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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 benefited from comments and suggestions of Dimitris KYRIAKOU from JRC-IPTS who reviewed the draft report. 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.

EXECUTIVE SUMMARY

The RTDI system in Cyprus was born in the mid-1990s and is evolving with the aim to increase efficiency and modernise the government, research and productive sector cooperation. At the operational level the Planning Bureau is an independent government agency engaged in the formulation of strategy, the identification of objectives and the introduction of policy measures aiming at the promotion of research activities in Cyprus. At the implementation level, research and innovation activities are integrated under the Research Promotion Foundation (RPF), which is an autonomous agency under the supervision of the Planning Bureau. The Ministry of Commerce, Industry and Tourism (MCIT) is responsible for industrial policy, including the promotion of technology and entrepreneurship. The most recent development is the creation of two organisations, the National Council for Research and Innovation (NCRI), composed of cabinet ministers and chaired by the President, and the Cyprus Scientific Council (CSC), a technical advisory board composed of high calibre scientists; these are two organisations, created in recent years, responsible for strategy and planning. Their operations took off slowly but they are expected to be more active in the future. The main research performer group are the public universities.

GERD/GDP is among the lowest in the EU accounting for 0.48% in 2011, slightly decreasing compared to 2010. This was not only due to lower growth of GERD than that of GDP, but also due to the absolute amounts of GERD that have decreased. The breakdown per course of funding and performance did not change in any significant way in 2012. The main source of research funding is the government, accounting for 68% of the total, followed by external funding, mainly European, at 15% and by business contribution at 12.7%. The remaining 4% is derived from funding offered by HEIs and private non-profit institutions. Public expenditure on research was at €86.2m in 2010 (latest available data) marking an annual decrease of about 3.8% since 2009. The largest performer are HEIs, absorbing 49.8% of total expenditure, followed by the government and the business enterprise sector, absorbing 19.6% and 17.2%, respectively. Most of the government contribution to GERD goes to the HEIs with 53.27% of total public funding. Public research organisations rank second with a 26.52% contribution. Business enterprises fund almost exclusively intramural R&D activities: they perform €10.2m worth of R&D activities and fund €10.9m. Their R&D activities are mainly intramural R&D and university-industry cooperation is only timidly emerging. Industry financed GERD and BERD differ by €0.7m only. The same applies to funding from HEIs, which fund again almost exclusively research performed within the institution. Most of the funding coming from abroad goes to the HEIs, namely 59.94% of total foreign-financed GERD. The rest is allocated to business enterprises (13.89%), private non-profit organisations (16.63%) and the government (9.52%)

Cyprus is one NUTS II region and there are no explicit regional plans. The European Commission has commissioned a RIS3 study for the country, which started in December 2012 and its results are expected in 2013.

The main structural challenges are:

1. ***Limited human resources for research,*** although there is a large potential in terms of highly educated young people (44.7%, which is among the highest rates in the EU-27. Efforts at all educational levels are undertaken to address this point.

2. ***Limited demand for R&D:*** The composition of the Cypriot business sector does not favour demand for R&D. Competitive funding is used as a way for providing incentives to the private sector.
3. ***Limited propensity to innovate:*** There is no innovation culture and efforts to create incentives are increasing despite serious budget limitations. The business sector is dominated by services (80% of GDP), whereas innovation support is not sufficiently oriented to the service sector. The lack of availability of seed capital and market exit capitalisation for R&D businesses deprives the country from an instrument that is effective in other countries.
4. ***Limited number of high-tech companies in the country:*** The best way to address the current deficiencies in terms of the number of high tech companies in the business sector is through the renewal of the productive capacities by placing emphasis on the development of high-tech companies in niche areas.
5. ***Too broad research orientation in need of more prioritisation:*** thematic priorities are still broad and it is expected that the newly created Councils will address the problem, which is particularly important because of the low overall amount dedicated to research.

RTDI is among the key priorities of the National Strategic Development Plan (NSDP) 2007-2013, which is the main strategy document reflecting guidelines for R&D and innovation policy in the country, and forming a basis for the preparation of the programming documents. However, there is no explicit multi-annual RTDI strategy. The closest to it is the main delivery instrument, the multi-annual and multi-thematic National Framework Programme for Research and Technological Development (DESMI), designed and managed by the RPF. DESMI always reflected bi-annual priorities. A major shift over the recent past was a new focus on innovation support. Since 2008, the RPF included in its framework programme new initiatives targeting cluster framework policies and innovation, the development of the innovation culture among economic actors, linking university and the business sector as well as the enhancement of endogenous capacity of enterprises to innovate. This was reinforced in 2012 by the adoption of the Enhancement of Business Innovation Measure of the Ministry of Commerce, Industry and Tourism.

According to the information from the current NRP 2011, a new strategy (to be announced soon based on the scientific consultation in CSC and approval from the NCRI) will be based on the following pillars: Increase human capital in research activities; Strengthen the scientific base; Promote international cooperation; Introduce innovation in the public sector; Promote research and innovation in enterprises; Prioritisation of research fields; Exploitation of innovative ideas and launching them in the market. These pillars are sufficiently broad to include all actions necessary to face the structural challenges, so the extent to which this will succeed.is a matter of implementation rather than policy design.

In terms of the ERA objectives most efforts focus on the labour market for researchers, research institutions and public-private partnerships. Cooperation within the EU relies mostly on the framework programme with few bilateral agreements. International cooperation is strengthened by national competitive funding and few but increasing numbers of bilateral agreements. The size of the country is an inhibiting factor for research infrastructures of global excellence but efforts are made and an ESFRI road is envisaged.

The size and structure of the economy and the immaturity of the RTDI system risk running into a vicious circle of wasted investments. A coordinated approach is needed to avoid creating a system that will not be embedded in the local economy.

Table of Contents

EXECUTIVE SUMMARY 2
INTRODUCTION 5
1 RECENT DEVELOPMENTS OF THE RESEARCH AND INNOVATION POLICY AND SYSTEM 8
1.1 National economic and political context 8
1.2 Funding trends 9
1.3 10
1.4 New policy measures 10
1.5 Recent policy documents 11
1.6 Research and innovation system changes 11
1.7 Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3) 12
1.8 Evaluations, consultations 12
1.9 Policy developments related to Council Country Specific Recommendations 12
2 STRUCTURAL CHALLENGES FACING THE NATIONAL SYSTEM 15
3 ASSESSMENT OF THE NATIONAL INNOVATION STRATEGY 18
3.1 National research and innovation priorities 18
3.2 Evolution and analysis of the policy mixes 19
3.3 Assessment of the Policy Mix 23
4 NATIONAL POLICY AND THE EUROPEAN PERSPECTIVE 26
5 REFERENCES 28
6 LIST OF ABBREVIATIONS 30

INTRODUCTION

Cyprus is the third largest Mediterranean island and one of the smallest member states of the European Union with a population of 803,000 (0.2% of the EU-27). The service sector dominates with 73% of GDP, composed mainly of tourism, which is the leading sector, followed by financial services and real estate. Manufacturing, transport-communication and construction account each for 7% of GDP[1]. Structural reforms followed the accession to the EU in 2004 and led to liberalisation of trade, finance and investments (Ministry of the Interior, 2008).

GDP per capita grew from 89% of the EU average in 2004, when Cyprus joined the EU, to 99% in 2010 reaching €21,000 but remained unchanged in 2011 hence sliding back to 94% of the EU-average in PPP2. Cyprus had a robust average annual growth of 4% outperforming the EU-27 average growth rates until the crisis (ERAWATCH Network, 2009). The driving forces were inflow of foreign (indirect) investments and tourism. The economic crisis resulted in a decline of 1.9% in 2009. In 2010 real GDP started growing again (1.1%)[3] but remained unchanged in 2011. Prospects of the economic climate were negative throughout 2012[4]. The economy is experiencing financial distress since 2011, initiated by the crisis but exacerbated by the losses suffered from a restructuring of Greek state bonds, in which the local banking system had invested heavily. The difficult financial situation led the country to request support from the EU (the funding body in 2012 being the EFSF, precursor to the ESF). The debt crisis culminated in March 2013, when the Troika and the Cyprus government agreed to a mandatory deposit taxation of bank deposits above 100,000 Euros to save the over-indebted banks and easy credit pressures on the public sector. While details are still to be revealed it is expected that this will trigger major turbulence and is very likely to reduce all types of public funding.

Cyprus ranks last in GERD/GDP shares among all the EU member states (0.48% in 2011, or less than 1/4 of the EU average). Research intensity increased after the accession but has stabilised since the crisis. BERD/GDP is among the lowest in the EU (0.08% in 2011 with the EU average reaching 1.26%), slightly declining since the crisis. The higher education sector was and remains the major R&D performer. Its share increased from 43.7% to 49.6%(p) of GERD over the last three years and is more than twice than the corresponding share of the EU average[5]. Enterprises perform 19.8 % of total GERD (in comparison to the 61.7% of the EU average) and the trend is decreasing. The Government sector contributes 20.4%.

S&T graduates' share in the labour force is steadily increasing reaching almost 44% in 2010[6]. The expansion (in terms of research priorities and graduate programmes) of the Cyprus University of Technology (CUT), continuous expansion of post-graduate courses in public and private universities and the development of new private universities (Neapolis University) are expected to further stimulate human resources development. The decision to generously fund cooperation with world-class universities in the past was expected to improve results in terms of both human resources and infrastructure. This has not produced the expected results as yet and there are

[1] http://www.pwc.com/cy/en/about-cyprus/services-sector.jhtml
[2] Eurostat Database, GDP
[3] See table below
[4] http://www.ucy.ac.cy/data/ecorece/erevnes%20oikonomikis%20sigkirias_11_2012.pdf
[5] The comparisons are made taking into consideration provisional data for 2010
[6] The figures refer to the HRST aged 25-64 as a percentage of active population from the Eurostat. More information is available in the Chapter 2.2.3

discussions about an evaluation of this strategy. International cooperation as well as emphasis of policy on supporting FP participation contributes to increasing competence and nurturing excellence. Research infrastructures are very small and only of local scale, but improvements are visible.

In terms of research output, Cyprus is underperforming. Total scientific publications passed from 197 in 2000 to 801 in 2008, only above Luxembourg and Malta in the former case but also surpassing Latvia in the latter. The country has however the third fastest growth rate in terms of publications in the corresponding period following Luxembourg and Malta. In terms of scientific publications within the 10% most cited scientific publications worldwide it passed from 10 to 66 (30.9% growth) (European Commission, 2011a), again with exactly the same ranking as in terms of total publications, indicating a similar performance in terms of citations. Patenting under the PCT is very low and rates Cyprus only at about 13% of the European average. The situation with PCT patent applications regarding challenges facing society is even worse (8.5% of the EU average). This performance does not seem to be improving over time. The country is only strong in trademarks (about 250% of the EU average)[7].

Cyprus is a service-based economy. Tourism and finance contribute most to GDP, followed by ICT, R&D, energy, shipping, education, professional and health services. ICT is the area with the highest performance in R&D calls for proposals[8]. As there are both capabilities and needs for e-government ICT is considered a potential area where public procurement for innovation can play a role stimulating demand-driven research. The government focuses on the development of an integrated National Strategy for the Information Society.

The RTDI system in Cyprus was born in the mid-1990s and is changing over time with the aim to increase efficiency and modernise the government, research and productive sector cooperation. Two new organisations, the National Council for Research and Innovation (NCRI), composed of cabinet ministers and chaired by the President, and the Cyprus Scientific Council (CSC), a technical advisory board composed of high calibre scientists are two organisations created in recent years responsible for strategy and planning. The NCRI has exclusive responsibility for the adoption of long-term strategies in research and innovation, while the CSC constitutes the advisory scientific board (composed of 18 members of qualified scientists) (ERAWATCH Network, 2011) to the government. Their operations took off slowly but they are expected to be more active in the future.

At the operational level the Planning Bureau is an independent government agency engaged in the formulation of strategy, the identification of objectives and the introduction of policy measures aiming at the promotion of research activities in Cyprus. At the implementation level, research and innovation activities are integrated under the Research Promotion Foundation (RPF), which is an autonomous agency under the supervision of the Planning Bureau. The Ministry of Commerce, Industry and Tourism (MCIT) is responsible for industrial policy, including the promotion of technology and entrepreneurship. A new "Technology Unit" was created in 2011 in the Ministry, which is expanding the activities of the already existing Technology Department and is expected to play a more active role. The Ministry of Agriculture is active in technology transfer services. Cyprus is a single region and policy is drafted and

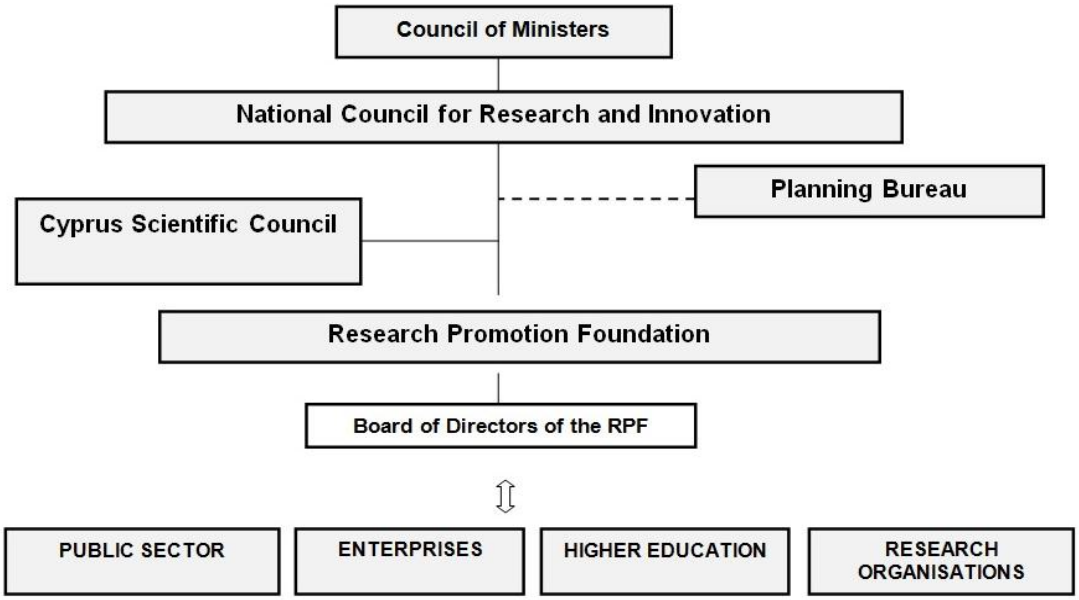
[7] The percentages are own calculations based on the data from the IUS 2010

[8] This conclusion is based on the applications and success rates to both the EU FP and the national framework programmes where applications for research in ICT rank top compared to other thematic priorities,

implemented centrally. Local authorities, namely districts, municipalities and communities only exceptionally play a role in implementing RTDI policies.

The main research performer group are the public universities (UCY[9] and CUT). The Open University has very few R&D projects. Four private universities are mainly offering undergraduate degrees and undertake applied research in the social sciences and humanities. Other major organisations undertaking research are the ARI, the Cyprus Institute of Neurology and Genetics (CING) and the Meteorological Centre. The Cyprus International Institute (CII) for the Environment and Public Health, the joint venture with the Harvard School of Public Health, implements research in the respective sectors. Another top-class venture, the Cyprus Institute (CyI), operates three Research Centres[10] in close collaboration with foreign establishments of international reputation.[11]

Figure 1: Overview of the Cyprus RTDI system governance structure



Source: Design based on a diagram provided by the Planning Bureau, http://www.planning.gov.cy/planning/planning.nsf/All/52642699216544DEC22574F2002E97A1?OpenDocument

[9] University of Cyprus

[10] The Energy, Environment and Water Research Centre (EEWRC), the Science and Technology in Archaeology Research Centre (STARC) and the Computation-based Science and Technology Research Centre (CSTRC)

[11] Including the MIT, the University of Illinois and Centre de Recherche et de Restauration des Musées de France

1 RECENT DEVELOPMENTS OF THE RESEARCH AND INNOVATION POLICY AND SYSTEM

1.1 National economic and political context

The economy of Cyprus is experiencing financial distress since 2011, exacerbated by the losses that the local financial sector suffered from the debt restructuring in 2012 of Greek state bonds (Private Sector Involvement – PSI). Particularly, in 2012, €8b out of the €14b Net International Investment Position is solely explained by the effect of the PSI and the losses the Greek subsidiary banks and financial investments in Greek Bonds[12]. In the period January-October 2012, public deficit increased marginally to 3.6% of GDP, compared to 3.4% of GDP in the respective period in 2011. Public debt reached 70.7% of GDP at the end of 2011 and is expected to reach 85.8% of GDP by the end of 2012, principally due to the increase of primary deficit, combined with a new bond issue for the recapitalisation of a Financial Institution. GDP is expected to contract by 2.4% in 2012 and by much more in 2013. Unemployment is expected to reach 12% in 2012, with construction, retail and leisure sectors suffering the most. Unemployment is expected to increase further in the period 2013-2015[13].

In order to correct its deficit problem, Cyprus adopted new fiscal measures such as increasing the tax rate on dividends from 15% to 17% (first phase) and then to 20% for a period of two years, introducing a €350 levy on all registered companies, increasing the withholding tax on interest accrued on deposits to 15% from 10%, increasing the tax rate for personal income above €60,000 to 35% from 30%[14]. Although these measures are necessary for addressing immediate fiscal imbalances and complying with Eurozone requirements, there is a risk that that they will undermine the successful development model of the last decades, whereby Cyprus was an attractive place for portfolio investments and leisure because of the low tax rates.

The debt crisis culminated in March 2013, when the Troika and the Cyprus government agreed to a mandatory deposit taxation of bank deposits above 100,000 Euros to save one of the two over-indebted banks, while forcing an immediate bankruptcy/resolution of the second one, and to ease credit pressures on the public sector. While details are still to be revealed it is expected that this will trigger major turbulence and is very likely to reduce all types of public funding.

In the medium to long term Cyprus is expected to overcome difficulties, thanks to the extraction and exploitation of natural gas in its continental shelf - Cyprus Exclusive Financial Zone (AOZ)[15]. The economy will benefit in the interim from the development of infrastructures for the extraction.

At this stage the economic distress has already affected and is expected to further affect public funding for RTDI. Within this context, education expenditure is expected to decrease by 7.7% in

[12] Cyprus National Reform Programme 2012
[13] Budget 2013
[14] Cyprus National Reform Programme 2012
[15] Budget 2013

2013. The research and innovation budget supported by the Structural Funds was not affected, as the Steering Committee refused to allow these funds to be diverted to other applications.

1.2 Funding trends

	2009	2010	2011	EU27
GDP growth rate	-1.9	1.3	0.5	- 0.3 (2012)
GERD (% of GDP)	0.49	0.5p	0.48p	2.03s (2011)
GERD (euro per capita)	104.1	105.2	102.6p	510.5s (2011)
GBAORD - Total R&D appropriations (€ million)	83.966	80.571	77.681	91,277.1 (EU27 total 2011)
R&D funded by Business Enterprise Sector (% of GDP)	0.08	0.06	-	1.26 (2011)
R&D performed by HEIs (% of GERD)	46.1%	49,8%	52.8%	24% (2011)
R&D performed by Government Sector (% of GERD)	20.4%	19.6%	17.1%	12.7% (2011)
R&D performed by Business Enterprise Sector (% of GERD)	19.8%	17.2%	15.9%	62.4% (2011)
Share of competitive vs institutional public funding for R&D	-	-	-	n/a

s - EUROSTAT estimate
Data Source: EUROSTAT, March 2013

GERD/GDP is among the lowest in the EU with 0.48% in 2011, slightly decreasing compared to 2010. This was not only due to lower growth of GERD than that of GDP but also in absolute amounts of GERD per capita. The breakdown per course of funding and performance did not change in any significant way in 2012:

The main source of research funding is the government, with a contribution of 68%, followed by external funding, mainly European, at 15% and by the enterprise contribution of 12.7%. The remaining 4% is derived from funding offered by HEIs and private non-profit institutions[16].

Public expenditure on research was at €86.2 in 2010 (latest available data) marking an annual decrease of about 3.8% since 2009. The largest performer are HEIs, absorbing 49.8% of total expenditure, followed by the government and the business enterprise sector, absorbing 19.6% and 17.2%, respectively.

Most of the government contribution to GERD goes to the HEIs with 53.27% of total public funding. Public research organisations rank second with a 26.52% contribution.

Business enterprises fund almost exclusively intramural R&D activities: they perform €10.2m and fund €10.9m. Industry-financed GERD and BERD differ by €0.7m only. The same applies to funding from HEIs, which fund again almost exclusively research performed within the institution.

[16] Eurostat: 2010 data

Most of the funding coming from abroad goes to the HEIs, namely 59.94% of total foreign-financed GERD. The rest is allocated to business enterprises (13.89%), private non-profit organisations (16.63%) and the government (9.52%)

Finally, private non-profit organisations mainly fund HEIs at 43.53%. The remaining is distributed internally at 39.55%, to business enterprises at 16.66% and a marginal share to the government (0.002%).

1.3

1.4 New policy measures

Very few new policy measures were initiated in 2012, which was marked more with an effort to speed up the implementation of existing interventions. The most significant new measure was a long expected support to business innovation by the Ministry of Commerce, Industry and Tourism; two platforms were also new, aiming at stimulating the modernisation of the business sector:

- Open tender for the submission of proposals for participation in the programme "Enhancement of Business Innovation in Cyprus", launched by the Ministry of Commerce, Industry and Tourism: The programme has a total budget of €4m, and is addressed to SMEs wishing to invest in research and technology for the development of market oriented competitive innovative products and services. Exempted from financing are activities related to primary production or trade of agricultural products, activities related to fisheries and aquaculture, retail/ whole commercial activities, hotel or leisure operations. 84 applications were submitted for participation in the programme and the selection process is expected to be concluded by June 2013.

- In March 2012, the Ministry of Commerce, Industry and Tourism organised the first introductory meeting of the technology platform "Manufuture-CY", an initiative for future industrial technologies. The purpose of the platform is to provide a forum for the exchange of views, the alignment of Cypriot industry to the priorities and the policy of the European platform and the allowance of Cypriot companies to participate in cooperation programmes led by the European platform in the context of the 7th CSF. The European Technology Platform for Future Industrial Technologies Manufacture reflects the decisions of the European industry in the decision-making bodies of the European Union. It has contributed to the creation of the Public Private Partnership initiative "Factories of the Future" in cooperation with the European Commission, for which €1.2b will be contributed in the period 2009-2013 for the support of industry and the creation of new and sustainable technologies. The activities of the platform Manufuture-CY include information exchange, thematic training workshops, the production of position papers and other contributions to industrial policy, as well as new initiatives for the enhancement of cooperation between its members. Except for industries, members of the platform may also be companies which influence and are influenced by the industry, associations of companies, IT companies and research centres with direct interest, as well as other Public Organisations, academic institutions and financial companies, cooperatives, and consumers associations which have an indirect industrial interest.

- "Students in Research – FOITO" Programme: A call for last year undergraduate and Master students to submit research proposals for a contest with financial rewards and

mentoring was launched in 2012 with deadline in June 2013. Five awards per category are foreseen (€500 to €2,500). Similarly a call in cooperation with the Ministry of Education and Culture "Pupils in Research - MERA" was prolonged until December 2012.

- Cyprus government has launched an e-PS a platform for the concentration of all public procurement in Cyprus, into a single web based system. The system received in 2011 the Cyprus Innovation Award by the Cyprus Employers and Industrialists Federation (OEB) and ranked Cyprus 1st in the area of pre-awarding electronically, amongst the 27 EU Member states, in accordance to Benchmark Measurement studies conducted on behalf of the European Commission for 2009 and 2010.

- Relaunch of the common Research Programme "Cyprus-France" (ZENON) – May 2012: The Programme aims to increase scientific cooperation between the two countries, through joint research proposals, which are jointly submitted to RPF and the French organisation EGIDE. Proposals may be submitted in the area of "Environment/Energy" for a maximum support of €60,000 (€30,000 from each country) and for a duration of up to 2 years.

- Competition for "Technology and Innovation in Education" - November 2012: Research Promotion Foundation (RPF), in cooperation with the Centre of Educational Research and Evaluation of the Ministry of Education and Culture, launched a competition for "Technology and Innovation in Education", within the context of RPF Program "Development of Research and Innovation Culture". The purpose of the competition is to raise awareness of pupils in public and private schools with innovative technology procedures and is addressed to pupils in secondary education.

1.5 Recent policy documents

The administration was engaged with the Presidency and the management of the financial crisis, hence there were no new documents on RTDI policies. The National Reform Programme of 2011, published in April 2011, is the most recent document identifying priorities and operational requirements.

1.6 Research and innovation system changes

No major changes took place at the level of governance. In November 2012, a new Chairman was appointed at the Cyprus Scientific Council with a three-year tenure. This was the result of the resignation of the previous Chairman; as the new one is resident in Cyprus, it is expected that the Council will be more active, and the system will adopt a set of narrow priorities to maximise the outcome of RTDI resources. At the level of performers the establishment of Liaison Offices is progressing.

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

Cyprus is one NUTS II region and there are no explicit regional plans. The European Commission has contracted a RIS3 study for the country, which started in December 2012 and its results are expected in 2013.

1.8 Evaluations, consultations

The Cypriot administration appeared as lacking an evaluation culture in the past but this trend seems to be rapidly changing. Ex ante and thematic evaluation in different topics were launched and partly completed in 2012. Two of those are of relevance for RTDI:

1. The first on-going evaluation of the implementation process of the Operational Programmes "Sustainable Development and Competitiveness" and "Employment, Human Capital and Social Cohesion" was completed in May, 2012.
2. The Board of the RPF has decided to launch an "Evaluation of the National Framework Programmes for Research Technological Development and Innovation (DESMI) 2008 and 2009-2010 and Evaluation of the Participation of Cypriot Organisations in the Seventh Framework Programme for Research and Technological Development of the EU (2007 – 2013)". The call was launched in 2012 and cancelled despite a number of proposals from experienced international evaluation consortia.

In the context of the evaluation study on the implementation process of the OP "Sustainable Development and Competitiveness" the methodological approach of the study included a SWOT analysis, Coherence, Effects and Logical Analysis Matrices, Problems, Interventions, Targets and Expected Impacts Charts, Bibliographic Research and Diagnostic Analysis. Field Research with the use of the specific questionnaires (for the selected objectives of the Programme) was undertaken for support schemes for female and youth entrepreneurship and the reinforcement of the competitiveness in SMEs in manufacturing as well as for the interventions in the sector of Rural Tourism were held. The evaluation study concludes with recommendations for taking the appropriate measures to ensure full and effective utilisation of the resources allocated to the Programmes, efficiency of interventions as well as modification of the Programmes in the light of recent economic developments.

1.9 Policy developments related to Council Country Specific Recommendations

The Country Specific Recommendation for Cyprus includes: Improve the skills of the workforce to reinforce their occupational mobility towards activities of high growth and high value added; Take further measures to address youth unemployment, with emphasis on work placements in companies and promotion of self-employment; Take appropriate policy measures on the demand side to stimulate business innovation.

Several policy developments have taken place in this direction:

1. Most interventions addressed skill development at all levels of education:

- At the level of tertiary education (university and technical university) there has been continued growth and increasing enrolment and ambitions.
- The Industrial Liaison Offices in process of implementation are expected to help placement of graduates. Extension of Liaison offices to 6 from the initial two pilots.
- The Establishment of four Post-Secondary Institutes of Vocational Education and Training (September 2012)[17]
- Design-development and application of the new national curriculum for all public schools of pre-primary, primary and lower secondary education[18].
- Restructuring of upper secondary and secondary technical and vocational education (consultation began in March 2012 and over 50 academics and 350 appointed teachers have participated). The new curriculum focuses on (a) the acquisition of an appropriate and coherent body of knowledge (b) the fostering of the qualities of a democratic citizen and (c) the development of specific skills, key competences that are increasingly required in the 21st century. The teacher, on the other hand, is provided with the freedom to adjust the curriculum and teaching methods so as to achieve that goal. For the smoother introduction of the new curriculum, a teacher training programme has been launched which will gradually engage every teacher[19].
- Approval of a proposal for the establishment of a National Board for the Lifelong Guidance (September 2012). The role of the National Board for the Lifelong Guidance will be to provide educational guidance and career counselling to students. The estimated budget for developing the appropriate mechanisms is set at €100,000[20].
- Approval of a proposal for the establishment of a National Qualifications Framework, namely a national policy for the application and use of EU tools appropriate for skills' validation, with an annual budget of €200,000[21].

2. Youth unemployment, with emphasis on work placements in companies and promotion of self-employment
   - Continuation of the implementation of the Youth Entrepreneurship Scheme but no funds for new calls in 2012.
   - Scheme targeting the young and the long-term unemployed[22].
   - Company incentive scheme for SMEs in the manufacturing sector, which runs from 2010, and provides subsidies for the development of a specific business plan that will increase their competitiveness and enhance quantitatively and qualitatively the employment within the specific enterprise. The programme has a total budget of €8m and is co-funded by the European Social Fund. By March 2012, about € 2.7m worth of subsidies had been approved in a total of 43 signed agreements. Three projects were completed and two were interrupted[23].
3. Policy measures on the demand side to stimulate business innovation:

[17] Cyprus National Reform Programme 2012
[18] Cyprus National Reform Programme 2012
[19]
[20] Cyprus National Reform Programme 2012
[21] Cyprus National Reform Programme 2012
[22] Cyprus National Reform Programme 2012
[23] Cyprus National Reform Programme 2012

- The implementation of the measures supporting the business sector in the context of DESMI (the Framework Programme of the Research Promotion Foundation), namely encouraging the cooperation of enterprises with local research organisations, the cooperation of local enterprises with foreign research organisations and the recruitment of new researchers by enterprises will stimulate the demand side.

The new Open tender for the submission of proposals for participation in the programme "Enhancement of Business Innovation in Cyprus", launched by the Ministry of Commerce, Industry and Tourism has a total budget of €4m, addressed to SMEs wishing to invest in research and technology for the development of market oriented competitive innovative products and services, and is a scheme targeted, for the first time, to stimulate demand. Its advantage lies in companies considering this Ministry as the public organisation than understands best their requirements and is better positioned to support them.

2 STRUCTURAL CHALLENGES FACING THE NATIONAL SYSTEM

HUMAN RESOURCES	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	0.2
Percentage population aged 25-64 having completed tertiary education	37.7
Open, excellent and attractive research systems	
International scientific co-publications per million population	1004
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	8.9
Finance and support	
R&D expenditure in the public sector as % of GDP	0.33
FIRM ACTIVITIES	
R&D expenditure in the business sector as % of GDP	0.08
Linkages & entrepreneurship	
Public-private co-publications per million population	26.6
Intellectual assets	
PCT patents applications per billion GDP (in PPS€)	0.6
PCT patents applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health)	0.05
OUTPUTS	
Economic effects	
Medium and high-tech product exports as % total product exports	101.72
Knowledge-intensive services exports as % total service exports	48.5
License and patent revenues from abroad as % of GDP	n/a

Data Source: Innovation Union Scoreboard 2011

According to the Innovation Union Scoreboard 2011, Cyprus qualifies as growth leader of the innovation followers, with an average growth rate of 2.4%. Its relative strengths are "Innovators" (5th ranking) and "Linkages & Entrepreneurship" (7th ranking), while its weaknesses are observed mainly in the categories "Finance and Support" and "Intellectual Assets" and to a lesser extent in category "Open, excellent and attractive research systems".

As indicated in the Peer Review of Cyprus 2010, the major constraints in the development of the research and innovation sector in Cyprus are:

1. Limited human capacity available for research:

- Small number of researchers.

- Low number of new doctorate graduates. New doctorate graduates (ISCED 6) per 1000 population was at 0.2 at the end of 2010, the lowest in Europe. This comes as a contrast to the high percentage of population aged 25-64 years old with tertiary education (37.7% compared ton an EU average of 26.9%).

- Restricted demand from industry and businesses for researchers and PhD holders, which prevents students to pursue a researcher's career.

2. Limited engagement of enterprises to research activities:

- The absence of significant size industries in Cyprus and the very small size of Cypriot businesses, 94% of which employ less than 10 persons.
- Limited research activities in the services sector, which accounts for about 80% of GDP.
- Lack of awareness (and culture) of enterprises for the potential benefits of innovation.
- Lack of availability of seed capital and market exit capitalisation for R&D businesses.
- Limited number of high-tech companies in the country[24].

These constraints, identified in the Peer Review, together with the Structural Challenges identified in the 2011 Erawatch Report can be summarised as follows:

Limited human resources for research

Although there is a large potential in terms of highly educated young people (44.7%, which is among the highest rates in the EU-27 (European Commission, 2010a)) and improving efforts in life-long learning, the labour market for researchers is still very small. The number of graduates in mathematics, science and technology (4.6 per 1 000 of population in 2009) is very low in comparison to the EU average (14.3 per 1,000 of population in 2009).[25] The share of new doctorate holders is among the lowest in the Union (0.2 per 1000 population between 25 and 34 years (European Commission, 2010a)). This is mainly the result of the late creation of universities on the island and is expected to improve significantly over time although the low levels of knowledge demand discourage young people to follow research careers. It is also a matter of comparatively high shares of education in social sciences and humanities. Moreover, the lack of adequate conditions for research (narrow research base, absence of large research infrastructures) as well as low interest from businesses to employ researchers further limits the career choices for researchers and lead to significant brain-drain.

Limited demand for R&D

The composition of the Cypriot business sector does not favour demand for R&D. There is insufficient involvement of firms in research activities in terms of participation and expenditures in R&D and innovation. According to the IUS, in "Business R&D expenditure" Cyprus appears as the worst performer among all 27 member states and venture capital is practically absent in the island. The structure of the productive sector does not favour R&D: very small sized family-run enterprises with limited export orientation dominate the economy. Most firms tend to concentrate on low value added product and services and don't take risks in new products or export markets. As the economy is dominated by the service sector (tourism, transport and finance), with manufacturing representing only 7% it is understandable that demand for R&D is low and the business sector has not developed an innovation culture. Small and micro – enterprises oriented mostly on low value added support services are unlikely to invest in RTDI. University-industry cooperation is in its infancy. Despite the continuous increase in national or European funding opportunities for SMEs, the mobilisation of SMEs is lower than national targets.

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[24] Cyprus National Reform Programme 2012

[25] Data for Graduates (ISCED 5-6) in mathematics, science and technology per 1 000 of population aged 20-29, Education and Training indicators, Eurostat, http://epp.Eurostat.ec.europa.eu/portal/page/portal/education/data/database

Limited propensity to innovate

The inadequate exploitation of knowledge is one of the major problems. The performance of the "Intellectual Assets" indicators of the IUS, which seem to be the weakest point of the national innovation performance, confirms that knowledge exploitation is limited. The number of patent applications filed under the PCT is very low and rates Cyprus only at about 13% of the European average. The situation with PCT patent applications in societal challenges is even worse (8.5% of the EU average). This performance does not seem to be improving over time. The country is only strong in trademarks (about 250% of the EU average). This is however compatible with the size and structure of the economy and it can only very slowly be improved.

This is associated with the lack of awareness (and culture) of enterprises for the potential benefits of innovation, the limited involvement of SMEs, the limited collaboration between business and academia (which could encourage companies to exploit university research results in the market) and last but not least a divide: the composition of the business sector is dominated by services (80% of GDP), whereas innovation support is not sufficiently oriented to the service sector. The lack of availability of seed capital and market exit capitalisation for R&D businesses deprives the country from an instrument that is effective in other countries.

Limited number of high-tech companies in the country

The best way to address the current deficiencies of the business sector is through the renewal of the productive capacities by developing high-tech companies in niche areas. Medium-tech and high tech product exports are 83% of the EU average and declines by 3.4% between 2010 and 2011. High-tech companies are mainly created in ICT and are of very small size.

Too broad research orientation in need of more prioritisation

The rapid increase of public RTDI funding developed across all disciplines without focusing on a limited number of scientific fields, where the national innovation system could be expected to excel. Funding is spread throughout different research areas leading to broad research orientation covering too many areas, which are not justified by the size of the country and its economy. Limited financial resources available for the investment in RTDI require stronger concentration to ensure smart specialisation. DESMI, the main policy implementation package of support measures for RTDI, focused on fewer areas than in the past in its 2009-2010 version but still sufficiently broad.

3 ASSESSMENT OF THE NATIONAL INNOVATION STRATEGY

3.1 National research and innovation priorities

RTDI is among the key priorities of the National Strategic Development Plan (NSDP) 2007-2013, the main strategy document reflecting guidelines for R&D and innovation policy in the country and forming a basis for the preparation of the programming documents. The NSDP for the first time was adopted after consultation with different stakeholders through wider public debate. The promotion of research and development constitutes one of the eight strategic development pillars highlighted in the document.

There is no explicit multi-annual RTDI strategy. The closest to it is the main delivery instrument, the multi-annual and multi-thematic National Framework Programme for Research and Technological Development (DESMI), designed and managed by the RPF. DESMI always reflected bi-annual priorities. However, due to administrative and financial constraint in 2012 the RPF was still managing DESMI 2009-2010 based on five pillars, which include a broad spectrum of measures through which it supports multi-thematic research projects in pre-selected fields, promotes research activities among young population, provides for the upgrading of existing and the build-up of new research infrastructure, supports international collaboration as well as research and innovation in enterprises. Each new DESMI outperforms the previous in terms of budget and number of measures.

The major shift over the recent past was a new focus on innovation support. Since 2008, the RPF included in its framework programme new initiatives targeting cluster framework policies and innovation, the development of the innovation culture among economic actors, linking university and the business sector as well as the enhancement of endogenous capacity of enterprises to innovate. This was reinforced in 2012 by the adoption of the Enhancement of Business Innovation Measure of the Ministry of Commerce, Industry and Tourism.

Based on the scientific consultation by CSC and approval from the NCRI, the new strategy was designed to be based on the following pillars:

- Increase human capital in research activities
- Strengthen the scientific base
- Promote international cooperation
- Introduce innovation in the public sector
- Promote research and innovation in enterprises
- Prioritisation of research fields
- Exploitation of innovative ideas and launching them in the market

Given the economic turmoil triggered in March 2013, it is unlikely that the NCRI will be dealing with R&D strategic priorities in the near future.
At a high political level, priorities were determined regarding the major challenges facing society. Energy, environment and in particular water resources were identified as the real future challenges for the island and the wider Mediterranean region. New Research Institutes and Research Centres were established in the last five years on the basis of the bilateral agreements

with European and international organisations and research centres of excellence.[26] Research in the determined grand societal challenges is also supported through DESMI allocations to projects in the fields of sustainable urban development, recycling, management of urban waste, control and protection from pollution under the Sustainable Development programme.
The Cyprus Construction and Technology Platform is a pilot testing the potential for stakeholder cooperation for priority setting in the sector. It was initiated by the Cyprus Scientific and Technical Chamber within the context of the corresponding European initiative. The Strategic Action Plan includes the research priorities and needs of the construction industry and is expected to contribute to a large extent to the future planning of the national research programmes (Scientific and Technical Chamber of Cyprus, 2011). In this way, the platform is expected to influence the RPF concerning the new measures to be introduced (TrendChart, 2011). The construction sector is also prioritised through the implementation of the cross-border cooperation projects in the framework of the ERACOBUILD initiative in Cyprus[27].

The policy mix reflects focus on existing companies and public funding. Engaging non-R&D performers and the creation of new high-tech firms were neglected in the past. The promotion of internationalisation of RTDI systems remains the major priority concerning the overall R&D policy-making as it was considered a very suitable mechanism for strengthening the platform for higher R&D investments. However, a shift towards the private sector is gradually taking place. It especially concerned the route targeting research cooperation with the public sector. Despite the significant efforts made towards the development of higher-level research system and progress recorded in the recent years, the evaluation mechanisms are still inadequate. No external evaluations of the RTDI policies have been conducted in the last years. The RPF launched a call for tenders for the evaluation of DESMI and the EU Framework Programmes' impact on Cyprus. Outcome was expected for 2014, however the call has been annulled as the proposals receive were rejected on formal grounds.

Overall national priorities are consistent with the challenges identified, although they are sometimes delayed or under-funded.

3.2 Evolution and analysis of the policy mixes

The Policy Mix adopted in Cyprus is evolving in terms of scope and number of measures. The major progress is the increased emphasis given to innovation and R&D in enterprises ("innovation" set of measures of the RPF, new call by the Ministry of Commerce, Industry and Tourism, newly created technology platforms). Among these measures, initiatives targeting research in firms and R&D public-private cooperation still exceed those focusing on innovation. The development of human resources in research as well as expansion and reinforcement of international cooperation continue to be strongly supported. Research and innovation policies are complemented by specific education, entrepreneurship and information society policies. In general, the policy mix was improving as more funds were dedicated to RTDI and the scope of intervention could be enlarged. This has, however, come to an end in 2012 with the financial constraints faced and it is likely that 2013 will see RTDI support shrink further.

[26] Such as the Cyprus International Institute (CII) for the Environment and Public Health providing joint with the Harvard School of Public Health research, education and technology initiative for the environment and public health and Cyprus Institute (CyI) already operating three research centres including one specialised on environment and water resources research in close collaboration with MIT

[27] A similar initiative announced for the Food Sector has not been implemented yet

The detailed analysis of the policy mixes targeting research and innovation and its recent evolution is following below using the IU self-assessment tool[28].

The role of research and innovation in the overall national/regional policy mix
There is still no integrated RTDI policy in the country. Although research and (since very recently) innovation are among the issues prioritised in the strategic papers for the overall development (NSRF 2007-2013 and Cyprus National Reform Programme 2011), a detailed RTDI strategy is still expected. The major shift is expected to take place in the very near future with the adoption of the first specific National Research and Innovation Strategy, which was delayed for reasons internal to the Cyprus Science Council.

Education policies are modernising and there are policies promoting entrepreneurship especially in the highest value added sectors. These policies started after the accession of Cyprus to the EU, they systematically continue and expand over time. However, their scale is considered still too low compared to the needs of the knowledge society.

The main instrument for the promotion of research and innovation policies remains the RPF's DESMI. Policies targeting R&D collaboration and education on energy, environment, water resources and health were put in place recently (in the form of new research institutes and research centres in collaboration with the distinguished institutions from abroad). Such collaboration is a particular strength for a small country pursuing excellence in particular fields. A core emphasis on sustainable development in the current DESMI is also evident. The resources directed to renewable energies (especially concerning the solar ones) are considered insufficient given the comparative advantage of the country.

The quality of the governance of research and innovation policies
Until very recently, the lack of vision, strategy and political coordination was the main weakness of the governance of the R&D policies. The integration of research and innovation activities under the RPF and the introduction, continuation and expansion of DESMI funding in a multi-annual basis RTDI activities in pre-selected fields aligned with the EU priorities was a step towards better governance. The major development was the operation of the new governance structure, which is expected to improve the effectiveness of the whole system by providing tools for monitoring and evaluation, thus facilitating the development of evidence-based policy. The first integrated National R&I Strategy is expected to give an emphasis to better prioritisation on a few research fields. These announced steps are crucial for improvement and they have been strongly delayed.

The scope of innovation policy (which should go beyond technological research)
Innovation policies are recent in Cyprus and the government has not yet fully shaped an adequate and clear context for policy-design in this area. The new call of the Ministry of Commerce, Industry and Tourism is expected to make a difference in this direction. Demand, especially from the business sector, is extremely low. As indicated in the IUS indicators, there is, however, a high propensity for non-technological innovation in enterprises, and this may be addressed by policies to further improve it. A strong ICT base constitutes strength, able to become a basis for the demand-side policy development and certain steps are already done (e-government, e-procurement, e-inclusion systems etc.). A pre-commercial procurement policy was also announced but postponed, due to lack of funds. Non-technological innovation has only very recently attracted policy attention.

[28] European Commission, 2010a, pages 32-35

The adequacy of public funding and its leverage effect on private investment

Although still very low in comparison to other EU countries, public funding directed to R&D was continuously growing until 2012. Its leverage effect was insufficient, however, as manifested by the stagnating and lately slightly diminishing private investment.

The primacy given to the pursuit of excellence in research and education policies

The major strength in this area is the continuous progress towards the development and enhancement of the higher education system. Despite late start, the system has evolved rapidly over the last three years with the development of new universities and faculties. A comparatively high level of academic autonomy allows universities to develop, on their own, their curriculum and methods of teaching, set institutional goals, areas, scope and methods of research, design their research agendas and topics of their research specialisation. However, there are some restrictions concerning the structure of their budget and the level of academic staff's salaries, which is common for the organisations receiving public funding in Cyprus. Public HEIs dedicate small amounts to research funding using excellence criteria for the allocation of resources.

Research implemented in the universities is mostly based on national funding with competitive procedures for project funding. Knowledge exploitation mechanisms have been developed in the last three years..

The ability of the education system to produce the right mix of skills

The major strength is a very high youth education level and further efforts to maintain them in terms of expansion of universities post-graduate programmes and plans for further expansion. New initiatives were introduced in the last five years, targeting awareness-raising on science and research in primary and secondary education, and research skills in HEIs. This includes, in particular, science and technology awareness in universities and schools (Students in Research – FOITO" Programme and Pupils in Research). "Science coffee house" is the organisation of scientific discussions for society in general, aiming i.a. to attract scientists to research careers.

Another positive point is a strong political commitment to develop cooperation with the leading foreign HEIs and certain steps have been made to this end.

The low S&E graduation rates were addressed by the creation of the Technical University. However, high levels of researchers' brain drain diminish the effectiveness of national policy efforts.

Overall, it is very difficult to address the right mix of skills, since what is mostly required at present by the market are skills for tourism and financial services. It is doubtful whether more highly skilled S&E would obtain adequate employment and pursue a rewarding career. On the other hand, for the country to maintain a competitive economy in the long run such skills are needed. But the imbalance between demand and supply in the short run risks to end up with the country educating high quality engineers only to see them emigrate to pursue more rewarding careers abroad.

The promotion of partnerships at all levels and between all research and innovation stakeholders

Promotion of partnership between all the stakeholders in R&I has gained some attention over the recent past with a range of measures introduced by the RPF (cluster development, innovation vouchers, development of mediation systems) and the creation of University Liaison Offices in all HEIs. However, the implementation of these measures has not attained a critical

mass. Other significant developments include the establishment of technology platforms mentioned above. The implementation of the Technology Park, significantly delayed, was expected to give new impetus to partnerships, when finalised. However, doubts are expressed whether the Park will ever materialise. By the same token, incubators supported early in the last decade, did not get any further public support.

The development of framework conditions promoting private investment in research and innovation

Business demand is low and the environment would need special effort to reverse such a deeply rooted culture. Efforts are made but are still of limited impact: Policies promoting innovation are very young and still very limited with no adequate interconnections developed with the policies targeting the general business environment and entrepreneurship. Entrepreneurship measures such as support to youth and female entrepreneurship prioritise innovative activities. Innovation support is mainly relied on traditional direct funding; VC and other less-traditional financial incentives are practically absent. The co-financed JEREMIE initiative is expected to foster private investments in innovative activities. The environment improved through operational Point of Single Contact and the Companies Registration System (e-filing).

Based on DG Enterprise Factsheets[29] Cyprus positions itself in line with the EU average in most Small Business Act areas, with the exception of "Environment" and "Responsive administration". Although it performs best in "Entrepreneurship" and "Internationalisation", it has a lot of catching up to do to reach the level of the EU's best performers.

High quality, simple and easily accessible public support

Support to business R&D and innovation is basically provided through DESMI and in the near future through the new schemes of the MCIT. Apart from the specialised measures targeting particularly enterprises, other DESMI measures are open for the private sector participation. DESMI actions are well-designed, clearly stated and adequately promoted. After an initial learning process timing and transparency have improved; a 2010 bottleneck created frustration to the business sector but progress in the selection of proposals and contract signing was made in 2012.

The EU FP has attracted many SMEs and is considered as a high quality source of R&D funding.

A public sector driving innovation through e.g. procurement

As already emphasised above,[30] innovation (both, technological and non-technological) in the public sector has gained attention in this period and the framework for the comprehensive policies is expected to be shaped in the new R&I strategy. ICT is the major strength. Important steps were undertaken (mainly at the level of individual organisations) to promote the development of an effective scientific information system and facilitate open access to knowledge within and across national borders.[31]

The adoption of pre-commercial procurement was announced but postponed because of financial constraints and lack of experience in such schemes.

[29] http://ec.europa.eu/enterprise/policies/sme/small-business-act/index_en.htm

[30] In the paragraph "The scope of innovation policy (which should go beyond technological research)" of the same Section, where more information may be found

[31] More information in the Section 5 of the Annex

3.3 Assessment of the Policy Mix

The five major challenges identified are recognised by the government and are increasingly addressed. However, one should recognise that in a country where both supply and demand of research inputs are low and an RTDI culture is missing, it is extremely difficult to address the problem in a period of financial distress. Nevertheless, efforts are being made:

Limited human resources for research

The government has addressed the problem with the continuously rising number of postgraduate courses in universities. The CUT makes a difference with rapid growth in the S&E fields and is expected to cover current and latent market needs of S&E graduates. In addition, with the aim of enlarging the critical mass of researchers the national policy offers incentives to individual researchers as well as to research organisations and private enterprises to hire new researchers. The Cyprus National Reform Programme includes an explicit target to increase participation in Higher education to 46% by the expansion and modernisation of HEIs, strengthening links between training and the labour market and promoting transnational mobility.

At a general level the Cyprus National Reform Programme includes priorities for the attendance and quality of secondary schools and includes as a priority: *Upgrading vocational education and training* for improving the quality and attractiveness of the education and training systems and establishing mechanisms of lifelong guidance and validation of acquired skills.

The RPF is also supporting exchange of researchers and keeps a database with Expatriate Researchers' Personal Information Form.

Limited demand for R&D (medium to long term)

The government is addressing the problem with generous financial incentives for business R&D. However, researchers from universities and research centres remain the main recipients of funding provided through the DESMI calls. The financial crisis that triggered budget reductions has affected R&D support in 2012 and may prove a medium term setback in the effort to stimulate demand for R&D.

The problem of limited R&D demand is associated with the structure of the business sector (sectors, share of traditional SMEs and size of the market). The creation of the Cyprus Association of Research and Innovation Enterprises by the business sector did not change the situation in any visible way. As long as the structure of production is not addressed and the market is not growing, using exports as an opportunity, demand is unlikely to grow, in particular under the current financial crisis. It is important to combine R&D support with business opportunities, if the government wishes to address deeply-rooted business behavioural patterns.

Limited propensity to innovate (short to medium term)

This is an area where most interventions took place. Public policy has addressed the problem with policies and instruments to support the commercialisation of innovative ideas, such as innovation/knowledge clusters, knowledge transfer platforms, and voucher systems. In order to improve the general frameworks for research exploitation through limitation of obstacles and creation of incentives for patenting, the RPF has launched an action ("Patents") aiming at

motivating individuals, research organisations and enterprises to file patent applications. The recent involvement in 2012 with the Ministry of Commerce, Industry and Tourism launching for the first time a scheme supporting innovation may prove very beneficial. These efforts contributed to the classification of Cyprus among the "Innovation Followers" countries since 2009 upgraded from the "Catching Up" category.

The situation may change by encouraging SMEs (especially from the services sector) to innovate. As referred in the NRP 2011, the currently elaborated RTDI strategy highlights the importance of other than technological innovation, including "innovation in design, in processing, in organisational reform, in public procurement etc." and recommended to focus the R&I policies in the service sector (including ICT, health, education, tourism, shipping, financial and legal services). "SMEs innovating in-house" (41.55%) and "Innovative SMEs collaborating with others" (21.31%) being well above the EU average in the last IUS indicate progress. The indicators in the "Innovators" category are amongst the highest in the EU. The expenditure on non-R&D innovation is also impressive (1.73% of the turnover). Further efforts are needed to maintain these positive trends.

The foreseen increasing introduction of e-government and public sector innovation in combination with the postponed pre-commercial procurement scheme may be a good opportunity to stimulate innovation in the future.

Limited number of high-tech companies in the country (medium to long term)

This challenge is not sufficiently addressed, although success stories exist with the establishment of a number of innovative companies that export to Europe and to the USA. Most of these companies have graduated from the business incubators programme[32].

However, more emphasis is needed to increase scale. Only internal university support schemes and the youth entrepreneurship scheme (with no funds left in 2012 for a new call) are the main instruments to support high-tech creation. The lack of a well organised capital market and venture capital discourage any potential external investors. University support is of limited volume and the Youth Entrepreneurship scheme addresses traditional and high-tech companies alike. The slow and inefficient operation of incubators and technology parks has been a barrier to innovative start-ups.

This challenge is one of the priorities of the Cyprus National Reform Programme 2011. In this respect, it is important to review and reconsider the implementation of measures such as the incubators scheme, a scheme for the development of new high-tech companies, development of a local Business Angels network etc. The creation of young innovative companies is now expected to be supported by a dedicated scheme for the development of new high-tech companies highlighted in the NRP 2011.

Too broad research orientation lacking prioritisation

The RPF has made successive efforts to limit the areas for which it launches competitive calls to avoid thinly spread budgets. This is, however, difficult and meets with resistance from the disciplines neglected. This is understandable, since the research budget is very low and the country needs to maintain and improve an effective education system, which needs research

32 Cyprus National Reform Programme 2011

funds to keep its knowledge basis up-to-date. In addition the RPF does not have the resources to devise such an important decision.

An important development in this direction was the reform of the National Research and Innovation System of Cyprus, which envisaged the establishment of two new autonomous entities; namely the National Research and Innovation Council (NRC) and the Cyprus Scientific Council (CSC). The NRC is responsible for adopting long-term strategies in research and innovation, while the CSC is the advisory board to the NRC and its mandate is to formulate research strategy proposals. The two bodies held their first meetings in 2010 but for internal reasons the prioritisation has not been adopted yet. The enactment of the CSC at the end of 2012 and the National Strategy for Research and Innovation 2011-2015 currently under preparation are expected to address this issue, provided that there are no additional barriers due to the economic crisis of 2012-2013.

Challenges	Policy measures/actions	Assessment in terms of appropriateness, efficiency and effectiveness
Limited human resources for research	Increase of graduate courses More S&E courses in the Cyprus University of Technology Improvement of life-long learning opportunities and awareness raising at schools	In terms of quantity and quality the government is addressing the problem and improving the composition of skills in the labour force As long as the demand side remains limited there is risk that the improvement of skills will not generate employment opportunities and there will be increasing emigration of specialised people.
Limited demand for R&D	Increased budget for R&D incentives to the business sector until 2011 Emphasis on collaboration schemes between business and academia	The problem of limited R&D demand is associated with the structure of the business sector (sectors, share of traditional SMEs and size of the market). As long as the structure of production is not addressed and the market is not growing, using exports as an opportunity, demand is unlikely to grow, in particular under the current financial crisis.
Limited propensity to innovate	RPF emphasis on innovation with appropriate schemes, like innovation vouchers and placement of graduates. New support schemes by the Ministry of Commerce, Industry and Tourism	The new measures started mobilising the business sector as manifested by the demand for the new schemes, which exceeds the corresponding demand for R&D support. It is, however, too early to assess their impact.
Limited number of high-tech companies in the country	Support of local HEIs for spin offs. Youth entrepreneurship schemes by the Ministry of Commerce, Industry and Tourism	This challenge is not sufficiently addressed. University support is of limited volume and the Youth Entrepreneurship scheme addresses traditional and high-tech companies alike; demand it for the former. This challenge is under the priorities of the Cyprus National Reform Programme 2011.
Too broad research orientation lacking prioritisation	Creation of two Councils (political and technical) to devise priorities. Increasing prioritisation in RPF calls	While the two Councils were created a few years ago, they have not started operating effectively yet and have not met their purpose. The increasing prioritisation is still insufficient, in particular as there have been no calls in the last three years.

4 NATIONAL POLICY AND THE EUROPEAN PERSPECTIVE

ERA is seen by the Cypriot government as an opportunity to integrate the small national RTDI system in the broader European market. The policy mix adopted is in line with ERA objectives. The promotion of internationalisation of the research system is a high priority. National measures support participation in all EU research programmes and bilateral agreement with both member states and non EU countries exist and are regularly renewed. Cross-border networking and collaboration is reinforced also through openness of the majority of the national research calls to foreign researchers.

Comparatively satisfactory salaries coupled with financial assistance for research and employment support for young talented scientists make research an attractive career. Still there is a lack of adequate conditions for research activities (absence of large RIs and growing but still insufficient participation in international infrastructures, narrow research base, and insufficient demand for knowledge) which counterbalance the direct benefits. There is a wage gap for female researchers. The most challenging problem in relation to ERA is the extremely low business sector involvement in research, despite increasing incentives. The structural factors such as the small size and the composition of the productive structure of the economy constitute the major challenge.

Major problems in relation to ERA are the size of research infrastructure and cross border cooperation. However, in all areas progress is achieved but more is needed. There are, however, significant fears expressed that the current economic crisis will divert attention and resources away from RTDI policies. In particular:

More effective national research systems: The national research system in Cyprus is young and evolving. GERD and BERD were and remain among the lowest in the EU, despite efforts to increase them. Competitive funding has been introduced with a Framework Programme (DESMI), with increasing resources until three years ago. Competitive funds were allocated following an international peer review wit Greek researchers playing a prominent role as reviewers. Both institutional constraints and overall economic austerity affected this trend negatively. Efforts to restructure the governance system and focus on clear and long term priorities are under way for a long time but have delayed for internal reasons. Institutional evaluations are foreseen but not systematically pursued and are not linked to the distribution of block funding.

Optimal transnational co-operation and competition: The size of the research system in Cyprus and its peripheral geographical location are significant barriers to transnational cooperation. Joint research agendas are mainly adopted through EU incentives in the context of ERAnets, JTIs and Territorial Development Programmes of the Structural Funds. National funding schemes are open to European researchers. However, there are few key research infrastructures, developed mainly in cooperation with foreign research institutes, and they do not appear particularly attractive on a pan-European basis.

An open labour market for researchers: The labour market is open, thanks partly to a long term tradition of cooperation with the UK and Greece, originating from the time the country did not have its own HEIs. Recruitment is open and there is portability of grants. Although the market conditions are good in higher education, private demand is minimal leading to

substantial brain-drain mainly towards other EU countries and in particular the UK and Greece. Salaries that were attractive in HEIs were reduced due to the austerity package adopted to restore public finances.
Gender equality and gender mainstreaming in research: Gender equality is not an important topic. General provisions for the public sector apply in research as well. Gender issues are to be addressed with more emphasis in the future and are subject to a specific evaluation currently contracted by the Planning Bureau concerning all ERDF funding. There are no explicit targets for female participation at the moment but in December 2012, Cyprus joined a COST project on "Gender, Science, Technology and Environment" . A training course was also organised - Gender in EU-funded Research (Toolkit and Training) in cooperation with Yellow Window. Skill enhancement and incentives are established priorities.
Optimal circulation, access to and transfer of scientific knowledge including via digital ERA: Open access is an issue discussed at HEIs but not an explicit policy at the moment. SMEs do not have their own research laboratories and are thus not involved in such a debate.

Assessment of the national policies/measures supporting the strategic ERA objectives (derived from ERA 2020 Vision)

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6 LIST OF ABBREVIATIONS

ARI	Agriculture Research Institute
BERD	Business Expenditures for Research and Development
CALC	Cyprus Academic Library Consortium
CARIE	Cyprus Association of Research and Innovation Enterprises
CEIF	Cyprus Employers' and Industrialists' Federation
CERN	European Organisation for Nuclear Research
CII	Cyprus International Institute for the Environment and Public Health
CING	Cyprus Institute of Neurology and Genetics
COST	European Cooperation in Science and Technology
CSC	Cypriot Scientific Council
CUT	Cyprus University of Technology
CyI	Cyprus Institute
CYIX	Cyprus Internet Exchange
CyNet	Cyprus Research and Academic Network
DESMI	Research Promotion Foundation's Framework Programme for Research, Technological Development and Innovation
ECTC	European Credit Transfer and Accumulation System
EEWRC	Energy, Environment and Water Research Centre
EIS	European Innovation Scoreboard
EPO	European Patent Office
ERA	European Research Area
ERA-NET	European Research Area Network
ERP Fund	European Recovery Programme Fund
ESA	European Space Agency
ESF	European Science Foundation
ESFRI	European Strategy Forum on Research Infrastructures
EU	European Union
EU-27	European Union including 27 Member States
FDI	Foreign Direct Investments
FP	European Framework Programme for Research and Technology Development
FP	Framework Programme
FP7	7th Framework Programme
GBAORD	Government Budget Appropriations or Outlays on R&D
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GOVERD	Government Intramural Expenditure on R&D
GPP	Green Public Procurement
GUF	General University Funds
HEIs	Higher Education Institutions
HERD	Higher Education Expenditure on R&D
HES	Higher education sector
HPCL	High Performance Computing Systems Laboratory
HRST	Human Resources in Science and Technology
ICT	Information Communication Technology
IP	Intellectual Property
IU	Innovation Union
IUS	Innovation Union Scoreboard
JEREMIE	Joint European Resources for Micro to Medium Enterprises

JRC	Joint Research Centre
MCIT	Ministry of Commerce, Industry and Tourism
NCRI	National Research Council for Research and Innovation
NRP	National Reform Programme
NSDP	National Strategic Development Plan
OECD	Organisation for Economic Co-operation and Development
OP	Operational Programme
PCT	Patent Cooperation Treaty
PNP	Private non-profit sector
PRO	Public Research Organisations
R&D	Research and development
R&I	Research and innovation
RES	Renewable Energy Sources
RIs	Research infrastructures
RPF	Research Promotion Foundation
RTDI	Research Technological Development and Innovation
S&E	Science and Engineering
S&T	Science and technology
SF	Structural Funds
SME	Small and Medium Sized Enterprise
STARC	Science and Technology in Archaeology Research Centre
TTO	Technology Transfer Office
UNESCO	United Nations Educational, Scientific and Cultural Organization
UCY	University of Cyprus
VC	Venture Capital

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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.

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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.

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