI, two other agencies need to be mentioned: Public Agency for Entrepreneurship and Foreign Investment (PAEFI) and Slovenian Enterprise Fund (SEF)<sup>18</sup>. While PAEFI had been merged with TIA into SPIRIT, SEF remains independent. Each has a set of measures through

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<sup>13</sup> More at [http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/odnosi\\_z\\_javnostmi/01.06.2011\\_dalje/01.06\\_RISSdz\\_ENG.pdf](http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/odnosi_z_javnostmi/01.06.2011_dalje/01.06_RISSdz_ENG.pdf) (15 February 2015).

<sup>14</sup> See more at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO3387#> (15 February 2015).

<sup>15</sup> See more at: <http://www.arrs.gov.si/en/novo.asp> (15 February 2015).

<sup>16</sup> See more at: <http://www.spiritslovenia.si/> (15 February 2015).

<sup>17</sup> More at <http://www.spiritslovenia.si/> (15 February 2015).

<sup>18</sup> See more at: <http://www.podjetniskisklad.si/home.html> (15 February 2015).

which they promote innovation in business sector and support especially RDI in SMEs and start-ups.

According to the statistical data, the registered research organisations in the business sector employed 9,811 R&D personnel (FTE), with 4,664 classified as researchers, 4,201 as technicians and 946 as other personnel in 2013 (SORS, 2014b). There are 1168 enterprises in Slovenia, registered as research and development organisations (M72 of the standard classification of economic activities). Their number has increased significantly: in 2008 only 780 such enterprises were registered. This data does not include business enterprises, which have not registered their R&D unit as a separate entity, so it is difficult to depict total size of R&D units<sup>19</sup>. Traditionally, manufacturing sector is most RDI intensive (46% of total GERD, 61% of expenditures in the BES) and within that one, pharmaceutical industry, which invests around one third of total business sector R&D expenditures. However in last years the RDI investments in service sector are increasing. Whether in 2008 services presented 16% of all expenditures in BES, in five years the share more than doubled. Thus in 2012 services presented 36% of all RDI expenditures in BES (SORS, 2014a).

Slovenia has five universities: the University of Ljubljana; the University of Maribor; the University of Primorska, University of Nova Gorica and EMUNI University.<sup>20</sup> Also, 28 independent higher education institutions operate. The first three are public universities, funded for their academic tasks mostly by the government. Within the four universities, there are 60 different HEIs in all academic fields. The HEI sector employs 4,310 researchers in nominal numbers, but they account for only 2,201 FTE (SORS, 2014b), since most researchers in the HEI sector are also teaching and are thus predominantly accounted as teaching personnel.

There are 47 research institutes in the government sector, employing 1,825 researchers (FTE count) in 2013 (SORS, 2014b). Since they depend extensively on public financing, the number of employees has reduced in the last years.<sup>21</sup> The public research institutes (15), which are having the Republic of Slovenia as their founder, are entitled to institutional (block funding) funding<sup>22</sup>.

Both PROs and HEIs receive most of their public funding from Slovenian Research Agency through regular public calls. Increasingly, they engage in international cooperation (especially applying for different EU funding) and in research cooperation with business sector, partly also to offset the decline in public sources.

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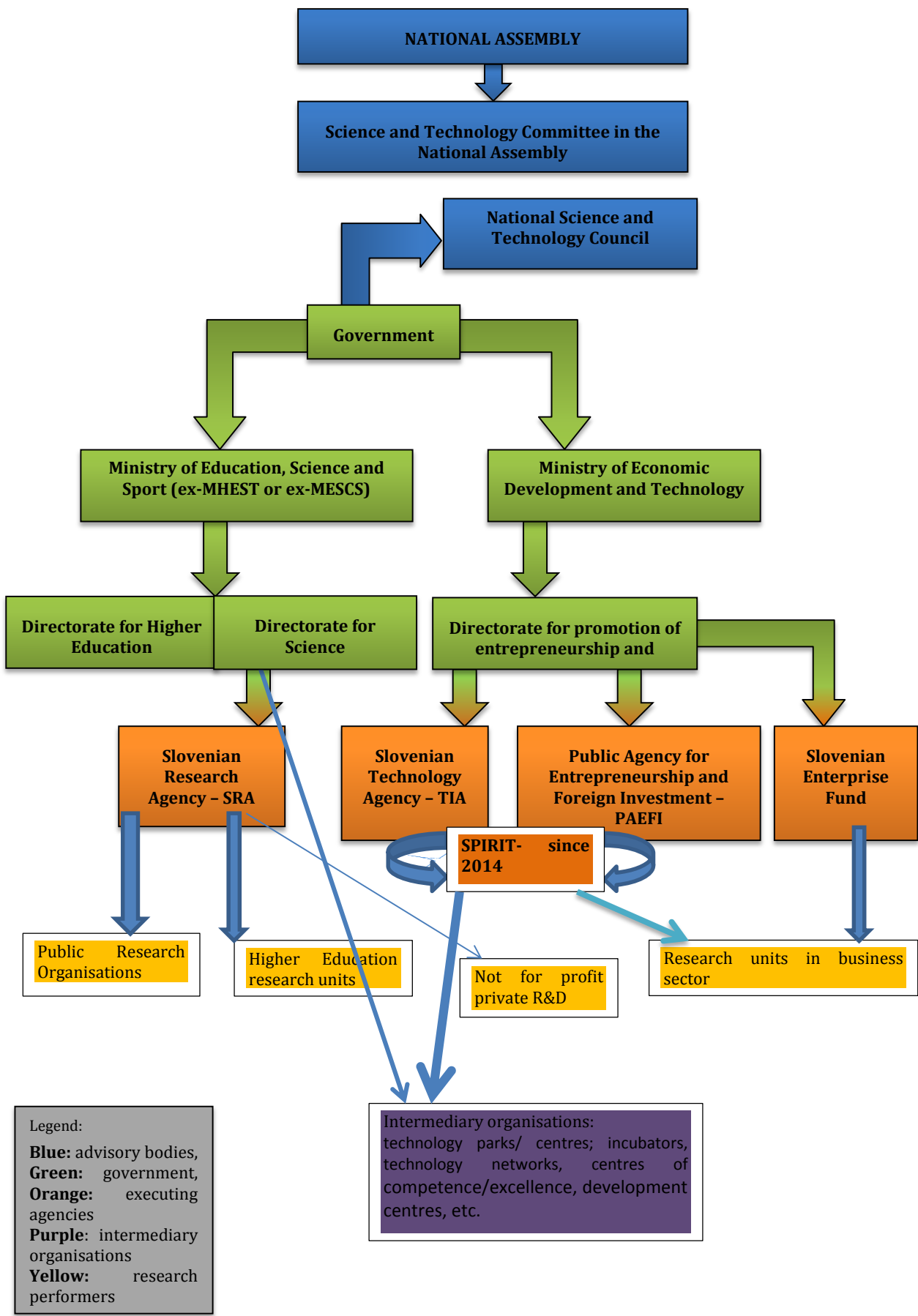
<sup>19</sup> For the purpose of statistical data gathering, the Statistic Office sends the questionnaire to all enterprises registered under M72, to all the enterprises, who received State aid during the observed period as well as in cooperation with the Tax authorities to all those claiming an R&D tax subsidy.

<sup>20</sup> The EMUNI University is an international association of universities with headquarters in Slovenia. It represents one of the six projects of the Union for the Mediterranean, approved in the frame of a common declaration, adopted in Paris on 13 July 2008 (EMUNI 2013 report, 5).

<sup>21</sup> In 2008, this sector employed 2,158 FTE (SORS, 2009).

<sup>22</sup> See details on block funding in chapter 2.5.2.

**Figure 1: Organisational structure of national R&D system (end-2014)**



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**Main Changes in 2009**

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*National Reform Programme*

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**Main Changes in 2010**

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*National Reform Programme*

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**Main changes in 2011**

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*Research and Innovation Strategy of Slovenia 2011–2020*

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*National Programme of Higher Education 2011–2020*

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*Technology section moved from Ministry of Higher Education, Science and Sport to the Ministry of Economy; Ministry of Economic Development and Technology and Ministry of Education, Science, Culture and Sport were created*

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**Main changes in 2012**

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*National Reform Programme*

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**Main Changes in 2013**

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*Drafting the S3 programme*

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*Drafting the OP programme*

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*Drafting the new Law on R&D*

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*Drafting the new Law on Higher Education*

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*Ministry of Culture re-established; Ministry of Education, Science and Sport*

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**Main changes in 2014**

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*Drafting the S3 programme*

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*Drafting the OP programme*

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*Drafting the new Law on R&D*

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*Drafting the new Law on Higher Education*

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

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

The economic crisis that hit Slovenia in late 2008 left dire consequences on national economy. In 2009 GDP dropped for almost 8%, while in 2010 and 2011 it stagnated. Slovenia faced in 2012 and 2013 a drop of around 2% yearly (see past EW reports, 2009, 2010, 2011, 2012, 2013). The calculations made by the EUROSTAT (2014) show, that ten years after its accession to the EU, Slovenia is at the same level of development as it was in 2004.<sup>23</sup>

The economic instabilities faced after 2008 have been reflected also in political instabilities and vice versa. The left-wing Government that came to power in fall of 2008, resigned in September 2011. Four months later a new (right-centre-wing Government) was established and ruled only for a year, since in March 2013 it received a non-confidence vote. The aftermath was that in the same month a new left-wing Government took the power, but again only for a year. Because of the intra-party disputes the Government dissolved in May 2014 and Slovenia went to vote in mid-July 2014. In September 2014, a centre-left Government was established.

The economic crisis had dire consequences not only on the national economy, but also on the stability of the political situation in Slovenia. In three years, since 2011, Slovenia changed three Governments, which has been an unusual practice. The changes of Governments have not affected only the perception of the political stability, but also the governing structure and the workload of ministries entitled for RDI. Since 2004 the Ministry responsible for RDI was the Ministry of Higher Education, Science and Technology (MHEST). After the 2011 elections this ministry split into two ministries. The former MHEST gained responsibility over culture but lost its technology section and was thus transformed into Ministry of Education, Science, Culture and Sport (MESCS). The technology section was moved to the Ministry of Economy, which became the Ministry of Economic Development and Technology (MEDT). The 2013 political change resulted in the re-establishment of a separate Ministry of Culture. In 2014, after the early elections there were two scenarios how the ministry, related to the RDI would be formed. The first idea, widely embraced by the R&D society was to re-establish the 'ex-MHEST', where technology and science would be under the 'same roof', but the political decision-makers opted for the choice that already existed and left science and technology separated. Thus Slovenia now has the Ministry of Education, Science and Sport (covering all levels of education, from kindergarten on) – MESS, while technology section has remained under the Ministry of Economic Development and Technology (MEDT)<sup>24</sup>.

The shifts in the structure of the RDI responsible ministries resulted also in delays in the implementation of the "Research and Innovation Strategy of Slovenia" (RISS), adopted in 2011<sup>25</sup>. It should be noted that RISS 2011–2020 being the last strategic RDI document adopted before the 2011 early elections, was partially dismissed by the following (Janša)

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<sup>23</sup> See more at

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00114> (23 November 2014).

<sup>24</sup> See more at [http://www.vlada.si/en/about\\_the\\_government/](http://www.vlada.si/en/about_the_government/) (15 February 2015).

<sup>25</sup> See detailed description of RISS in ERAWATCH Country Report 2012

Government and revived with the 2013 (Bratušek) Government. However, the current (Cerar) Government declaratively supports the RISS as the main RDI document.

The “2013–2014” Government started the preparation of two key laws in the field of R&D, i.e. the Law on RDI that would replace the 2002 Law on R&D and the Law on Higher Education, replacing the 2006 Law on Higher Education. Both laws have been prepared accordingly with the National Programme on Higher Education 2011–2020 and RISS 2011–2020. Since the “2013–2014” Government stepped down in September 2014, the future developments in the field of R&D and higher education are still not clear, since the new government addressed this field only in a very general manner so far.<sup>26</sup> The new ministers have also not yet laid out any specific plans for their activities in the field of science and technology, except rather inconclusive statements that the preparation and adoption of both laws will receive their priority attention.<sup>27</sup>

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

As already mentioned, in May 2011 the Slovenian National Assembly adopted a long-term strategic document of research and innovation, named Research and Innovation Strategy of Slovenia (RISS) 2011–2020 (see EW, 2011, 2012, 2013)<sup>28</sup>. In the RISS, Slovenia committed to the increase of public resources for R&D of 1% by 2012 and 1.5% by 2020, with total R&D expenditures to reach 3.6% of GDP. Within subcategories, the larger increase was proposed for the research infrastructure (increase of 240% from the level in 2011) and for the support to human resource development at the level of 0.15% of GDP (in current prices). RISS defined the R&D priorities for the next decade (2011–2020) summarised as follows:<sup>29</sup>

- a) Better integration of research and innovation;
- b) Publicly funded sciences and scientists shall contribute to economic and social restructuring;
- c) Enhancing/ensuring closer cooperation between PROs and the business sector;
- d) Increasing scientific excellence, partly by increasing competitiveness within S&T stakeholders and partly by providing necessary resources, both human and financial.

Parallel with the aim to increase RDI expenditures RISS calls for other changes within the RDI: the organisational structure of RDI institutions, the funding system (towards more block-funding), the set of priorities and the international cooperation. The documents

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<sup>26</sup> However a signal was sent by the Minister of Education, Science and Sport on the 24th December 2014, that the Ministry has the intention to prepare a new Law on R&D in the first half of 2015. This was confirmed also by the intervention of the Minister on the 16 February 2015 (cf.

[http://www.mizs.gov.si/si/medijsko\\_sredisce/novica/article/55/9068/5e184f16b3073ee37fcea4a025fa1461/](http://www.mizs.gov.si/si/medijsko_sredisce/novica/article/55/9068/5e184f16b3073ee37fcea4a025fa1461/), 16 February 2015)

<sup>27</sup> Statement of the Secretary General of the MESS at the session of the Council for Science and Technology, December 2014.

<sup>28</sup> More at

[http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/odnosi\\_z\\_javnostmi/01.06.2011\\_dalje/01.06\\_RISSdz\\_ENG.pdf](http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/odnosi_z_javnostmi/01.06.2011_dalje/01.06_RISSdz_ENG.pdf) (22 December 2014)

<sup>29</sup> There are also some other RISS priorities that are relevant. See more at

[http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/odnosi\\_z\\_javnostmi/01.06.2011\\_dalje/01.06\\_RISSdz\\_ENG.pdf](http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/odnosi_z_javnostmi/01.06.2011_dalje/01.06_RISSdz_ENG.pdf) (15 February 2015)



provide also a list of activities that should be made for the establishment of a RDI friendly, competitive and successful environment.

The implementation of the RISS 2011–2020 called for several legal acts to be prepared during the second half of 2011 and first half of 2012, but because of early elections (held in December 2011), nothing happened within the field. The government constituted in February 2012, announced that RISS needs to be revised, but no activities were started in that direction. More was expected from the government elected in 2013, which recommitted itself fully to RISS and prepared an overall assessment and working plan for the implementation of RISS. On top of its agenda was the preparation of a new law on research and development, which was to reflect fully the interconnectedness of research and innovation, as stated in RISS. The minister of education, science and sports appointed a special *ad-hoc* team of experts from the research community as well as some government officials with a task to prepare the draft for further public discussion. The government crisis erupted just as the draft was submitted to the Ministry. The current minister recommitted the current government to RISS, but stated that the MESS will start the procedure of the preparation of the law anew (*cf. supra*).

Parallel with the plans on revival of RISS, further steps in the implementation of the National Programme of Higher Education (also adopted in 2011) were also announced. The “2013–2014” government prepared a new Law on Higher Education. The first draft, submitted to public debate at the end of 2013, was revised in the spring of 2014, but also did not reach the parliamentary discussion. While the text of the law primarily addresses higher education, it does discuss the financing of research at university level and suggests higher level of autonomy in internal distribution of research funding, especially of so-called institutional block-funding for research at HEIs. On the 16 February 2015 the MESS issued the proposal of the new Law on Higher Education, which has entered in the first stage of the public debate. As visible from different reactions, the proposal has not been embraced by the stakeholders neither by the common public.

In the beginning of March 2014, the Government re-established a special Government Office for Development and European Cohesion Policy (GODC),<sup>30</sup> which has as a primary task to speed up the preparation of the necessary national documentation for the EU structural and cohesion funds. This also meant that a new team had been assembled to work on the RIS3 and address the deficiencies in the draft document as submitted to the Commission in November 2013. The first public presentations of the concepts were implemented from mid-April to June. In June, a new version of the RIS3 was prepared which included an amended SWOT analysis, a vision with strategic objectives, more focused priorities, an elaborated set of measures to support these priorities, and a monitoring mechanism. The second draft of RIS3 was harmonised at the inter-ministerial level in July and August 2014 and published on the official website of GODC on 29 August 2014. The document was to be the basis for further coordination with the EC (Partnership Agreement, September 2014, <http://www.eu-skladi.si/ostalo/pa-eng>). Yet with the change of government, RIS3 is being reopened and further amendments/changes are expected.

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<sup>30</sup> See more at:

[http://www.vlada.si/en/about\\_the\\_government/government\\_offices/government\\_office\\_for\\_development\\_and\\_european\\_cohesion\\_policy/](http://www.vlada.si/en/about_the_government/government_offices/government_office_for_development_and_european_cohesion_policy/) (23 December 2014)

As mentioned, RISS identified major thematic fields of research, but left the decision on priorities to RIS3. According to the existing system of financing RDI,<sup>31</sup> only broad contours are defined and within them, competitive public calls are issued. An important segment of public allocation of RDI funding is decided through a bottom-up approach (See ERAWATCH 2010, 2011 for details). This has often been criticized (OECD, 2010, ERAC, 2009). Slovenia has not included in its strategic documents priority areas, which would correspond to EU definition of frontier science or organized its RDT policy according to thematic areas: in fact the current public funding of Slovenian research via SRA research programmes and projects is focused on scientific excellence *per se* and allows for significant degree of bottom-up initiative in the selection of specific priorities. While RISS partly acknowledges this as a problem which needs to change, it does not provide the final solution – the mechanism to select priorities is to be smart specialisation and its implementation will require a changed financing system of publicly supported RDT.

Indirectly, by looking at the structure of the RDI expenditures of the public sector into consideration, it is possible to suggest that the priorities of Slovenian R&D are: Engineering and Technology (52% of all funds disbursed), Natural Sciences (35%) and SSH with 8% of total expenditures.<sup>32</sup>

**Table 1: GBAORD (2013) expenditures** Source: SORS (2014c).

	Final budget 2013	Provisional budget 2014
	1,000 EUR	
<b>Total</b>	<b>174,507</b>	<b>182,695</b>
Exploration and exploitation of the Earth	2,061	2,819
Environment	5,415	6,567
Exploration and exploitation of space	862	713
Transport, telecommunications and other infrastructure	5,799	5,814
Energy	5,062	6,214
Industrial production and technology	26,475	27,796
Health	12,775	16,265
Agriculture	6,968	8,840
Education	2,110	3,121
Culture, recreation, religion and media	3,132	4,119
Socio-political systems, structures and processes	3,851	5,252
General progress of knowledge: Research & Development financed from General University Funds (GUF)	439	439
General progress of knowledge: R&D financed from other resources – not from General University Funds	98,383	93,746
Defence	1,175	989

<sup>31</sup> Which has so far not been modified in line with RISS.

<sup>32</sup> See more at: [http://www.stat.si/eng/novica\\_prikazi.aspx?id=6527](http://www.stat.si/eng/novica_prikazi.aspx?id=6527) (23 December 2014)

The draft strategy of RIS3 has set seven priorities of the 2014–2020 Slovenian R&D system: alternative energy sources and application, sustainable tourism; health, SIndustry4.0 – smart factories; energy savings; smart use of resources.

Following the adoption of RISS, Slovenia also prepared the national programme on research infrastructure (see details in ERAWATCH Country Report on Slovenia 2013), where priorities of participation in ESFRI are declared.

With the reorganisation of the government in 2012 and the move of technology section to the Ministry of Economic Development and Technology, the innovation policy should be primarily coordinated by this ministry. Yet, both the financial as well as human resources devoted at MEDT to the issues of technology and innovation have been reduced significantly over the recent years and so has the policy input in implementation of RISS, the preparation of new law on R&D or the RIS3.

### **2.3 National Reform Programmes 2013 and 2014**

NRP recommitments Slovenia to RISS, yet the implementation documents which are crucial for RISS, are still not in place, as described under 2.2. The statement in the Commission's working paper of 2013, affirms that *“The main challenges remain the consistency and coordination of the policies to provide support to research and to stimulate innovation, the effective implementation of these policies, and the efficient deployment of available resources (including from the European Regional Development Fund). Improved governance and clear prioritization are essential to address these challenges”* is just as relevant in 2014. It seems that improved governance under the spread of authorities between ministries and unclear (sometimes overlapping) division of workload will be very difficult to achieve.

The 2014-15 NRP is devoted mostly to the financial stability of the country, since Slovenia from 2009 onwards faces strong public debt and financial deficit imbalances. In spite of overall harsh economic situation, Slovenia in chapter 4.2 (p. 27) acknowledges and reaffirms its commitments to increase R&D investments to the EU-agreed level of 3 % until 2020, which is in fact lower than initially committed under RISS (3.6%)<sup>33</sup>. One of the supporting instruments for achieving the settled goal is the RIS3 strategy, which will “define the priority areas in which Slovenia intends to invest resources from structural funds”, help to “establish a single institutional framework for channelling subsidies (i.e. policy mix)” and “will provide the harmonised implementation of support instruments for industrial and innovation policies”.<sup>34</sup> Yet, RIS3 received adequate attention only after its first draft, submitted to the Commission, was negatively assessed. As mentioned above, by mid-March 2014, a new team was appointed to restructure the text and organise a new round of public discussions.

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<sup>33</sup> According to our knowledge, at no occasion has the RISS plan of 3.6% been addressed and officially changed, lower figure just »emerged«.

<sup>34</sup> More at: [http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/index\\_en.htm](http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/index_en.htm) (15 February 2015)

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

Council of the European Union has recommended to Slovenia, upon examination of Slovenia's 2014 national reform programme and Slovenia's 2014 stability programme that it should, among others: *"streamline priorities and ensure consistency between the 2011 Research and Innovation and the 2013 Industrial Policy Strategies with the upcoming strategies on Smart Specialisation and Transport, ensure their prompt implementation and assessment of effectiveness."*<sup>35</sup>

The recommendation points out the considerable challenge for Slovenian government. Its frequent changes during the last years and current difficult financial situation in Slovenia have slowed down the introduction of new policy initiatives but also made the coordination among the policies very difficult. As already mentioned the 2013 government revised the implementation programme of RISS and planned to put in place the necessary legal acts, which have to be changed and adjusted to the RISS goals. Such work requires a clear commitment to RISS and sufficient stability to prepare several documents and policies in parallel. The periods of a little over a year for the last two governments were much too short to expect a more fruitful outcome.

At the same time, Slovenia has been trying to prepare all the required documents for the next financial perspective, including RIS3. This was initially in the hands of the Ministry of Economic Development and Technology until spring 2014, when due to the slow preparation of the strategic documents and several deficiencies in reimbursement of cohesion and structural funds a new government Office for Development and European Cohesion Policy (GODC)<sup>36</sup> was created to speed up the process. The most difficult issue to resolve was the coordination and ownership of various documents, where within the existing political crises only very few had the courage to decide on the direction of the strategic documents. Slovenia was criticised for all three submitted documents and received also some recommendation how the documents should be improved: first the Partnership Agreement<sup>37</sup>, to be followed by relatively critical assessment from the Commission of first draft of RIS3<sup>38</sup> and finally, the numerous remarks on the draft

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<sup>35</sup> More at: <http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2010803%202014%20INIT> (30 December 2014)

<sup>36</sup> More at: [http://www.svrk.gov.si/en/media\\_room/news/select/sporocilo\\_za\\_javnost/article/12447/5687/b0af45f17ce88f175fc2b783500c8494/?tx\\_ttnews%5Byear%5D=2014&tx\\_ttnews%5Bmonth%5D=02](http://www.svrk.gov.si/en/media_room/news/select/sporocilo_za_javnost/article/12447/5687/b0af45f17ce88f175fc2b783500c8494/?tx_ttnews%5Byear%5D=2014&tx_ttnews%5Bmonth%5D=02) (21 December 2014).

<sup>37</sup> First unofficial draft of Partnership Agreement was submitted to the EC in July 2013, to be redrafted and revised several times during fall of 2013 and spring 2014. On July 28th, the Government approved of the Agreement and submitted it officially to the Commission. After receiving the comments, the text was revised and finally, on Oct. 30th, 2014, the Partnership Agreement was approved by the Commission. More at [http://www.svrk.gov.si/en/media\\_room/news/select/sporocilo\\_za\\_javnost/article/12447/5879/9adb2b729925c2db375d82f9569a06d8/?tx\\_ttnews%5Byear%5D=2014&tx\\_ttnews%5Bmonth%5D=10](http://www.svrk.gov.si/en/media_room/news/select/sporocilo_za_javnost/article/12447/5879/9adb2b729925c2db375d82f9569a06d8/?tx_ttnews%5Byear%5D=2014&tx_ttnews%5Bmonth%5D=10) (30 December 2014)

<sup>38</sup> Information obtained by the authors informally from the staff, working on the documents for the Cohesion Policy. The government did not make the assessments publicly available. The only publically available text is the article in Slovenian from February 2014, prepared by one of the staff involved in the drafting of RIS3, where she discusses the difficulties in the preparation of RIS3. More at <http://www.dnevnik.si/mnenja/pisma-bralcev/slovenska-strategija-pametne-specializacije-kolo-ki-se-vrti-v-prazno> (30 December 2014).

Operational Programme. Finally, on 15 December 2014 the European Commission approved of the Operational Programme for the period of 2014–2020<sup>39</sup>.

However, due to the delays in the preparation of the documentation and also slow disbursement of funds within the current financial perspective, a certain re-organisation of staff in the GODC took place. The complex system of structural funds and its programming, including also the coordination of RIS3, requires experienced people with sufficiently high political authority and a clear understanding of priorities and time required for careful planning. It remains to be seen if the reorganisation will bring forward expected optimisation of the processes and improve the coordination.

## **2.5 Funding trends**

### **2.5.1 Funding flows**

As identified in the past ERAWATCH reports (EW 2011, 2012), one of the important challenges for Slovenia is to sustain the level of RDI financing, both from the public resources as well as from the business sector. The past years were characterised by continuous growth of RDI funds. In 2007 GERD amounted up to €500.5 million and continued to grow in spite of decline in GDP. In 2010, the R&D expenditures increased by nearly 14% to €745.9 million, primarily on account of business sector, and €894.2 million in 2011 (SORS, 2012). The 2012 data show the GERD at the level of 2.63% of GDP or €928 million (SORS, 2014). The preliminary data for 2013 show a stagnation of GERD (a slight increase of €7 million, i.e. less than 1%), which stopped at the level of 2.59% of GDP, namely €935 million (Eurostat, 2014).

The decline of 8% of GDP and the stagnation of GDP growth (in 2010 and 2011) or even the following decrease (in 2012 and 2013) had two impacts on R&D investments. On one hand the public R&D finance decreased, while on the other hand the business R&D expenditures increased. The latter can be explained by two variables, i. e. (a) the 2010 (and later 2012) tax subsidy, and (b) the better absorption of funds from abroad. The tax subsidy caused the increase of BERD and an increase in R&D personnel in private enterprises. However, the introduced subsidy has not changed the structure of GERD, where business sector accounts for 63% of all investment in R&D and performs almost 75% of all research and development activities. The distribution of BERD is even more concentrated: 95% of all BERD is allocated to BES.

The government was still able to provide increased allocation of resources during the first years of economic crisis, which, in view of the growing public deficit, was no longer able to guarantee from 2011 on. With 2011, we have seen fewer public calls for the support measures for RDI and innovation in business sector and with 2013 also reduced financing of PROs. The support measures, where funding was received through EU structural funds have increased the expectations in RDI community, both in public and business sector, yet the end of financial perspective 2007–2013 brought to the end also support for Centres of

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<sup>39</sup> More at:

[http://www.svrk.gov.si/en/media\\_room/news/select/sporocilo\\_za\\_javnost/article/12447/5926/0ee0aa533034ca77b169d018f59548b7/?tx\\_ttnews%5Byear%5D=2014&tx\\_ttnews%5Bmonth%5D=12](http://www.svrk.gov.si/en/media_room/news/select/sporocilo_za_javnost/article/12447/5926/0ee0aa533034ca77b169d018f59548b7/?tx_ttnews%5Byear%5D=2014&tx_ttnews%5Bmonth%5D=12) (30 December 2014)

Excellence/Competence Centres as well as several other support measures co-financed with structural funds.

The optimism of growing RDI funds from 2007 on resulted in a very ambitious target, set in RISS: 3.6% of GDP to be allocated to RDI by 2020<sup>40</sup>, with 1.5% coming from public sources and the rest from business sector. As in the area of legal framework, also in the area of budgetary targets RISS is not being implemented. In fact, the government reduced overall budget for 2013 and 2014 to lower the deficit in public finance and only minimal corrections in favour of higher education expenditures and selected RDI measures were implemented in 2013. The revised budget of 2014 and 2015 further decreased government RDI financing. For 2014, the last revision of the budget lowered the funds of MESS for RDI activities from planned €181.2 to €149.2 million.<sup>41</sup> How the reduced government support for RDI will affect the business sector's investment in RDI, remains to be seen, but both MEDT and MESS have experienced significant cuts in funds aimed at support of technological projects from 2013 to 2014, with further cuts planned for 2015.<sup>42</sup>

Albeit the total nominal GERD increased, Slovenia, because of strong austerity measures, decreased its GBAORD, which was in 2012 only slightly higher compared to 2007 (€189 million in 2012 compared to €180 million in 2007) and further decreased in 2013 to the level of €175 million (0.48 % of GDP). The expected level of GBAORD 2014 was €183 million (SORS, 2014), but according to the data on revision of 2014 budget and opinion of some experts the final amount will be lower (Interviews at the MESS, 2014).

The austerity measures also strongly impacted R&D performance. The instability of R&D funding caused serious problems in R&D activity of PROs and HEIs. For example: in 2011 and 2012 the national research agency (SRA), which is the main individual funder for R&D did not launch some of its funding schemes (targeted research programmes, basic and applied projects etc.), while other calls were delayed/postponed several times. The same situation continued also in 2013 and 2014, when the SRA has been experiencing annual decline of funding sources. Also, the support provided to business R&D units has diminished since these programmes moved under the roof of the Ministry of Economic Development and Technology. The Ministry's decision to create a new agency SPIRIT, which joined together Technology Agency, PAEFI and Slovenian Tourist Agency, resulted in survival of only a few of ex-PAEFI and TIA programmes. At the same time the sector for technology at the Ministry introduced no new support measures and suffered significantly from reduced financial and human resources.

Parallel with BERD also funds from abroad gained importance in the last years. According to the data of Slovenian Statistical Office (2014) Slovenia received in 2010 approximately €44 million from abroad, where €24 million were disbursed by the European Commission (54%). In 2011 the amount from abroad increased to €62 million, with European

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<sup>40</sup> RISS target, as adopted in the Parliament, is still 3.6%. Even though the revision to 3% was discussed during the revision of RISS in the annual report on its implementation, it was never officially changed. Yet in the National Reform programme, submitted to the Commission, the Government committed itself to 3% of GDP. See more at [http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014\\_slovenia\\_en.pdf](http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014_slovenia_en.pdf) (15 February 2015).

<sup>41</sup> More at:

[http://www.mf.gov.si/si/delovna\\_podrocja/proracun/sprejeti\\_proracun/2014/rebalans\\_proracuna\\_republike\\_slovenije\\_za\\_leto\\_2014/](http://www.mf.gov.si/si/delovna_podrocja/proracun/sprejeti_proracun/2014/rebalans_proracuna_republike_slovenije_za_leto_2014/) (30 December 2015).

<sup>42</sup> In 2013, MEDT had €24.4 million for the subsidies of technology projects of business enterprises, in 2014 this was reduced to €13.4 million, and for 2015 only €7.2 million are planned. The allocations at MESS for this type of financing have decreased from €21.3 million in 2013 to €7.3 million in 2014, with only €0.82 million planned for 2015 (see the link above).

Commission funding of €30 million (48%). In 2012 the amount jumped to €79 million, out of which, 36 million were given by the European Union (4%). As seen from these figures the EU funds present an important part of funds from abroad. Preliminary data on 2013 shows again an increase of funds received from abroad to €83.33 million or as much as 8.9% of total GERD (SORS, 2014b).<sup>43</sup>

In total, Slovenia received until mid-2014 €170 million from FP7 projects, a considerable increase over FP6 where total value of the projects was €67.4 million. Also, the number of projects and partners increased significantly: from 503 contracts in FP6 to 692 contracts for FP7 and 616 participants to 910 (MESS, 2014)

The 2013 SRA budget presents a fund allocation as follows: 28% has been allocated to natural sciences, 29% technology sciences, 12.7% to humanities, 9.3% to social sciences, 9.6% to biotechnology and 9.3% to medical sciences (Financial Report SRA, 2014). Only a very small fraction of research money was directed towards multi and interdisciplinary research (1.7%). In terms of research performers, most of the financial resources went to PROs and HEIs (98%); the business sector received 1.4% of the public funds and 0.25 % went to private non-profit institutions, according to the Agency's financial report (SRA, 2014). The structure of allocations changes only at the margins from year to year, since the allocations are closely monitored by scientific councils organised around the individual sciences.

**Table 2 Basic indicators for R&D investments**

	2009	2010	2011	2012	2013	EU28 (2013) ..
GDP growth rate	-7.8	1.2	0.6	-2.6	-1.0	0.3
GERD (% of GDP)	1.82	2.06	2.43	2.58	2.59	2.02
GERD (euro per capita)	323	364	436	452	454	539.2
GBAORD - Total R&D appropriations (€ million)	244	217	219	189	189	90,505
R&D funded by Business Enterprise Sector (% of GDP)	58	58.4	61.2	62.2	63.8	n.a.
R&D funded by Private non-profit	0	0.1	0	0.1	0	n.a.
R&D funded from abroad	6	6	7	8.6	8.9	n.a.
R&D funded by Framework Programmes	18.6	21.8	23.5	37.2	28.9	n.a.
R&D funded by the Structural funds <sup>44</sup>	n.a.	n.a.	n.a.	120	131	92.7
R&D related FDI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
R&D performed by HEIs (% of GERD)	14.6	13.9	11.8	11	10.3	23
R&D performed by Government Sector (% of GERD)	20.8	18.2	14.3	13	13	12.3
R&D performed by Business Enterprise Sector (%)	64.6	67.8	73.9	75	76.5	63.7

<sup>43</sup> In the preliminary figures no break-down is provided as to the source of foreign funds.

<sup>44</sup> See also table 3 below

	2009	2010	2011	2012	2013	EU28 (2013) **
of GERD)						
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	8.5	8.6	8.2	7.8	8.3	5.6
Employment in knowledge-intensive service sectors as share of total employment	31.9	32.9	33.6	34.5	34	35.6
Turnover from Innovation as % of total turnover	n.a.	10.7	n.a.	n.a.	n.a.	13.4

**Table 3: Structural funds for R&D activity**

	2011	2012	2013
GBOARD (without EU Structural funds) in € million	219.4	189.9	174.5
Sources for R&D from Structural funds, of which	141.3	155.0	109.1
- EU component	120.0	131.8	92.7
- National co-financing	21.3	23.2	16.3

Source: SORS internal data (2015).

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

Slovenia has relatively limited institutional allocation of public funding for RDI. According to the provisions of the Law on Research and Development (OG 96/2002 and 115/2005; rev. 22/2006), institutional funding is the obligation of the founder (the government) towards public research and infrastructural institutes<sup>45</sup>. Through these funds, the Slovenian Research Agency covers the fixed operating costs of the research or infrastructural activities only of the public research institutions, where the government is present as a founder and thus also has the prevailing role in the management of these institutions<sup>46</sup>. The institutional funding provided under the founder's obligations comprises part of the administrative costs, fixed operating costs and the fixed costs of maintaining and repairing property and equipment. For this purpose, the National research agency as the government's agent disbursed in 2013 18% of its total budget as institutional block

<sup>45</sup> As the infrastructure institutes the Institute of Information Science, which operates the Information System on Slovenian Science [SICRIS] and the Co-operative Online Bibliographic System and Services [COBISS] are defined.

<sup>46</sup> The institutional funding is provided to the following institutes: Agricultural Institute of Slovenia; Educational Research Institute; GeoZS, Geological Survey of Slovenia; IER, Institute for Economic Research; Institute for Hydraulic Research; IJS, Jozef Stefan Institute; IMT, Institute of Metals and Technology; INV, Institute for Ethnic Studies; INZ, Institute of Contemporary History; National Institute of Chemistry; NIB, National Institute of Biology; Slovenian Forestry Institute; UI, Urban Planning Institute; ZAG, National Building and Civil Engineering Institute and ZRC SAZU, Scientific Research Centre of SASA.



funding. Depending on the individual institute, this covers between 10-30% of their basic running costs.

Universities do not receive this type of institutional funding: their institutional funding is only for teaching activities), so a majority of RDI activity at the HEI are financed through regular participation at public calls at the Slovenian Research Agency (competitive funding), other governmental public calls, international calls or from business sector. In the draft R&D law (2014) special institutional funding was proposed for the higher education institutions as well, which would put the full-time researchers at the universities on the same footing as researchers in PROs.

### **Project funding**

The largest share of the basic and applied research is funded through so called "Research Group Programme funding" (hereafter RGPs), a system established in 1999 to secure stability in funding of the basic and applied research. The funding is allocated on the basis of a public call issued by SRA, but since it provides long-term support (up to 6 years) it is more stable than typical research project funding (1–2 years). The RGP funding is a subject of debate among evaluators of Slovenian research system. The SRA claims this is a clear competitive funding scheme, since there are periodical calls and the applications are submitted by the existing and new research groups. The applications (research proposals) are evaluated with assistance of external evaluators. However, on the other hand, the RGPs are a long-term instrument, since once a research group is selected for funding it can re-apply to all subsequent calls. Since the data shows that there is practically no exit flow, the external evaluators (ERAC team in particular<sup>47</sup>) determined that RGPs in fact constitute semi-institutional or at least not fully competitive funding.

This type of programme fits well into "responsive mode" funding where funding is provided directly to research teams to carry out specific projects of their own choosing. The system provides for formation of research groups within specific science disciplines. The research group, eligible to apply under Research Groups' Programme (RGP) comprises a head of the group, at least five researchers holding a doctorate and technical staff from one or more research organisations. Researchers can take part in only one research programme. Researchers must have a doctorate, a record of research and development results for the last five years and research titles in line with existing regulations. Young researchers may also participate in a research group. The evaluation process is spelled out by the Slovenian Research Agency, which is responsible for monitoring and administering programmes. So far, bibliometric criteria have been favoured, especially scientific articles and citation indexes. Increasingly, however, the SRA is requesting information on the socio-economic relevance of the research and data on contractual research as an additional positive reference for a particular research team.

In 2013, the Slovenian Research Agency funded RGPs in the amount of €52.7 million or more than 36% of total disbursement of research funding (SRA financial report for 2013).

Another major scheme for financing is called "Basic and Applied projects", also operated by the Slovenian Research Agency, distributing funds in 2013 in the amount of €25.5 million

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<sup>47</sup> Their assessment of RGPs was the following: "A very low rejection rate of research groups suggests that the system is actually system of soft funding." (ERAC, 2010, p. 22; [http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/znanost/ang\\_verzija/Slovenia\\_OMC\\_Report-FINAL\\_dec.pdf](http://www.arhiv.mvzt.gov.si/fileadmin/mvzt.gov.si/pageuploads/pdf/znanost/ang_verzija/Slovenia_OMC_Report-FINAL_dec.pdf); 14 December 2014)

or 17.6% of the Agency's whole budget. This scheme funds basic, applied and post-doctoral research projects of shorter periods (up to three years). However, due to the austerity measures it is difficult to predict the timing of the calls: while in the past, the calls were issued by the SRA on regular annual basis, during the last years this is no longer the practice. In 2011 the scheme was not launched, while in 2012 it was delayed several times. In 2013 the final selection results of the 2012 call were issued only few days prior to the launch of the next call. In 2014 it was postponed at least three times (it was planned for July, then September and mid-October). Finally, the call was launched on 24 December 2014, but the co-financing will start approximately in December 2015. Such environment hinders the planning of R&D activities in research institutions and causes insecurity and instability of employment of researchers, who depend on project financing (especially for more junior researchers).

The selection criteria for projects to be funded are first of all the conditions, which need to be met by the project leader (specified in the regulations of SRA)<sup>48</sup> and evaluation by experts. In recent period, SRA has changed the criteria from one to the next call, partly as a response to the critics from research community and partly in a desire to simplify the procedure. Yet each change had as many supporters as critics and on the whole, made the system less transparent. The most recent change of criteria, approved by the Scientific Council of SRA, gives certain advantage to project proposals, which are going to be submitted by research groups already receiving funding through RGP. The argument for such a decision was that this will provide for concentration of resources in the hands of the best, yet the criticism is going in direction of increasingly "closed" financing, which does not allow younger researchers, who are not members of the research groups to access public funding.

The proposal evaluation at SRA is increasingly done by foreign experts, so the submission of project proposals is both in Slovenian and in English for the RGPs. Some of the public calls, run by MESS were also engaging foreign experts (Centres of Excellence; Competitive Centres) along with the team of Slovenian experts. The first were engaged in scientific evaluation, while the Slovenian counterparts were primarily assessing the quality of the research teams and the alignment of the proposed activities with development strategy of the country.

The mode of evaluation (peer reviews, publications/citation data, ponders) is a subject of continuous debate in Slovenian research community. So far, the SRA has yet to develop the mode which will accomplish fair selection of proposals, which will be satisfactory to the research community as well as to the funder (MESS), will be simple to implement and not allow for biased interventions of Scientific or Management Council.

SRA's more targeted funding mode is used for commissioning specific research to assist in public policy. These schemes are known as Targeted Research Programmes. The thematic priorities are specified by each of the interested ministries, with the aim of the scheme being the provision of scientific support to policy-makers in the preparation of their programmes and policies or in the evaluation of the existing work programmes. Targeted research projects run from one to three years, with semi-annual reporting and annual evaluation. In 2010 (for the period 2010–2012), €7.2 million were allocated to Targeted Research Programmes. Only minor call for project in the field of agriculture was run in

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<sup>48</sup> Mostly publication and citation record

2014, otherwise the programme is a victim of budget cuts and no new calls are foreseen in the near future.

To summarise, Slovenian public RDI system is mostly based on competitive funding, implemented through SRA. In the current economic crisis this causes several problems of strategic planning and R&D system developments, especially for PROs and HEIs. Even though there are some institutions that receive block institutional funding (*cf. supra*), the majority of RDI activities depend either on RGPs or on classical project competitive funding. The draft texts of the Law on RDI and in part also the draft Law on Higher Education included proposals to move towards the direction of increased share of institutional funding on one hand and more competitive on the other (shifting the funding amounts in favour of project financing from RGPs). Also, RISS envisaged change in financing with more explicit research priority areas. Considering the delay in the implementation of new legal framework and budget restrictions it is not expected that the current situation will change soon.

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

While strategic documents, especially RISS as well as legal provisions envisage the funding streams in such a way as to cover the entire RDI process, the practice differs from one to the next institutional configuration on one hand and on the other, differs with regard to availability of funds. Probably most comprehensive system was put in place with the instruments of the Cohesion Policy 2007–2013. The funding was provided for basic research via SRA and MHEST (Cos), for applied research through Technology agency, MHEST (CCs) and SRA, and Ministry of Economy provided support to start ups, introduction of new technologies, incubators and technology parks via Slovene Enterprise Fund and PAEFI. On its own, Ministry of Economy funded Development Centres, which were to be the last element in the funding chain- already providing ground for test production. With the end of financial perspective, austerity measures and closing of TIA, the comprehensive financing scheme is no longer existing and even current RDI measures are less and less favourable, since their financing is continuously under question.

As already mentioned the main accelerator of RDI activities in the business sector has been the 2006/2010/2012 tax incentive, which subsidised RDI activities in private enterprises. The increase in subsidy was positively assessed by the business community. According to IMAD's Development Report, a total of 571 taxpayers claimed tax relief (2011: 515, 2008: 483) and the volume of tax relief amounted to €183.9 million (an increase of 83.6% compared with 2011). In the period 2009–2012, for which comparable data are available, most tax reliefs on investment in R&D were claimed by taxpayers from technology-intensive manufacturing activities,<sup>49</sup> accounting for 85% of the total tax relief claimed in manufacturing.<sup>50</sup> In the period of the economic crisis, except in 2011, manufacturers of pharmaceutical raw materials and preparations (C 21) have accounted for a good half of the tax relief claimed.

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<sup>49</sup> The chemical and pharmaceutical industry (C20-21); the manufacture of ICT and electrical equipment (C26-27); the manufacture of other machinery and equipment (C28); the manufacture of transport vehicles (C29-30)

<sup>50</sup> In 2009–2012, taxpayers in manufacturing on average claimed almost four fifths of the total tax relief on investments in R&D. The remaining fifth was claimed by taxpayers in service activities (UMAR, 2014).

Regarding RDI the former Slovenian Technology Agency (TIA) measures should be mentioned (see EW 2010, 2011, 2012), which even though proved to be successful, have not been launched after 2011. One such measure was research and investment project support (RIP)<sup>51</sup>, which provided co-financing of highly applied and pre-market research as well as the establishment of test production line. The measure was co-financed by European Regional Development Fund (ERDF). Since TIA in 2013 merged with PAEFI and STO to SPIRIT (*cf. supra*) the joint activities have covered mostly entrepreneurship promotion and to a lesser extent technological issues. Business sector, especially SMEs, find the subsidies provided by the Slovene Enterprise Fund, very attractive, since every year their calls are over-subscribed. Their main products include subsidised bank guarantees, grants and equity financing.<sup>52</sup>

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

After a very slow start, Slovenia finally started by the end of 2012 with the preparation of the RIS3. The coordination was entrusted to the Ministry of Economic Development and Technology (MEDT), yet the initial approach was not following the EU guidelines sufficiently, in particular not positioning the RIS3 as an overarching strategy of the country. The working group claimed that in the drafting of RIS3 they were taking under the consideration the RISS 2011–2020, as well as all different other consultations (Technology platforms, preliminary foresight), existing experience of the centres of excellence, competence centres and centres of development, co-financed under the current financial perspective from The European Regional Development Fund. Also, a research paper had been commissioned on overlapping/ matching of research and industrial capacity as they can be identified according to standard indicators (value added and export share for industry, patents/publications for scientific output). The process progressed very slowly. In the spring of 2013, Chamber of Industry and Commerce got actively involved and helped organize a set of panels where the ideas on how the RIS3 should look like were discussed. The first-draft was submitted to the Commission in the end of November 2013. The document received a number of comments from the Commission which led the government to reorganise the approach to the preparation of all three strategic documents: RIS3, Operational Programme and Partnership Agreement. It seems that the importance of the documents was finally better understood by the policy makers; this led to the (re)-establishment of the special Government Office directly responsible for the cohesion policy. The new group engaged more actively with key stakeholders to attract sufficient attention and various inputs, leading to a new version, submitted in the end of August 2014 for the assessment of the Commission.

The document states in its introductory chapter that the “smart specialisation is a platform for establishing consensus on the focus of development investments in the areas where Slovenia has the critical mass of knowledge, capacities and competences and where there is innovation potential for development recovery of Slovenia. It is a process that is the basis to ensure balanced and development priority-oriented functioning of policies in practice and monitoring of their implementation.” (RIS3 Slo, 2014: 9)

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<sup>51</sup> See ERAWATCH Country Report Slovenia 2012 for details.

<sup>52</sup> More details can be found at: <http://www.podjetniskisklad.si/home.html> (2 January 2015)

The RIS3 was structured in *two pillars*:

1. Entrepreneurial and innovation ecosystem, which should be developed to support entrepreneurial growth and development;
2. Value chains and networks, where niche products and services are being identified in the areas where Slovenia has both production and knowledge expertise.

In the document, specific indicators at various levels (strategic, with regard to knowledge transfer and use of knowledge; entrepreneurship, creativity and talent as well as at the level of internationalisation) are specified. Also, each pillar is explained in detail, along with the SWOT analysis, actions and measures. The first pillar stresses the importance of setting up supportive environment for start-ups, knowledge and technology transfer, and creativity&design. The second pillar structures itself around five priority areas, which are multidisciplinary in their character: SI-ndustry 4.0 smart factory; smart cities & communities; smart building & homes; smart use of resources and health. Each of the selected priority areas is described as to why it had been selected, what are the Slovenian competencies and capacities in the area and where the future opportunities are. The way the priority areas are defined leaves ample opportunity for horizontal integration of various scientific fields, including »soft« sciences. This openness which could also be assessed as not sufficiently specialised priorities is the reality of Slovenian research and business sphere where the cross-disciplinary cooperation needs to be encouraged to pull all available human resources together.

The next steps in implementation of RIS3 are of significant importance- transfer of envisaged measures into specific instruments to be supported by structural funds. There the need for coordination among different ministries and their sectors is apparent, since without this, the instruments may follow the logic of individual sector and not the approach of the RIS3 with its stressed cross-disciplinarity. This is particularly problematic in view of the fact that Slovenia's Operational Programme, where the targets for certain areas are already specified and instruments are to be designed in harmony with RIS3<sup>53</sup>, yet RIS3 is still in a draft form.

The current developments in the field show that in the beginning of March 2015, a new team at GODC presented to various stakeholders a new (third) draft for comments and further elaboration of instruments for its implementation. Yet, this version received already internally many comments that a relatively major revision seems to be going on with the engagement of the ministries, Chamber of Industry and Commerce and several other stakeholders. Since the document is not publicly available, we cannot present its main outline.

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

Traditionally, Slovenia commissions evaluations at the time when the strategic documents in the field of R&D are being prepared. That is how the ERAC and OECD evaluations of the R&D system in 2010 (see ERAWATCH Country Report Slovenia 2012 for details) were

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<sup>53</sup> OP talks of designing concrete instruments/ measures in accordance with RIS3 (OP, 2014) and states on page 58: »Supported measures will be in full compliance with the Strategy of smart specialisation, which will, in coherence with OP, specify in more detail the means and procedures for the allocation of resources.« (translated from Slovenian by authors).

carried out: they offered an external view of the system and its positive/negative characteristics during the preparation of RISS 2011. Some of the recommendations were taken on board, some were to be integrated in the follow-up legal documents (see ERAWATCH reports 2012, 2013) and some were dismissed.

In the past, the government used the Targeted Research Programme of the SRA for the evaluations of different policies and measures in the field of RDI as well as certain foresight exercises. Yet due to the lack of resources no evaluation of the system as such had been commissioned. Since then only segmented evaluations have been carried out by various actors were carried out.

Monitoring of the preparation of RIS3 had been provided by the DG REGIO and DG Research and Innovation, but these reports are not publicly available. Also, internal report of the implementation of the RISS has been prepared by the MESS for the government and was presented on the December 2013 session of the Science and Technology Council and on the committee for science in the National Assembly. This type of evaluation needs to be done annually, so a new evaluation of the implementation was started in December 2014 and will be presented to the government in February/March of 2015. The SRA was positively evaluated by the European Science Foundation.

The MESS commissioned in the beginning of 2014 the evaluation of the Centres of Excellence (COs) and competence centres (CCs) as the instruments (not the performance of individual centres, only the achievements of the instruments as such). On the basis of analysing the end reports submitted by the Cos and CCs and interviews with the members of the COs and CCs from all three research communities (PROs, HEIs and business), the assessment of achieving the policy objectives was carried out. The analysis (Bučar et al. 2014) showed that the most important contribution of these two new forms of cooperation was improved understanding of different objectives in public research sector and business sector. Also, both instruments resulted in several new research initiatives more in line with the business sector needs. Some deficiencies and practical implementation issues were identified (administrative regulations of public procurement, pre-financing, unclear intellectual property rights regulation, etc.) which could be improved in the next round. On one hand some CE and CC aimed that the co-financing should be extended, while on the other hand some of CEs and CCs asked for a greater autonomy in the marketization process.

The evaluation was to contribute to the decision whether to continue with the support via such instruments, yet in spite of positive evaluation of each type of support the Operational programme does not specifically address either of the two instruments. This has occurred in the past as well: the findings of evaluation reports had often been neglected by the policy designers, especially in the cases when the evaluation was commissioned by one government and the new measures were being designed by the following one.<sup>54</sup>

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<sup>54</sup> Typical such case happened with the evaluation of cluster programme. The cluster initiative in Slovenia, beginning in 2000, was one of the top priority measures when introduced. By 2004, 18 cluster offices were operational. All together 29 projects related to clustering were being supported: 3 pilot cluster projects, 13 early stage clusters and additional 13 cluster initiatives, bringing together 350 companies and 40 education/research institutes. Yet a positive evaluation of the programme (commissioned by the Ministry of Economy at time) was not sufficiently convincing for the next government to continue with the support measure and by 2005, the cluster programme was closed (Trendchart report on Slovenia, 2007).

In the preparation of the RIS3, two different in-depth analyses were prepared: one prepared by FIDEA (2014),<sup>55</sup> is based on the estimate of the export potential based on the comparison of the volume of export with the leading countries in *individual product groups*. The analysis stems from Eurostat data – the International Trade Database for the period 2011–2013 at the level of 4-digit product groups. The selection of reference countries is subject to three leaders based on prices and three leaders based on the quantity for a product group. This served as the basis for the calculation of a weighted average price which the leading countries actually achieve on the market, which is compared to the prices actually achieved on the market by Slovene producers. Another analysis, prepared by Burger&Kotnik (2014)<sup>56</sup> tried to assess technologically comparative advantages of Slovene industry. The information on the R&D intensity by activity and the data on the projects of the 7<sup>th</sup> FP in the 2007–2013 were used. In both cases these were the data on input investments which should ensure technological comparative advantages. R&D intensity of an individual Slovene branch was compared to the average of five most innovation-active states in the EU and thus the datum on relative R&D intensity compared to the innovation leaders was obtained. The results were used to back the selection of priority areas in RIS3.

Institute of Macroeconomic Analyses and Development (IMAD) annually assess the implementation of Slovenian Development Strategy (SDS 2005–2013) and other structural changes in Slovenia's economy in so called Development Report (IMAD, 2014)<sup>57</sup>. The analysis also includes a review of implementation of the strategic objectives of the EU, which are also binding for Slovenia (the EU 2020 strategy targets, the indicators of the Macroeconomic Imbalance Procedure Scoreboard). The report is organised according to the priorities of SDS and thus includes data on implementation of actions in the second priority "Use of knowledge for economic development", where assessment is made of R&D policies. 2014 Report noted that *"The level of knowledge transfer from the research sector to the business sector is still insufficient to enable faster growth in the innovation capacity and competitiveness of the economy, and there is also a mismatch between the supply of and demand for a workforce with tertiary education."* (ibid., p.12). As in many other policy areas, the report noticed problems in the implementation of strategic documents due to the political instability during the last years.

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<sup>55</sup> FIDEA (2014): The assessment of industry growth potential. Smart Specialization Strategy. Export value benchmarking. RIS3 Slovenia case analysis. The report was part of contribution to the event "Dynamic, Innovative and Open Slovenia", 17 April 2014.

<sup>56</sup> Burger, Anže and Patricia Kotnik (2014): Professional analysis as the basis for the Smart Specialisation Strategy. Ljubljana: April, 2014

<sup>57</sup> More at [http://www.umar.gov.si/fileadmin/user\\_upload/publikacije/pr/2014/Apor\\_2014.pdf](http://www.umar.gov.si/fileadmin/user_upload/publikacije/pr/2014/Apor_2014.pdf) (2 January 2015)

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

The national progress towards the realisation of ERA develops slowly, but steadily. On one hand there are some ERA priorities (such as human resources, peer-review etc.), where Slovenia complies with the ERA requirements, while on the other hand in some other ERA priorities (e.g. ERA priority 2) Slovenia still lags behind the ERA requirements. This split in complying with ERA priorities can be partially explained by the problem of segmentation of Slovenian RDI, where different processes get along with different channels of command. The fragmentation of process then leads to the inefficient distribution of powers and causes also some overlapping in the decision-making structure.

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

The second ERA priority is one of the priorities of Slovenian National Innovation System mentioned in RISS 2011–2020. In RISS, a special section (chapter 3.3.) is devoted to international cooperation of Slovenian RDI sector. On p. 13 of RISS it is written: *“The increasing globalisation demands an improvement of the scientific and technological excellence and of sustainable development. Without increasing of the scientific and technological co-operation in the European and worldwide context, it is not possible to address effectively the challenges which are crossing the national and continental borders. Globalization calls for new and different approaches and methods on local, regional and national level. On a global international level the co-ordination of the R&D policies, instruments and measures has become a necessity, compelling also for Slovenia”* (RISS, p. 13, bold B. U. and M. B.).

RISS presents two directions in which actions should be taken to strengthen the trans-border cooperation of Slovenian R&D stakeholder: multilateral and bilateral. In the field of multilateral cooperation, RISS auspices to intensify cooperation within the European Union, especially in EU programmes and networks. Within this, a strong link between public-private research activities should be formed, further encouraging enterprises to participate with their R&D activities in the EU multilateral R&D and innovation programmes. The strengthening activity of companies in EU/trans-border multilateral programmes can be illustrated with two figures: (a) the increasing share of funds from abroad in total and especially in business sector, and the (b) increasing participation in various EU programmes. Regarding the first action, it should be noted that in the period 2007–2012, the funds from European Union in BERD triplicated. In 2012, the share of funds from EU programmes presented 6.3% of total BERD (or 3.8% of total GERD) (SORS, 2014a). Complementing the data on BERD, the internal MESS data shows that the number of projects (within the FP7 framework) is increasing annually. The numbers are higher in ICT and in nanotechnologies, but at the same time Slovenian enterprises cooperate with other partners (at the multilateral level) quite intensively in other fields as well.<sup>58</sup>

Parallel with multilateral cooperation, RISS exposes the necessity of strong bilateral cooperation in the field of R&D, especially with BRIC countries. Next to them, RISS states that the scientific cooperation should be improved also with “the most advanced countries”,

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<sup>58</sup> An internal MESS calculation is that the Slovenian researchers within FP7 received more than €155 million during the period 2007–2012



while for the South-Eastern European (Western Balkan) countries, Slovenia should become a “hosting country for their excellent researchers and enterprises” (RISS, p. 15).

RISS mentions also the importance of cooperation in research infrastructure. The “annex” of RISS, Research Infrastructures Roadmap (RIR) 2011–2020, presents key areas and priorities in which international cooperation should be fostered, if Slovenia wants to become a knowledge-based society. Areas that are deemed extremely important for Slovenian R&D are: (a) advanced materials and nanotechnology, (b) energy efficiency, (c) environmental technologies, (d) biotechnology, (e) biomedicine and biological sources etc. Next to these, RISS also calls for the better exploitation of RI with diversifying among RI, which is important for Slovenia, and RI in which Slovenia should be a partner of the international consortia.

The 2013 RISS evaluation report implicitly lists two categories, which can be understood as “Grand challenges” in the case of Slovenia: the efficient use of energy and the renewable sources of energy. Both are linked to the issue of environment preservation and sustainable development. Slovenia also addresses the Grand Challenges through transnational R&D cooperation, most notably through the participation in JPIs and ERA-NETs. In 2014 Slovenia actively participated in JPI Climate and JPI JPND Research with observer status in JPI A Healthy Diet for a Healthy Life. Furthermore Slovenia actively participated in many ERA-NETs addressing grand challenges including ARIMNET2, SUMFOREST, ERA-MBT, WOOD-WISDOM-NET+, CORE ORGANIC PLUS, ERASynBio, SUSFOOD and TRANSCAN. In 2015, Slovenia will join TRANSCAN II, JPND, SYSMED and M.ERAIL.

### **MUTUAL RECOGNITION OF PEER-REVIEW STANDARDS**

Even though RISS strongly supports the idea of peer-review, there is as yet no practice to recognise the international peer-review evaluation as the national one. In the case of national project/ programme proposal evaluations, Slovenian institutions (predominantly Slovenian Research Agency) more and more often combine national and international experts. In some cases, the review panels are also composed of Slovenian and foreign experts. The only (known) case where the international peer-review is regularly taken as a basis for the national funding, is the case of EUROSTARS projects, led through the ex-Ministry of Higher Education, Science and Technology (today MEDT, since the participation in EUREKA/EUROSTARS is coordinated by them).

The peer-reviews and evaluation reports play an important role in the process of selection of RDI projects for funding. While the ex-post evaluations are also taking place upon the conclusion of the project, the relevance of the key findings in the ex-post evaluation is lesser. In most cases the ex-post evaluations are based on the reports the research groups submit (this is the case in the RGPs instrument). There are examples of the evaluations by external experts of individual instruments or policy. Most recent such evaluation was performed in first half of 2014 of the instruments, supporting the formation of the Centres of Excellence and the Centres of Competence, in which the authors emphasised that the instruments should be continued. While the Operational Programme plans for similar instruments for 2014-2020 period, by December 2014 no explicit plan has been elaborated.

In Slovenia, the key requirement to apply for a post in the public sector is fluency in Slovenian language. This is still the main hindering factor also for exchange of staff at the R&D and higher education activities. Nevertheless, the national research agency (SRA) requires that all applications for projects have to be submitted in Slovenian and English,

which enables them to co-opt foreign reviewers for the evaluation processes of national projects. However it should be noted that even though the research proposals have to be written in English and Slovenian, the calls are often published only in Slovenian language and non-Slovenian researchers can take part only if registered by SRA.

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

#### **3.2.1 Introduction**

The third ERA priority is quite developed in Slovenia, since already before Slovenian independence various measures have been introduced to establish attractive careers for scientists and RDI experts. Especially during the last 10 years many actions have been taken to accelerate the mobility between PROs and private sector. Here at least three instruments should be mentioned: Young researchers from business sector, Centres of Excellence (CE) and Centres of Competence (CC), and the Call for Basic and applied projects (issued on 24 December 2014 and closed on 12 February 2015), which strongly emphasises applications coming from the business sector. However it should be noted that strategically RISS 2011–2020 is still the most important document, defining the strategic approach for enhancing research mobility, training and attractive carriers.

Even though the Slovenian system of recruitment is set-up quite well, one problem that has eluded all measures still remains. The so called cross-border employment of researchers is an on-going topic between the Ministry of the Interior and Ministry of Education, Science and Sport. Despite the fact that various ministers for education tried to reach an agreement on leveraging the visa issue or widening the criteria for applicants from non-EU/third countries, the Ministry of the Interior refused to budge, meaning that the legislation virtually remains unchanged. That is why only a few researchers from third countries actually come to Slovenia. However, in 2010, a new law was adopted, which widened the possibilities for the recruitment of researchers from third countries. The impact of this law can hardly be measured since there are only few foreign researchers that are active in the Slovenian PROs.

The next issue hindering the cross-border mobility of researchers is the salary-system, which is understood as “non-attractive” and “non-stimulative”. As in many countries, in Slovenia researchers are part of the public sector wage-system, where the payments are regulated in accordance with the social contract between the employer (government) and public sector unions<sup>59</sup>. With the crisis measures, all incentives in public sector were temporarily cancelled, so no variable payment is permitted. Additionally, SRA for the programmes and projects it finances applies so called “research hour” as the accounting unit, not the actual costs of personnel/ material costs. This research hour is strictly regulated as per percentage dedicated to labour costs, material costs, amortisation and overhead and the project/programme team needs to spend the resources in accordance with the prescribed proportions. The most problematic issue deriving from this system is

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<sup>59</sup> It is necessary to emphasise that RISS in different parts declares that the precondition for the excellence in research consist of the exit from the civil servant (and civil servant salary) system (see pg. 8, 10, 11, 23).

the labour costs for more labour intensive research (social science, humanities) of teams with senior researchers.

Slovenia was able, to before the crisis, rejuvenate its RDI personnel quite intensively, partly also on account of the Young researchers' measure. However the current crisis and the introduction of austerity measures on one hand limited the recruitment of R&D personnel in PROs, while tax subsidies increased the employment of such personnel in business sector and HEIs. In 2007 there were 5,299 RDI personnel in business sector (in FTEs), 3,096 in PROs and 1,954 in HEIs. In 2013 the data somehow differs from the previous years. In business sector the RDI personnel amounts up to 9,811 (index 2013/2007=185), in HEIs up to 2,805 (index 2013/2007=143), while in PROs to 2,596 (index 2013/2007=84). The increase in the business sector can be attributed to the 2010 and 2012 tax reform, subsidising enterprises for RDI activities, while the increase in the HEIs is to be attributed to FP7 projects in which Slovenia participated actively.

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

Slovenian researchers' labour market remains relatively closed due to the internal restrictions, i.e. compensation limitations due to the classification of researchers (HEIs and PROs) as public employees, where salaries have to follow Public Sector Salary System Act and collective agreements for all public sector employees and specific collective agreements for RDI employees. In the case of HEI one of the requirements for the employment is also the active knowledge of Slovenian language.<sup>60</sup> All-in-all it can be said that albeit the Slovenian RDI labour market is officially deregulated, there are some formal and informal barriers to the recruitment of researchers.

All-in-all it is possible to say that the employment procedures of RDI staff are quite simple in the case of business enterprises, while quite complicated in HEIs or PROs. In the case of PROs and HEIs there should be a public call for a vacant post. The decision to employ a new RDI employee has to be adopted at the level of the University office (rector) and university supervisory board. If they do not agree with the proposal of an individual faculty/department, there is no appointment of new RDI personnel. In case of PROs the selection process is more alleviated and depends on available funds. However, here the final word is left to the directors of the institutes or heads of projects in case of provided international funding. The situation is similar in the business sector, where the directors have the authority to decide whether the candidate would be appropriate or not.

In the case of HEIs and PROs the process starts with the publication of job vacancy on a relevant national online platform, in 2014 the PROs and HEIs intensified the publication of job vacancies also on relevant Europe-wide online platforms, including the EURAXESS portal (in the case of University of Ljubljana this is obligatory from August 2014 onwards). Vacancy announcements of public research and higher education institutions include the job profile, skills and competencies required, and eligibility criteria.<sup>61</sup> Together with job advert the relevant institutions publish the selection criteria. They regulate a minimum time period between vacancy publication and the deadline for applying and offer institutions the right to receive adequate feedback and the right to appeal (Deloitte, 2012). The selection panel is set-up after the end of the time provided (its composition is not

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<sup>60</sup> By Law, teaching of compulsory courses can only be in Slovenian language.

<sup>61</sup> However, not all of the job vacancies are published in English.

public)<sup>62</sup> by the advert and decides on the applications. The selection panel decides only on who the most appropriate candidate is. Whether there are two or more, they leave the final decision to the head of the department or to other relevant stake-holders. After the adoption of the final decision, the non-selected candidates are informed only that they have not been selected. They have the right to appeal and they have the possibility to look into their assessment made by the expert commission). However they are not allowed to have a look in other candidates' files. After the decision on the selection is adopted, the rector/head of the institute signs the contract with the selected person.

The described process is quite straight-forward in cases when all applicants come from the same University or PROs, but becomes more complicated when there is a candidate (or more) from different universities or PROs or even from abroad. When there is such case the first step after the submission of application is the process of verification of the habilitation standards. A special commission from the scientific field is appointed to decide whether the applicants qualify in accordance with the habilitation of the institution where they seek employment. After this decision has been adopted the candidate(s) who qualify are evaluated according to the procedure described above.

With regard to career development, in 2010, all Slovenian universities have established career counselling centres. Also, some of other higher education institutions have followed the example. The establishment was supported under the special public call of ex-Ministry for Higher Education, Science and Technology (today's MESS) with the co-financing from ESF.<sup>63</sup> The career centres organise various workshops for the students, contacts with potential employees and advisory service.

Although the RDI system in Slovenia can be as a whole assessed as open, transparent and merit-based, there are some barriers which should be eliminated to enhance the attractiveness of the national RDI system. Firstly, the system should become more internationalized. An important step forward in this direction could be the alleviation of the salary-system for foreign researchers, obtaining their own grant or external funds. Secondly, the RDI system should become more attractive to foreign and domestic researchers if the contracts would allow not only temporary but also a more permanent type of contract. However this is constrained by the funding of RDI, mostly on a competitive-basis. Thirdly, the current economic crisis opened the issue of precarious workers in RDI sector, which was not really an issue prior to the crisis. The decrease of employment in public RDI because of the austerity measures and the increase of temporary contracts, especially for younger researchers (based on the time-frame of projects) opened the debate on the future developments of the Slovenian RDI system. As in other EU, the main burden of the temporary contracts and precarious working conditions concerns the young(er) generation of researchers.

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<sup>62</sup> In most cases the members of the selection panels are national experts. In the case of University of Ljubljana the selection panel is composed by three members: one being from the faculty which published the job advert, the next being from one of the faculties of University of Ljubljana, while the third should be employed outside the University of Ljubljana. However it is important that all the members of the selection commission have at least the same academic title as announced in the job advert (e.g. if the vacancy is for professor, all three members of the selection commission should be full professors).

<sup>63</sup> More available at [http://www.mizs.gov.si/fileadmin/mizs.gov.si/pageuploads/razpisi/Visoko\\_solstvo/Karierni\\_centri/Predstavitev\\_KC.pdf](http://www.mizs.gov.si/fileadmin/mizs.gov.si/pageuploads/razpisi/Visoko_solstvo/Karierni_centri/Predstavitev_KC.pdf) (15 February 2015)

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

RISS 2011–2020 implicitly focuses on the importance of cross-border cooperation and removal of (legal, political etc.) barriers, which hinder cross-border cooperation. However, there is no official document, which would deal with this issue in a more specific manner, by listing activities that should be performed or with some other particularities.

The issue of cross-border cooperation and portability of national grants is defined by the structure of the Slovenian R&D system, within which a condition *sine qua non* for applying for national grants is that the applicant has to be registered in the national database of all researchers (meaning SICRIS). When an applicant is registered in SICRIS, there are not obstacles to concur for national grants. In some cases, researchers and research organisations from abroad can apply for national grants if they are applying together with Slovenian researchers (sort of consortium). In these cases they obtain a non-permanent SICRIS code.

However, in the last years, some changes also occurred in the field of cross-border portability of national grants. Although the national innovation system does not allow changing the “residency” when a national grant is received without the consent of your home research institution, the new contracts for young researchers allow the portability of grants, for a maximum of one year, and only in the cases when the young researcher is going abroad to take advantages for its PhD study.

### **3.2.4 EURAXESS**

In Slovenia, the Ministry of Higher Education, Science and Technology by an internal decree in 2005 decided that the bridge-head organisation of EURAXESS (BHO) in Slovenia should become CMEPIUS. CMEPIUS is the national organisation entitled for mobility of pupils, students, university teachers and researchers. Under the patronage of CMEPIUS, the website for the promotion of mobility has been established, presenting key requirements and particularities of the intra-EU researchers’ mobility scheme. Next to the BHO, there are also seven national contact points, on each university (five), one at the International School for Social and Business Studies, and one at the Jozef Stefan Institute (Ljubljana). In August 2014 the University of Ljubljana obliged its members to publish all calls on the EURAXESS portal.

### **3.2.5 Doctoral training**

The doctoral training in Slovenia is well-developed and traces back in the period of ex-Yugoslavia. However, with the Bologna system also the doctoral training in Slovenia converged with the requirements of the EU. As such, the period of the doctoral training was reduced from five to three-and-a-half years and the mentors received a greater responsibility (defined by the contract in some cases between the University, mentor and the candidate) for the successful end of the PhD study. During the first years after the introduction of the Bologna PhD study (third cycle), the enrolment was relatively high since enrolment criteria were lowered in accordance with the translation of previous study levels to the new ones and the candidates with completed previous undergraduate programmes were treated as that they have completed the second-cycle. While in Slovenia there is no tuition for the regularly enrolled B. A. and M. A. students, the PhD programmes are offered only as paid ones. The tuition differs from programme to programme: from €2,700

annually to €4,200. This is relatively high for an average Slovenian student. The Government offered in 2010 the programme for (co-)financing the enrolment in PhD programmes on the basis of the Innovative Doctoral Training (OG 88/2010).<sup>64</sup>

The call to which the higher education institutions apply is run by the MESS with the financial assistance of ESF. Although there were some minor differences on who was eligible for such PhD co-financing among universities, the idea of the introduced measure is to increase the number of enrolled in PhD training/education through the co-financing of their study. Two types of scholarships were offered: a more competitive one where the tuition and the scholarship was provided for three and a half years and a more “open” one where students could receive the reimbursement of the tuition. Since the programme is co-financed by ESF, it was not offered for the school year 2013/14. It remains to be seen what form it will have in the new financial perspective.<sup>65</sup>

The next instrument that should be mentioned here is the instrument of Young Researchers, which was established in 1985. The main idea of the measure has been to rejuvenate the R&D personnel in PROs and HEIs. Since today more than 5,000 candidates have participated in the programme.<sup>66</sup> According to the SRA web page (ibid.) the Young Researchers programme have three characteristics:

1. young researchers participate in research work during their postgraduate studies on basic research or applied research projects;
2. they have regular, fixed-term employment contracts;
3. SRA finances their salaries, social contributions, as well as material and non-material costs for research and postgraduate study.

Since the measure of Young Researchers was influential and proven to be successful the State in 2001 decided to establish a »twin« measure of Young researchers from the business sector, lasting until 2009, when it became part of other RDI measures.

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

The key document dealing with the development of human resources and Ethical dimension of RDI is RISS 2011–2020. RISS 2011–2020 emphasises that Slovenian research and innovation system needs some ramifications and corrections in (the) (a) higher number of researchers and developers in the economy; (b) increasing number of doctors of science; (c) strengthening the qualifications of the research personnel; and (d) ensuring effective inter-institutional and interstate mobility of researchers.

Next to the above-listed activities, RISS 2011–2020 devotes its attention to the question of ethics, honour and good practices in scientific research. RISS claims that the aim of the Slovenian R&D policy is to “*ensure high-level of ethical awareness of researchers at their work and outwards*”. That is why the decision-makers, in cooperation with all stakeholders,

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<sup>64</sup> The measure in a wide sense applies all conditions set by the scheme of Innovative doctoral training. But since there are different paths to enrol in the doctoral system, it is hard to apply all the required measures in the doctoral scheme.

<sup>65</sup> The measure had been updated annually, for 2012/13 the call was issued in February 2013 and all-together amounted to almost €7 million. Within this, the University of Ljubljana took its greater slice, with €3.9 million.

<sup>66</sup> See more at <http://www.arrs.gov.si/en/mr/predstavitev.asp> (15 February 2015)

should prepare “*systematic institutional arrangement of dealing with the ethical questions in all the important areas, following the example of the European Union countries*”. Next to it a “*national code of ethics, honour and good practices in science should be adopted, serving as a basis for codes of individual research institutions*”. Finally, RISS calls for the establishment of “*Court of Honour for the scientific area*”. The deadline for all activities has been prolonged from December 2012 to December 2014 (2013 RISS evaluation, p. 56), but as it is expected that it will be prolonged deep in 2015.

Regarding the level of implementation of the Charter&Code in the Slovenian R&D system, it should be explained that few universities fulfilled actions in the field. The internal data from the MESS shows that the first step towards the incorporation of Charter&Code was done by the Rector’s conference in 2008, when the rectors committed themselves that their universities are going to comply with the Charter&Code as soon as possible. The developments followed in a timeline as followed: among universities the University of Maribor was the first that adopted and started to follow the provisions of the Charter&Code. A year after it was followed by the University of Primorska and in 2011 by University of Ljubljana and University of Nova Gorica. Also, the Research Centre at the Slovenian Academy of Science and Arts (ZRC SAZU) started the process of adoption of the Charter&Code, but until yet ZRC SAZU has not finished the procedure, because of the lack of human resources. Finally the Celje International School for Social and Business School also accessed to the Charter&Code.

As explained the Slovenian RDI system is quite complex and partially closed for foreign researchers. However, in the last years, especially because of austerity measures, Slovenian institutions opened their activities more broadly and thus it is expected that in the following years also a new legislation would follow, granting a more competitive RDI system, which is already climbing scientific excellence. One of the possible steps towards a greater openness of the Slovenian RDI system might be the adoption on the new Law on RDI, promised by the MESS for the first half of the 2015.

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

The Slovenian education system has some minor problems, but all-in-all is a well-known and well-performing system. Slovenian graduates and researchers easily compete with their ‘western’ colleagues on international tenders; Slovenian postgraduate students study at prestigious world universities and also are competitive on a world job market. One of the problems which the Slovenian education system is facing is the lack of clear demarcation of university studies and vocational colleges. As part of the economic and political transition, Slovenia after 1991 has lost mostly the vocational colleges and focused primarily on the university study. Students enrolling in the tertiary education opted more for SSH studies than for S&T. Such trend continued until med-2005 and decelerated with the current economic crisis (*cf.* SORS, 2014). This trend is now visible for the last 6 years and it is expected that it would continue also in the future (*cf.* UMAR, 2014). Finally, regarding the policies and incentives in place to ensure a sufficient supply of graduates in science, technology, engineering and mathematics it should be noted that the education system is moving in that direction. However, there are not radical shifts expected in next years, but the trends are stable and clear. The current economic crisis also supported the enrolment in the S&T, engineering and natural sciences studies, since the job opportunities in SSHs drastically decreased, while the opportunities in STEM field progressively increased in the last years.

Regarding the excellence in education, it should be noted that most Slovenian schools and universities have quite new and spatial building, they are computerised and they have the technology, which support the interactive modes of teaching. Most of the curricula are built of cross-disciplinarity, however one of the reproaches of Slovenian education system is that it lacks innovativeness and entrepreneurial education. In last years this has been improved, especially in the field of S&T where new instruments have emerged, such as business angels, spin-off environment etc. At the same time there is more collaboration between different faculties within and outside Slovenian universities and cross-fertilisation of knowledge. An important step forward in enhancing entrepreneurship has been done also by the measures of young researchers from business sector and the basic and applied projects, aiming to enhance the passage between public and private research.

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

The informatisation of the scientific field started relatively early in Slovenia. RCUM (Computer centre of University of Maribor), being a predecessor of Slovenian research e-infrastructure was established in 1983 as the informational trust of the University of Maribor. Realising that it has performed an important work for seven years and its contribution to the digitalisation, the Ministry of Science and Technology decided that IZUM (the renamed RCUM to IZUM) would become a platform for the development of digitalisation and knowledge access for all Slovenian libraries and interested public (COBISS). After the establishment of a database of all libraries and their units in 1999, IZUM made a step further for a scientific research, by establishing the so-called SICRIS. SICRIS is a system that quantitatively evaluates the research performance and scientific excellence of Slovenian researchers, by assessing their publications and other activities according to the criteria set by the Slovenian Research Agency (before: the entitled Ministry).

Next to SICRIS, that still stays at the level of a bibliographic database, the dLib should be mentioned. The dLib is a digital library, under patronage of the National Library (NUK), covering mostly social sciences and humanities. Its activities started in 1996, when the National Library digitalised the portraits of famous Slovenians (writers, poets, politicians), seven years after the dLib became public. From that date onwards, the National Library aims to digitalise the historical and current material of wide interest for scientists, researchers and historians. The position and necessity to elaborate the dLib system is mentioned also in the RISS 2011–2020.

In Slovenia, each university (University of Ljubljana – Dikul; University of Maribor – Dkum; University of Primorska – each faculty has its own digital library) has its own digital library. These universities' digital libraries offer to students, professors and researchers various services and materials. The downside of these libraries is that in some cases, they are not publicly accessible, but are rather opened only to their members. Among services, most of the digital libraries also offer access to journal databases or specific databases, important for scientific research.



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

RISS is the key document related to e-infrastructure. As already explained in the introductory paragraph, the most important platform for the preservation of documentation is IZUM/COBISS. COBISS contains the key data on all materials available in public and some personal libraries. Regarding the measures for supporting the development of e-infrastructures, it should be explained that financing of COBISS is channelled through Slovenian Research Agency, especially by its infrastructural financing. Because of public funds, COBISS is available for all internet users, and in some cases, bibliographic note includes a link to the actual material, while in other cases, it is always clear which library has the needed material.

The IZUM/COBISS platform includes also a SICRIS system, which presents a detailed analysis of scientific achievements of individual researchers. One of the condition for having a status of a researcher in Slovenia is to receive the SICRIS code. This code is a sort of identification for each researcher, since anybody with looking in SICRIS can find all materials, reports, publications and other research activities of the researcher.

In 2010 the SRA adopted also the idea of an e-identity for researchers, which is relevant for the researchers that want to apply at project calls. In five years almost all applications are done electronically and therefore the e-identity is not anymore an option, but a necessity.

Next to COBISS we have also some other digital research services. The most used in the field of SSH is the database of the Social Science Data Archive, which is the national archive for all national and international research in the field of Social Sciences. The Social Science Data Archive is resident at the Faculty of Social Sciences.

On the other hand in Slovenia we have also two documentation centres, one being the European Documentation Centre at the Faculty of Economics, while the other is the United Nations Documentation Library at the Faculty of Law. Both institutions have a large depot of useful materials in the field of the European Union integration processes and United Nations policies and activities.

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

More than 35 Slovenian scientific journals are indexed in Directory of Open Access Journals (DOAJ) out of approximately 120 published. Researchers are still reluctant to publish in OA journals – because of the evaluation metrics they prefer hybrid journals of traditional publishers. The electronic versions of all publicly co-financed Slovenian subscription journals (approximately 65 titles) and final reports of research projects, financed by the Slovenian Research Agency, must be deposited into the Digital Library of Slovenia. There are five active interoperable repositories following the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH): Digital Library of Slovenia, Digital Library of the University of Maribor, ePrints.FRI, PeFprints and Digital Repository of University of Ljubljana at Faculty of Construction and Geology. Some of the research institutions publish Open Access monographs (e.g., Digital Library of the Educational Research Institute). The country does not have a national portal for Open Access monographs (OpenAIRE 2013). SSDA prepared the Action plan on establishment of Open Access system for research data generated

through public resources in 2013<sup>67</sup> for the MESS and SRA, where they highlighted the benefits and the costs of such a system.

According to the study produced by the European Commission<sup>68</sup> Slovenia is among the countries where researchers publish more in “Gold journals”. One “interesting hypothesis is that researchers in [Slovenia] may use Gold journals because they more frequently allow publishing in languages other than English” (p. 25). However the problem of publishing in Gold journals is also the lower level of citations (ibid.), which can – not by purpose, but because of limited conscience of national language – limit also the research outcomes. Finally, such publications hinder also the development of ERA, as it was established by the Ljubljana process in 2008 (see Bučar and Udovič, 2010).

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<sup>67</sup> More available at [http://www.adp.fdv.uni-lj.si/o\\_arhivu/publikacije/odpp10\\_akcijski\\_nacrt](http://www.adp.fdv.uni-lj.si/o_arhivu/publikacije/odpp10_akcijski_nacrt) (15 February 2015)

<sup>68</sup> More 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) (15 February 2015)

## **4. Innovation Union**

### **4.1 Framework conditions**

The RISS was the first legal document where both R&D and innovation policies were merged in a single framework. At the time, this was considered as a major break-through which would also allow for more systematic supply and demand-side policies and instruments. Yet the dissolution of the common ministry, many changes in the organisation of the government and poor implementation of RISS have resulted in a situation that Slovenia now lacks a comprehensive innovation policy, there is nearly non-existent policy coordination and complete lack of any systematic evaluation.

The most elaborate system of support measures for business sector RDI was in place during 2008–2011, also due to the availability of EU structural funds. While there was some overlap in terms of similar support measures implemented by different agencies, the business sector had enjoyed both R&D tax subsidies as well as subsidies from TIA for joint strategic research projects, joint development-investment projects and young researchers from business sector, from PAEFI for technology parks and several voucher schemes and from SEF direct investment grants to start-up enterprises in technology parks and incubators, several types of guarantees, including the guarantee for loans for technological projects, equity finance line for SMEs, co-financing (subsidies) of new technical equipment in SMEs. On top, the MHEST ran a scheme of COs and CCs, where both instruments involved also business sector and Ministry of Economy financed the formation of development centres.

With the end of the financial perspective 2007–2013 and budget cuts practically all of the support measures have ceased to be financed by the government. Only SEF managed to maintain its programme. TIA and PAEFI, merged in SPIRIT, maintain only promotional activities (annual innovation forum) and some support for intermediary institutions.

The frequent changes of the government have resulted in weak innovation policy, where previous support measures are no longer available and new measures are awaiting the next round of structural funds. Due to the delays in the preparation of the OP and still unfinished RIS3 it is difficult to assess how the government plans to support business sector research and innovation, besides the tax subsidy. At various fora ideas that in the next programming period Slovenia will move from subsidies to providing more favourable credit was launched, yet with no specific instruments in place at the moment it is difficult to confirm this trend.

### **4.2 Science-based entrepreneurship**

While in the past, technology parks and other intermediary institutions were able to annually apply for co-financing from ministry, responsible for technology, by 2014 the only available support is for SMEs, operating in the registered technology park/ incubator. Intermediary organisations are thus engaging in various activities for their members (advisory services, presentations to potential investors, including business angels, brokerage events, etc.) to cover their operating costs. This means that in 2014 there was no support scheme for the creation of university spin-offs or funding for technology transfer offices. Some of the technology parks initiated on their own special events to attract (venture) capital and business angels, but the only activity supported by SPIRIT as

the government agency was an Innovation forum (a two day conference/ exhibition) of different projects/ proposals.<sup>69</sup>

SEF is still able to maintain its scheme of supporting start-ups, if they are located within incubator or a technology park. The funding scheme provides them financial support to develop their ideas and purchase required equipment to start with operation.

### **4.3 Knowledge markets**

The Slovenian Intellectual Property Office (SIPO)<sup>70</sup> is an autonomous body within the Ministry of Economic Development and Technology. It is responsible for the field of industrial property and copyright, with main tasks of carrying out of proceedings for the grant of patents and supplementary protection certificates for medicinal and plant protection products, and proceedings for the registration of industrial designs, trademarks, topographies of integrated circuits and geographical indications, with exception of those relating to agricultural products, foodstuffs, wines and other products obtained from grapes or wine, keeping of registers of industrial property rights and the preparation of legal regulations in the field of intellectual property. SIPO provides a range of information services, such as standard information about Slovenian and foreign patents, trademarks and industrial designs, searches in SIPO databases, searches for similar or identical trademarks, CETMOS (Central European TradeMark Observation Service) – *new information service*, expert opinions of foreign patent offices on novelty and inventive step, selective dissemination of information and trademark monitoring, preparation of portfolios of industrial property rights, first information on IP as well as organisation of seminars and trainings.

Basic acts regulating the field of intellectual property are:

- Industrial Property Act,
- Copyright and Related Rights Act,
- Act on Protection of Topographies of Integrated Circuits,
- Employment Related Inventions Act, and several international treaties, which Slovenia is bound with<sup>71</sup>.

The promotion of intellectual property rights seldom enjoyed systematic support. Still, in 2010, Slovenia introduced innovation voucher with the purpose to provide support for patenting costs to high tech small firms. Even though initially the value of individual voucher was not particularly high (between €3,000 and €20,000), the measure was well received. Yet, by 2013 no more voucher support was available.

The issue of intellectual property protection was one of the top problems, experienced by the COs and CCs, due in part also to their specific legal status. The funder expected them to be legal entities on their own, while the participating organisations, be it from public R&D sector or from business sector, wanted to participate in sharing the potential benefits of IPRs. The MHEST assisted some COs to agree on rules with regard to IPRs, similar to EU practice.

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<sup>69</sup> More at <http://www.foruminovacij.si/sfi/program> (3 February 2015). No English version since 2013

<sup>70</sup> More at <http://www.uil-sipo.si/sipo/office/tools/home/> (3 February 2015)

<sup>71</sup> More at <http://www.uil-sipo.si/sipo/office/about-us/basic-acts/> (3 February 2015)

Slovenia has no policy or instruments in place for developing knowledge markets for patents and licencing. That the area is important and needs to be supported had been recognised in RISS, yet it remains to be seen if in operationalising the programmes and measures under the next financial perspective 2014-2020 some new instruments are going to be introduced in this area.

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

In accordance with the RISS 2011–2020, knowledge transfer is defined as one of the strategic missions of PROs. In order to attain this objective, it is necessary to enhance the interaction between the education, science and business sector and accelerate the transfer of the results of scientific research to business via contractual cooperation, the sale and licensing of intellectual property and the establishment of new companies (RIS3, 2014: 17). Several instruments have been put in place in Slovenian R&D system to promote knowledge transfer, including the establishment of special institutional set-up, like centres of excellence and competence centres, where cooperation between public sector research organisations and business sector could flourish. Yet most of them are no longer receiving any financial support from the government.

The evaluation of CO and CC (MESS, 2014) showed that in many instances, both instruments proved a valuable surrounding for knowledge transfer. In their annual reports, both COs as well as CCs report on significant partnerships resulting in joint patents and new codified knowledge (non-technical innovation). In spite of legal difficulties in establishing spin-offs from PROs, it is expected that through cooperation with business sector several innovations which were developed especially in CCs will be introduced commercially.

In RIS3 document several measures are planned to further promote knowledge transfer (RIS3, 2014: 17-18):

- Creation of a uniform national system of technology and knowledge transfer;
- Support to the intellectual property licensing and protection
- Support to development and contractual cooperation
- Promotion of the creation of spin-off companies
- Promotion and education concerning the transfer of knowledge and technologies and the importance of the intellectual property system and its entrepreneurial role.

While no special award system is in place which would promote cooperation between public research sector and business sector, indirectly the level of cooperation can contribute to the individual's standing according to SRA. The monitoring system of individual researchers includes a section where so called socio-economic relevance is being measured: the indicator being the amount of funds generated from non-budget sources (international funds, business sector). Since the position of individual researcher in this system is important for applying for new projects, indirectly the researchers with good track record of cooperation with business sector can benefit significantly.

Open innovation is being discussed at various fora (for example PODIM, annual conference on innovation), but no systematic analysis exists on how much such concept is practiced among Slovenian enterprises. Also, no active measures to support open innovation have so far been introduced.

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

Business environment for SMEs was not particularly friendly in the last years. The access to credit has been much more limited and several government support measures<sup>72</sup> have either ceased or been substantially lowered. What was still available to SMEs, were the programmes of SEF and a new line of the Slovenian export and investment bank SID<sup>73</sup>. SID provides financing of SMEs' investments in research, development and innovation, and provides guarantees for bank credits to SMEs' investments in research, development and innovation. The programme for financing RDI, which is partly supported by the government and thus has elements of state aid, is available to all enterprises, but the level of co-financing varies depending on the size of the firm (30% for large firms to 50% for small firms), the type of research (industrial research receives higher level of co-financing than the experimental projects) and quality of the project proposed. The Bank does not provide data on the number of enterprises who applied for the financial scheme, but according to the press release of SID, by first half of 2014, 23 projects were approved in total value of €108.2 million.

In 2014, no new policy measures have been introduced, even though the Ministry of Economic Development and Technology prepared an extensive programme of measures to support economic growth and create new jobs, which was accepted by the government on April 10<sup>th</sup>.<sup>74</sup> Some of the measures are directly aimed at investments in R&D with the ambition to strengthen the innovation capacities of enterprises in all stages of development of the product: from research to the market. This is seen as a pre-condition to increase value-added, create quality jobs and long-term competitiveness of Slovenian economy (MEDT, 2014). Yet the programme's timeframe was not respected even at the start: some of the instruments ought to be introduced in 2014 already, which was not the case. In fact, the revision of the budget for 2014 cut further the support to business RDI: if in 2013 the support to RDI programmes was €108.4 million, the revised 2014 figure is €66.2 million with even further decrease in 2015, when only €23 million are planned. This suggests that support for innovation is diminishing at the MEDT and the Programme is not considered as binding even by the Ministry which had prepared it.

In addition, most of other legislation, like insolvency regulations, is often criticised by various for as business unfriendly (GEM Report 2014). There is practically no room for the entrepreneur to re-establish his business after a failure, since banks have become increasingly restrictive in financing even sound small business.

In the past, SRA financed a specific programme, called targeted research projects. Other (non-science) ministries often used this programme to finance various evaluations of

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<sup>72</sup> Like support for technology/knowledge platforms, clusters, different voucher system supports etc.

<sup>73</sup> More at: <http://www.sid.si/financing/financial-services-for-development-research-technology-education-employment> (3 January 2015)

<sup>74</sup> More at: [http://www.mgrt.gov.si/si/medijsko\\_sredisce/novica/article/2159/9790/90ab2b8143850653da2f8a0825779951/](http://www.mgrt.gov.si/si/medijsko_sredisce/novica/article/2159/9790/90ab2b8143850653da2f8a0825779951/) (22 February 2015)

measures and policies. Since 2012 there had been no calls under this programme and since then, only sporadically the government finances evaluations of measures, and none in the area of innovation.

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

Venture capital market is gradually developing in Slovenia. Since 2010, SEF provides support to private venture capital firms by special instrument of equity financing. The instrument is implemented through a public tender, inviting private venture capital companies, which comply with terms and criteria of the tender, where such companies will acquire the stake of the Republic of Slovenia equalling up to 49% of their total capital or a minimum of €1 million, respectively. These selected venture capital companies are then able to invest the acquired funds, together with funds provided by private investors, as venture and mezzanine capital in promising, innovative and fast-growing SMEs. SEF decided to have an open public tender as long as the funds allocated to a particular year are available.<sup>75</sup>

One of the first venture capital firms in Slovenia was RSG Capital, which was founded in 2006 by the Chamber of Commerce and Industry of Slovenia, which provided the initial €3.5 million needed to start operations and make the first investment. Today several more private venture capital firms operate in Slovenia: some with foreign capital and some also on foreign markets.

Several Slovenian start-ups have in recent period been successful in raising starting capital at Kickstarter. Also, technology parks in Ljubljana and Maribor organise various events where young potential entrepreneurs are able to present their business ideas to potential investors.

On the other hand, the government does not provide any more favourable treatment of VC and/or business angels and so far SEF instrument (indirectly financed by the government) is the only one in this area.

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

The current public procurement policy in Slovenia is subject to a lot of discussion and criticism, but not from the point of view of innovative procurement of goods and services. In the past, there were several initiatives from MESS to adjust the procurement policy to stimulate innovation, but the prime concern of the Ministry of finance was given to transparency of the process and other legal stipulations. So, further discussion on the possible innovative procurement schemes exists only within expert circles.

At the moment, Slovenia is not using innovative public procurement and therefore does not apply qualitative criteria which would favour innovative solutions when awarding contracts. Even a debate on introduction of such schemes had ceased over the last years.

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<sup>75</sup> The call is opened until August 2015. More at <http://www.podjetniskisklad.si/home.html> (3 January 2015)

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

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

On average in 2012, Slovenia produced 25.35 publications per 10,000 inhabitants, well above the EU-28 average of 13.8. Almost half (43.24%) of these are internationally co-published. In 2012, Slovenia had about 1096.1 international scientific co-publications per million population ranking 10th out of the EU28. In the period 2002-2012, 8.43% of the Slovenian scientific publications were in the top 10% most cited publications worldwide in comparison which is only slightly lower than the EU-28 figure of 11.2% (Science Metrix, 2014)<sup>76</sup>. The share of public-private co-publications in Slovenia was 1.2% in the period 2008-2013 against 2.8% for the EU-28<sup>77</sup>.

The statistical data does not reflect fully the current performance of the research and innovation system, since the data is still based on the period of extensive support to RDI. According to the statistics, especially in the enablers indicators Slovenia is either above or close to EU average. Outstanding are the figures on scientific co-publications per million population and R&D expenditures of business sector as percentage of GDP. Less favourable are output indicators (see below Table 4), and even more so those gathered by the Innovation Union Scoreboard, where Slovenia is grouped among innovation followers (IUS, 2014). While classified in this group, the Scoreboard also notices that Slovenia is among the weakest members of this group in terms of more recent performance. The gap between Slovenian performance and EU average is not closing or closing very slowly in categories like *knowledge intensive services export, sales share of new innovations, license and patents revenues from abroad*, as well as in all three indicators of “innovators” category: *SMEs with product/process innovation; SMEs with marketing/ organisational innovation and fast growing innovative firms* (IUS, 2014: 66).

The Scoreboard findings have not changed over the years in spite of increased investment in RDT, which opens a legitimate question of effectiveness of investment in Slovenian NIS.

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<sup>76</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>77</sup> Scival 2014, Scopus based publication indicators derived from Elsevier's SciVal platform, [www.scival.com](http://www.scival.com) last accessed December 2014



**Table 4: Assessment of the Performance of the National Research and Innovation System**

<b>1. ENABLERS</b>	Year	SI	EU
<b>Human resources</b>			
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	2011	1.70	1.70
Percentage population aged 30-34 having completed tertiary education	2012	39.20	35.80
<b>Open, excellent and attractive research systems</b>			
International scientific co-publications per million population	2012	1,041.60	343.15
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	2009	7.03	10.95
<b>Finance and support</b>			
R&D expenditure in the public sector as % of GDP	2012	0.63	0.75
Venture capital (early stage, expansion and replacement) as % of GDP	2012	N/A	0.08
<b>2. FIRM ACTIVITIES</b>			
R&D expenditure in the business sector as % of GDP	2012	2.16	1.31
<b>Linkages and entrepreneurship</b>			
Public-private co-publications per million population	2011	85.42	52.84
<b>Intellectual assets</b>			
PCT patent applications per billion GDP (in PPSE€)	2010	3.05	3.92
PCT patent applications in societal challenges per billion GDP (in PPSE€) (climate change mitigation; health)	2010	0.94	0.85
<b>3. OUTPUTS</b>			
<b>Economic effects</b>			
Contribution of medium and high-tech product exports to trade balance	2012	6.54	1.27
Knowledge-intensive services exports as % total service exports	2011	21.36	45.26
License and patent revenues from abroad as % of GDP	2012	0.19	0.59

Source: European Commission, IUS Database (2014).

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

Already the 2011 ERAWATCH Report (Bučar, 2012) identified as one of the potentially important challenges facing the national RDI system the issue of **sustainability of the level of R&D financing**, especially from the public resources. This has proved to be correctly identified challenge even if at the time the government approved of the RISS with planned increased level of expenditures to 3.6% of GDP for RDI. Looking at the revised budget of 2014 and the plan for 2015, the government decided on further cuts in the RDI area, both for the financing of public research sector as for the support measures for business RDI. Even though preliminary data for RDI investment by business sector in 2013 still reflects an increase, the rate of growth of investment has slowed down from previous years. We also need to take into account that 2013 was the last year of the financing of Cos and CC – two major instruments, receiving substantial support from ERDF during the financial perspective 2007–2013. With slow progress in the preparation of RIS3 it is unlikely that 2015 will bring any new financing through instruments potentially developed for the structural funds of the financial perspective 2014–2020.

This leads us to the next challenge, identified in the past reports as well as by European Commission (see point 2.3 of this Report). The insufficient coordination and streamlining of the RDI and innovation policy including governance structure and organisational set-up of the support infrastructure remains one of the major challenges. Partly due to the separation of the science and technology, each being the responsibility of a different ministry, but also due to the consequent staff changes in MEDT, the lack of coordination seems to remain unresolved issue. The absence of the representatives of the Ministry of Economic Development and Technology from various events and meetings, noticed already in the second half of 2013 continued. There are no indications that coordination has in any way improved with the 2014 government.<sup>78</sup>

What is a question for special analysis is the weak link so far between investments in RDI and the overall performance of the business sector. The insufficient effectiveness of investing in RDI in the case of Slovenia was identified in IMAD's Development Report (2014). While theory acknowledges certain time lag between investing in new knowledge and technology and turning this into economic growth, it seems that Slovenian business sector is rather segmented in terms of investing in RDI with still several segments of industry not sufficiently active in innovation to make major contribution to value added and to the competitiveness of the country. PROs and HEIs are adjusting to lower financing by cutting the investments in research infrastructure and to certain extent also in labour force, but if the financial crunch continues in the future, more drastic cuts will be needed. This may have negative effect on research output and add to the brain drain already on the increase. The research teams with modern research infrastructure in public sector are more attractive to business sector<sup>79</sup>, but with outdated equipment and reduced manpower researchers in public sector risk that their capacities will lag further behind research

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<sup>78</sup> They officially withdrew from the expert group claiming that the prepared draft insufficiently addresses the innovation component. Since the expert group had the mandate till end of June 2014 when it was also already known that Slovenia will have parliamentary elections and probable change in the government.

<sup>79</sup> This was amply demonstrated in business sector cooperation in COs, where ability to access top research equipment was seen as a major advantage for business sector to join the COs. (Bučar et al., 2014).

frontier and loose competitiveness both in international research cooperation as well as partners in research projects with business sector.

**Table 5: Structural challenges of the national R&I system**

<b>Challenge</b>	<b>Policy measures/actions addressing the challenge</b>	<b>Assessment in terms of appropriateness, efficiency and effectiveness</b>
Sustainability of the level of R&D financing, especially from the public resources	Continued decrease of public resources for RTI; Lack of vision and understanding of RTI on part of political parties	If present trends continue, many of the positive elements of NIS may be lost
Insufficient coordination and streamlining of the RDI and innovation policy including governance structure and organisational set-up of the support infrastructure	No policy measure observed	
Links between RDI investment and economic growth	Analytical work of some groups (IMAD) explaining time lag and innovation capacity, but no specific measure detected	

### **5.3 Meeting structural challenges**

Identified structural challenges are interlinked and only strengthen each other. This is why the policy to deal with either one of them needs to consider all them on equal footing. The frequent changes in the government have negative impact on meeting any challenge, and even more so in the cases of rather complex challenges Slovenia is facing. If at the time of preparation of RISS the overall opinion of the policy-makers was very favourable of RDI and potential contribution of innovation to economic development and growth of competitiveness, the absence of more explicit policy by the end of 2014 both at MESS and at MEDT suggests that research is increasingly considered as an unnecessary expense and not as investment in the future. The correctness of this assessment will be proved or negated within the first few months of 2015 when further work on RIS3 will show what kind of instruments and at which level of financing the government plans to propose. Very low figures planned for RDI in budget 2015 however do not justify any optimism.

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## Annex 2 - Abbreviations

BERD	Business Expenditures on R&D
CC	Competence Centres
CESSDA	Council of European Social Science Data Archives
CERIC	Central European Research Infrastructure Consortium
CERN	European Organization for Nuclear Research
CMEPIUS	Center Republike Slovenije za mobilnost in evropske programe izobraževanja in usposabljanja (Centre of RS for Mobility and European Educational and training Programmes)
CO	Centre of Excellence
COBISS	Cooperative On-line Bibliographic System & Services
COST	European Cooperation in Science and Technology
DARIAH	Digital Research Infrastructure for the Arts and Humanities
ERA	European Research Area
ERA-NET	EU scheme for networking of research activities conducted at national or regional level
ERAC	European Research Area and Innovation Committee
ESF	European Social Fund
ESFRI	European Strategy Forum on Research Infrastructures
EU	European Union
EUREKA	Intergovernmental organisation for market-driven industrial R&D
FAIR	Facility for Antiproton and Ion Research
FP	Framework Programme
FTE	Full time equivalent
GBAORD	Government Budget Appropriations or Outlays for R&D
GDP	Gross Domestic Product
ERD	Gross Expenditures on R&D
HEIs	Higher Education (Institutions)
HORIZON2020	EU R&D programme for 2014-2020
IMAD	Institute for Macroeconomic Analysis and Development
ISCED	International standard classification of education
IZUM	Institute of Information Sciences
MEDT	Ministry of Economic Development and Technology
MESCS	Ministry of Education, Science, Culture and Sport
MHEST	Ministry of Higher Education, Science and Technology (until 2012)
NIS	National Innovation System
NPHE	National Programme of Higher Education
OP	Operational Programme
PAEFI	Public Agency for Entrepreneurship and Foreign Investments
PCT	Patent Cooperation Treaty
PROs	Public Research Organisation(s)

RDI	Research, Development and Innovation
RGP	Research Group Programme
RI	Research Infrastructure
RISS	Research and Innovation Strategy of Slovenia
RIS3	Smart Specialisation Strategy
SEF	Slovenian Enterprise Fund
SHARE	Survey of Health, Ageing and Retirement in Europe
SICRIS	Information System on Research Activity in Slovenia
S&T	Science and Technology
SRA	Slovenian Research Agency
SDS	Slovenian Development Strategy
SORS	Statistical Office of the Republic of Slovenia
SMEs	Small and Medium-sized Enterprises
SPIRIT	Public Agency of the Republic of Slovenia for the Promotion of Entrepreneurship, Innovation, Development, Investment and Tourism
SSDA	Social Science Data Archives
SSH	Social Sciences and Humanities
TIA	Technological Agency of Slovenia

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European Commission

**EUR 27297 EN– Joint Research Centre – Institute for Prospective Technological Studies**

Title: RIO Country Report Slovenia 2014

Authors: Boštjan Udovič & Maja Bučar

Luxembourg: Publications Office of the European Union

2015– 53 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1831-9424 (online)

ISBN 978-92-79-48953-2 (PDF)

doi:10.2791/453214



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doi:10.2791/453214

ISBN 978-92-79-48953-2

