# OMC Policy Mix Review Report

# Country Report
# The Netherlands

**April 2007**

**Reviewers:**

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| Per Eriksson | Vinnova, Sweden |
| David Rawlins | Department of Trade and Industry, United Kingdom |
| Patrick Brenier | European Commission - DG Research |
| Krzysztof Gulda | Ministry of Economic Affairs and Labour, Poland |
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This report is prepared by Patries Boekholt of Technopolis as part of the IPTS Specific Contract No. C 150176.XII to support the CREST OMC-3% Policy Mix Peer Reviews

# CONTENTS

# 1 Introduction

This report gives a reflection of the views of the experts who have reviewed The Netherlands in the context of the CREST -Open Method of Coordination (OMC) Policy Mix exercise. The expert review was conducted by the following four experts:

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| Per Eriksson | Vinnova, Sweden |
| David Rawlins | Department of Trade and Industry, United Kingdom |
| Patrick Brenier | European Commission - DG Research |
| Krzysztof Gulda | Ministry of Economic Affairs and Labour, Poland |

To prepare for their visit to The Netherlands the experts were provided with a background report written for the purpose of this policy review. The OMC Policy Review Background Report (Annex B) on The Netherlands provides information on the Science Base, Business R&D and Innovation, Economic and Market Development, Human Resources and the overall Innovation System. In addition the reviewers were sent a joint publication from the Ministry of Economic Affairs and the Ministry of Education, Culture and Science, providing Policies, Facts and Figures of 2006.[1] The extended version of the programme provided additional information on each of the sessions, the background of the guests (interviewees) and some key issues that could be addressed.

The visit of the experts took place on 13, 14 and 15 December 2006 in The Hague (hosted by the Innovation Platform and NWO) and Rotterdam (hosted by The Ministry of Economic Affairs). The programme (see Annex A) included representatives from many stakeholders involved in Science, Technology and innovation from the public and private sector. The CREST-OMC examination took place on March 29th in Brussels and led to extensive discussion with the OMC Policy Mix Group.

The following report summarises the observations by the experts, synthesised on the basis of themes. It provides recommendations for the Netherlands and reports on some lessons learnt by the reviewers to disseminate in their own countries and organisations. The report reflects the situation at the time of the review. The final Country Report after the CREST examination will include comments on changes that have occurred since then. Before Section 3 discusses the Commentary by the reviewers, Section 2 provides a summary of the Dutch R&D system and the Policy Mix.

# 2 The Dutch R&D and Innovation System and Policy Mix

The relatively small economy of the Netherlands shows its strength on indicators such as GDP/Capita, which is, already for quite some years, amongst the highest in the EU.

[1] Science, Technology and Innovation in The Netherlands, Policies, facts and figures 2006. Ministry of Economic Affairs and the Ministry of Education, Culture and Science, The Hague, September 2006

And for most of the period starting from the end of the 1980s until the end of the 1990s, GDP-growth has outpaced the EU and OECD average. There are however structural problems and developments, which threaten the strong position of the Netherlands. If we consider for example the competitiveness of the Netherlands based on international rankings such as the one of the Institute for Management Development, World Economic Forum or the Economist intelligence Unit, the position of the Netherlands indicates an average performance compared to its competitors, with a decreasing position in recent years, but a slight rise in 2006 to the 9$^{th}$ position.

The main driver for economic growth in the Netherlands in the past decade has been the growth of employment (deployment of labour) resulting from the so-called 'Dutch model' characterised by low costs and wage restraint. The limits of this factor driven economic growth, however, will be reached in the near future, because of for example the aging population in the Netherlands. The government has realised that future GDP-growth will have to be realised more and more through increasing labour productivity. Nevertheless, the absolute level of labour productivity in the Netherlands (in GDP per hour worked) is amongst the highest in Europe.

Moreover, international comparisons of the major economies (by both the Economist Intelligence Unit and others (such as the World Competitiveness Yearbook produced by the International Institute for Management Development) have consistently ranked the Netherlands as one of the most attractive destinations for FDI. In 2002 FDI inflows totalled €30.8bn, a dramatic decline compared with the €56.7bn in inflows registered in 2001, but still a strong performance in view of the sharp global decline in cross-border capital flows in that year.

The Dutch manufacturing sector is relatively small, accounting for around 15% of value added according to figures for 2002. The services sector, in contrast, is comparatively large, providing over 70% of GDP in 2002. Commercial services account for just under half of GDP (48%), with public-sector and personal services accounting for 24%. Within the commercial sector, the largest business segments are wholesale and retail trade (accounting for 12.8% of value added in 2002), real estate and renting (7.9%), transport and communications (7%), and financial services (6.5%). The agricultural sector is also larger than in most OECD countries (2.6% of gross value added in 2002). It has a leading position in the world market for horticultural products, and is also a major exporter of meat and dairy products.

The NIS, however, is also characterised by specific features and (structural) problems that weaken the strong innovative performance of the Netherlands, while countries with a less favourable innovation performance seem to be catching up. The total financial efforts in R&D expenditure are stagnating; business expenditure on R&D lags behind compared to main competitors. R&D expenditure in the public sector has decreased in the last years. Despite a generally favourable investment climate, few foreign companies decide to locate RTDI activities in the Netherlands.

In the policy document *"Science Budget 2004: Focus on excellence and greater value"* by the Ministry of Education, Culture and Science, the major challenge for science policy was identified as fostering top-class basic research while at the same time significantly improving the transfer of knowledge to society as a whole, and

specifically to business enterprises. A key issue is the fragmentation of the Dutch research policies and research performers. Several policy initiatives have been launched with the intention to create more 'focus and critical mass'. A much debated issue is the choice of priority areas for the Netherlands and how this should be done. The history of funding mechanisms for the public research sector has led to fragmentation of research efforts across many universities, research institutions and networks. Finding the appropriate balance between creating sufficient focus and critical mass, while also supporting excellence in a number of priority areas is a major policy challenge. The Ministry of Education, Culture and Science has chosen for a governance model where universities have the main responsibility for developing their research strategies. In the area of innovation policy the Ministry of Economic Affairs has increased focus by launching 'programmatic' policies aimed at certain technological domains, alongside a package of generic instruments. The Dutch regions are also stimulated to become more focused on a number of limited innovation policy areas through the 'Peaks in the Delta' policy.

The interaction between the actors of the NIS particularly science and industry is not yet intensive, resulting in inadequate exploitation of research results. Stronger incentives have to be put in place to valorise the research results in the public knowledge institutes. The Policy Mix includes various instruments that aim at fostering the linkages between academia and industry, including public private partnerships such as the Technological Top Institutes. Nevertheless universities and research centres are relative latecomers in setting up facilities for economic valorization.

In addition the increasing shortage of highly educated people, especially in science and technology is recognised as a major policy concern. The shortage and quality of skills is also recognised by the Innovation Platform as a key challenge for The Netherlands. The Innovation Platform is a high-level advisory board to the Cabinet concerning especially innovation. The Innovation Platform was launched by the previous Cabinet Balkenende II, with the objective "to propose strategic plans to reinforce the Dutch knowledge economy and to boost innovation by stimulating business enterprises and organisations in the public knowledge infrastructure to work closely together". This body, led by the Prime Minister and with the Minister of Education, Culture and Science and the Minister of Economic Affairs represented, was foreseen to give strategic direction and coordination across the various domains, stakeholders and sectors.

A number of initiatives have been launched to address the challenges in human resources, such as the Delta Plan Science and Technology to make education and careers in science and technology more attractive and the Casimir programme to encourage industry – academia mobility. The immigration rules have been changed to allow knowledge workers to locate in the Netherlands.

The Netherlands has formulated an ambitious objective for the scale of public and private investment in research and development. The target is an R&D intensity of 3% of GDP in 2010[2]. In view of the relatively low level of private R&D expenditure,

[2] The point of departure is 1/3 publicly financed and 2/3 privately financed.

the principal challenge lies in the private sector. However, private expenditure on R&D has stayed around 1% of GDP since the late 1970s.

The government has realised that future GDP-growth will have to be realised more and more through increasing labour productivity. It has therefore formulated an Innovation White paper called the Innovation Letter *Action for Innovation: Raising the Dutch knowledge economy to a leading position in Europe* in 2003, which addresses innovation driven growth, and outlines the policy aimed at, amongst others, improving labour productivity by increasing efforts in R&D/innovation, and strengthening human capital. Following this analysis the 2005 White Paper '*Strong basis for delivering top performance'* responded to the challenges by a renewal and streamlining of its policy mix.

The Innovation Letter identified a series of 'focus areas' for the innovation policy and its instruments supporting it, which address the bottlenecks as mentioned above:

- **Strengthening the climate for innovation.** The Netherlands has to become an attractive business location from the point of view of innovation. The government also has to provide a favourable business environment (good macro-economic policy, fewer restrictive laws and regulations, etc.). A particular concern is that few foreign companies invest in R&D activities in the Netherlands.
- **Creating the right dynamics: encouraging more companies to be innovative.** Dutch companies should produce more new products and provide innovative services. In order to achieve this, the government has to guarantee a more dynamic climate, for instance by enhancing competition. Nevertheless innovative entrepreneurial activity is still limited. The reviewers met with representatives of universities and other organisations dealing with start-up companies.
- **Taking advantage of opportunities for innovation by opting for strategic areas.** All policy documents state that it is impossible for the Netherlands to excel in all fields. With limited resources and increasing competition, it is essential to invest in those areas of innovation that provide the best opportunities for strengthening the country's competitiveness and generating the greatest social benefits. The reviewers were therefore presented with a number of initiatives that aim at making these strategic choices.

On the request of the hosting ministries The Ministry for Economic Affairs and the Ministry of Education, Culture and Science, the Netherlands' peer review had a particular focus on two aspects of the innovation system that need particular improvement:

1 The public research basis, in particular the issues of creating focus and critical mass and ensuring research excellence
2 Intensifying the private sector R&D expenditures.

These issues were also identified in the *Knowledge Investment Agenda*, the Advice from the Innovation Platform published in 2006.

The extended programme (see Annex A) reflected the above-mentioned issues and the reviewers met with a wide set of policy makers and stakeholders from the public and the private sector. Annex A also provides more information on the range of organisations and policy initiatives that were reviewed.

# 3 Commentary by the Review Team

## 3.1 Introduction

Generally speaking the experts are positive about the development of the Dutch innovation system and the measures that are put in place to support Research, Technological Development and Innovation (RTDI). There was a particularly a positive response to:

- The existence and role of the Innovation Platform
- The high quality level of Dutch science
- The new pilot of the Innovation Vouchers, a scheme which allows SMEs to spend a voucher with any accredited research or technology centre of their choice
- The wide set of instruments in place to tackle the various challenges in the Innovation System
- The existence of a number of internationally strong R&D intensive companies

Nevertheless the experts made a number of observations that would need further attention from Dutch policy makers and stakeholders.

## 3.2 Commitment to Science and Innovation Policy

Overall the discussions with many stakeholders from the NIS has left the experts with a concern that there is an **insufficient sense of urgency** in the Netherlands concerning the vital role of science technology and innovation to underpin future economic growth. Particularly as the Netherlands are in the fortunate position that economic performance is better than EU average, and the achievements of the scientific community are of international excellence. This however does not imply that the country can relax its RTDI efforts. Continuous investments in RTDI resources remain of vital importance for The Netherlands' future performance. "*If policies are to be coherent and effective, it is essential that there is broad-based political consensus that greater innovation in Dutch businesses and society as a whole will be the most effective response to the challenges of globalisation.* The reviewers did not get the impression that this was clearly expressed in the interviews with the stakeholders.

The experts applauded the role which the **Innovation Platform** has played and its analysis of The Netherlands' challenges in the Knowledge Investment Agenda. Given the Dutch governance structure in science and technology, the existence of a high-level coordination and strategy-setting mechanisms was deemed to be an important co-ordination mechanism.

There were three main concerns relating to the Innovation Platform:

- As the Innovation Platform was attached to the Balkenende II government, its existence is put on hold during the government negotiations taking place during the peer review. The experts stressed that a continuation of such a strategic forum would be important to oversee all policy areas. In the meantime the new

government Balkenende IV has started and has explicitly stated that it would continue with the Innovation Platform;

- In the previous composition of the Innovation Platform an important stakeholder was missing, i.e. the Ministry of Finance. In order to coordinate the financial ambitions of the Innovation Platform with the options in the Financial Budget, the participation of this Ministry would be an indispensable addition;
- Despite the extensive work of the Innovation Platform there is still a problem with choosing a limited set of national priorities, as other key actors in the Dutch Innovation System have also chosen different priorities using other sets of consultation methods.

## 3.3 The governance of RTDI and fragmentation of the system

Despite the ample attention in many policy instruments to creating 'focus and mass' the experts observed a fragmentation in the governance of RTDI. It was **not made very clear how focus and mass is delivered**. Although many of the single instruments that were presented promote focus and mass, the abundance of measures, initiatives and intermediaries involved, left the reviewers with the impression that the implementation of focus and mass needs more strategic focus and coordination.
An exception was the case of the three Technical Universities (3TU) which was received with great interest by the experts.

One particular feature in the governance causes concern with the experts and that is the apparent **lack of co-ordination** between on the one hand the policy system dealing with industrial R&D and the part of the system dealing with academic and other scientific research. The Dutch innovation system really distinguishes two sides: a public science base constituted of highly-performing universities and a rich and diversified industrial fabric of medium to high-tech companies. Several issues seem to hamper stronger synergies between the two sides. As one of the examiners put it:

*"In simple words, two separately optimised parts of the same system do not necessarily make for an optimised global system. Every effort should be made to ensure that the policy areas concerned (science policy and industrial/innovation policy) define a common vision, set common priorities and rethink together the whole range of supporting instruments "from the lab to the shelf".*

Another element of fragmentation came from the sheer **number of initiatives, programmes and intermediaries** in place to support RTDI. This means that research performers or companies seeking support for innovation, have to comply with many reporting and accountability rules, while financial support for excellence does **not have a long-term and strategic outlook**. In the words of one of the experts: *"This is most important to allocate long time stable resources for R&D to universities and research institutes since R&D generally needs long time commitment to be effective. Allocation of the money should be based on strategy and quality"*. This includes the investment of state-of-the-art research infrastructures.
Despite the recent streamlining of policy instruments that has taken place in RTDI policy over the last years, there is still a need for a simplification of the number of

programmes and initiatives, which also requires a better interplay between the actors in the innovation system. This is particularly the case for SMEs seeking support in their local and regional innovation systems and who are faced with multiple small-scale support desks from various actors. But this is also the case for the many initiatives that aim to support 'research excellence' that lack the long-term perspective to really make a difference.

A final point related to governance is the relationship between **Ministries and Agencies**. Whereas NWO has considerable independence to develop strategies and launch new programmes in the science area, SenterNovem has a much more limited role. As one of the peers suggested: "*Governmental agencies, like SenterNovem and others need to have larger freedom like in Finland and Sweden (Tekes and VINNOVA) to not only implement but also to design and experiment with new instruments. They have however always to give full credit to government and ministers for success stories but also take full responsibility for failures that always is needed in developing and effective research and innovation system*."

## 3.4 The Science Base

### 3.4.1 Governance of the science system

The Netherlands' science system is still highly recognised internationally and performs well on many output indicators. Nevertheless the experts express their concern that this might be based on past investments and efforts to support the science base, while the current situation is not adapted to future challenges such as globalisation and internationalisation of R&D.

Much of these concerns are related to the governance and funding mechanisms of the science system.
Although The Netherlands have a long tradition of science assessments and self evaluations, these are not used as criterion for the overall science funding system. The funding system today is on the basis of quantitative parameters historically linked to numbers of students, but not to **qualitative performance indicators related to research**. The allocation of first tier science (base) funding – which is a comparably high share of funding approximately 65% of total funding - is hardly driven by criteria of quality and international excellence. The matching requirements of the additional competitive funding does pull the first tier funding towards excellent research. Nevertheless, this hampers a real implementation of the 'focus and mass' discussion that is used as a rationale for many policy instruments. One barrier to greater focus and mass seems to be to be that the research assessment exercise is not linked to funding levels in universities.

In the view of the experts, the economic **valorization tasks** in the universities need further **professionalizing** and expansion. It was agreed that this is a task for professionals and not researchers. Nevertheless only few universities have invested in hiring these –expensive- professionals. Again the not fully developed **'third mission'** and the lack of strategic guidance on this matter from the Ministry of Education of

Culture and Science, explain why this has been developed in a haphazard way so far. In the view of the experts the mind-set of those involved in academic science were not fully supportive to the role academia has to play in society and economy. The responsiveness to the needs of industry and the willingness to have a 'two-way learning' process has to improve.

One of the peers phrased this shared view as follows: *"Dutch universities seem reluctant to fully develop their third mission and are eager to keep as much of their former institutional funding as possible. They perceive a decrease of governmental funding as a major threat to the quality of Dutch science, and were instrumental in rejecting a plan aimed at reallocating part of their institutional funding to competitive grants."* This could endanger the role the Netherlands can play in European networks based on excellence and critical mass.

Thus, in general the **bridges between academia and industry** need strengthening. However, as the visit also showed in some areas this works very well (chemistry, electronics) and a long history of intensive collaboration has been built up. This includes a good mobility between the business sector and academia through part time professorships. The 'value for research money' in those areas is considered quite good compared to countries such as Spain or Germany, according to a representative of the business sector. These linkages seem to work less well in newly emerging areas. The finding that the overall **framework for IPR** is not used consistently by the different universities was considered as a potential hindrance for collaboration, while at the same time it was acknowledged that IPR arrangements should also be 'custom made'. The essential message is that valorization in all its aspects, needs to be dealt with by professionals.

## 3.5 Skills and human resources for Science and Innovation

From various angles (e.g. business sector, policy makers from education and science, the Innovation Platform) the experts were informed about one of the key (structural) challenges in the Dutch innovation system: human resources for Science and innovation. Despite a high score of the Netherlands in the regular PISA tests (see Background Report Annex B) various interviewees summarised the problems as follows:

- Overall the quality level of education and skills acquired during formal education is perceived to have dropped compared to say 1-2 decades ago. Lower levels of teacher education, entry requirements for the teaching profession, and lack of motivation surrounding educational professions were given as explanations for this. Particularly in the science and engineering areas this affects the quantitative levels of students entering higher education. A general disaffection of children and youth for science and technology adds to this trend. The latter is however not unique for the Netherlands.
- The share and flow of students who choose to pursue their career in research and particularly science and technology is also dropping, leading to a shortage of skilled personnel in many RTDI sectors.

The interviewees gave a good account of the various policy instruments and incentives that were put in place to address this problem. The experts found that in principle a good mix of policies (Casimir programme, Academic Talent Policy, Platform BetaTechniek, change in immigration rules) were chosen to address these issues but some further recommendations were made:

- In addition to attracting researchers from Europe more effort could be made to attract researchers from the US.
- The size of the programmes are not sufficient to make a real impact on the short to medium term. This would need to be stepped up considerably to address the structural problem.

## 3.6 Company investment in R&D and the service sector

The background report suggests that there seems to be an untapped potential to increase industrial R&D in the Netherlands. As aforementioned in some areas the existence of good supplier networks and highly skilled people are a reason to maintain an R&D presence in the Netherlands. Large companies face the situation of skills shortages as a bottleneck for further expansion. It was also acknowledged that the larger, R&D intensive firms have been disinvesting in research and development in the last decade and are finding new ways to interact with the public research sector. The threat that new R&D investments of domestic firms are not placed in The Netherlands but in other parts of the world was clearly put forward by some representatives. This confirms the relative 'urgency' of maintaining a good science and technology base with sufficient skilled workers for the future development of the Netherlands.

The experts were presented with a number of examples such as the Technological Top Institutes, the Societal Top Institutes, the Netherlands Genomics Initiative, the new programmatic approach (with the example of Point One), where **public private partnerships** are stimulated by government policy, and which attract the commitment of both academia and business. Despite these initiatives of collaborative research there still seems to be a reluctance with some of the universities to step up the share of privately funded research activities.

The pool of R&D intensive high growth start-ups is not very large so partnerships in emerging technology areas are relatively underdeveloped. The experts were of the opinion that more could be done to stimulate start-up companies in newly emerging areas. Fewer and better financed knowledge brokers, business facilitators/ incubators/ science parks and seed financial facilities would play a decisive role in linking science to business. More needs to be achieved in terms of knowledge transfer, researchers' mobility between universities and industry and spin-off creation. Given the successful development of "open innovation" in the Netherlands, in particular around Philips, it might be more promising to promote further links between university and industry starting from the industry end (e.g. open campuses)."

One instrument that draws particular attention is the experimental Innovation Voucher Scheme, which appears to attract a large number of SMEs to engage into

collaborative RTDI projects. Some of the experts would like to monitor this programme more closely in order to consider implementation in their own countries.

The Netherlands shares the situation with other countries that an important driver for economic growth is the **service sector**. RTDI policies that focus solely on formal R&D activities are less appropriate for this sector as innovations often take place close to the market. The sector does not have a strong tradition to work closely together with research organisations. The experts suggested that more exchange of experiences could be developed in collaboration with other countries to tackle the issue of encouraging innovation in the service sector.

## 3.7 Attracting RTDI investment from abroad

It was confirmed by many interviewees and by the information from the background report that The Netherlands, despite its good track record in science, has not yet managed to attract foreign investments, with a significant R&D component. From the side of the agencies for Foreign Investments the profile mostly used to attract foreign companies is based on favourable general framework conditions (fiscal climate, stability, geographical location) or on expertise in service sectors (e.g. shipping, logistics). The peers found that a more appropriate **branding** is needed to market the strengths of the Dutch RTDI climate.
The issue of branding is interconnected to the **lack of strategic direction** and a clear and long-term commitment to creating excellence, focus and mass in a small number of areas. A more targeted strategy would ask for a very professional and business-like approach of the Foreign Investment services and a **re-profiling** of Dutch strengths in terms of science and technology. Nevertheless, as the representatives of the business community clearly stated, foreign investment of R&D often follows production so attracting foreign investors should not neglect the basic framework conditions.
In addition, the above mentioned weak linkages between academia and industry need to be tackled in order to create sustainable partnerships with foreign companies. The open innovation concepts, as were presented by some interviewees, were welcomed as a good basis for creating business-to-business and business-academia collaborations.

## 3.8 Evaluation Culture

The Netherlands is renowned for their evaluation culture and the use of peer reviewed evaluations in the science system. Nevertheless the results of these evaluations seem to be underutilised when it comes to strategic decisions and creating focus and mass.

Particularly the aforementioned decoupling of academic research assessments with the research funding system hampers strategic choices based on quality. This should be improved in order to make real changes in the system. Evaluations focus mostly on ex-post programme evaluations, *"however there is a lack of evaluation standards particularly for public research organizations (external and internal - organizations are not evaluated by government and research staff (or research groups) is not assessed in the organization). Some important governmental decisions on spending substantial amounts of public money are taken without deep analysis"* as one reviewer stated.

# 4 Lessons for the Netherlands

The reviewers have formulated a number of lessons for the Netherlands.

On the overall RTDI policy strategy and position of RTDI in Policy making the reviewers made the following recommendations:

1 First of all RTDI policy should remain **high on the political agenda** as it remains a cornerstone for economic development. Continuation of a co-ordinating body as the **Innovation Platform** is an important step in this direction. The inclusion of the Finance Ministry as one of the stakeholders will help with the implementation of the IP's plans;
2 In various areas i.e. education, structure of the research system, public attitude to risk and entrepreneurship, it seems that there is a need for fundamental change in system. Quoting the Esko Aho Report "Creating an Innovative Europe" about social model for Europe: "*The opportunity to implement the proposed actions will not be available for much longer. Europe and its citizens should realize that their way of life is under threat but also that the path to prosperity through research and innovation is open if large scale action is taken now by their leaders before it is too late."* All actors should become aware of a **sense of urgency** that can not be simply solved by adding more money into the system, but also by making the system and its inter-linkages work better;
3 In areas with a potential for public private partnerships and industry oriented research, more efforts should be made to focus **on a few priority** areas where critical mass in RTDI can make a difference; This needs a better coordination between all the actors that engage in these prioritization exercises;
4 Foreign direct investment should incorporate a better **branding** of these priority areas and work towards creating an international profile;

Regarding the Mix of Policies the following recommendations were made:
5 In terms of the Mix of Policies The Netherlands seem to have a quite broad package of instruments available addressing the key challenges. An area where more efforts could be needed was in the overall support of new business start-ups and entrepreneurship;
6 Despite the existing initiatives and programmes more effort should be made to interest young children and youngsters for Science and Technology and to address the shortage of skills in general. This could be complemented with initiatives to stimulate creativity; Although a package of policies are in place, their size and scope do not match the urgency of the problem as it was put forward to the reviewers during the review. This would need to be stepped up. To address the skills shortages an effective measure that was suggested by one of the peers is to gradually introduce a 'quota' system directing students towards the academic fields where there is a need and shortage. This can be achieved indirectly by differencing student grants in function of the relative needs.

The Science System and in particular the interaction of the Science System with the Business R&D and innovation system need reinforcement:
7 The Dutch innovation system needs better co-ordination and co-operation between the various actors, particularly to reinforce inter-linkages between the science

system and the system for industry oriented research. In addition, the Dutch ministry in charge of research should build a strategic research agenda guiding the decisions of the 13 universities, and the allocation of institutional funding. A more strategic approach (vision and priority setting by government, increased collaboration with European partners in world class research partnerships, strategic alliances with industry in specific fields) should help counter the fragmentation of Dutch science and ensure its results are better exploited;

8 A larger share of the funding to public research should be based on criteria of research quality. Research assessment practices should be better used in order to have consequences for the funding allocations;

9 Fewer (less dispersed) and better financed knowledge brokers, business facilitators/ incubators/ science parks and seed financial facilities would play a decisive role in linking science to business. More needs to be achieved in terms of knowledge transfer, researchers' mobility between universities and industry and spin-off creation.

10 Valorization of public research and technology transfer should be professionalized. More people with a business background should be actively involved or act as intermediaries. A streamlined array of better supported intermediaries would add clarity and efficiency. This should go hand in hand with an active stance concerning the 'third mission' of the universities;

11 The pro-active use of existing IPR rules and frameworks by Dutch public research organisations should be reviewed, in line with the improved professionalization of overall valorization tasks.

An additional governance recommendation was made relates to the Agency/Ministry relationship:

12 A more flexible relationship between the SenterNovem Agency and the Ministry would be beneficial so that the agency has the opportunity to develop and experiment with new instruments;

A number of practical examples are put forward that could serve as an inspiration for Dutch RTDI policy:

- The UK system of rewarding the highest performing university Departments (the assessment of performance is likely in future to include a measure of valorisation activity) does seem to result in focus and mass, though this brings other issues to be tackled e.g. the viability in research terms of universities outside the top 20."
- The Smart Mix programme seems to have some similarities to the UK's Technology Programme Innovation Platforms, two of which are currently being piloted. Further information about these is at www.dti.govuk/innovation/technologystrategy/innovation_platforms
- In the UK, there is considerable effort being made in employer-led Govt programmes like "Train to Gain" to increase the level of skills in the workforce. There may be lessons NL authorities can learn from this.
- The experts heard about the plans for enhanced marketing activities by the NL Foreign Investment agency around value propositions based on NL academic and industry strengths – these seem to be based on very similar principles to those of UK Trade and Investment published earlier this year in its 5 year strategy. Sweden also has a very active Foreign Investment strategy based on RTDI strengths.

# 5 Lessons for other countries

The experts also took some lessons from the Netherlands to their own policy situation

- The cooperation and profiling between the three technical universities can serve as a model for the technical universities in Sweden.
- To form an Innovation Platform to enhance policy corporation could provide inspiration from the Netherlands for both Sweden and Poland.
- The WBSO – fiscal facility for R&D workers – is considered a very effective tool stimulating R&D and innovation activity of companies, especially for SMEs. This improves own R&D potential of companies, but also absorptive capacity. This instrument supports innovation activity in companies from both the production and service sector. This is seen with interest in Poland.
- Innovation vouchers – a very interesting instrument to promote "first step" into R&D activity was of interest to Poland, Sweden and the UK. Simple and friendly from the company perspective. Sweden has introduced the full US-style SBIR programme whereas the Netherlands only has a partial –pilot – introduction;
- A discussion about a more independent, TEKES style, innovation agency is also relevant to discussion on future of Polish Enterprise Development Agency.

There were also issues where an exchange of experience and collaboration was welcomed:

- The lack of interest and competence in the school system for mathematics, science and technology is also a very important problem in Sweden and need to be addressed.
- The development of appropriate policies to address non-technological innovation and service sector innovation are particularly an issue in the UK, as in the Netherlands.

# ANNEX A THE REVIEW VISIT PROGRAMME

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**Organisation:**
- Stef Smits, DG for Enterprise and Innovation, Ministry of Economic Affairs, NL

**Dutch Participants:**

**Ministries**
- Ministry of Economic Affairs (EZ)
- Ministry of Education Culture and Science (OCW)
- Ministry of Justice

**Agencies/ Government Initiatives/ Universities**
- Netherlands Organisation for Scientific Research (NWO)
- Innovation Platform (IP)
- SenterNovem
- Netspar
- Advisory Council for Science and Technology Policy (AWT)
- Netherlands Foreign Investment Agency (NFIA)
- Foundation for Fundamental Research on Matter (FOM)
- TNO
- Royal Netherlands Academy of Arts and Sciences (KNAW)
- Confederation of Netherlands Industry and Employers (VNO-NCW)
- Noord-Brabant Development Agency (BOM)
- University of Leiden
- University of Tilburg
- University of Utrecht
- University of Nijmegen

**Companies**
- Shell
- DSM
- AKZO
- Unilever
- GE Plastics
- Buck Consultants
- ASML

**Wednesday 13 December 2006**

| Time | Location | Focus Introduction and KIA | Participants |
|---|---|---|---|
| 12:30 – 13:00 | Innovation Platform (IP) – Plein 1813 nr. 2 | Arrival, Sandwiches | Examining team + Patries Boekholt |
| 13:00 – 13:45 | IP | Welcome & Introduction<br><br>Setting the scene | Theo Roelandt (Ministry of Economic Affairs) |
| 13:45 – 14:45 | IP | Preparations & Briefing | Examining team + Patries Boekholt |
| 15:00 – 16:00 | IP | Dutch Research and Innovation System, focus on Knowledge Investment Agenda (KIA) | Jan Peter van der Toren (IP)<br>Thomas Grosfeld (IP)<br>Frank Zuijdam (NWO)<br>Koen de Pater (SenterNovem) |
| 16:00 – 17:00 | IP | Informal exchange of views on Dutch knowledge infrastructure. Possibility for questions | • Frank Zuijdam (on public knowledge base)<br>• Koen de Pater (on private r&d expenditures and location factors) |
| 18:30 | The Hague | Diner | Examining team + Patries Boekholt |

# Background Wednesday December 13

**Introduction in Dutch Innovation System and Knowledge Investment Agenda**

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**Session 1.**
**Dutch Innovation System and the Why of an Innovation Platform**

Starting point:
The Netherlands is developing into a knowledge economy. At present this development
is in full force and takes place with future economic and educational requirements and the unique characteristics of our country in mind. The cabinet takes a special interest in this.

Innovation is one of the central themes of the Balkenende cabinet, which took office in 2003. The cabinet has outlined the approach and strategy for the knowledge economy. Its
policy is aimed at the following issues:

- More focus and multitude in scientific research
- Improving public-private cooperation
- Rewarding excellence in all areas
- Stimulating the share of (international) knowledge workers
- Making better use of the built up knowledge
- Institutional innovation (simplifying and adjusting laws and regulations)
- Attention for (new) entrepreneurship and promoting innovation in SME

These measures are to ensure that innovation gets into the DNA of the Netherlands. In addition to these measures the cabinet has established the Innovation Platform, a special
organ that contributes to the development of a successful knowledge economy. The Innovation Platform wants to strengthen the innovative force of the Netherlands. The Netherlands is to become a country with ample room for excellence, ambition and entrepreneurship of individuals and organizations. The platform wants to accomplish that our innovation system is arranged in a way that it offers room to innovators and promotes innovation. This affects a large number of fields and policy areas. It may concern the reorganization of economic chains, the optimal development of individual capacities or a change in thinking.

Main policy instrument:
**The Knowledge Investment Agenda 2006-2016**
The year 2006 is the last full year of this Innovation Platform. In all likelyhood there have been elections in November 2006 which will lead to the formation of a new cabinet somewhere around March 2007. The term of existence of the Innovation Platform is linked to that of the current cabinet. This year, in view of 2007 the Innovation Platform has launched an important project that is aimed at the innovation policy of future cabinets. The ‘Knowledge Investment Agenda 2006-2016’ (KIA) is to become a guideline for future investments of public and private parties. While

formulating the KIA it is important to attract a maximum flow of extra private means with extra government investments by the next cabinet. This is necessary, as investments by the business community in knowledge and innovation are not up to the Barcelona-goals (two percent of the GNP).

***Participants***

- **Mr. Jan Peter van der Toren: Innovation Platform**

*Secretary of the Innovation Platform. The Innovation Platform wants to strengthen the innovative force of the Netherlands. The Netherlands is to become a country with ample room for excellence, ambition and entrepreneurship of individuals and organizations.*
*The platform wants to accomplish that our innovation system is arranged in a way that it offers room to innovators and promotes innovation. This affects a large number of fields and policy areas. It may concern the reorganization of economic chains, the optimal development of individual capacities or a change in thinking.*
*The platform develops various activities to complete this mission. It mainly makes directive recommendations and monitors their implementation. Most recommendations are the result of task forces made up of members of the platform, together with key players from the government, the business community, social organizations and knowledge institutions. The platform also organizes meetings and collects and discloses knowledge, for example through publications.*

- **Mr. Thomas Grosfeld: Innovation Platform/ Ministry of Economic Affairs**

*Member (part time) of Innovation Platform and head of unit at Ministry of Economic Affairs*

- **Mr. Theo Roelandt: Ministry of Economic Affairs**

*Director of Strategy, Research and International Affairs Department*

- **Mr. Frank Zuijdam: Netherlands Organisation for Scientific Research**

*The Netherlands Organisation for Scientific Research is responsible for enhancing the quality and innovative nature of scientific research as equally initiating and stimulating new developments in scientific research mainly fulfils its task by allocating resources facilitates, for the benefit of society, the dissemination of knowledge from the results of research that it has initiated and stimulated mainly focuses on university research in performing its task.*

- **Mr. Koen de Pater: SenterNovem**

*Manager of Strategic Innovations and International of SenterNovem.*

**Thursday 14 December 2006**

| Time | Location | Focus Public Knowledge Base | Participants |
|---|---|---|---|
| 9:00 – 10:30 | NWO – Laan van Nieuw Oost-Indië 300 (The Hague) | Supporting scientific talent | - Yvonne Schaap (OCW)<br>- Wilma van Donselaar (NWO)<br>- Emile Broesterhuizen (KNAW)<br>- Frank van der Duyn Schouten (UvT) |
| 10:30 – 12:00 | NWO | Excellent research facilities | - Herman van der Plas (OCW)<br>- Hans Chang (FOM)<br>- Theo Verrips (Unilever) |
| 12.00 – 12.15 | | Transfer from NWO to lunch | |
| 12.30 – 13.30 Lunch at Restaurant Christian, Laan van NOI 1f.<br>Hosted by Renk Roborgh Director-General for Higher Education and Vocational Training | | | |
| 14:00 – 16:00 | NWO | a. Priorities in research<br>b. Focus and mass in research<br>c. Funding mechanisms for research | - Cornelis van Bochove (OCW)<br>- Peter Nijkamp (NWO)<br>- Douwe Breimer (UL)<br>- Veronique Timmerhuis (AWT)<br>- Diederik Zijderveld (NGI) |
| 16:00 – 17:30 | NWO | Valorisation scientific knowledge | - Anton Franken (STW)<br>- Bert Geerken (Smart Mix)<br>- Theo Nijman (Netspar)<br>- Jan Vogel (TNO/GTI)<br>- Jan de Wit (Akzo) |
| 17:30 – 18:15 | NWO | Discussion on impressions of the day and debriefing | Examining team + Patries Boekholt |
| 19:15 | Wox – Buitenhof 36 (The Hague) | Diner | Examining team + Patries Boekholt, Aafke Wortelboer, Frank Zuijdam, Koen de Pater, Stef Smits |

# Background Thursday December 14

**Public Knowledge Base**

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**Session 1.**
**Supporting Scientific talent**

Starting point:
Not nearly enough people are opting for a career in science (a shortage of PhD students) and there are not enough development opportunities for those who do. In some disciplines levels of mobility among the personnel is very low. The academic staff are ageing, though this varies according to the discipline, and there are problems with some of the target groups. Not enough young people are choosing science and technology. Ethnic minorities are underrepresented in the science subjects and women are experiencing problems with career development. Last but not least, the Netherlands is faced with the challenge of giving further shape to international exchange among researchers (brain circulation).

Main policy instruments:
Renewal Impetus (Veni, Vidi Vici), NWO: Person-based support to help PhD graduates build an academic career.
Spinoza Prize, NWO: The NWO/Spinoza Prize, regarded by some as the 'Dutch Nobel Prize', is awarded to Dutch scientists at the very peak of the research profession. The laureates are internationally renowned and are an inspiration to young scientists. Each laureate receives 1.5 million euros.
Rubicon, NWO: The Rubicon programme is intended for promising young postdoctoral researchers who are still at the start of their career but whose academic strengths give them the potential to become established figures in the Dutch research world.
Toptalent, NWO: Toptalent enables young creative students to set up their own PhD programme. The target group consists of talented final year students with imaginative research ideas.
Aspasia, NWO: The aim of the Aspasia programme is to stimulate the throughflow of female university teachers to associate professor level. Since 2005 the Renewal Impetus Programme has been linked to a new-style Aspasia Programme. Aspasia grants are made available to Executive Boards who promote female VIDI and VICI laureates (circa 2005 *et seq.*) within a year.
Mozaiek, NWO: The aim of this programme is to get more graduates from ethnic minorities to participate in scientific research, where they are under-represented. NWO is a strong advocate of diversity and is concerned about potential loss of talent.
Travel and visiting scholarships, NWO: Small scholarships to encourage short periods of international exchange between researchers (for research programmes, visits to congresses, preparation for international conferences etc.)
Platform Bèta Techniek, OCW: The Platform Bèta Techniek has been commissioned by the government and the education and business sectors to secure a sufficient flow of people with a background in science or technology. The aim is to bring about a fundamental increase of 15 percent in the numbers of pupils and students in scientific and technical education and to use the existing talent more effectively in businesses and research institutes.

Jetnet, Axis (www.platform-axis.nl), TechnikaTien: various forms tot stimulate youngsters to take an interest in technical issues en studies.
Tenure tracks, universities: Tenure tracks are career paths for researchers, extending, in principle, over a five or six-year period, which includes an interim assessment after the first three years and a final assessment at the end of the fifth year. The candidates are then expected to attain the required level and to be able to progress to associate professorship positions within a further year.

Questions:

- How can more young people be encouraged to pursue a career in science, especially members of the above-mentioned target groups?
- How can improved career development be guaranteed?
- How can international brain circulation be achieved?
- Is the policy mix adequate and complementary at system level (or are there incongruities)?

Participants

- **Yvonne Schaap – OCW** (Ministry for Education, Culture and Science)

*Directorate of Research and Science Policy*

- **Wilma van Donselaar – NWO**

*General Policy Department of NWO and coordinator of the person-based NWO support*

- **Emile Broesterhuizen – KNAW (Royal Netherlands Academy of Arts and Sciences)**

*Director of the KNAW. The Academy's mission is to ensure the quality of scientific research in the Netherlands. The fundamental research carried out today will provide a basis for the applied research of tomorrow and, in turn, for the practical application of science in the future.*

- **Frank van der Duyn Schouten –University of Tilburg** (UvT)

*Rector Magnificus of University of Tilburg*

**Session 2.**
**Top-Notch Research Facilities**

Starting point:
Scientific research is getting more capital-intensive all the time. The facilities for top-quality research are extremely costly (clean-rooms, particle accelerators etc.) and the Netherlands does not have enough resources to invest in state-of-the-art equipment. Investment levels in the Netherlands are relatively low compared with the European average (e.g. there is no public funding for extensive research facilities, as in other parts of Europe). The Innovation Platform has therefore been pushing for doubling the budgets for medium- and large-scale infrastructure. Particular emphasis has been placed on the need for mega-sized research facilities, which would require an annual budget of 125 million. Businesses are making more and more use of research facilities as they cannot afford to invest in research themselves and as a result of the Open Innovation Model. Another problem is that the policy on large-scale research facilities tends to be made 'on the hoof'. Attempts are underway to remedy this by developing a national roadmap with investment priorities.

Main policy instruments:

NWO-Groot and NWO-Middelgroot: NWO has two investment programmes, one for large-scale investment (*NWO-Groot,* for acquisitions of over € 900,000) and one for medium-scale investment (*NWO-Middelgroot,* for acquisitions between €110,000 and € 900,000). These are intended not only for equipment but also for setting up databases and developing software and bibliographies if they cannot be purchased and if they make a clear nationally accessible contribution to the infrastructure.
BIG Facilities, NWO and SenterNovem: A national programme for the purchase of large-scale research facilities (25 million euros and above), geared to humanities and social sciences as well as exact and life sciences.
European projects, OCW: Participation in large-scale European infrastructural projects such as CERN, ESA, ESO and ITER.
Roadmaps: The development of roadmaps at national and European level.

National research institutes, NWO and KNAW: National institutes with a remit which includes the development and management of national research facilities on the one hand and the promotion of (leading-edge) research on the other.

Questions:
- How can adequate funding be secured? (Double the current budgets and 125 M€ a year for mega-sized programmes.)
- How are the investment priorities to be defined: top-down, bottom-up, on the basis of roadmaps? How do we arrive at a less *ad hoc* policy.
- What account is to be taken of the economic value of the research facilities? To what extent and in what way?
- Where do the institutes fit into a policy to improve research facilities?

Participants
- **Herman van der Plas – OCW** (Ministry for Education, Culture and Science) *Directorate of Research and Science Policy*
- **Hans Chang – Foundation for Fundamental Research on Matter**

*FOM is part of the NWO. It funds basic research on physics and manages a number of national institutes.*

- **Theo Verrips – Unilever**

*Formerly employed by Unilever Research and currently Professor of Cell Biology at Universiteit Utrecht.*

**Session 3**
**Focus and mass, priorities in research, funding mechanisms**

Starting point:
The Netherlands needs to deploy its scarce resources prudently. This means that choices need to be made. At the same time, it is becoming increasingly important from the global perspective, and given the international competition, for research units to have weight and substance. Choices will have to be made if the Netherlands is to continue as a front-runner. The resources for research must not become too fragmented: so, we need clear choices and more cooperation between researchers and research groups. The policy will therefore increasingly reflect focus and mass and set heavy challenges for the selection process. Another idea is that research should be assessed more in terms of performance, a national debate on whether we should switch to more performance-based funding.

Main policy instruments:
BSIK/FES, government: In the Netherlands, over 40% of the natural gas revenues go to the FES (*Fonds Economische Structuurversterking* / Economic Structure Enhancing Fund) to finance projects that strengthen the economic structure. Around half the funding is invested in knowledge, education and innovation.
NWO themes, NWO: Theme-based incentive programmes for ground-breaking research that can help solve societal and economic questions. The themes are national and multidisciplinary insofar as they address developments which exceed the capacity of individual research institutes.
Smart Mix, NWO and Senter/Novem: Smart Mix is a new grant programme with an annual budget of EUR 100 million. It was established to encourage cooperation between businesses, public sector organisations and knowledge institutes. Consortia of knowledge-users (companies, organisations etc.) can submit programme proposals jointly with knowledge institutes (universities, colleges and research schools). The programme has two aims: to stimulate valorisation and to promote focus and mass.
Platforms, NWO: Three platforms have been set up to steer a multi-disciplinary scientific domain which is recognised as a national spearhead (due to its potential value to society). These three groups, which are semi-permanent and work under the auspices of the NWO, are: Advanced Chemical Technologies for Sustainability (ACTS), Netherlands Genomics Initiative (NGI), and ICT Regie (national platform for ICT research and innovation).
Local research centres, universities: Concentrated research in (multidisciplinary) research units at universities.
National institutes, NWO and KNAW: National institutes with a remit which includes the development and management of national research facilities on the one hand and the promotion of (leading-edge) research on the other.

Visitation Committees, peer review of research activities in a scientific field (e.g. physics in all universities): benchmarking, transparancy, recommendations, steering instruments for university management
3 TUplan: the three technical universities have joined forces. Collective planning of research en education activities, division of work. Not a merger, but close cooperation.,
ERA-net, EU and Eurocores, ESF: Policy instruments for coordinating the national research programmes in Europe with the aim of developing transnational research programmes. (The Netherlands is very active in this type of support).

Questions:

- How can we ensure that the scarce resources go to the very best groups?
- How can we compile a national portfolio? What process(es) would be adequate? Or, how do we put together a coherent ´strategic agenda for the Netherlands´ (without accumulation or duplication of all sorts of themes)? Who decides on the areas which will benefit from the investments? Which players have a say (ratio of academic to public players). Should this process be primarily bottom-up (market mechanisms) or top-down (government-steered)? What is the basis for these choices (social urgency and/or academic excellence)?
- How do we finance the choices? Should there be more centralised funding (through the appropriate national programming organisations) or should there be more multiple funding (also through BSIK, FES etc)? Are there any objective indicators for steering these processes (NOWT)?
- How do we determine adequate ´critical mass´ (which varies from domain to domain)?
- Should a more sophisticated form of performance-based funding be introduced? (e.g. should we adopt the English RAE model?)
- What financial incentives can be offered to encourage more inter-university collaboration and more concentration?
- Matching problems: is matching by universities a realistic problem and, if so, how can we deal with it?
- What is the role of the research institutes in concentration policy. Should institutes work more closely together or be downsized? Do we need a separate organisation for research institutes (as in other countries)?

Participants

- **Cornelis Bochove – OCW** (Ministry for Education, Culture and Science)

*Directorate of Research and Science Policy*

- **Peter Nijkamp – NWO**

*Chairman of the Executive Board, NWO*

- **Douwe Breimer – University of Leiden**

*Chairman of the Executive Board, University of Leiden*

- **Veronique Timmerhuis – AWT (**Advisory Council for Science and Technology Policy**)**

*Secretary of the AWT. The Advisory Council for Science and Technology Policy (AWT) advises the Dutch government and parliament on policy in the areas of scientific research, technological development and innovation.*

- **Diederik Zijderveld – NGI**

*Director of the Netherlands Genomics Initiative***.**

## Session 4
## Valorisation of scientific research

Starting point:
The standard of scientific research in the Netherlands is high, but not enough of the results are converted for practical use (the 'knowledge paradox'). It is crucial to the development of our knowledge economy that this knowledge paradox be settled and that publicly funded research be valorised as much as possible. Various policy instruments have been applied to plug the 'innovation gap'. Attention is focusing more and more on the establishment of dynamic knowledge networks in the style of the Open Innovation Model.

Main policy instruments:
IOPs, SenterNovem: Thematically defined innovation programmes aimed at a long-term strategic R&D partnerships between businesses and government-funded knowledge institutes in order to stimulate areas that are important to the Dutch economy.
TTIs, Ministry of Economic Affairs: A Top Technological Institute (TTI) is a public-private partnership which engages in research programmes that develop knowledge on a limited, specific theme of international relevance. These programmes aim to find answers to fundamental strategic questions in the business community.
MTIs, OCW and NWO: Top Societal Institutes (MTIs) are centres of research where knowledge institutes study societal issues for the benefit of social partners (like the TTIs but for humanities/social sciences).
Open Technology Programme, STW: Non-thematic programme for the development of technology with clear utilisation prospects.
Platforms, NWO: Three platforms have been set up to steer a multi-disciplinary scientific domain, which is recognised as a national spearhead (due to its potential value to society). These three groups, which are semi-permanent and work under the auspices of the NWO, are: Advanced Chemical Technologies for Sustainability (ACTS), Netherlands Genomics Initiative (NGI), and ICT Regie (national platform for ICT research and innovation).
Smart Mix, SenterNovem and NWO: Smart Mix is a new grant programme with an annual budget of EUR 100 million. Smart Mix has been established to encourage cooperation between businesses, public organisations and knowledge institutes. Consortia of knowledge-users (companies, organisations etc.) can submit programme proposals jointly with knowledge institutes (universities, colleges and research schools). The programme has two aims: to stimulate valorisation and to promote focus and mass.
SBIR and Valorisation Grants: The Valorisation Grant is an SBIR-inspired programme (Small Business Innovation Research) that aims to commercialise knowledge and expertise in public institutes of scientific research. The programme is split into two phases. The first phase investigates the technological and commercial feasibility of a proposal. The second concentrates on systematically strengthening innovation and organisation. Hopefully, at the end of this phase, a point is reached at

which private backers are prepared to pay for further commercial development. Pilot projects are now carried out (railways, navy, STW, TNO).
BSIK/FES: In the Netherlands, over 40% of the natural gas revenues go to the FES (*Fonds Economische Structuurversterking* / Economic Structure Enhancing Fund) to finance projects that strengthen the economic structure. Around half the funding is invested in knowledge, education and innovation. Valorisation is one of the elements of the projects.
Innovation Vouchers: Innovation vouchers enable SMEs to submit research questions to knowledge institutes, thereby encouraging meetings between the two. Vouchers are given to SMEs that need a little bit of research to innovate products, production processes or services. After completing their research, knowledge institutes can cash the vouchers with SenterNovem. For 2006, a total of 3,000 large vouchers are available.
IRC: Innovation Relay Centre, a network of 70 centres in Europe that help SME's te get access to newly developed know how in other companies, universities, research institutes and the like. Co-funded by the Eur. Commission and the ministry of Economic Affairs.
NWO themes, NWO: Theme-based incentive programmes geared to ground-breaking research that can help to solve societal and economic questions. The themes are national and multidisciplinary insofar as they address developments which exceed the capacity of individual research institutes.
Various modalities for knowledge transfer, universities and NWO: A broad spectrum of activities geared to the transfer of knowledge to professionals working at the coalface.

Questions:

- What works well? Which modalities that we have already used for public-private partnerships (platforms, MTIs, TTIs, STW, Smart Mix, BSIK, Casimir, etc) have been successful?
- What does not work / which obstacles need to be removed? Not enough venture capital, better IPR rules, inadequate steering, EU regulations, etc.?
- How can we effectively drive the demand for scientific (also fundamental) research?
- Are the incentives wrongly placed? Do we need more direct stimuli (rewards) to promote valorisation?
- Relationship between more fundamental top-down / more applied bottom-up research: is the emphasis on innovation a threat to (high-quality) fundamental research? What should the ratio be?

Participants

- **Anton Franken – STW** (Stichting Technisch Wetenschappelijk Toegepast Onderzoek)

*Director, Technologiestichting STW. The Technology Foundation STW is the Dutch funding agency for university research. Tenured university staff can apply for a research grant, provided that their proposal includes utilization: the embedding of the results in society. The STW actively supports utilization by involving market parties in the users committee.*

- **Bert Geerken – Smart Mix**

*Director, Smart Mix. Smart Mix is a subsidy programme which supports innovators who work together. Smart Mix encourages economic, civil-societal and cultural*

*innovation that will enable the Netherlands to excel both nationally and internationally. Companies and/or civil-society organisations will work together with knowledge institutes like universities on a very broad range of subjects to realise this, on the basis of questions from the market and society.*

- **Theo Nijman – Netspar**

*Director, Maatschappelijke Topinstituut Netspar. Netspar is a national network for research and education in the field of pensions, aging and retirement. It is an independent network composed of academics and practitioners in the field, supported by universities as well as private and public institutions with an interest in Netspar's research topics.*

- **Jan Vogel – TNO**

*Policy Director, TNO. TNO makes scientific knowledge applicable in order to strengthen the innovative capacity of business and government.*

- **Jan de Wit – AKZO/ University of Nijmegen**

*Formerly Director of Technology at AKZO Nobel and currently Professor of Research Strategy and Management at Radboud University, Nijmegen*

**Friday 15 December 2006**

| Time | Location | Focus<br>Increasing Private R&D Expenditures through improving location factors | Participants |
|---|---|---|---|
| 9:15-10:45 | Van Nelle Fabriek – | **1 Excellent R&D investment climate**<br>- General view<br>- Acquisition policy<br>- Focus | - Serv Wiemers (NFIA)<br>- Cees Oudshoorn and Joke van den Bandt (VNO-NCW)<br>- Richard L'Ami (BOM) |
| 11:00-12:30 | | **2 Highly skilled personnel**<br>- National Education<br>- Foreign students<br>- Foreign "knowledge workers" | - Teun Graafland (Shell)<br>- Rob Hartman (ASML)<br>- Nick den Hollander (Casimir)<br>- A.P.Taselaar (Ministry of Justice) |
| 12:30-14:15 | LUNCH at Van Nelle Fabriek, hosted by Acting Secretary General of Ministry of Economic Affairs Chris Buijink. Including guided tour with visit to creative industry located within Van Nelle Fabriek. | | |
| 14:15-16:15 | | **3 Knowledge infrastructure and focus & mass**<br>- Accessibility of knowledge<br>- Public Private Cooperation<br>- Visibility and branding of Dutch knowledge infrastructure<br>- Shift from generic to specific support by government<br>- Selection of themes<br>- Innovation clusters<br>- Regional policy (a.o. ELA triangle)<br>- Branding and marketing of hotspots | - Willem Sederel (GE Plastics)<br>- Nora van den Wenden (EZ)<br>- Sigrid Johanisse (EZ – Innovation programme Point One)<br>- René Buck (Buck Consultants)<br>- Alle Bruggink (ACTS/ DSM) |
| 16:15 – 17:15 | | **Reflections** on best policy mix for increasing private R&D investments | Hans de Groene. Dep Director General for Enterprise & Innovation |

# Background Friday December 15

**Increasing Private R&D Expenditures through Improving the Location Factors**

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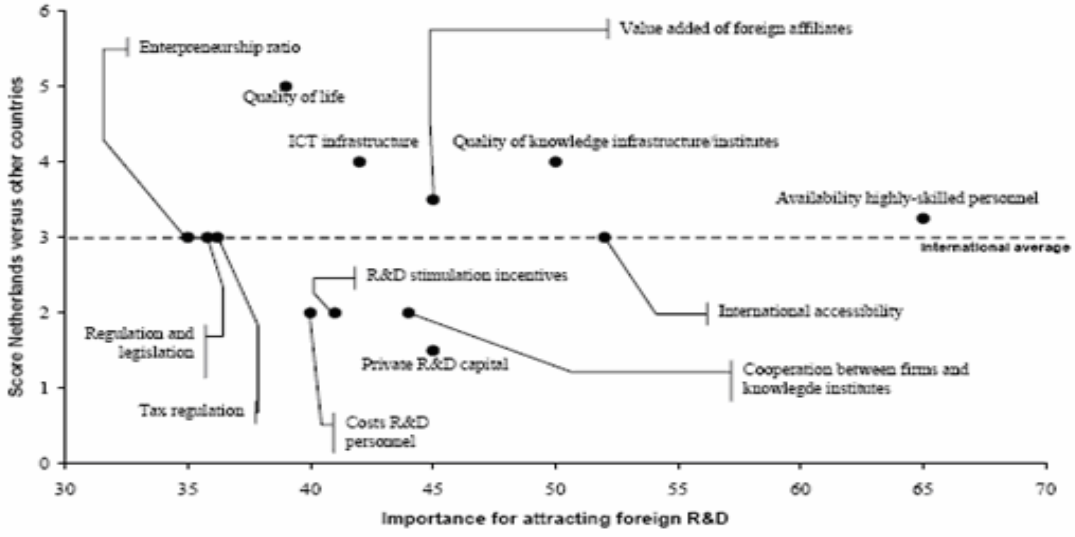
**Session 1.**
**Excellent R&D investment climate**

Starting point:
In accelerating productivity growth, innovation plays a key role. One of the most important criteria to indicate the degree of innovation in a country, is its business R&D intensity.
In the Netherlands, the business R&D intensity is relatively weak.[3] For this shortfall, low inward R&D investments are largely responsible.[4] The performance of the Netherlands on the decisive location factors (1) availability of highly skilled personnel and (2) international accessibility is average. The scores on important location factors (3) public-private cooperation and (4) private R&D capital are relatively low. However, the Netherlands perform well on other location factors (quality of life, quality universities and research institutions, added value of foreign companies and IT infrastructure).

In 2001, approximately one quarter of the total private R&D investments in the Netherlands were conducted by foreign affiliates. The results of econometric analysis show that, given the open character of the Dutch economy, this percentage should be in the region of 50%. Also when compared to other countries, the Netherlands attract relatively little inward R&D. Of total foreign R&D investment in the EU, only 2% took place in the Netherlands, whereas other open economies like Sweden and Denmark perform better.

**Performance of the Netherlands on the important location factors for foreign R&D investments**




[3] 1% of GDP compared with an OECD average of 1,5%. (OECD)
[4] i.e. 0,25% points

Generic policy instrument:
Research and Development (Promotion) Act (WBSO): a fiscal facility for companies, knowledge centres and self-employees who perform research and development (R&D) work. Under the Act, a contribution is paid towards the wage costs of employees directly involved in R&D. The contribution is in the form of a reduction of payroll tax and social security contributions and an increase in the tax deductions available to the self-employed. Applications must be received a month before the start of the period for which these facilities are required for a term of 3 till 6 months. The WBSO is initiated by the Ministry of Economic Affairs and is executed jointly by SenterNovem and the Tax authorities.

Questions:

- Is high ranking of innovation on the political agenda of significant importance for an attractive R&D climate?
- How can the Netherlands best organise the **branding and marketing** of the Dutch R&D investment climate?
- Should Dutch policy makers focus on knowledge based foreign R&D investments in stead of production seeking R&D investments?
- What are the most important and successful location factors in Sweden, Poland and the UK? Can the Netherlands learn from them?

Participants

- **Mr. Serv Wiemers – NFIA** (Netherlands Foreign Investment Agency)

*As a government agency, the Netherlands Foreign Investment Agency (NFIA) facilitates North American companies' direct investments in the Netherlands. Whether developing a first European presence or reconfiguring existing European operations, companies can obtain information, strategic perspective and practical assistance from NFIA's business consultants.*

- **Mr. Cees Oudshoorn and Mrs. Joke vd Bandt – VNO-NCW** (Confederation of Netherlands Industry and Employers)

*The Confederation of Netherlands Industry and Employers (known as VNO-NCW) is the largest employers' organisation in the Netherlands. VNO-NCW represents the common interests of Dutch business, both at home and abroad and provides a variety of services for its members. VNO-NCW has got 180 (branch) associations as a member, representing more than 115,000 enterprises. They cover almost all sectors of the economy, including more than 80% of all medium-sized companies in the Netherlands and nearly all of the larger, corporate institutions.*

- **Mr. Richard L'Ami – BOM** (Noord-Brabant Development Agency)

*The mission of the N.V. Noord-Brabant Development Agency (BOM) is to create, improve, maintain and develop the industrial structure in Noord-Brabant by offering a range of professional services. The BOM was established in 1983 and is funded and financed by the Dutch State and the Province of Noord-Brabant. Noord-Brabant is a region in the south of the Netherlands. The BOM Foreign Investment Department assists potential foreign investors in every field required, free of charge. The BOM organizes fact-finding trips, visits potential investors abroad and supports in site-selection and negotiations with national and local authorities. The BOM Venture Capital Department finances innovative and financially healthy companies by providing equity capital and subordinated loans of up to 1,8 million Euros.*

**Session 2.**
**Highly skilled personnel**

Starting point:
Because of its relatively small market and high labour costs, the Netherlands are less attractive for foreign R&D investments following production. However, for knowledge seeking R&D investments, the Netherlands could be an interesting location.

A sufficient quantity of people with tertiary education turns out to be a decisive location factor for foreign R&D intensive companies. The Netherlands scores average on this factor.
Increasing the proportion of population with a tertiary education can be achieved through:
a) Stimulating Dutch youth to study science
b) Attracting and retaining foreign students with a tertiary education
c) Attracting and retaining foreign engineers and knowledge workers

Main policy instruments:
Casimir programme: To make jobs in research more attractive, the government wishes to increase the mobility of research staff in the public and private sector. Mobility in the form of exchanges of workers between the two sectors is a good way of making research careers more attractive and interesting. It can enable academic researchers to participate in corporate R&D and industry researchers to participate in research at public-sector knowledge institutions. The allocated budget per proposal is 100,000 euro max. and only serves to cover the staff costs of the researcher who is to be exchanged. Other costs are to be carried by the companies and institutions concerned. The total project costs must be twice as high as the staff costs. In 2005, 23 researchers started with Casimir; in 2006 the number is 15.
Jet-net: Jet-Net was set up in 2002 between - at that time - five major companies, the economics and educations ministries, Dutch employer's organizations and intermediary organizations in the education sector. Its prime aim is to stimulate increased interest among high school students to pursue their studies and future career in Science and Technology.
Platform Bèta en Techniek: The Platform Bèta Techniek has been commissioned by the government, education and business sectors to ensure sufficient availability of people who have a background in scientific or technical education. The aim: to achieve a structural increase of 15 per cent more pupils and students in scientific and technical education and to use existing talent more effectively in businesses and research institutes.

Questions
- Next to stimulating Dutch youth to study science and attracting foreign students and engineers, are there other interesting options that lead to increasing the population with a tertiary education?
- Do you know of any best practices to make tertiary education more attractive?
- How can we best stimulate Dutch higher education institutes to compete with foreign institutes in attracting foreign students?
- Do you know of any interesting policy options in order to retain (foreign) students in a country after they graduate?

- How can the Netherlands best stimulate the inflow of highly skilled foreign scientists and engineers?
- Is it worthwhile to specifically develop a more friendly investment climate for foreign spin offs / spin outs who envisage to establish an independent micro company?

Participants

- **Mr. A.P Taselaar – Ministry of Justice (Immigration and Integration)**

*Project Manager and expert on migration legislation at the Ministry of Justice and Aliens Affairs and Integration. The Ministry is responsible for maintaining order in the Dutch society, while ensuring that justice, safety and unity come first. The integration of established migrants and newcomers receives particular attention.*

- **Nick den Hollander – NWO/EZ Casimir programme**

*To make jobs in research more attractive, government wishes to increase the mobility of research staff in the public and private sector. Mobility in the form of exchanges of workers between the two sectors is a good way of making research careers more attractive and interesting. It can enable academic researchers to participate in corporate R&D and industry researchers to participate in research at public-sector knowledge institutions. Exchange projects of this kind give researchers the chance to experience a different professional environment. They broaden the understanding of young researchers and provide a fillip for those at a more advanced stage of their careers. The resulting circulation of knowledge also ensures fuller use of existing research potential and creates stronger networks and closer interaction between parties in the public and private sector.*

- **Mr. Teun Graafland – Shell/ Jet-Net**

*Shell is a global group of oil, gas and petrochemical companies with a broad portfolio of hydrogen, biofuels, wind and solar power interests.Shell was one of the first companies to take part in the Jet-Net initiative, which aim is to stimulate increased interest among high school students to pursue their studies and future career in Science and Technology.*

- **Mr. Rob Hartman – ASML** *(director R&D)*

*ASML is a world leader in the manufacture of advanced technology systems for the semiconductor industry. The company offers an integrated portfolio for manufacturing complex integrated circuits (also called ICs or chips).*

**Session 3.**
**Knowledge infrastructure and focus & mass**

Starting point:
The second decisive location factor for inward R&D investments is availability of world class knowledge infrastructure. The Netherlands score more than average on this location factor. However, research indicates that the Netherlands are relatively lagging behind in attracting foreign R&D investment. Taking the openness of the Dutch economy into account, inward R&D should be much higher.

Another important location factor is focus and mass on certain themes, also in government support. More focus and mass on certain themes is believed to be a good instrument to put certain strengths of the Dutch economy and knowledge infrastructure prominently on the international knowledge chart, hence improving visibility and R&D investment climate in the Netherlands in general.

During this session, we would like to introduce three examples of private-public cooperation with focus and mass. The first is the example of the leading technology institutes, the second is the ACTS initiative and the third is the new innovation programma Point One. Furthermore, we invited the foreign company General Plastics to share experiences with us, and Buck Consultancy to point out the branding aspects of knowledge infrastructure and private-public research programmes.

Main policy instruments:
Leading Technology Institutes (LTI's): The LTI's aim at enlarging the competitiveness of Dutch industry in the areas of telematics (TI), food (WCFS), polymers (DPI) en metals (NIMR). An LTI is a virtual institute formed by multi disciplinary teams from industry (private) and knowledge institutions (public). An LTI works on the commercial and social use of fundamental research. This programme has open for proposals every four years; it is to be integrated into the innovation programmes mentioned hereafter.
Innovation Programmes: the ministry of Economic Affairs is setting up integral innovation programmes, covering research, development, SME's, venture capital, internationalisation actions etc. First programmes on nano-electronics & embedded systems (Point One), food & nutrition, water purification. More may follow in e.g. automotive, life sciences/health, services, materials, logistics, security. In these programmes, the business sector has the lead. They are targeted towards business development, more than science. The theme must have Dutch excellent quality, good market perspectives, and a cooperative and enthusiastic group of companies.
Smart Mix: The Smart Mix program is meant to strengthen research areas in The Netherlands of outstanding quality and excellence. The program focuses on exploring and building new fundamental knowledge, which should subsequently flow into more applied research. Ultimately the results should lead to solving problems that are relevant for society and/or industries. From this perspective, the Smart Mix program requires that you build a consortium representing all parties to which your project is relevant, i.e., from the scientist through to the end-user, and with partners who will actively contribute to and participate in the project. Partners may be selected from universities & institutes, higher educational schools, governmental and/or societal organizations, and industries.

Investing in Knowledge Infrastructure (BSIK): The BSIK scheme aims to bring together players from public research and industry and support their joint research efforts with funding of up to 50 percent. A EUR 802 million budget highlighted the country's grand ambitions.
In order to be applicable for funding, projects should focus on one of five multidisciplinary themes: 1) Information and communication technology; 2) Spatial planning; 3) Sustainable system innovations; 4) Micro system technology and nanotechnology; 5) Health, food, biotechnology, and genomics. In all, 37 long-term collaborative projects are subsidized under the BSIK scheme. They were selected on the bases of their scientific excellence and their relevance for the economy and Dutch society as a whole.
Innovation subsidies Partnership Projects (IS): This programme focuses on projects involving fundamental and applied research. A project team should consist of an industrial applicant and at least one additional industrial partner. The program favors participation of universities and institutes by increased funding percentages. This programme is now integrated into the innovation programmes mentioned above.
Innovation Vouchers: Innovation vouchers enable SMEs to submit research questions to knowledge institutes, thereby encouraging meetings between the two. Vouchers are given to SMEs that need a little bit of research to innovate products, production processes or services. After completing their research, knowledge institutes can cash the vouchers with SenterNovem. Every SME is entitled to a onetime 'small voucher' worth EUR 2,500. In 2006, a total of 3,000 small vouchers were available. 'Large vouchers' are worth EUR 7,500 but they come with a price tag: an SME has to contribute one-third of the research costs itself, while the government adds the remaining two-thirds up to a maximum of EUR 5,000. Large vouchers cover more extensive research questions. Each SME may receive a maximum of one large voucher per year. For 2006, a total of 3,000 large vouchers are available.
Loan Guarantees for Small and Medium-sized Enterprises (BBMKB):
Dutch regulation provides opportunities for small and medium-sized enterprises (SMEs) to receive bank loans in cases where they lack sufficient collateral. In such cases, the government steps in with an extra guarantee of up to EUR 1 million. If SMEs apply for loans, banks can use the extra government guarantee on the basis of criteria laid down in BBMKB regulation.
Technopartner: Goal of Technopartner is to realise an increase in and improvement of the quality of Technostarters by: mobilising the risk capital market for technostarters through the Seed Facility. A Facility which will accommodate loans to private investment funds and offering support and financial scope to technostarters and stimulating knowledge institutions to professionalize their patent policy through the Subisidy programme Knowledge Exploitations (SKE).

Questions

- Accessibility of public research institutes
    - Are their sufficient possibilities and incentives for cooperation between public research institutes and companies? Are these incentives and possibilities useful to foreign companies in the Netherlands?
    - Is the Dutch knowledge infrastructure accessible for foreign companies, whether they are or are not based in the Netherlands? Does the Dutch knowledge infrastructure sufficiently react to the international demand for knowledge and technology? (eg; Dutch companies relatively often cooperate with foreign research institutes)

- Focus and mass
    - Shift from generic to specific support by government: can we expect a positive effect on inward R&D? Does the new innovation policy (innovation programmes with focus on specific themes) match with an excellent R&D investment climate for (foreign) companies?
- Theme selection process
    - How can interesting R&D investment themes be easily recognised? What are the experiences in Sweden, United Kingdom and Poland?
- Technology branding
    - How can we best present the Dutch knowledge infrastructure to foreign companies? What should we put in the Dutch shop window?

Participants

- **Mr Willem Sederel – GE Plastics (**director R&D)

*GE Industrial provides a broad range of products and services throughout the world, including appliances, lighting and industrial products; factory automation systems; plastics, silicones and quartz products; security and sensors technology, and equipment financing, management and operating services. The European headquarters for plastics, quartz and silicones are in Bergen op Zoom, the Netherlands and currently employ 1500 people in the Benelux. GE Plastics has just recently invested 62 million Euro for a facility in the Netherlands. To provide a European source of supply for its line of "xtreme" Lexan polycarbonate resins while boosting overall capacity by approximately 300 percent, GE Plastics will expand its production of these products to its Lexan Resin facility in Bergen op Zoom. This expansion beyond the U.S. will give European customers the advantage of shorter delivery times and broader availability of unique materials.*

- **Mr. René Buck – Buck Consultants Internationals**

*René Buck has established since 1985 a large, independent location consulting practice with a focus primarily, but not exclusively, on European projects. It competes mainly with other European location consultants, but does work beyond Europe. Based in the Netherlands, with almost 70 professionals, it has several international branch offices and a network of alliances with other firms in this niche, such as to provide greater capabilities in particular specialties or geographic areas. A recent focus has been to develop greater capabilities for project support in Asia. The company provides services in this niche both to corporate investors and to some of the leading investment promotion agencies, which contributes to familiarity with the current investment conditions and incentives in many locations for greater efficiency.*

- **Mr. Alle Bruggink – DSM/ Advanced Chemistry and Technology for Sustainability**

*ACTS is the Dutch platform for pre-competitive research in chemistry and chemical technology in which catalysis plays a pivotal role. In ACTS government, industry, university and knowledge institutes cooperate in public-private partnerships. Through its activities ACTS will contribute to the sustainable economic growth and to the knowledge infrastructure in the Netherlands, and attract young talent to a career in science and technology.*

- **Nora van den Wenden – Ministry of Economic Affairs**

*Head of Unit for Emerging Innovation Areas within Innovation Department with specialty leading technology initiatives.*

- **Sigrid Johannisse – Ministry of Economic Affairs**

*Project coordinator of High Tech Systems and Materials and project leader of Poles de Competitivité/ innovation programme Point One.*

**Session 4.**
**Reflections**

Starting point:
This session will be an excellent moment to reflect on the Friday focus: intensifying the private R&D expenditures through improving location factors. It is also a moment to link the private R&D issues with themes from Thursday such as the issue of valorisation of knowledge.

What are the impressions of the examiners, is there something that strikes them? During this session the peer review of the Dutch innovation policy can be placed in a perspective by both the examiners and Mr. Hans de Groene.

A specific issue that in this context can be raised is: Is/ should attracting foreign R&D investments be a question of Dutch policy or to be organised at interregional/ Benelux level or even EU.

Participant

- **Mr. Hans de Groene – Ministry of Economic Affairs**

*Deputy Director General for Enterprise and Innovation*