

# 2014

## Enterprise Policy Monitor



Ministry of Economic Affairs



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## Executive summary

The *Enterprise Policy Monitor 2014* is the latest edition of an annual publication of the Ministry of Economic Affairs (EZ) and provides a detailed overview of the current progress of the enterprise policy. The 2014 monitor is an annex to the Progress Report on Enterprise Policy 2014, which outlines the main policy developments in the past year. The Monitor's focus is not on policy, but on the most important facts and figures.

Key Data on Enterprise Policy, including top sector approach, 2010-2014

	2010	2011	2012	2013	2014
Labour productivity (international position)	5	4	5	5	
GCI (international position)	8	7	5	8	8
R&D intensity (in % of GDP)*	1.83	1.90	1.97		
R&D intensity in top sectors (in % of added value)	-	4.2	4.4		
Number of WBSO businesses	19450	20530	22220	22640	
Number of RDA businesses	-	-	13860	16160	
TKI PPP projects (in cash, in millions)	-	-	-	571	
TKI private share (in %)	-	-	-	35	
Science & technical enrolments	80068	74785	74109	75844	
% fast growers	3.32	3.19	1.97		
<i>Relative development of top sectors versus overall economy</i>					
Added value (2010 = 100)	100.0	100.6	100.8	102.0	
Labour productivity (overall economy = 100)	126.6	127.7	128.0	128.1	

\* The year 2010 is the Ministry of Economic Affairs' own calculation based on change in unrevised figures 2011/2010.

The enterprise policy has three central ambitions:

- ✓ The Netherlands is among the world's top five knowledge economies (in 2020);
- ✓ Increase Dutch R&D efforts to 2.5% of GDP (in 2020);
- ✓ Top Consortiums for Knowledge and Innovation to which public and private parties contribute more than €500 million of which at least 40% is financed by the business sector (in 2015).

PPP

### *Knowledge economy top 5*

As in 2013, the Netherlands achieved eighth place in the 2014 Global Competitiveness Index (GCI) of the World Economic Forum. Unlike 2013, however, when the Netherlands' score deteriorated, 2014 brought a renewed improvement. Since the start of the enterprise policy, most GCI pillars have shown an upward trend. In 2014 major steps forwards were made on innovation, better availability of technical staff, increased private investments in R&D and intensified public-private collaboration between businesses and knowledge institutions in top sectors.

### *R&D efforts at 2.5% of GDP*

Though R&D intensity fell below 2% in 2012 after mandatory statistical revisions by Statistics Netherlands, the R&D figures have been on an upward trend for several years. Adjusted for differences in economic sector structure, the R&D investments of Dutch businesses are even slightly above the OECD average. The further advance in 2012 stems from the increase in R&D intensity among businesses and, in particular, those active in the top sectors. Moreover, Dutch businesses also invest a relatively large amount in non-technological knowledge investments which serve to convert R&D efforts into productivity gains.

#### *Top Consortiums for Knowledge and Innovation (TKIs)*

This is the first year that quantitative results are available about the TKIs (for 2013). Private parties contributed €199 million (cash) to public-private partnership projects (PPPs) which formed the basis for the TKIs' applications for a TKI supplement. The total estimated size of PPP projects (for which TKI supplements were requested) amounted to €571 million. The private share of the top sectors in the TKIs thus came to 35% for the year 2013. Within the top sectors, there are several TKIs whose private share exceeded 40% in 2013.

#### Other key results:

- The Netherlands is one of the most productive countries in the world, but its productivity growth has been lagging behind the US since 2007. This is partly because Dutch companies were slower to lay off staff during the recession ('labour hoarding').
- The monitor shows that investments in knowledge capital contribute to productivity growth alongside, and above all, in combination with 'hard' technological R&D contributions – which is why the Netherlands, despite only making average expenditures on hard R&D, still realises internationally high productivity levels.
- Moreover, the Netherlands boasts a strong international position in terms of human capital, as shown by the fourth place in the Human Capital Index of the World Economic Forum. Interest in technical subjects is growing, with technical enrolments in higher education rising from about 25,000 in 2002-2003 to almost 40,000 in 2013-2014. The only decrease in technical enrolments occurs at senior secondary vocational level (MBO). Increasing the number of technical enrolments is one of the objectives of the Technology Pact.
- After a steady decline since 1999, the investments in equipment recently started to rise again. The attraction of foreign investments, which help to boost productivity and innovation in the Netherlands, is also regaining momentum.
- Measured by international standards, the Netherlands is one of Europe's most entrepreneurial countries, with healthy market dynamics and an entrepreneurship-friendly climate. The Netherlands also scores well compared with OECD countries on cost burden. The Netherlands is in first place with the lowest score for product market regulation in 2013, and the enterprise policy is continuing to make further steps forwards: the cost burden has already been reduced by €715 million (measurement April 2014) and the tailored approach for eleven heavily-regulated domains has been started up. However, financing bottlenecks still pose a problem, particularly for SMEs. These are now being tackled with new policy initiatives. Finally, the Netherlands needs to make more improvements to the labour market.

- New figures underline the importance of the nine top sectors for Dutch R&D and exports. Most top sectors are more productive than the rest of the economy. Moreover, in the 2010-2013 period the top sectors generated more added value and labour productivity growth than the Dutch average.
- Innovation in the top sectors makes a substantial contribution to the creation of full and partial solutions for societal challenges. This is evident from, among other things, an analysis of the participation in European R&D programmes and the project portfolio of the TKIs.





## **1. Introduction: progress of enterprise policy**

The *Enterprise Policy Monitor 2014* is the latest edition of an annual publication of the Ministry of Economic Affairs (EZ) and provides a detailed overview of the current progress of the enterprise policy. The 2014 monitor is an annex to the Progress Report on Enterprise Policy 2014, which outlines the main policy developments in the past year. The Monitor's main focus is not on policy, but on the most important facts and figures. It also interprets these facts and figures in the correct economic context.

### **Purpose of this monitor**

The cabinet attaches great value to the monitoring of the enterprise policy and the measurement of its impacts, also in the light of the recommendations of the Theeuwes Committee.<sup>1</sup> The future policy results can only be properly measured if all relevant data are carefully monitored and recorded over time. The Ministry of Economic Affairs (EZ) is therefore working hard to ensure that the progress of the enterprise policy is effectively monitored. This Monitor is one example of these efforts.

The purpose of the Monitor is to provide entrepreneurs and administrators, members of parliament, researchers and other interested parties with insight into the current progress and development of the enterprise policy. The Monitor contributes towards the transparency about what the enterprise policy does and delivers. Amongst other things, it gives a numerical overview of the use and effectiveness of the policy instruments in achieving the stated objectives. In addition, the developments in the top sectors are discussed. The figures from this Monitor, supplemented with specific qualitative information, provide input for the Progress Report on Enterprise Policy that is presented to the House of Representatives.

### **What is the enterprise policy?**

Over the past years, the Netherlands has laid the foundations for the enterprise policy: a modern form of industrial policy aimed at all entrepreneurs (generic track) and, within that track, special attention for nine top sectors (top sector track) in which the Netherlands holds an internationally strong, promising and innovative position.

The generic track of the enterprise policy focuses on entrepreneurship and innovation promotion among all businesses in the Netherlands. The instruments include tax incentives, loans and guarantees, and reduction of the regulatory burden. This track creates the required conditions for successful entrepreneurship, innovation, investments, growth and exports for all companies in the Netherlands; from large to small, from start-ups to household names, irrespective of the sector in which they are active. Good generic conditions for entrepreneurs constitute the foundations of the enterprise policy. These basic conditions, however necessary, are not sufficient in themselves to secure and retain a position among the global leaders. For this reason, the generic track is

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<sup>1</sup> See Reaction to 'Durf te meten: Eindrapport Expertwerkgroep Effectmeting' (Theeuwes Committee), dated 13 December 2012.

supplemented with a top sector track that focuses on the most important knowledge-intensive clusters of economic activity. Innovation is heavily concentrated in the top sectors which have formed the backbone of our economic structure for decades. Moreover, Dutch top sectors operate at the cutting edge of the technology frontier (highest productivity level). This robust position cannot be maintained by simply following in the slipstream of foreign competitors. To remain in the forefront as a sector and country, breakthrough technologies are vital. This is why the top sectors and the Top Consortiums for Knowledge & Innovation (TKIs) are so central to the enterprise policy and play such a prominent part in connecting state-of-the-art knowledge with innovative entrepreneurs. Bottlenecks and challenges in terms of e.g. education, regulatory burden and internationalisation are also sector-specific and call for a specific tailored approach. Each top sector has its own unique set of conditions that must be addressed with a specific mix of policy instruments. Public-private collaborations based on shared agendas, prioritisation and implementation (including financial commitment) are central to this endeavour.

The initiation of the new enterprise policy in 2010 also marked a systemic break with the past and a new policy departure: more tax facilities, less subsidies, incentives to encourage more venture capital and private contributions, and more public-private collaborations. Since the adoption of the new policy, businesses, knowledge institutions and government have been working shoulder to shoulder to make the Netherlands economically strong and internationally competitive, whilst simultaneously tackling the societal challenges. Top sectors are not traditional sectors. Their activities cross over the traditional boundaries between sectors. Research has shown that public-private collaborations in cross-over economic clusters greatly leverage the chances of innovative success (OECD, 2014).<sup>2</sup>

This Monitor reports on the three central ambitions defined at the outset of the enterprise policy:

- The Netherlands is among the world's top five knowledge economies (in 2020),
- Increase the Dutch R&D efforts to 2.5% of GDP (in 2020),
- Top Consortiums for Knowledge and Innovation to which public and private parties contribute more than €500 million, of which at least 40% is financed by the business sector (in 2015).

### **More enterprise policy data now available**

Though the enterprise policy has been under way for three and a half years and is already well-established, the real macroeconomic effects will only become clearly visible in a few years' time. One important difference with last year's Monitor is that more numerical data have become available on the relevant developments in the top sectors, the progress of policy initiatives and the use of policy instruments, as well as on the specific involvement of SMEs. Moreover, Statistics Netherlands has carried out a new baseline measurement for the top sectors.<sup>3</sup> New numerical data on many key indicators have become available for each top sector for the years 2010-2012. This presents the opportunity to sketch developments since the inception of the top sector policy. In

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<sup>2</sup> OECD, 2014, OECD Reviews of Innovation Policy: Netherlands.

<sup>3</sup> This Monitor's publication coincides with the publication of Statistics Netherlands 'Monitor Topsectoren 2014: Uitkomsten 2010, 2011 en 2012'.

addition, the recent availability of certain key data for the top sectors as a whole for the year 2013 now allows us to sketch a picture updated to the end of that year. Finally, more information has been released about the extent to which the enterprise policy contributes to societal challenges and about several innovation indicators. In short, this Monitor outlines the developments and progress of the enterprise policy including the top sector approach.

Despite the vastly improved availability of data, it is still too early to make any hard-and-fast statements about the enterprise policy's effectiveness in achieving the stated objectives. Measuring the enterprise policy's effects regarding key outcome variables such as economic growth and productivity is a methodologically complex exercise and these effects will only become visible in the medium term. However, the progress made on key indicators as sketched in this Monitor does give an indication of the movement that the enterprise policy has set in motion.

### **Structural versus cyclical aspects**

Like last year, this Monitor underlines the strong structural foundations and position of the Netherlands, and particularly of the Dutch business sector. The Netherlands is among the world's most prosperous and productive nations. It is now emerging from the crisis and staging a tentative economic recovery. After undergoing contraction in the years 2012 and 2013, the CPB Netherlands Bureau for Economic Policy Analysis expects the Dutch economy to grow this and next year by, respectively, ¾% and 1¼%, mainly on the back of reviving global trade.<sup>4</sup> According to the CPB, unemployment will start falling again next year. The recovery is visible, but also fraught with uncertainties. Political tensions in Ukraine and in the Middle East constitute a risk for the further recovery of global trade and hence also for the potential growth of the Dutch economy.

The adverse macroeconomic conditions in recent years are reflected in the results of businesses. Those active in the top sectors have been particularly hard hit. The results and progress of the top sectors are therefore viewed in this macroeconomic context.

### **What sources were used?**

This Monitor centres on the most important data for the enterprise policy. These data were derived from various sources, such as Statistics Netherlands (including the publication 'Monitor Topsectoren 2014: uitkomsten 2010, 2011 en 2012'), Eurostat, the Dutch Central Bank (De Nederlandsche Bank, DNB) and the Netherlands Enterprise Agency (RVO.nl). Wherever possible, Dutch data are compared over time as well as internationally, drawing on such sources as the OECD and the World Bank. The basic data, including technical explanations, are available via [topsectors.nl](http://topsectors.nl) and [volginnovatie.nl](http://volginnovatie.nl).

### **Changes in data partly due to revision by Statistics Netherlands**

Compared with the previous Monitor, certain key data have been adjusted by Statistics Netherlands for statistical reasons and this has consequences for the numerical data presented in this Monitor.

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<sup>4</sup> For the most recent estimates see: <http://cpb.nl/>.

The most important reason for the adjustment is the revision of the National Accounts (NA) as performed this year by Statistics Netherlands in conformity with international guidelines. An NA revision is carried out with the aid of new and improved data sources. The most important result is that the Gross Domestic Product (GDP) has been adjusted upwards by almost 8%. The top sector figures for production, added value and employed persons were also revised. Other important changes at Statistics Netherlands that influence the outcomes include the adjusted demarcation of some top sectors and the adjusted method for determining R&D expenditures. Wherever possible, this Monitor draws on consistent data series based on the new standards and measurement methods. In some cases this also resulted in a revision of the baseline measurement.

### **Reader's guide**

The remainder of this Monitor is organised as follows. Chapter 2 provides a broad overview of the enterprise policy and its economic background. It gives insight into where the Netherlands stands in terms of productivity and key productivity determinants such as innovation/R&D, investments including ICT, human capital and the business climate. The policy mix is designed to influence the determinants of sustainable productivity growth. The connection between the enterprise policy and these determinants is explained and policy challenges are identified. Chapter 3 casts light on the new data for the top sectors. This chapter contains a summary of the most important results from the Top Sector Monitor of Statistics Netherlands, analyses the use of instruments by top sectors and describes the progress made towards achieving the ambitions of the enterprise policy in general and the top sector approach in particular. Finally, Chapter 4 is devoted to the highlighted topic: the contributions of the enterprise policy to societal challenges.

## 2. A broad overview of the enterprise policy

### 2.1 Introduction

Productivity is an indicator of operational efficiency and, as such, an important measure of a company's competitiveness. Being more productive than your competitor or your own past performance means producing more with the same time input of workers (labour) and machinery (capital). In other words, you create more added value. Productivity is also important at country level. It tells something about the population's standard of living and level of prosperity. Higher productivity is a vital engine of economic growth and, hence, a driver of prosperity.

Higher productivity improves the international competitiveness of businesses, boosts the material prosperity of citizens and expands the economic base for public expenditures. Over time, the increase in labour supply and labour productivity jointly determine economic growth. Today, the quest to find new ways of increasing economic growth via structural productivity growth is more urgent than ever in the Netherlands. First of all, because the steadily diminishing supply of labour is making sustainable economic growth in the Netherlands even more dependent on labour productivity growth.<sup>5</sup> Second, because the financial-economic crisis has put pressure on the public finances by exacerbating the public deficit and public debt.

Figure 2.1 sketches the main factors for increasing labour productivity and improving competitiveness: i) the total factor productivity (TFP), ii) investments in physical capital per unit of labour, including ICT-related investments, and iii) use of other inputs such as energy, materials, commodities and services. According to the economic growth analysis, the first factor has a particularly vital bearing on long-term productivity growth. TFP growth is productivity growth that is not caused by more inputs and investments. Economic research has shown that R&D/innovations, human capital and the business climate are key determinants for TFP growth.

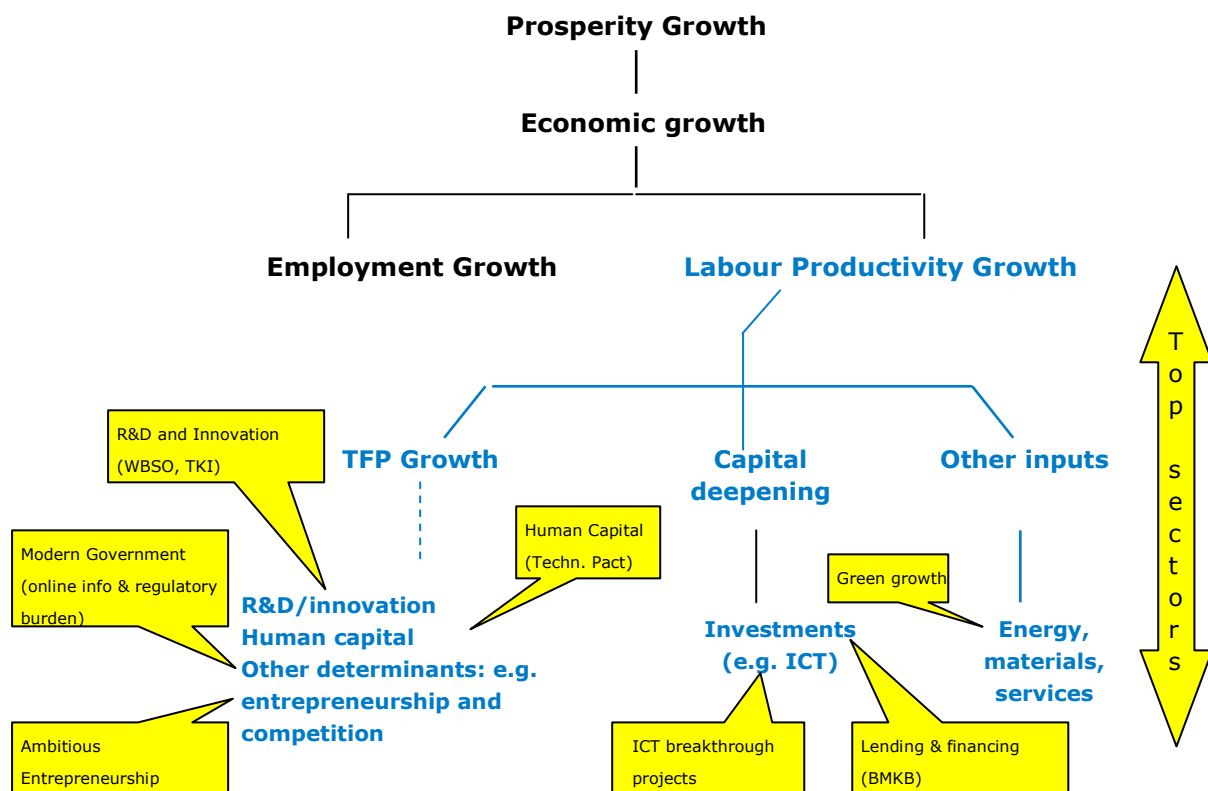
The yellow blocks in Figure 2.1 indicate in outline the deployment of the various enterprise policy components that serve to boost crucial productivity growth factors and thus help to achieve stronger competitiveness and a higher level of prosperity in the Netherlands.<sup>6</sup> The remainder of the Enterprise Policy Monitor is organised along the lines of Figure 2.1. The rest of Chapter 2 centres mainly on the generic pillar of the enterprise policy, outlining where the Netherlands stands regarding these factors and what policy efforts are being undertaken.

*Figure 2.1 Relationship between policy themes and labour productivity growth, economic growth and prosperity growth*

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<sup>5</sup> See CPB, 2014, Roads to recovery.

<sup>6</sup> Note, incidentally, that the components of the enterprise policy often impact on more than one determinant. For instance, long-term employment growth is mainly determined by labour market institutions and the size of the labour force.



Section 2.2 casts light on the Netherlands' structural productivity and competitiveness. Next, the main focal issues for the enterprise policy are discussed, starting with the determinants which, in the first instance, are controlled by the entrepreneurs themselves. Innovation is the subject of section 2.3. Next, section 2.4 deals with human capital and section 2.5 discusses investments, placing particular emphasis on the importance of ICT investments. Finally, Section 2.6 looks at the business climate in the Netherlands, focusing on such matters as regulations, financing and internationalisation.

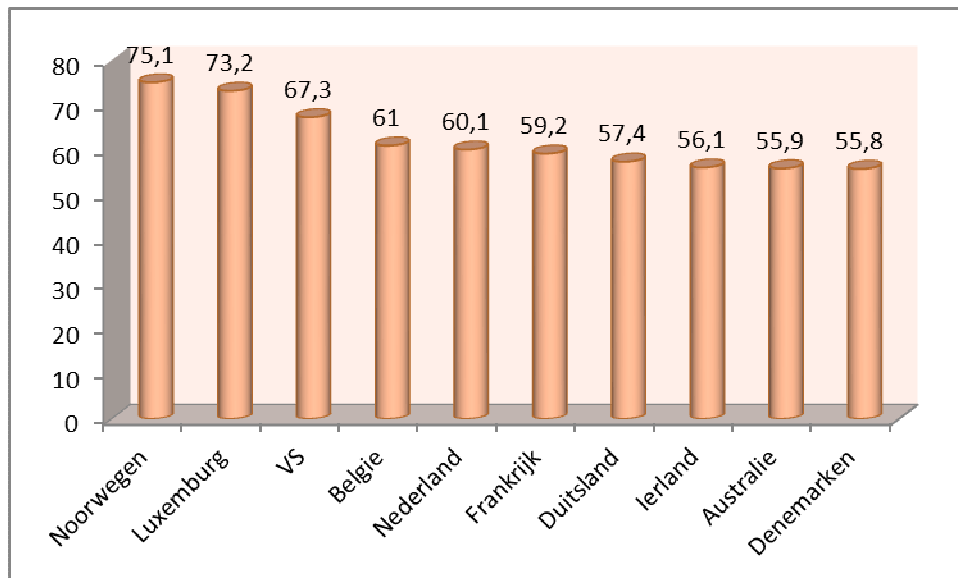
## 2.2 Productivity and competitiveness

*The Netherlands is one of the most productive countries in the world. However, since 2000, and particularly after 2007, Dutch productivity growth has lagged behind the US. One ambition of the enterprise policy is to belong to the world's top five knowledge economies. After securing fifth place on the league table in 2012, the Netherlands came eighth in 2013 as well as 2014. Unlike in 2013 however, when the Netherlands' score deteriorated, 2014 brought a renewed improvement. Since the start of the enterprise policy in October 2010, the scores of most pillars have shown an upward trend. In 2014, major improvements were realised in the field of innovation. The World Economic Forum attributes this progress to better availability of technical staff, higher private investments in R&D and increased cooperation of businesses with knowledge institutions.*

### Productivity

For many years now, labour productivity in the Netherlands has been high by international standards. The latest figures of the Conference Board put the Netherlands in fifth place on the world rankings, just like last year.

*Figure 2.2 Top 10 countries with highest labour productivity level (per worked hour), 2013*



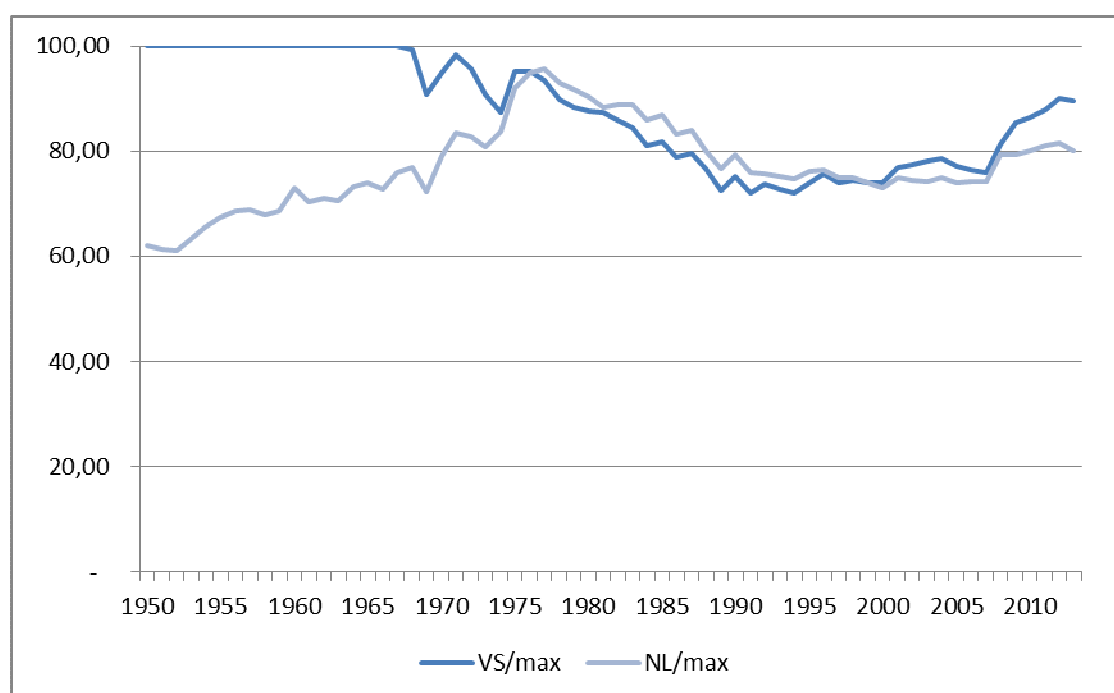
Source: Calculations based on The Conference Board Total Economy Database, January 2014 (<http://www.conference-board.org/data/economydatabase/>).

[Norway, Luxembourg, US, Belgium, Netherlands, France, Germany, Ireland, Australia, Denmark]

The high productivity level indicates that, in general, businesses based in the Netherlands are innovative and efficient. Norway has the highest labour productivity, closely followed by Luxembourg. The main reason why these two countries achieve relatively strong scores is their one-sided production structure, with Norway depending heavily on oil and gas production and Luxembourg on the financial sector. The Netherlands' good position at macro level is largely determined by the strengths within our economic structure, including the top sectors. On average, the top sectors have a high productivity level (see Chapter 3).

Comparison with the US is particularly interesting for the Netherlands. Widely perceived as the global productivity leader, the US is ranked third on the Conference Board league table. Compared to the US, Dutch productivity has been disappointing in recent years (see Figure 2.3). This is in stark contrast with the 1976-1999 period, when the Netherlands actually overtook the US in productivity terms after staging an impressive catch-up race following WW2. For years Dutch businesses were able to grow rapidly by imitating and applying cheap new technologies from the US – long the world's undisputed frontrunner.

*Figure 2.3 US and Dutch productivity levels compared with highest measured productivity in the world, 1950-2013*



Source: Calculations based on The Conference Board Total Economy Database, January 2014 (<http://www.conference-board.org/data/economydatabase/>).

Since 2000, and particularly after 2007, the Netherlands has trailed behind the US in terms of productivity growth. The financial-economic crisis appears to have hit our country harder. Table 2.1 breaks down the increase in labour productivity into four determinants according to the growth accounting method.<sup>7</sup> As is clear from the table, the Netherlands compares unfavourably with other countries, and above all with the US, notably in the 2009-2012 period. The negative development of productivity in the Netherlands in that period was largely due to the fact that Dutch companies were slower to lay off staff during the recession ('labour hoarding effect').<sup>8</sup> According to the CPB, this effect was particularly strong in the first years of the crisis. Due to the combination of ample financial resources and the tight labour market prior to the crisis, companies were wary of dismissing employees whom they might badly need in the not too distant future. Productivity is expected to improve again once the economy revives and companies start realising catch-up growth.

*Table 2.1 International decomposition of labour productivity growth, 1991-2012 (% and % points, average per year)*

Labour productivity growth,	Contributions in % points per year of			
	Change in labour	Growth in ICT capital per	Growth in non-ICT	Growth in total

<sup>7</sup> This is a method for breaking down labour productivity growth on the basis of several neoclassical accounting assumptions into various labour productivity determinants.

<sup>8</sup> Labour hoarding means that companies retain staff whom they do not really need at that time. Companies expect sales to recover and do not want to lose their staff. This saves severance costs and future recruitment costs.



	<i>average</i>	<i>composition</i>	<i>person employed</i>	<i>capital per person employed</i>	<i>productivity factor</i>
<b>1991-2000</b>					
Netherlands	1.3	0.3	0.5	0.0	0.5
Germany	2.1	-0.0	0.4	0.5	1.3
United States	2.0	0.3	0.8	0.2	0.7
Japan	1.9	0.4	0.4	1.4	-0.3
OECD (pre-1994), weighted average	2.1	0.3	0.6	0.6	0.6
EU-15, weighted average	2.1	0.3	0.5	0.5	0.7
<b>2001-2008</b>					
Netherlands	1.4	0.3	0.3	0.2	0.6
Germany	1.5	0.1	0.3	0.3	0.8
United States	1.6	0.3	0.5	0.5	0.4
Japan	1.5	0.3	0.2	0.5	0.5
OECD (pre-1994), weighted average	1.5	0.3	0.4	0.6	0.2
EU-15, weighted average	1.2	0.2	0.3	0.5	0.1
<b>2009-2012</b>					
Netherlands	-0.3	0.1	0.2	0.3	-0.9
Germany	0.4	0.1	0.3	0.0	-0.1
United States	1.5	0.1	0.3	0.3	0.7
Japan	1.0	0.1	0.3	0.3	0.2
OECD (pre-1994), weighted average	0.9	0.1	0.3	0.5	-0.1
EU-15, weighted average	0.4	0.2	0.3	0.6	-0.7

Source: Calculations based on The Conference Board Total Economy Database, January 2014.  
(<http://www.conference-board.org/data/economydatabase/>).

### Competitiveness: Global Competitiveness Index

One of the main ambitions of the enterprise policy is to make the Netherlands one of the world's top five knowledge economies by the year 2020. This ambition is measured according to the Global Competitiveness Index (GCI) of the World Economic Forum (WEF). Each country's position on the GCI is determined on the basis of 114 indicators, divided over twelve themes.

The information used to compile the index comes from data sources such as the World Bank, the IMF and UNESCO. To measure the more qualitative and subjective aspects of the business climate, as well as to gather information for indicators for which no data are available, the GCI also makes use of a self-developed survey among entrepreneurs and senior managers.

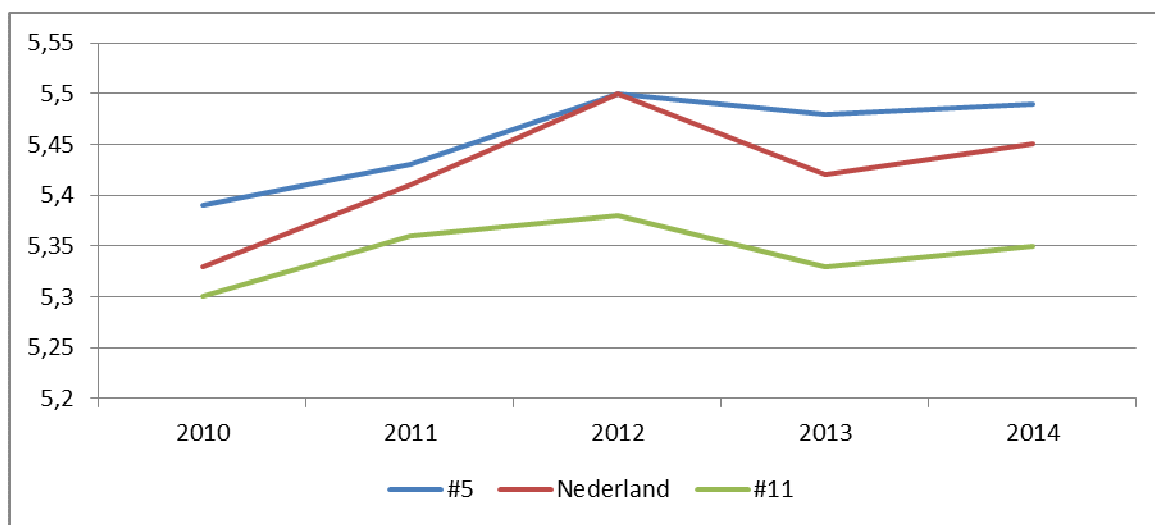
#### How does the Netherlands score on the GCI?

In each year of the 2009-2012 period the Netherlands managed to advance a step closer to the global knowledge economy top five, climbing from tenth place in 2009, to eighth and seventh place

in the two years thereafter, and finally securing fifth place in 2012, before falling back to eighth place in 2013.

In 2014 the Netherlands once again came eighth. However, unlike in 2013 when the Netherlands' score deteriorated, 2014 brought a renewed improvement. As a result, we advanced 0.03 points on the overall ranking. That may seem negligible, but the differences in the top ten are small. By way of illustration: ranks eight to four on the rankings are only 0.05 points apart. Notable risers and fallers this year are Japan (riser) and Sweden (faller). Japan jumped from place nine to six, while Sweden sank from place six to ten. The most important consequence of this is that the Netherlands moved up a place within Europe.

Figure 2.4 Distance of NL (red) to number five (blue) and number eleven (green) in rankings



Source: World Economic Forum, GCI 2014-2015.

Figure 2.4 shows the Netherlands' score in the bandwidth from place five to eleven. The eleventh position was taken as a reference to determine the solidity of the position in the global top ten is. In 2014, the Netherlands resumed the upward path, after falling back in 2013; the gap narrowed versus the top five, and widened versus number eleven. The figure also clearly shows that an improved score is no guarantee for a higher ranking: whereas a score of less than 5.4 was sufficient to enter the top five in 2010, the required score in 2014 is almost 5.5.

#### Analysis of the sub-themes and indicators

As noted, the development sketched in Figure 2.4 is the aggregate effect of scores for more than 100 indicators, which have subsequently been assigned to twelve 'pillars'. Looking at the Netherlands' **rankings** for the underlying pillars, we can conclude that the Netherlands belongs to the global top ten for eight of the twelve pillars (see Table 2.2) and even to the top five for such pillars as 'higher education and training', 'infrastructure', 'health and primary education' and 'business sophistication'. The most salient areas where the Netherlands fares less well are 'macroeconomic environment' and 'financial market development'. Though comparable in ranking in 2014, these two pillars developed in an opposite direction, with 'macroeconomic environment' climbing five places and 'financial market development' declining seven places.

Table 2.2 The Netherlands' rankings for twelve pillars in Global Competitiveness Report

Basic requirements (5% weighting)		Efficiency enhancers (8% weighting)		Innovation factors (15% weighting)	
Institutions	10	Higher education and Training	3	Business sophistication	5
Infrastructure	4	Goods market efficiency	9	Innovation	8
Macroeconomic environment	39	Labour market efficiency	21		
Health and primary education	5	Financial market development	37		
		Technological readiness	9		
		Market size	23		

Source: World Economic Forum, GCI 2014-2015.

Table 2.3 Development of underlying twelve pillars of GCI-score (2010 = 100), 2011-2014

	2011	2012	2013	2014
<b>Institutions</b>	101.3	103.2	101.4	99.8
<b>Infrastructure</b>	101.5	104.2	103.4	105.4
<b>Macroeconomic environment</b>	100.9	98.3	98.7	101.7
<b>Health and primary education</b>	100.2	101.1	101.2	101.7
<b>Higher education and training</b>	100.5	102.8	102.7	106.4
<b>Goods market efficiency</b>	100.0	102.3	101.5	103.3
<b>Labour market efficiency</b>	100.2	103.3	100.2	97.9
<b>Financial market development</b>	103.2	105.3	99.4	96.6
<b>Technological readiness</b>	102.3	99.8	99.7	100.2
<b>Market size</b>	100.0	100.2	100.2	99.4
<b>Business sophistication</b>	100.5	101.4	100.2	100.4
<b>Innovation</b>	105.5	111.3	108.2	110.1
<b>Overall Score</b>	<b>101.5</b>	<b>103.2</b>	<b>101.7</b>	<b>102.3</b>

Source: World Economic Forum, GCI 2014-2015.

Looking at the historical development of the **score** from the start of the enterprise policy in October 2010, most pillars show an upward trend, resulting in an increasing overall score of the Netherlands (see Table 2.3). The Netherlands achieved marked improvements on 'innovation', 'higher education and training' and 'infrastructure', and, to a slightly lesser extent, on 'goods market efficiency'. By contrast, the scores for 'labour market efficiency' and 'financial market development' deteriorated. The latter development, incidentally, is attributable to the period after 2012 and is thus closely connected with the weak economy.

#### What are the implications for policy and the top five ambition?

In 2012 the Netherlands managed to claim a place in the top five of the most competitive knowledge economies, but was unable to retain this position in 2013: a sign that we must remain sharply focused and continue to seize every opportunity to hone our competitiveness in order to meet the set ambition in 2020. Encouragingly, the decline in 2013 has not continued, so this may have been a one-off dip. What is also positive is that, whilst the ranking remained unchanged, the

Netherlands did improve its score and was able to narrow the gap with the top five. Major gains were achieved in respect of the 'innovation' pillar. The reasons, according to the WEF, are the better availability of technical staff, higher private investments in R&D and intensified collaboration of businesses with knowledge institutions. The good scores on the 'higher education and training' and 'infrastructure' pillars are also mentioned as explanations for the Netherlands' solid position in the top ten.

It is vital for the Netherlands to continue pursuing progress on each of the twelve competitiveness pillars. However, it would seem that 'labour market efficiency' and 'financial market development' are the areas in which the main gains can be achieved. Accordingly, the enterprise policy will in the coming period intensify its efforts on the latter pillar via the Supplementary SME Finance Action Plan.<sup>9</sup> Outside of the enterprise policy, the Work and Security Act (*Wet Werk en Zekerheid*) will take effect in 2015, thus also making major steps forwards in relation to the labour market.<sup>10</sup>

## 2.3 Innovation

*The Netherlands is making moderate progress in the field of innovation: the country managed to maintain a position in the group of followers in Europe and the R&D expenditures are rising. Though the R&D intensity dipped back below 2% after the statistical revisions, the revised figures point to an upward trend. In keeping with the ambition of the enterprise policy, this upward trend is mainly driven by extra private R&D expenditures; this is encouraging, as private R&D expenditures long lagged behind the international standards. Adjusted for differences in economic sector structure, Dutch businesses actually invested in R&D slightly more than the OECD average. Dutch businesses also devote a relatively large amount of their non-technological knowledge investments to innovation. These investments contribute to productivity growth alongside, and, above all, in combination with 'hard' technological R&D. This is why the Netherlands still realises high productivity levels for hard R&D even though its expenditures are only average.*

### 2.3.1 Relevance of innovation

Innovation is one of the most important drivers of economic growth and prosperity. Product and process innovation by companies leads to more added value and higher productivity. Improved products offer higher added value (per unit of input), while improved processes (e.g. through the use of new machinery) enable faster, more efficient, 'greener' and cheaper production. Companies invest in innovation because better and/or new products open up lucrative new markets, thereby strengthening their market position and competitiveness. Added to this, innovations also have a wider social significance because new products and production processes also contribute towards the removal of social bottlenecks in such diverse fields as health, ageing, depletion of resources, climate change and food quality. This section illustrates where the Netherlands stands in the international context in the field of innovation (section 2.3.2), focusing in particular on R&D as this

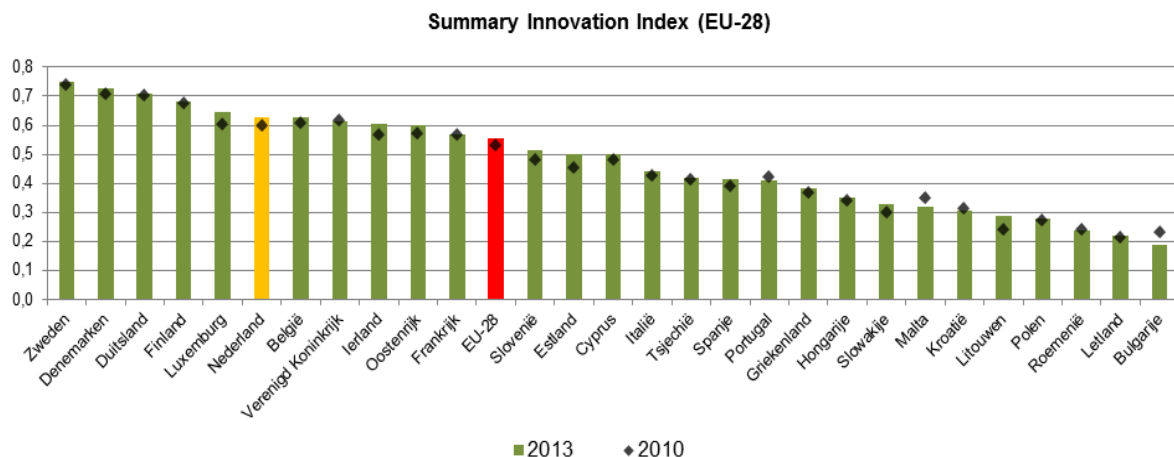
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<sup>9</sup> <http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2014/07/08/kamerbrief-aanvullend-actieplan-mkb-financiering.html>.

<sup>10</sup> [https://www.eerstekamer.nl/wetsvoorstel/33818\\_wet\\_werk\\_en\\_zekerheid](https://www.eerstekamer.nl/wetsvoorstel/33818_wet_werk_en_zekerheid).

concerns one of the central policy objectives. Wherever possible, a distinction is made by top sector. Subsequently, the various innovation instruments in the enterprise policy and their significance are dealt with (section 2.3.4.).

Figure 2.5 The Netherlands' European position on the Innovation Union Scoreboard 2010, 2013



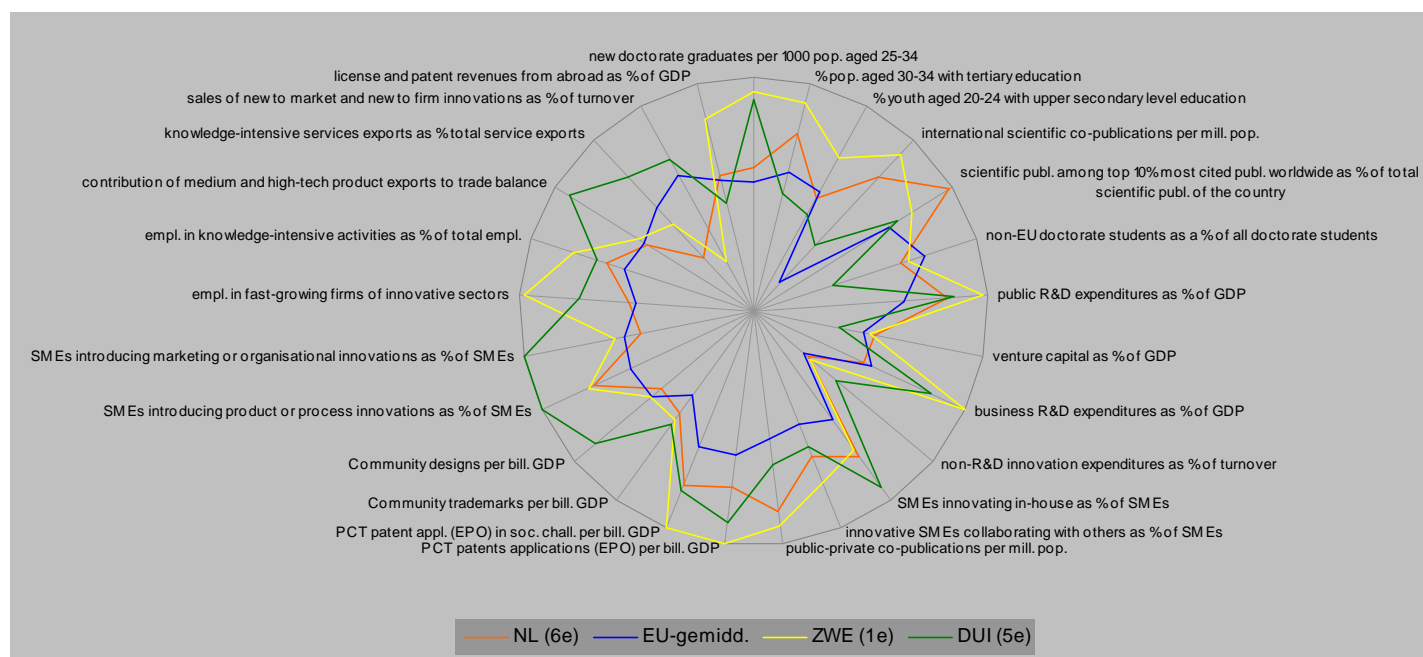
Source: IUS 2014 (EC).

[Sweden, Denmark, Germany, Finland, Luxembourg, Netherlands, Belgium, United Kingdom, Ireland, Austria, France, EU-28, Slovenia, Estonia, Cyprus, Italy, Czech Republic, Spain, Portugal, Greece, Hungary, Slovakia, Malta, Croatia, Lithuania, Poland, Romania, Latvia, Bulgaria]

### 2.3.2 Innovation Union Scoreboard 2014

Early this year, the European Commission published its Innovation Union Scoreboard 2014 (IUS). The IUS ranks all EU member states on the basis of 25 indicators that measure the quality and quantity of research, capital investments, human resources, innovation and competitiveness. The Netherlands ranked sixth in the latest IUS, one place lower than last year. The leader remains Sweden, followed by Denmark, Germany, Finland and Luxembourg. According to the Commission, the Netherlands belongs to the group of innovation followers, together with such countries as Belgium, the UK and France. As Figure 2.5 shows, the Dutch score has improved since 2010 relative to the leaders, but not yet sufficiently to catch up with them. Nor are the other countries sitting still: Luxembourg and Belgium, like the Netherlands, improved their score and will be seeking to sustain their upward trajectory in the coming years.

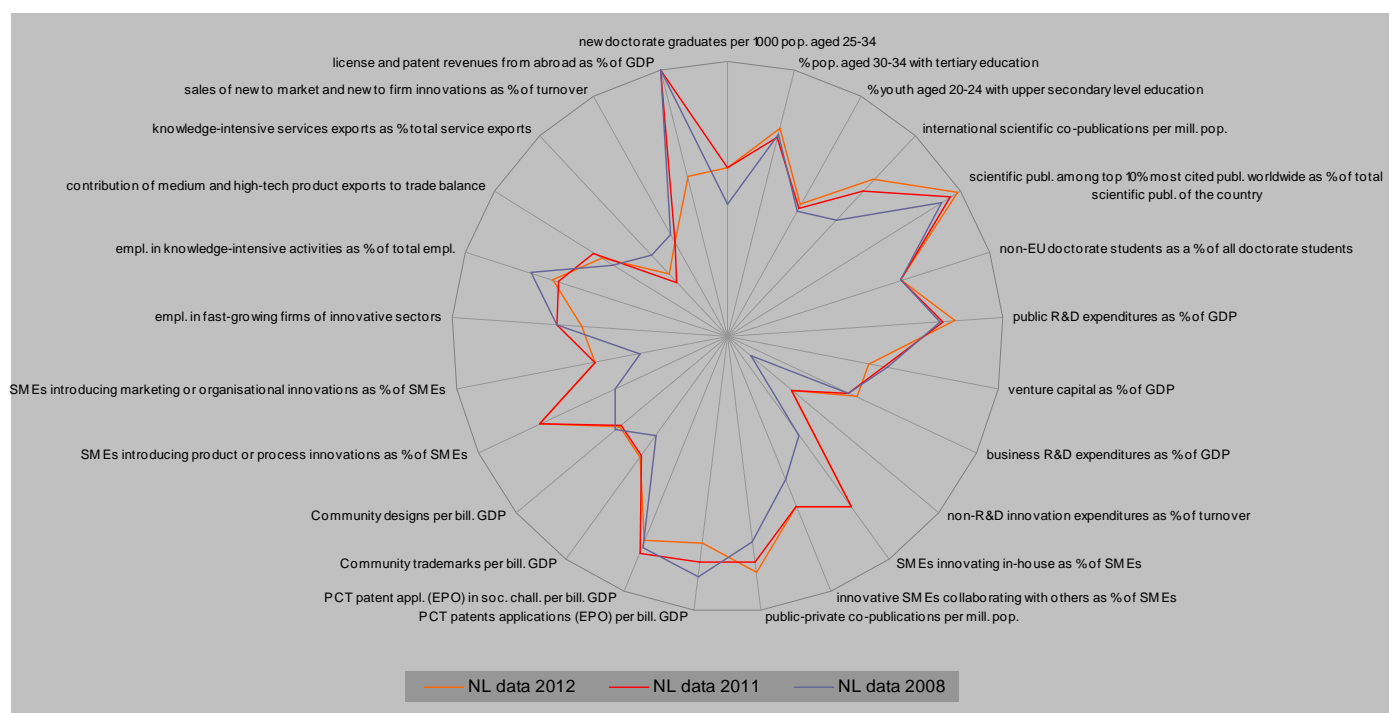
Figure 2.6 Relative performance of the Netherlands in the IUS2014



Source: IUS 2014 (EC).

[NL (6th); EU average; SWE (1st); GER (5th)]

Figure 2.7 The Netherlands' performance according to IUS; 2008, 2011, 2012



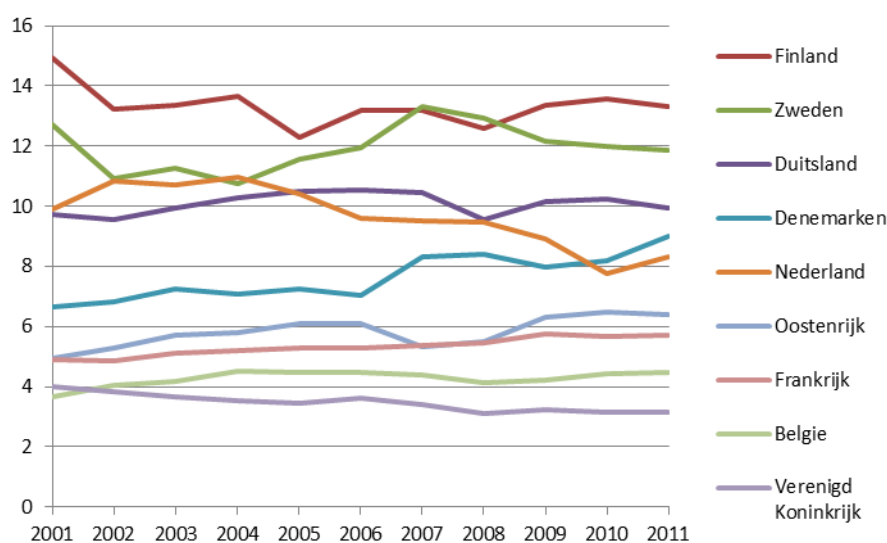
Source: IUS 2014 (EC).

Figure 2.7 shows the development of the Dutch position by comparing data from 2012 and 2011 with data from 2008 (all data are from IUS 2014). The Dutch performance has improved on most indicators since 2008. One positive factor is that SMEs have started to innovate more, in terms of both in-house technological innovation and product, process, organisational and marketing

innovation. The expenditures on R&D have risen accordingly, particularly in non-technological areas. Another noticeable improvement is that since 2008 SMEs have also started collaborating more with other organisations (e.g. customers, suppliers, knowledge institutions).

Finally, according to the IUS, the Netherlands' performance is below average on the indicators of 'knowledge-intensive services exports' and 'sales share of new innovations'. The IUS gives no explanation for this. Our own analysis of the composition of the indicator for 'knowledge-intensive services exports' (using data of the Netherlands Enterprise Agency) shows that the Netherlands' lower score is attributable to statistical flaws. The Commission leaves over €20 billion of Dutch services exports (royalties and licences) out of consideration. Moreover, enquires at the Commission revealed a second reason why the Dutch total score is not accurate. The licence and patent revenues from abroad are understated in the calculations. The Netherlands is actually performing as well as ever in this area, but the IUS does not yet have the most recent patent application data. New data show that after a long decline, the number of patent applications started to recover from 2010 (see Figure 2.8).

*Figure 2.8 Top ten EU countries with highest number of patent applications per € billion of GDP (adjusted for PPP), 2001-2011*



Source: Netherlands Enterprise Agency (RVO.nl). Explanation: Patent applications submitted to WIPO and/or the European Patent Office on the basis of patent families. Patent families are groups of patent documents relating to one and the same invention. Applications belonging to the same family that are selected both at the WIPO and the European Patent Office are counted only once.  
[Finland, Sweden, Germany, Denmark, Netherlands, Austria, France, Belgium, United Kingdom]

### 2.3.3 Innovation key data

One indicator for a country's innovative capability and also one of the objectives of the enterprise policy concerns the R&D intensity (total R&D expenditures as a percentage of gross domestic product). According to the most recent data of Statistics Netherlands, this amounted in 2012 to 1.97%, up 3.7% relative to 2011. Earlier data of Statistics Netherlands on the R&D intensity in 2011 and 2012 were higher, but these were adjusted in the spring of 2014 in line with the internationally agreed GDP revision (see boxed text). The level according to the new Statistics

Netherlands data is lower than before the revision; but even in the revised series, R&D expenditures still show an upward trend. After the GDP revision, the R&D intensity of companies in 2012 came to 1.14% of GDP while that of public knowledge institutions worked out at 0.83% of GDP. For comparison: in 2012 the EU average amounted to 2.07% of GDP, of which 1.31% private and 0.76% public. These Eurostat data, however, have not yet been revised downwards for GDP revision purposes.

#### Consequences of GDP statistical revision for R&D intensity

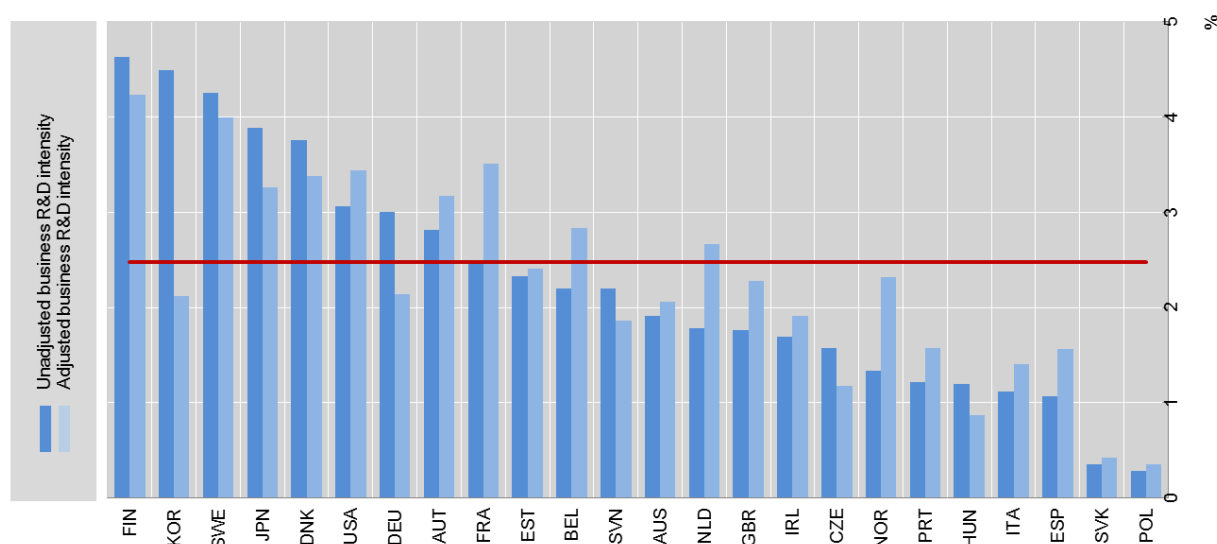
Statistics Netherlands recently published 'ICT, knowledge and the economy 2014', a document containing new figures on the R&D expenditures in the Netherlands for 2011 and 2012. These show the impact of the upward GDP revision (as part of the revision of the National Accounts) on R&D intensity. The table indicates that the upward GDP adjustment leads to a decrease in the R&D intensity of about 0.13 percentage points in both years. R&D intensity in 2012 thus came to 1.97% GDP. These changes are therefore purely statistical in nature, but make the 2.5% target even more ambitious.

Table R&D expenditures as % of GDP, before and after GDP revision

	Before GDP revision		After GDP revision	
	2011	2012	2011	2012
Businesses	1.16	1.22	1.08	1.14
Public knowledge institutions	0.89	0.89	0.83	0.83
Total	2.04	2.10	1.90	1.97

Source: Statistics Netherlands (2014). ICT, knowledge and economy 2014.

Figure 2.9 R&D expenditures of businesses (% GDP) with and without adjustment for sector structure, 2011



Source: OECD (2013) STI Outlook 2013.

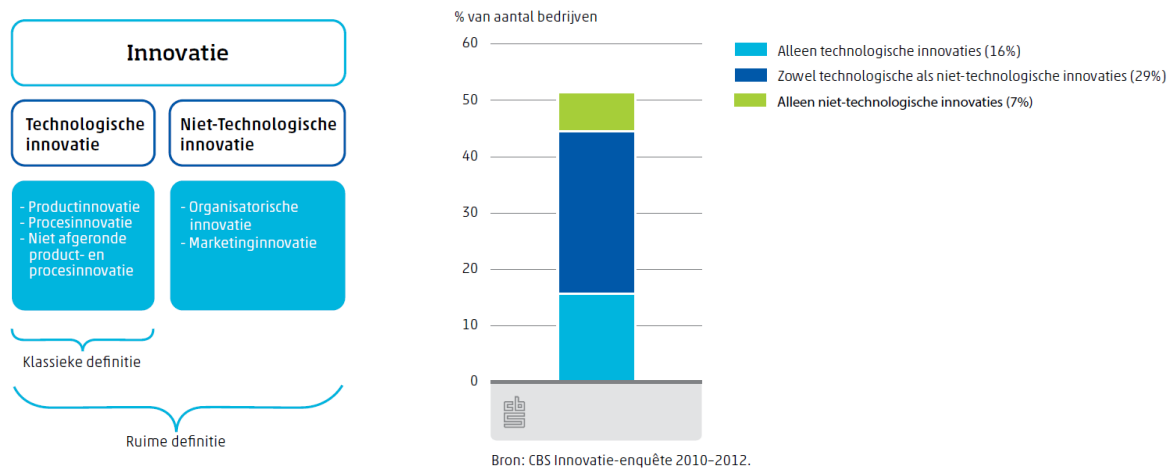
As part of the European EU2020 strategy for growth and jobs, the Netherlands is striving for 2.5% GDP in 2020. This is also one of the objectives of the enterprise policy. Many other EU member states have set their target at 3%. The Netherlands has justified its choice for 2.5% on the grounds of international differences in sector structure. Figure 2.9 shows an international comparison of the



R&D intensity by businesses, indicating that these are below the OECD average – but the OECD also shows in this figure that if differences in sector structure are taken into account, the Netherlands actually scores just above the OECD average. This means that, on average, businesses that invest in R&D in the Netherlands currently do no less than their foreign competitors (and even a little more than German companies). The difference in private R&D intensity is thus largely the consequence of the fact that the R&D-intensive sectors constitute a smaller part of the economy in the Netherlands than in other OECD countries. Any future strengthening of the private R&D intensity must thus be achieved through structural improvements, such as the attraction of new foreign R&D investments to the Netherlands or rapid growth of small (often young) R&D-intensive businesses.

Recent research (e.g. of the OECD) shows that productivity growth is not driven by R&D investments alone. Other knowledge-related investments also contribute, by converting ‘hard’ technology into marketable products. Such investments in knowledge-based capital (KBC) include investments in software and databases, design & marketing and intellectual property as well as investments in company-specific knowledge and organisational capability. The innovations resulting from these efforts are also referred to as social innovation.<sup>11</sup> Though more research into the size of the contribution of these elements is necessary, initial studies point to a substantial contribution to labour productivity growth ranging from 19.9% (14 EU countries) to 33.7% (US) in the 1995-2007 period; which is about equivalent to the contribution of investments in physical capital to productivity growth.<sup>12</sup>

*Figure 2.10 Investments of companies in innovation, by type of innovation, 2010-2012*



Source: Statistics Netherlands (2014). ICT, knowledge and the economy 2014.

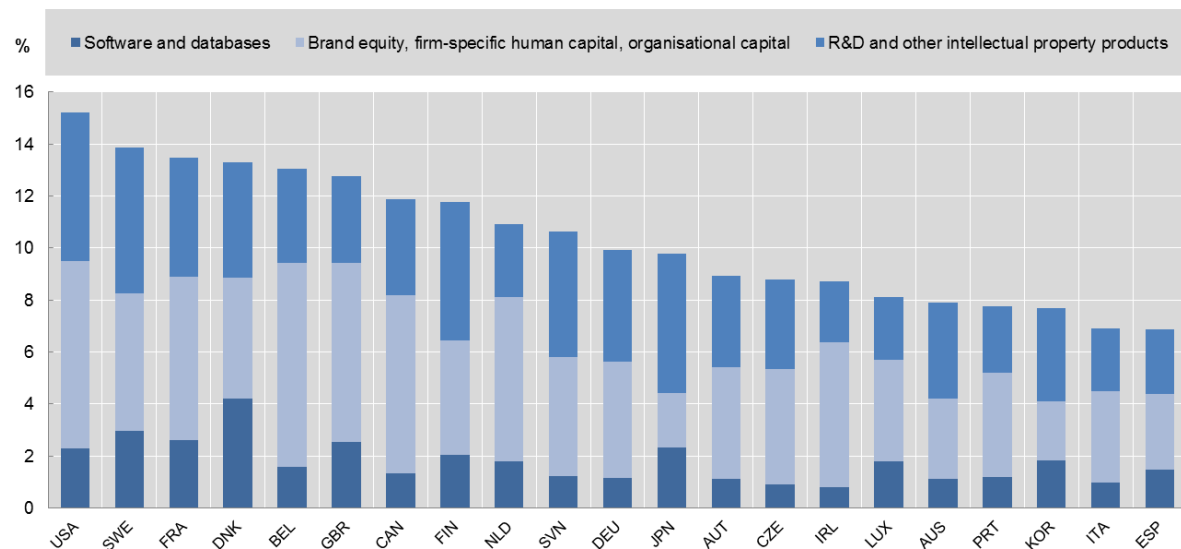
[Innovation; Technological innovation; Non-technological innovation; Product innovation; Process innovation; Uncompleted product and process innovation; Organisational innovation; Marketing innovation; Classical definition; Broad definition; % of number of businesses, Only technological innovations (16%), Both technological and non-technological innovations (29%); Only non-technological innovations (7%); Source: Statistics Netherlands Innovation Survey 2010-2012.]

<sup>11</sup> See publications of Volberda (RSM) for explanations of the significance of social innovation alongside technological innovation.

<sup>12</sup> See for example: OECD (2013). Supporting Investment in Knowledge Capital, Growth and Innovation, OECD Publishing, pp. 23, 26.

Statistics Netherlands makes a distinction between technological and non-technological innovation (Figure 2.10). The significance of technological and non-technological activities at innovating companies can be determined on the basis of the Innovation Survey 2010-2102. This reveals that a mere 16% of businesses innovate according to the 'classical definition'; in other words, they concentrate exclusively on technological product or process innovations (the classical and linear innovation model). Most businesses (29%) combine technical with non-technological innovation. It is precisely this combination that makes an important contribution to productivity growth.<sup>13</sup>

Figure 2.11 Business expenditures on three types of knowledge-based capital in % GDP, 2010



Source: OECD (2013) STI Outlook 2013, chart edited by the Ministry of Economic Affairs.

Figure 2.11 shows that Dutch businesses spend about 11% of GDP on knowledge-based capital. A particularly large amount goes into non-technological innovation (over 6% of GDP), which is more than in e.g. Germany and the Scandinavian countries. It would seem plausible that the relatively high investments in knowledge-based capital help the Netherlands to realise high productivity levels despite modest R&D expenditures.

### Collaboration

Research by Faems et al. (2005)<sup>14</sup> and De Jong & Hulsing (2010)<sup>15</sup> shows that businesses that work closely together with knowledge institutions more frequently achieve innovations that are 'new for the market'. The promotion of public-private partnership (in the top sectors) is an

<sup>13</sup> See Wiel, H., van der, G. van Leeuwen and T. Hempell, 2004, 'ICT, Innovation and Business Performance in Services: Evidence for Germany and the Netherlands,' ZEW Discussion Papers 04-06; Polder, M., G. van Leeuwen, P. Mohnen and R. Wladimir, 2010, 'Product, Process and Organizational Innovation: Drivers, Complementarity, and Productivity Effects,' MPRA Paper 23719, University Library of Munich, Germany.

<sup>14</sup> Faems, D., B. Looy, Van & K. Debackere, (2005), 'Interorganizational Collaboration and Innovation: Toward a Portfolio Approach,' Journal of Product Innovation Management, 22, pp. 238-250.

<sup>15</sup> Jong, J.P.J. de & W. Hulsing (2010). Patterns of Innovation Networking in Dutch Small Firms. EIM Research Reports, H201002, January 2010.

important part of the enterprise policy and forms the core of the 'Top Consortiums for Knowledge and Innovation (TKIs)', many of which were set up towards the end of 2012. Since 2012, this public-private partnership has resulted in the conclusion of Innovation Contracts, so that a growing proportion of the research resources provided by national government to NWO, KNAW and TO2 institutions are being programmed in consultation with businesses.

*Table 2.4 Innovation results of the Netherlands versus EU average, 2008-2012*

	2008-2010	2010-2012
<b>Share of innovating companies engaging in technological collaborations with public parties:</b>		
• Government or public research institutions (EU average)	7% (6%)	8%
• Universities and other higher education institutions (EU average)	8% (11%)	11%
<b>Sales share of new and strongly improved products, total</b>	10% (13%)	13%
• Industry (EU average)	12% (18%)	18%
• Services (EU average)	9% (10%)	11%
<b>Sales share 'new-for-the-market' innovations</b>	5%	7%

Source: Statistics Netherlands, 'ICT, Knowledge and the Economy' and Eurostat (outcomes of two-yearly innovation surveys, rounded off to whole numbers). EU averages over 2010-2012 are not yet known.

Is the envisaged intensification of public-private collaboration already visible in the statistics? In its publication 'ICT, Knowledge and the Economy 2014', Netherlands Statistics (CBS) provides an initial picture consisting of the outcomes of the innovation survey 2012 for the 2010-2012 period. Table 2.4 shows an increase compared to 2010, but this occurred too soon after the launch of the enterprise policy and the top sector approach to be attributed to these policy measures. The next innovation survey covering the 2012-2014 period will tell us more about this. The sales share of new and improved products also expanded relative to 2010 from over 10% to 13%. This jump mainly came from industry which, with 18%, was at the average EU level in 2010. In line with the aforementioned literature on collaboration and radical innovations, the share of 'new-for-the-market' innovations within the total sales share rose from 5% to 7%.

#### 2.3.4 Resources and instruments to promote innovation

Innovation and R&D are encouraged in the enterprise policy in various ways. This section provides the financial multi-year statement and shows the efforts and results of:

- ✓ R&D tax incentives (WBSO, RDA),
- ✓ public-private partnership (Top Consortiums for Knowledge & Innovation),
- ✓ Scheme to Promote SME Innovation in Top Sectors (MIT),
- ✓ Internationalisation of R&D,
- ✓ Stimulation of ICT applications (ICT breakthrough projects), and
- ✓ the utilisation of the government's procurement power (innovation-driven procurement)

Table 2.5 shows the resources that are deployed on the part of national government for innovation and research, as reported in the National Reform Programme of April 2014. The figures reveal that in the 2012-2014 period the total resources remained roughly at the same level (despite the overall spending cuts), while a shift took place from direct financing of applied research institutes and knowledge programmes by ministries to tax-based instruments in order to promote R&D by businesses.

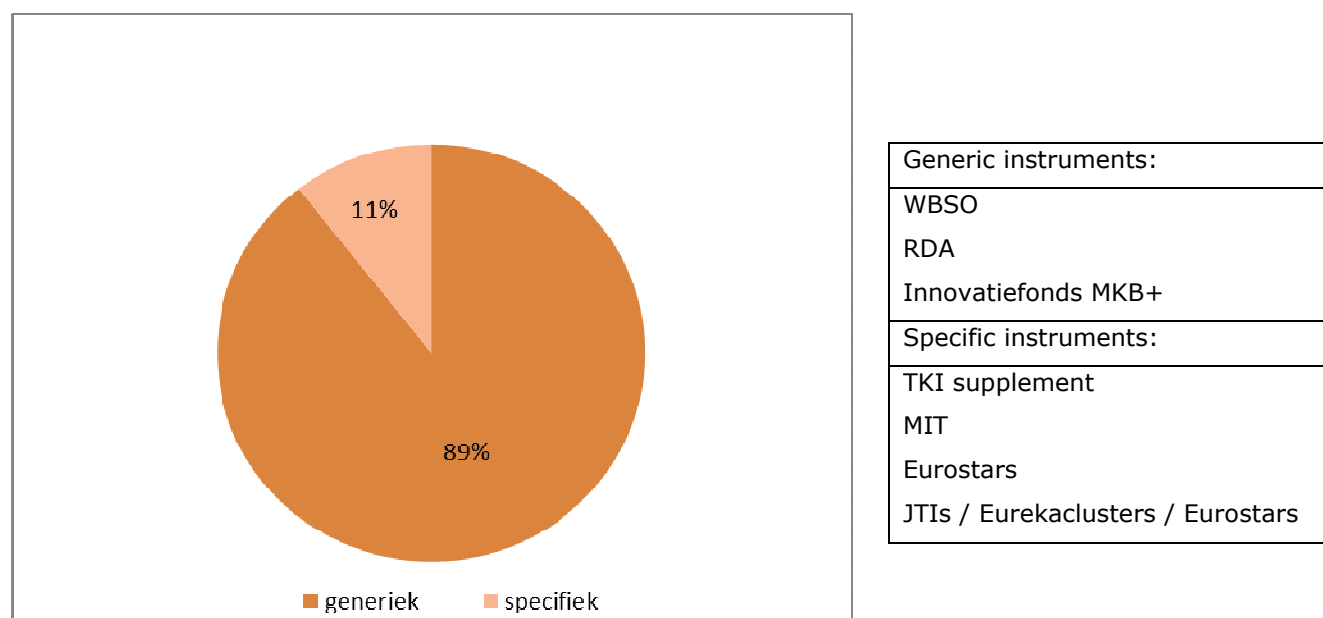
*Table 2.5 Multi-year statement of national/regional government resources for innovation and research, 2012-2017*

	2012	2013	2014	2015	2016	2017
Fundamenteel onderzoek	2.970	2.989	3.017	2.997	2.980	2.979
Toegepast onderzoek	483	437	389	359	339	336
Uitgaven departementen	1.453	1.481	1.375	1.215	1.084	1.016
Fiscale middelen voor R&D en innovatie	1.494	1.701	1.694	1.725	1.621	1.606
<b>Totaal</b>	<b>6.400</b>	<b>6.608</b>	<b>6.475</b>	<b>6.295</b>	<b>6.024</b>	<b>5.936</b>

Source: National Reform Programme 2014 (based on TWIN 2014 of the Rathenau Institute).

[Fundamental research; Applied research; Ministerial expenditures; Tax resources for R&D and innovation; Total]

*Figure 2.12 Budget innovation instruments: generic and specific, 2015*



Source: the Ministry of Economic Affairs' own calculations.

[generic, specific]

The innovation policy comprises two tracks: the generic track and the specific track (see Chapter 1). The generic track consists of tax-based innovation instruments (WBSO, RDA, Innovatiebox<sup>16</sup>), the SME innovation und 'Innovatiefonds MKB+' and several other instruments. The specific track relates to the top sector approach (see Chapter 3). Figure 2.12 shows that 89% of the total budget for innovation instruments is available to all companies. It is also clear that the innovation policy is strongly focused on SMEs as this sector receives a relatively large share (65%) of the innovation resources that go to the business sector (Figure 2.13 left).<sup>17</sup>

*Figure 2.13 Resources (left) and private R&D expenditures (right) for SMEs and large corporates*



Source: the Ministry of Economic Affairs' own calculations; Left: innovation instruments budget 2015 for SMEs and large corporates (based on usage in 2013). Right: private R&D in the Netherlands for SMEs and large corporates (2012).

[SME share; large corporates share]

### WBSO and RDA

Businesses have access to two R&D tax incentive schemes: WBSO and (since 2012) RDA. These schemes are designed to reduce their research & development costs. The WBSO reduces R&D-related wage costs, while the RDA provides tax relief for other R&D costs and expenditures (e.g. for prototypes or research equipment).

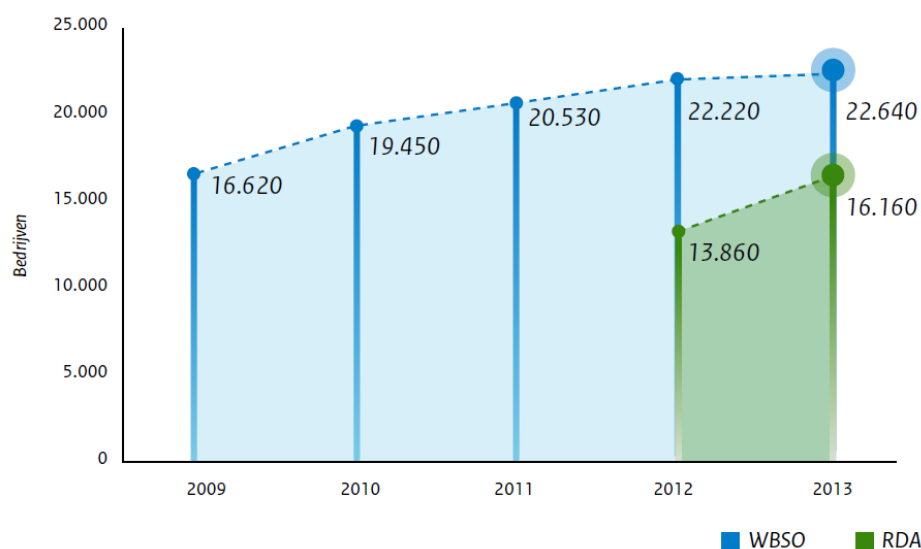
The number of businesses making use of the WBSO and RDA schemes grew in 2013. As shown in Figure 2.14, a total of 22,640 businesses and independent entrepreneurs as well as a relatively small number of knowledge institutions made use of the WBSO. By far the largest WBSO and RDA take-up occurred in the SME sector, which accounted for no less than 97% of the take-up of both schemes. Of the WBSO businesses, 71% also make use of the RDA. The increase in the number of users shown in the figure was made possible due to the relaxation of the eligibility criteria for tax

<sup>16</sup> The Ministry of Finance does not yet have sufficient data about the use and budgetary impact of the Innovatiebox; this instrument is therefore not reported on in this publication.

<sup>17</sup> Figure 2.13 includes the instruments in this budget article (cash amounts, 2015) where the benefits fall directly to businesses: WBSO, RDA, Innovatiefonds MKB+, MIT Scheme (incl. IPC), Eurostars and JTIs/Eurekaclusters. User numbers for 2013 (source: Netherlands Enterprise Agency) provide insight into the distribution between users belonging to the SME sector and large corporates. The SME share is an average of the SME user shares per instrument, weighted according to the budget volume of the instrument in 2015.

incentives since 2008 and the introduction of the RDA in 2012. This resulted in rising tax expenditures up to and including 2013.<sup>18</sup>

Figure 2.14 Number of businesses participating in WBSO and/or RDA, 2009-2013



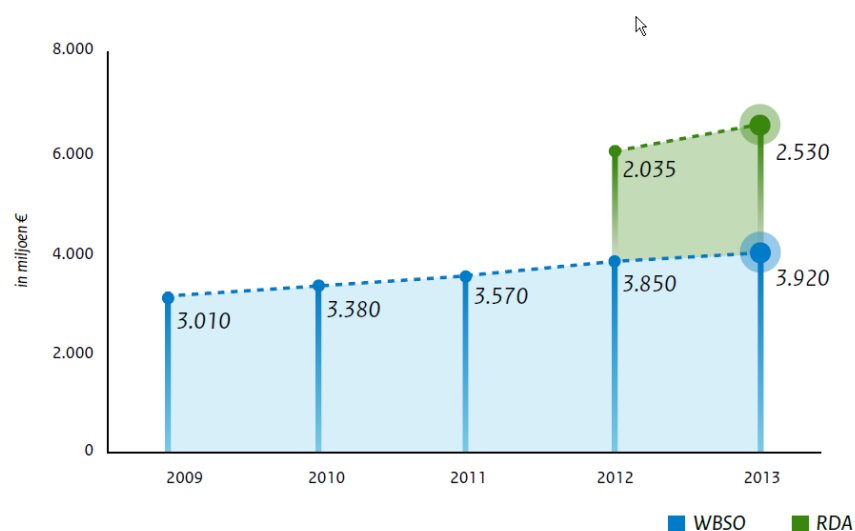
Source: Netherlands Enterprise Agency (RVO.nl) (2014). Focus on research and development work of the WBSO/RDA in 2013.

[Figure: change points to comma's: 5,000; 10,000; 16,620; ...]

The growing number of businesses also served to increase the sum of facilitated R&D to €6.45 billion in 2013. The total awarded R&D expenditures of businesses are made up of a wage component (WBSO) and a non-wage component (RDA). The R&D wage awarded to businesses (WBSO) was some 2% higher than in 2012. The non-wage expenditures (RDA) were 25% higher than in 2012.

Figure 2.15 Size of tax-facilitated R&D expenditures, 2009-2013

<sup>18</sup> This increase in resources for tax instruments is visible in consecutive budgets of the Ministry of Economic Affairs and the TWIN total overview of resources for knowledge and innovation, which is made annually by the Rathenau Institute on the basis of e.g. ministerial budgets. Table 2.5 is based on this. However, the tax resources for R&D and innovation in this table not only contain the WBSO/RDA, but also the estimated tax expenditures on the Innovatiebox of €625 million per year.



Source: Netherlands Enterprise Agency (RVO.nl) (2014). Focus on R&D work of the WBSO/RDA in 2013.  
[in € million]

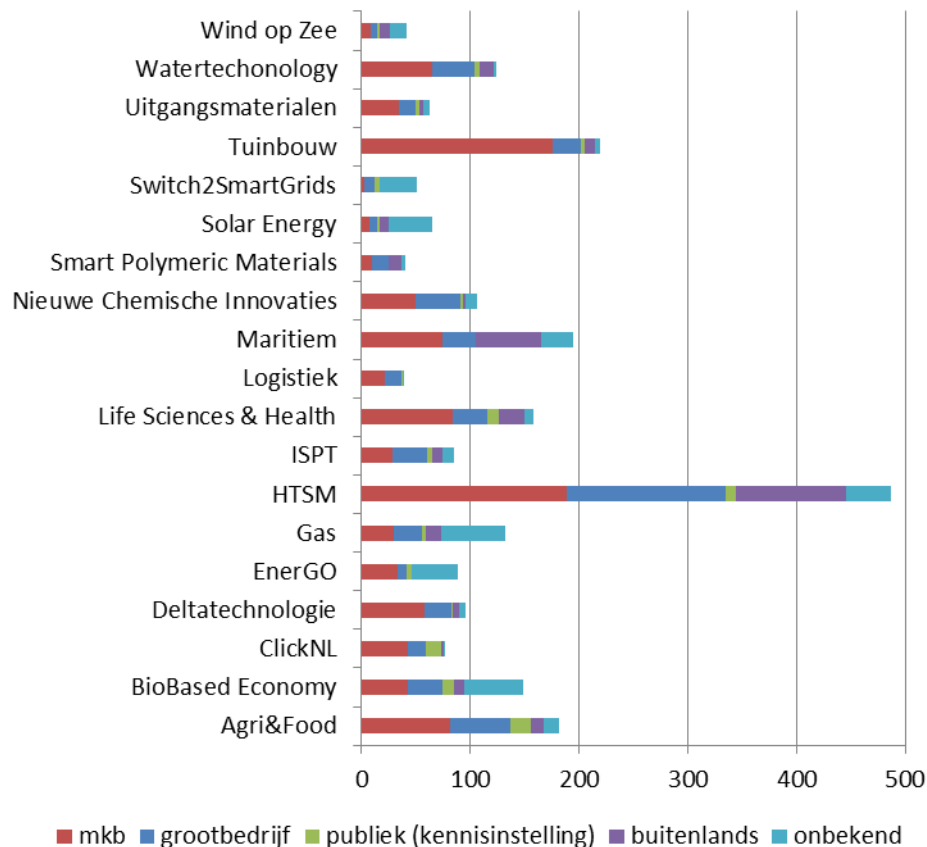
It is perfectly possible that the growth in tax-facilitated R&D provides an explanation for the increased private expenditures on R&D as observed by Statistics Netherlands for 2011 and 2012 (see Table in box), but no definite conclusions can be drawn until a more in-depth evaluation is carried out.

#### Top Consortiums for Knowledge and Innovation

Within the 19 Top Consortiums for Knowledge and Innovation (TKIs) in 2013, businesses and knowledge institutions jointly programme, organise and finance research and innovation. This takes place with the aid of 'roadmaps' and in cooperation with ministries, making maximum use of EU resources (see below). In order to encourage businesses to take part in these TKIs via private investments in public-private partnership (PPP) projects, the government introduced a TKI supplement in 2013.<sup>19</sup>

*Figure 2.16 Number of unique participants in TKI projects (by type of participant), 2013*

<sup>19</sup> In 2013 the government added 25 cents for every euro that a business invested in a TKI. The TKI supplement for the first €20,000 invested is even 40%. The supplement does not go to the business itself, but to the TKI.



Source: Netherlands Enterprise Agency (RVO.nl).

[SME, large corporates, public (knowledge institution), foreign, unknown]

[Offshore Wind, Water Technology, Propagation Materials, Horticulture ... New Chemical Innovations, Maritime, Logistics ... Delta Technology]

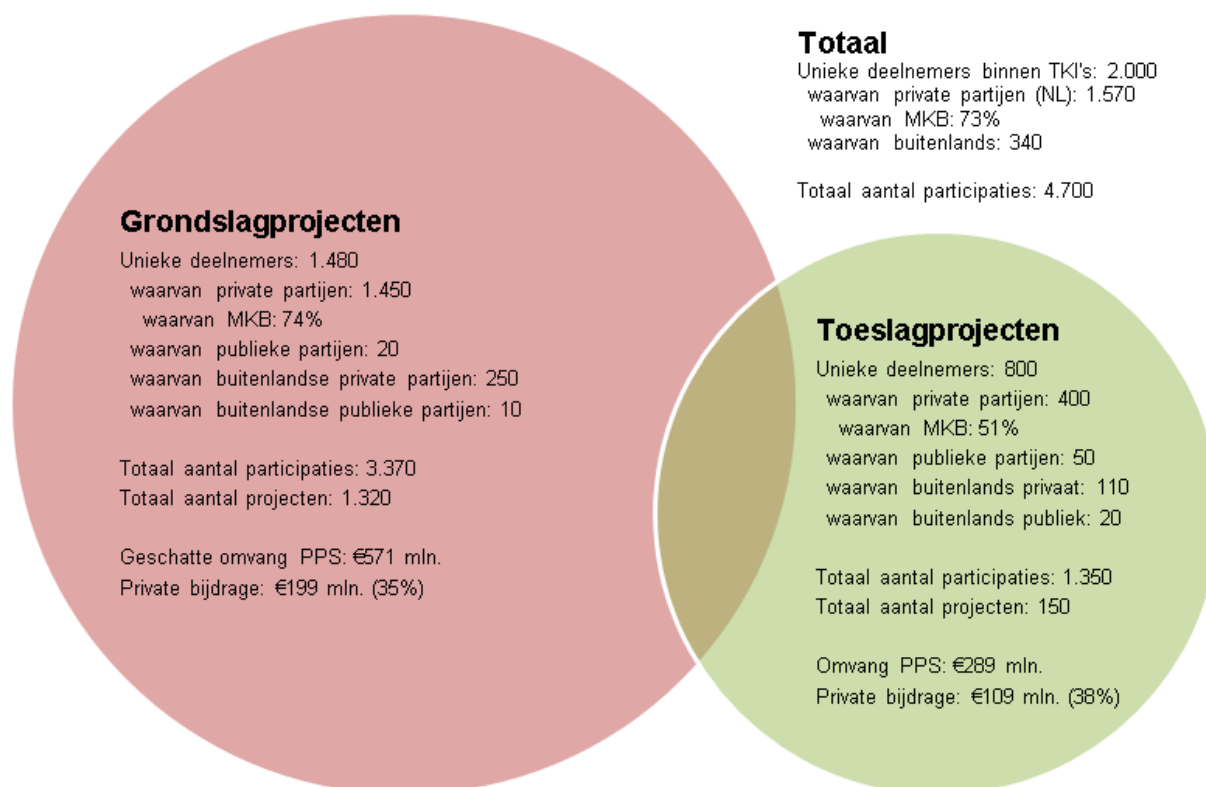
Data from the Netherlands Enterprise Agency (RVO.nl) for 2013 show that about 1550 PPPs currently being carried out link up with the TKI roadmap themes. Figure 2.16 indicates project participation in all separate TKIs by type of organisation. Apart from large corporates, the participation of SMEs in the TKIs is also substantial, as is the participation of foreign organisations (these are not divided into public or private). As many parties take part in more than one TKI, there are 2,000 unique participants, of which the overwhelming majority (1,910) belong to the private sector. Of this group, about three quarters on average are SMEs, but this share varies per TKI between 20% and 87%.

PPP is not just about actual participations, but also the investments that participants make jointly. One objective of the enterprise policy therefore is to ensure that PPPs are carried out to the tune of more than €500 million in 2015, with private parties contributing at least 40%. To determine the total size of the PPP, it is necessary to make a distinction between the supplement-earning projects ('grondslagprojecten'), i.e. the projects on the basis of which the TKI supplement is awarded, and the supplement-funded projects ('toeslagprojecten'), i.e. the new projects that are started up with the aid of the TKI supplement. Figure 2.17 shows that the size of the total PPP in 2013 is estimated



at €850 million, of which €571 million concerned supplement-earning projects with a private contribution averaging 35%.<sup>20</sup> This entails that in terms of total size the PPP target for 2015 was already achieved in 2013. The Annex provides more detailed information on the budgetary development of the TKI supplement.

Figure 2.17 Key Data on public-private collaboration in TKIs, 2013



[Supplement-earning projects ('grondslagprojecten') Unique participants, of which private parties; of which SME; of which public parties; of which foreign private parties; of which foreign public parties; Total number of participations; Total number of projects; Estimated PPP size €571 million; Private contribution €199 million

Total  
 Supplement-funded projects ('toeslagprojecten')]

Source: Netherlands Enterprise Agency (RVO.nl). The supplement-funded projects ('toeslagprojecten') category also includes the projects financed from the Ministry of Economic Affairs' energy resources and the SDE+ Scheme. This concerns 92 projects under the direction of the TKIs within the Energy top sector. In 2013 these projects were co-financed by about €25 million of SDE+ funding and about €17 million of the Ministry of Economic Affairs' energy resources.

<sup>20</sup> Of the supplement-earning private contribution of €199 million, about €9 million belongs to projects that were initiated with the aid of a TKI Supplement (about 50 projects). This is the 'overlap' in Figure 2.17. An adjustment for this must be made when calculating the total PPC size: €571 million (supplement-earning) + €289 million (supplement-funded) – €9 million (overlap) = €850 million (rounded off).

### Recurring themes from the TKI Annual Reports 2013

2013 was a year of institutional renewal, in which the TKIs built structures and looked for the correct approach. It is clear from their Annual Reports that the TKIs put a great deal of work into the development of new ecosystems, structures and procedures in 2013. In this process, each TKI followed its own route at its own pace. As a result, significant differences occur between the TKIs: there is no standard format and some TKIs have reached a more advanced stage of development than others. This diversity offers an opportunity to learn from one another. Differences also exist in the manner of presentation to the outside world (website, design and content of the annual report) and the organisational set-up (e.g. regarding the outsourcing of the administration).

Virtually all TKIs placed strong emphasis on SME activities in 2013, seeking 'cross-overs' with other TKIs wherever possible. What is striking is that almost all TKIs found it hard (at least in their annual report) to translate the long-term objectives into medium-term targets for the next one or two years. Aspects that the TKIs want to improve are the staff shortages at their policy support units and the continuity and/or consistency of policy. They also indicate that setting up the required procedures was a time-consuming exercise and that they experienced a heavy 'bureaucratic burden' in their first full year. Now that the procedures are in place and it is also clear what is expected from TKIs in terms of reporting and administration, things are expected to go more smoothly in the future.

### MIT

The Scheme to Promote SME Innovation in Top Sectors (MIT) has existed since 2013 and is intended to intensify the SME sector's involvement in the innovation plans (via public-private research) of the top sectors. To link up as closely as possible with the business activity in each sector, the MIT provides scope for a tailored approach. Top sectors can choose between: R&D collaboration projects, feasibility studies, knowledge vouchers, hiring of high-qualified staff, network activities and innovation brokers. Figure 2.18 indicates that in terms of budget, almost 95% of the MIT went to R&D collaboration projects, feasibility studies or vouchers. The MIT instrument is thus strongly oriented towards technological innovation. The difference between applications and awards as shown in Figure 2.19 demonstrates that SME interest in carrying out such largely technological projects with support from the MIT scheme vastly exceeded the available budget.

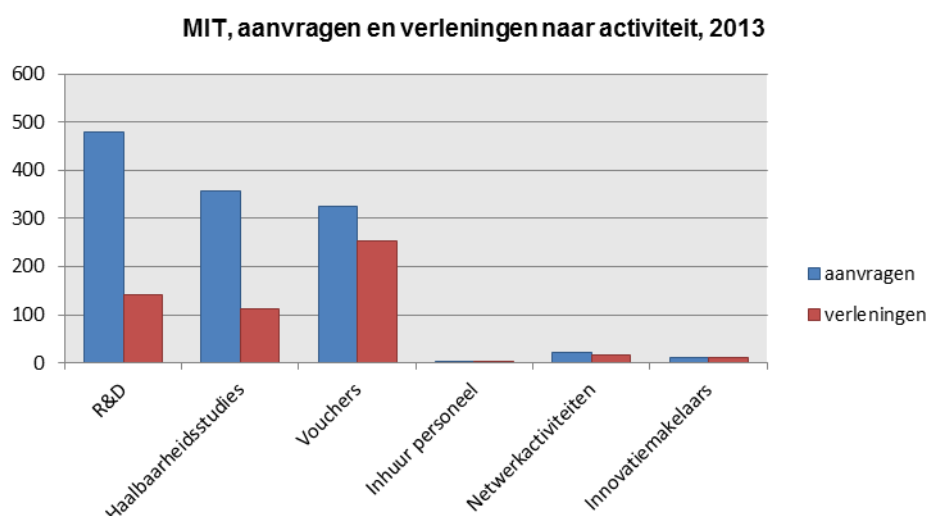
Figure 2.18 MIT budget allocation by activities, 2013



Source: Netherlands Enterprise Agency (RVO.nl)

[R&D, Feasibility, Vouchers, Staff, Network activities, Innovation brokers].

Figure 2.19 MIT applications and awards by activity, 2013



Source: Netherlands Enterprise Agency (RVO.nl)

[R&D, Feasibility, Vouchers, Staff, Network activities, Innovation brokers; applications, awards]

### *International programmes for innovation*

A good alignment with the initiatives of the EU and other countries forms an integral part of the Dutch innovation policy. It is essential to ensure close connections between the top sectors and the EU programmes in the field of knowledge and innovation. The top sector policy also takes a more targeted approach to bilateral contacts and economic diplomacy.

The best-known EU research and innovation programme is the Seventh Framework Programme (FP7), which ended in 2013 and received a successor in Horizon 2020. The Dutch participation in this programme was already extensively reported on to the House of Representatives in June 2014.<sup>21</sup> Table 2.6 shows how about half of the resources received from FP7 can be broken down by top sector and type of participant. It is clear that HTSM and LSH acquired the most funding, with the latter having the biggest rate of return. Businesses in the Energy (50% (= 89/179.6)), Chemicals (41%), Logistics (40%) and HTSM (39%) top sectors acquired the most FP7 funding. Regarding the share of the funding for SME participants, only Chemicals (31% (= 40.1/130.4)) and Energy (28%) exceeded 25%, which is the target value for the new Horizon 2020 programme.

<sup>21</sup> House of Representatives, 2013-2014, 21 501-31, No. 343.

Table 2.6 FP7 subsidy received by the Netherlands and rate of return by top sector and type of participant, 2007-2013

	Received subsidy (€ million)			Rate of return <sup>2</sup> (%)
	total participants	total businesses	of which SME <sup>3</sup>	
<b>Agri &amp; Food</b>	146.3	28.0	20.9	9.8
<b>Horticulture and Propagation</b>	49.1	15.0	11.5	9.0
<b>Materials</b>				
<b>High Tech Systems and Materials</b>	626.9	246.1	123.2	5.9
<b>Energy</b>	179.6	89.0	51.1	6.5
<b>Logistics</b>	50.0	19.9	6.5	8.9
<b>Creative Industry</b>	70.8	17.1	10.3	7.1
<b>Life Sciences &amp; Health</b>	668.5	125.0	91.6	10.0
<b>Chemicals</b>	130.4	53.2	40.1	8.6
<b>Water</b>	79.6	28.9	14.9	8.2
<b>Total Top Sector subjects<sup>1</sup></b>	1,658.7	486.9	298.2	7.7
<b>other FP7</b>	1,713.8	244.6	141.9	7.2
<b>total Netherlands</b>	3,372.5	731.6	440.0	7.4

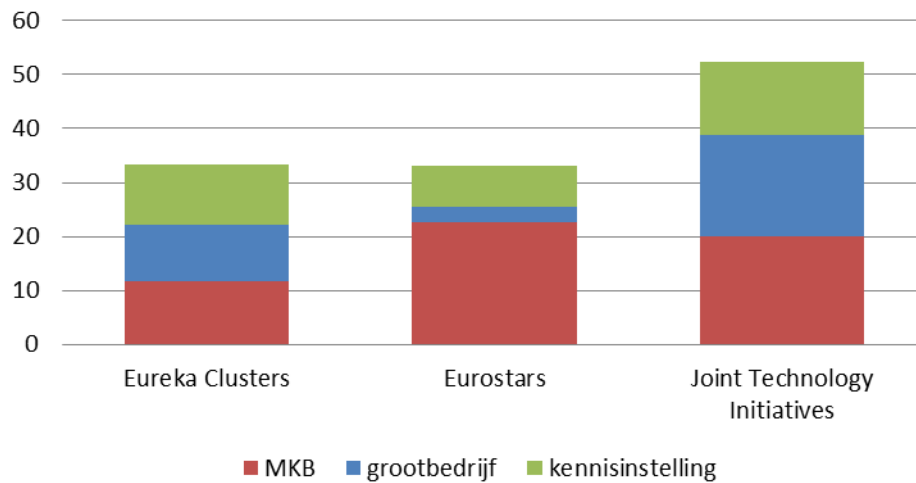
Source: Netherlands Enterprise Agency (RVO.nl.) 1) Due to the overlap between top sectors, the figures for the individual top sectors do not always add up to the total figure. 2) Rate of return is defined as the share of the total available subsidy within FP7 that goes to Dutch participants. 3) SME businesses are defined as businesses with less than 250 employees and sales lower than €50 million or an annual balance sheet less than €43 million.

In addition to FP7, businesses and knowledge institutions can also make use of complementary schemes for international cooperation in research and innovation:

- **Eureka:** Eureka offers countries a platform for setting up a joint research and innovation agenda as well as the instruments for implementing this agenda. It thus constitutes a bridge between the national innovation programmes of the member states. Some examples of Eureka programmes are 'ITEA2' and 'Catrene' in the field of micro- and nanoelectronics and embedded systems.
- **Eurostars:** Eurostars helps small and medium-sized companies to carry out market-oriented technological development. The aim is to shorten the time-to-market of these new technologies and reduce the technical risks. This is expected to help small companies develop faster and thus grow in terms of sales and number of employees.
- **Joint Technology Initiatives (JTIs):** A JTI is a collaboration of public and private parties that engage in cross-border research programmes. Businesses, knowledge institutions, the European Commission and national authorities work together within the JTIs.

Figure 2.20 indicates how many Dutch parties have taken part in the three programmes over the past years. It is clear that JTIs attract the largest number of participants, many of which belong to the SME sector. Eureka clusters and Eurostars attracted the same number of participants in the indicated period but Eurostars, which is primarily aimed at innovative SMEs, has a higher SME share.

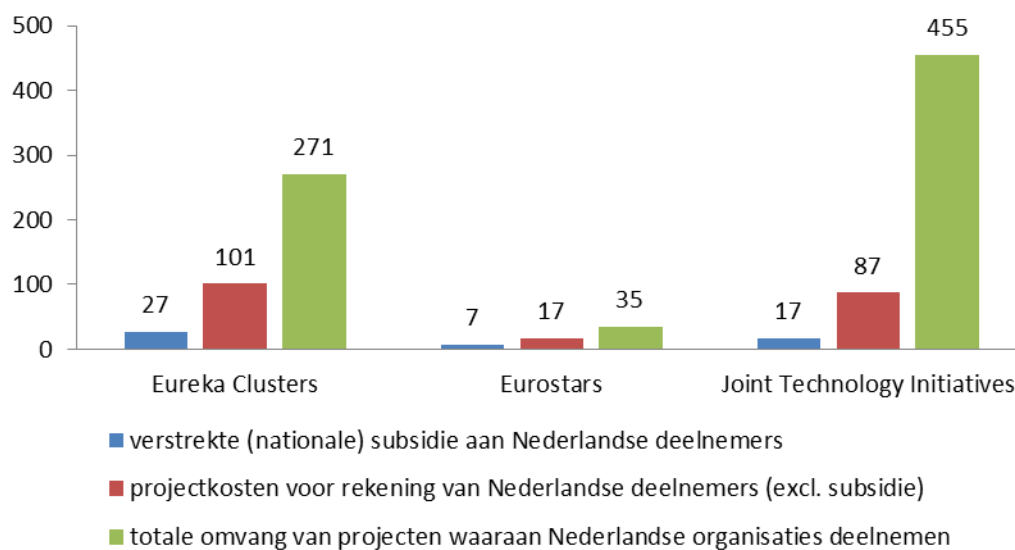
Figure 2.20 Participation in EU programmes, average per year over 2009-2013



[SME, large corporates, knowledge institutions]

Figure 2.21 shows, for each of the three instruments, the average subsidy amount granted per year, the total size of the projects and the Dutch participants' own contribution towards the project costs. If the total size of the projects minus the project costs of Dutch participants is regarded as the (ex ante) value of the knowledge to which Dutch participants gain access, it is interesting to ascertain the size of the Dutch government's relative contribution. This contribution has a leveraging effect. Figure 2.21 shows that the greatest leverage occurs with JTIs. The leverage with Eurostars is much smaller. The reason for this is that this instrument (unlike JTIs) is not targeted at broad-based consortiums, but mainly at innovative SMEs.

Figure 2.21 Leverage of subsidy on EU programmes by total project costs, average per year over 2009-2013 (in millions of euros)



[national subsidy granted to Dutch participants  
project costs contributed by Dutch participants (excl. subsidy)  
total size of projects in which Dutch organisations participate]

## **ICT & Innovation**

As an 'enabling technology', ICT often plays some role in the innovation processes of numerous sectors, particularly in the completion of new products and services or 'smart' ways of working and producing. To take full advantage of ICT's cross-sector enabling power for top sectors, a study is being carried out within the PPP context into new ICT applications (known as the 'ICT Roadmap for Top Sectors'<sup>22</sup>). This concerns such application areas as cybersecurity, identifying big data applications (e.g. in radio astronomy and for traffic management), smart aerial systems for mobile telecommunications and brain-operated computer systems in the healthcare industry. Under the ICT Roadmap, the TKI supplement-earning private investments for PPP projects have grown from €1 million in 2013 to about €10 million in 2014.

In view of ICT's crucial importance for innovation, the cabinet has decided to start up ten public-private ICT breakthrough projects. Within these projects, businesses and research and knowledge institutions are working together with the government on new ICT advances. Nine ICT-based breakthrough projects are already under way (Table 2.7).

## **Innovation-driven procurement**

Alongside targeted efforts to encourage innovation, the government can also spur innovation by harnessing its procurement power. The government's important role in stimulating and procuring innovations is emphasised by e.g. Mazzucato (2011),<sup>23</sup> who points to the vital role played in the past by the government in bringing about historically important innovations.

Innovation-driven procurement is essentially about organising the public procurement process in such a way that room is created for the creativity of the market. A government that is open to new ideas and solutions from the market, and is prepared to venture off the well-trodden paths, can encourage businesses to come up with innovations. The potential benefits are great, because the government, as a demanding customer, can challenge businesses to produce broadly applicable innovations that would otherwise never have seen the light of day. The immediate presence of an important launching customer also makes it profitable and lucrative for businesses to take the risk and invest in innovation (i.e. sufficient critical mass).

Despite its crucial catalysing role, innovation-driven procurement is by no means the norm in the public sector. This is due to all sorts of reasons. One is that price and efficiency are central factors in the government's procurement decisions. Another is that the government, as the guardian of the public's interests, is expected to steer clear of risks and spend its tax revenues on proven 'value-

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<sup>22</sup> See <http://www.rvo.nl/subsidies-regelingen/ict-topsector-htsm>.

<sup>23</sup> Mazzucato, M. (2011), *The Entrepreneurial State*, Demos, London, UK. ISBN 978-1-906693-73-2.

for-money' solutions. These are the tensions that must be overcome in the innovation-driven procurement policy.

Table 2.7 Current progress on ICT breakthrough projects

Project	Objective	Progress to date:	Results
<b>Ambitious SMEs innovate with ICT</b>	SMEs prepared for ICT developments of tomorrow: - 10,000 SMEs informed; - 1,000 SMEs taking part in workshops, seminars; -100 innovations realised.	Project partners organise SME meetings. Service contracts with SURF and KvK.	- Almost 10,000 SMEs have been reached via website, publications; - Active involvement in meetings about new ICT dev. (3D printing, big data, etc.).
<b>Open Geo Data</b>	Businesses can develop digital products and services with open government data: matching of supply and demand in 6 sectors	1st relay meeting held.	- Renewable energy: options have been listed and assessed; - Water: 12 proposals for applications; - RWS database on heights in the Netherlands made publicly accessible.
<b>Massaal digitaal</b>	By starting up 6 concrete cases, usage of public digital services is significantly improved.	Implementation started.	Cases at DUO, Ministry of Health, Welfare and Sport (VWS), CAK Pijnacker, Veere now operational.
<b>Information platform in top sectors</b>	Collaboration concept Neutral Logistics Information Platform is being scaled up, first to Agri-Logistics, then to other interested top sectors.	- Arrangements in Agri-Logistics sector completed; - Decision made to connect platform and data sources.	- Connection between platform and Portbase data.
<b>Ondernemingsdossier</b>	Entrepreneur can comply with laws and regulations via one-time data entry: less time-consuming, better compliance, simpler supervision.	Upscaling phase started in 2014.	4,000 businesses, 46 municipalities, 5 environment enforcement agencies, 3 provinces, 2 government inspectorates work with OD.
<b>De Zorg ontzorgd met ICT</b>	Increase self-reliance of people requiring long-term care via smart ICT usage.	Input for Ministry of Health, Welfare and Sport (VWS) 'e-health' letter to HoR delivered.	Proposals from breakthrough project in VWS HoR e-health letter adopted.
<b>Education and ICT</b>	Primary and secondary schools better able to let pupils develop talents to the full via use of digital teaching aids.	Arrangements embedded in secondary education agreement. In principle agreement about this with primary education.	9 public/private roundtables (70 parties) started.
<b>Smart Energy Services</b>	Businesses save energy via smart use of ICT: energy management raised to higher level via ICT in 3 sectors.		
<b>Big Data</b>	Businesses develop new products and services with big data: fine-tuned in 3 to 5 sectors; minimum of 100 (SME) businesses/start-ups use big data market opportunities.		'Knowledge Database' developed; Knowledge-deepening session on big data and health sector opportunities started up.



### *Where does the Netherlands stand on innovation-driven procurement?*

The extent to which procuring/contracting organisations within national government engage in innovative procurement has been studied on behalf of the Ministry of Economic Affairs (EZ) since 2011. The most recent measurement from April 2014 (for 2012) indicates that innovation-driven procurement took place in 3.6% of the cases, leading to a genuinely innovative end result in 2.7% of the cases.

*Table 2.8 Innovation-driven procurement within national government*

	<b>n = 122</b>
% seeking an innovative solution	4.5%
% innovation-driven contracting	3.6%
% led to an innovative solution	2.7%

Source: Dacclé (2014), Innovatiegericht Inkopen 2012.

### *Progress on actions*

The concrete actions undertaken in relation to innovation-driven procurement largely consist of informing procurement parties within national government of the importance of innovation-driven procurement. In addition, a toolbox has been developed that can be used during the procurement process.

The innovation-driven procurement programme also contains a financial instrument (SBIR) and example-setting flagship projects. News and information on the progress of these projects can be found on the website and in the project book that is available on the website.<sup>24</sup> Regarding SBIR, three SBIR calls were held in 2013 with a total budget of €6.2 million. A total of seven SBIR calls are planned in 2014.

### *Innovation-driven procurement with the European space policy*

Alongside the national innovation-driven procurement programme, the European space programme can also be considered as an innovation-driven procurement programme. This programme challenges companies to come up with innovations that are actually purchased (e.g. for satellites). The programme thus acts as launching customer, thereby facilitating the development of innovative solutions that can subsequently evolve into new commercial applications outside the space industry. Since the programme started in 2000, over 9,200 contracts in total were awarded to over 500 Dutch parties with a cumulative value over €1.4 billion (source: Netherlands Space Office, NSO). NSO estimates the high-tech and knowledge-intensive part of this (notably R&D) at about 4,500 contracts, which were awarded to some 100 unique companies with a value of almost €700 million.

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<sup>24</sup> <http://www.inkoopinnovatieurgent.nl/wp-content/uploads/2011/07/Projectenboek.pdf>.

## 2.4 Human capital

*The Netherlands is an international frontrunner when it comes to human capital, as witnessed by the country's fourth place on the Human Capital Index of the World Economic Forum. Interest in technical subjects is growing. Technical enrolments in higher education rose from 25,000 in 2002-2003 to almost 40,000 in 2013-2014. Technical enrolments only fell at senior secondary vocational level.*

Investments in human capital can be a key driver of productivity. This is why it is so important to ensure supply meets demand in the labour market. The enterprise policy is particularly focused on achieving a strong alignment between education and the labour market in the technical sector. Bottlenecks in the labour market have been identified in close dialogue with businesses and other stakeholders and are now being resolved by means of the National Technology Pact 2020.

### *Where does the Netherlands stand?*

The Netherlands is an international frontrunner when it comes to human capital, as witnessed by the country's fourth place on the Human Capital Index of the WEF. This index contains a selection of indicators from the GCI that are relevant for a well-functioning labour market. The Netherlands also comes out well in other international comparative research into the population's skills and competencies, such as the PISA (Programme for International Student Assessment) and PIAAC (Programme for the International Assessment of Adult Competencies) measurements.<sup>25</sup>

Measured by international standards, however, relatively few people in the Netherlands opt for a degree in technology or engineering at higher educational or university level. This group made up only 10.7% of all graduates in 2012, placing the Netherlands in the lower section of the European league table. The share has increased by 1.8 percentage point since 2007, but this is only a small advance compared to the progress made by other countries. Further evidence of the growing interest in technology is provided by the recent Technology Pact progress report. Technical enrolments in higher education increased in the past years, rising from about 25,000 in 2002-2003 to almost 40,000 in 2013-2014. The WEF confirms this improving trend: the Netherlands has climbed 11 places to rank 30th on the 'availability of technicians and engineers' indicator (see section 2.2).

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<sup>25</sup> <http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2013/12/03/resultaten-pisa-2012.html> and <http://www.piaac.nl/>

Table 2.9 Science and technology graduates (in %), 2007 and 2012

	Total		Male		Female	
	2007	2012	2007	2012	2007	2012
EU-27 <sup>(1)</sup>	13.8	16.8	18.5	22.3	8.9	11.1
Belgium	14.0	13.0	20.4	19.5	7.6	6.3
Bulgaria	8.4	13.3	10.0	16.1	6.8	10.4
Czech Republic	12.0	16.7	16.6	22.0	7.2	11.1
Denmark	16.4	18.8	20.8	23.3	11.9	14.2
Germany	11.4	16.2	15.9	23.1	6.9	9.0
Estonia	13.3	12.3	16.0	15.4	10.4	9.0
Ireland	18.7	22.7	25.5	33.1	11.8	12.7
Greece	8.5	14.6	9.1	17.5	7.8	11.5
Spain	11.2	15.8	15.3	21.6	6.9	9.9
France <sup>(1)</sup>	20.8	22.1	29.9	31.1	11.7	13.1
Croatia	6.8	16.6	8.6	21.3	4.8	11.7
Italy <sup>(2)</sup>	11.4	12.8	14.0	14.9	8.8	10.5
Cyprus	4.2	9.0	5.8	9.3	2.7	8.8
Latvia	9.2	13.7	12.2	18.7	6.1	8.4
Lithuania	18.1	23.0	24.0	32.8	12.0	12.8
Luxembourg	.	2.8	.	3.2	.	2.3
Hungary	6.4	9.0	9.2	12.7	3.5	5.1
Malta	7.1	11.1	8.5	16.1	5.5	5.7
Netherlands	8.9	10.7	14.4	16.3	3.4	5.0
Austria	11.1	16.3	16.7	24.0	5.3	8.4
Poland	13.9	17.9	16.7	21.1	11.1	14.5
Portugal	14.2	19.4	18.2	23.9	10.2	15.0
Romania	11.9	15.5	14.0	17.9	9.8	13.0
Slovenia	9.8	19.3	14.2	26.1	5.1	11.8
Slovakia	11.9	17.9	15.1	22.6	8.6	13.1
Finland	18.8	21.7	26.1	30.5	11.1	12.4
Sweden	13.6	15.9	17.8	21.1	9.2	10.6
United Kingdom	18.5	19.5	25.6	26.6	11.3	12.2
Iceland <sup>(3)</sup>	10.2	13.6	13.1	15.2	7.2	12.0
Liechtenstein <sup>(1)</sup>	10.5	12.2	14.4	13.2	6.5	11.1
Norway	9.3	10.5	13.1	14.3	5.4	6.5
Switzerland	17.9	17.0	29.4	26.9	6.4	6.9
FYR of Macedonia	4.6	7.6	5.4	9.0	3.7	6.2
Turkey <sup>(1)(4)</sup>	6.2	9.4	8.5	12.3	3.8	6.3
Japan	14.4	14.6	24.2	24.6	4.2	4.3
United States <sup>(1)</sup>	10.1	11.6	13.5	15.9	6.4	7.2

(<sup>1</sup>) 2011 instead of 2012.

(<sup>2</sup>) 2007: excluding graduates from ISCED level 6.

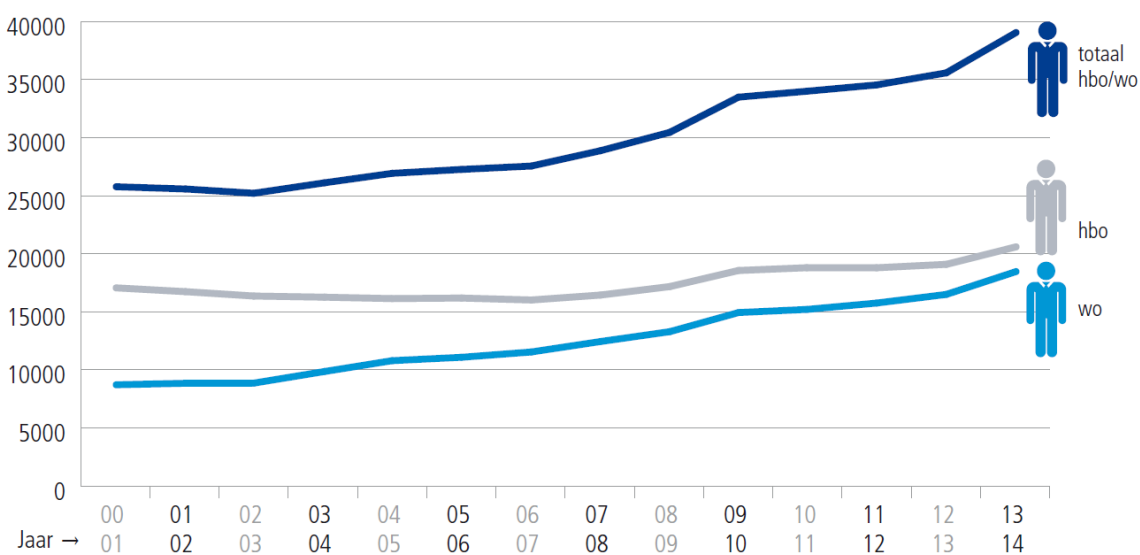
(<sup>3</sup>) 2010 instead of 2012.

(<sup>4</sup>) 2006 instead of 2007.

Source: Eurostat (online data code: tps00188)

Source: Eurostat (2014).

Figure 2.22 Science and technology enrolments for higher education, 2000-2014



Source: Platform Betatechniek (2014), Facts & Figures.

[total higher vocational education/university; higher vocational education; university]

The situation within senior secondary vocational education is less encouraging, with the number of graduates and enrolments in technical and engineering courses both falling in the 2005-2012 period from 33% to 28% (graduates) and from 30% to 27% (enrolments).

### Progress on ambitions

The Technology Pact is aspiring to reduce the shortage of highly qualified scientists and technicians. As these groups of employees are particularly crucial to the top sectors, records are kept of their availability for these top sectors. These figures show that the number of university science and technology graduates is rising substantially, but that the same does not apply at the level of senior secondary and higher vocational education (see Table 2.9).

*Table 2.9 Science & technology enrolments and enrolments relevant to top sectors, 2009-2013*

University					
	2009	2010	2011	2012	2013
<b>Total Netherlands</b>	233 170	242 380	245 430	241 370	250 140
<b>Science &amp; Technology education</b>	79 720	84 810	88 020	90 400	97 090
<b>Total top sectors</b>	53 010	55 940	58 250	59 650	64 150
Higher vocational education					
	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013
<b>Total Netherlands</b>	66 550	67 230	67 440	70 930	64 070
<b>Science &amp; Technology education</b>	15 360	15 430	15 190	16 410	15 420
<b>Total top sectors</b>	12 660	12 990	12 990	13 500	12 740
Senior secondary vocational education					
	2009	2010	2011	2012	2013
<b>Total Netherlands</b>	535 760	545 640	534 650	525 300	513 950
<b>Science &amp; Technology education</b>	190 320	191 190	186 070	178 860	173 220
<b>Total top sectors</b>	128 510	130 500	130 550	129 490	127 390

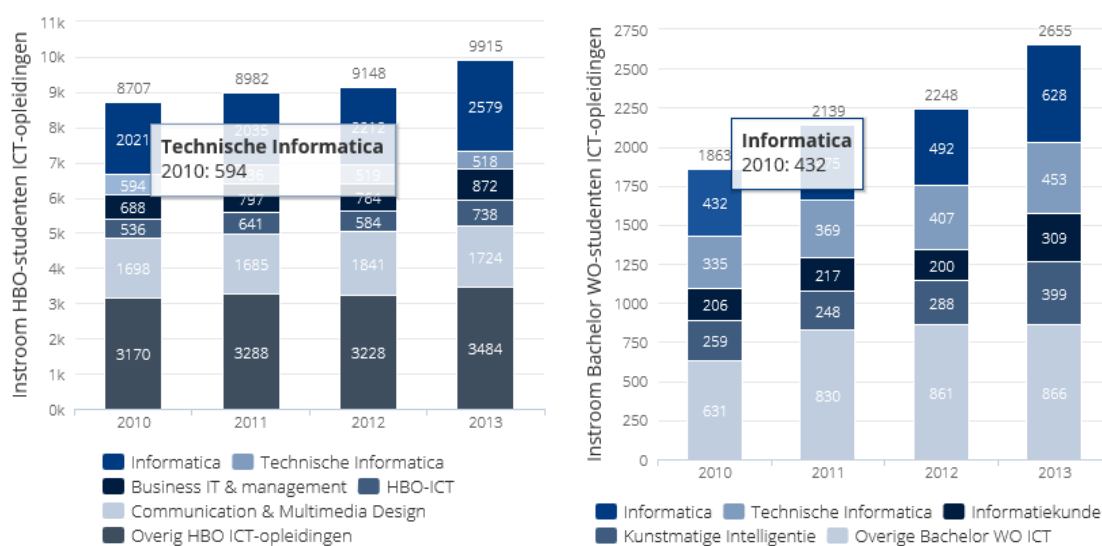
Source: Statistics Netherlands, Monitor Top Sectors 2014.

### *ICT skills*

Alongside the availability of scientists and technicians, a sufficient supply of qualified ICT employees is also vital for successful innovation and production. Figure 2.23 shows that ICT enrolments are rising, both in higher vocational education and university education.<sup>26</sup>

<sup>26</sup> VSNU, 2014 and ICT-Marktmonitor 2014 (Nederland ICT).

Figure 2.23 ICT enrolments in higher vocational education (left) and university (right), 2010-2013



Sources: VSNU, 2014 and Vereniging Hogescholen 2014 in ICT-Marktmonitor 2014, Nederland ICT.

[ICT enrolments in higher vocational education; Technical Information Technology; Information Technology, Technical Information Technology; Business IT & Management; Higher Vocational Education ICT; Communication & Multimedia Design; Other higher vocational education ICT courses

ICT enrolments in university education; Information Technology; Information Technology; Technical Information Technology; Information Science, Artificial Intelligence, Other university ICT Bachelor's degrees]

## 2.5 Investments

*After a steadily falling trend since 1999, investments in the Netherlands recently started to rise again. Investments in ICT capital make a strong contribution to economic growth, though a shift appears to be taking place from 'hard' to 'soft' ICT investments. The attraction of foreign investments, which also give an impulse to Dutch productivity and innovation, is gaining momentum.*

### 2.5.1 Significance of investments

Investments in physical capital such as buildings, machinery, information and communication technology (ICT) serve to leverage production capacity, thereby enabling businesses to produce more goods and services. Put differently, investments lead to capital deepening: a higher amount of (physical) capital per unit of labour translates into increased labour productivity (see Figure 2.1). Investments in ICT enable businesses to achieve faster and more efficient production processes and tailor their products better to the customer's wishes. This, in turn, boosts their employees' productivity. ICT is a pervasive presence throughout the economy: from agriculture to healthcare.

### 2.5.2. The significance of investments in physical assets

The movement in business investments (excluding housing) in the 2008-2013 period reflects the detrimental consequences of the financial-economic crisis in the Netherlands. In this period, business investments declined in every year except 2011. Most businesses had sufficient production capacity at their disposal and saw no need for expansion investments. According to the latest forecasts of the CPB Netherlands Bureau for Economic Policy Analysis, businesses – buoyed by the reviving economy and burgeoning economic optimism – are set to invest more this year and in 2015. Manufacturing capacity utilisation rates are rising and the optimists in the producer confidence indexes are gaining ground. Thanks to the accelerating investments, the investment ratio (= investments as a share of added value) is finally rising again after a steadily falling trend since 1999.<sup>27</sup>

A recent CPB study commissioned by the Ministry of Economic Affairs (EZ) looked at the causes of this downward trend in the investment ratio,<sup>28</sup> which is currently hovering at about 15% as opposed to some 20% around the year 2000. The decreasing investment ratio is not unique to the Netherlands; in other EU countries too, investments are currently lagging behind added value. The decline in the Netherlands is greater, but this can be largely explained. Half of the drop in the 2000-2011 period is attributable to the fact that the price of investment goods – and particularly of ICT equipment – increased less than the added value.<sup>29</sup> This also partly explains the stronger decrease in international perspective. Another important reason for the relatively strong drop in the Dutch investment ratio concerns the lagging investments in e.g. the communication sector, industry and wholesaling. One possible explanation put forward by the CPB is that the economic downturn lasted for more years in the Netherlands than in the EU core countries. Due to the resulting undercapacity utilisation, businesses were cautious about expansion investments. It should also be noted in this context that in the period before 2001 the Dutch communication sector invested much more heavily than their counterparts in other countries (in UMTS licences, for instance).

A falling investment ratio can depress the economy's growth potential, but the CPB has no evidence that this actually occurred. As discussed in section 2.2, the labour productivity in the 2000-2008 period grew at roughly the same rate as in Germany, the US, Japan and the EU-15. Figures presented there indicate that the contribution of capital deepening to productivity growth is comparable with these countries. According to the CPB, the lagging investment ratio could be a sign of efficient production. Regarding the longer-term growth potential, incidentally, it should be pointed out that innovations are a crucial driver of TFP growth.

### *The significance of ICT investments*

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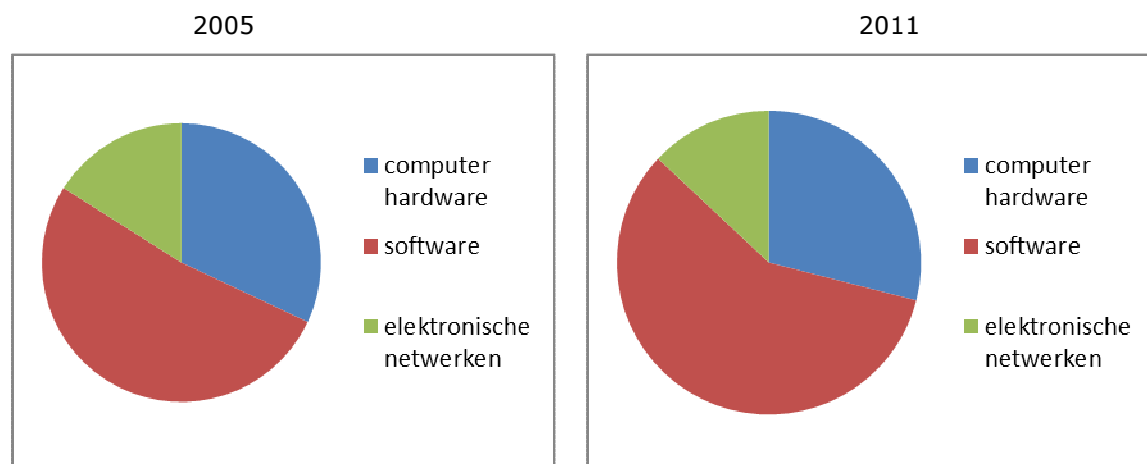
<sup>27</sup> To encourage investments, businesses were allowed in 2013 to apply accelerated depreciation under certain conditions for certain types of investments (see e.g. Enterprise Policy Monitor 2013). The old depreciation rules were reinstated in 2014.

<sup>28</sup> See CPB, 2014, Spaaroverschot niet-financiële bedrijven: ontwikkeling, oorzaken en gevolgen, CPB Background Document 28 August 2014.

<sup>29</sup> Prices for ICT equipment are actually falling.

Investments in ICT are obviously an important component of the overall capital expenditures and make a substantial contribution to productivity growth, though the relative significance of ICT investments appears to be decreasing (see Table in section 2.2), partly due to the falling prices of ICT products. In a recent more detailed productivity analysis, Statistics Netherlands concluded that ICT capital punches well above its weight as a driver of economic growth, contributing over 20% on average while accounting for only 4% to 5 % of the costs.<sup>30</sup>

Figure 2.24 ICT investments in the Netherlands, 2005 and 2011



Source: Statistics Netherlands, IKE 2014.  
[electronic networks]

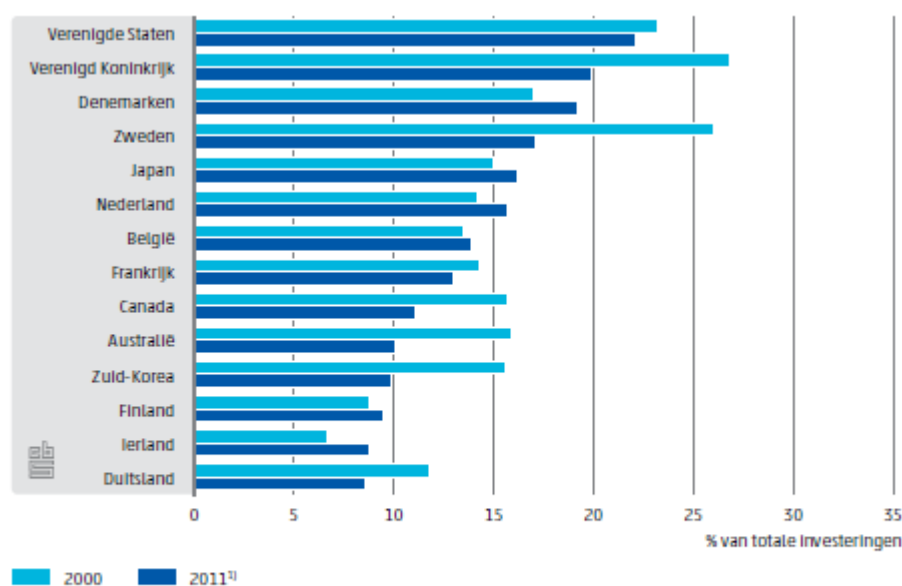
In 2011 Dutch companies and the government invested just under €14 billion in ICT, representing almost 13% of the total investments in that year. In the 2005-2011 period software accounted for a steadily growing share of the ICT investments (see Figure 2.24). One possible reason for this relative shift is the advent of foreign 'cloud' services. Instead of investing in their own data storage hardware, businesses are increasingly opting to use external cloud storage capacity; in this case, investments are replaced by the procurement of services.

Internationally, the Netherlands occupies a mid-league position when it comes to ICT investments. However, unlike in many other countries, the ICT share in business investments has grown over the years in the Netherlands (from 14% to 16%). Denmark and Ireland are other countries with a rising ICT share.

ICT enables companies to integrate business processes. On the sales side, it creates entirely new opportunities for analysing data and tailoring their processes accordingly to the customers' needs. Businesses that tap into this potential are more productive. Research by Statistics Netherlands indicates that businesses with ICT-intensive production processes are more competitive and grow more strongly than their less ICT-intensive counterparts (Statistics Netherlands, 'ICT, Knowledge and the Economy 2014').

<sup>30</sup> Statistics Netherlands publication 'ICT, Knowledge and the Economy', IKE, July 2014.

Figure 2.25 ICT investments: international, 2000 and 2011



Bron: OESO, gebaseerd op OECD Annual National Accounts (SNA) Database; Eurostat, EU-KLEMS Database en nationale bronnen, Juli 2013.

<sup>21</sup> Australië: 2008 i.p.v. 2011; Denemarken en Verenigd Koninkrijk: 2009 i.p.v. 2011; Ierland en Japan: 2010 i.p.v. 2011.

[United States, United Kingdom, Denmark, Sweden, Japan, Netherlands, Belgium, France, Canada, Australia, South Korea, Finland, Ireland, Germany]

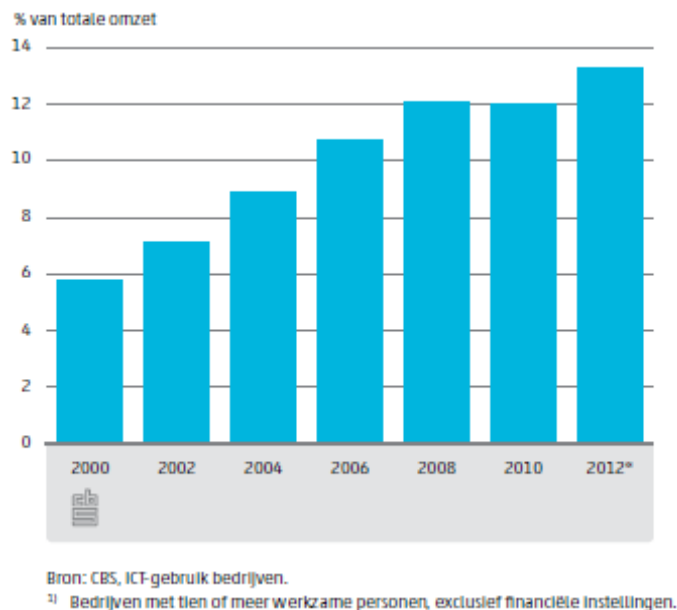
Source: OECD, based on OECD Annual National Accounts (SNA) Database; Eurostat, EU-KLEMS Database and national sources, July 2013

Australia: 2008 instead of 2011; Denmark and United Kingdom: 2009 instead of 2011; Ireland and Japan; 2010 instead of 2011.]

ICT clearly also plays an increasing role in financial transactions between businesses, though electronic invoicing is less popular in the Netherlands than elsewhere in Europe. The EU average for receiving electronic invoices was 25% in 2013 (Finland: 60%) versus 19% in the Netherlands. Online sales (e-commerce) have taken flight in recent years, though the rate of growth is now flattening. E-commerce as a share of total business sales is about 13%, which is roughly the EU average.

Figure 2.26 E-commerce sales, 1999-2012<sup>1</sup>





[% of total sales

Source: Statistics Netherlands, ICT usage of businesses

<sup>1</sup>Businesses with ten or more employed persons, excluding financial institutions]

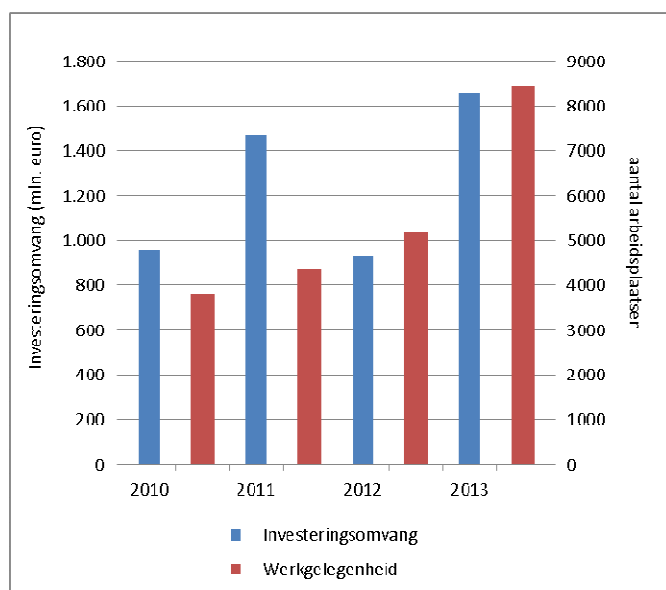
### 2.5.3 The significance of foreign investments

Foreign investors create high-quality employment in the Netherlands and encourage innovation. A previous Statistics Netherlands study revealed that foreign investors often engage more in innovation and are more productive than Dutch businesses without foreign ownership (Statistics Netherlands, Internationaliseringsmonitor). In this sense, the attraction of foreign investment helps to attain the objectives of the enterprise policy. Moreover, research also suggests that these 'foreign' companies spur domestic companies to step up their own R&D investments in order to improve their productivity (CPB, 2008).<sup>31</sup>

The focus in the acquisition of foreign investments in the Netherlands is on high-quality strategic investments in top sectors, such as head offices, distribution centres and R&D establishments. The Netherlands Foreign Investment Agency (NFIA) plays an important role in attracting foreign investments.

*Figure 2.27 Foreign investments in the Netherlands: size and employment, 2010-2013*

<sup>31</sup> Wiel, H. van der, H. Creusen, G. van Leeuwen and E. van der Pijll, 2012, 'The Dutch Productivity Performance: Cross Your Border and Look Around', Chapter 14 in M. Mas and R. Stehrer (eds), *Industrial Productivity in Europe, Growth and Crisis*, Edward Elgar, pp. 337-368.



Source: NFIA.

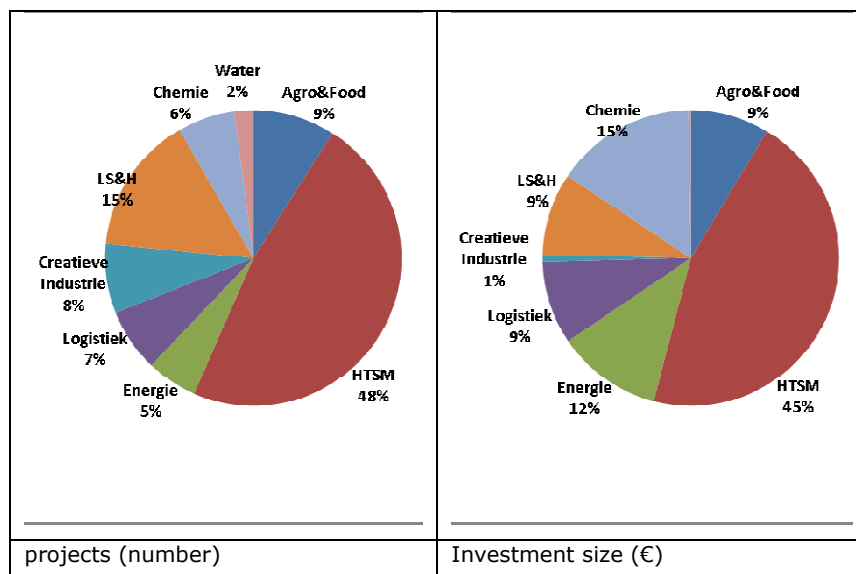
[Investment size (€ million); number of jobs; Investment size; Employment]

In 2013 the NFIA was instrumental in securing investments totalling €1.7 billion (see Figure 2.27), a sharp increase compared to the previous year (€930 million). The resulting rise in employment was also significant (63%). After the decline in 2012, the secured foreign investments are now back above the 2011 level of about €1.5 billion. Since 2010 the investment size has hovered between roughly €900 million and €1.7 billion, with the number of projects ranging between 150 and 190. Interestingly, the accompanying employment showed year-on-year growth in the 2010-2013 period, irrespective of the number of projects and investment size. In 2010 and 2011 the expected number of new jobs was about 4,000, rising in 2012 – despite a substantially lower investment size – to over 5,000 jobs, before jumping to almost 8,435 jobs in the past year.

The vast majority of the secured foreign investments gravitated towards the top sectors (some 94%). Almost half of the top-sector investment projects (69 projects with a size of €705 million) relate to the HTSM top sector (see Figure 2.28). Strong capital-intensive top sectors (Chemicals with €238 million and Energy with €178 million) account for a larger share in terms of investment size (15% and 12%, respectively, of the total foreign investment inflow into top sectors). Foreign investment inflow into the Water and Creative Industry top sectors is limited in size.

In the past year the top sectors developed broadly in line with the pattern at macro level. The investment size within top sectors almost doubled from €876 million in 2012 to over €1.5 billion in 2013, with particularly robust growth in HTSM (from €289 to €705 million), Energy (from €9 to €178 million), Logistics (from €14 to €141 million) and Life Sciences & Health (from €74 to €141 million).

*Figure 2.28 Distribution of NFIA-secured foreign investments to top sectors, 2013*



Source: NFIA.

## 2.6 Business climate

*Entrepreneurship has been on the rise for several years in the Netherlands. Measured by international standards, the Netherlands is one of the most entrepreneurial countries in Europe, boasting healthy market dynamics and a business-friendly climate. The Netherlands also achieves a high score compared with OECD countries on cost burden. According to the April 2014 measurement, this has already been reduced by €715 million, while the tailored approach for eleven heavily-regulated domains is also up and running. However, SMEs still face financing difficulties and new policy initiatives were recently taken to address this problem. The labour market is the main area where the Netherlands can still make substantial progress.*

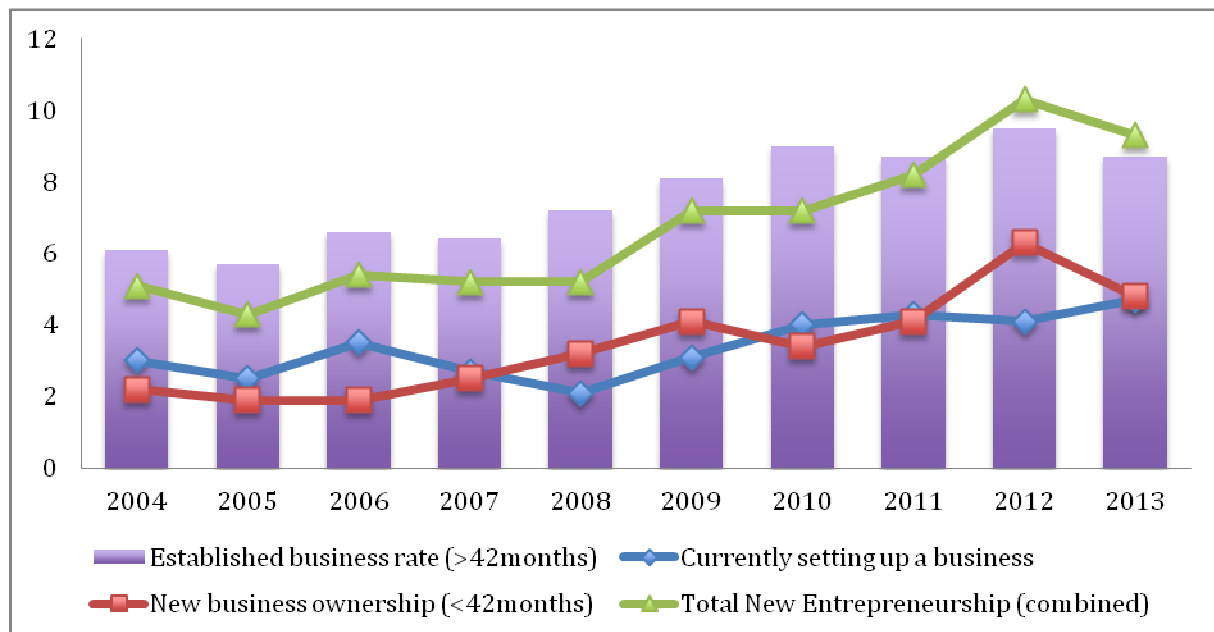
### 2.6.1 Introduction

Market dynamics contribute to productivity growth. A strong and vibrant entrepreneurial population is therefore needed to capitalise on new opportunities. This, in turn, calls for a congenial climate in which businesses can germinate, grow and thrive. The requisite conditions range from business-friendly regulations to an efficient capital market and a culture that embraces entrepreneurship.

#### *Where does the Netherlands stand?*

The Netherlands has made strong advances, particularly in the field of aspiring and young entrepreneurship (measured according to the TEA indicator in the Global Entrepreneurship Monitor). The Netherlands is now among the EU's most entrepreneurial countries on this indicator. Looking at countries with a comparable level of development (i.e. the 'innovation-driven economies'), the Netherlands is even the most entrepreneurial country in Europe.

Figure 2.29 Proportion of entrepreneurs in adult population, 2004-2013



Source: Global Entrepreneurship Monitor (2014).

The strong dynamics in the Dutch entrepreneurial landscape is also reflected in the data on business start-ups and discontinuations. The annual Statistics Netherlands publication on the Dutch business climate ('Ondernemingsklimaat in cijfers') confirms the picture that emerges from the GEM. Within a group of sixteen reference countries, the Netherlands belongs to the top three when it comes to business start-ups and discontinuations.<sup>32</sup>

Since 2009 the share of the labour force that earns his/her living as an entrepreneur in the Netherlands has risen faster than in the rest of Europe. Whereas the share in Europe is more or less constant at 11.8%, the percentage in the Netherlands expanded from 11.7% in 2009 to 13.2% in 2013 (see Table 2.10.). This is largely attributable to the swelling group of 'self-employed persons without employees', witness also the faster decrease in the percentage of entrepreneurs with employees in the Netherlands. It has also become easier to start your own business in the Netherlands.

Partly due to the economic downturn, the share of entrepreneurs who have rapidly increased their number of employees or expect to realise strong growth in the coming five years has fallen since 2010. The consequences of the weak economy are also visible in the number of jobs created by second-stage companies, which fell from almost 60,000 jobs in 2010 to 27,000 jobs in 2013. Within the enterprise policy, the Ambitious Entrepreneurship programme is mainly focused on ambitious growth-oriented entrepreneurs. The ambition is to secure a position in the OECD top five in the 'fast growers' and 'ambition' categories. We are now 22nd in the Global Entrepreneurship Monitor (2014) on 'ambition' within the group of OECD countries.

<sup>32</sup> <http://www.cbs.nl/nl-NL/menu/themas/bedrijven/publicaties/publicaties/archief/2013/2013-het-ondernemingsklimaat-in-cijfers-2013-pub1.htm>.

Table 2.10 Key entrepreneurship data, 2009-2013

		2009	2010	2011	2012	2013
<b>Entrepreneurs in labour force</b>						
<b>EU-15</b>	% labour force active as entrepreneur	11.8	11.9	11.9	11.9	11.8
	Of which with employees	35	34	33	32	32
<b>NL</b>	% labour force active as entrepreneur	11.7	11.9	12.2	12.6	13.2
	Of which with employees	30	27	27	26	25
<b>Basic Entrepreneurship Requirements</b>						
<b>Doing Business (ranking)</b>	Overall	-	-	-	30	28
	Ease of starting a business	-	-	-	66	14
<b>Entrepreneurship culture</b>						
<b>GEM</b>	%TEA with high growth expectation	23	27	22	18	15
<b>CBS/OECD</b>	% Fast growers	n.a.	3.32	3.19	1.97	
<b>CBS</b>	Second-stage companies after 3 years (in %) <sup>1</sup>		7.4	6.9	6.4	6.4
<b>CBS</b>	Jobs created at second-stage companies after 3 years <sup>1</sup>		59,150	55,890	36,420	27,175

Source: Miscellaneous (Statistics Netherlands (CBS), Eurostat and World Bank). 1) This refers to cohorts. For example: 7.4% of the starters cohort with base year 2007 had continued growing in the first three years at the time of measurement 2010.

## 2.6.2 Regulations

The quality of laws and regulations and the elimination of unnecessary red tape and administrative costs are other important aspects of creating a congenial business climate.

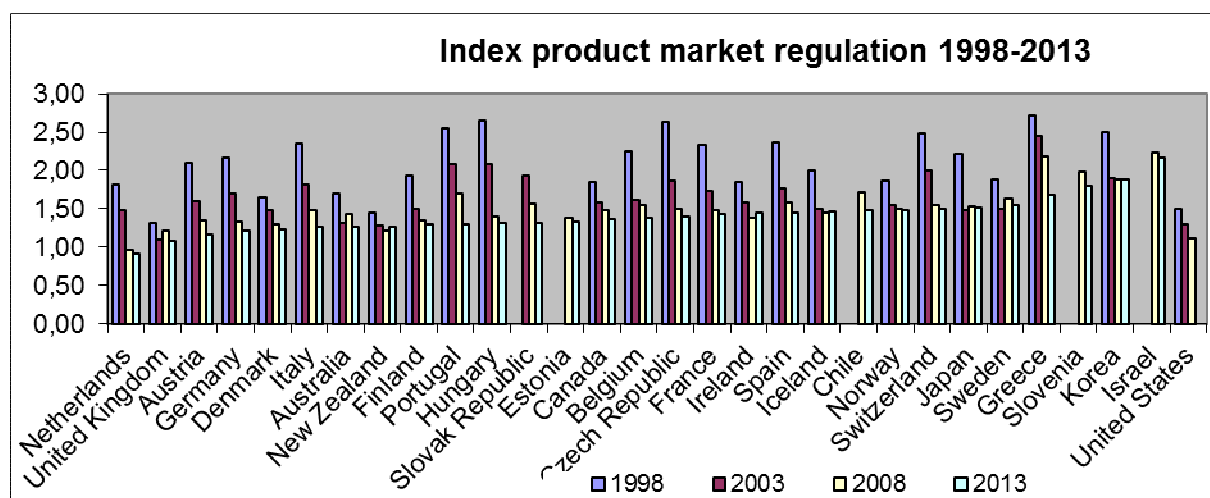
### *Where does the Netherlands stand on regulatory burden?*

The OECD uses the 'Product Market Regulation' (PMR) Index to measure the regulatory burden for businesses in the various OECD countries. This comparison – which is updated every five years – gauges the relative performance of 34 countries regarding the degree of government control over businesses, as well as obstacles to entrepreneurship, international trade and investments.

The Netherlands is an attractive country for entrepreneurs. In the fourth PMR Index, as compiled in 2013, the Netherlands is identified as the OECD country with the "most competition-friendly regulatory environment", followed by the United Kingdom, Austria and Germany. The OECD does detect a deceleration or even deterioration (New Zealand) in the reduction of PMR among countries that have already achieved a lot. The Netherlands is still making modest progress compared to previous measurements.

The Netherlands also achieves a high score in the WEF's 'Europe 2020 Competitiveness report' of 2014, where it is ranked third (previously fourth) as one of the "most efficient and pro-business operating environments." According to the report, the Netherlands can still make progress regarding the labour market.

Figure 2.30 International OECD product market regulation scores, 1998-2013



Source: The Global Competitiveness Report 2013–2014, OECD.

The Netherlands fares less well on business regulation aspects in the World Bank's Doing Business report from 2013. Doing Business differs from the other sources because it mainly looks at the speed with which practical matters (starting a business, registering property, getting credit, getting electricity and procedural issues) are dealt with. In that report, the Netherlands ranks 28th (of the 189 countries), which is below ten other EU member states. The Netherlands does not score lower across the board: starting a business (the Netherlands is 14th on that indicator), trading across borders and resolving insolvency are among the Netherlands' stronger aspects. However, dealing with construction permits and getting electricity are time-consuming procedures, and getting credit is difficult. The World Bank also believes that the level of protection for investors is relatively low.

#### *The Dutch policy on regulatory burden*

The current cabinet, like its predecessors, has set itself the objective of achieving a noticeable reduction in the regulatory burden for businesses, citizens and professionals. The measures to alleviate the regulatory burden are aimed at creating better conditions for entrepreneurs in the Netherlands. Fewer regulations mean that entrepreneurs waste less time and money on compliance issues.

The current cabinet-wide approach to regulatory reform consists of six interconnected lines of action: 1) less regulatory pressure by improving the quality of legislation; 2) structural reduction of the regulatory burden by €2.5 billion in the 2012-2017 period for citizens, businesses and professionals; 3) noticeable regulatory reduction in heavily-regulated domains (the 'tailored approach'); 4) less regulatory stacking, smarter supervision; 5) less regulatory pressure through administrative collaboration (with other government bodies, Europe) and 6) better digital services. What are the results so far?

#### *Structural reduction of regulatory pressure by €2.5 billion*

In April 2014 the cabinet had lined up measures worth €2.22 billion (of the planned €2.5 billion). That is an increase of more than €440 million relative to the previous measurement in November 2013. A relatively large amount of this regulatory reduction, over €1.5 billion, is intended for the

business sector.<sup>33</sup> Of these plans, over €800 million had been realised on 1 April 2014, including €715 million for businesses. The majority of the achieved regulatory reduction is beneficial for SMEs (see Table 2.11).

*Table 2.11 Share in regulatory reduction by company size*

Number of employees	Percentage
1	14%
2-249	69%
> 249	17%

Source: Voorjaarsrapportage regeldruk (2014).

#### *Tailored approach to heavily-regulated domains*

The cabinet is giving an extra impulse to noticeable regulatory reduction by starting up the tailored approach alongside the pursuit of quantitative objectives. Unlike the general regulatory reduction measures, therefore, this approach is less focused on quantitative objectives and more on the removal of obstacles or frustrations that businesses encounter in practice. A tailored approach is currently in place for ten business sectors.

*Table 2.12 Progress of tailored approach*

Sector/phase	preparation	problem identification	analysis	elaboration/implementation
<b>Logistics</b>	Completed	Completed	Completed	1st measures in progress
<b>Chemicals</b>	Completed	Completed	Completed	Start-up phase
<b>Life sciences</b>	Completed	Partly Completed		
<b>Agri &amp; Food</b>	Completed	Completed		
<b>Banks</b>	Completed	Completed	Started	
<b>Healthcare</b>	Completed	Completed	Completed	1st measures in progress
<b>Hospitality</b>	Started			
<b>Metal</b>	Completed	Completed	Completed	Start-up phase
<b>Childcare</b>	Completed	Started		
<b>Construction</b>	Completed	Completed	Partly Completed	1st measures in progress

Meanwhile, the first tangible results are becoming visible in the field of Logistics (faster handling of border formalities by equipping customs officials with tablets), Healthcare (minute-by-minute time reporting has been simplified) and Construction (team of Ministry of the Interior and Kingdom Relations experts is helping municipalities to minimise building regulations and experiments are

<sup>33</sup> See spring progress report on regulatory pressure as sent to the House of Representatives on 18 June 2014.

being performed with outsourcing building plan assessments to private parties). The tailored approach is still in its infancy, so it is not yet known whether companies already experience a noticeable reduction in the regulatory burden. A monitoring system is being developed for this purpose.

#### *The role of supervision*

The cabinet is teaming up with the inspectorates and municipalities to reduce the supervisory costs for businesses. One measure, the 'Ondernemingsdossier', is a joint initiative of businesses and government agencies. It effectively offers businesses a one-time data input service where data only need to be entered once in order to be submitted to several supervisors and licensing authorities. The pilot phase in 2012-2013 was followed in 2014 by the upscaling phase. The ambition is to have 80,000 businesses connected to the service by the end of 2016. There are already over 4,000 entrepreneurs using the service, with about 50 municipalities, 3 provinces, 5 environment enforcement agencies and 2 national inspectorates taking part on the government's behalf.

#### *Digital services to reduce regulations*

Digital services make the application handling procedure easier and faster by:

- reducing costs and the regulatory burden for businesses and citizens;
- making government services cheaper and better;
- preventing fraud.

A large number of digital services have been developed in recent years and these are to be implemented in the coming period. The aim is to create, by 2017, a single digital portal for government services (Ondernemersplein.nl), with a single key (eID-stelsel), a single messaging service (Berichtenbox) and open standards for the exchange of information. The building blocks will form part of the government's Generic Digital Infrastructure for offering digital services to citizens and businesses.

In the first quarter of 2014, 79 government service providers were connected to eHerkenning. These included 14 public service departments such as the tax authorities, the Chamber of Commerce (KvK), the Netherlands Enterprise Agency (RVO.nl), the Justis screening authority and the Council for the Judiciary, as well as 4 provinces and 57 municipalities. Since 1 July 2014 the use of eHerkenning has been mandatory when logging into the services of the Ministry of Economic Affairs (EZ). The Quality Institute of Dutch Municipalities (KING) is providing tailored support to help municipalities connect with eHerkenning. These municipalities aim to have a connection in place before the end of 2014.

At the start of 2014 the 'Ondernemersplein' website for entrepreneurs attracted about 40,000 visits per month. The number has meanwhile soared to about 300,000 visits per month. The ambition is to achieve an average of 500,000 visitors per month by the end of 2014. To this end, the website will be integrated with the 'antwoordvoorbedrijven.nl' and Chamber of Commerce websites, and a communication campaign will be conducted. The more entrepreneurs that find their way to



'ondernemersplein.nl' the better, because the website will make their dealings with government less time-consuming, while also making them more aware of what the government can do to facilitate their business.

### 2.6.3 Financing climate

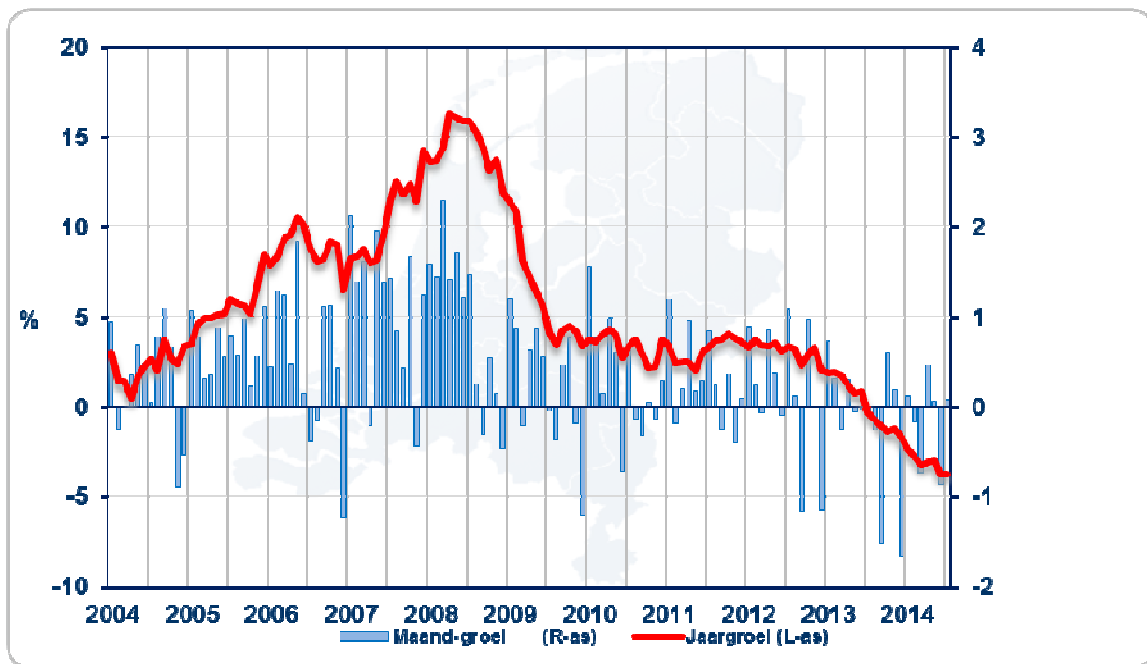
The availability of business finance is essential to create a stimulating entrepreneurial climate in which businesses can obtain sufficient funding to invest and implement their plans for the future. The enterprise policy is designed to tackle structural financing bottlenecks with a broad array of financing instruments. Specific attention is devoted to SMEs, as the financing difficulties are particularly acute in this sector.

#### *Financing in the Netherlands: what is the current picture?*

The credit crisis of 2008 and the prolonged economic downturn have had a strong impact on the supply and demand of business finance. The financing monitor of research agency Panteia/EIM shows a dramatic drop in the demand for commercial loans. The SAFE survey of the ECB indicates that the percentage of businesses seeking finance in the Netherlands is also low by international standards.

Weaker credit demand is a normal phenomenon during a recession because businesses are less inclined to make expansion investments. However, even businesses that are seeking finance are encountering increasing difficulties and none more so than innovative small businesses. One of the reasons is that, in the aftermath of the crisis, lenders have tightened up their conditions for business loans, making small businesses, which have an increased risk profile, even less eligible for finance in a shrinking capital market. Alongside the ailing economy, the stricter credit conditions of banks (partly due to Basel III) have further squeezed the supply of credit. Furthermore, the Global Competitiveness Report shows that the 'health' of Dutch banks has deteriorated in the past years. Though any form of quantification is surrounded by uncertainties, DNB has calculated that the more stringent lending policies of banks are currently holding back business investment in the Netherlands by 0.5% to 1.5%.

Figure 2.31 Bank lending to non-financial businesses, 2004-2014



Source: DNB.

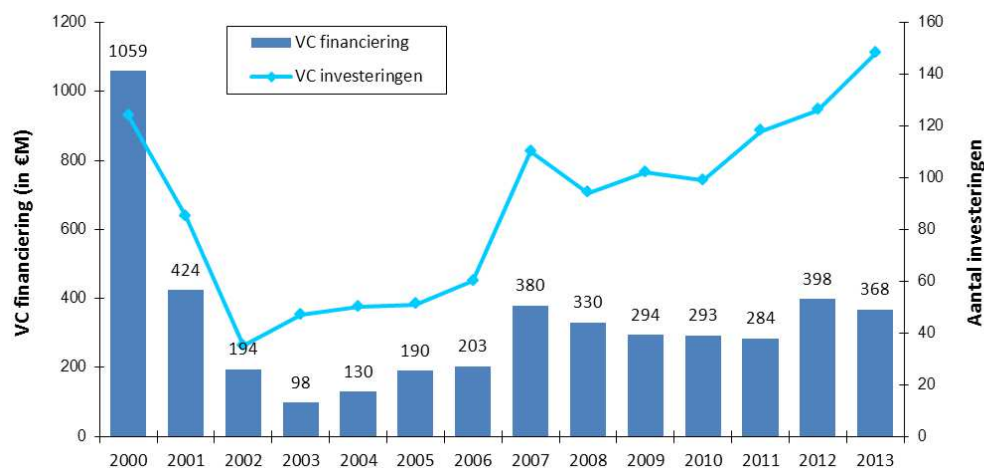
[Monthly growth (R-axis), Yearly growth (L-axis)]

Figure 2.31 shows that after peaking in 2008, lending growth suffered a strong slowdown, and even turned into contraction in 2013. The weakness in the capital market has taken a heavy toll on the SME sector in general and small businesses in particular – witness the sharp decline in the number of loans below €250,000.

### Venture capital

Another important potential source of financing for innovative and ambitious start-ups, apart from loans, is venture capital (VC). Due to their higher risk profile, young and highly innovative businesses are less eligible for bank loans. Such companies must therefore turn to the VC market. After shrinking for four years in a row, the total amount of invested venture capital expanded again in 2012. Despite a slight dip in 2013, the VC investments in that year were still substantially higher than in 2011.

Figure 2.32 Number of VC investments (*light blue, line*) and size of VC investments (*dark blue, bar*), 2000-2013, in Netherlands



Source: Tornado Insider (2014).

[VC financing in € m; VC financing, VC investments; Number of investments]

From an international perspective, the Netherlands does relatively well when it comes to the supply of VC. On the GCI 'availability of VC' indicator, the Netherlands was 22nd in 2014, just under the leader group on the world league table. However, the Netherlands is losing ground on this GCI indicator, because it was still 14th in 2011. The fact that the VC market appears to be developing/recovering faster in other countries is also reflected in the Netherlands' declining share in the overall European market for VC investments.

Table 2.13 VC from an international perspective

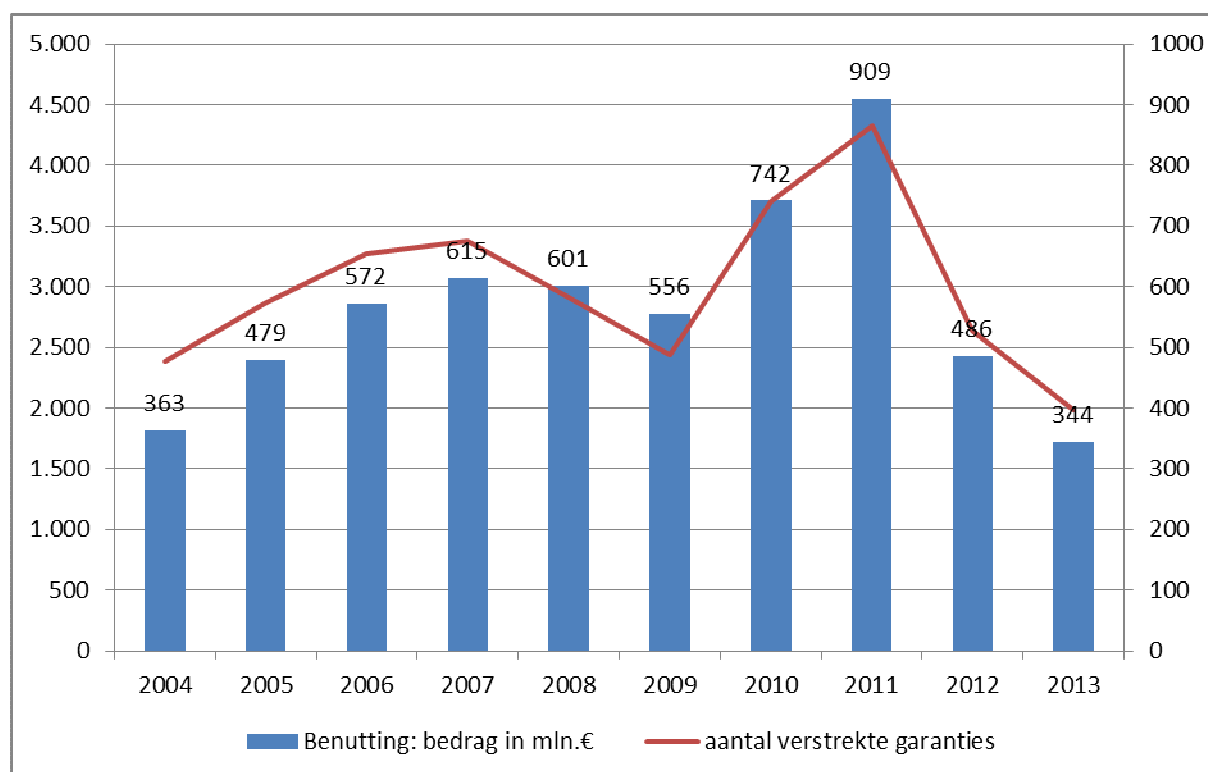
	2009	2010	2011	2012	2013	2014
<b>Global Competitiveness Index</b>						
VC availability (NL ranking)	n.a.	17	14	15	21	22
<b>European Venture Capital Association</b>						
NL share in total VC investments in Europe (in %)	8.3	8.0	7.2	7.5	5.4	

Source: GCI (2014) and Tornado Insider (2014).

#### Use of financing-related policy instruments

The enterprise policy encompasses a broad array of instruments for giving businesses better access to finance. The instruments aim to remove the aforementioned structural financing obstacles for businesses, such as lending to SMEs and the availability of venture capital, notably for innovative and growth-oriented companies.

Figure 2.33 Use of BMKB in budget (blue) and number of businesses (red), 2004-2013



Source: Netherlands Enterprise Agency (RVO.nl) (2014).

[Use: amount in € m, Number of issued guarantees]

Government guarantees mitigate the risk profile of businesses, making banks more inclined to lend them money. In 2013 the three guarantee schemes (BMKB, GO, Groeifaciliteit) helped more than 1,900 SMEs to raise business finance to the tune of about €1.4 billion. After peaking in 2011, the number of issued guarantees has declined over the past two years, with just under 50% of the available BMKB budget and 41% of the GO budget being used in 2013. The underutilisation may be partly because businesses are making less expansion and other investments due to the recession.

#### *Innovatiefonds MKB+*

The SME innovation fund 'Innovatiefonds MKB+' consists of three instruments: SEED Capital, Innovation Credit, and the Fund-of-Funds (DVI). The purpose of this fund is to improve the availability of venture capital for young, innovative and fast-growing companies in the Netherlands.<sup>34</sup> The available budget for innovation credit in 2013 was not fully used: the extended loans amounted to €53 million, representing about 55% of the available resources. This was the same level as in 2012, but there was a substantial decrease in the number of applications for innovation credit. Table 2.14 also shows that the number of loans in the commercial phase doubled in 2013, that repayments rose to more than €13 million and that the income from interest payments exceeded €2 million. As indicated in Table 2.15, the SEED scheme has now clocked up more than 200 participations, with about €140 million of capital being made available to young innovative companies.

<sup>34</sup> SEED and Funds-of-Funds carry a higher risk profile than guarantees. Innovation credit is not business finance, but project finance for risky R&D programmes that are relatively close to market applications.

Table 2.14 Key innovation credit data, 2011-2013

	2011	2012	2013
<b>Number of applications</b>	82	122	68
<b>Number of provided loans</b>	39	36	39
<b>Size of provided loans (€ million)</b>	47.8	52.9	52.9
<b>Number of loans in commercial phase</b>	9	19	42
<b>Repayments (€ million)</b>	0.7	5.1	13.4
<b>Interest income (€ million)</b>	0.0	0.6	2.1

Source: Netherlands Enterprise Agency (RVO.nl).

Table 2.15 Key SEED data, 2009-2013

	2010	2011	2012	2013
<b>Funds</b>				
Total number of funds	33	36	40	42
New number of funds	5	3	5	2
<b>Participations</b>				
Current participations	119	155	175	205
New participations	29	39	37	33
<b>Capital</b>				
Total available capital (€ million)	108.4	120.4	132.4	140.4

Source: Netherlands Enterprise Agency (RVO.nl).

As the DVI and early-phase financing schemes were only recently launched, no figures on these schemes are available as yet. These figures will be included in the 2015 Enterprise Policy Monitor.

#### *Supplementary SME Finance Action Plan*

In July 2014 the cabinet announced supplementary measures to further improve the access to SME finance. The action plan drawn up for this purpose is designed to reinforce the financial position of SMEs, encourage alternative sources of funding and improve market forces. In addition, measures are also being taken to enhance the effectiveness of the existing instruments.<sup>35</sup> As many of these measures are still under development, no monitoring data are available as yet.

#### 2.6.4 Internationalisation

In view of their internationally small home base, Dutch businesses obviously rely heavily on foreign markets for growth. Statistics Netherlands research shows that internationally-oriented entrepreneurs are more productive and innovative, as well as more likely to build a strong competitive position (Statistics Netherlands, Internationaliseringsmonitor). The enterprise policy helps entrepreneurs to venture abroad by means of export promotion initiatives (trade missions), the Innovation Attaché network and development cooperation.

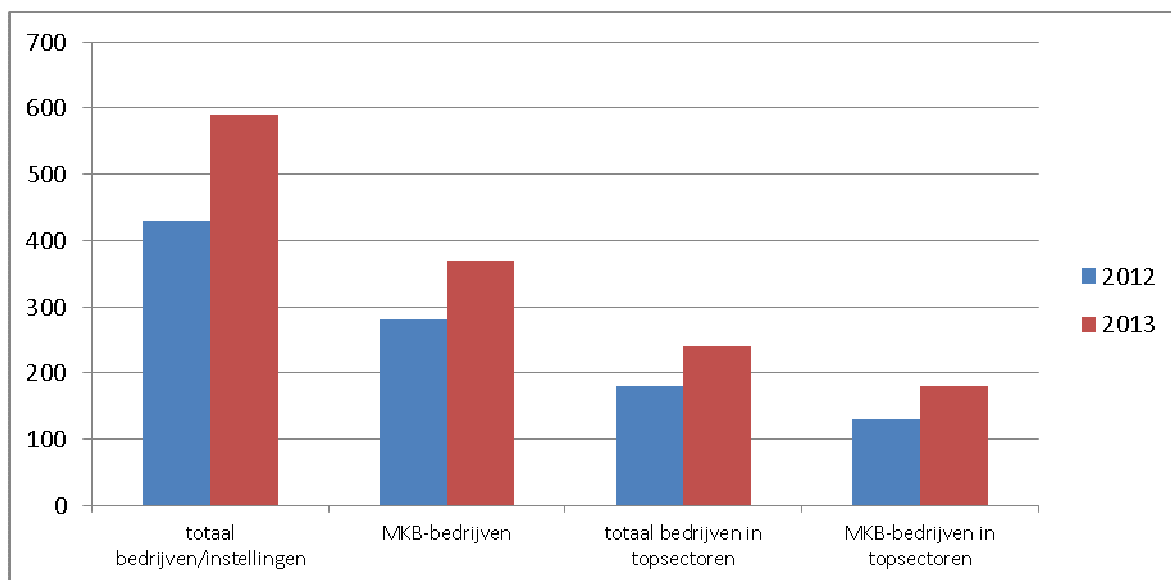
#### *Economic missions with government representatives*

<sup>35</sup> <http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2014/07/08/kamerbrief-aanvullend-actieplan-mkb-financiering.html>.

Participation in economic missions with government representatives is a great way for Dutch businesses to meet potential partners, expand their international network, explore market opportunities, exchange knowledge and raise their profile abroad. The purpose of economic missions with government representatives is to open doors that normally remain closed to entrepreneurs. Missions can thus be a first important step towards building a market position abroad.<sup>36</sup>

In 2013, 15 missions were organised with the participation of 590 businesses/institutions in total, including 370 SMEs. These numbers imply an upward trend compared to last year (2012: 430 businesses/institutions, including 280 SMEs). A large number of these businesses/institutions took part in several missions; in 2013 the aforementioned 590 businesses/institutions participated 910 times in missions with government representatives.

*Figure 2.34 Businesses/institutions participating in economic missions with government representatives, 2012-2013*



Source: Statistics Netherlands, based on Netherlands Enterprise Agency (RVO.nl).

[total businesses/institutions, SMEs, total top sector businesses, total top sector SMEs]

#### *Innovation Attachés*

The Innovation Attaché network (IA, formerly Technical Research Attachés) supports the international innovation ambitions of Dutch businesses, knowledge institutions and, in particular, the top sectors. The IAs work from embassies and consulates in 14 high-tech countries and engage in 'economic diplomacy' to promote Dutch technology and knowledge and identify opportunities for R&D collaboration and joint innovation. The IA network is active around the world, supplying services to businesses, knowledge institutions and government agencies, often in private-public collaborations. Considerable progress was realised in 2013 compared with 2012 on all key

<sup>36</sup> A survey (n = 254) shows that 53% of the participating businesses anticipated securing contracts with a joint estimated value of €119 million.

indicators, such as answering questions, organising missions and realising collaborations (see Table 2.16).

*Table 2.16 Some key Innovation Attaché network data, 2012-2013*

	2012	2013
<b>Questions or requests for information</b>	2,753	3,123
<b>Link-ups with potential foreign R&amp;D counterparts</b>	495	585
<b>Missions and conferences</b>	284	450
<b>Seminars</b>	109	199
<b>Formalised collaborations</b>	50	65

#### *Development cooperation*

Public-private collaboration plays a key role in development cooperation, both in the Netherlands and developing countries. Together with local partners, Dutch businesses and institutions can make a big contribution towards resolving bottlenecks in such fields as water management and food security. The most extensive programmes concern private sector investment (PSI), public-private partnership programmes (PPP) and infrastructure (ORIO).

PSI supports private investments in developing countries. The government's contribution has been steadily increased in the past years. In the 2009-2013 period, 554 investment projects were supported within the programme, with the government contributing over €375 million. Over half of this amount relates to the Agri & Food/Horticulture and Propagation Materials themes.

*Table 2.17 Subsidy for private sector investment (PSI) projects, 2009-2013*

	2009	2010	2011	2012	2013	2009-2013
<b>Total</b>	67.4	68.2	69.6	81.4	88.7	375.3
Of which A&F/H&PM theme	37.1	40.4	39.3	38.8	38.6	194.2
Water theme	1.8	1.5	2.0	0.7	0.9	6.9
LS&H theme	5.9	3.6	6.5	4.0	4.5	24.5

PPPs focus on water supply (Sustainable Water Fund and Ghana WASH Window) and food security (FDOV). At least one Dutch party is involved in each partnership project. In 2013, over €123 million of subsidy was granted to 40 partnership projects, involving a total of 81 Dutch companies.

The ORIO facility supports the development, implementation and operation of public infrastructure in developing countries via donations to the national government. Since ORIO started in 2009, 73 projects have been selected, with the total donated amount running to €832 million. The actual donated amount may work out lower, depending on the project's progress and the achievement of milestones. Most of the projects are still in the development or tendering phase. Of the total expenditure of €22.3 million, €17.2 million was paid directly to Dutch parties involved in the development, implementation and operation of the infrastructure.





### 3. Developments in top sectors

*The latest numerical data on the top sectors underline the importance of the nine top sectors for Dutch R&D and exports. Most top sectors are more productive than the rest of the economy. Moreover, the top sectors as a whole outperformed the overall Dutch economy in the 2010-2013 period in terms of added value development and labour productivity growth. The upward trend in R&D intensity in 2012 which became visible at macro level is driven by the growing R&D intensity at businesses and particularly in the top sectors. The private share of the top sectors in the total financing of the collaborative projects in the TKI context worked out at 35% for 2013. However, major differences exist between the private shares of the individual top sectors.*

#### 3.1 Introduction

Alongside the generic policy discussed in Chapter 2, the enterprise policy also comprises an approach that is specifically targeted at top sectors. This approach is based on three principles: public-private partnership, an integrated approach and joint programming of research. Entrepreneurs, researchers and government (national and regional) are all at the helm, with each party carrying its own set of responsibilities. The parties involved, brought together in the 'top teams', jointly identify the opportunities and bottlenecks as well as the most appropriate allocation of public resources.

There are nine top sectors: Agri & Food<sup>37</sup>, Chemicals, Creative Industry, Energy, High Tech Systems & Materials (HTSM), Life Sciences & Health (LSH), Logistics, Horticulture & Propagation Materials (HPM)<sup>38</sup> and Water. These top sectors have constituted the backbone of our economy for decades. They are responsible for the largest part of the R&D expenditures in the Netherlands and are major drivers of exports. In addition, the Dutch top sectors operate at the cutting edge of the 'technology frontier' (highest productivity level). To maintain this strong position, it is not sufficient to follow in the slipstream of foreign competitors. Individual sectors and the country as a whole depend on breakthrough technologies to remain in the forefront of developments. This is why the top sectors play such a central role in the enterprise policy in general and the innovation policy in particular. Moreover, many bottlenecks and challenges in such fields as knowledge, education and regulatory burden are of a sector-specific nature. A tailored approach is therefore required, where each top sector has its own specific mix of policy instruments that caters to its own unique conditions and needs. In addition to their economic significance, the top sectors are also pivotal to the resolution of societal issues (see also Chapter 4).

Since the previous Top Sector Monitoring Study (2012), a great deal of new numerical data has become available about the top sectors. Statistics Netherlands has performed a new baseline

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<sup>37</sup> The core of Agri & Food consists of the primary production of (raw materials for) food and their processing in the food industry. This is the demarcation applied in this chapter unless otherwise indicated. The Agri & Food top sector also comprises food-related logistics, trade and financial services as well as R&D in agriculture and the food industry.

<sup>38</sup> Wherever possible, figures are also presented for HPM for the 'Horticulture Complex'. These figures consist of the results of research by the LEI Wageningen UR into the Agri-complex (see: Het Nederlandse agrocomplex 2014. LEI, expected December 2014).

measurement for the top sectors.<sup>39</sup> For each top sector, new figures have been produced on a large number of key indicators for the years 2010, 2011 and 2012. This presents an opportunity to portray the developments since the start of the top sector policy. In addition, a number of key data have become available for the top sectors as a whole for the year 2013, thus enabling us to sketch the most up-to-date picture possible.

#### **Top Sector Data: Logistics versus Transport & Storage**

The Logistics top sector comprises all logistics activities in the business sector, so this covers a wider range of activities than 'transport & storage' alone. However, based on this comprehensive definition, Statistics Netherlands is only able to construct representative data for the Logistics sector for a limited number of variables. Where possible, these figures are presented in the Monitor; where this is not possible, figures are presented for 'transport & storage'. The latter applies in any case to such variables as R&D and the extent to which instruments are used, where the difference between the two definitions is less relevant.

Compared with the previous Monitoring Study, several key figures of the top sectors have been adjusted for statistical reasons by Statistics Netherlands. The most important reason is the revision of the National Accounts (NA) as performed this year by Statistics Netherlands in accordance with international guidelines.<sup>40</sup> An NA revision is carried out with the aid of new and improved data sources. The figures for the top sectors for production, added value and employed persons have also been revised as a result of this. Other important changes at Statistics Netherlands that influence the outcomes of the top sectors include the adjusted demarcation of several top sectors and a change in the method for determining R&D expenditures.

### **3.2 Structure and developments in top sectors**

This section highlights several key data from the Top Sector Monitoring Study of Statistics Netherlands. The first part of this section centres on the importance and structure of the top sectors in the Netherlands on the basis of these sectors' share in the added value, R&D expenditures and total goods exports. The second part sketches the developments in the 2010-2013 period. Issues discussed include the dynamics in the added value, employment and labour productivity of the top sectors compared with the overall Dutch economy.

#### *Significance and structure of top sectors in the Netherlands*

The share of the nine top sectors in the added value of the Netherlands amounted to 25% in 2012 (see Figure 3.1). In addition, the nine sectors are jointly responsible for 87% of R&D expenditures.<sup>41</sup> This high percentage illustrates the knowledge-intensive character of the top sectors. The orientation towards exports can be seen in the top sectors' share in exports: more than half of Dutch goods exports (excluding re-exports) are generated by top sectors (57%).

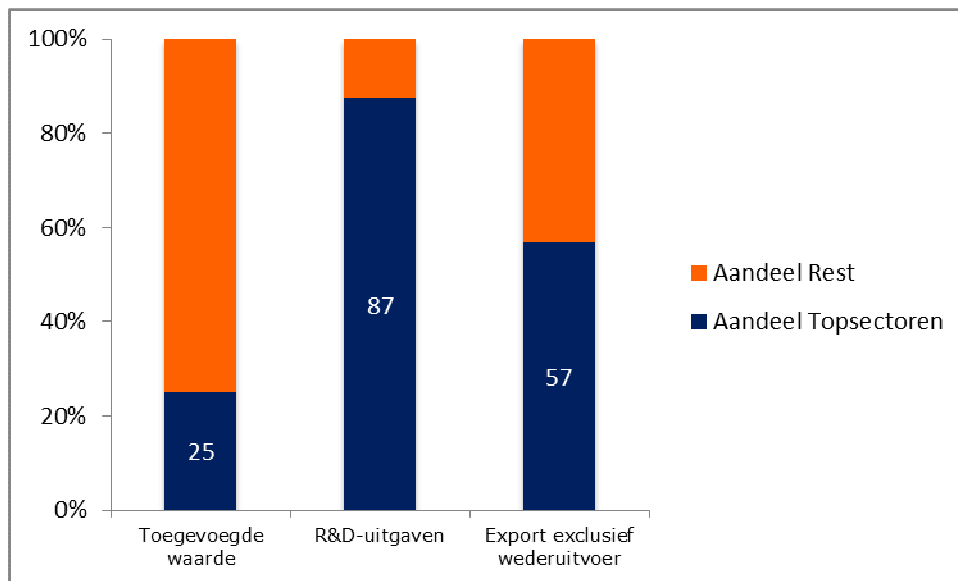
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<sup>39</sup> For a detailed numerical overview of top sectors, see the Statistics Netherlands Top Sector Monitoring Study 'Monitor Topsectoren 2014: Uitkomsten 2010, 2011 en 2012' and for a description of the methodology, see 'Monitor Topsectoren 2014: Methodebeschrijving en tabellenset'.

<sup>40</sup> As a rule, such revisions are performed every eight years.

<sup>41</sup> This percentage is considerably lower than the 97% that resulted from the previous Top Sector Monitoring Study of Statistics Netherlands. It recently emerged that Statistics Netherlands had miscalculated the total percentage for the top sectors for the year 2010. Adjusted for this miscalculation, the percentage would have been 89%.

Figure 3.1 Share of top sectors in the Dutch economy, 2012

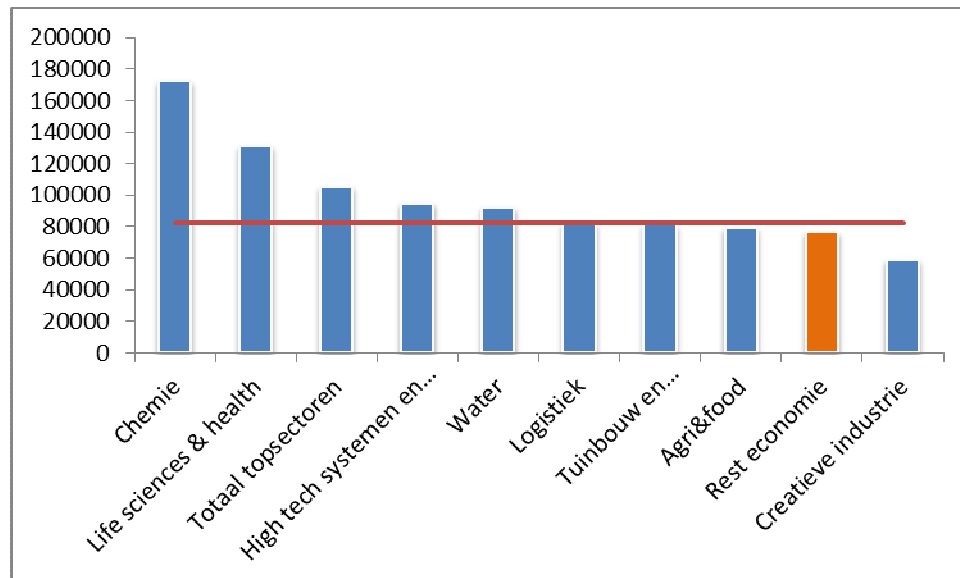


Source: Statistics Netherlands, Top Sector Monitoring Study 'Monitor Topsectoren 2014'.  
[Share of Remainder, Share of Top Sectors]

Labour productivity in the top sectors is higher on average than in other sectors of the Dutch economy (see Figure 3.2). This difference (€105,000 per FTE relative to €82,000 per FTE for the Dutch economy as a whole) is partly due to the fact that the top sectors are both more capital-intensive and more knowledge-intensive. The Energy top sector in particular has a high labour productivity: this is no less than five times greater than the Dutch average and is therefore not included in Figure 3.2. One important reason for this high productivity is the extremely capital-intensive nature of this top sector.

The Chemicals and LSH top sectors are also well above the average. Both these sectors combine a high degree of innovation with a relatively limited use of employees. The Creative Industry, by contrast, has a lower labour productivity than the Dutch average; partly because it is extremely labour-intensive and partly because it has a relatively large number of SMEs, which typically have a lower productivity than large companies. Moreover, this young sector comprises many new start-ups that tend to be less productive in their early stages than established companies.

Figure 3.2 Labour productivity level (per FTE), 2012

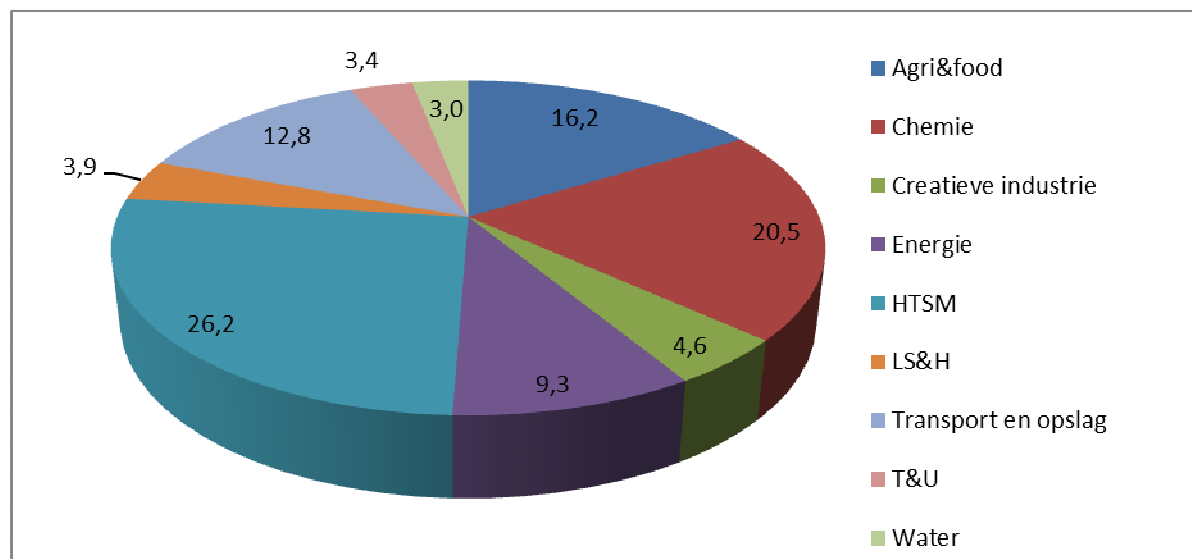


Source: the Ministry of Economic Affairs' own calculation based on Statistics Netherlands figures (2014). N.B.: the Energy top sector is not included because of its high productivity, but is included in the average of the top sectors.

[Chemicals, LSH, Top sector total, HTSM, Water, Logistics, HPM, Agri & Food, Remainder of economy, Creative Industry]

Figure 3.3 shows that HTSM has the largest share in the top sector in added value terms. This sector is responsible for more than a quarter of the added value of the nine top sectors jointly. Water, HPM and LSH are the smallest sectors in the total of the top sectors.

Figure 3.3: Share of top sector in added value of nine top sectors jointly, 2012



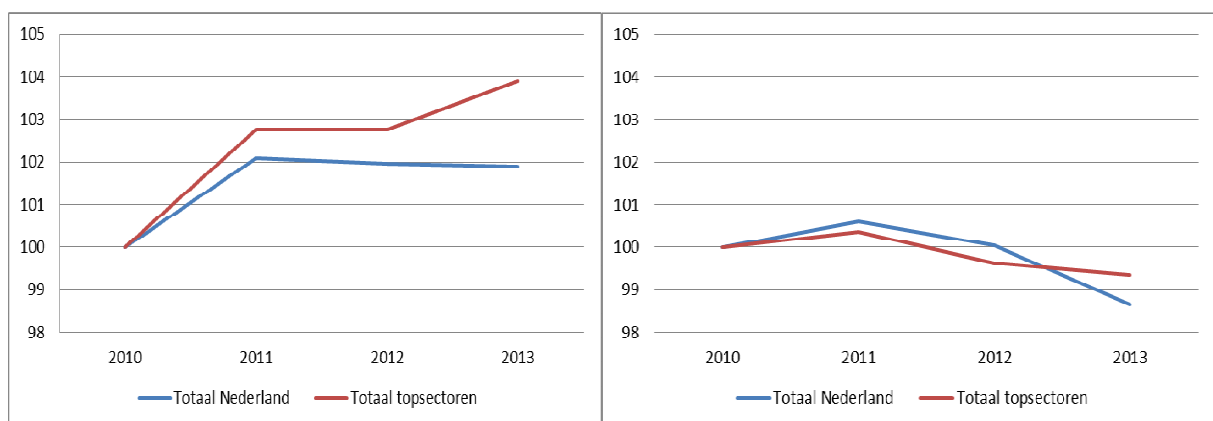
Source: the Ministry of Economic Affairs' own calculation based on Statistics Netherlands figures, 'Monitor Topsectoren 2014'.

[Agri & Food, Chemicals, Creative Industry, Energy, HTSM, LSH, Transport & storage, HPM, Water]

### Top sector developments 2010-2013

In the 2010-2013 period the top sectors jointly saw their added value grow and employment fall slightly (see Figure 3.4), so that the net effect was an increase in labour productivity.<sup>42</sup> The top sectors as a whole perform better than the overall Dutch economy. The average added value of the Netherlands grew (nominally) by 0.6% on average per year in the 2010-2013 period, while the added value of the top sectors increased by 1.3%.<sup>43</sup> Regarding labour productivity, too, the top sectors outperformed the Dutch average in the 2010-2013 period, both in absolute and in growth terms. This is largely down to the strong export orientation of businesses in the top sectors, where they must compete with foreign companies. Higher productivity contributes to improved competitiveness.

Figure 3.4 Development of added value (left) and employment (right), 2010-2013



Source: the Ministry of Economic Affairs' own calculations based on Statistics Netherlands figures (2014).  
[Netherlands total, Top sector total]

Large differences occur within the top sectors (see Table 3.1). The star performer is Chemicals, which was the top sector with the fastest growth in terms of both added value and labour productivity. Energy also displayed strong growth on these key indicators. Water, by contrast, suffered a sharp fall in terms of added value and labour productivity. Despite the contraction in sales, companies in the Water top sector expanded their workforce, resulting in a considerable loss of labour productivity. The disappointing sales performance in this sector is due to the severe impact of the weak international economy. The explanation for the uplift in employment in the sector may be that water companies are currently engaging expert staff in anticipation of reviving orders.

<sup>42</sup> Statistics Netherlands has made a flash estimate for certain key variables for the top sectors as a whole for 2013. This flash estimate is not available for the individual top sectors.

<sup>43</sup> This concerns the value development, without price adjustment. After a price adjustment, greater differences in real terms are to be expected between the top sectors as a whole and the Dutch economy. The reason for this is that the price movement in the services sector was higher than in the rest of the economy and services sectors largely fall outside the top sectors.

Table 3.1 Added value, employment and labour productivity development, 2010-2012 (2010 = 100)

	Added value			Employment			Labour productivity		
	2011	2012	av. growth	2011	2012	av. growth	2011	2012	av. growth
<b>Total Netherlands</b>	102.1	102.0	1.0	100.6	100.0	0.0	101.5	101.9	1.0
<b>Top sector total</b>	102.8	102.8	1.4	100.4	99.6	-0.2	102.4	103.1	1.6
<b>Agri &amp; Food</b>	99.5	105.1	2.5	96.7	96.7	-1.7	103.0	108.7	4.2
<b>Chemicals</b>	109.4	115.5	7.5	100.0	101.3	0.7	109.4	114.0	6.8
<b>Creative Industry</b>	100.7	97.4	-1.3	104.0	104.0	2.0	96.7	93.6	-3.2
<b>Energy</b>	105.0	110.7	5.2	106.7	105.0	2.5	98.4	105.4	2.7
<b>HTSM</b>	104.5	101.6	0.8	100.2	100.2	0.1	104.3	101.3	0.7
<b>LSH</b>	101.0	98.3	-0.8	97.3	94.6	-2.7	103.8	104.0	2.0
<b>Transport and Storage</b>	102.3	94.5	-2.8	100.7	94.7	-2.7	101.6	99.8	-0.1
<b>HPM</b>	94.0	97.8	-1.1	98.1	100.0	0.0	95.9	97.8	-1.1
<b>Water</b>	94.2	90.7	-4.8	109.8	111.8	5.7	85.8	81.1	-9.9
<b>Logistics</b>	100.8	105.0	2.5	100.3	103.0	1.5	100.5	101.9	1.0
<b>Horticulture Complex</b>	94.5	95.1	-2.5	97.9	95.9	-2.1	96.5	99.2	-0.4

Source: the Ministry of Economic Affairs' own calculations based on Statistics Netherlands, 'Monitor Topsectoren 2014'.

### 3.3 Use of instruments by top sectors

As already indicated in section 2.3.3, the number of companies making use of the WBSO has grown in the past years, albeit to a slightly lesser extent in the top sectors than the Dutch average. This is partly because top sectors have relatively fewer SMEs, whereas it was primarily SMEs that were encouraged to take up the WBSO in recent years (see Table 3.2). Accordingly, the use of this scheme in the top sectors mainly accelerated in the Creative Industry where SMEs have a dominant presence. The calculated R&D wage sum in this sector has also risen strongly since 2011. Though the calculated R&D wage sum also grew in the Energy sector relative to 2011, the number of companies making use of the WBSO scheme decreased. The picture in the Logistics top sector is exactly the reverse, though it should be added that the focus in this sector is on services innovation (new governance and collaboration models) rather than on technological innovation.

The take-up of the RDA scheme, which was introduced in 2012, increased in most sectors in 2013 relative to 2012. The growth in the number of businesses making use of this scheme and of the calculated R&D expenditures is slightly higher in the top sectors than the Dutch average.

#### BMKB take-up

As already indicated in section 2.6.3, the take-up of the BMKB scheme (SME credit guarantee fund) contracted at macro level – from €486 million in 2012 to €344 million in 2013 – and underwent a similar relative decrease among top sector companies (from €101 million in 2012 to €73 million in 2013), with a particularly strong decline in the Creative Industry. Interestingly, the BMKB take-up did increase in the HPM and Agri & Food top sectors.

Table 3.2 WBSO and RDA take-up in 2013

WBSO take-up 2013					RDA take-up 2013			
Calculated R&D wage sum			No. of companies		Calculated R&D expenditures		No. of companies	
<i>Size</i> <i>(€ billion)</i>	<i>Index</i> <i>(2011=100)</i>		<i>Total</i>	<i>Index</i> <i>(2011=100)</i>	<i>Size</i> <i>(€ billion)</i>	<i>Index</i> <sup>2</sup> <i>(2012=100)</i>	<i>Total</i>	<i>Index</i> <sup>2</sup> <i>(2012=100)</i>
Netherlands	3.4	107	17,400	105	1.7	121	11 760	115
Top sectors <sup>1</sup>	2.2	104	8,040	103	1.3	126	5 200	117
Agri & Food	0.1	91	560	97	0.1	-	390	-
Chemicals	0.1	101	520	108	0.1	-	360	-
Cr. Industry	0.0	143	420	120	0.0	-	260	-
Energy	0.4	112	370	90	0.3	-	230	-
HTSM	1.6	106	5,680	103	0.8	-	3 590	-
LSH	0.2	103	280	108	0.2	-	180	-
Logistics	0.1	85	220	105	0.0	-	110	-
HPM	0.1	103	490	98	0.1	-	380	-
Water	0.1	92	250	104	0.0	-	170	-
Other outside top sectors	1.1	112	8,930	106	0.4	107	6 300	113

Source: Statistics Netherlands use of instruments. <sup>1</sup> Top sector total need not be equal to the sum of the individual top sectors as a company can belong to several top sectors. <sup>2</sup> No index figures were calculated for the RDA within the top sectors because the year 2013 is not directly comparable with the year 2012 due to changes in the demarcation of the various top sectors.

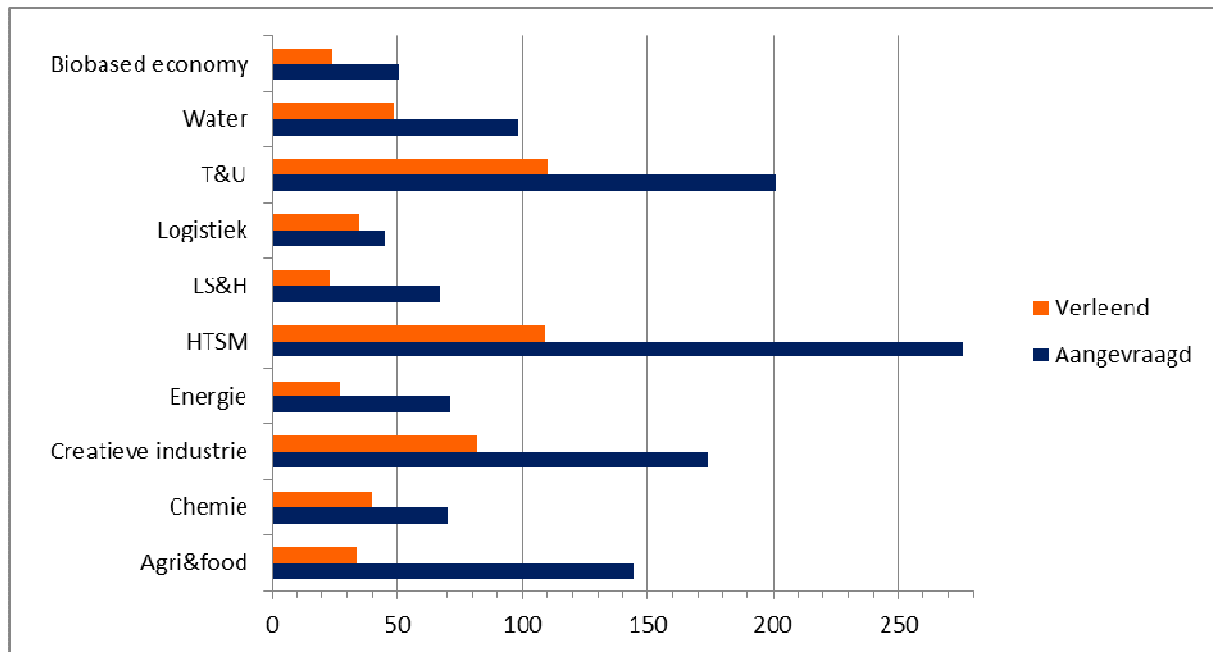
### *Economic missions*

The strong growth in the participation in economic missions with government representatives as discussed in section 2.6.4 is also noticeable in the top sectors. The growth rate is just under the Dutch average. The number of top sector participations in economic missions was almost twice higher in 2013 than in 2011 (from 240 to 440). Of the top sectors, HTSM was the most prominent participant in missions in 2013. Of the 910 participations in 2013, 200 involved a business from this sector.

### *MIT (Scheme to Promote SME Innovation in Top Sectors)*

Figure 3.5 compares the number of MIT applications with the number of awards in 2013. As noted in section 2.3.3, demand was greater than the available budget. A total of 44.5% of the applications were awarded subsidies in 2013. Demand from the HTSM top sector was particularly strong: 276 applications with a size of €22.7 million. Of these applications, less than half were approved. HPM also submitted a large number of applications (201), of which just over half were approved (54.7%). Logistics submitted the fewest applications, namely 45. In 2013 this sector deliberately opted to focus strongly on a limited number of subjects in the MIT. Agri & Food saw a quarter of its applications awarded.

Figure 3.5 MIT applications and awards by top sector in 2013



Sourced: RVO.nl

[Awarded, Applied for]

#### R&D wage sum versus R&D expenditures for top sectors

According to Statistics Netherlands in its Top Sector Monitoring Study for 2014 'Monitor Topsectoren', top sectors accounted for 87% of the R&D expenditures in 2012. The top sectors' share in the calculated R&D wage sum (based on figures of the Netherlands Enterprise Agency<sup>44</sup>) was clearly lower, namely 67%. The latter figure could imply that the top sectors play a considerably less important role in R&D terms in the Netherlands. However, further analysis of, respectively, the R&D wage sum (WBSO) and the R&D expenditures from 2010 reveals that the difference between the data from the two sources can be traced to clear causes.

There are three important *technical* causes that determine the difference between the two outcomes: i) differences in population, ii) different ways of linking companies to data, and iii) differences in R&D terminology.

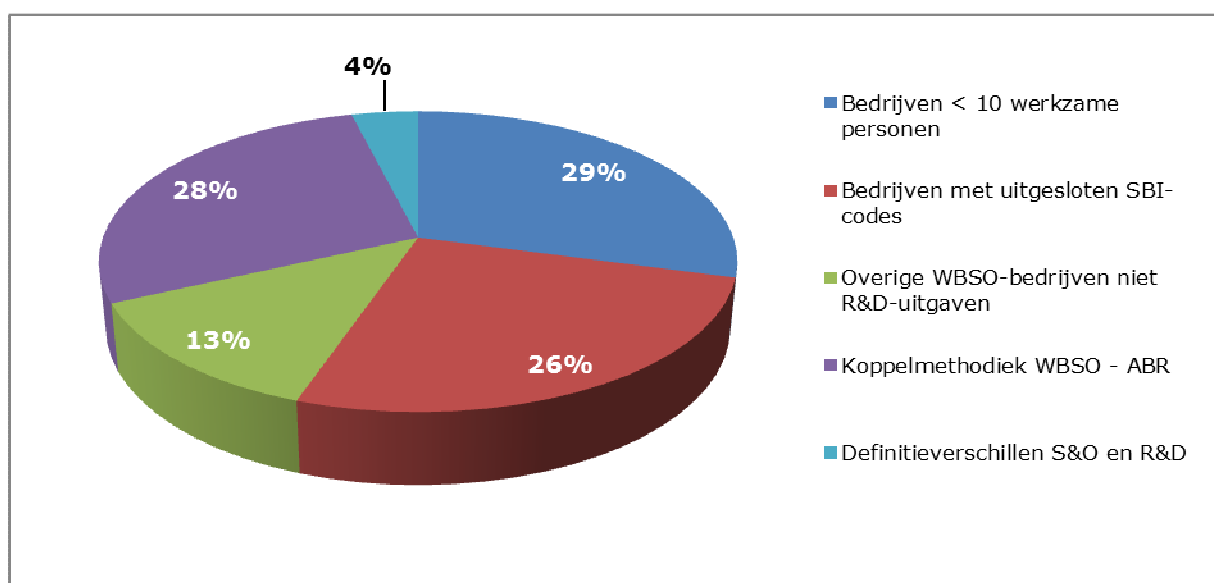
The largest part of the difference is attributable to the first factor. Some companies make use of the WBSO scheme and are therefore included in the R&D wage sum data, but are not included in the R&D expenditure data of Statistics Netherlands. This group of companies has a clearly lower share in the top sectors. This factor explains about 68% of the difference between the R&D share of the top sectors according to Statistics Netherlands and the Netherlands Enterprise Agency. This group broadly consists of three types of companies:

<sup>44</sup> Statistics Netherlands, Gebruik Instrumenten door de topsectoren 2012.



- Until 2010 inclusive, businesses with fewer than ten employed persons were not included in the R&D expenditure data (Statistics Netherlands).<sup>45</sup> By contrast, the WBSO scheme (R&D wage sum, Netherlands Enterprise Agency) comprises a relatively large number of small non-top sector companies with fewer than ten employed persons. This explains 29% of the difference between the data.
- Companies with certain SBI codes (e.g. companies active in the public and educational sectors) are excluded from the Statistics Netherlands data. No SBI codes are excluded from the Netherlands Enterprise Agency data for the WBSO scheme. This explains 26% of the difference.
- Finally, some companies make use of the WBSO scheme, but do not belong to the two abovementioned groups. This explains about 13% of the difference.

*Figure 3.7 Indicative explanation of differences between the top sector R&D share according to Netherlands Enterprise Agency and Statistics Netherlands data (2010, in %)*



Source: the Ministry of Economic Affairs' own calculations based on comparative research of Netherlands Enterprise Agency and Statistics Netherlands. N.B.: the percentages are indicative, partly due to the overlap, however limited, between the various explanations.

[Businesses < 10 employed persons; Businesses with excluded SBI codes; Other WBSO businesses non-R&D expenditures; WBSO-ABR data linkage method; definition differences R&D wage sum and R&D expenditures]

A second important cause, which explains 28% of the difference, is methodological. Due to the method used to link WBSO businesses to the General Business Register (ABR), a business may be linked to a different business unit than the business unit for which R&D data are known. This may even occur when both business units belong to the same corporate group.

The final cause of the difference between the top sector R&D shares is that the R&D wage sum as used by the Netherlands Enterprise Agency is not identical to the R&D expenditures as used by Statistics Netherlands. The R&D expenditures are higher than the R&D wage sum. The reasons for

<sup>45</sup> Statistics Netherlands did include companies with fewer than 10 employed persons for the R&D expenditures of 2012 (from the WBSO data).

this are set out below. Note, however, that this factor's influence on the difference is limited (4%):

i) The R&D expenditures also comprise non-wage expenditures. ii) Statistics Netherlands defines wages differently from the Netherlands Enterprise Agency. The latter considers the R&D hours of an approved R&D project and the hourly R&D wage of the R&D employees; Statistics Netherlands includes the full gross R&D wage costs of R&D employees. iii) The WBSO scheme has a maximum ceiling, so that the wage costs of the large R&D companies can be understated.

### 3.4 Objectives and ambitions of top sectors

The enterprise policy has three general objectives: i) the Netherlands is among the world's top five knowledge economies in 2020, ii) increase R&D intensity to 2.5% of GDP in 2020, iii) public and private parties contribute at least €500 million in TKIs in 2015, of which at least 40% is financed by the business sector. As the top sectors are a specific target group in the enterprise policy, we will examine in section 3.4.1 how the top sectors – working in conjunction with other businesses, knowledge institutions and government – help to achieve the second and third objectives. This analysis is not performed for the first objective, because the top five position cannot be derived back to individual top sectors. Next, section 3.4.2 deals with the ambitions and target values of top sectors as defined in consultation with the top teams in so far as these have not yet been covered elsewhere in this chapter.

*Table 3.3 R&D expenditures as a percentage of added value, 2011-2020*

	2011	2012	2020
	<i>Indicative reference value</i>		
Agri & Food	3.6	3.2	4.7
Chemicals	6.1	6.3	8.1
Creative Industry	0.5	0.6	0.6
Energy	4.3	4.3	5.6
High Tech Systems and Materials	7.9	8.6	10.4
Life Sciences & Health	16.8	14.9	22.1
Transport and Storage	0.6	0.6	0.7
Horticulture and Propagation Materials	3.0	3.5	3.9
Water	9.0	10.3	11.9
Businesses	1.1	1.1	1.4
Of which top sectors	4.2	4.4	5.6
Other sectors	0.2	0.2	0.2
Public knowledge institutions	0.8	0.8	1.1
Total R&D expenditures	1.9	2.0	2.5

Source: Statistics Netherlands for the years 2011 and 2012; N.B.: No figures are included for 2010 because figures before and after 2011 are no longer comparable.

#### 3.4.1 General R&D and TKI objective

For monitoring purposes and to indicate how the top sectors and, by extension, the top sector approach contribute to the attainment of the R&D objective of 2.5% (of GDP), indicative reference

values have been calculated for each top sector for 2020, as well as for the rest of the economy including the public R&D efforts (see Table 3.3). It is assumed that each sector – including a random top sector – makes a proportionate contribution to the envisaged increase in the R&D efforts to 2.5% of GDP in 2020.<sup>46</sup> It should be noted, however, that the top sectors receive extra financial incentives to step up their private R&D efforts via e.g. the TKIs (including the TKI supplement) and the MIT scheme.

The upward trend in R&D intensity in 2012 that is visible at macro level is driven by the increase in R&D intensity at business level, and particularly at top sector businesses. Despite the financial-economic crisis, the top sectors as a whole have made steps towards the realisation of the objective in 2020. The main top sectors where the private R&D expenditures have increased substantially in relation to their added value are HTSM, HPM and Water. LSH, where important R&D establishments have been closed or downsized, is a negative exception. The substantial decrease in funding from the Economic Structure Enhancing Fund (FES) for LSH may be another reason why businesses are allocating a smaller budget to R&D in this sector. The innovation data, incidentally, produce a brighter picture for LSH; the innovation expenditures in 2012, for instance, were substantially higher than in 2010 (2012: €1,630 million, 2010: €1,121 million), while the percentage of innovating companies was 60% in 2012 versus 52% in 2010.

#### *TKI objective*

For some time now, entrepreneurs and researchers of the nine top sectors have been working together in TKIs<sup>47</sup> with a view to bringing innovative products and services onto the market. In order to encourage businesses to participate in these TKIs, the government introduced a TKI supplement in 2013.

*Table 3.4 TKI supplement-earning PPP projects (in million), 2013<sup>1</sup>*

	Private contribution	Estimated size of public-private partnership <sup>2</sup>	Earned TKI supplement
<b>Agri &amp; Food</b>	€21.0	€40.1	€5.6
<b>Chemicals</b>	€25.4	€60.6	€7.1
<b>Creative industry</b>	€0.1	€3.3	€0.1
<b>Energy</b>	€18.4	€44.1	€5.5
<b>HTSM</b>	€74.9	€256.2	€19.2
<b>LSH</b>	€14.8	€27.3	€4.1
<b>Logistics</b>	€2.4	€6.4	€0.7
<b>H&amp;PM</b>	€14.2	€44.1	€3.9
<b>Water</b>	€28.5	€89.5	€8.0

<sup>46</sup> Assuming that every sector has the same structural growth rate in the 2010-2020 period, the R&D intensity of each top sector (and non-top sector) has the same growth rate as the Netherlands as a whole.

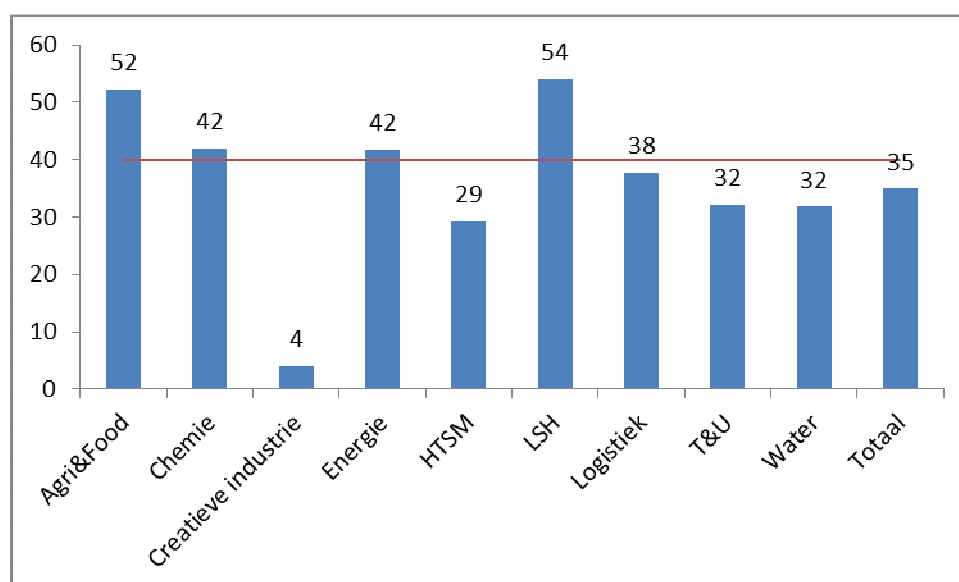
<sup>47</sup> Due to the merger of three TKIs into the new Chemicals TKI, the number of TKIs was reduced from 19 in 2014 to 17 in 2015.

<b>Total</b>	<b>€199.7</b>	<b>€571.8</b>	<b>€54.2</b>
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Source: Netherlands Enterprise Agency (RVO.nl); 1) a small overlap exists between the TKI-funded projects and TKI supplement-earning projects: this is because some projects are both supplement-funded and supplement-earning; 2) estimated on the basis of the private contribution and the share of the private contribution in other PPP projects.

The first full results of the TKIs for 2013 are now available. In 2013 private parties contributed €199 million (cash) to TKI supplement-earning PPP projects (see Table 3.4). The size of the private contribution differs significantly between the top sectors. HTSM, for instance, contributed almost €75 million of private funding to the PPP projects, while the Creative Industry contributed a mere €0.1 million.

*Figure 3.8 Estimated share of private contribution (in %) in TKI supplement-earning PPP projects, 2013*



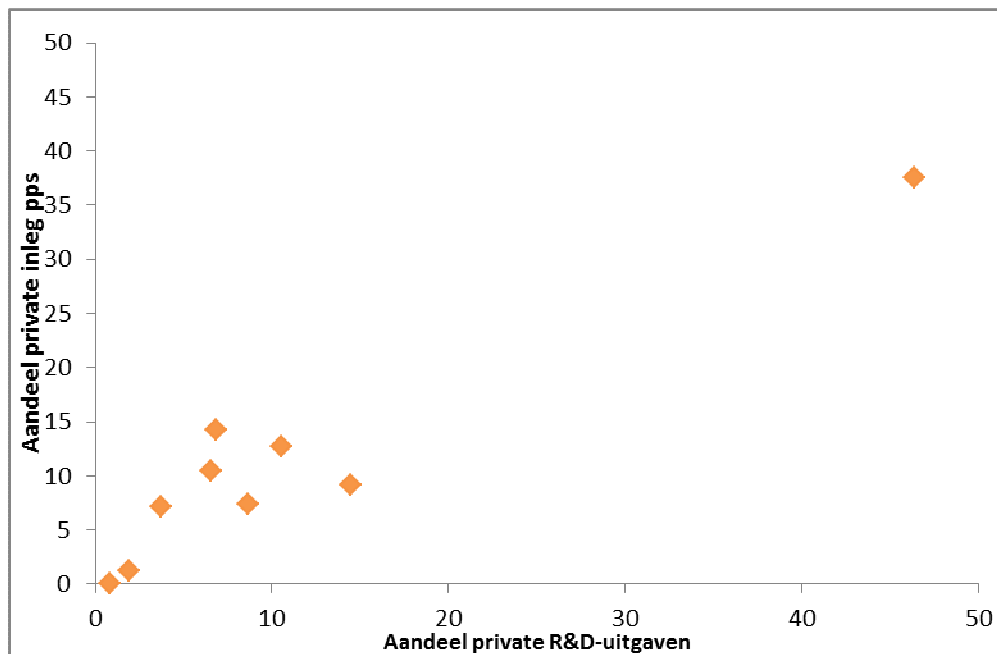
Source: the Ministry of Economic Affairs' own calculations based on Netherlands Enterprise Agency data.

Together with the public contribution, the total estimated volume of TKI supplement-earning PPP projects amounts to €571 million. The private share in the total financing of these PPP projects thus works out at 35% for 2013, which is well on track for the 40% target for 2015. Figure 3.8 shows the private contribution shares for all top sectors. Major differences exist between the top sectors. LSH and Agri & Food are well above the target with their private contribution share, while the Creative Industry does not get beyond 4%. HTSM is also well below the target.

The Creative Industry's low private share in PPPs is related to the small amount of private R&D expenditures compared to other top sectors (see Figure 3.9). The sector is relatively small and its R&D efforts are also on a relatively small scale (in cash terms). This indicates that a relatively large amount of public funding went into this sector's PPPs. By contrast, HTSM's comparatively low private share seems to be mainly due to the contribution of private funding. The private contribution is relatively low compared to what could be expected based on the relative private

R&D: the share of the private funds of HTSM in the total private funds is 37%, while the share of the private R&D expenditures of this sector in the total private R&D expenditures is 46%. It should be added, however, that the estimate of the public funds includes an EU FP7 contribution, which depresses this sector's private contribution in relative terms.

*Figure 3.9 Share of private R&D expenditures (in %, x-axis) and share of private contribution to PPP (in %, y-axis) in nine top sectors*



Source: the Ministry of Economic Affairs' own calculations. Data on private R&D expenditures are based on Statistics Netherlands, 'Monitor topsectoren'.

In 2014 the TKI supplement scheme was brought more into line with the various sectors' specific wishes. Supplements can now be applied for at more times throughout the year and multi-year programmes are now also eligible for the scheme. In addition, when calculating the first €20,000 of their TKI supplement-earning contribution, companies are now allowed to include their in-kind contributions (hours worked) as well as their cash contributions. All this will help to achieve the 40% objective, particularly in top sectors with many SMES such as the Creative Industry. A further simplification of the TKI supplement scheme has been worked out in consultation with the stakeholders, and will take effect in 2015.

### 3.4.2 Top sector ambitions and target values

Further to the promise made in the Letter on Industry ('Naar de top') of 2011, this section presents several indicators for the top sectors linked to target values, as determined in consultation with the top sector leaders and their teams.

Target values can be regarded as a dot on the horizon. They tell us something about the shared ambitions of the entire top sector policy as well as the individual top sectors. Based on the target values, it is possible to track over time whether the objectives/ambitions have or have not been

achieved. Target values provide a clear indication of the movement (versus the baseline situation) that is to be strived for. Target values can thus be seen as a beckoning beacon. A second reason for using target values is that network collaboration, such as in the form of the 'golden triangle' (knowledge institutions, companies and government), calls for transparent communication on the use and results of policy resources to the participating parties and society. The monitoring of target values should not be confused with impact measurement, because the target value score is influenced by more factors than policy alone.<sup>48</sup>

Table 3.5 presents the indicators with target values for 2020 (and in some cases for 2030) for each top sector. In addition, the year 2010 is stated as the point of departure – the baseline situation – for these indicators, while the year 2012 is mentioned as the latest situation. Most top sectors opt for an economic outcome variable such as added value, employment or exports. Several top sectors also focus on the achievement or consolidation of a certain league table ranking or market share. Agri & Food, for instance, is aiming to be a leader in innovation by 2020. Its ambitions are to become number 1 (now 2) in the EU in private R&D expenditures as a share of GDP and number 3 (now 5) in the EU in public R&D expenditures as a share of GDP in Agri & Food.

Energy and LSH have both been omitted from the table, albeit for different reasons. Energy has not been included as yet pending the publication early in October of the National Energy Report (*Nationale Energieverkenning*, NEV), which will contain a baseline measurement for the objectives in the Energy Agreement. The Energy sector is keen to align its efforts with the NEV system so that a uniform measurement method for energy data can be used. It must therefore await the publication of the measurement system before setting its targets. LSH is not included in the table because there are no quantitative target values. This top sector has stated its ambitions regarding regulatory burden (lead times of clinical research) in the 2010 action plan. Its principal concern is to make new products rapidly eligible for reimbursement. In policy terms, it wants lead times in the Netherlands to be among the fastest in Europe.

Little can be said at this stage about the development of the indicators in the 2010-2012 period relative to the target values, partly also because the current economic weakness has affected the results achieved so far.

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<sup>48</sup> A responsible impact measurement calls for more detailed information and requires data at micro level, making use of a treatment and control group (i.e. one group with policy intervention and one group without).

Table 3.5 Top sector ambitions and target values, 2010-2020

	2010	2012	2020
			<i>Ambition*)</i>
<b>Agri &amp; Food chain</b>			
Added value (billion)	39.9	42.2	51.3
<b>Chemicals</b>			
European market share (in %)	9.5	9.6	12,5
Innovation rate (in %)	72	65	80
R&D intensity	5.7	5,3	7,0
<b>Creative Industry</b>			
Added value (billion)	10.8	10.5	13.7
<b>HTSM</b>			
Added value (billion)	41.6	42.3	61.9
Employment (x 1,000)	446	447	454
Goods exports (billion)	41.3	45	82.1
<b>Logistics</b>			
Position in Logistic Performance Index	4	3	1
<b>HPM</b>			
Added value (billion)	10.8	10.2	23.8
Market share position			
Of which Horticulture	1	1	1
Of which Propagation Materials	2	2	2
Increase energy efficiency (1990 = 100)	48	45	43
<b>Water</b>			
Added value (billion)	5.8	5.2	11.6

Source: 2010 and 2012 data come partly from Statistics Netherlands, 'Monitor topsectoren 2014', where 2012 is provisional. \*) *Chemicals*: Market share applies to SBI 20, Innovation rate and R&D intensity concern SBI 20 and 22; *HTSM*: The target values set by HTSM in the innovation contract 2014-2015 are based on the original baseline measurement for 2009. They differ from these target values which are based on the new Statistics Netherlands measurement for 2012. Ahead of the new innovation contract, HTSM will set the definite target values in 2015 on the basis of the latest available figures; *Logistics*: No. 1 position in Europe in 2020. *HPM*: added value concerns figure for Horticulture Complex based on LEI calculations.





#### **4. Highlighted Topic: Societal challenges in the enterprise policy**

*Recent data of the Netherlands Enterprise Agency make it possible to provide quantitative insight into the degree to which innovation instruments are deployed for programmes and projects with a clear relationship to a specific societal challenge. It emerges that these innovation instruments are used to a substantial extent to address societal challenges: 70% of the FP7 resources and 30% of the TKI supplement went to projects that are specifically targeted at societal challenges. On top of this, 26% of the WBSO users and 58% of the MIT subsidies are focused on one or more green growth themes. The ongoing decoupling of economic growth and environmental degradation can, in all probability, be further accelerated by these efforts.*

##### **4.1 Introduction**

Ever since the enterprise policy was launched, attention has been called to the extent to which this policy, and within it the top sector approach, contributes towards the resolution of societal challenges (e.g. WRR, AWT, OECD).<sup>49</sup> New technologies and innovations play a key role in this respect by delivering new products and services in such fields as medical technology, energy and green (environmentally-friendly) manufacturing. Besides unlocking new national and international growth markets for Dutch businesses, such technologies and innovations also serve to boost Dutch productivity and, hence, prosperity. In a letter to the House of Representatives (TK 2013-2014, 32637, No. 70), the cabinet notes that Dutch businesses, knowledge institutions and government agencies are working shoulder to shoulder in the top sectors to bring about innovations, both in order to bolster Dutch competitiveness and resolve the societal challenges of today and tomorrow, including solutions for better healthcare, a safer and more productive food industry and more efficient and renewable energy.

The extent to which these efforts are actually bearing fruit in the top sectors can be illustrated with the project data gathered by the Netherlands Enterprise Agency about the Netherlands' participation in the European Seventh Framework Programme (FP7) (section 4.2), TKI supplement-funded Projects (section 4.3), resources for NWO co-funding (section 4.4), 'green' WBSO applications and Green Deals (section 4.5).

##### **4.2 The Seventh EU Framework Programme**

To determine the extent to which the FP7 programmes help to resolve societal challenges, the Netherlands Enterprise Agency has divided the projects within the Seventh Framework Programme (FP7) into specific societal challenges, taking the Grand Challenges as its point of departure and using the descriptions of these societal challenges in the European Horizon 2020 programme that became operational as the successor of FP7 in 2014.

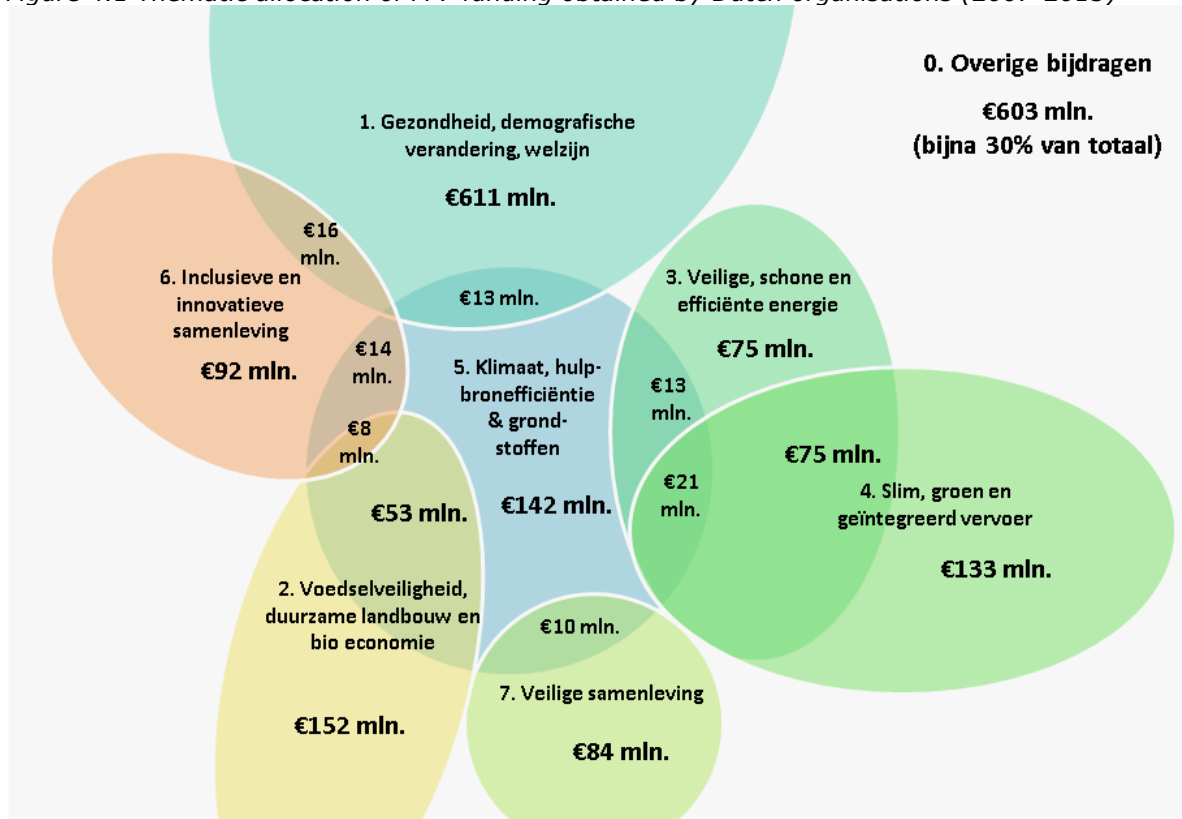
Figure 4.1 presents the results of this exercise. It shows that 70% of the allocated budget is directly linked to a societal challenge. Clearly, many programmes address more than one societal challenge: the use of less fossil fuel or less environmentally-harmful raw materials, for instance,

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<sup>49</sup> See e.g. <http://www.awti.nl/publicaties/waarde-creeren-uit-maatschappelijke-uitdagingen/item605>.

also helps to promote the sustainable use of resources. These cross-overs are reflected in the overlapping areas in Figure 4.1. Many of the remaining 30% of research projects are of a fundamental, and hence general, nature. This mainly concerns projects in the fields of space technology, ICT and nanotechnology.

Figure 4.1 Thematic allocation of FP7 funding obtained by Dutch organisations (2007-2013)



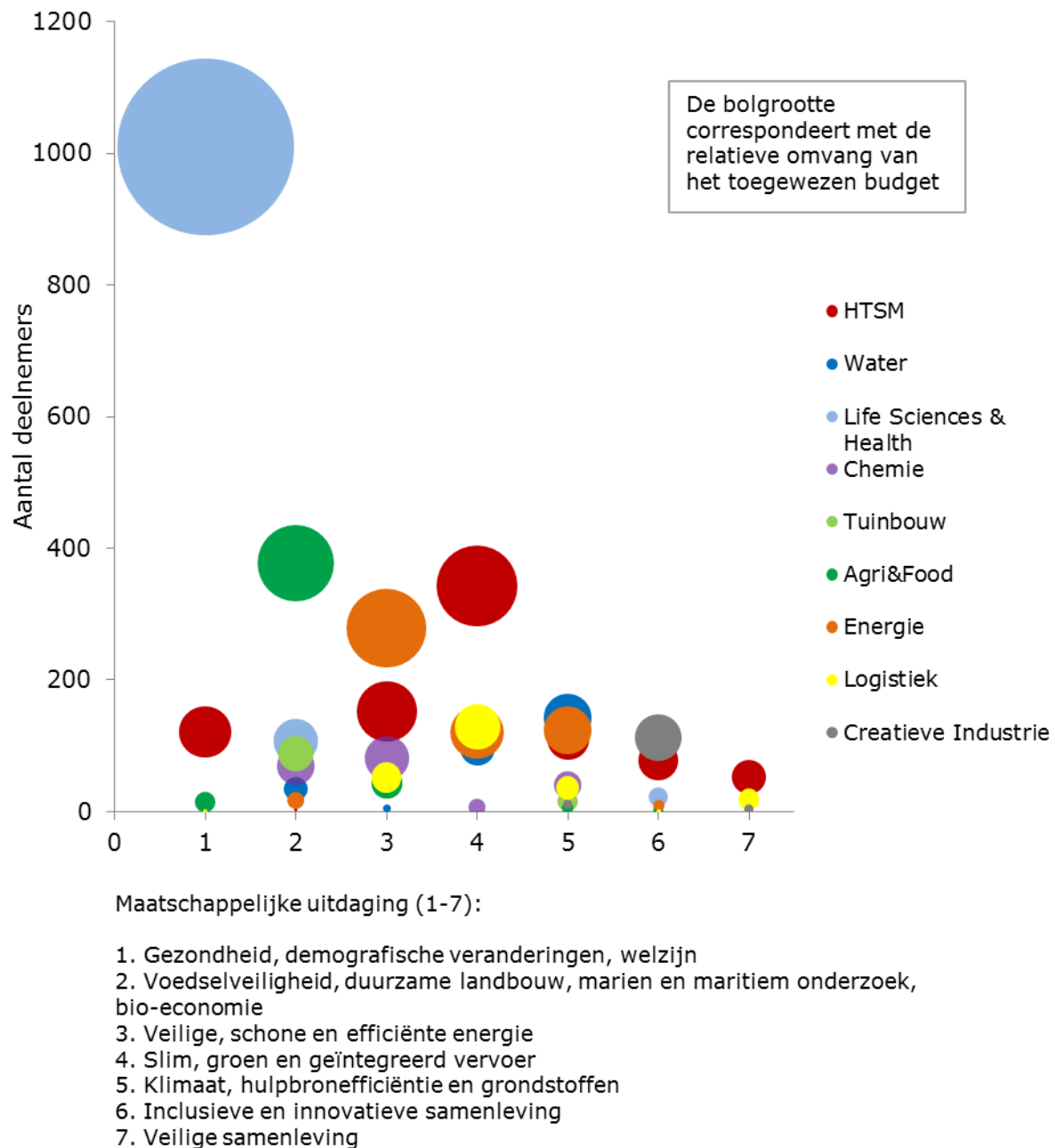
Source: Netherlands Enterprise Agency; \* The Seventh Framework Programme (FP7) is the research programme of the European Commission. The Expert Center for International Research and Innovation (EiOI) acts within the Netherlands Enterprise Agency as the Dutch National Contact Point for the Framework Programme. It thus helps to ensure the closest possible alignment of Dutch organisations with FP7.

\* The demarcation of the top sectors was determined by the EiOI on the basis of the research subjects of the projects within the FP7 COOPERATION and EURATOM programmes. The ERC, PEOPLE and CAPACITIES programmes are generic and can therefore not be broken down by specific research subject. The demarcation was agreed with the top teams' policy support officers. EURATOM was left out of consideration for the societal challenges.

[0. Other contributions €603 million (almost 30% of total)

1. Health, demographic changes, well-being €611 million
2. Food safety, sustainable agriculture and bio-economy €152 million
3. Safe, clean and efficient energy €75 million
4. Smart, green and integrated transport €133 million
5. Climate, resource efficiency and raw materials €142 million
6. Inclusive and innovative society €92 million
7. Safe society €84 million]

Figure 4.2 FP7 Cooperation budgets (€1.5 billion) in 2007-2013 for Dutch participants in the top sectors, broken down by societal challenges and numbers of participants



Source: Netherlands Enterprise Agency; \* The Seventh Framework Programme (FP7) is the research programme of the European Commission. The Expert Center for International Research and Innovation (EiOI) acts within the Netherlands Enterprise Agency as the Dutch National Contact Point for the Framework Programme. It thus helps to ensure the closest possible alignment of Dutch organisations with FP7.

\* The demarcation of the top sectors was determined by the EiOI on the basis of the research subjects of the projects within the FP7 COOPERATION and EURATOM programmes. The ERC, PEOPLE and CAPACITIES programmes are generic and can therefore not be broken down by specific research subject. The demarcation was agreed with the top teams' policy support officers. EURATOM was left out of consideration for the societal challenges.

[The size of the circle corresponds with the relative size of the allocated budget

Number of participants

Societal challenges (1-7): see Figure 4.1]

Figure 4.2 shows how the budgets from Figure 4.1 have been allocated per top sector and how many Dutch organisations took part in these programmes.<sup>50</sup> All top sectors contribute towards and are focused on societal challenges, but the intensity obviously varies strongly between the sectors according to the specific nature of each sector's economic activity. LSH, for instance, makes a strong contribution to the health theme, Energy to sustainable energy, Agri & Food to food safety and sustainable agriculture, and HTSM to smart and green transport systems. In other words, the intensity of the contribution follows the pattern of specialisation in the specific top sector.

#### **4.3 TKI supplement and societal challenges**

As an initial analysis of the TKI projects that were co-funded with the TKI supplement in 2013 shows (insofar as known on 1 July 2014), the TKIs are also using the TKI supplement to address societal challenges, with about 30% of the awarded €19.7 million going to projects that are directly linked to one or more of the EU's Grand Challenges. This overall picture is largely determined by the HTSM TKI (€14 million of the €19.7 million of awarded TKI supplement was deployed by this TKI). It is precisely in this TKI that many projects contribute to themes such as nanotechnology and ICT; too little information is available at the present moment to say whether these projects are related to a specific societal challenge. Excluding the HTSM TKI, just over 70% of the TKI supplement was used for projects relating to the societal challenge themes, the same percentage as with the FP7.

Figure 4.3 shows that the top sectors address all societal challenges except 'safe society'. Whereas Figures 4.1 and 4.2 looked back at the 2007-2013 period, the TKI supplement analysis for 2013 focuses more on the present and near future. Though the figures only provide a partial picture of the areas that the TKIs intend to address in the coming years, the greatest thematic intensity would appear to fall on the challenges of 'health, demographic changes and well-being', 'food safety, sustainable agriculture, marine and maritime research, bio-economy' and 'climate, resource efficiency and raw materials'. These are also the fields with the greatest overlap between sectors. In addition, the 'safe, clean and efficient energy' challenge would have been an important theme if the TKIs had made use of the supplement for projects in the Energy top sector. The figures in Table 4.1 confirm this, though this table exclusively concerns research of a largely fundamental nature, while TKIs are also active in other types of research collaboration.

#### **4.4 Alignment with societal challenges via NWO**

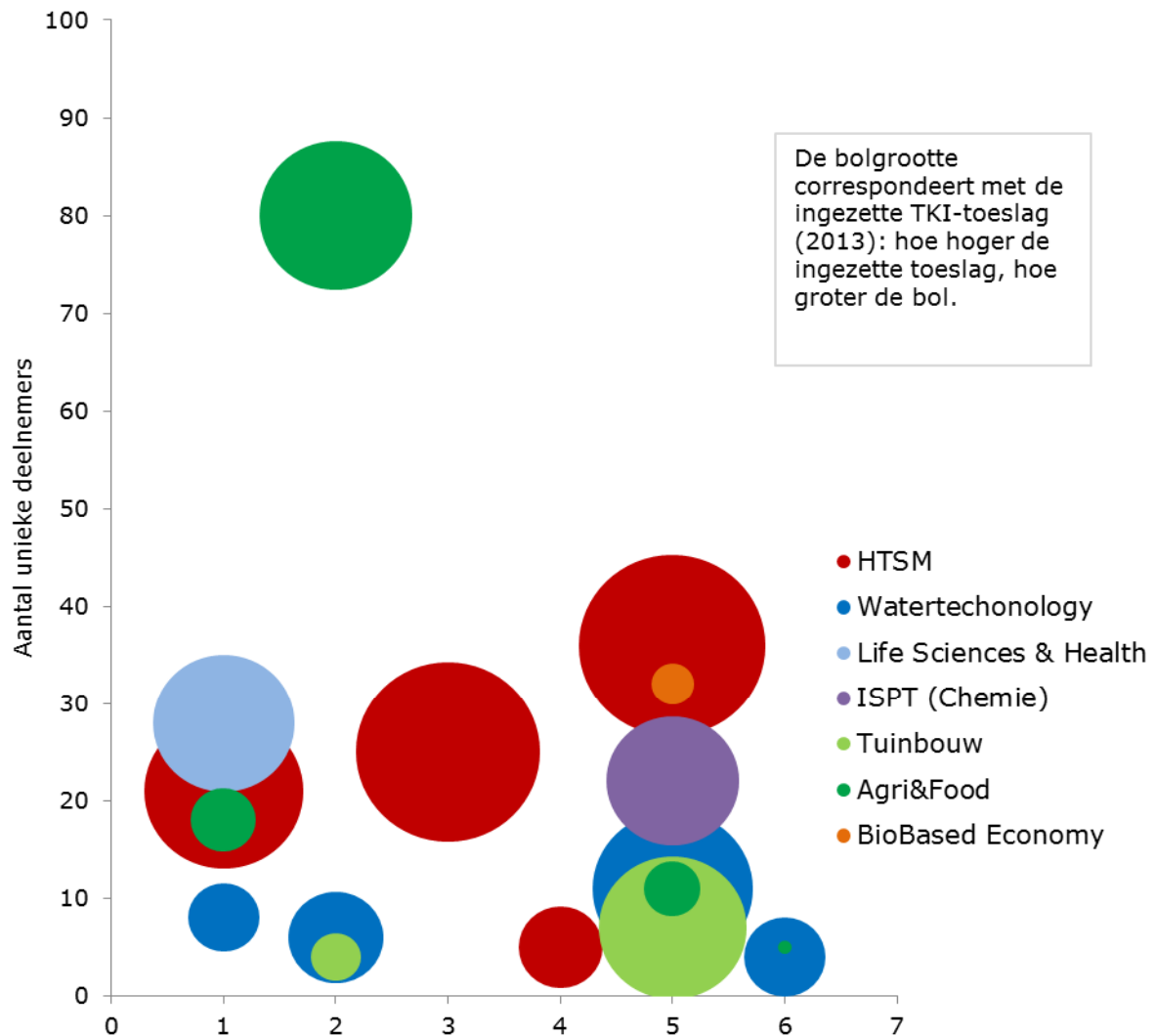
The resources that go to EU programmes from NWO provide an impression of the future alignment between the top sector activities and the themes of the societal challenges. It should be borne in mind that these concern fundamental research resources. In the Progress Report on Enterprise Policy 2013, the cabinet announced its intention to give participation in European programmes an impulse by making co-funding available via NWO (€36 million for the 2014-2017 period). This co-funding forms part of the NWO resources for the top sectors and must be deployed for initiatives in

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<sup>50</sup> This follows the subdivision in 'Nederlandse oplossingen voor wereldwijde uitdagingen' (Dutch solutions for global challenges), an annex with the letter of Minister Kamp and State Secretary Dekker to the House of Representatives in November 2013 (TK 2013-2014, 32637, No. 70).

the field of societal challenges. Part of these resources has now been released for initiatives. Table 4.1 shows these initiatives and the relationship with top sectors and societal challenges.

Figure 4.3 TKI supplement-funded projects by societal challenge, unique participants and used TKI supplement, 2013



Source: Netherlands Enterprise Agency (RVO.nl).

[The size of the circle corresponds with the amount of TKI supplement used to fund projects (2013): the higher the amount, the bigger the circle.]

Table 4.1 Co-funding of EU programmes via NWO by top sector and societal challenge

EU initiative	Co-funding to be awarded (in € million)	Relevant top sector (primary)	Accompanying EU H2020 Grand Challenge
<b>Joint Programming Initiative Food Security and Climate Change</b>	3.6	Agri & Food and HPM	Food security, sustainable agriculture, marine and maritime research and bio-economy.
<b>Eranet CAPITA (Innovative catalysis for the monetization of low value carbon)</b>	1.8	Chemicals	Secure, safe, clean and efficient energy supply.  Climate, resource efficiency and commodities.
<b>ERA IB-2 (Industrial Biotechnology)</b>	1.8	Chemicals	Food security, sustainable agriculture, marine and maritime research and bio-economics.  Complementary to JTI Bridge.
<b>Joint Programming Initiative Cultural Heritage</b>	1	Creative Industry	Inclusive and innovative society.
<b>Eranet plus Humanities in the European Research Area</b>	0.5		
<b>Eranet plus BioEnergy Sustaining the Future 2</b>	1.75	Energy	Secure, safe, clean and efficient energy supply.
<b>Eranet plus Smart Grids</b>	1.75		
<b>Eranet Solar Europe Industry Initiative</b>	0.5		
<b>FET Flagship Graphene</b>	0.75	HTSM	Cross-sector for e.g. health, climate and energy.
<b>FET Flagship Human Brain Project</b>	0.75	ICT	Health, demographic changes and well-being.
<b>Joint Programming Initiative Urban Europe</b>	1.06	Logistics and SIA	Safe society.  Smart, green and integrated transport.
<b>Joint Programming Initiative Healthy Diet for a Healthy Life</b>	4.5	LSH	Health, demographic change and well-being.
<b>Joint Programming Initiative Climate</b>	1	Water	Climate, resource efficiency and commodities
<b>Joint Programming Initiative Oceans</b>	1	Water	Food security, sustainable agriculture, marine and maritime research and bio-economy.  Climate, resource efficiency and raw materials

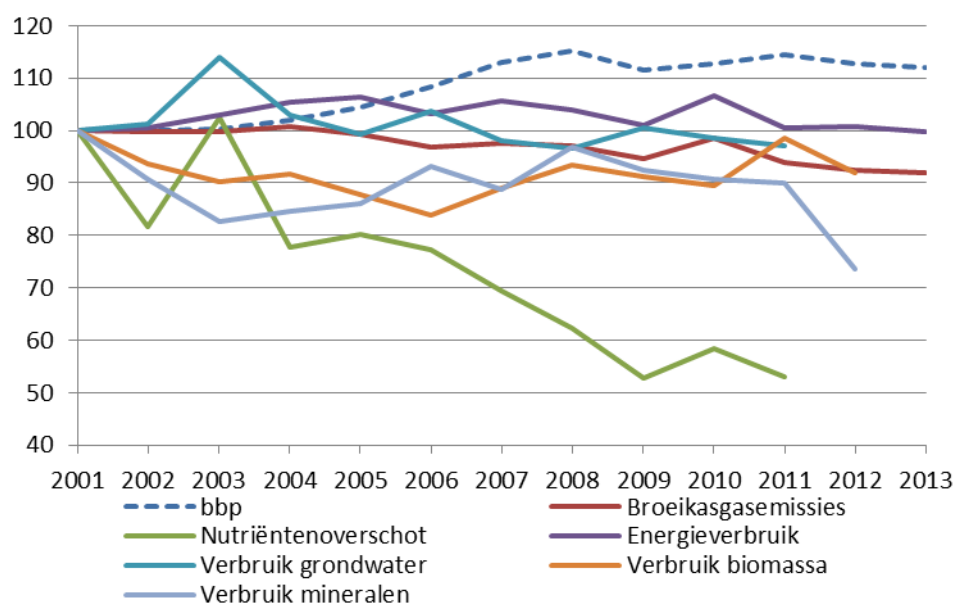
Source: NWO.

#### 4.5 Green growth as a societal challenge

One of the societal challenges that the enterprise policy is helping to address is the 'greening' of the Dutch production activities. The current cabinet's 'green growth' ambition is to reinforce the competitiveness of the Dutch economy, while simultaneously reducing environmental degradation and the dependence on fossil energy.<sup>51</sup> More specifically, the cabinet is seeking to combine economic growth with more sustainable usage of energy, raw materials and water as well as the reduction of environmentally harmful water, air and soil emissions. The cabinet's green growth strategy is focused on the domains of energy, bio-based economy, climate, construction, food, mobility and water.

To keep close track of this relationship between economy (added value, production and consumption) and the environment, Statistics Netherlands gathers data in its Environmental Accounts about the degree of coupling/decoupling between environmental indicators and production activities in the Netherlands: greenhouse gas emissions, nutrients surplus, energy consumption, water usage and materials consumption in relation to the gross domestic product.

Figure 4.4 Environment and economic growth, index (2001 = 100), 2001-2013



Source: Statistics Netherlands, Environmental Accounts, 2014.<sup>52</sup>

[GDP, Nutrients Surplus, Groundwater abstraction, Minerals consumption, Greenhouse gas emissions, Energy consumption, Biomass consumption]

Figure 4.4 shows that Dutch production-related emissions and consumption of materials both decreased in the 2001-2013 period while the economy grew. This signals an absolute decoupling between environmental pressures and economic growth. Interestingly, this applies both to the

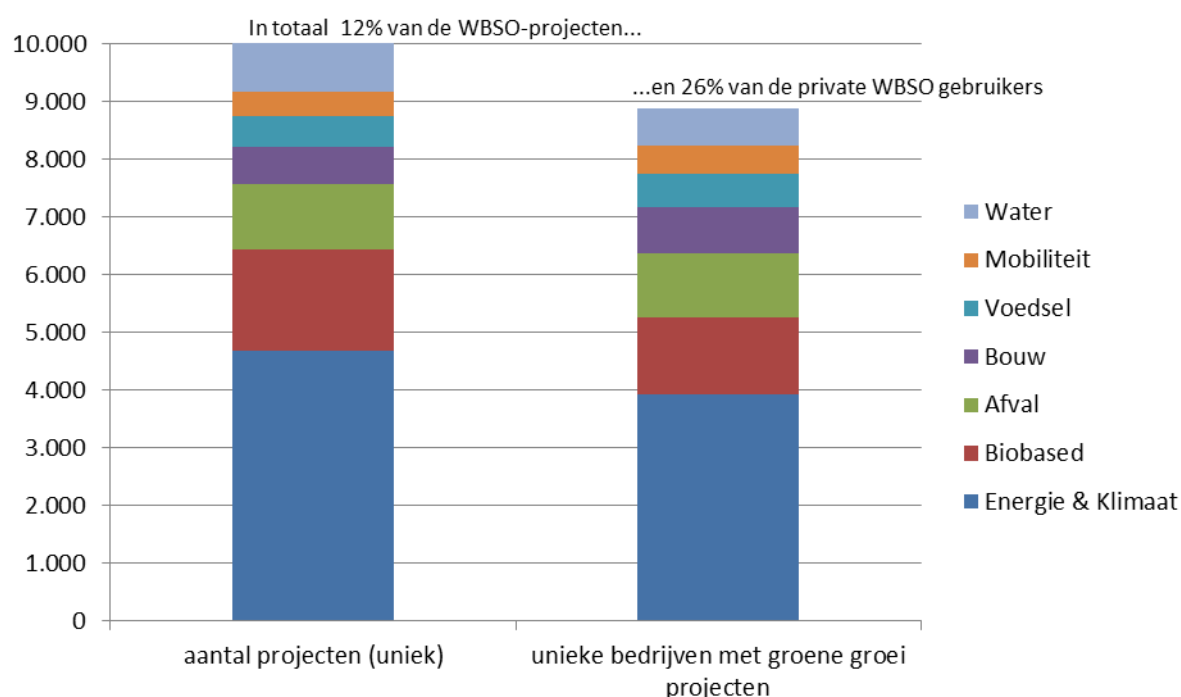
<sup>51</sup> <http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2013/03/28/kamerbrief-groene-groei-voor-een-sterke-duurzame-economie.html>.

<sup>52</sup> A more detailed Statistics Netherlands report about the green growth policy will appear shortly in 'Monitor Duurzaam Nederland 2014', Chapter 4.

2001-2007 period just before the crisis and to the period from 2008. Only groundwater abstraction and biomass consumption are slightly higher now than before the economic contraction, so the economic decline appears to have little direct effect on the environmental efficiency of production processes. In European terms the Netherlands achieves an average score (information from 'Monitor Duurzaam Nederland 2014').

Innovation is one of the key pillars of the green growth policy. Further analysis of the WBSO data shows that about one in eight WBSO projects and about a quarter of the private WBSO users are focused on the domains of the green growth strategy.

Figure 4.5 WBSO usage for green projects, 2013



Source: Netherlands Enterprise Agency (RVO.nl.)

[12% of the WBSO projects in total... ...and 26% of the private WBSO users

Water, Mobility, Food, Construction, Waste, Biobased, Energy & Climate

Number of projects (unique), unique businesses with green growth projects]

A substantial 58% of the MIT subsidies awarded in 2013 also relate to the domains of the green growth strategy, with the lion's share targeted at Energy, Water and Bio-based and the overlap areas between these themes (see Figure 4.6). As is evident from Figure 4.7, most Green Deal projects are also dedicated to the green growth strategy domains, with a particular emphasis on Energy, Raw Materials and Biobased.

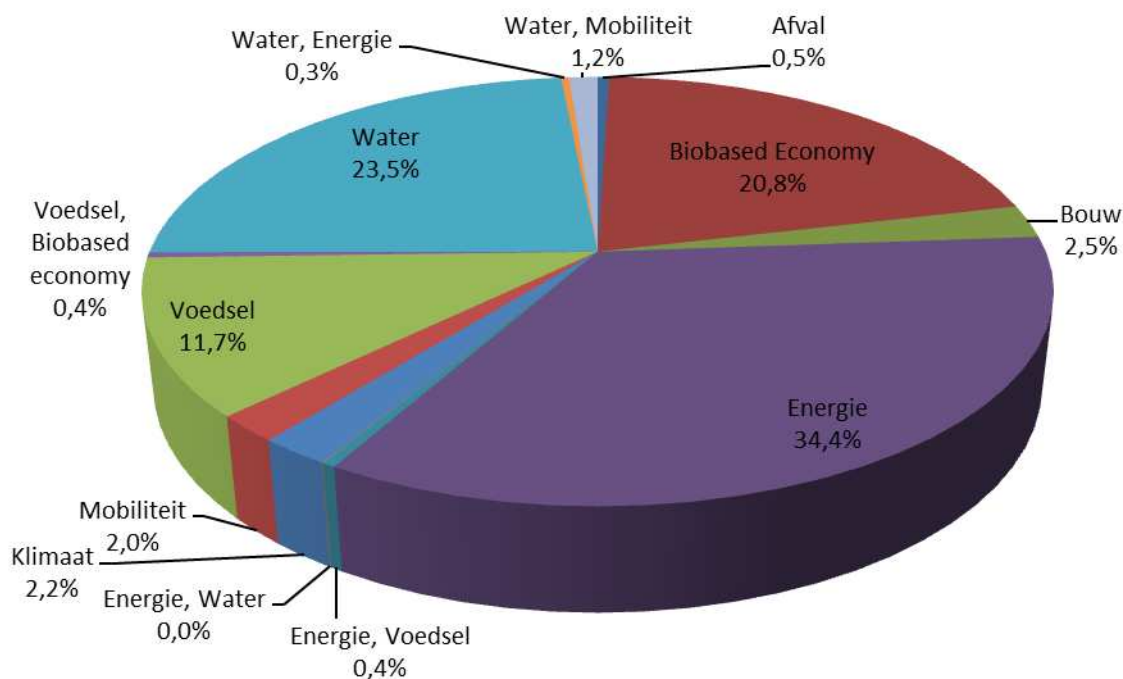
## 4.6 Conclusions

Recent data from the Netherlands Enterprise Agency make it possible to provide quantitative insight into the degree to which innovation instruments are used for programmes and projects with a clear relationship to one of the societal challenges. It turns out that this concerns a substantial



proportion: 70% of the FP7 (Cooperation) resources and 30% of the TKI supplement went to such projects. Moreover, 26% of WBSO users and 58% of MIT subsidies are focused on one or more green growth themes. Within this context, Dutch parties appear to concentrate mainly on themes concerning energy, biobased/circular economy and food & health.

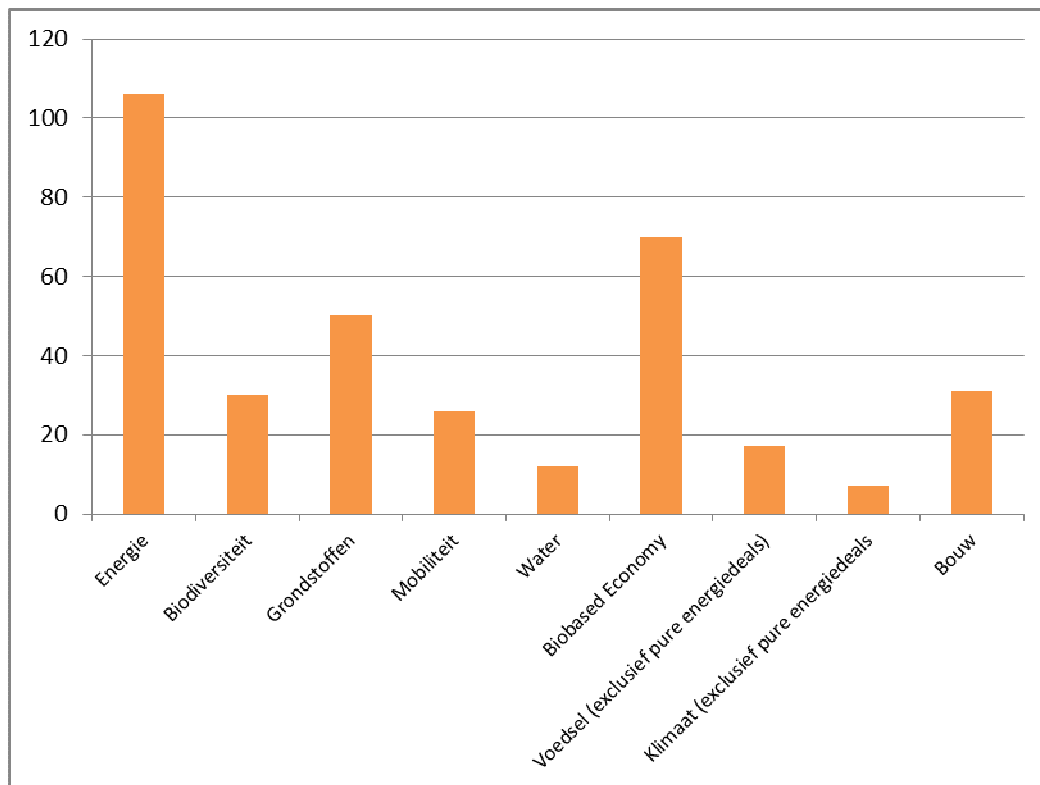
*Figure 4.6 MIT projects divided by green themes; awarded subsidies, 2013*



Source: Netherlands Enterprise Agency (RVO.nl). The breakdown above only concerns the MIT projects that could be linked to one or more green themes. A total of €17.1 million has been allocated to projects, comprising about 58% of the subsidies awarded in 2013.

[Water, Energy; Water, Mobility; Waste; Biobased Economy; Construction; Energy; Energy, Food; Energy, Water; Climate; Mobility; Food; Food, Biobased Economy]

*Figure 4.7 Green Deals divided by green themes (as at September 2014)*



Source: Netherlands Enterprise Agency (RVO.nl). 167 Green Deals have been concluded since 2011. The Netherlands Enterprise Agency has subdivided these green deals by theme. Some relate to several themes. [Energy, Biodiversity, Raw materials, Mobility, Water, Biobased economy, Food (excluding pure energy deals), Climate (excluding pure energy deals), Construction]

The decoupling between economic growth and environmental degradation that has been under way for some time is probably being accelerated by these efforts. The challenge, of course, is to translate successful results into economic opportunities both inside and outside the Netherlands, as well as into environmental gains and improvements in well-being. It is too early to say whether the current efforts to address societal challenges are sufficient to achieve this, but these first quantitative insights point to a movement in the right direction, thus providing a platform for further progress.

## Annex: Resources for public-private partnership in the top sectors

The cabinet is encouraging innovation in order to continue realising prosperity growth in the future. In this endeavour, it is devoting particular attention to the promotion of knowledge circulation through public-private partnership between business and research institutions. Including the €110 million intensification earmarked in the Coalition Agreement, structural funding of about €200 million is available annually for public-private partnership (PPP) in the field of research and innovation. This annual structural funding consists of the TKI supplement (€115 million from 2017 aimed at multi-year PPPs based on the top sector agendas in particular), the MIT (€29 million from 2016 aimed at SME innovation in the top sectors) and international innovation projects (€58 million from 2018 for European co-funding). Alongside this funding, further resources are also available from the terminating Economic Structure Enhancing Fund (FES) programmes dating from the period before 2011.

*Table 1 Use of PPP funding in top sectors (budget 2015, cash amounts in € million)*

<b>Innovation and PPP*, usage</b>	<b>2013*</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>TKI supplement</b>	25	67	81	101	115	115
<b>Scheme to Promote SME Innovation in Top Sectors (MIT)</b>	10	21	28	29	29	29
<b>European co-funding</b>	7	12	25	39	51	58
<b>Subtotal</b>	42	100	134	169	195	202
<b>Termination of FES and innovation programmes</b>	162	165	111	48	20	10
<b>Total</b>	204	265	245	217	215	212

\*2013 concerns actual figures (Annual Report 2013).

Though €200 million was available for PPP via the above lines from 2013, Table 1 shows that this structural amount will be realised gradually over the coming years. This meant that funding was available for other expenditures on public-private partnership. Among other things, this concerns a one-off contribution to NWO in order to enable NWO to speed up the realisation of the PPP expenditure of €275 million as agreed in the Coalition Agreement, and resources for the transition of Technological Top Institutes to a new form of collaboration in the Top Consortia for Knowledge and Innovation that calls for a larger contribution from businesses and knowledge institutions than the TTI funding. Resources have also been made available to enable TO2 institutes to accelerate the allocation of research capacity to certain societal challenges. Finally, on the grounds of the subsidy-reduction task as set in the Coalition Agreement, a reduction has been applied to the budget and certain financial setbacks in e.g. the SME finance instruments (notably the BMKB) were covered by the funding that was available.<sup>53</sup>

<sup>53</sup> The House of Representatives was informed of these changes in the Spring Budget Statement 2013, the Autumn Budget Statement 2013, the Budget 2014, the Spring Budget Statement 2014 and the draft budget 2015.

## TKI supplement applications and awards in 2014

In 2014 TKI supplement applications were received for a total of €102.8 million (see Table 2). In conformity with expectations, the total obligations budget (€102.8 million) applied for in 2014 is well above the obligations budget of €74 million applied for in 2013. Table 2 shows how the applications and awards are distributed across the TKIs. The definite obligations amount in 2014 will be adopted on 1 March 2015.

Table 2 TKI supplement applications and awards in 2014 (× €1,000)

TKI	Awarded supplement 1st round	Applied for and still to be awarded supplement 2nd round
<b>Stichting TKI Agri &amp; Food</b>	8,744	1,227
<b>Stichting TKI Biobased Economy</b>	3,106	
<b>Stichting TKI-ISPT</b>	2,101	6,000
<b>Stichting TKI Smart Polymeric Materials</b>	1,104	1,838
<b>Stichting TKI Nieuwe Chemische Innovaties (New Chemical Innovations)</b>	1,244	940
<b>Stichting TKI CLICKNL</b>	914	396
<b>Stichting TKI-EnerGO</b>	2,562	614
<b>Stichting TKI SWITCH2SmartGrids</b>		
<b>Stichting TKI Solar Energy</b>		1,061
<b>Stichting TKI Gas</b>	4,465	
<b>Stichting TKI-Wind op Zee (Offshore Wind)</b>		251
<b>Stichting TKI HTSM</b>	27,226	4,846
<b>Stichting Life Sciences Health – TKI</b>	2,720	9,938
<b>Stichting TKI Logistiek (Logistics)</b>	1,948	
<b>Stichting TKI Uitgangsmaterialen (Propagation Materials)</b>		2,254
<b>Stichting TKI Tuinbouw (Horticulture)</b>	5,482	
<b>Stichting TKI Maritiem (Maritime)</b>	3,142	462
<b>Stichting TKI-Deltatechnologie (Delta Technology)</b>	3,827	440
<b>TKI Watertechnology (Water Technology)</b>	4,215	43
	72,803	29,955
<b>Total awarded + applied for and still to be awarded 2014</b>		102,758

Source: Netherlands Enterprise Agency (RVO.nl).

## Budgetary development of TKI supplement

The TKI supplement encourages parties to enter into PPPs. Most of these are multi-year projects. As a result, substantial differences arise, particularly in the first years, between the multi-year obligations that are entered into by the Netherlands Enterprise Agency and the cash paid out in the form of advances on the grounds of these obligations. This difference between cash advances and

obligations is a normal phenomenon with government schemes aimed at encouraging multi-year projects and programmes.

Table 3 shows the expected TKI supplement obligations and cash budgets in the 2013-2019 period. As indicated above, the obligations budgets are significantly higher in the first years than the cash budgets because the Netherlands Enterprise Agency spreads the outgoing cash payments in respect of the obligations over several years. As a result, the cash budget required in the first years is lower than the obligations entered into.

*Table 3 Multi-year budget for TKI supplement (budget 2015, in € million)*

TKI supplement	2013*	2014**	2015	2016	2017	2018	2019
<b>TKI supplement obligations budget</b>	74	96	104	119	124	124	124
<b>Cash ***</b>	25	67	81	101	115	115	118

\* 2013 concerns the actual figures in conformity with the Ministry of Economic Affairs Annual Report 2013 (excluding revocations to be adopted in 2014); \*\* 2014 concerns the Budget Memorandum; \*\*\* amounts for 2015, 2016 and 2017 concern the draft budget 2015 and may be adjusted to new insights in the Spring Statement 2015 or the Budget 2016.

Another important aspect is that the supplement amount used by TKIs for multi-year research programmes of a relatively fundamental character is larger than originally estimated. With such programmes, considerably less than 25% of the available obligations budget is called in the year of application. However, the cash funds that are thus released within the budget cannot be used on a structural basis for other purposes, as these funds are required to meet the obligations in respect of the multi-year programmes in later years.

Table 3 shows the pace at which the cash expenditures are expected to come into line with the obligations over the years. The difference never disappears entirely, because account must be taken of the cancellation of projects (which is why the cash payments are structurally estimated at 5% lower than the obligations budget permits).

Based on the current cash utilisation in 2014, limited cash underutilisation is to be expected relative to the €67 million reported in the budget. In the Autumn Budget Statement, the House of Representatives will receive further information on the manner in which this will be fitted into the Ministry of Economic Affairs (EZ) budget. This will be done in accordance with the budget discipline rules, which means that any windfalls must be used in the first instance to compensate setbacks in the same budget.