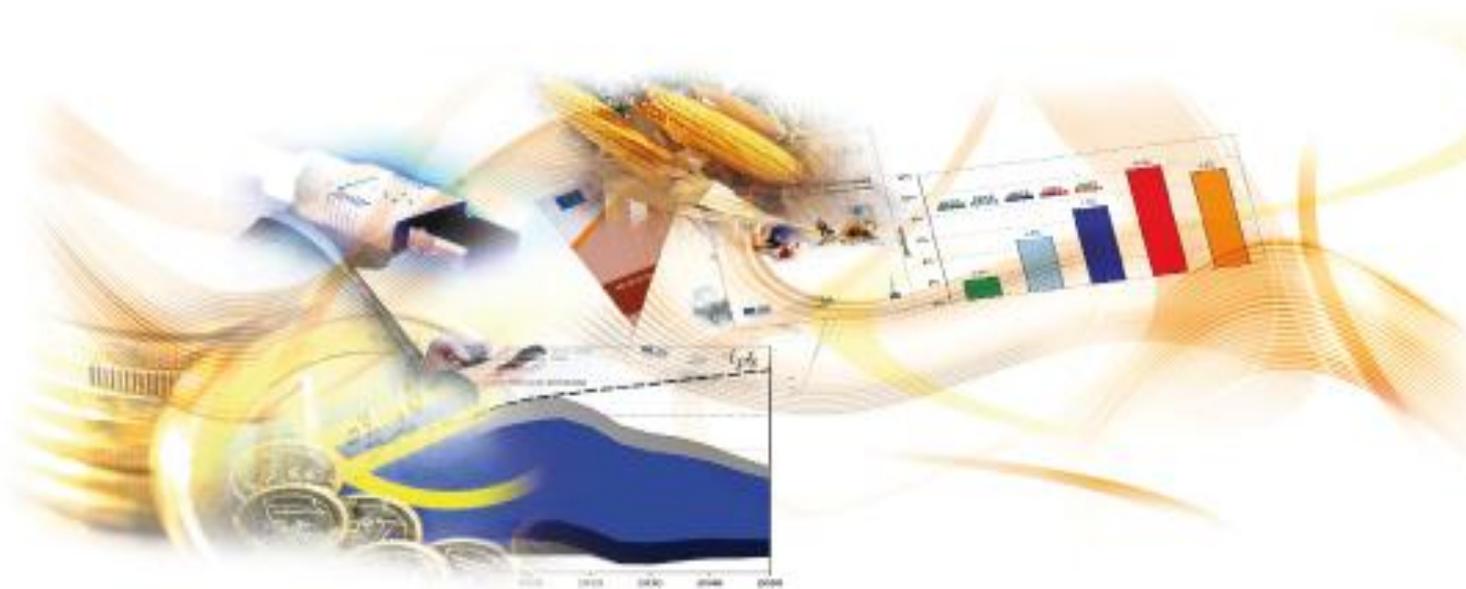


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Boštjan Udovič and Maja Bučar

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Contact information

Address: Edificio Expo. c/ Inca Garcilaso, 3. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300

<http://ipts.jrc.ec.europa.eu>
<http://www.jrc.ec.europa.eu>

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The Country Report 2012 builds on and updates the 2011 edition. The report identifies the structural challenges of the national research and innovation system and assesses the match between the national priorities and the structural challenges, highlighting the latest developments, their dynamics and impact in the overall national context.

The first draft of this report was produced in December 2012 and was focused on developments taking place in the previous twelve months. In particular, it has benefitted from the comments and suggestions of Ales Gnamus from JRC-IPTS. The contributions and comments from DG-RTD are also gratefully acknowledged.

The report is currently only published in electronic format and is available on the [ERAWATCH website](#). Comments on this report are welcome and should be addressed to jrc-ipts-erawatch-helpdesk@ec.europa.eu.

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EXECUTIVE SUMMARY

The level of research and development (R&D) investment in Slovenia has been continuously increasing from 2008 on: from 1.65 % of GDP in 2008 (SORS, 2010) to 1.86 % of GDP or € 656.9 million in 2009, to 2.11 % of GDP or € 745.9 million in 2010 (SORS, 2011). Further increase has been estimated in 2011, yet due to the changed methodology¹ this figure is not fully compatible with the earlier years. The preliminary figure for 2011 shows R&D investment at the level of 2.47 % of GDP.

This trend has come to a sudden stop in 2012. Especially for GBAORD, preliminary figures show a significant drop. If 2011 figure was € 211 million, the planned budget for 2012 already was agreed on (only) € 203 million, to be further scaled down in the budget re-adjustment to € 177 million (internal data of the Ministry of Education, Science, Culture and Sports–MESCS, 2012). This decrease had serious repercussions for the public research organisations, which depend to a large extent on public funding. It is difficult to predict what is happening with business investments in R&D and innovation, yet in view of the decreased economic activity and significant drop in overall investment, there is little room for optimism.

With the new government in the beginning of the 2012, the organisational structure for R&D and innovation has changed. The technology segment of the previous joint Directorate for Science and Technology at the Ministry of Higher Education, Science and Technology, had moved to the Ministry of Economic Development and Technology (MEDT).² Former Ministry of Higher Education, Science and Technology was expanded by entire education sector, culture and sports to become Ministry of Education, Science, Culture and Sports (MESCS).³ Within the ministry, a new Directorate was established, merging higher education and science.

The limitations in the budget have led to a certain change as well in the policy measures. A number of support measures available via Slovenian Research Agency – SRA, Public Agency for Entrepreneurship and Foreign Investment – PAEFI and Technology Agency – TIA were not announced in 2012 due to the lack of resources. On the other hand, the mode of funding changed, especially for the measures supporting business R&D and innovation projects. The government increased significantly the R&D tax subsidy, which for 2012 is 100 % (Official Gazette 30/2012). Also, the credits for R&D investment by business companies to be disbursed via the Slovene Export and Development Bank have been expanded. The amount available till end of 2013 is € 150 million. The Slovenian Enterprise Fund still offers credit guarantees, while other lines of credits or subsidies have ceased in 2012.

However, the MEDT announced two calls during the summer months: one for the investments in new technical equipment in enterprises and the second one, which is a continuation of the 2011 measure, supporting the development of R&D units in enterprises⁴ (co-financed from

¹ See detailed explanation of changed methodology on page 6.

² See details on:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/si/organisation/organisation_0012?avan_type=organisation&matchesPerPage=5&orden=LastUpdate&searchType=advanced&intergov=all&tab=template&index=Erawatch+Online+EN&sort=&avan_other_prios=false&searchPage=3&subtab=&reverse=true&displayPages=10&query=&country=si&action=search.

³ See details on:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/si/organisation/organisation_0011?avan_type=organisation&matchesPerPage=5&orden=LastUpdate&searchType=advanced&intergov=all&tab=template&index=Erawatch+Online+EN&sort=&avan_other_prios=false&searchPage=2&subtab=&reverse=true&displayPages=10&query=&country=si&action=search.

⁴ See details on:

European Social Fund; *Call for strengthening of development units in business enterprises (KROP)*). The funds at MEDT for support measures in 2013 and 2014 are planned in amount of € 11 million annually. The MESCS issued in September 2012 two calls: the support for the *Formation of Creative Nucleus* (€ 4 million) and the *Research Voucher Scheme* (€ 8 million), both to be co-financed with European Structural Funds.

One of the currently most important challenges facing the national R&D system is the issue of ***sustainability of the level of R&D financing***, both from the public resources as well as from the business sector. The lack of public funds is problematic also due to practically ***non-existent policy debate*** at the level of the government as well as among all stakeholders, where important decisions need to be made in view of the new strategic documents (Slovenian Development Strategy, Slovenian Industrial Policy, Smart Specialisation Strategy etc.) This brings a new and much more dramatic challenge for Slovenian R&D system of reviving the ***interest in R&D and innovation*** and convince the major government players that the exit strategy without investing in new knowledge and technology is a short-sighted and very likely un-sustainable. The issue of poor ***coordination and streamlining of the R&D and innovation policy***, including governance structure and organisational set-up of the support infrastructure was identified by the national as well as international evaluations of the Slovenian NIS as the major challenge already in earlier periods. Recent changes in organisational structure put additional pressure on this challenge. Timely measures to overcome the coordination challenge may be detrimental at the stage where Slovenia will have to decide on the ***strategic and funding priorities for R&D and innovation*** in the next financial perspective.

The challenges are reflected also in the assessment of the policy mix. With the Research and Innovation Strategy of Slovenia (RISS), basic elements of policy mix had been identified and some already implemented through specific measures (for example the logic of creation of Centres of Excellence, Centres of Competence and Development Centres to cover all stages of knowledge creation and transfer in practice). The unclear situation as to the implementation of RISS or its renovation opens the issue of assessment of policy mix widely, since it is difficult to identify which are the specific policies to be assessed.

The participation in EU research programmes remains a high priority, but this field also has not escaped financial cuts. Several of the measures supporting internationalisation have received less financial support.

To conclude, Slovenian R&D and innovation system is faced with a challenge of lower financial resources, combined with a lack of clear policy focus. The later makes constructive adjustment even more critical, with increased risk of negative consequences for all its stakeholders. In view of the most recent change in the government (March 2013) Slovenia is bound to undergo further changes in policy. It is too early to say what the focus will be, but it is encouraging that in the new coalition agreement, RISS is specifically mentioned as the central policy document.

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1 INTRODUCTION

Slovenia is among the smaller EU member countries with its 2 million inhabitants and GDP in current prices amounting to € 36,172 million or € 17,620 *per capita* in 2011 (SORS, 2012). The level of research and development (R&D) investment in Slovenia has been continuously increasing from 2008 on: from 1.65 % of GDP in 2008 (SORS, 2010) to 1.86 % of GDP or € 656.9 million in 2009, to 2.11 % of GDP or € 745.9 million in 2010 (SORS, 2011). Further increase has been estimated in 2011, yet due to the changed methodology⁵ this figure is not fully compatible with the earlier years. The figure for 2011 shows R&D investment at the level of 2.47 % of GDP.

The increased allocation of resources through all these years had been remarkable in the light of severe economic crisis faced by the country. The 8 % decline of GDP in 2009, followed by a slow recovery in 2010 and 2011 (the GDP growth was 1.4 % in 2010, while for 2011 only 0.4 %), seemed to have limited impact on R&D investment, since the business sector as well as government sector managed to maintain the upward trend of R&D investments, with increased importance of the sources from abroad. The growth was impressive in nominal numbers. Comparing to the year 2007, when GERD amounted up to € 500.5 million, in 2009 the expenditures for R&D were at the level of € 656.9 million. This trend has been continuing also in 2010 (with an increase for 13 % comparing to the nominal level of 2009, i.e. € 745.9 million) and in 2011, when GERD amounted to € 894.2 million (SORS, 2013).⁶

Looking at the figures in 2011, one could hardly predict the trends occurring in 2012, when Slovenia found itself in serious budgetary constraints. It seems that the full impact of the unresolved economic crisis is reflected in the events of 2012. The reduction in GBAORD was already planned in the proposed budget for 2012 and went even further downwards in the re-adjusted budget.

Preliminary figures show a significant drop in GBAORD: if 2011 figure was € 211 million, the planned budget for 2012 already was agreed on € 203 million, to be further scaled down in the budget re-adjustment to € 177 million (internal data of the MESCS, 2012). This decrease had serious repercussions for the public research organisations, which depend to a large extent on public funding. It is difficult to predict what is happening with business investments in R&D and innovation, yet in view of the decreased economic activity and significant drop in overall investment, there is little room for optimism there.

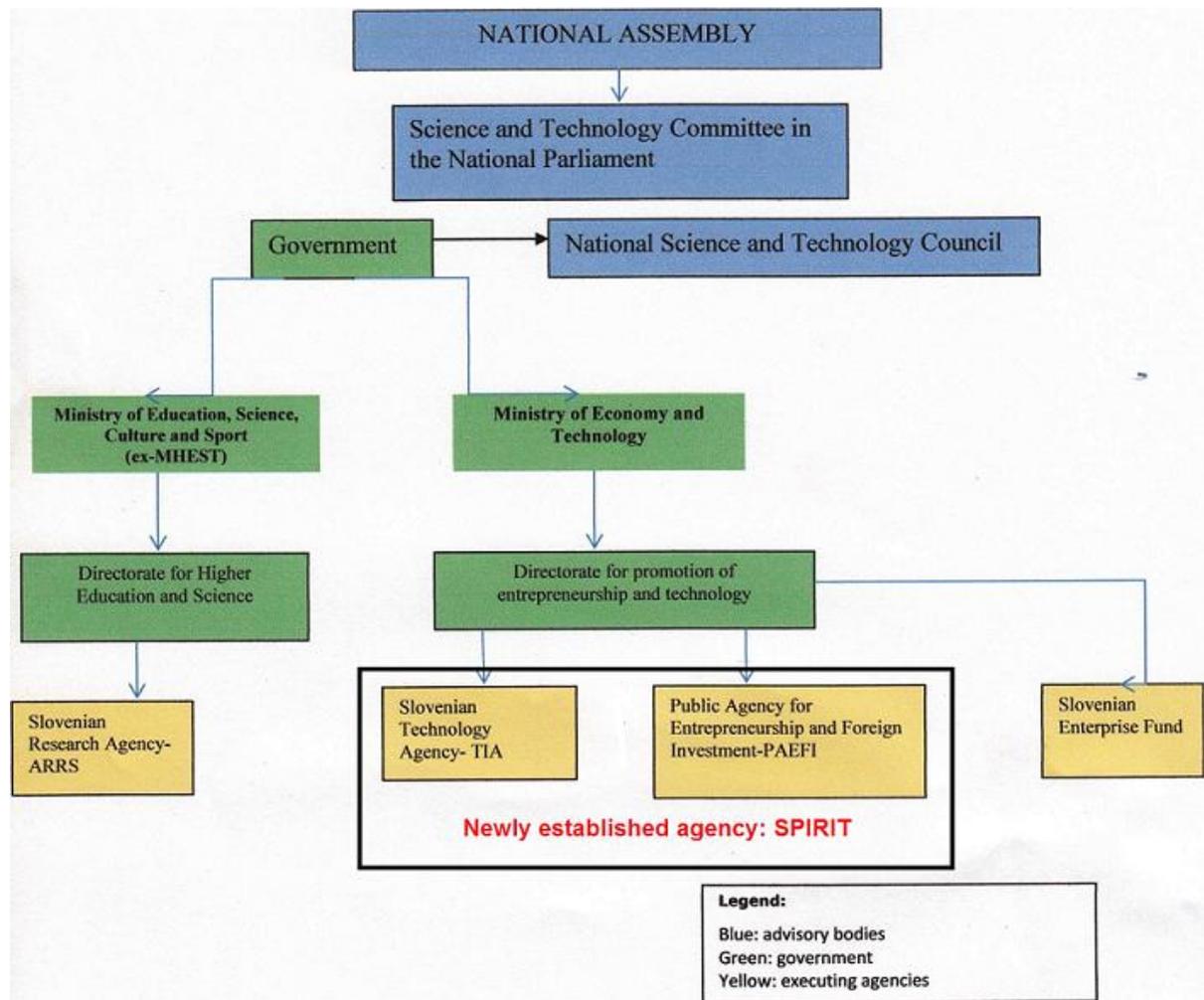
The past National Research and Development Programme 2006–2010 focused on increasing the scientific quality of Slovenian science through the evaluation criteria of Slovenian Research Agency (SRA) applied for competitive financing. Furthermore, the promotion criteria and the universities stressed the publication activity of professors which resulted in significant increase of publication activity. In 2008 Slovenia had all together 3,701 scientific publications according to Science Metrix/Scopus (Elsevier). Yet in 2007 only 284 or 7.7 % of all scientific publications

⁵ The survey on R&D activities in the reference year 2011 was based on new administrative sources (tax subsidy claims, state aid for R&D, database of Technology agency etc.), which enabled further identification of R&D companies/organisations 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 time, with the reference year 2011 the analysis of non-response had been improved, which also helped increase the value of all published statistics in all sectors.

⁶ The index 2010/2007 was 149, while the index 2011/2007 was 179 (SORS, 2012).

were among the 10 % of most cited publications in the world (IU, 2012). This suggests that Slovenia reaches 71 % attention of all the publications of the EU member states (100 %). The figures reflect what has been often pointed out in the national debates: researchers need to publish due to the promotion criteria, but the funding as well as the pressures to produce negatively affects the quality.

Organisational structure of the R&D and innovation system (end 2012):



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 share of researchers in total employment in Slovenia is 0.71 %, with EU27 average at 0.68 %.

Table 1: Total R&D personnel, employed for indefinite and definite period, and external collaborators, by sector of employment, occupation and sex in FTE, Slovenia, 2011

	Sector of employment									
	Total		Business sector		Government sector		Higher education sector		Private non-profit sector	
	total	women	total	women	total	women	total	women	total	women
Occupation - Total	15,269	5,396	9,622	2,624	2,628	1,322	3,003	1,441	16	9
Researchers	8,774	3,094	4,510	1,162	1,817	854	2,431	1,069	16	9
Technicians	5,045	1,631	4,079	1,087	525	277	441	267	-	-
Other personnel	1,452	671	1,034	374	285	191	133	106	-	-

- no occurrence of event

1) Because of rounding, the totals do not always add up.

Source: SORS (2012).

2 Recent developments of the research and innovation policy and system

2.1 National economic and political context

With the government elected in the beginning of the 2012, the organisational structure for R&D and innovation has changed (see above). The technology segment of the previous joint Directorate for Science and Technology at the Ministry of Higher Education, Science and Technology, had moved to the MEDT⁷. The former Ministry of Higher Education, Science and Technology was expanded by entire education sector, culture and sports to become MESCS.⁸ Within the ministry, a new Directorate was established, merging higher education and science.

The new government announced several policy changes in both strategic documents, accepted by the government and the Parliament in 2011: the Resolution of the Research and Innovation Strategy of Slovenia (RISS) and the National Programme for Higher Education (NPHE). The changes would also require the changes in the Law on Research and Development. The Law on Higher Education was in some parts amended during the summer 2012,⁹ while the R&D legislation as well as RISS so far remain unchanged.

In the RISS, Slovenia committed to the increase of public resources for R&D of 1 % by 2012 and 1.5 % by 2020. 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). None of the two receive special attention of the new government: the national investment in research infrastructure has been stopped¹⁰ and higher education sector suffered a significant budget cut in 2012.

After internal political crisis the government of Janez Jansa was forced to resign in the end of February 2013. By March 20th Slovenia got a new government, led by centre-left coalition. The coalition agreement addresses R&D very briefly, by re-instating the commitment to RISS.

⁷ See details on:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/si/organisation/organisation_0012?avan_type=organisation&matchesPerPage=5&orden=LastUpdate&searchType=advanced&intergov=all&tab=template&index=Erawatch+Online+EN&sort=&avan_other_prios=false&searchPage=3&subtab=&reverse=true&displayPages=10&query=&country=si&action=search.

⁸ See details on:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/si/organisation/organisation_0011?avan_type=organisation&matchesPerPage=5&orden=LastUpdate&searchType=advanced&intergov=all&tab=template&index=Erawatch+Online+EN&sort=&avan_other_prios=false&searchPage=2&subtab=&reverse=true&displayPages=10&query=&country=si&action=search.

⁹ None in relation to R&D or innovation, mostly concerning the financing of higher education and the Slovenian Higher Education Accreditation Agency (NAKVIS).

¹⁰ Slovenia however tries to maintain its cooperation within ESFRI, and has kept up investment in FAIR, more problems seem to emerge with ESA, where with the move of technology and innovation department under the MEDT also the membership fees now have to be met by MEDT, where the interest in cooperation is lower. Also, certain delay is being accounted for in signing for membership in some other infrastructure research projects, like SHARE and ESS, where government decision on joining the renewed networks is pending.

2.2 Funding trends

If in 2010 the share of R&D expenditure in GDP surpassed the “ceiling” of 2 % by reaching the level of 2.11 % of GDP and in 2011 amounted to 2.47 %, according to the preliminary figures,¹¹ the trends for 2012–2014 look less optimistic. GBAORD has been already decreasing from year to year from 2010 on. In 2009 it amounted to € 245 million (0.78 % of national GDP), in 2010 it decreased to € 217 million (0.62 % of national GDP), while in 2011 it stopped at the level of € 200.7 million (0.55 % of national GDP).¹² The GBAORD for 2012 was planned initially at 203 million €, but was revised significantly to € 177 million (MESCS Internal data, 2012).

The result is that a number of public research organisations as well as public higher education institutions (HEIs) have serious financing difficulties, and are calling for revision of funding position in the 2013 budget. Simultaneously with decrease of funding provided to the HEIs, the allocation of resources was also decreased for Slovenian Research Agency (SRA), which is a key funding agency in the field of R&D. The cuts in the SRA’s budget resulted in several actions. First, the announcement of the results of the Applied and Basic projects call (issued in December 2011) has been postponed until the adoption of budget 2013.¹³ The SRA had to cut several of its regular financing schemes: research programmes received lower financing, most of the support to international activities of the researchers ceased and no new calls for Applied and Basic projects as well as Targeted research programmes had been implemented in 2012.

There is an on-going debate in Slovenia regarding the budget cuts for R&D in 2013, where the amount of € 147.7 million is planned. However, the most drastic cut was prevented partly by the protests of HEIs and public research organisations (PROs); the parliament approved additional € 16 million for HEIs, and the same amount for research in 2014, but the outcome is still not clear as to which area the retained funds will be going: HEIs or PROs. Each sector claims the urgency of additional funding: HEIs due to the need to fully implement Bologna reforms and PROs to be able to engage at least some of the Young Researchers who will complete the programme in 2013 and thus prevent brain-drain. The MESCS has so far avoided open statement on how the allocation will be made, except that they see this as a discretionary right of the Minister and that the prevention of brain-drain and financing of nationally important higher education programmes will be given the priority.¹⁴ With the change in the Ministry in March 2013 this question is likely to be re-opened.

¹¹ See footnote 5.

¹² According to the internal data of MESCS, the 2011 budget was not more than € 187 million.

¹³ The evaluation results were announced on Dec. 31st, 2012, and expected funding announced for October 2013.

¹⁴ See: the letter of the Minister to Rectors of the universities, Dec. 26th, 2012 http://www.mizks.gov.si/nc/si/medijsko_sredisce/novica/article/12058/7869/

Table 2: Selected R&D indicators for 2009-2012

	2009	2010	2011	2012 estimate*	2020 national target	EU average
GDP growth rate	-8.0	1.4	0.6			1.5
GERD as % of GDP	1.86	2.11	2.47		3.6%	2.03
GERD per capita	323	364	436			510.5
GBAORD (€ million)	245	217.9	239.22			92,308
GBAORD as % of GDP	0.69	0.61	0.66		1.2%	0.73
BERD (€ million)	381	435	547.5			132,956 (2010)
BERD as % of GDP	1.08	1.23	1.51		2.4%	1.08 (2010)
GERD financed by abroad as % of total GERD	6.0	6.0	7			8.9 (2010)
R&D performed by HEIs (% of GERD)	14.6	13.9	11.8			24
R&D performed by PROs (% of GERD)	20.8	18.2	14.3			12.7
R&D performed by Business Enterprise sector	64.6	67.8	73.9			62.3
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	1.1	1.3	1.5			1.5
Percentage population aged 30-34 having completed tertiary education (Eurostat)	22.6	31.6	34.8			33.6
International scientific co-publications per million population	n.a.*	750	827			301
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	n.a.*	7	7.62			10.73
PCT patents applications per billion GDP (in PPS€)	n.a.*	2.56	2.97			3.78
PCT patents applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health)	n.a.*	0.65	0.63			0.64
Public-private co-publications per million population	42.6	51	51			36.2
Medium and high-tech product exports as % total product exports	56.5	58.45	56.84			48.23
Knowledge-intensive services exports as % total service exports	21.2	27.23	27.11			48.13
License and patent revenues from abroad as % of GDP	n.a.*	0.08	0.08			0.51

*No data for 2012 is available yet, not even estimates.

2.3 New policy measures

The limitations in the budget have led to a certain change as well in the policy measures. A number of support measures available via SRA, PAEFI and TIA were not announced in 2012 due to the lack of resources. On the other hand, the mode of funding changed, especially for the measures supporting business R&D and innovation projects. The government increased significantly the R&D tax subsidy, which for 2012 is 100% (Official Gazette 30/2012). Also, the credits for R&D investment by business companies to be disbursed via the Slovene Export and Development Bank have been expanded. The amount available till end of 2013 is € 150 million. The Slovenian Enterprise Fund (SEF) still offers credit guarantees, while other lines of credits or subsidies have ceased in 2012.

However, MEDT announced two calls during the summer months: one for the investments in new technical equipment in enterprises and the second one, which is a continuation of the 2011 measure, supporting the development of R&D units in enterprises¹⁵ (co-financed from European Social Fund; *Call for strengthening of development units in business enterprises (KROP)*). This measure replaced in 2011 the three measures that were active in the past (Young Researchers from business sector, Interdisciplinary teams in the business sector, Mobility grants for researchers from public sector to enter business enterprises). The funds for 2013 and 2014 are planned in amount of € 11 million.

MESCS issued in September 2012 two calls: the support for the *Formation of Creative Nucleus* (€ 4 million) and the *Research Voucher Scheme* (€ 8 million), both to be co-financed with European Structural Funds. Under the first measure, the financing of the establishment or *creative nucleus*, supporting polycentric regional development of R&D and education centres, which will serve the regional economy, is planned. Existing research or higher education institutions, public as well as private, in less developed parts of Slovenia are eligible for the government 100 % financing of their expansion (human resources, research equipment, infrastructure etc.). The call corresponds with the government plan to decentralise R&D and higher education, claiming that the current concentration in the central region (Ljubljana) is not contributing to the regional development sufficiently. It is expected that the results of the call will be published in January 2013.

The second measure introduces research voucher, which helps enterprises to commission research at R&D institutes and/or higher education organisations (be it private or public) for the period of three years. With the research voucher of € 30,000 to € 100,000 the enterprise will be able to co-finance industrial research needed for its business in any area (new products, new processes or new services). The call was designed on first come, first serve basis: the applications were to be submitted from October 22nd, 2012, and the projects were to be approved until the allocated resources were available. The co-financing depends on the size of the enterprise: micro and small firms may receive up to 70 % co-financing, medium-sized firms 60 % and large ones 50 %. The call attracted numerous applications, since there were practically no subsidies for R&D available for business sector in 2012. Within four days the MESCS already received more than 300 applications. The results were published on January 9th, 2013; 186 applications were approved to receive co-financing. The Ministry received on the first day (October 22nd, 2012) 285 applications out of which 274 were eligible for co-financing. Following the principle first come-first served, 186 applications were approved until the resources were available. All of the applications received after the first day of opening of the call have been returned to the firms.

¹⁵ See details on:

http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/si/supportmeasure/support_0025?tab=template&avan_type=support&country=si.

Since the exact break-down of the 2013 budget allocation is not known yet, it is difficult to predict which of the support measures will be implemented this year. In view of lack of open policy discussion, it is also impossible to predict the direction of the possible new measures.

2.4 Recent policy documents

The single document available to date on the planned changes in the R&D and innovation area is the *Coalition agreement*, named Agreement for Slovenia¹⁶ (referred in text as Agreement, 2012) that was signed by the political parties, who since February 2012 formed the government. Following targets were set and the activities planned:¹⁷

- increased R&D tax subsidy for the enterprises;
- systematic assistance to the creative industries (design, brands, service innovation) through institutional support similar to that put in place for technical innovations and knowledge;
- the promotion of entrepreneurship and innovation in educational processes;
- improvement of the quality of Slovenian science on the global scale by consistently implementing internationally comparable standards, promoting excellence and introducing incentive financing (Agreement, 2012: 32);
- link and strengthen the integration of scientific and research work taking place in various organisations and increase the share of publicly financed scientific research carried out outside universities and large institutions (*ibid*);
- link scientific work with the needs of the economy and other knowledge users as a matter of urgency, primarily by linking funding with knowledge transfer and enhancing the mechanisms and networks of intermediary institutions for knowledge transfer (*ibid*);
- increase public funds in financing scientific and research work in compliance with the Barcelona objectives until the end of this term of office (*ibid*);
- the internationalisation of Slovenian science, in particular by stimulating cooperation with the world's best institutions and by giving an opportunity to employ high quality foreign researchers in Slovenian research organisations;
- elimination of the irrational administrative steps defined in the existing legislation regarding foreign researchers in Slovenia (Agreement, 2012: 33);
- consistency when taking meritocratic measures into account for financing scientific work (*ibid*);
- strengthening the mechanisms of control over the efficient use of budgetary funds (*ibid*);
- the reasonable adjustment of the quality criteria system to the nature of scientific and research work (natural science/social science) (*ibid*).

The Agreement also indicates the government's plan to amend the strategic documents (as mentioned earlier) where necessary to implement their policies. Until December 2012 however no draft amendments have been released for public discussion.

With the fall of the previous government (2012-2013) the above coalition agreement is no longer valid. The new government, formed on March 20th, prepared a much shorter coalition agreement where it refers to RISS as the main strategic document in the R&D area.

¹⁶ Available at http://www.vlada.si/fileadmin/dokumenti/en/Agreement_for_Slovenia_2012-2015.pdf.

¹⁷ Text taken directly from the Agreement.

The two other relevant policy documents, still not released for open public discussion, which were prepared by the MEDT are the draft of Slovenian Development Strategy (SDS 2014–2020) and the draft of Slovenian Industrial Policy (SIP). Both have been prepared internally by the Ministry's staff. This process is significantly different than in the past when special teams were assembled under the guidance of the Institute for Macroeconomic Analysis and Development to prepare the background material as well as the final version of the documents. Currently (December 2012–January 2013), the two documents are being discussed internally by the ministries. Both documents stress in particular the need to (re)gain more competitive capability of Slovenian industry. To achieve this, different activities are proposed, focusing on the improvement of environment for entrepreneurial activity, friendlier administrative support, better government support to innovative (new) enterprises and more structured support to priority industrial and technical fields.

The draft documents stress that they are prepared as the backbone of the more specific Operational programmes for the Financial Perspective 2014–2020, since Slovenia will have to rely intensively on the European funds in view of the considerable lack of national resources for development. While both documents discuss the importance of innovation and innovative behaviour, it seems from the current text that this is restricted solely to technical innovation in manufacturing sector. Limited attention is given to R&D policy, except the need to improve linkage between science and entrepreneurship. Draft SIP defines priorities through selected technologies and industrial sectors (12), but it seems like development in these sectors needs little in terms of science input. The holistic view of interrelation of R&D and innovation, which prevailed in RISS, has disappeared, along with the broad definition of innovation. Draft SDS 2014–2020 discusses the research and innovation strategy only indirectly, by pointing that Slovenia should “*support the research which generates concrete results and is useful for business, whether it is implemented in public or private research organisations*” (Draft SDS 2014–2020: 11). Also, the support for “*excellent science, applicative and developmental projects*” is proposed (*ibid.*).

Since both draft documents have only recently been released for internal discussion and have not yet been offered for discussion among all stakeholders, it remains to be seen what will be the reaction of different groups, the business community as well as the HEIs and PROs. From the policy mix perspective the very fact that the preparation was not carried out jointly already opens the questions of interdisciplinarity and policy coordination.

2.5 Research and innovation system changes

As already mentioned, with the reorganisation of the government, the previous Ministry of Higher Education, Science and Technology was reorganised significantly. With Technology department moving to MEDT, the painfully built link between R&D and innovation policy under the previous government, has been broken again. According to the internal sources at both ministries, there remains little coordination either at the level of policy or at the level of specific measures. With each ministry designing its own policies and measures, the synergies planned by RISS are unlikely to occur. This is reflected also in the attitude towards RISS itself. The draft SDS 2014–2020 does not mention the document at all, while SIP draft talks about building “*Comprehensive development innovation environment for technology and business development*” and not RISS explicitly.

As planned in the Coalition Agreement, the government decided to merge previously separate agencies: Public Agency for Entrepreneurship and Foreign Investment (PAEFI), Slovenian Tourism Organisation (STO) and Technology Agency (TIA). This institutional change was agreed in October 2012, when the government established a new agency SPIRIT for supporting

and promoting internationalisation, entrepreneurship, technology development, and tourism. The newly-established agency is starting in January 2013, but at least initially its programme is simply pasting together previous programmes of individual agencies. It remains to be seen if the merger will provide better policy coordination and more effective support to business sector, as promised by the promoters of the merger. Other system changes envisaged by RISS for the period 2011–2020 have not been initiated.

2.6 Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3)

The institutional reorganisation of the R&D sector has in part contributed to a delayed start in the preparation of the *National Research and Innovation Strategy on Smart Specialisation (RIS3)*. The MEDT is in charge of the preparation of the strategic documents which will form the backbone of Slovenia's programme for the Cohesion and Structural Funds. In December 2012, the MEDT produced two strategic documents for internal government discussion: the draft SIP and the draft of SDS. At the same time, a more intensive discussion has started between the two ministries (MESCS and MEDT) on the RIS3. By the end of the year, a working group had been established at each of the two ministries as well as a coordinating body. The content and the shape of RIS3 remain undisclosed to the public, but unofficially the group is to build on positive experience of the R&D support mechanisms which were funded through ERDF and ESF during the current financial perspective (2007–2013) such as the Centres of Excellence, Competence Centres and schemes for strengthening of human resources in R&D. In March 2013, a set of discussions with various actors in R&D area was initiated by a team of EU experts, which gave further boost to the internal team at the MEDT. The MEDT announced that draft proposal of RIS3 is to be delivered for public consultation by end of April 2013.

If two years ago during public discussion on RISS, selection of national priorities for R&D and innovation attracted heated debates at least in the R&D circles and industry, in 2012 little attention has been given to these issues. One can expect a more active debate and probably certain changes in policy priorities with forthcoming planning of the measures for the next financial perspective, preparation of the strategic documents as well as the RIS3. RISS already talks about “smart specialisation” and states: “*The aim is to create smart specialization fields of state or region, on which Slovenia will be able to establish itself as excellent and competitive country in the international context*” (RISS, 2011: 23). RISS planned that through a bottom-up process, identification of priority areas will take place. The selected specialisation fields would then receive priority funding. Since no implementation documents of the RISS were prepared later and the new government announced the amendments to RISS, this process is not likely to be realised and RIS3 drafting is taking a different approach.

In September the MEDT published an invitation to the public to cooperate in the preparation of drafting new Slovenian Development Strategy and other programme documents via on-line questionnaire, where institutions or individuals can express their opinion on development priorities for 2014–2020 (SDS, 2014–2020). No report on the response has been published, but a draft SDS 2014–2020 has been submitted for the intragovernmental discussion at the end of December. The draft however does not address smart specialisation – either as a generic term or as a specific document to be prepared.

A draft of SIP suggests that as a response to societal challenges the support for prospective industrial and technology areas should be provided by the government. The preliminary

identification of internationally competitive strategic areas where Slovenia has the knowledge and competencies and other conditions (business entities, research and development facilities) is presented in the draft text. These include:

- Environmental/energy challenge with efficient use of natural resources;
- Sustainable mobility;
- Food, health and ageing population;
- Potential of the key enabling technologies.

These four areas are aligned with twelve industrial sectors:

- Energy/smart systems
- Sustainable construction
- Manufacturing sector (especially wood processing industry)
- Chemical and processing industry
- Automobile industry
- Pharmaceutical industry
- Food-processing industry and sustainable agriculture
- Sustainable tourism
- ICT
- Electro industry and electronics
- New materials
- Metal processing industry, machine-building and tools.

Text further specifies which activities within these relatively numerous industries are to be supported with regard to the existing capabilities and growth potential in the future. The modalities of the support are not specified and no mentioning whether these will also be priorities for the research policy is provided. It is unclear, whether the MEDT sees these also as priorities for RIS3. As mentioned, the document has not been released yet for the open discussion among stakeholders.

2.7 Evaluations, consultations

During the preparation of RISS, two external evaluations of Slovenian NIS (Bučar et al., 2010) were implemented (details in Erawatch Country Report on Slovenia – Bučar, 2011), one by OECD (2011) and the other one by the ERAC team of experts (ERAC, 2010).

MEDT officially released the OECD Review of Innovation Policy in July 2012, even though the review was finalised in the first months of 2011.¹⁸ In spite of the fact that the Review covers R&D and higher education as well, no high officials of MESCS were present at the official release with OECD officials.

The OECD team found that the RISS (evaluated at the time still as a proposal) is putting more effort on building a high-performing science system than on the diffusion of existing technologies (domestic as well as foreign) and non-technological innovations. According to the experts, Slovenia faces the challenge of integrating and prioritising the actions that address both near-term needs as well as actions relating to longer term structural and institutional change. Their recommendation was that policies and actions directed at both sets of problems are needed. This advice should be reiterated in the present situation, when nearly all of the measures are short-term related.

¹⁸ Party the delay was caused by political events: at the time the evaluation was completed, the minister of science stepped down, which led to a government crisis and early elections in the second half of 2011.

ERAC experts also pointed out the issues of priority setting and coordination. While acknowledging that RISS addresses this issue, they stated that *“the future governance structure will be a key element in delivering an efficient national innovation system with a clear political direction and with stronger connections between the ‘innovation actors’ working towards common and not competing aims”* (ERAC, 2010). Coordination and streamlining of the innovation policy, including governance structure and organisational set-up of the support infrastructure was identified by the experts as the major challenge for improved policy implementation (Bučar, 2011).

In the spring 2012, a national evaluation of the support measures implemented by the former Ministry of Economy during the period 2004–2009 was presented.¹⁹ The evaluation stressed the need to provide more systematic and harmonised support, avoid frequent changes in the types of measures, and introduce various indirect support measures like support to innovation through public procurement, private-public partnerships and innovation infrastructure support. The most promising past measures were measures supporting business R&D projects and the measures focused on human resources (like young researchers from industry).

The RISS calls for continuous monitoring/evaluation of the implementation of the strategy. Since very little has been done during 2012, and in view of many changes in the R&D environment, both institutional and financial conditions, the preliminary report on the implementation shows serious difficulties.

¹⁹ Evaluation was implemented by a team of researchers at the Faculty of Social Sciences and financed through Targeted Research Programme Scheme (see more Jaklič et al., 2012)

3 Structural challenges facing the national system

Already the 2011 Erawatch Report (Bučar, 2011) identified as one of the potentially important challenges facing the national R&D system the issue of *sustainability of the level of R&D financing*, both from the public resources as well as from the business sector. The EU Report on 2020 R&D targets however still sees Slovenia as one of the countries which are on track to reach their targets by 2020, but this expectation is based on the average rates of growth of investment in R&D in the period 2000–2011 (European Union, 2012). Looking at the events in 2012, the reduced availability of budgets for research, development and innovation, both within the government's budget as well as within the business units become the key factor driving the future development of research and innovation policy in Slovenia. The government planned a reduced overall budget for 2013 and 2014 to lower the deficit in public finance and in spite of minimal corrections in favour of higher education expenditures and selected R&D measures the parliament adopted this reduced budget. The exact break-down of the figures in terms of which types of expenditures will suffer most is at the time of writing still not known (January 2013). There are some preliminary speculations that only the already committed funding under the support measures, where co-financing from Structural Funds is involved, will be continued.

It is difficult to predict how the slow-down in government R&D financing will affect the business sector's investment in R&D, where significant growth was recorded in 2011. Several of "standard" support measures directed towards business, like co-financing of applied projects, financing of R&D start-ups, co-financing of university incubators and technology centres/parks, EUREKA projects were not implemented in 2012. On the other hand, the tax subsidy for R&D investment had been increased to a 100 % in March 2012. Yet in the circumstances of low economic activity²⁰ it is unlikely that the business sector will be able to sustain the level of its R&D investment as well.

The lack of public funds is problematic also due to practically *non-existent policy debate*. If saving is the principle, several groups (Chamber of Industry and Trade, Slovenian Academy of Science and Arts, KORIS—a coordination of directors of PRO) have demanded that the selective savings politics is implemented in the field of R&D and innovation. Of course the criteria each of these pressure groups had in mind were significantly different, yet the point they were making is that the MESCS needs to have a strategy, which are the essential priorities needed to be maintained regardless of the shortage of funds. No such clear policy message has been produced, just as no open deliberation took place on the future of RISS. In spite of high expectations only 18 months ago with the adoption of RISS, it is now observed that the innovation policy has receded from the top of the policy agenda. In a situation of high economic and political uncertainty, with serious financial problems and unavailability of credits, both the government and business community are much more short-term focused on survival, so growth, and with it research and innovation, do not figure in the on-going policy discussion. A new and much more dramatic challenge for Slovenian R&D system is how to *revive the interest in R&D and innovation* and convince the major government players that the exit strategy without investing in new knowledge and technology is a short-sighted and very likely un-sustainable.

²⁰ For 2012, the Institute of macroeconomic analyses and development (IMAD) suggests a drop in real GDP of 2 %, with a drop of investment by 9 %. Not much more optimistic is the forecast for 2013, when still a negative growth of GDP and investment is predicted. See details in IMAD (2012b).

The issue of *coordination and streamlining of the R&D and innovation policy*, including governance structure and organisational set-up of the support infrastructure was identified by the national as well as international evaluations of the Slovenian NIS as the major challenge already in earlier periods. During the preparation of RISS it seemed that some of the coordination issues had been relatively successfully addressed since close cooperation was established between the science and technology units within the ex-Ministry of Higher education, science and technology as well as with the representatives of the Directorate for entrepreneurship at the Ministry of Economy. With the reorganisation of the government and the move of technology section to the Ministry of Economic Development and Technology, policy coordination suffered a significant step back. Only very recently one can observe some signs of cooperation at the level of officials in the preparation of the strategic documents, yet this is not reflected at the higher level.

This may be detrimental at the stage where Slovenia will have to decide on the *strategic and funding priorities for R&D and innovation* in the next financial perspective. The revealed priorities of the draft SIP are only partly based on the priorities supported under the current financial perspective through centres of excellence, competence centres and development centres. As mentioned, RISS counted on bottom-up approach for the selection of strategic priorities in line with the smart specialisation strategy. The lack of open dialogue during the current drafting of the strategic documents suggests that the selection of priorities will be driven by only a small group of officials in a non-transparent manner, creating a document with limited impact.

Table 3: Selected indicators on R&D system from the Innovation Union Scoreboard 2011

HUMAN RESOURCES	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	1.5
Percentage population aged 25-64 having completed tertiary education	34.8
Open, excellent and attractive research systems	
International scientific co-publications per million population	827
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	7.62
Finance and support	
R&D expenditure in the public sector as % of GDP	0.67
FIRM ACTIVITIES	
R&D expenditure in the business sector as % of GDP	1.43
Linkages & entrepreneurship	
Public-private co-publications per million population	51
Intellectual assets	
PCT patents applications per billion GDP (in PPSE)	2.97
PCT patents applications in societal challenges per billion GDP (in PPSE) (climate change mitigation; health)	0.63
OUTPUTS	
Economic effects	
Medium and high-tech product exports as % total product exports	56.84
Knowledge-intensive services exports as % total service exports	27.11
License and patent revenues from abroad as % of GDP	0.08

The need to increase the effectiveness of higher education system has been identified as a challenge for several years now by various evaluations (Bučar, 2010, 2011; ERAC, 2010; IMAD, 2011, 2012a; OECD, 2011). The current tertiary attainment rate in Slovenia is above the EU average. The number of students enrolled in tertiary education relative to the number of the population aged 20 to 26 increased from 29.9 % in 2000 to 47 % in 2010/2011 (IMAD, 2012a). Also, the structure of enrolment is changing in favour of natural and technical sciences (the share of students in social sciences and humanities has dropped from 43.5 % in 2005 to 34.7 % by 2010). However, the relatively slow throughput and drop-out rates of university students clearly indicate inefficiencies. A thorough reform of the university was suggested in ERAC evaluation which proposed “*a complete overhaul of the legal, financial and operational aspects of the university sector, where the main objective should be to establish a climate of trust and a shared vision between the government and universities*” (ERAC, 2010).

In the spring of 2011, the previous government prepared a new National Programme on Higher Education (NPHE), which addresses many of these issues, yet its implementation is faced with the same problems as RISS. There is still no new Higher Education Act to operationalize the participation and completion rates planned in the National Higher Education Programme. The changes to the old law on Higher Education that the government introduced in 2012 related to the changes in the regulation of National Accreditation Agency (NAKVIS) as well as to the changes in the allocation of teaching load, yet much more impact on the functioning of HEIs so far had the budget cuts. Most HEI lost about 10–12 % of their annual budget derived from the government for the academic programmes. Several programmes have already run into financial difficulties and more are expected to run deficit in 2013, yet the MESCS claims that according to their estimates the public universities have sufficient reserves and should be able to adjust to the lower financial support. How these adjustments will hinder/stimulate the increase in efficiency is yet to be seen, but the MESCS’s austerity measures have already led to open protests of the university staff and students.

None of identified challenges for Slovenian research and innovation system are mentioned in the EU Council Recommendation (European Council, 2012), assessing the economic situation in Slovenia and the reform programmes: attention is given to the budget deficit and banking sector, to a need for a pension reform and employment protection regulation and strengthening of the market opening. The Commission’s Working document had, however noticed that “*planned improvements in R&D and education await implementation. Meanwhile, the business environment has worsened significantly, with viable firms — especially small and medium-sized enterprises — facing subdued demand and tightened borrowing conditions*” (EC, 2012: 17). This observation is in line with our assessment of worsening situation also for the business investment in R&D. The Working document notes that the measures outlined in the 2011 Research and Innovation Strategy and the National Programme for Higher Education have not been materialised. According to the Commission’s staff, the main challenges remain “*the effective and efficient deployment of available resources (including from the European Regional Development Fund), the structure of policies to provide support to research and especially to stimulate innovation, enhanced cooperation with the business sector and focus on strategic industrial sectors, and investment to support key enabling technologies*” (EC, 2012: 18) These challenges correspond to the challenges identified above: the selection of priorities for funding and especially, more intensive policy debate and implementation.

4 Assessment of the national innovation strategy

4.1 National research and innovation priorities

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. The proportions of funding among scientific fields have not changed significantly over the years. In 2011, the SRA disbursed funds as follows: Engineering and Technology (30 % of all funds) and Natural Sciences (27 % of all funds); followed by Humanities (11.8 %), Biotechnology, Social Sciences and Medical Sciences (between 9.6 and 9.8 %), Multidisciplinary projects and programmes received 1.5 % of all funds disbursed. Within a particular scientific field, priorities are mostly determined by the scientific community itself on the basis of peer review of submitted projects.

This lack of priorities is reflected also in the statistics on allocation of GERD (2011) according to the socio-economic objectives (SORS, 2013), since as much as 64 % of research performed in government and HEI is research for general advancement of knowledge. On the other hand, business R&D is heavily concentrated in industrial production and technology (50.4 %), followed by 18.4% of research for general advancement of knowledge (SORS, 2013).

The *Research and Innovation Strategy of Slovenia (RISS)* defines the R&D policy priorities for the next decade (2011–2020). These can be summarised as follows:

- a) Better integration of research and innovation,
- b) Publicly funded sciences and scientists shall contribute to economic and social restructuring,
- c) Enhancing 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.

The selection of priorities as to the specific fields had been left to the process which was to follow the adoption of RISS. In line with the concept of *smart specialisation* the “*permanent and bottom-up open process of recognition and selection of priority fields*”, was to be launched (RISS, 2011: 24). The priorities are to be identified by individual stakeholders, but substantiated with comparative analyses of their competencies either within the framework of research and innovation policies or industrial policies. Selection and development of the selected priority fields should be the subject of internal and foreign evaluations every second year, which may lead to changes in the earmarked support to the particular priority fields. This approach however, depends on whether the current government will re-commit to RISS, which was not the case of the MEDT or MESCS 2012-2013.

After a very slow start, finally Slovenia has decided by the end of 2012 on the preparation of the RIS3. The coordination has been entrusted to MEDT, yet the approach so far is not following the EU guidelines, in particular not as an overarching strategy of the country. One would expect that at times when several strategic documents are being discussed (SIP, SDS, preparation of the outline for NSRF for the next financial perspective, RIS3 would be the central process, receiving high political priority. Yet the working groups, established by the previous government (2012-2013) at the MEDT and MESCS do not have this kind of authority, but are primarily involved in

the preparation of a draft document on RIS3 as a sort of innovation strategy where closer attention will be paid to research priorities which will contribute to increase of industrial competitiveness. They claim that in the drafting of RIS3 they are 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. They have with the help of former Technology Agency commissioned research paper 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 work has so far been closed to the scientific and business community (with the exception of preliminary presentation at the management board of Chamber of Industry and Commerce) or even the policy advisory boards, like the Science and Technology Council. As already mentioned, the SIP is also suggesting certain priorities for development of business sector, but whether these will be further assessed also from the perspective of new knowledge creation and innovation, remains to be seen. For illustration, the SIP does not mention RIS3 at all, even though it discusses the next financial perspective as well as Horizon 2020.

At this point the assessment of the linkages between RIS3 and other policy documents is impossible to undertake, since no disclosure of the content has been made so far. The working group decided on a preparation of a draft RIS3, which will only afterwards be released to public for discussion. This seriously undermines the participatory process of RIS3 preparation, advocated by the EU. With no involvement of universities, civil society and only partial sporadic involvement of business community as important stakeholders the mobilisation impact of RIS3 process is unlikely to happen. Also, the impact of this process on the encouragement of policy innovation and experimentation is limited.

4.2 Evolution and analysis of the policy mixes

Due to the preparation of the Research and Innovation Strategy of Slovenia for 2011–2020, the policy discussions during 2010 and 2011 have been quite dynamic, at least within the R&D sector and its main stakeholders. Since it was assessed that the major goals in the area of science (increase of publication activity, improvement in citation indexes etc.) had been achieved, more attention was given to the meeting the goals in technological restructuring, i.e. the increase in value added, high-tech exports, employment in high tech manufacturing, and services. This, as well as the growth of the R&D in business sector (both as an investor and performer), led to the policy conclusion to integrate the future innovation strategy and the R&D strategy into a single policy document called RISS. At the same time, this policy document was prepared in close cooperation with the ministry's sector for higher education where a new strategy paper was also elaborated for their area of coordination. The coordination of the National Programme for Higher Education (NPHE) and RISS is especially important in view of the research potential of Slovenian HEIs.

As noted in the Erawatch Country Report 2011 (Bučar, 2011), the elaboration of RISS was in fact the culmination of policy mixes in R&D area, which first received an increased attention in the Slovenian Development Strategy (2005–2013), where much emphasis was given to the R&D and its potential contribution to the economic growth and business sector restructuring. The Strategy was the backbone for the National Strategic Reference Framework and derived Operational Programmes, where the OP for Strengthening Regional Development Potentials (OP SRDP) receiving funding from the European Regional Development Fund (ERDF) and the OP for Human Resources Development funded by European Social Fund (ESF), have included

several measures related to R&D and innovation. After the initial problems with the complex administrative structure for the drawing of the EU funds, both the PRO and the business R&D units welcomed significant increase in the amounts available for specific R&D and innovation measures, co-financed by the EU structural funds.

The preparation and the implementation of the new measures, e.g. Centres of Excellence, Competence Centres, and most recently Development Centres, required an increased cooperation between different ministries and their agencies, which proved to be at times a lengthy process. The support provided for the establishment of competence and development centres in 2010 (the first financed by the former MHEST and the second by the former Ministry of Economy) complimented the establishment of the Centres of Excellence, a measure introduced in 2009. The Centres of Excellence (CO) have focused on basic research and were initiated primarily by PROs in cooperation with those business R&D units which, in the long run, see the benefits of basic research in a particular area. The competence centres, on the other hand, are consortiums led by businesses combining both basic and applied research with clear focus on their future market opportunities. To complete the set-up, the former Ministry of the Economy introduced measures to support formation of the development centres. The support of the development centres also provides co-financing for R&D projects, but specifically for the so-called close-to-the-market research projects and, in particular, for the development of new products, processes, and services.

The three measures together represent a significant proportion of public research funding which is much more focused on selected priorities than the overall public funding channelled via SRA. The set-up and the focus of the measures could be assessed as an effective policy mix, since in this way support is provided to all stages of innovation process as well as to all the major stakeholders: PROs, business R&D units, and the network organisations such as technology platforms, clusters, or technology centres.²¹ In addition, the Research Infrastructure Roadmap, adopted in April 2011 by previous ministry (MHEST), followed the same priorities as the centres of excellence and competence centres, which suggests potential for positive synergies in specific scientific fields.

This positive, even if sometimes lengthy procedure of jointly designing support measures during the past years should be carried on in the next financial period and should build on experience of the various implemented measures. What can be a cause for some concern is less attention to the policy dialogue and coordination across all relevant sectors, from science, higher education, entrepreneurship support and financial possibilities in the process of preparation of the strategic documents for the next financial perspective.

4.3 Assessment of the policy mix

The implementation of the policies in the field of R&D and innovation, and their coordination (so-called implementation deficit) has been identified as one of the major problems of Slovenia in several Erawatch reports (Bučar 2010, 2012A, 2012B). To this problem, the lack of appropriate policy mix can be added since 2012, resulting primarily from the lack of coordination and unclear policy directives. The coordination between the two ministries (MEDT and MESCS) is minimal and no regular inter-ministerial group has been established so far. To this problem, the lack of appropriate policy mix can be added since 2012, resulting primarily from the lack of

²¹ The latter cannot be the initiators of the Competence/Development Centres, but can act as institutional support providers.

coordination and unclear policy directives. The coordination between the two ministries (MEDT and MESCS) is minimal and no regular inter-ministerial group has been established so far. By the end of 2012 however, a working group on preparation of RIS3 was established, led by MEDT, but in cooperation with MESCS. In spite of this body, which is formed at the level of staff, the coordination at the political level is still missing. It remains to be seen if with the change of government the dialogue will improve.

The advisory body, the National Council for Science and Technology, had met only twice in 2012 with the current minister: first in April and then again in December on explicit request of the members of the Council.²² In between, the MESCS found no reason to consult its advisory body on any of the pertinent issues. And yet this is the body where not only a number of ministers (finance, S&T, economics) need to take part, but also representatives from higher education, PRO and business sector and its prime objective is the assessment of the appropriateness of policies.

Table 4: Selected challenges and policy actions

Challenges	Policy measures/actions ²³	Assessment in terms of appropriateness, efficiency, and effectiveness
Implementation deficit	Introducing a set of indicators used for continuous evaluation of the policy documents, including RISS.	The introduction of the regular monitoring and assessment of the policy implementation was first done with the Slovenian Development Strategy – government’s think tank- the Institute for Macroeconomic Analysis and Development- prepares annually a Development Report where the evaluation of the implementation of Slovenian Development Strategy (SDS) is carried out. RISS planned a bi-annual evaluation of its implementation, but unclear commitment of the current government to RISS makes the evaluation difficult.
Sustaining the level of financing of R&D and innovation	100 % tax subsidy to stimulate further business investments in R&D. Increased allocation of EU structural funds to R&D.	Only indirect assessment of the tax subsidy as an appropriate measure can be given. Since the introduction of tax subsidy, the BERD has grown continuously. As demonstrated, up until the year 2011, Slovenia was able to maintain the growth of resources allocated to R&D. The budget for 2012 cut the government’s spending on R&D due to the overall need to cut down public spending. This along with planned further reduction of resources for 2013 and 2014 is having serious consequences for public R&D performers as well as HEIs.
Coordination and stream-lining of the innovation policy	No measure.	Reorganisation of the government led to separation of technology/innovation department from the science and HE department and no joint coordination has been established so far.
Strategic and funding priorities	Observation of topical priorities in funding of the centres of excellence and competence. Introduction of the concept of “smart specialisation” in RISS.	Some of the major allocations of new resources for R&D and innovation, especially resources channelled to centres of excellence and centres of competence, followed closely the priorities selected with the help of semi-foresight exercise and technology platforms. RISS proposed “smart” specialisation even though it is still unclear if/ how this will be applied in practice. ERAC expert group (2010) called upon the policy-

²² Several initiatives of the Chair of the Council to meet went un-answered by the MESCS, so the members of the Council applied their statutory right and demanded a meeting. How much the MESCS plans to involve them in the activities in 2013, remains to be seen, but the Council formed a team to monitor the preparation of Smart Specialisation Strategy.

²³ Changes in the legislation and other initiatives not necessarily related to funding are also included.

		makers to specify the priorities more clearly and to do so in close connection with the priority sectors in national economy. This remains an open task.
Improved HEI efficiency and quality	Planned reorganisation of Higher Education sector within the new National Programme for Higher Education has to be followed by more specific changes in the Law on Higher Education, which had not been prepared so far.	<p>In the past years, most of the attention of the policy makers was given to the increase of the enrolment rate in tertiary education and the implementation of the Bologna reform. Although this resulted in a high number of students, it did not improve the quality or efficiency. On average, the three- to four-year programmes still require 7 years to complete, because students take part-time jobs, which the current legislation allows.²⁴</p> <p>Research at the HEIs is currently highly fragmented with small groups limiting the potential for collaboration with industrial partners, whereas the academic promotion system nearly exclusively stimulates publications as the key merit. In spite of the envisaged changes in the strategic documents, the policy-makers have yet to prepare specific policy measures suitable for implementation. However, the notion of change itself is met with high level of resistance in many HEIs.</p>

²⁴ See details in Erawatch 2010 report on Slovenia (Bučar, 2011).

5 National policy and the European perspective

The national policy in the domain of research and innovation can also be characterised with reference to the objectives set forth for the development of the European Research Area (ERA). The table below identifies the main short and medium-term challenges at the national level and policy changes in Slovenia along the five ERA priorities on the basis of ERA Communication priorities. In 2012, few changes have occurred besides certain slow-down in EU and international scientific cooperation due to the limited available funding.

Table 5: Assessment of the national policies/measures supporting the strategic ERA Communication priorities.

	ERA dimension	Main challenges at national level	Recent policy changes
1	ERA priority 1: More effective national research systems	<p>Ambitious plans were laid out in the RISS, but due to the constraints in public finance PROs need to adjust to lower levels of financing from the government's sources.</p> <p>In particular, the human resource strategy is needed, since younger generation is much more open to the internationalisation and Slovenia is likely to experience more significant brain-drain in the near future.</p>	<p>RISS proposed increase in institutional funding based on the regular evaluation of research institutes and universities. Yet the implementation of new funding scheme has been postponed.</p> <p>A positive development with regard to effectiveness was the introduction of external evaluators in all the major calls of Slovenian Research Agency.</p>
2	ERA priority 2: Optimal transnational co-operation and competition	<p>Slovenian researchers actively participate in FP as well as in many other EU and international R&D programmes. There is also an increase in participation, both for students and researchers, in various mobility programmes.</p>	<p>Slovenian Research Agency has promoted and co-financed participation in FP and other programmes through various support schemes. RISS placed significant attention to the international cooperation, yet the decrease of funds has caused that in 2012 most of the support measures were either stopped or provided very limited financial support. For example, for the first time since joining EUREKA, in 2012 no resources were provided for the projects.</p>

3	ERA priority 3: An open labour market for researchers	Slovenian labour market for researchers remains relatively closed and unfriendly (due to the internal restrictions, compensation limitations due to the classification of researchers in public sector (HEIs and PROs) as public employees, where salaries have to follow Public Sector Wage System Act and a collective agreement for all public sector employees. With new measures, some mobility in the direction of private sector R&D is experienced.	RISS had planned to change the regulation qualifying employees in public R&D as public employees, but the required legal changes have not been prepared yet. Furthermore, more systematic public calls for new job openings are envisaged (University of Ljubljana already requires international job opening announcement), yet not fully enforced.
4	ERA priority 4: Gender equality and gender mainstreaming in research	The discrepancy between the numbers of women graduating and obtaining Ph.Ds with the numbers of women employed in R&D is increasing. As many as 68% of women scientists cite that they have been discriminated against during their research careers.	RISS addresses the issue of gender mainstreaming, but no specific activity except indirect support to research on gender has so far been initiated by SRA or the Ministry.
5	ERA priority 5: Optimal circulation, access to and transfer of scientific knowledge including via digital ERA	Slovenia has two relatively well developed bibliometric systems for gathering data on research in the country. Also, universities provide access to major data bases for their researchers. Electronic identity is promoted actively by SRA.	Results of publicly funded research (research reports) are published by SRA. Limited discussion has been so far initiated in PROs with regard to open access.

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List of Abbreviations

BERD	Business Expenditures on R&D
CC	Competence Centres
CO	Centre of Excellence
ERA	European Research Area
FP	Framework Programme
GBAORD	Government Budget Appropriations or Outlays for R&D
GERD	Gross Expenditures on R&D
HE(I)s	Higher Education (Institutions)
MEDT	Ministry of Economic Development and Technology
MESCS	Ministry of Education, Science, Culture and Sport
NAKVIS	National Accreditation Agency
NIS	National Innovation System
NPHE	National Programme of Higher Education
PAEFI	Public Agency for Entrepreneurship and Foreign Investments
PROs	Public Research Organisation(s)
RI	Research Infrastructure
RISS	Research and Innovation Strategy of Slovenia
SEF	Slovenian Enterprise Fund
S&T	Science and Technology
SRA	Slovenian Research Agency
SIP	Slovenian Industrial Policy
SDS	Slovenian Development Strategy
SORS	Statistical Office of the Republic of Slovenia
TIA	Technological Agency of Slovenia

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Abstract

This analytical country report is one of a series of annual ERAWATCH reports produced for EU Member States and Countries Associated to the Seventh Framework Programme for Research of the European Union (FP7). The main objective of the ERAWATCH Annual Country Reports is to characterise and assess the performance of national research systems and related policies in a structured manner that is comparable across countries.

The Country Report 2012 builds on and updates the 2011 edition. The report identifies the structural challenges of the national research and innovation system and assesses the match between the national priorities and the structural challenges, highlighting the latest developments, their dynamics and impact in the overall national context. They further analyse and assess the ability of the policy mix in place to consistently and efficiently tackle these challenges. These reports were originally produced in December 2012, focusing on policy developments over the previous twelve months.

The reports were produced by independent experts under direct contract with IPTS. The analytical framework and the structure of the reports have been developed by the Institute for Prospective Technological Studies of the Joint Research Centre (JRC-IPTS) and Directorate General for Research and Innovation with contributions from external experts.

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new standards, methods and tools, and sharing and transferring its know-how to the Member States and international community.

Key policy areas include: environment and climate change; energy and transport; agriculture and food security; health and consumer protection; information society and digital agenda; safety and security including nuclear; all supported through a cross-cutting and multi-disciplinary approach.

