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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 Andries Brandsma from JRC-IPTS. The contributions and comments from Jan van Steen, Ministry of Education, Culture and Science (The Netherlands), Piet Donselaar and Sander Kes, Ministry of Economic Affairs (The Netherlands) are also gratefully acknowledged.

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EXECUTIVE SUMMARY

The Netherlands is, in economic terms, among the better performing countries in the world. The Dutch expenditures on Research & Development (R&D) in terms of GERD as percentage of GDP amount to 2.04% (2011), which is slightly above the EU27 average (2.03%). Moreover, the R&D intensity has increased strongly from 2010 to 2011. Even without the statistical adjustment in 2011, it has shown consistent increase in the past few years. R&D intensity of the business sector (BERD) is relatively low (1.07% in 2011, while the EU27 average is 1.21%). In 2011, 36.96% of the total R&D was performed by the higher education sector (HERD), while the EU27 average was 23.2%. The business sector (BERD) is still the most important performer of R&D with 52.2% of the total R&D, but significantly below the EU27 average of 60.2%. The R&D performed by public research organisations (GOVERD) is with 10.84% around the EU27 average of 12.25%.

The international position of the Dutch HE sector is good with relatively high publication output and high impact-scores. Researchers in the Netherlands are one of the most productive in the world. The share of R&D personnel and researchers in the labour force is, however, relatively low.

The main actors and institutions in research and innovation governance system are the Ministry of Education, Culture and Science (OCW) and the Ministry of Economic Affairs (EZ). The main bodies responsible for managing and implementing policies are the Netherlands Organisation for Scientific Research ([NWO](#)), the Research Council for Technical Sciences (STW, an independent part of NWO), the Royal Netherlands Academy of Arts and Sciences ([KNAW](#)), and NL Agency (an agency of EZ).

The Netherlands has a large number of organisations that conduct research. A distinction is made between four main groups: 14 research universities (including the Open University Netherlands), 47 universities of professional education (specialized in technical and vocational training), research institutes (including private non-profit institutes) and companies. The Netherlands has many public research institutes, many of them are financed by [NWO](#) and the [KNAW](#). Both organisations take on the role of an umbrella organisation for research institutes that carry out basic and strategic research in various disciplines (2 for NWO and 11 institutes for the KNAW).

The Innovation Union Scoreboard 2013 shows, at the national level, that Netherlands can be found as the leader of the group classified as “innovation followers”. The Innovation Union Scoreboard 2013 shows a relative high improvement in the innovative performance in the Netherlands between 2010 and 2012. The Netherlands has experienced a growth performance rate between 2008-2012 of 2.7%. In particular, looking at the national innovation performance per dimension, the Netherlands appears among the 8 top countries in the dimensions: “human resources”, “open, excellent and attractive research systems”, “finance and support”, “linkages and entrepreneurship” and “intellectual assets”. However, it does not score above the EU27 average in the dimensions: “firm investments” and “economics effects”¹.

The Regional Innovation Scoreboard 2012², which replicates the methodology of the Innovation Union Scoreboard 2011 at the regional level, shows that in the Netherlands there are three moderate innovator regions (Friesland, Drenthe and Zeeland), four innovation followers (Groningen, Overijssel, Gelderland and Flevoland) and four innovation leaders (Utrecht, Noord-

¹ See European Commission (2013): [Innovation Union Scoreboard 2013](#)

² See European Commission (2012a): Regional Innovation Scoreboard 2012

Holland, Zuid-Holland and Noord-Brabant). Regarding, regional competitiveness, the first European Regional Competitiveness Index (RCI)³, which refers to the regional inclination and skills to compete, classifies three Dutch provinces among the top 10 most competitive European regions: Utrecht, North and South Holland. In the case of regional heterogeneity, the Netherlands appears to have a regional variation similar to the whole European average. This underlines the fact that competitiveness does not have a strong regional dimension in the case of the Netherlands comparing to other countries such as France, Spain or Belgium.

The Dutch national innovation system faces two main structural challenges: the lack of innovativeness and investments of the business sector and the (future) supply of human capital, especially in science & engineering.

The R&D intensity and innovativeness of the private sector is relatively low compared to other European countries. There are various indicators that point at this: BERD is moderated but shows a strong increase helped by the temporary measures implemented to encourage R&D in the private sector. In the last years, some signs of recuperation can be found, the Netherlands has experienced the fastest growth Non-R&D innovation expenditures and SMEs innovating in-house of all Member States (IUS 2013). Entrepreneurship in the Netherlands is also becoming stronger especially in terms of higher entrepreneurial intentions, a higher early-stage entrepreneurial activity and a higher rate of informal investment. Remaining weaknesses include the rates of product innovation and business innovation among early-stage entrepreneurs and the number of fast-growing enterprises.⁴ The share of R&D personnel and researchers in the labour force, has fluctuated during 2000-2011, showing an increase in the period 2009-2011.

In the last years, the Netherlands appears to have a structural challenge in human capital. Too many HE students dropped out too early, talented students were not sufficiently stimulated and challenged in their education, and the HE system was too inflexible to respond adequately to the varied demands from students and the labour market. The IUS 2013 shows still a reduction of -0.2% in the annual average growth of population aged 30-34 who completed tertiary education, with a higher percentage of females who completed tertiary education. The number of graduates in science & engineering is also well below EU average. However, in the last years, new doctorate graduates have experienced an important annual average growth of 7.9%, together with a moderate increase of 0.2% in the annual average growth of youth aged 20-24 that completed the secondary level of education.

The Inspectorate's Education Report of the State of Education in the Netherlands summarizes the main developments of the Educational System of the Netherlands during the years 2010-2011⁵. Among other factors, it shows that there have been favourable developments such as fewer presence of weak and unsatisfactory schools and study programmes, an increase the number of pupils and students who continue to higher forms of education and as a result an increase in the average level of national education⁶, and, a slight increase in the educational achievement in primary education, there were fewer early school leavers in secondary vocational education as comparing to previous years. Nevertheless, the report also shows that there is still room for improvement in the educational system of the Netherlands. In particular, in the level of

³ See [Dijkstra, L., Annoni, P. and K. Kozovska \(2011\) A New Regional Competitiveness Index: Theory, Methods and Findings, European Union-Regional Policy Working Papers, 02/2011.](#)

⁴ See EIM (2011): Global Entrepreneurship Monitor 2010 The Netherlands. The emergence of an entrepreneurial society

⁵ See Ministry of OCW (2012): The [State of Education in the Netherlands](#). Highlights of the 2010/2011 Education Report, *Education Inspectorate, Ministry of Education, Culture and Science*, April, 2012.

⁶ The number of young people with a higher education diploma is high in comparison with the rest of the world (OECD, 2011). The proportion of students attending senior general secondary education (HAVO) and pre-university education (VWO) is increasing as well.

the quality of teaching, there is a need for major investment in teacher professionalization to improve their complex skills, in the support provided to vulnerable pupils or students, in the boardroom attention for the quality of educational practices and for compliance with legislation and regulation and, in the performance of a number of small schools and study programmes.

In OCW's Strategic Agenda four main lines of action are identified: (1) a more stringent and ambitious study climate; (2) stronger distinguishing profiles and more differentiation in education; (3) stronger (public-private) collaboration in the triangle education-research-entrepreneurship; and (4) stronger distinguishing profiles and specialisation of knowledge institutes.⁷ Performance agreements were made between OCW and HEIs to make them accountable for the achievements in these four areas. The performance agreements result in a reduction of the number of study programmes, study programmes that are more relevant for the labour market, more focus and critical mass in research and more impacts of research. Other concrete policy measures include: a reallocation of budgets for a 'quality impulse' in higher education; changes in the allocation system for HE funding, with a large component for 'quality and profile'; and new laws and regulations to effectuate new policy measures for ensuring/-guaranteeing the quality of diplomas, study success, teaching quality and intensity, selection of students, differentiation in supply of study programmes and funding of HEIs. To support the top sector approach, the valorisation task of HEIs is better anchored (in the mission).

The national R&I strategy, by the EZ, includes a 'top sector' approach. The government has chosen nine 'top sectors',⁸ which are characterised by strong market and export positions, a good knowledge base, public-private collaborations and a potential to contribute to innovative solutions for societal challenges.⁹ For each top sector a 'top team' of entrepreneurs and researchers has been formed. These have been asked by the cabinet to make concrete proposals for these policy agendas. The results of these proposals have made the Government to focus in tackling, over the next few years, mainly in administrative problems. These will involve improving professional education, removing obstacles to trade, strengthening the infrastructure, scrapping unnecessary rules and ensuring easier access for knowledge workers.

The national R&I priorities are consistent with structural challenges in the Dutch R&I system. Much of the policy measures are aimed at increasing the R&D-intensity of the Dutch business sector, especially via the top sector approach. The challenges in human capital are also addressed in EZ's top sector approach and in OCW's Strategic Agenda. Many of the instruments of innovation policy which formed part of the top sector policy (RDA+, TKI-allowance, WSBO) have been enlarged in the budget for the following years. Other instruments will be phased out, such as the innovation programmes and the innovation vouchers programme, or have been stopped.

With regard to the alignment of the national policy mix with the ERA objectives, the following summarising conclusions are made:

1. Labour Market for Researchers: The share of R&D personnel and researchers in the Dutch labour force has experienced an important increase in the period 2009-2011. Entrepreneurship amongst

⁷ Profiles relate to specialisation and differentiation of universities vis-à-vis other universities in terms of research and/or education. Currently, universities are rather similar and do not have a distinguishing profile. The Strategy Agenda argues for more differentiation and specialisation between universities.

⁸ Agro-food; Horticulture and propagating stock; High-tech materials and systems; Energy; Logistics; Creative industry; Life sciences; Chemicals; and Water

⁹ The 'top sectors' largely overlap with the 'key areas' from the previous cabinet period. In the period 2007-2010 subsidies for innovation programmes in key areas were a major instrument in the innovation policy mix.

students and (young) researchers could however be improved. Recent changes in policy that address these challenges are: (i) More variation in researchers' training and allowing universities to introduce bursary PhD students; (ii) Action plans in the top sector approach to increase the number of students in science & engineering (at all levels); and (iii) More attention for entrepreneurship in education and alignment of education and training with business needs (in top sectors).

2. *Cross-border cooperation*: A main challenge would be to further explore and exploit opportunities for cross-border cooperation. However, there have not been recent policy changes.

3. *World class research infrastructures*: A main challenge is that there is no structural budget for large-scale research infrastructures. A recent policy change is that there will be investments in large-scale research facilities as part of reallocation of budgets to stimulate universities to create more distinguishing profiles. In addition, the national roadmap for large-scale research facilities will be updated.

4. *Research institutions*: A main challenge is to create more distinguishing profiles in education and research for universities: In OCW's Strategic Agenda, changes in the allocation system for HE funding are announced, with more attention for 'quality' (rather than quantity) and creation of a distinguishing profile. In addition, performance agreements between universities and the government are introduced.

5. *Public-private partnerships*: A main shift in national policy is the discontinuation of subsidies (e.g. from the FES fund) for PPPs in R&D. The new top sector approach put firms in the lead of developing public-private 'innovation contracts'. Firms are expected to contribute 40% of the budget. In addition, national policy has emphasised valorisation as a formal third mission of HEIs.

6. *Knowledge circulation across Europe*: National policy puts an emphasis on national knowledge circulation and R&D cooperation rather than cross-border circulation and cooperation. Policy is structured according to national top sectors rather than European challenges. The top sectors are expected to take the lead in developing cross-border collaborations – if this helps to improve the competitiveness of the top sector.

7. *International Cooperation*: The latest internationalisation agenda (national strategy for international cooperation) is from 2008 and there have not been main recent policy changes.

Among the country specific recommendations, promoting innovation, private R&D investment and close science-business links were among the 2012 Dutch commitments. The Netherlands has implemented many of the EU recommendations. Although being too early to judge whether the new measures on research and innovation policy are effective in addressing the challenge, some evaluation exercises have shown that the effects are in the right direction.

Regarding the monitoring and impact, during the last few years several activities have been undertaken to achieve an adequate monitoring and impact of the recent business policy¹⁰. The report includes several recommendations on how to measure the effects of specific policy instruments. The report is mainly focused in determining the direct impact of policy, given the fact that the secondary impact on economic and social growth requires a longer period of analysis. In the same line, the first evaluation exercise of the Top sector Policy¹¹ conducted by the CBS in consultation with the Ministry of Economic Affairs, Agriculture and Innovation (EL&I) emphasizes the importance of the leading sectors for the Dutch economy. Nearly a quarter of all companies in the Netherlands in 2010, belonged to a top sector. These companies together provided 38% of the Dutch production. The top sectors contributed significantly in terms of value added, FTE employment and export value of goods.

¹⁰ See: Ministry of EZ (2012): "[Durf Te Meten: Eindrapport Expertwerkgroep Effectmeting](#)"

¹¹ See: CBS (2012): "[Monitor Topsectoren: Uitkomsten eerste meting](#)", CBS, Centraal Bureau voor de Statistiek

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1 INTRODUCTION

The Netherlands - a unitary state - is a prosperous, densely populated country with 16.8 million inhabitants (2012) according to [Statistics Netherlands](#)¹², which amounts to 3.32% of the total EU27 population¹³. The Dutch knowledge economy is, in economic terms, among the better performing countries in the world. The share of the Netherlands in the total GDP of the EU27 is relatively high with 4.3% (2011)¹⁴. The GDP per inhabitant is well above EU27 average. In the period 2009-2011 it first grew from €31,000 per inhabitant to €32,100 and then grew again to €32,900 per inhabitant. Due to the economic crisis, GDP growth varied: while growth was moderate (1.8%) in 2008, it deteriorated heavily to -3.7% in 2009 and then started growing again 1.6% in 2010. In 2011 there was a small drop with 1.0% and for 2012 -0.3% growth is expected. In terms of GERD as percentage of GDP, however, the Netherlands performs above EU27 average (GERD = 2.04% in 2011). BERD in particular is relatively low (BERD = 1.07% in 2011). GBAORD in percentage of GDP, on the other hand, is well above EU 27 average (GBAORD = 0.83% in 2011).

According to the [Innovation Union Scoreboard 2013](#), the Netherlands is one of the *'innovation followers'*, with innovation performance below those of the *'innovation leaders'* but above that of the EU27 average (i.e. less than 20% above but more than 10% below that of the EU27)¹⁵. Within this group, the Netherlands is, however, a *'moderate grower'* maintaining the level of the Innovation Union Scoreboard 2011. According to the IU Scoreboard 2013, the Netherlands has relative strengths in 'Open, excellent and attractive research systems'¹⁶ and for "Linkages and entrepreneurship". It also appears in the top-8 innovation performers "Human resources", 'Finance and support' and 'Intellectual assets'. Relative weaknesses are in 'Firm investments' and 'Innovators'. The Netherlands has experienced the fastest growth in "Non-R&D innovation expenditures" and "SMEs innovating in-house" of all Member States. A strong decline is observed for "Knowledge-intensive services exports".

The business sector structure of the Netherlands is characterised by a number of strong sectors, i.e. the community services, business activities and the ICT sectors, electronic equipment and office machinery industries, the chemicals and the food industry and mining (natural gas & oil) and agriculture¹⁷. A large part of R&D by Dutch businesses is performed by a limited number of large multinationals.

The structure of the national research and innovation system and its governance is presented in the figure below:

¹² Statistic Netherlands (2012). Population counter.

¹³ Eurostat (2012). Total population. The 2012 estimate of the total EU27 population is 503.7 million.

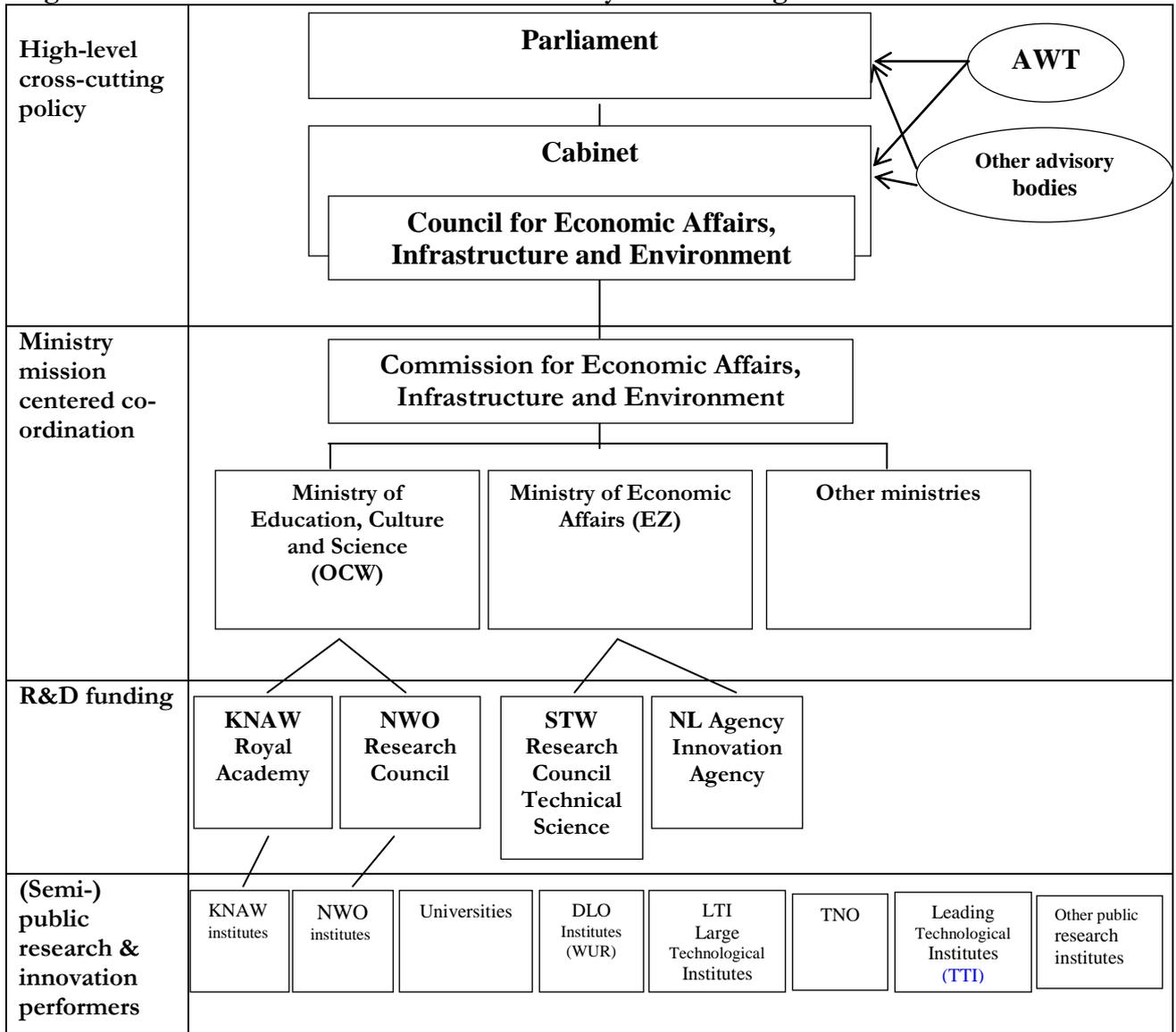
¹⁴ Eurostat (2012), Gross domestic product at market prices; Millions of Purchasing Power Standard. The GDP (2011) of the Netherlands is €548.6 billion, the GDP (2011) of EU27 is €12,651.0 billion.

¹⁵ Other *'innovation followers'* in 200/2011 are Austria, Belgium, Cyprus, Estonia, France, Ireland, , Luxembourg, Slovenia and the UK (source: [Innovation Union Scoreboard](#) (IUS) 2013).

¹⁶ The Netherlands has the most open, excellent and attractive research system due to its strong performance in both "International scientific co-publications" and "Most cited publications".

¹⁷ ERAWATCH (2006) Country Specialisation Report: The Netherlands, June 2006.

Figure 1 The national research and innovation system and its governance



Source: Own elaboration based on the Erawatch Country Report 2011: The Netherlands

The main actors and institutions in the Dutch science, research and innovation governance system are the Ministry of Education, Culture and Science (OCW) and the Ministry of Economic Affairs (EZ). The main bodies responsible for managing and implementing policies are the Netherlands Organisation for Scientific Research (NWO), the Research Council for Technical Sciences (STW, an independent part of NWO), the Royal Netherlands Academy of Arts and Sciences (KNAW), and NL Agency (an agency of EZ). Additionally, the Advisory Council for Science and Technology (AWT), an independent body, advises the government and parliament on policy relating to scientific research, technology development and innovation in both at national and an international context. Finally, a Knowledge Forum has been established with the aim of strengthening interactions between senior civil servants and research institutions¹⁸.

The Netherlands has a large number of organisations that conduct research. A distinction is

¹⁸ Other institutions may advise on issues related to the knowledge-based economy, as part of their regular duties. Among them, the Advisory Council on Government Policy (WRR), the Social and Economic Council of the Netherlands (SER), the Netherlands Institute of Social Research (SCP), the Netherlands Bureau for Economic Policy Analysis (CPB) or the Netherlands Environmental Assessment Agency (PBL).



made between four main sectors: 14 research universities (including the Open University Netherlands), 47 universities of professional education (specialized in technical and vocational training), research institutes (including private non-profit institutes) and companies. Secondly there are many public research institutes. Some of them are financed by the [NWO](#) and the [KNAW](#): both organisations take on the role of an umbrella organisation for research institutes that carry out basic and strategic research in various disciplines.

2 RECENT DEVELOPMENTS OF THE RESEARCH AND INNOVATION POLICY AND SYSTEM

2.1. National economic and political context

Like many other countries in the Eurozone, the Netherlands suffered slowing growth, rising unemployment and declining inflation in the last two years. The second half of 2011 tipped the Netherlands officially into a recession and in 2012 the government expected the economy to shrink by 0.5%. The conclusions raised in the Budget Memorandum of 2013 are that the Dutch economy shrunk continuously because the decline of domestic demand (domestic consumption, investment and government spending in 2012). In addition, the exports declined in 2011 and 2012, partly as a result of the economic recession. In 2012, for the fourth consecutive year, there was a budget deficit that exceeded the agreed European standard of the 3% of the GDP. The Dutch government expects a lower potential economic and productivity growth in the coming years, mainly because the population growth is reducing because of falling birth rates in recent decades, combined with a longer life expectancy. Despite the growing debt, Dutch economy has not experienced problems in financing the debt.

In April 2012, the Dutch prime minister Mark Rutte tendered his government's resignation after the Freedom Party (PVV) decided to withdraw its parliamentary support for the minority coalition of the pro-business People's party for Freedom and Democracy (VVD) and the Christian Democratic Appeal (CDA). This meant a political deadlock for the months to follow. New general elections were held on 12 September 2012. In the meantime, on 26 April 2012 an agreement was reached by the VVD and the CDA, both parties of the previous minority coalition, and three other parties: the Democrats 66 (D66), a progressive, social-liberal democrat party, GreenLeft (GL), the green party, and the Christian Union (CU), the Christian party. In this so-called 'spring agreement' important measures with regard to future government budget development have been affected. The three parties were able to reach an agreement with the minority government on the budget deficit to be cut to below 3%, as required by a European Commission deadline.

In September 2012, general elections were held and in November 2012 a new government coalition was established. In this new cabinet, as it was the in the previous one, innovation policy is closely related to science policy and is mainly the responsibility of the Ministry of Economic Affairs (EZ), former Ministry of Economic Affairs, Agriculture and Innovation (EL&I). The core of the new enterprise policy, the top sector policy, developed by the previous government in February 2011, was reaffirmed in the Coalition Agreement of October 2012. The cooperation between enterprises, scientific institutions, regions and the government has continued within the current financial framework.

Over the past years, 2011 and 2012, the Government planned to tackle administrative problems.¹⁹ This involved improving professional education, removing obstacles to trade, strengthening the infrastructure, scrapping unnecessary rules and ensuring easier access for knowledge workers. In addition, 1.5 billion euros of research funding were targeted at the nine leading sectors across the entire government budget. Entrepreneurs, the authorities and research

¹⁹ See: [The Dutch Science System: Innovation Policy](#).

institutions in each sector set up their own agendas, which were presented to the Ministry of EL&I on 17 June 2011.

The budget proposals for the year 2013 have as a background the economic crisis and the financial setbacks suffered in previous years. The budget proposals aim at repairing and reinforcing the Dutch economy damaged by the economic recession. Sound public finances and a shock-resistant and resilient economy are the basis of the Budget Agreement of 2013. The agreement of the five cooperating parties includes a 12 billion package with substantial measures on labour issues such as changes in the retirement age and the housing market reform²⁰. With the measures in the Budget Agreement 2013 the government ensures the 3 % target.

Regarding businesses, the budget agreement shows that bankruptcies in the industry have increased since 2007²¹. In the second quarter of 2012, 2009 companies declared themselves in bankrupt, which represents an increase of 24% compared to the second quarter of 2011, but a decrease compared to the first quarter of the same year. Despite the bankruptcies increase the total number of farms has increased since 2007. The number of companies in all years since the crisis is larger than the numbers of deaths. This is partly explained by the number of self-employed since 2007 which has increased by nearly 100,000 to 728,000 in 2011²⁴. The Dutch industry (specially SMEs) is highly dependent on bank financing, this is the main reason why the new budget proposals include a series of measures to make the Dutch SMEs become less dependent on bank credit. The government supports lending through schemes such as the Surety SME loans (BMKB) and the Export Credit Insurance (EKV). There are also new arrangements set as the Enterprise Guarantee Facility (GO) and the Export Credit Guarantee (ECG) to increase the competitiveness of the Dutch industry. The government also supports the creation of private initiatives that complement the public ones, such as SME funds debt or equity offerings, crowdfunding, credit unions for private loans.

An overview of the resources available for innovation and research can be found in the [“Memo multiannual budgetary image innovation and research and top sector policy”](#) published by the Ministry of Economic Affairs (EZ). The memo provides an overview of the development of public investment in research and innovation in recent years. It also looks at the effects of the coalition agreement of the Cabinet on the budgets for research and innovation and the leading sectors in the coming years.

The memo shows that the Netherlands has further invested in innovation and research since the beginning of the crisis. Netherlands scores well in funds for R&D in comparison with other European countries and above the EU average (in 2011: NL 0.83% of GDP, EU27, 0.73%). The increase in public investment in research and innovation in the last years came partly to temporary measures. The tax deduction for research and development (WBSO) was expanded in 2009-2010. Under the knowledge scheme, researchers from industry could work partially at public research institutions. And the Economic Structure Enhancing Fund (FES) encouraged the investment in high-tech initiatives. These two temporary measures provoked a visible “investment peak” during the years 2010-2012.

2.2. Funding trends

The expenditures on Research and Development (R&D) in terms of GERD as percentage of GDP amount to 2.04% (2011), which is slightly above the EU27 average (2.03%). Moreover, the

²⁰ For further information on the budget see: <http://www.rijnsbegroting.nl/2013/overzicht/begrotingsstaat>

²¹ Source: CBS

R&D intensity is apparently stable, rather than growing (see table below). Especially the R&D intensity of the business sector (BERD) is relatively low (1.07% in 2011, while the EU27 average is 1.21%). On the positive side, in 2011, 36.96% of the total R&D is performed by the higher education sector (HERD), while the EU27 average 24.2%. The business sector (BERD) is still the most important performer of R&D with 52.2% of the total R&D, but significantly below the EU27 average of 60.2%. The R&D performed by public sector (GOVERD) is with 10.8% around the EU27 average of 12.25%.

Table 1: Basic Indicators for R&D investments in the Netherlands

	2009	2010	2011	EU27
GDP growth rate	-3.75	1.67	1.0	-0.3 (2012)
GERD as % of GDP	1.84	1.85	2.04	2.03s (2011)
GERD (euro per capita)	631.3	657.1	738bp	510.5s (2011)
GBAORD Total R&D appropriations (€ million)	€4,953.726	€5,112.248	€4,740.148p	€91,277.1 (2011)
R&D funded by Business Enterprise Sector (% of GDP)	0.85	0.89	1.07bp	1.26 (2011)
R&D performed by HEIs (% of GERD)	40.2	40.3	36.9p	24.0 (2011)
R&D performed by Government sector (% of GERD)	12.7	11.7	10.8s	12.7 (2011)
R&D performed by Business Enterprise sector (% of GERD)	47.1	47.9	52.2	62.4 (2011)
Share of competitive vs. institutional public funding for R&D	n/a	n/a	n/a	n/a

Source: Eurostat, March 2013. Note: s=Eurostat estimation, p=Eurostat prevision, bp= prevision with break.

The national investment target is GERD=2.5% of GDP in 2020 (3% in EU). Because of the sector structure in the Dutch economy – with a large service sector and a small high-tech sector within a relatively small industry sector – a 2.5% target is argued to be more realistic and appropriate than a 3% target. An employment rate of 80% of the population to be employed is the target set in 2020 (EU: 75%). The National tertiary education attainment target for 2020 is set around 40-45%.

The following table shows a historical summary of the government resources for innovation and research for the years 2008-2016. Total public expenditures on research and innovation show an increase of €0.7 billion in 2016 compared to 2008. The government reconsidered the way in which support to research and innovation helps to stimulate economic growth. This resulted in a major shift in the use of resources. The grants for businesses have been reduced. The analysis shows a reduction in resources devoted to applied research comparing to an increase to financial resources that makes it more fiscally attractive for companies to invest in research and development (see the resources increase in the RDA scheme or Innovation box). Finally, the table incorporates the resources earmarked for the top sector policy. The top sector policy encourages the public-private cooperation programs with a stronger emphasis on the collaboration between entrepreneurs and researchers embedded in the strategic knowledge in leading sectors.

Table 2. Historical summary resources for innovation and research for the period 2008-2016

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Research resources									
1.Fundamental Research	2,975	3,122	3,183	3,234	3,280	3,282	3,309	3,269	3,293
First flow ¹	2,434	2,458	2,500	2,578	2,572	2,587	2,622	2,637	2,663
Second flow ²	541	664	683	656	708	695	687	632	630
Intensification coalition in 2012 ³							[PM]	[PM]	[PM]
2.Applied research	512	503	488	455	453	407	384	368	361
Fiscal resources									
3.Total	797	1,054	1,497	1,546	1,777	1,753	1,765	1,698	1,698
WBSO ⁴	447	704	872	921	902	753	733	733	733
RDA					250	375	500	500	500
Innovation Box ⁵	350	350	625	625	625	625	625	625	625
Task coalition in 2012							-93	-160	-160
Spending departments									
Innovation expenditures									
4.EZ	566	654	701	738	687	668	683	548	444
TKI surcharge						90	200	200	200
5.Expenditure innovation and research other departments	751	936	1,077	939	858	686	644	606	589
Relevant to top sectors ⁶					130	131	125	126	132
6.Grant mission coalition 2012							-54	-60	-60
EZ							-46	-52	-52
Other departments							-8	-8	-8
Total	5,601	6,269	6,946	6,912	7,055	6,796	6,731	6,429	6,325
Abolish PMOS							[-47]	[-47]	[-47]

Source: [Kamerstuk](#), 13 December 2012.

Note: amounts (in millions of euros) according to the budget, unless otherwise indicated

1. Source of facts and figures: Summary total Research Funding (TOF) from 2010 to 2016 by the Rathenau Institute: Public expenditure universities includes the WUR and government funding for research at UMC
2. Cover expenditure on NWO and KNAW. Amounts are on a cash basis. Share of wages and price adjustments are not computed. 2011 expenditures are actual figures. The funding for the years 2012 and beyond are based on the budget for 2013.
3. There are 75 million invested in basic scientific research. This rises to 150 million structurally.
4. Includes supplementary fiscal package for innovation (WBSO)
5. In 2010, policy EXTENSIONS applied as broadening the definition, termination of the limitations and reductions of the tariff.
6. Amounts summary table top sectors and industry policy, budget of Economic Affairs 2013, p.21.

2.3. *New policy measures*

In February 2011, the previous government presented a new action plan for secondary vocational education (MBO) focusing on skills, covering 2011-2015 and this is still under implementation until a new one appears. In order to reduce the drop-out rate from the 2012/2013 school year onwards, students in vocational training will be able to enrol in fields of training containing modules from different courses with related content, rather than following standard courses.

The new strategy [“Quality in Diversity”](#) for higher education/advanced vocational education and training calls for a streamlining of the existing system using performance agreements, with less but better focused study programmes, in particular in professional higher education, including a clear call for additional training of teachers.

- **Generic fiscal incentives** play a large role in the policy mix. First, a new RDA (R&D Deduction) scheme was introduced in 2012. The aim of RDA was to make investments in innovation more attractive (from a fiscal perspective). The RDA offers a higher tax relief for R&D investments in capital equipment and exploitation costs. The RDA is introduced in 2012 and the budget will increase to €500 million in 2015, making it one of the largest measures in the innovation policy mix. It is complementary to the ‘old’ WBSO scheme offering a tax relief on R&D wage costs. The budget is €864 million in 2012. In addition, the ‘innovation box (625 mln.) will be evaluated in 2013. The new government will reduce the budget for fiscal incentives by €160 m (which instruments will bear the burden, is to be decided later in 2013). The RDA+ scheme is a new tax credit scheme to promote private-public partnership in Top Consortia for Knowledge and Innovation (TKIs), it is a measure that will be only identified for the “top sectors” of the economy.

Included in previous table 2, the new measures of the new government in the field of research and development can be summarized as follows:

- **TKI-surcharge:** the government makes for 2014, €110 million free for Top-consortia for Knowledge and Innovation (TKIs). The previous government has €90 million for the TKI-charge (a contribution in addition to the contribution that businesses make to the study of the TKIs). In total the budget for 2014 raised the €200 million.
- **Expenditure in top sectors:** the coalition has a target of €60 million in spending on business policy and leading sectors.
- There is an agreement for increasing the proportion of funding for **applied research** ([TNO](#), [DLO](#) and [LTI](#)) for the top sectors (is expected €250 million in 2016).
- The government is investing €75 million in **fundamental research**. There will be a contribution by the NWO of €235 million for Innovation Contracts during the period 2012-2013. In accordance with the coalition agreement in 2015, it is expected to designate €275 million for excellent basic research in the leading sectors within the means of the NWO. It is also expected to implement a target for central government grants from 2014 and an additional AAA discount from 2016. These discounts can be affected by the availability of funds for basic research.
- There will be more money available for **financing and partnership** among European research programs (particular emphasis is devoted to Horizon 2020), thanks to the increase in the budget for the **TKI-allowance** (€110 million) and for **fundamental research** (€75 million rising to €150 million).
- **Taxation:** the coalition agreement contains a mission statement on the fiscal measures for promoting R&D (RDA, Innovation box and WBSO) from €93 million in 2014 and €160 million from 2015. The RDA+ scheme is a new tax credit scheme to promote private-

public partnership in Top Consortia for Knowledge and Innovation (TKIs), it is a measure that will be only identified for the “top sectors” of the economy.

- In the coalition agreement, the **Company of Public Organisations (PMOs)** and **PBO tax** are expected to disappear from 2014. This has particular implications for the top sectors Agri&Food and Horticulture and starting materials, because the contribution of the PMOs was part of the private contribution to the Innovation Contracts, with a reduction of €47 million. The government is expected to come with a solution to the problem during the summer of 2013.

Support measures for innovation in SMEs

Additionally, to the fiscal measures, there are other support measures for innovation in Small and Medium Enterprises under the [SME Innovation Fund+](#). Starting in January 2012, the SME Innovation Fund+ builds on existing successful among other financing instruments such as the Innovation Credit and the SEED Capital Scheme. The EZ has allocated a total of €500 million for the period 2012 to 2015. The SME Innovation Fund+ includes the financial instruments available for innovation and funding fast growing innovation companies. It consists of three main pillars: [Innovation credit](#), [Seed Capital Scheme](#) and [Fund-of-funds](#).

- **Innovation credit** is issued directly to innovative companies with a financing need (25%-35% of credit). The budget will increase from €47.5 million to €95 million. The minimum project cost size is reduced from €300,000 to €150,000. For projects that needs a certification, the project duration will be extended to six years and the repayment period to 10 years. The company pays back the loan if the project is successful. If the project failed then the loan can be converted to a grant.
- **Seed capital scheme** focuses on high technology or creative entrepreneurs. It provides public venture capital investment funds. The scheme improves the return-to-risk ratio for investors.
- **Fund-to-funds** provides access to venture capital to fast growing innovative companies. This scheme began in January 2013 with an amount of €150 million (€100 contributed by Dutch government and €50 million by the European Investment Fund).

2.4. *Recent policy documents*

National Reform Programme 2012 for the Netherlands

In April 2012, the Dutch government submitted its [National Reform Programme 2012](#) to the European Commission. In the field of enterprise policy, the Top Sector agendas have been endorsed and sectoral "innovation-contracts" have been signed between the governments and industry representatives. Support to private research is being increased through the introduction of the research and development (RDA+) tax deduction scheme as part of the incentives to further promote innovation, private R&D and closer science and businesses.

The Netherlands has set itself the target of spending 2.5% of gross domestic product on research and development (R&D) by 2020. The government will pursue this ambitious target by implementing its new policy for the business sector ("[Naar de Top](#)") in 2012 and the Quality in Diversity strategic agenda ("[Kwaliteit in verscheidenheid](#)"), which presents a long-term scenario for higher education, research and science. The government recognises that R&D expenditure is an important input indicator but a country's innovative capacity should be assessed mainly on its output. Innovation output depends on other factors besides R&D, such as human capital, entrepreneurship and public authorities implementing a coherent facilitating policy.

In August 2012, European Council produced the assessment of the 2012 national reform programme and stability programme for the Netherlands. Research and innovation measures are assessed in the report under the section of structural measures promoting growth and competitiveness. Among the recommendations, the report makes explicit that although the Dutch research and innovation system has managed to maintain and in some areas improve its innovative capacity, the relative underperformance of the Netherlands in private research and development expenditure may reduce future economic growth and weaken the competitiveness of the Dutch economy.

Stability Programme of the Netherlands

The 2012 update of the Dutch Stability Programme was approved by the Dutch Council of Ministers on April 23rd 2012 and discussed in Dutch Parliament on April 26th 2012. On April 27th, a final document (written in Dutch) was sent to both Parliament and the European Commission.

The Stability Programme focuses on macroeconomic developments, budgetary developments and budgetary policies, whereas the National Reform Programme considers policy measures related to the priorities of the Europe 2020 strategy.

Among the Dutch policy measures mentioned in the Dutch Stability Programme that can have an effect in the Dutch research and innovation system, can be found:

1. Regarding business:
 - A number of reservations for lower corporate taxes will be withheld (430 million euro). The tax treatment of the acquisition of Dutch subsidiaries with debt will be adjusted to limit interest deductability (“deelnemingsrente”; 150 million euro).
 - The bank levy will be doubled, from 300 million euro in revenue to 600 million. The taxable base is the total amount of the unsecured debts of the bank. Doing so, the government aims to reduce risks and strengthen financial stability.
2. Regarding education
 - Efficiency gains will be realized in health care and education by reducing the administrative burden.

The document also incorporates the policy developments that have been implemented in the last years following previous recommendations by the European Council (see previous subsection).

New Government and New government coalition

In September 2012, general elections were held and in November 2012, a new government coalition was established. In the new government coalition agreement some aspects of the new research, education and innovation policy can be seen. Among them, the increase in funding addressed to education and research with respect of previous years.

The agreement of the five cooperating parties includes substantial measures in the labour market and a housing market reform. Its R&I strategy follows, with some modifications, the one incorporated by the Ministry of Economic Affairs (EZ): [“To the top: Towards a new enterprise policy”](#) (February 2011). That was followed by [“To the top: Enterprise policy in action\(s\)”](#) (September 2011) - for the Dutch original see [here](#); and OCW's [‘Quality in diversity: Strategic Agenda Higher Education, Research and Science’](#) (July 2011) (Original document see [here](#)). For the new measures adopted by the new coalition cabinet see the new [Budget Agreement 2013](#). At the request of the Cabinet, several top teams constituted by representatives from the industry, research institutes and government, contribute actively to the strengthening of the new enterprise policy with the objective to increase the competitiveness and the knowledge base of

the Dutch industry. An important assumption is that Dutch companies are given the opportunity to do business, invest, innovate and export. The government has implemented various actions based on the advice of the top teams. An example of this is the tax deduction of investments in Research and Development (R&D).

In EZ's R&I strategy, entrepreneurship is considered as crucial for wealth creation in the Netherlands. It is argued that societal and economic challenges demand for a policy that gives 'room for entrepreneurs'. Indeed, entrepreneurs - rather than the government - seize economic opportunities and creates economic growth, jobs and wealth. The government should not steer with rules and subsidies. Instead, it should ensure that companies have sufficient room to do business, to invest, to innovate and to export. The government strengthens the commitment to public-private collaboration between entrepreneurs, researchers and government in the top sectors. On balance, the new budget proposal shows a solid financial base under the top sector policy. Key elements in the current enterprise/innovation policy are:

- less subsidies in exchange for lower (corporate) taxes and tax incentives;
- less and simpler rules;
- broader access to corporate finance (credit facilities);
- better utilisation of the public knowledge infrastructure by businesses - especially in the 'top sectors'; and
- better alignment of fiscal policy, education policy, foreign policy and diplomacy with the needs of businesses - especially in the 'top sectors'.

The formal longer-term policy ambition is:

- The Netherlands in the top 5 of knowledge economies in the world (in 2020);
- Increase of Dutch R&D-expenditures to 2.5% of GDP (in 2020);
- Creation of [Top consortia for Knowledge and Innovation](#) (TKIs) in which public and private parties participate for more than €500m, of which at least 40% is funded by the business sector (in 2015).

The basic rationale for the enterprise/innovation policy is that globalisation and societal challenges (e.g. ageing, food security, scarcity of raw materials, reduction of biodiversity and climate change) not only create threats but also (economic) opportunities that can be seized by companies. This requires an excellent public knowledge infrastructure that is better aligned with the needs of the business sector and a business sector, which invests more in R&D and innovation. Furthermore, strong regional clusters are important because they contribute to the attractiveness of the Netherlands as a location for (foreign) knowledge-intensive companies. Therefore, the national and regional governments should collaborate more intensively. In the national R&I strategy, regional governments are invited to align their policy agenda (and budgets) with the priorities in national policy. Also the European level is considered as important, not only in terms of the internal market and a level playing field, but also in terms of aligning 'top sectors' in the Dutch economy with EU programmes for R&I (Horizon 2020).

The national R&I strategy identifies nine 'top sectors': Agro-food; Horticulture and propagating stock; High-tech materials and systems; Energy; Logistics; Creative industry; Life sciences; Chemicals; and Water. The top sectors build on the unique strengths of the Dutch economy. They are characterised by strong market and export positions, a good knowledge base, public-private collaborations and a potential to contribute to innovative solutions for societal challenges.

In an interactive policy process, the government, the business sector and knowledge institutes in the top sectors will jointly identify the problems and opportunities for each sector. In the sectoral approach all relevant policy domains (e.g. education policy, research policy, foreign

policy, environment policy, among others) are combined in integral policy agendas. For each top sector a 'top team' of entrepreneurs and researchers has been formed. These have been asked by the cabinet to make concrete proposals for these policy agendas.

For the coming years, the government puts the top sector policy in the center of the new Budget Agreement. In the coming years, the top sectors will especially benefit from the increase in the budget for the [Topconsortia for Knowledge and Innovation](#) (TKIs), the extra investment in basic research and the space for co-financing and matching of European programs. The coalition agreement, in addition to research and innovation for the top sector policies, include measures to reshape the technology pact with the aim to increase the connection between education and the labour market, the (domain) approach to regulatory pressures and the design of a new revolving fund of 750 million € for industrial development.

Agreement with the US on cooperation in science and technology

On 29 November 2012, the [Agreement](#) between the Government of the Kingdom of the Netherlands and the Government of the United States of America on cooperation in science and technology concerning homeland and civil security matters, was concluded and provisionally applied. The Agreement aims to enforce cooperation in scientific and technological research concerning homeland and civil security matters, especially cyber security. With respect to the Kingdom of the Netherlands, the Agreement applies only to the European part of the Netherlands.

2.5. Research and innovation system changes

The most recent description of the research and innovation Dutch system can be found in the publication [The Science System in The Netherlands: and organisational overview \(April 2012\)](#).

The majority of the research and innovation system changes are related to the new measures and funding structure included in the new [Multiannual Budget Agreement](#)²².

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

Regarding structural funds, the Netherlands has been allocated almost €2 billion in total for the period 2007-2013 (€1.7 billion under the Regional Competitiveness and Employment Objective and €247 million under the European Territorial Cooperation Objective). All Dutch regions belong to the Regional Competitiveness and Employment Objective. Under this Objective, the Netherlands has five programmes: one national programme co-financed by the ESF and four regional programmes co-financed by the ERDF. Promotion of research and innovation is the most important strategic priority for the Netherlands in 2007-2013. In financial terms, the Netherlands plans to invest over €800 million of Structural Funds (49% of its total Community allocation) in fields that will promote research and innovation.

In the Netherlands four regions will absorb European Structural funds in the new programming period 2014-2020: North, East, South and West. With their regional focus on regions, the Structural funds can be seen as supplementary to the Dutch top sector policy. Both Dutch top sector policy and European Structural funds put research, entrepreneurship, technological development and innovation firmly on the agenda for the coming years. Some examples of the Dutch regional Smart Specialisation Strategies can be found. Among them, the Brainport 2020,

²² For a more detailed information see: <https://zoek.officielebekendmakingen.nl/dossier/32637/kst-32637-47?resultIndex=4&sorttype=1&sortorder=4> and <http://www.rijksbegroting.nl/2013/overzicht/begrotingsstaat>

developed in 2010, has been considered as an example of Regional Research and Innovation Strategy on Smart Specialisation (OECD, 2012) or the case of Limburg (Foray et al., 2011).

2.7. Evaluations, consultations

In the last years, different evaluation and monitoring activities have been undertaken. A general picture of the evolution of the Dutch economy can be found in the note: “[Nota Over de Toestand Van’s Rijks Financiën. Tekstgedeelte van de Miljoenennota 2013](#)”. It is a description of the state of the National Finances, presented in September 2012.

With the aim to develop a series of activities to achieve an adequate monitoring and impact analysis of the financial budget, the Dutch government established the Commission Theeuwes. The Commission Theeuwes, a panel of experts on policy evaluation commissioned by the Ministry of Economic Affairs, was constituted by scientists, the Central Planning Bureau, the General Court (as observers), the Central Bureau of Statistics, the NL Agency and the EZ Ministry itself. The Commission has elaborated two reports. “[Durf Te Meten: Eindrapport Expertwerkgroep Effectmeting](#)” presents a series of recommendations on how the effect of policy can be made more visible, and some proposals for the evaluation of policy designs. “[Bedrijvenbeleid in cijfers](#)” offers statistic to monitor the progress and impact of the top sector policy.

Regarding the top sector approach, the Central Bureau of Statistics (CBS) in consultation with the Ministry of Economic Affairs, Agriculture and Innovation (EL&I) and the Centre of Policy Statistics (EB) has elaborated the first monitoring report of the policy based on a consistent statistical overview of the economic position of the top sectors: “[Monitor topsectoren: Uitkomsten eerste meting](#)”. The aim of the report was to obtain a picture of the top sectors in the form of (macro)economic indicators, that can be followed over time and thus contribute to the monitoring analysis of the evolution and development of the selected leading sectors²³.

Among others, the results show that nearly a quarter of all companies in the Netherlands in 2010, belonged to a top sector, and accounted for 38% of the Dutch production. This total of over 260,000 companies, the majority small and medium enterprises (SMEs), provided a production of €429 billion in 2010. The top sectors contributed to the 21% of the total full time employees (1.4 million persons employed in FTEs). With €149 billion generated, the top sectors contributed to the 40% of the total export value of goods in the Netherlands in 2010. Around the 96% of the total private R&D spending belongs to the top sector, being high-tech systems and materials the largest contributor. In the Netherlands, 35% of the employment are knowledge workers²⁴, the knowledge workers represent 32% of the workers working in the top sectors, with important disparities within them. In each top sector innovation plays an important role. In 2010, around 50% of the companies belonging to the top sectors are innovative, this figure was similar to the average of the whole population of Dutch companies in the same year. In 2010, spending in innovation²⁵ by the leading sectors reached the 8.5 billion euros, about two thirds of the total amount of spending in the Netherlands.

The evaluation or consultation, within the context of the Europe 2020 strategy, can be found the report of the [contribution to the social partners to the National Reform Programme](#). The report contains the social partners’ main contributions towards meeting the Europe2020 goals as a result of the consultation by the Labour Foundation and the Social Economic Council (SER).

²³ See as well, [Brief van de Minister van Economische Zaken, landbouw en Innovatie](#)

²⁴ Workers with at least a college education.

²⁵ These include among others spending on own and outsourced R&D, associated equipment, and other external knowledge training.

The report elaborated by the Labour Foundation (*Stichting van de Arbeid*) indicates the measures that social partners undertook to reach the targets during the period April 2011 to March 2012.

Among the measures related to innovation and business development, we can find a series of Social and Economic Council (SER) advisory reports, for example:

- [report on supporting initiatives to strengthen the private sector of developing countries](#)
- [report on greater differentiation in higher education.](#)
- [report on development through sustainable enterprise](#)

Other measures that have been taken in the area of business and innovation are the conferences and symposium organized by SER, such as, the one organized on 1 February 2012, *The new generation of entrepreneurs and workers*, where entrepreneurs, new workers and their representatives engaged in a debate within the SER regarding the changes in the labour market and their consequences.

And additional analysis of the innovation performance changes since the launch of the Europe 2020 strategy can be found at the Innovation Union Scoreboard 2013. The Europe2020 Innovation Union flagship initiative was launched by the European Commission in October 2010 aiming to improve Europe's innovation performance. The IUS 2013 analyses the progress made since late 2010 by comparing innovation performance for 2012 with that of 2010 using the IUS 2013 set of indicators. The analysis shows that the Netherlands shows the greater innovation performance improvement between 2010 and 2012.

2.8. Policy developments related to Council Country Specific Recommendations

The Netherlands has made a number of national commitments under the Euro Plus Pact. These commitments, and the implementation of the commitments presented in 2011, relate to fostering employment, improving competitiveness, reinforcing financial stability, and enhancing sustainability of public finances. The Commission has assessed the implementation of the Euro Plus Pact commitments. The results of this assessment have been taken into account in the recommendations.

In June 2011, the Commission proposed four country specific recommendations for economic and structural reforms policies for the Netherlands. In July 2011 the Council adopted these recommendations which concerned economic and structural reform policies. The four country specific recommendations addressed to the Netherlands referred to public finances, the pension system, the labour market, innovation, and investment in research and development.

On 27 April 2012 the Netherlands presented updates of its national reform programme and stability programme detailing progress made since July 2011 and plans going forward.

During the summer of 2012, the Commission produced a series of documents with the overall assessment of the 2012 National Reform Programme and Stability Programme for the Netherlands. The overall assessment is centered in the most important challenges that the country faces: fiscal consolidation, long-term sustainability of public finances (in particular pensions), the labour market, innovation policy, education, and the housing market. The Commission considers that the policy plans submitted by the Netherlands to help overcoming these challenges, such as the proposal to increase the retirement age, are for a large part relevant. However, several measures appear insufficiently specified or quantified and in some areas, the policy plans fall short of addressing the challenges in a comprehensive way. In particular, the

strategy for the promotion of private R&D investment is not accompanied by an impact assessment and a monitoring framework.

Following the assessment, the Commission recommends that the Netherlands take action within the period 2012-2013 to:

1. Ensure timely and durable correction of the excessive deficit. To this end, fully implement the budgetary strategy for 2012 as envisaged. Specify the measures necessary to ensure implementation of the 2013 budget with a view to ensuring the structural adjustment effort specify in the Council recommendations under the excessive deficit procedure. Thereafter, ensure an adequate structural adjustment effort to make sufficient progress towards compliance with the debt reduction benchmark whilst protecting expenditure in areas directly relevant for growth such as research and innovation, education and training. To this end, after the formation of a new Government, submit an update of the 2012 Stability Programme with substantiated targets and measures for the period beyond 2013.
2. Take measures to increase the statutory retirement age, including linking it to life expectancy, and underpin these with labour market measures to support rising the effective retirement age, whilst improving the long-term sustainability of public finances. Adjust the second pension pillar to mirror the increase of statutory retirement age, while ensuring an appropriate intra and inter-generational division of costs and risks. Implement the planned reform in long-term care and complement it with further measures to contain the increase in costs, in view of an ageing population.
3. Enhance participation in the labour market, particularly of older people, women and people with disabilities and migrants, including by further reducing tax disincentives for second-income earners, fostering labour market transitions, and addressing rigidities.
4. Promote innovation, private R&D investment and closer science-business links, as well as foster industrial renewal by providing suitable incentives in the context of the enterprise policy, while safeguarding accessibility beyond the strict definition of top sectors and preserving fundamental research.
5. Take steps to gradually reform the housing market, including by: (i) modifying the favourable tax treatment of home ownership, including by phasing out mortgage interest deductibility and/or through the system of imputed rents, (ii) providing for a more market-oriented pricing mechanism in the rental market, and (iii) for social housing, aligning rents with household income.

The introduction of a new business policy, comprising a sectoral, more business-driven approach, with fewer specific-purpose grants, more generic tax cuts and more scope for enterprise, it was among the 2011 commitments of the Netherlands following the Euro Plus Pact national commitments.

In July 2012, [country specific recommendations](#)²⁶ by the Council of the European Commission with regards to research and innovation focused on promoting innovation, private R&D investment and closer science-business links, as well as fostering industrial renewal by providing suitable incentives in the context of the enterprise policy, while safe guarding accessibility beyond the strict definition of top sectors and preserving fundamental research.

²⁶ The Country-specific Recommendations are documents prepared by the European Commission for each country, analysing its economic situation and providing recommendations on measures it should adopt over the coming 12 months. They are tailored to the particular issues the Member State is facing and cover a broad range of topics: the state of public finances, reforms of pension systems, measures to create jobs and to fight unemployment, education and innovation challenges, etc. The final adoption of Country-specific Recommendations prepared by the Commission is done at the highest level by national leaders in the European Council.

3 STRUCTURAL CHALLENGES FACING THE NATIONAL SYSTEM

The Dutch economy was deeply affected by the financial and economic crises, causing a severe contraction in 2009 and a recession in the second half of 2011 that still has an effect in the Dutch economy. Fostering the Dutch economy's innovation capacity by supporting investment in and orientation towards high added-value production and services are among the major challenges that the Dutch economy is facing and are clearly considered in the growth-enhancing macroeconomic policy measures. The Netherlands ranks among the Member States with a legal and regulatory environment that encourages business competitiveness, but research and development intensity was below the EU average in the last years. Table 3 introduces some of the main indicators of the science and innovation system of the Netherlands.

Table 3. Main Science and Innovation figures: the Netherlands

HUMAN RESOURCES	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	1.9% (2011)
Percentage population aged 30-34 having completed tertiary education	41.1% (2011)
Open, excellent and attractive research systems	
International scientific co-publications per million population	1,330 (2011)
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	15.13% (2008)
Finance and support	
R&D expenditure in the public sector as % of GDP	0.83% p (2011)
FIRM ACTIVITIES	
R&D expenditure in the business sector as % of GDP	1.07%bp (2011)
Linkages & entrepreneurship	
Public-private co-publications per million population	128.2(2009)
Intellectual assets	
PCT patents applications per billion GDP (in PPS€)	6.24 (2009)
PCT patents applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health)	1.48 (2009)
OUTPUTS	
Economic effects	
Medium and high-tech product exports as % total product exports	40.46% (2010)
Knowledge-intensive services exports as % total service exports	26.31% (2010)
License and patent revenues from abroad as % of GDP	1.80% (2011)

Source: Innovation Union Scoreboard 2013 and Eurostat. Note: The data was updated –March 2013

The Netherlands exhibits high and still rising completion rates in tertiary education and has already achieved its Europe 2020 target. However, students with a migrant background are relatively underperforming, also compared to the EU average (tertiary education completion rates for students with a migrant background are 34.3% versus 42% for people without migrant background). The reform of higher education student support, moving from a grant-based to a refundable loan-based system, aims to reduce relatively long study times and allow budgetary resources to be invested in additional quality measures, in particular teachers training. Experience with loan systems for higher education students in New Zealand and Australia shows that this type of scheme is more equitable and does not deter underprivileged students.

The Inspectorate's Education Report of the State of Education in the Netherlands summarizes the main developments of the Educational System of the Netherlands during the years 2010-2011²⁷. Among other factors, it shows that there have been favourable developments such as a fewer presence of weak and unsatisfactory schools and study programmes, an increase the number of pupils and students who continue to higher forms of education and as a result an increase in the average level of national education²⁸, and, a slight increase in the educational achievement in primary education, as well as fewer early school leavers in secondary vocational education as comparing to previous years. Nevertheless, the report also shows that there is still room for improvement in the educational system of the Netherlands. In particular, in the level of the quality of teaching, there is a need for major investment in teacher professionalization to improve their complex skills, in the support provided to vulnerable pupils or students, in the boardroom attention for the quality of educational practices and for compliance with legislation and regulation and, in the performance of a number of small schools and study programmes. Finally, regarding education, with 41.1% the Netherlands has satisfactorily reached and passed the Europe2020 target of the 40% for 2020 of the tertiary education attainment for the age group 30-34. However, there is still a challenge to complete the target (7.9%) of early leavers from education and training that is 9.1%, still relatively low compared to other European countries.

According to the [Innovation Union Scoreboard 2013](#), the Netherlands remains in the "innovation followers" groups of countries, a group that shows a performance close to that of the EU27 (i.e. less than 20% above but more than 10% below that of the EU27). The Netherlands is the leader innovation performer in the "innovation followers" group, followed by Luxembourg, Belgium, UK and Austria, among others. The Netherlands presented an average annual innovation growth rate of 2.7% for the period 2008-2012. It is excellent in terms of frequently quoted scientific publications and licence or patent revenues from abroad²⁹. The report shows that the Netherlands is the country that has experienced a greater innovation performance growth between the years 2010 and 2012.

The business sector's level of research and development is relatively low (1.07% in 2011) compared to other EU Member States. This is partly due to the fact that the Dutch economy features a large service sector and a relatively small manufacturing industry which is focused in medium-tech sectors, such as electrical machinery, food processing, chemicals and petroleum refining³⁰. The top sector policy with a broader set of measures aimed to encourage the investment in research and development seems to contribute to the increase of the private sector investments in research and innovation.

The business sector structure of the Netherlands is characterised by a number of strong sectors, i.e. the community services, business activities and the ICT sectors, electronic equipment and office machinery industries, the chemicals and the food industry and mining (natural gas & oil) and agriculture.³¹ A large part of R&D by Dutch businesses is performed by a limited number of

²⁷ The [State of Education in the Netherlands](#). Highlights of the 2010/2011 Education Report, *Education Inspectorate, Ministry of Education, Culture and Science*, April, 2012.

²⁸ The number of young people with a higher education diploma is high in comparison with the rest of the world (OECD, 2011). The proportion of students attending senior general secondary education (HAVO) and pre-university education (VWO) is increasing as well.

²⁹ The high level of patent and licence revenues could also be influenced by the facts that the Dutch tax system is attractive for locating international firms (Van Dijk, Weyzig and Murphy, 2006).

³⁰ Council Recommendation: Assessment of the 2012 National Reform Programme and Stability Programme for the Netherlands, COM(2012) 322 final.

³¹ ERAWATCH (2006) Country Specialisation Report: The Netherlands, June 2006.

large multinationals. Large companies are the main contributors to private R&D expenditures in the Netherlands (BERD)³².

Community services include: L–Public administration and defence; compulsory social security; M–Education; N–Health and social work; O–Other community, social and personal service activities; P–Private households with employed persons; Q–Extra-territorial organisations and bodies (ISIC v3 codes 75-99).

In terms of share of GDP, the Netherlands has a small Industry sector (with Food and Chemicals as exceptions), a large Services sector, a large Mining and quarrying sector and a large Agriculture sector in comparison with EU15 (Parliamentary document 21501-20, nr. 533, “Factsheet over de invloed van de sectorstructuur op de private R&D-positie van Nederland”, 23 May 2011).

³² Based on figures provided by [Statistics Netherlands](#)

4 ASSESSMENT OF THE NATIONAL INNOVATION STRATEGY

4.1 National research and innovation priorities

The national R&I priorities are consistent with structural challenges in the Dutch R&I system. Much of the policy measures are aimed at increasing the research and innovation investment of the Dutch business sector, especially via the top sector approach. The challenges in human capital are also addressed in EZ's top sector approach and in OCW's Strategic Agenda. In this regard, the concentration of Structural funds on a small number of sectors could reduce the positive effects they have on triggering private research and development investments.

The "[Policy Mix Project](#)" identified the following six 'routes' to stimulate R&D investment.³³

- Promoting the establishment of new indigenous R&D performing firms;
- Stimulating greater R&D investment in R&D performing firms;
- Stimulating firms that do not perform R&D yet to perform R&D;
- Attracting R&D-performing firms from abroad;
- Increasing extramural R&D carried out in cooperation with the public sector or other firms;
- Increasing R&D in the public sector.

Route 1 is not one of the dominant routes in the Dutch policy mix in terms of budgetary weight. Route 2 was and is a very important route in the Dutch policy mix. It includes several of the largest policy measures, including the fiscal incentives [R&D tax credit \(WBSO\)](#) and the [R&D Allowance \(RDA\)](#). Route 3 is mainly taken indirectly via measures that subsume under route 2. Route 4 becomes increasingly important, but it is mainly addressed indirectly via a good 'climate' for business and research & innovation and via other routes (especially 2, 5 and 6). In the new top sector approach, foreign policy will be used to create a stronger 'brand' of the Netherlands as an attractive location for talented knowledge workers, R&D investments and R&D-performing businesses. Route 5 no longer benefits from programme-based subsidies and investments from the FES fund. Both are being phased out. In the top sector approach, companies are invited to participate in TKIs and a fiscal scheme (RDA+) will be introduced to give a tax incentive to companies to participate in the TKIs. Route 6 will remain important in terms of size of public research funding. In the top sector approach, a substantial share of the R&D funding via NWO, KNAW and the PROs will, however, become part of the innovation contracts of the top sectors (cf. route 5).

With regard to the alignment of the national policy mix with the ERA objectives, the following summarising conclusions are made:

1. Labour Market for Researchers: The share of R&D personnel and researchers in the Dutch labour force is relatively low, and declining. Especially in science & engineering the situation is not

³³ The routes cover the major ways of increasing public and private R&D expenditures in a country. Each route is associated with a different target group, though there are overlaps across routes. The routes are not mutually exclusive as, for example, competitiveness poles of cluster strategies aim to act on several routes at a time. Within one 'route', the policy portfolio varies from country to country and region to region depending to policy traditions, specific needs of the system etc.

good. In addition, entrepreneurship amongst students and (young) researchers could be improved. Recent changes in policy that address these challenges are: (i) More variation in researchers' training and allowing universities to introduce bursary PhD students; (ii) Action plans in the top sector approach to increase the number of students in science & engineering (at all levels); and (iii) More attention for entrepreneurship in education and alignment of education and training with business needs (in top sectors).

2. *Cross-border cooperation*: A main challenge would be to further explore and exploit opportunities for cross-border cooperation. However, there have not been recent policy changes.

3. *World class research infrastructures*: A main challenge is that there is no structural budget for large-scale research infrastructures. A recent policy change is that there will be investments in large-scale research facilities as part of reallocation of budgets to stimulate universities to create more distinguishing profiles. In addition, the national roadmap for large-scale research facilities will be updated.

4. *Research institutions*: A main challenge is to create more distinguishing profiles in education and research for universities: In OCW's Strategic Agenda, changes in the allocation system for HE funding are announced, with more attention for 'quality' (rather than quantity) and creation of a distinguishing profile. In addition, performance agreements between universities and the government are introduced.

5. *Public-private partnerships*: A main shift in national policy is the discontinuation of subsidies (e.g. from the FES fund) for PPPs in R&D. The new top sector approach put firms in the lead of developing public-private 'innovation contracts'. Firms are expected to contribute 40% of the budget. In addition, national policy has emphasised valorisation as a formal third mission of HEIs.

6. *Knowledge circulation across Europe*: National policy puts emphasis on national knowledge circulation and R&D cooperation rather than cross-border circulation and cooperation. Policy is structured according to national top sectors rather than European challenges. The top sectors are expected to take the lead in developing cross-border collaborations – if this helps to improve the competitiveness of the top sector.

7. *International Cooperation*: The latest internationalisation agenda (national strategy for international cooperation) is from 2008 and there have not been main recent policy changes.

4.2 Evolution and analysis of the policy mixes

With the introduction of the new enterprise policy in 2010, and the continuation by the new government, the policy mix has experienced some changes in particular in the last year. As described above, there are several changes:

- The 'key area approach' (via the 'programmatic package') was replaced by the 'top sector approach'. While the key areas and the top sectors largely overlap, the policy approaches are quite different. The subsidies for (large, multifaceted) innovation programmes for each of the key areas are abolished – for instance, the FES fund will no longer be used for investment impulses in such programmes. Instead, 'action agendas' are currently being developed for each of the nine top sectors (by 'top teams' with members from the business sector and knowledge institutes). In these agendas opportunities and bottlenecks for the top sectors are addressed and concrete (policy) actions are suggested. Topics include research and innovation, foreign policy, (sectoral)

framework conditions, education and training and sustainability. These suggestions are taken up by the cabinet and translated into concrete policy measures. ‘Innovation contracts’ will be an important element in the sectoral agendas. These contracts state the agreements made (on content and financial contributions) between businesses, knowledge institutes and the government (ministries, research council, etc.). The government has a total budget of circa €1.5b available for the top sectors – mainly existing R&I budgets that are reallocated. The ‘top teams’ can make proposals for allocating these resources. The top teams do not have their ‘own’ budgets, but can influence the way in which available budget is spend. NWO, KNAW and the PROs use their existing budgets to participate in the innovation contracts (in 2015 at least €600m of their R&D budgets will be tied to these contracts). The business sector is expected to fund 40% of the R&I that is performed under the innovation contracts – which is considerably more than what they used to contribute to public-private collaborations in R&I. The RDA+ scheme is a new tax credit scheme to promote private-public partnership in Top Consortia for Knowledge and Innovation (TKIs), it is a measure that will be only identified for the “top sectors” of the economy.

- The generic ‘basic package’ in the ‘old’ innovation policy mix is evolving as well. While some existing measures are continued (e.g. [Innovation Performance Contracts subsidy scheme \(IPC\)](#), [Syntens](#) and [Eurostars projects subsidy scheme](#)), new or renewed generic measures are introduced as well. New measures are aimed at improving access to corporate financing. Support measures for innovation in Small and Medium Enterprises, the SME Innovation Fund+. Starting in January 2012, the SME Innovation Fund+ is an umbrella for different financing instruments for encouraging innovation such as the Innovation Credit and the SEED Capital Scheme. The EZ has allocated a total budget of €500 million for this funds over the period 2012 to 2015. The SME Innovation Fund+ includes the financial instruments available for innovation and funding fast growing innovation companies. It consists of three main pillars: **Innovation credit**, **Seed Capital Scheme** and **Fund-of-funds**. The SME+ fund is designed as a revolving fund, where on average about 80% of the invested money should return for new investments. It is open to the entire private sector, though part of its spending is earmarked for the top sector “creative industry”.
- Generic [tax benefits](#) in innovation costs play an important role in the policy mix. First, a new [Research & Development Allowance \(RDA\)](#) scheme is introduced in 2012. The aim of RDA is to make investments in innovation more attractive (from a fiscal perspective). The RDA schemes encourages entrepreneurs to conduct R&D activities. Companies can obtain deductions on income and corporation taxes calculated on the costs and expenses for R&D projects (such as prototypes or test-or analytical equipment). Labour costs are not covered by the RDA, these are included in the WBSO scheme. For the entrepreneurs with relatively low R&D activities the deduction works as a fixed amount. The RDA offers a higher tax relief for R&D investments in capital equipment and exploitation costs. In 2013 the deduction rate is 54% of the approved costs and expenses, or 54% of the lump sum on the basis of the approved R&D hours. The RDA was introduced in 2012 and the budget has increased, €375m in 2013, and will increase in the coming years, €500m in 2015, making it one of the largest measures in the innovation policy mix. It is complementary to the ‘old’ [R&D tax credit \(WBSO\)](#) which offers a tax relief on R&D wage costs. The [evaluation of the WBSO](#) over the period 2006-2010 shows that this has been a successful measure in the wage spending by companies related to research and development. In addition, the WBSO ensure that entrepreneurs take risks, explore better business plans and a favourable business climate. The budget is €735m in 2013 and will continue in the following years. However, the Cabinet has implemented some [changes](#) in the RDA and WBSO

measures for 2013 mainly related with self-employed. In addition, the ‘[innovation box](#)’ (until January 2010 called ‘patent box’) offers a corporate tax relief for all revenues from innovation – a reduced tariff of 5%. All profits earned from innovative activities fall into this box. Any company or entrepreneur is entitled to choose the “innovation box” measure if there is an internal development of an intangible asset and a patent has been granted for this asset. The income achieved with these assets must be at least 30% associated to the patent received. The total budget for fiscal measures increases (with 30%) in the period 2011–2015 from €1.5b to €1.9b. From 2013, there is the possibility to opt for a fixed amount (lump sum) on which you want to apply the innovation. The lump sum is 25% of your total earnings, with a maximum amount of €25,000. It should be applied the year of the development of the intangible asset and can be bring forth in the next 2 years. The RDA+ scheme is a new tax credit scheme to promote private-public partnership in Top Consortia for Knowledge and Innovation (TKIs), it is a measure that will be only identified for the “top sectors” of the economy.

- Research and Innovation are to be strengthened via “innovation contracts” for the top sectors. The contracts are based on public private partnership agreements at the sector level, aiming at reaching a balanced mix of fundamental research, applied research and the application of knowledge in private activity. Moreover, long-term partnership between industry and research bodies within top sectors is promoted via a planned additional tax credit for participation in Top Consortia for Knowledge and Innovation (TKIs). The TKIs build on already existing initiatives in some sectors (i.e. the virtual “Technologische top instituten” or Leading/Top Technological Institutes), where several research and private parties work on demand driven fundamental and strategic research as well as the application of scientific knowledge in processes.

4.3 Assessment of the policy mix

The two main structural challenges are well-recognised in policy. As discussed above, the current cabinet decided to change track in innovation policy and to abolish most subsidy/grant schemes and replace them with generic tax incentives and loans and with a top sector approach which put businesses in the lead. In the table below, an assessment is given of the new policy mix. Although much of the policy changes can be considered appropriate in times of economic crisis and budgetary restrictions, there are risks as well. It remains to be seen to what extent the top sector approach combined with generic tax incentives and loans will succeed in creating an economic structure in the Netherlands that is more R&D intensive and more innovative. There is a risk that radical innovation and renewal is not sufficiently encouraged and that the status quo is reinforced.

The actions in OCW’s Strategic Agenda for Higher Education, Research and Science appear to be appropriate as well. Policy aims to improve the quality and diversity in higher education, which is in line with the main structural challenge in human capital.

It is positive that the coordination between EZ’s and OCW’s strategies appears to be more intensive than it has been in the past. EZ’s emphasis on top sectors and OCW’s emphasis on specialisation/differentiation of HEIs coincide. A general risk is that the ‘shock to the system’ may be too large or too sudden to be absorbed effectively by the R&I system, especially when the changes are not accompanied by additional policy budgets. The coming years will show the responsiveness of the Dutch R&I system to the new policy mix.

The European Council elaborated a policy assessment of the “top sector” industrial policy measures of the Netherlands, previous to the policy recommendation by the European Commission. The main comments included in the assessment can be summarised as follows:

- The effectiveness of the “top sector” industrial policy is difficult to assess at this stage: it is unclear whether research and development investments promised by some “top sectors” are simply “relabelled” research and development investments that companies would have made even in the absence of a new policy, rather than representing any newly mobilised resources. It is also unclear how small enterprises can be effectively involved. Moreover, fast-growing firms that do not fall under one of the top sectors might be sidelined.
- There is a need of a sound rationale supporting this sector-based industrial policy. As the first results seem to show, the more developed regions benefit the most from the resources made available through the “top sector” policy, potentially increasing the innovation gap between regions.
- Finally, neglecting basic research in favour of applied research may well harm the long-term growth prospects of the economy. In this respect, the channelling of a substantial share of the funding of fundamental research by the Netherlands Organisation for Scientific Research (NWO) to applied uses under the top sector approach is a cause for concern.
- As the measures taken have not yet proved to be effective, the country specific recommendation on research and innovation has only partially been implemented and remains valid. The measures taken so far are *relevant* (i.e. there is a link between the measures presented and the challenges identified in the country specific recommendation) in promoting closer science and business links, but the relevance is less clear in promoting innovation and private research and development investment. It is too early to judge the *effectiveness* in the measures taken as they will mainly have an impact in the medium term. The criteria that were used to identify the “top sectors” are not fully clear. If fully implemented, they could in principle be *ambitious* enough to promote closer science-business links. A shortcoming of the strategy is the lack of monitoring and impact assessment.

In April 2012, the [OECD Economic Survey on the Netherlands](#) was published, the report includes a description and assessment on the implementation and development of different policies in the Netherlands.

Regarding the top sectoral approach, the OECD recommendations are the following:

- To take full advantage of the top team approach to improve sector regulation, similar teams should be created for more sectors of the economy, especially services.
- The government should ensure that the funds earmarked to top sectors in the area of research do not become a vehicle for favouring particular firms, especially as incumbents may benefit from a first mover advantage.
- The top sector approach should remain open to future emerging sectors and industries as well as to let any declining ones go. A swift and broad implementation of the planned move towards evidence-based policy-making would facilitate future sector selection.
- Regarding economic diplomacy, the public services offered should reflect at least some of the costs, in order to secure the cost-efficient use of scarce public resources.

Further enhanced framework conditions:

- The policy shifts towards tax incentives and evidence-based innovation policy may improve the business environment, makes innovation policies simpler and strengthen policy guidance. The shift could make the system more effective, as empirical studies show that tax incentives tend to have a relatively higher impact on private innovation than direct R&D subsidies, although at the cost of subsidizing activities that would have been undertaken anyway. Tax incentives have the advantages that they can potentially benefit all firms, reducing the “picking winners” effect and are more flexible regarding the range of R&D activities undertaken.
- The stability of the new R&D support framework should be backed by long-term political commitment to support firms’ multi-year research programmes.
- The R&D support framework should be simplified by reducing the number of tax credits.
- To strengthen the relatively weak science-business linkages, researchers’ incentives to market the results of their research should be enhanced by establishing clear and more generous rules or sharing patents rights.
- The government should further promote framework conditions by giving greater attention to competition policies. In particular, lower entry and exit barriers will support the process of “creative destructions”.
- The policies to improve the business sector environment should be backed by reforms that address labour market rigidities.

Table 4. Assessment of policy measures addressing economic-social challenges.

Challenges	Policy measures/actions addressing the challenge ³⁴	Assessment in terms of appropriateness, efficiency and effectiveness
Innovativeness of the business sector	Less innovation subsidies More tax incentives More loans Less and simpler rules for businesses More involvement of business with the public knowledge infrastructure Aligning education and training with business needs International positioning and branding of (the top sectors of) the Netherlands	In times of severe budget restrictions due to the financial and economic crisis it is appropriate to try to reallocate existing budgets in a more effective and efficient way. The replacement of specific subsidies by generic tax incentives is part of this effort. It may be a risk, however, that tax reliefs are more usable and beneficial for larger companies, rather than (young, innovative) SMEs – thus reinforcing the status quo and the reliance of the Netherlands of the large multinational R&D intensive companies. Tax incentives seem not very appropriate to change the economic structure of the Netherlands towards a more R&I intensive structure. It is also appropriate to put the business sector in the lead in developing action agendas for the top sectors, expecting them to contribute 40% in public-private R&I collaborations. It remains to be seen, however, what the

³⁴ Changes in the legislation and other initiatives not necessarily related with funding are also included.

Challenges	Policy measures/actions addressing the challenge ³⁴	Assessment in terms of appropriateness, efficiency and effectiveness
		<p>‘innovation contracts’ will contain and if the 40%-target will be met. It is also a risk that the emphasis will be too much on shorter-term application oriented R&D and that longer-term strategic basic research will be under pressure.</p>
<p>Supply of human capital: more graduates, higher quality and better aligned with business needs</p>	<p>Promoting a climate that stimulates students to perform and excel; more emphasis on quality rather than quantity in student numbers</p> <p>Development of distinguishing profiles and specialisation of HEIs, rewarding quality and sharp profiles in the allocation of funding of HEIs.</p> <p>More specialisation and differentiation and less fragmentation in supply of study programmes, taking into account needs of the labour market</p>	<p>It is appropriate that the supply of study programmes will be aligned with business needs. Idem. for the stronger role of entrepreneurship in education and researcher training.</p> <p>It is appropriate that the HE system provides more incentives for students (and lecturers) to perform better.</p> <p>It is appropriate that HEIs are induced to create more distinguishing education and research profiles. It will help to align the universities with the business sector in the top sectors. There is a risk, however, when there is insufficient coordination at the system level, that gaps will emerge in the broad base of scientific education and research.</p>

5 NATIONAL POLICY AND THE EUROPEAN PERSPECTIVE

The national policy mix has been changed significantly recently. The first evaluation exercises and the position of the Netherlands in the top of many of the ranking comparing the most prosperous nations world-wide suggest that the national policy mix is adequate and has adapted successfully to the hostile economic environment of the last years.

In the table below, the new five ERA priorities, as identified by the ERA Communication of July 2012 are presented in column 1 and an assessment of the alignment of the national policies in line with the ERA priorities is presented in column 2.

Table 5: Assessment of the national policies/measures supporting the strategic ERA priorities (identified at the ERA Communication, July 2012)

ERA priority	Commission proposal to the Member States	Policy measures adopted in line with the priority
1. Effective ness of national research systems (including increased competition within national borders and sustained or greater investment in research)	Introduce or enhance competitive funding through calls for proposals and institutional assessments as the main modes of allocating public funds to research and innovation, introducing legislative reforms if necessary	In the budget of 2013, there are €75 million (rising to €150) earmarked for basic/fundamental research. The Netherlands Organisation for Scientific Research (NWO) set approx. €275 million over two years available for excellent basic research in the leading sectors. The NWO research grants are broad in terms of applicants and topics (TOP grants for outstanding research groups –social-science, health issues, chemicals, physics, etc.-, for top researchers -astronomy, computer science, mathematics-,
	Ensure that all public bodies responsible for allocating research funds apply the core principles of international peer review	Some evaluation exercises has been conducted in order to evaluate the implementation of the top sector policy and to develop a system to monitor and evaluate the impact of the business policy in general and its implemented measures.
2. Optimal levels of transnational co- operation and competition (defining and implementing common research agendas on grand- challenges, raising quality	Step up efforts to implement joint research agendas addressing grand challenges, sharing information about activities in agreed priority areas, ensuring that adequate national funding is committed and strategically aligned at European level in these areas and that common <i>ex post</i> evaluation is conducted	NWO broad themes for the period 2011-14 that relate to national and international agendas: -healthy living -water and climate -cultural and societal dynamics -sustainable energy -connecting sustainable cities -materials: solutions for scarcity This selection is based on an inventory of the priorities of the government, TNO, Innovation programmes and European themes.
	Ensure mutual recognition of evaluations that conform to international per-review standards as a basis for national funding decisions	The Dutch Science System has as a basis for its evaluation the national Standard Evaluation Protocol 2009-2015 . That lays down four main assessment criteria: quality, productivity, feasibility/vitality and societal relevance. A

ERA priority	Commission proposal to the Member States	Policy measures adopted in line with the priority
through Europe-wide open competition, and constructing and running effectively key research infrastructures on a pan-European basis)		<p>separate committee is appointed to evaluate each institute, working on the basis of a self-evaluation report from the institute and a site visit. The most recent evaluations were conducted in 2011, (for more information here).</p> <p>Additionally, three panel of experts have elaborated three advisory reports on quality assessment in three different research areas: design and engineering disciplines; quality indicators in humanities research, and, quality assessment of social science research (here).</p>
	Remove legal and other barriers to the cross-border interoperability of national programmes to permit joint financing of actions including cooperation with non-EU countries where relevant	NWO has led to a new, programmatic cooperation with India and China by the Joint Scientific Thematic Research Programme.
3. Openness of labour markets for researchers (to ensure removal of barriers to research mobility, training and attractive careers)	Remove legal and other barriers to the application of open, transparent and merit based recruitment of researchers	<p>The Netherlands encourages the international mobility of researchers. It has a range of grants and fellowships designed to promote international cooperation between researchers. These include NWO mobility grants (e.g. Rubicon, which gives postdoctoral researchers the chance to gain experience at top research institutions in other countries). This, like the Innovational Research Incentives Scheme, is now open to talented foreign applicants.</p> <p>Recently, Nuffic (the Netherlands organisation for international cooperation in Higher Education) has launched a new website that provides international students and alumni with reliable and up-to-date information about career opportunities in Holland after their studies.</p>
	Remove legal and other barriers which hamper cross-border access to and portability of national grants	
	Support implementation of the Declaration of Commitment to provide coordinated personalised information and services to researchers through the pan-European EURAXESS network	The Netherlands provides support to take part in EURAXESS initiatives. It provides personalised information (such as Dutch education system, research funding, fellowships and grants available, living in the Netherlands) and services to researchers and Phd. students who want to participate in activities through the pan-European EURAXESS network in the Netherlands or in another related country.
	Support the setting up and running of structured innovative doctoral training programmes aiming the principles for Innovative Doctoral Training	The Dutch system contains an accreditation system by the Dutch Higher Education and Research Act, is a formal and independent decision that indicates that an institution and programme meets certain predefined quality standards. However, PhD programmes are the responsibility of the individual university and therefore outside the scope of the accreditation

ERA priority	Commission proposal to the Member States	Policy measures adopted in line with the priority
	<p>Create an enabling framework for the implementation of the HR Strategy for Researchers incorporating the Charter & Code</p>	<p>process.</p> <p>The Code of Conduct of International Student in Dutch Higher Education intends to contribute as a quality tool to the ambitions of the government and the educational institutes regarding internationalization as a means to turn the Netherlands into an attractive destination for knowledge and development. There are two institutions that have already completed the procedure and are granted to use the logo of the Charter and Code of Conduct :</p> <p>-Radboud University -Wageningen University and Research Centre</p>
<p>4. Gender equality and gender mainstreaming in research (to end the waste of talent which we cannot afford and to diversify views and approaches in research and foster excellence)</p>	<p>Create a legal and policy environment and provide incentive to:</p> <ul style="list-style-type: none"> -remove legal and other barriers to the recruitment, retention and career progression of female researchers while fully complying the EU law on gender equality -address gender imbalances in decision making processes -strengthen the gender dimension in research programmes <p>Engage in partnerships with funding agencies, research organisations and universities to foster cultural and institutional change on gender – charters, performance agreements, awards</p> <p>Ensure that at least 40% of the under-represented sex participate in committees involved in recruitment/career progression and in establishing and evaluating research programmes</p>	<p>Charter ‘Talent to the Top’. The Charter was developed in 2008 under the leadership of former minister Sybilla Dekker in close consultation with the business sector, public bodies and the Ministries of Economic Affairs and Education, Culture & Science. The aim is to achieve a higher intake, promotion and retention of female talent in top jobs. Several universities have chairs and fellowships exclusively for top female researchers (e.g. VU University: Fenna Diemer Lindeboom chairs, Groningen University: Rosalind Franklin Fellowships)</p>
<p>5. Optimal circulation and transfer of scientific knowledge (to guarantee access to and uptake of knowledge by all)</p>	<p>Define and coordinate their policies on access to and preservation of scientific information</p> <p>Ensure that public research contributes to Open Innovation and foster knowledge transfer between public and private sectors through national knowledge transfer strategies</p> <p>Harmonise access and usage policies for research and education-related public e-infrastructures and for associated digital research services enabling consortia of different types of public and private partners</p>	<p>No action has been recently taken on this.</p> <p>The top sector policy has exacerbated the public-private cooperation, which used to be fragmented and temporary financed, between entrepreneurs, researchers and government. Example of measure: Top Consortia for Knowledge and Innovation (TKI-surcharge, €110 millions). TKI-allowance that is implemented for financing and matching among European research programmes (such as Horizon 2020). NOW’s institutes have set up an Industrial Liaison Officers Network (ILO-net) where</p>

ERA priority	Commission proposal to the Member States	Policy measures adopted in line with the priority
		they regularly organise company contact days to encouraging collaboration between industry, government and civic society organisations.
	Adopt and implement national strategies for electronic identity for researchers giving then transnational access to digital research services	The Netherlands participates in the Scientific Visa Package for long-term admissions; the Dutch EURAXESS service center is able to assist with details on entry requirements.

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LIST OF ABBREVIATIONS

AWT	Advisory Council of Science and Technology Policy
BERD	Business Expenditures for Research and Development
CBS	Statistics Netherlands (<i>Centraal Bureau voor de Statistiek</i>)
CDA	Christian Democratic Appeal
CPB	Bureau of Economic Policy Analysis
CU	Christian Union
D66	Democrats 66 Party
DLO	Agricultural Research Institutes
EL&I	Ministry of Economic Affairs, Agriculture and Innovation
ERA	European Research Area
ERDF	European Regional Development Fund
EU	European Union
EU15	European Union including 15 Member States
EU27	European Union including 27 Member States
EZ	Ministry of Economic Affairs
FES	Economic Structure Enhancement Fund
FTE	Full Time Equivalent
GBAORD	Government Budget Appropriations or Outlays on R&D
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GL	Green Left party
GOVERD	Government Intramural Expenditure on R&D
HAVO	Senior general Secondary Education
HE	Higher Education
HEI	Higher education institutions
HERD	Higher Education Expenditure on R&D
HES	Higher education sector
ICT	Information and Communication Technology
IPC	Innovation Performance Contracts
KNAW	Royal Netherlands Academy of Arts and Sciences
LTI	Large Technology Institute
MBO	Vocational Secondary Education
NL	The Netherlands
now	Netherlands Organisation for Scientific Research
OCW	Ministry of Education, Culture and Science
OECD	Organisation for Economic Co-operation and Development
PBL	Netherlands Environmental Assessment Agency
PMO	Company and Public Organisations
PRO	Public Research Organisations
PVV	Freedom Party
R&D	Research and Development
R&I	Research and Innovation
RCI	Regional Competitiveness Index
RDA	Research & Development Allowance

SCP	Netherlands Institute of Social Research
SER	Social and Economic Council of the Netherlands
SME	Small and Medium Sized Enterprise
STW	Research Council for Technical Sciences
TKIs	Top consortia for Knowledge and Innovation
TTI	Technologische Topinstituten
UMC	University Medical Center
VWO	Pre-university education
VVD	People's Party for Freedom and Democracy
WBSO	Research and Development (R&D) tax credit
WRR	The Advisory Council on Governance Policy
WUR	Wageningen University and Research Centre

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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.

