

Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments: the 'policy mix' project: The Netherlands

Citation for published version (APA):

Wintjes, R. J. M. (2007). *Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments: the 'policy mix' project: The Netherlands*. European Commission. Report for DG Research

Document status and date:

Published: 01/01/2007

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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**Monitoring and analysis of policies
and public financing instruments
conducive to higher levels of R&D investments:
The “Policy Mix” project**

Case Study

The Netherlands

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December 2007



A study funded by the European Commission – DG Research

The Policy Mix project

This case study is one of the results of the “policy mix” project funded by the European Commission (DG Research).

The overall purpose of the “policy mix” project is to develop a framework to help policy-makers build more efficient policy mixes with the view of raising R&D investments in their country. The underlying idea of the project is that impacts on R&D should be viewed as the results of a combination of interacting policies, rather than the product of policies acting in isolation from each other.

While the focus of this work is on impacts on R&D, the scope of policies considered as part of the policy mix is however much broader than what is traditionally considered as R&D policy instruments: this scope includes all types of instruments from any policy areas, which directly or indirectly affect the R&D domain. A policy mix (targeted at R&D investments) is defined as: *“the combination of policy instruments, which interact to influence the quantity and quality of R&D investments in public and private sectors.”*

The project is coordinated by UNU-MERIT, a research institute of the University of Maastricht (the Netherlands) and the United Nations University (<http://www.merit.unu.edu>). The following organizations were part of the consortium:

- Technopolis (The Netherlands)
<http://www.technopolis-group.com>
- PREST – University of Manchester (United Kingdom)
<http://www.mbs.ac.uk/research/engineeringpolicy/index.aspx>
- ZEW (Germany)
<http://www.zew.de/>
- Joanneum Research (Austria)
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- INTRASOFT International (Luxembourg)
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Executive Summary

This country case study builds on the Country Report on the policy mix for the Netherlands (March 2007) and adds a thematic focus. Besides the country case studies there are also regional cases and sector cases. The themes are actually specific interpretations of the policy mix concept.

By addressing these themes this case study also reports on a more conceptual discussion about the policy-mix reasoning and activities in the Dutch research and innovation policy arena. The conceptual shift in the overall research and innovation policy approach revolves around concepts such as: 'backing winners', 'focus and critical mass', 'programmatic policies', 'peaks in the Delta', 'streamlining' and 'policy packages'. Essential in the development of this approach has been the selection of 'sleutelgebieden' (key national technological domains) by the Innovation Platform, which has led to the development of Innovation Programmes which are the core of the new policy approach.

Generating more business R&D expenditures has been acknowledged as an important challenge, but it is not seen as the most important task of the government. E.g. it is not seen as a task for the Ministry of Education, Culture and Science. The WBSO as the tool to directly promote R&D expenditures is the most important policy tool of the Ministry of Economic Affairs, but, overall most attention of the Dutch government is on public research and a large part of the budgets goes to existing government research institutes, and increasingly the FES funds are used for building new institutes of national importance.

Over the last few years the Ministry of Economic Affairs has developed a new policy mix approach. Former streamlining operations were focused on reducing the number of firm-oriented policy instruments. In the new approach the mix consists of an 'Omnibus' of programmes that have a specific focus, e.g. the Peaks of the Delta programmes that target a specific region (see the regional case study on North Brabant); the Technopartner programme that supports a specific target group (see the themes mini-mixes and routes to increase R&D in this country case study of the Netherlands), and the Innovation Programmes that support specific technological domains (see the sectoral case study of ICT in the Netherlands). There is also a generic set of mostly financial tools which are focused on providing support to SME's in particular. We have seen that some of these generic instruments are also part of some specific programmes, such as the Technopartner mini mixes programme. The balance and mix between generic and specific instruments is a dynamic one, and evaluations will have to show for example which elements can best be addressed with generic tools and which elements are more appropriate to be taken up in the specific programmes.

A major issue in the Dutch system remains the still rather limited coordination, cooperation or integration between the Ministry responsible for science and the one responsible for industry. Moreover, the ministry of Education, Culture and Science has a more 'hands-off' mode of governance towards its policy portfolio, with more responsibilities of organizations such as N.W.O, KNAW, Universities and TNO. As a consequence there is less attention to policy mix concepts such as coherence and interaction from the 'science side'. The Innovation Platform serves, among others, to

integrate both fields of science policy and innovation policy, and in some respect this has led to improvements, but there are still (coordination) gaps and lack of interaction between research policy and innovation policy. A last remaining gap we identified is between the increased ambitions and the hardly changed budget for R&D (related policies).

1 Introduction

This report is one of the country case studies produced for the research project “Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments”. The case study is a next phase to the country reviews produced earlier in 2007.

The country reviews were based on the methodological framework produced by the consortium to frame the “policy mix” concept. They have been implemented on the basis of expert assessments derived from the analysis of National Innovation Systems characteristics and policy mix settings. The “policy mix for R&D” is defined by the consortium as: *“the combination of policy instruments, which interact to influence the quantity and quality of R&D investments in public and private sectors.”*

In this definition, policy instruments are: *“all programmes, organisations, rules and regulations with an active involvement of the public sector, which intentionally or unintentionally affect R&D investments”*. This usually involves some public funding, but not always, as e.g. regulatory changes affect R&D investments without the intervention of public funds. Interactions refer to the fact that the influence of one policy instrument is modified by the co-existence of other policy instruments in the policy mix”. Influences on R&D investments are either direct (in this case we consider instruments from the field of R&D policy) or indirect (in that case we consider all policy instruments from any policy field which indirectly impact on R&D investments).

This country case study builds on the Country Report on the policy mix for the Netherlands (March 2007) and adds a thematic focus. Besides the country case studies there are also regional cases and sector cases. The themes are actually specific interpretations of the policy mix concept. By addressing these themes this case study also reports on a more conceptual discussion about the policy-mix reasoning and activities in the Dutch research and innovation policy arena. The conceptual shift in the overall research and innovation policy approach revolves around concepts such as: ‘backing winners’, ‘focus and critical mass’, ‘programmatic policies’, ‘peaks in the Delta’, ‘streamlining’ and ‘policy packages’. Essential in the development of this approach has also been the selection of ‘sleutelgebieden’ (key national technological domains) by the Innovation Platform, which has led to the development of Innovation Programmes which are the core of the new policy approach.

First we provide a summary and synthesis (in paragraph 2) of the existing country report. With the theme ‘routes’ (paragraph 3) we see the policy mix as a combination of policies to promote an increase in R&D expenditure via addressing different target groups. In this case study on the Netherlands we emphasise two routes within this mix of routes. The second theme addresses the concept of Mini-mix (paragraph 4), which refers to a deliberate interaction between policy instruments within one policy scheme or programme.

2 The Dutch Policy Mix Context

In this paragraph we briefly recall the main descriptive and analytical aspects covered in the policy-mix review of the Netherlands.

The four main challenges for the National Innovation System are: Business R&D expenditures; Innovation oriented public research; Human resources for research and stagnating public R&D expenditure. The Netherlands' peer review report to support the CREST OMC-3% Policy Mix Peer Reviews (Boekholt, 2007) summarized these four points into the following 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.

Table 1 R&D intensity of the Dutch economy, 1995-2004

	1995	2000	2001	2002	2003	2004
R&D Intensity, Total R&D expenditures as % of GDP	1.97	1.82	1.80	1.72	1.76	1.78

Source: National Statistics Netherlands, 2006, pp.16

In view of the Lisbon agenda, the main challenge for the Dutch Government is to increase the R&D intensity (1.78% of GDP in 2004; see table 1), and especially the R&D intensity of the business sector (0.91% of GDP in 2004; see also table 2).

Table 2 R&D expenditures per sector in the Netherlands, in Million Euro, 1995, 2000, 2004.

R&D expenditures in Million Euro	1995	2000	2004
Business, R&D expenditures, intra-mural	37.817	47.509	49.915
Government research institutes	16.929	13.726	13.578
Universities	24.888	26.764	28.100

Source: National Statistics Netherlands, 2006

However, one R&D policy which fully integrates both the aspects of science and innovation, does not exist in the Netherlands. Although the Innovation Platform has promoted a more horizontal view, the R&D policy is to a large extent still vertically organized. In terms of budget the two most important ministries with regard to Research and Development activities are the Ministry of Education, Culture and Science and the Ministry of Economic Affairs.

The main aim of research policy of the Ministry of Education, Culture and Science (OCW), as stated in the policy document "Science Budget 2004", is increased focus on excellence (Ministry OCW, 2003). The general objective of the innovation policy of the Ministry of Economic Affairs (EZ) is strengthening the innovation capacity of the Dutch economy. The objectives of both Ministries have been very ambitious for

many years, but in terms of public policy investments the budgets have not changed much and on many R&D and innovation indicators the position of the Netherlands has not improved. There are recent improvements, but the main gaps between the major challenges and the policy objectives are the lacking budgets for R&D and the lacking coherence between science and innovation policy.

The Dutch government has never been at ease with the 3% target of increasing R&D expenditures as a percentage of GDP. Typically, the first reaction of the Advisory Council for Science and Technology Policy (AWT) in 2002 to the 3 percent Barcelona target was basically not to change the R&D policy efforts: “3% of GDP by 2010 should not be taken too literally ... The most important issue is to increase the capacity for innovation” (AWT, 2002).

While the investments of the departmental budgets have largely remained unchanged, the increase in investments in knowledge and innovation comes from the increased FES funds. The FES funds have been increased because of higher natural gas profits (as a result of higher oil prices). Amongst others, the OECD has criticized this fund. In terms of policy mix, this Fund is problematic. One of the main problems mentioned was that this Fund does not fall under the responsibility of one of the ministries, and the coordination and control is not very transparent. Moreover, the objectives are very broad, the projects are very diverse, and the funding has an ad-hoc nature. The FES is basically a very diverse group of activities and projects for which there was no funding through normal procedures in departments.

A general strategic or conceptual element in the Dutch research policy (including the science and innovation policy) is the increased emphasis on “excellence” and the creation of “focus and mass” in the research and innovation system. The idea was that clear choices had to be made together with public and private stakeholders, in order to create critical mass in targeted “key areas and key technologies”. After many years of more and more generic policy, the concept of “focus and mass” is very refreshing and the concept matches the challenges of a small country in a European and globalising context. However, in many ways, the government did not apply this strategy of focus and mass to its research and innovation policy. E.g., a large part of the policy is based on ad-hoc budgetary decisions to increase the FES funds, and there is no focus or strategy in the large and very diverse mix of investment projects. Another example of the lack of focus and strategic policy-making is the observation made by the AWT that three of the largest institutions in the Dutch research structure, namely TNO, NWO, and KNAW, all have their own, different research themes.

Generating more business R&D expenditures has been acknowledged as the main challenge and main priority, but it is not seen as the most important task of the government. E.g. it is not seen as a task for the Ministry of OCW. The WBSO as the tool to directly promote R&D expenditures is the most important policy tool of the Ministry of Economic Affairs, but, overall most attention of the Dutch government is on public research and a large part of the budgets goes to existing government research institutes, and increasingly the FES funds are used for building new institutes of national importance.

The science part of the set of R&D policy instruments has a long and rather stable history. Namely the part related to the public research institutes, e.g. the Universities,

NWO, KNAW, etc. The innovation related set of programmes and instruments has been subject to much more fluctuations. Ministry of Economic Affairs (EZ) more often changes its mix of policy instruments.

Although in this mix is to a large extent a deliberate and continuous “construct”, it is very difficult to govern this policy mix, because there is always a new (“ex post”) reality, and it is very difficult to assess how the different elements of the mix interact.

There is hardly any evidence for interactions among the R&D policy instruments in place in the Netherlands. Policies are often evaluated independently from each other. Some agencies can tell something about the linkages of the different set of tools they deliver. E.g. SenterNovem can tell which companies benefit from one or more of the measures they implement. An organisation such as Syntens can also tell about spillovers between the support activities they offer, and they adjust their portfolio of support accordingly. The difficulty though is to assess and govern the linkages between the policies of different organisations, and it becomes theoretical when policies of other Ministries or other policy area’s are concerned.

Most of the above mentioned observations have also been mentioned in the CREST OMC Policy Mix Review Report on the Netherlands. 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” (Boekholt 2007, p.11). The foreign reviewers also have pointed at the importance for the Netherlands of Foreign Direct Investments as a route to increase R&D investments.

Another important policy-mix theme for the Netherlands is the ‘mini-mix’ aspect of the new ‘programmatic approach’, which is for instance implemented in the Innovation Programmes.

3 Routes to increase R&D investments (Theme 2)

3.1 Introduction

There are a limited number of routes by which R&D investment levels can be raised. The six potential routes are identified in the Methodological report. Route 2 (greater R&D investment in R&D-performing firms) and 6 (increase R&D in public sector) are the most obvious, and more traditional routes, the former is the route supported by the Ministry of Economic Affairs and the latter mostly by the Ministry of OCW. Route 2, 3 and 4 are not clearly identified or recognized as separate target group or route towards increasing R&D expenditures. E.g. there is no discrimination between supporting foreign or indigenous business R&D activities. The main policy tool that is specifically designed to promote R&D investments is the WBSO tax-deduction scheme. The results of the evaluation showed that there is a positive impact of additional R&D investments. The induced additionality of this instrument, however, is lower for larger companies, and larger for SME's.

In terms of recent additional funding from the national budget, the prioritized route seems to be to increase R&D in the public sector. Recently additional funds have been dedicated to more NWO research and new research institutes (e.g.: Top Institute Pharma and Holst Centre). For the Netherlands we will focus in this case study on two routes, which can be seen as sub-routes, addressing more specific target groups: promoting the establishment of new R&D performing firms; and attracting R&D performing firms from abroad. Both these routes have been highlighted by the CREST OMC Policy Mix reviewers (Boekholt, 2007) as very relevant and challenging.

ROUTE 1: promote establishment of new indigenous R&D-performing firms
ROUTE 2: stimulate greater R&D investment in R&D-performing firms
ROUTE 3: stimulate R&D investments in firms non-performing R&D
ROUTE 4: attract R&D-performing firms from abroad
ROUTE 5: increasing extramural R&D carried out in cooperation with public sector
ROUTE 6: increase R&D in public sector

The importance of promoting the establishment of new innovative firms is also one of the main conclusions of the recent assessment from the Scientific Council for Government Policy (WRR) on innovation. For a long time the generic policies to promote the various routes identified to increase R&D expenditures have dominated the policy scene, but the shift towards more specific key area's has changed this. This Scientific Council for Government Policy headed by Bart Nooteboom, is less enthusiastic about the approach of 'backing winners' (Nooteboom 2007; AWT-nieuwsbrief juli 2007), implemented by for instance the Innovation Programmes, which are examples of 'mini-mixes' within the Dutch programmatic approach.

The two routes we focus on in this case study are rather selected on the basis of the most relevant challenge, and not on the prioritization. We will provide examples of the policies and policy mixes in place to stimulate R&D investment via the two selected routes, looking in particular at the rationale for adopting these policies; the

emphasis and shifts in emphasis placed on these routes; and the overall effectiveness of these policies and their likely impact on R&D investment levels. The other route to discuss will overlap with discussing the technopartner-programme in paragraph 5.2 in the light of a ‘mini-policy-mix’ programme.

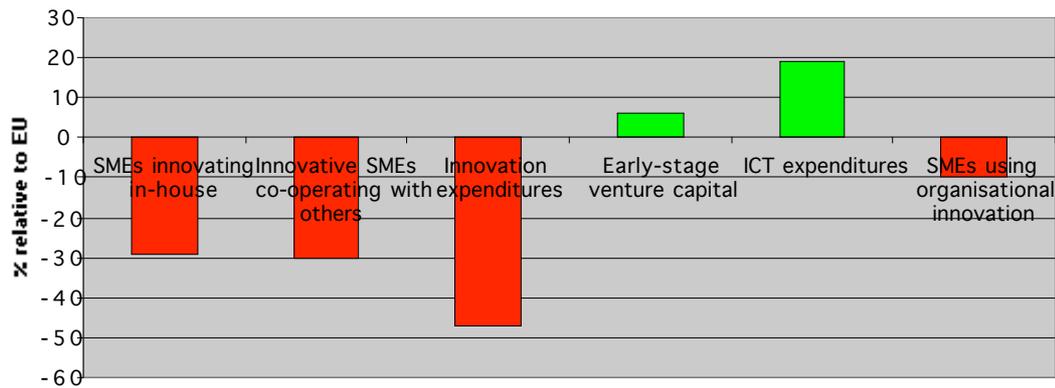
3.2 Increasing R&D by promoting the establishment of new R&D performing firms

This route is a major policy challenge for the Netherlands. It is not the dominant, nor prioritized route to increase RTDI input or output, but several reviews have assessed that more should be done in the Netherlands to enhance the establishment of new innovative companies. When taken more broadly, entrepreneurship policy in general is an important policy area for the Dutch Ministry of Economic Affairs. Some of the relevant policies on this route, are on the intersection between entrepreneurship policy and innovation policy. However, most entrepreneurship policies can be considered non-R&D policies, but policies that make it more easy to establish a new firm in general, are also beneficial to the establishment of new R&D performing firms. On the other hand, all support instruments that are relevant for R&D performing firms are also relevant after establishment of such a new firm. The policy tools specifically targeting the narrowly defined route of promoting the establishment of new R&D performing firms is rather limited.

The reviewers of the CREST OMC Policy Mix Review on the Netherlands, for instance, have stated that: “An area where more efforts could be needed is in the overall support of new business start-ups and entrepreneurship” (Boekholt 2007, p.11). Although, the annual number of new firms in the Netherlands has almost tripled over the period 1987-2006, there are more weaknesses than strengths with regards to entrepreneurship in the Netherlands (Stam 2007). A large part of the population of new firms is not very innovative SMEs (mainly self-employed in the construction and services sectors). On average SMEs have become less and not more innovative in the last decade, and the percentage of innovative SMEs is much lower than the EU average (see figure 1). Third, the Netherlands is lagging behind internationally with respect to entrepreneurial activities in general and ambitious entrepreneurship in particular.

A small set of specific types of entrepreneurship – technology start-ups, spin-offs and corporate venturing, and high growth start-ups – seems to be more relevant for this route than other types of entrepreneurship.

Figure 1 Innovation and entrepreneurship indicators, NL relative to the EU 2003



Source: European Commission 2006.

As with most of the other routes most of the policy activities that can be attributed to the route do not have the main objective to increase R&D investments. Increase in R&D investments is a welcomed impacted, but it is not the main objective, neither for the Ministry responsible for Science, not the Ministry of Economic Affairs. The ‘natural’ policy-mix potential for this route in particular is based on the fact that two different phases have to be promoted, that is, the phase before establishment and the phase after establishment. Both the Ministry of Economic Affairs and the Ministry of Education, Culture and Science (OCW) are involved in policy actions for this route. The Ministry responsible for science is mostly involved in promoting the pre-establishment phase, and the Ministry of Economy is more focused on improving the conditions after establishment. In this respect there is a potential for positive interaction between the activities of both Ministries and for collaborative, coordinated actions, and this is one of the reasons why both Ministries are involved in the Technopartner programme.

This programme is a good example of a policy that has been designed to combine or mix a number of existing, but formerly separated policies concerning innovative start-up and spin-off companies. The programme promotes different actors that provide different, but inter-related support to formalise a partnership, a partnership that combines a package of relevant services and resources. Mixing the elements and the partnership between the different actors involved increases the effectiveness and efficiencies, e.g. due to economies of scale and scope. One of the regions in the Netherlands that have promoted such an integrated approach of this route regarding the establishment of new R&D performing firms is the Eindhoven region. A study that analysed the existing support to fast growing and R&D performing young companies in the region concluded that there were many inefficiencies due to the lack of coherence and cooperation between the relevant policy makers and intermediates.

At the national policy level, the objectives and motivations at both the involved Ministries are different, but especially regarding the promotion of academic spin-off’s there are clearly mutual benefits. Benefits that can be described as policy-mix benefits. From the science viewpoint increased valorization and utilization of public research results is the main objective, while on the industry side the new business

formation and growth is central. The Ministry of Economic Affairs for instance has proposed as target (and evaluation) indicator the amount of turnover of the so called ‘technostarters’.

The most relevant policies for this route from the Ministry of Economic Affairs are part of the base-package (Basispakket) for entrepreneurship. This package consists of tools to support firms with: start-up, growth, innovate and go international. The most relevant tools for this route, highlighted in bold below, are part of the Technopartner Programme.

The base-package:

Start-up

- “Tante Agaath” measurement, a fiscal benefit for private investors in new ventures, executed by the tax authority.
- **SKE**, knowledge exploitation instrument, which is part of and executed by Technopartner, aimed at cooperation between knowledge institutes, agencies and companies in supporting needs of technology start-ups.

Grow

- Groeifaciliteit
- Besluit Borgstelling Midden-en Kleinbedrijf (BBMKB)

Innovate

- Innovatie vouchers
- Innovatieprestatiecontracten (IPCs)
- WBSO
- **SEED-facility** (part of and executed by Technopartner)
- **Business Angels** (part of and executed by Technopartner)

Internationalise

- Programma starters on foreign markets (PSB)
- Programme Economic cooperation Projects (PESP)
- Facility upcoming markets (FOM)

Source: <http://www.minez.nl>

Regarding start-ups, new policy action will also include:

- a greater focus on business studies in education,
- the simplification of the business start-up process,
- the launching customer role of the government (pilots started).

The most relevant policy actions for this route from the Ministry of Education, Culture and Science involve activities such as valorization, technology transfer, training in entrepreneurship and spin-off support. Also the research institutes that are funded by this Ministry provide support to new firm formation. E.g. TNO has its own TNO Holding which includes about 90 spin-off companies. TNO Companies is a holding company for all the privately owned TNO divisions (about ninety companies). Its main task is to commercialize and exploit knowledge resources, most of which were developed by TNO. The spin-off promotion activities include: a) scouting and screening potential start-ups; b) incubating them until the incorporated company is formed and c) coaching them through their initial steps along the commercial path. TNO Companies is responsible for actively seeking outside financing. The ultimate goal is to eventually sell the start-ups when the time is right.

Also many of the N.W.O. institutes and KNAW institutes promote spin-offs in some way and not all of these initiatives are part of the Technopartner programme. The initiatives at universities are often part of the Technopartner programme.

We conclude that there could be more synergies to be generated between the policies that are relevant for this route. The Technopartner programme is a good initiative to involve both the science policy-makers and the innovation policy makers, but there are more initiatives that could add up to the synergies between all the relevant tools. Also the recent initiatives regarding the promotion of company spin-off by developing campuses close to private research labs as implementations of the concept of Open Innovation (e.g. Philips and DSM) could perhaps be linked to the Technopartner programme (and Innovation Programmes).

3.3 Increasing R&D by attracting R&D performing firms from abroad

The route of increasing R&D investments by attracting R&D performing Foreign Direct Investments is coordinated by the national agency of the Ministry of Economic Affairs: the Netherlands Foreign Investment Agency (NFIA). Attracting more foreign R&D investments is one of the main policies of the NFIA as has been set out in the policy document: “In actie voor acquisitie” (Ministry of EZ, 2006).

The main elements of the changed acquisition policy are:

- Acquisition in more countries: new NFIA offices in China and India. Possibly also in Malaysia, Singapore and the Middle-East;
- A pro-active approach: focus on strong Dutch sectors;
- Promote expansion of existing foreign companies;
- Attract knowledge intensive investments, more foreign R&D;
- Branding of the Netherlands.

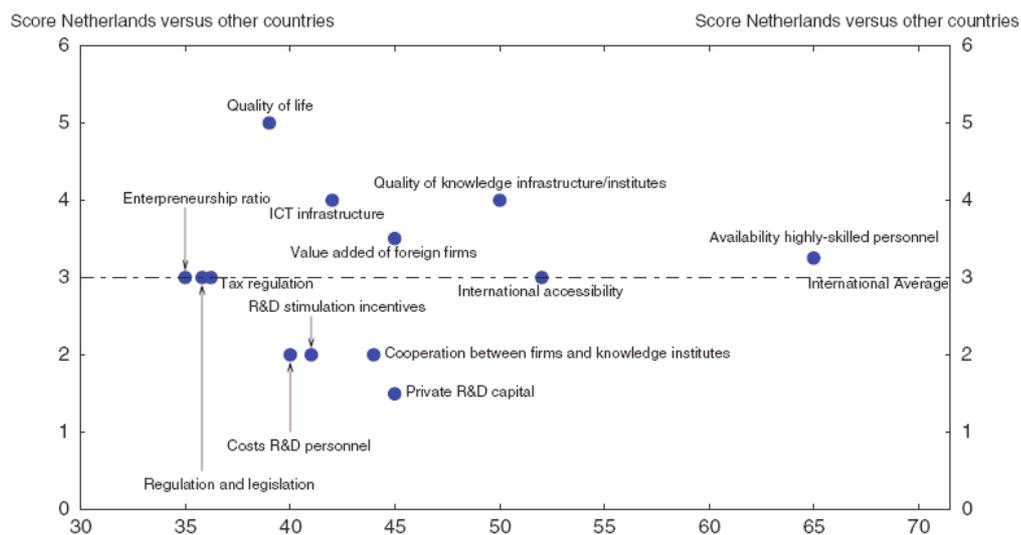
Over the last two years the policy of the NFIA has become integrated into the innovation policy.

A specific tool to improve the matching between the technology needs of the foreign companies and the knowledge a country can offer is “Technology Matchmaking”. Technology Matchmaking is a service provided by the Netherlands Foreign Investment Agency (NFIA) to further assist foreign technology companies seeking European partners and a supportive business environment. Technology Matchmaking facilitates the search process for a suitable technology partner in the Netherlands and is offered in strict confidence, without obligation and free of charge. The matchmaking service is open to companies active in the following sectors: ICT; Life Sciences; Nanotechnology; Polymers; Water Treatment. Matchmaking offers two different target partnerships, i.e. technology offer and technology request. According to the Ministry the services may result in one of the following types of collaboration: Research and Development programs; Technical cooperation; Joint Venture agreements; Manufacturing agreements; License agreements. Besides this pro-active foreign investment policy, there is also a more defensive policy, where existing foreign firms are approached. Together with the regional development agencies the NFIA has developed an ‘anchoring’ and investment development programme. It mostly consists of a sort of after-sales visits to foreign companies after they have settled in the Netherlands.

Relevant, but not new, for this route of increasing R&D expenditures are the Technical-Scientific Attachés (TWAs). The ministry of Economic Affairs has stationed Technical-Scientific Attachés (TWAs) at ambasy's in Brussels, London, Paris, Berlin, Stockholm, Helsinki, Rome, Singapore, Tokyo, Being, Seoel, New Delhi, Washington and Silicon Valley. These TWAs gather and analyse information about technology/innovation and technology/innovation policy for Dutch companies, knowledge institutes, universities and the government.

Many factors have an impact on the success of this route of increasing R&D investments by attracting R&D performing firms from abroad. All aspects of an attractive investment climate are relevant. We can think of factors such as the availability of highly-skilled personnel. According to Erken et al. (2005) it is the most important location factor for foreign R&D investments (see figure 2). Quality of life is a less important location factor, but the Netherlands performs relatively high on this factor compared to other countries.

Figure 2 Performance of the Netherlands on location factors for foreign R&D investments



Source: Erken, Kleijn and Lantendorffer (2005).

The Netherlands performs rather low on the factor 'Private R&D capital', which shows that the routes affect each other. It could be one of the reasons why the Netherlands does not have a good performance within Europe concerning attracting foreign R&D investments (see table 3). Nevertheless, overall foreign companies are more innovative than Dutch owned companies in the Netherlands, as a recent study has shown (Berenschot, 2007).

Table 3 EU Host-countries, per activity (number of projects, marketshare) 2002-2005

Production (2.823 projects)	Marketing & Sales (1.734 projects)	Logistics (689 projects)	R&D (494 projects)	HQ (482 projects)
1. Poland (12%)	1. UK (24%)	1. UK (13%)	1. UK (19%)	1. UK (33%)
2. Hungary (12%)	2. France (17%)	2. France (12%)	2. France (13%)	2. Germany (10%)
3. UK (10%)	3. Germany (12%)	3. Germany (8%)	3. Germany (11%)	3. France (9%)
4. Czech Rep. (10%)	4. Spain (6%)	4. Poland (8%)	4. Ireland (10%)	4. Ireland (8%)
5. France (9%)	5. Netherlands 5%	5. Belgium (8%)	5. Spain (8%)	5. Netherlands (8%)
6. Spain (8%)	6. Italië (4%)	6. Netherlands 8%	6. Sweden (7%)	6. Denmark (7%)
7. Germany (8%)	7. Denmark(4%)	7. Spain (7%)	7. Czech Rep. 5%	7. Spain (6%)
8. Slovak Rep. (6%)	8. Sweden (4%)	8. Hungary (7%)	8. Poland (5%)	8. Sweden (5%)
9. Belgium (4%)	9. Belgium (3%)	9. Austria (4%)	9. Hungary (5%)	9. Belgium (5%)
10. Austria (3%)	10. Poland (3%)	10. Czech Rep.(4%)	10. Denmark (4%)	10. Hungary (2%)
13. Netherlands (2%)			15. Netherlands (2%)	

Source: Locomonitor (2006)

More recent (between 2005 and 2006) there has been an increase in the number of attracted R&D performing companies. The percentage of R&D performing investments in the total attracted foreign investments has increased from 5 to 9 percent. Also the investment amount and the involved number of jobs have increased (Ministry of Economic Affairs, 2007). According to the Secretary of State van Gennip: *“this is an important development, because attracting foreign R&D investments is a key factor in strengthening the Dutch innovation performance”*. The importance of this route was also emphasized by the foreign experts in the CREST OMC Policy Mix Review on the Netherlands.

3.4 Conclusion

Many policy instruments contribute to one or more of the identified routes to increase R&D activities in the Netherlands. Two of the identified routes to increase R&D expenditures in the Netherlands have priority (dominate the mix of routes), e.g. in terms of budget, namely to increase public R&D and to increase R&D by stimulating companies to do more of it. The WBSO is the main instrument for the latter route. It is also one of the rare policy instruments in the Netherlands that have the explicit objective to promote additional R&D investments.

The other routes work less direct. The two routes chosen for this case study are two ways to increase the number of R&D performing companies, namely by new start-ups and foreign investments. The performance of the Netherlands on both these routes is not strong, so they both are major challenges addressing two types of very complex events (start-up and FDI) which call for a specific mix of policy initiatives. After the establishment the companies may benefit from the more generic routes.

Especially for the route regarding start-ups there might still be an under-used policy mix potential. The Technopartner Programme has increased the coherence between the most relevant instruments and initiatives (and Ministries), but there are still initiatives that seem more isolated within this policy mix, e.g. the TNO spin-off activities and spin-off initiatives at government research institutes and the campus developments around large private R&D labs, such as the High-tech Campus build around the R&D lab of Philips in Eindhoven. However, ‘bigger is not always better’: merging formerly isolated policies might lead to increased fragmentation of an

‘umbrella programme’ and therefor reduce the internal coherence and synergies. Here we touch on a (mini-) policy mix issue, which will be addressed in the next section.

4 Dutch Mini-mixes (Theme 6)

4.1 Introduction

Two programmes will be studied more in depth. The first is the Technopartner programme, and the second mini-mix scheme is that of Innovation Programmes. Both have been designed as ‘policy packages’ or ‘umbrella programmes’. Both programmes are quite flexible policy support frameworks that have to be ‘filled bottom-up’.

Some issues or sectors, or themes require a multi-faceted approach, rather than a single R&D policy instrument. Some policy objectives need a wider range of support activities, while other policy objectives can be met with a simple generic centrally delivered subsidy or grant. In this respect it is likely to find mini-mix programmes among the programmes that promote the establishment of R&D performing companies, because there is a complexity of different but relevant support elements, ranging from different types of funding, to information, and support related to real-estate. Here the rationale for developing a mini-mix is based on the complexity of the objective. If the objective is to persuade all R&D performing companies to do more of it, a single, isolated tool such as the WBSO tax deduction scheme seems sufficient. Another rationale to develop mini-mixes could be to create focus and critical mass in policy support addressing some specific selected sectors, technologies, themes or regions, with a tailored, inter-relates system of policy-tools. The Innovation Programmes are the result of such a ‘backing winners’ approach.

We could call this a ‘packaged’ approach where certain policy issues are tackled simultaneously with more than one policy modality. A mini-mix approach is a policy that explicitly uses different types of policy instruments (e.g. human resource initiatives, fiscal exemptions, grant schemes, regulation) to achieve a specific RTDI policy goal (e.g. R&D investments in bio-tech) or support a specific target group (e.g. new technology based firms). These interacting instruments can involve non-R&D policies (e.g.: regulation, fiscal, innovation oriented) as well.

In some cases governments have streamlined existing policies and bundled them into one umbrella programme. If it merges similar type of policy instruments (e.g. research grants) into one bigger but single modality instrument, we would not call it a mini-mix. It also must be more than a new ‘label’ to satisfy the political wish to diminish the number of schemes, without promoting interactions between the previous instruments. In a mini (policy) mix programme different types of policy tools are deliberately brought together to create synergies, synchronisation and or coordination between the separate instruments.

There are more good examples of mini-mixes than the two we have selected. Other mini mix cases are for instance Research Programmes such as the EOS, (in English: ERS Energy Research Subsidy) programme, implemented by SenterNovem. This programme aims to initiate and support innovation and research in the fields of energy efficiency and sustainable energy. Besides funding research and development, they set up brainstorm sessions, workshops and conferences to help spark the innovations. The programme encompasses about twenty research fields, grouped into five separate energy networks. While the subsidy scheme covers everything from new ideas to

market introduction, there are separate instruments dedicated to four specific development phases:

- ERS New Energy Research, intended for early-stage innovative ideas;
- ERS Long Term, for research into sustainable energy technology;
- ERS Energy and Collaborative Projects, for all collaborative projects in the field of innovation and durability, also in other fields than sustainable energy;
- ERS Demonstration, subsidising tests of new energy technologies in environments where they will actually be applied.

The possibility of sequencing phases is a strong rationale for a policy-mix. The needs for support differ per phase, so the instruments or modules differ per phase. But the links and interactions between the different phases and between the different policy modules is stronger than it would have been in the case of completely different programmes.

We can also think of several mini-mixes that consist of the different policy activities of one agency or knowledge institute. In this respect the activities of large knowledge institutes such as TNO, NWO, KNAW, and Universities, can also be regarded as mini-mixes.

Next we will focus more in depth on two Mini-mixes.

4.2 The Technopartner programme as a Mini-mix of policy

The TechnoPartner Programme is a good example of a policy that has been designed to combine or mix a number of existing, but mostly separated policies concerning innovative start-up and spin-off companies. Several formerly separated policies interact under the Programme umbrella. In 2002 the Ministry of Economic Affairs has analysed all the existing tools, the overlap and the evaluation results that indicated the importance of the different policy elements.

Table 4 Analysis of bottle-necks in ‘technostarters’ policy portfolio in 2002, according to phases in the life-cycle

	Phase 1: planning		Phase 2: Starting-up	Phase 3: growing	
	1a creating idea for commercialisation	1b from idea and financed businessplan (and prototype)	From businessplan to first customer and sales	From first sales to first profits	From first profits to organisational growth in next 5 years
Entrepreneurial spirit/culture	Dreamstart Biopartner				
Entrepreneurship	Dreamstart Biopartner	Dreamstart New Venture	BioPartner Twinning SIT Dreamstart		
Funding		BioPartner SIT	Biopartner Twinning SIT Technostarter-funds	Biopartner Twinning Technostarter funds	
Patenting		BIE			

Note: the shaded areas have bottle-necks (knelpunten). Source: Ministry of Economic Affairs (2004), Actieprogramma TechnoPartner; van kennis naar welvaart

Technopartner is an example of deliberate linking of policies in order to induce interactions between instruments in relation to technology start-ups. The Programme also combines the different objectives of the two Ministries involved. For the Ministry of Economic Affairs the goal is to enhance the share of ‘technostarters’ in the Dutch

economy. For the Ministry of Science, Culture and Education, the objective is to increase the impact of public research institutions on society by helping students and employers to start a company and provide incubator support, and by providing IPR support in commercialisation of research results. The TechnoPartner Programme is a “mini – mix” policy instrument that promotes more and better technology-based start-ups ("technostarters"), through the creation of a better climate for technostarters inside and outside universities. It is a generic and flexible programme, designed with the intention to streamline and coordinate the existing technostarters policy in the Netherlands. The TechnoPartner programme includes several action lines: TechnoPartner Seed facility, which aims to promote and mobilise the Dutch venture capital market to the benefit of technostarters; TechnoPartner Knowledge Exploitation Subsidy Arrangement (SKE), which includes a Pre-Seed facility for potential technostarters and a Patent facility for knowledge institutes to professionalize their patent policies. A third action line is the TechnoPartner platform, which provides information and expertise to technostarters. A fourth action involves the Business Angel Programme (BAP). Financing by informal investors (business angels) is important for they also offer knowledge and experience. Next to these operational action lines, the programme has an "institutional pillar" which is focussed on the improvement of the environment in which starters operate.

The Technoparter programmes is a multi-level programme. The programme has mini-policy-mix elements at different levels. At the higher programme level there is interaction between the above mentioned action lines, but the main rationale for the combination of policy action lines at the programme level is more an efficiency argument from the policy side and a convenience/virtual one-stop-shop factor at the user-side. But the strongest policy-mix interactions between policy instruments is at the lower, regional level within one of the above action lines, namely the SKE arrangement. The following 13 SKE-projects have been approved, so far:

- TechnoSpurt Eindhoven
- Design Incubator Eindhoven
- Zuidas Kennis Exploitatie Amsterdam
- SKE-project AMC Amsterdam
- Food Valley Consortium Wageningen
- LeeuwenhoekStarters Leiden
- KERN Nijmegen
- Technosprint TUD Delft
- Starterslift Tilburg
- Start Impuls Utrecht
- Hoogstarters Techstart Limburg
- Techno Track Enschede
- Business Generator Groningen

The above SKE-projects consist of consortia of stakeholders and formerly competing support providers. We have a closer look at three examples:

Hoogstarters TechStart consists of a consortium of the following initiating organisations:

- NV Industriebank LIOF;
- Syntens;

- Universiteit Maastricht;
- Fontys Hogeschool;
- Hogeschool Zuyd;
- Chemelot.

Additional funding is provided by the following partners: Provincie Limburg, BioMed Booster, Océ, and several other companies in the region of Limburg.

Besides the Higher Education Institutes, regional development agencies, Syntens and some major R&D performing companies in the regions are often part of such consortia.

The second example is the SKE-project KERN, which was the result of an application by a cooperation between:

- Radboud Universiteit Nijmegen
- UMC St Radboud
- Mercator Incubator Nijmegen BV
- Health Valley
- Hogeschool van Arnhem en Nijmegen
- Syntens
- Ontwikkelingsmaatschappij Oost NV
- Rabobank Rijk van Nijmegen
- Organon NV
- NXP
- Royal Haskoning
- DSM
- Pepscan Systems

The third example is Technospurt of Stichting Incubator3+. It was the first SKE-project (16 June 2005), which is a cooperation between:

- Technische Universiteit Eindhoven
- NV BOM
- NV REDE
- Fontys Hogescholen
- Philips
- TNO
- Rabobank
- Syntens

The idea's for cooperation in the Eindhoven region regarding the fragmented and overlapping support for innovative start-ups date from before the start of the Technopartner programme. The programme promotes different actors that provide different, but inter-related support to formalise a partnership, a partnership that combines a package of relevant incubation services and resources.

Mixing the elements and the partnership between the different actors involved, increases the effectiveness and efficiencies, e.g. due to economies of scale and scope. One of the regions in the Netherlands that have promoted such an integrated approach

of this route regarding the establishment of new R&D performing firms is the Eindhoven region. A study that analyzed the existing support to fast growing and R&D performing young companies in the region (Wintjes & Cobbenhagen, 2001) concluded that there were many inefficiencies due to the lack of coherence and cooperation between the relevant policy makers and intermediaries. The several, sometimes competing support providing organizations all claimed they could offer everything a technology intensive start-up could possibly need (building, funding, coaching, etc.) but in fact each of these organizations had their own specific strength to offer, but on other services they were not very strong. The study made all the involved actors realize that they were fishing in the same pond of potential start-ups and that there would be much synergy to gain from joining forces and offer a joint package of inter-related services. The Incubator3+ SKE project has developed its own format and procedures.

There are some similarities among the consortia and amongst the SKE projects, but in essence each of the SKE's is a unique mini-mix which consists of the policy tools and services of each of the consortium partners.

4.3 The Innovation Programmes as a Mini-mix of policy

In 2004 the Innovation Platform listed some 'sleutelgebieden' ('Key-areas) which were key technological areas in which the Netherlands should and could seek 'focus and critical mass', because there were already many competitive strengths in these areas. The selection of key-areas has led to a 'key-area-approach'. A similar 'backing winners' approach has also been adopted in a spatial perspective with the "peaks in the Delta" concept. The Netherlands has drafted in 2005 the ideas of a new innovation policy (Van Rijswijk, Kleijn, Janson and Menten, 2006) consisting of a basic package for all entrepreneurs and a programme-based package aimed at supporting the Dutch industry in achieving global excellence, in a limited number of (business) areas. The programme-based package is characterized by an integral approach, resulting in user-driven public-private innovation programmes, thereby creating focus and critical mass. A unique aspect of the new approach is that industrial foresight processes are integrated in the selection and design of the programmes and with actual policy implementation.

In answer to the 'key-area' approach of the Innovation Platform the Ministry of Economic Affairs in the Netherlands has introduced in 2006 a new type of policy instrument called the 'programmatische approach'. Three features of this programmatic approach are rather new to Dutch innovation policy (Technopolis Group 2007):

- The programmatic approach focuses on specific themes (or technology domain, or societal issue) and aims at creating international excellence in those themes.
- The process of selecting these national priority research themes. (e.g. making use of foresights, high level panels, bottom up competition, involving companies and other stakeholders, etc.)
- The approach relies on a bottom-up process where consortia of stakeholders (public-private-partnerships) and particularly the business sector take the initiative to define the main portfolio or mix of instruments and the contents and parts of the programme. Not only linkages between academia-industry are stimulated but also between companies. Another trend is the increased involvement of public research institutes as stakeholders in the design of a certain programme.

The policy literature often refers to user-driven programmes. But there are different kinds of user-involvement. Besides the involvement of stakeholders in high level prioritisation of specific themes or technologies on which a country should focus, the stakeholder involvement in many Dutch programmes also concerns the design and management of the programme (e.g. what problems does the programme address, with which types of intervention, the portfolio of instruments and the form and degree of collaborations, etc.). Part of the programmatic approach is also the trend to absorb a mix of inter-related instruments within one programme. Because once the key-areas had been identified and selected, policies started to cluster and accumulate around these key-areas.

One phase or element in the evolution of the Innovation Programmes was the merger of two formerly separated policy instruments. In 2005 the IOP-TTI arrangement became effective. The idea is that successful research programmes could be supported to establish excellent research institutes. IOP are Innovation Oriented research Programmes and TTI's are Technological Top Institutes. For a number of existing IOP's the goal (and support) of becoming a Top Technological Institute (TTI) has become effective in 2005. The main objective is to establish long-term strategic R&D collaboration between companies and publicly funded knowledge institutes in those areas that are considered to be of strategic importance for the Dutch economy.

The process in the programme-based package for innovation starts bottom-up with industry and knowledge institutes indicating their willingness to work together on drafting a shared vision and strategic agenda in a certain focussed application area. A vision and strategic agenda is to include crucial factors for success of the envisaged programme which must be broader than R&D, also addressing vocational training, promoting start-ups, knowledge transfer and embedding in international initiatives. An external strategic advisory committee advises the Minister of Economic Affairs in selecting those visions/strategic agenda's that are most promising. Selection criteria used include: stakeholder commitment, impact on sustainable economic growth, innovativeness, internationally distinguishing (business and research) excellence and legitimacy of government intervention. After selection, programmes are built, in interaction with government. These programmes are then again advised upon by the strategic advisory committee. The approach taken in the programme-based package is in line with the policy of the European Commission, such as Technology Platforms and Joint Technology Initiatives.

The total annual budget for the innovation programmes is about EUR 200 million. The first innovation programme resulting from this approach was in the field of nano-electronics and High Tech Systems: Point-One. Partners include Philips, ASML and over 30 SME's.

Recently there is a fourth interim report of the Ministry to the parliament on the progress on the 'key-areas' and the Innovation Programmes. In the report "Innovation Programmes; up and running" (Ministry of Economic Affairs 2007) the progress in the running programmes is described and it is explained that the Ministry aims to increase the coherency between the different elements of the programmatic approach and its relation to the base-package of more generic financing and SME oriented support.

The Innovation Programmes are open, integrated programmes that addresses all relevant problems in a certain key-area or theme, e.g., by investing in R&D, commercialization of knowledge, promoting the participation of SMEs, but also to address or prevent problems regarding human resources, and for instance by export promotion. The consortium holds the ownership of the programmes, a representative of SenterNovem is safeguarding the government perspective. The consortia are quite autonomous in deciding which activities they want to initiate and what should be the technological focus. The government asks the consortia to develop roadmaps e.g. regarding Human Capital, SMEs and Internationalisation.

The Ministry of Economic Affairs also aims for increased coherence with initiatives of NWO, TNO, and STW. Coordination with the Ministry of Education, Culture and Science is therefore an important condition. Because this latter Ministry has a more 'hands-off', decentralized approach toward ownership and management of policy mix issues, this collaboration between these Ministries remain an important challenge for the future.

The first three Innovation Programmes are: Point-One, Food&Nutricion Delta and Water technology. Two recently started programmes are The Maritime Innovation Programme and the programme for High Tech Automotive Systems. More consortia have started to develop a programme.

The Point-One programme was the first one, established by ASML, Philips, NXP, ASMI, Holst Center and the Embedded Systems Institute. Within one year 56 organisations have participated in R&D projects. An Academic council of 27 professors was set up to work on a long term vision and promote interaction between science and industry. In close collaboration the involved knowledge institutes and companies have drawn up a Strategic Research Agenda in the field of nanoelectronics and embedded systems. Aim is "to expand the current strong position of the Netherlands in these fields and bring it up to Silicon Valley proportions". Point-One focuses on:

- Expanding collaboration between (small and large) high-tech companies, knowledge institutes and the government in strategic research projects;
- Creating outstanding technology institutes for open innovation;
- Stimulating excellent and attractive technical courses that meet the needs of the industries;
- Supporting small and medium-sized businesses with advice, research facilities and financial means.

The activities include:

- two strategic R&D collaboration platforms, also open for SMEs;
- The establishment of a widely shared strategic innovation agenda and international profiling and collaboration R&D projects: two tenders in 2006 and 2007 to broaden the technological base and the involvement of innovative SMEs;
- establishment of a Venture Capital Fund with EUR 50 million by 2009 to support start-ups in nanoelectronics and embedded systems;
- establishment of road maps, coaching programmes and upgrading activities for SMEs, international grants for students, and an industrial PhD programme.

The number of participating SMEs has increased over the past year from 12 to 37. There are potential linkages between this programme and related research policy initiatives such as NanoNed (a Bsik funded research programme and network), the ESI (Embedded Systems Institute) and Holst Center.

A new Innovation Programme HighTech Automotive Systems (HTAS) started this year. The Dutch automotive sector consists of over 200 companies, mainly suppliers, with special strengths in materials, mechatronics, embedded systems and heavy duty vehicles. Academic research and education is concentrated at the three technical universities and several polytechnical colleges. TNO is a top technological institute in the related areas of integrated safety, vehicle dynamics, power-trains, human factors, mobility, logistics and ICT. The sector benefits from knowledge institutes as the Embedded Systems Institute (ESI), the Holst Centre and top ranking cross border institutes like IMEC, RWTH, FEV, Fraunhofer, IKA/FKA.

The Dutch automotive industry joined forces to create the HTAS Innovation Programme. HTAS is initiated by the Federatie Holland Automotive (FHA). HTAS is set-up as an open programme in which industrial partners, knowledge institutes, both national and international, and government can participate. HTAS is based on a common vision and policy that can be summarized as follows:

- The Dutch automotive industry chooses ‘Driving Guidance’ and ‘Vehicle efficiency’ as prime focus areas for growth and innovation.
- An ‘Enablers’ programme on Education, Knowledge Transfer and Business Development is needed to support innovation and development of SME as well as growth in employment.
- The goal is to increase turnover from € 12 to 20 billion and employment with 10.000 FTE by 2015.

The total investment for the periode 2007-2011 is estimated to be 158 million Euro. Involved companies include: Philips, NXP, Inalfa, TomTom, BoschVDT, Daf Trucks, VDL Bova, SKF, DTI, Vredestein, PDE Automotive, and DSM Engineering Plastics.

On the key-area ‘Water’ (sleutelgebied Water) there are two programmes, the Innovation Programme Watertechnology started in 2006. It focuses on the purification of waste water and the production of drinking water and water for industrial use. In 2007 the Maritiem Innovation programme has started, it includes off-shore, maritime manufacturing industry and the so-called wet-construction branche. On the key-area Creative Industries the Ministry of Economic Affairs and the Ministry of Education, Culture and Science have started a programme that is linked to the area-specific approach Peaks in the Delta for the Northern part of the Randstad. Other consortia that have started to prepare applications and develop an Innovation Programme are in the field of Chemicals, one on Life Sciences& Health. There are also initiatives on the areas of Pensions and social security, The Hague: Residence of Peace and Justice, and Energy transition.

There are several cases where mini-mixes are related. It is not really a case of overlapping, but actually a concrete policy initiative can be part of different policy mixes, or mini-mix programmes. There are three different types of mixes, lenses or view-points. In the Dutch Innovation policy jargon they are three different types of programmes in “the Omnibus of programmes”. E.g. there are incubation initiatives that are part of three different programmes or (mini-) policy mixes, namely the

Technopartner Programme, an Innovation Programme, and a territory-oriented (Peaks in the Delta) programme.

Each key-area and each Innovation Programme ask for a different policy portfolio. Some Innovation Programmes are clearly linked to territory-oriented policy-mixes, in other cases it is less obvious. And for some Innovation Programmes a certain theme (be it incubating technostart-ups; or export-promotion; or Human Capital) can be more important than for another Innovation Programme. Ex-ante it is therefore hard to tell which elements are necessary parts of the mix and which elements may not result in enough synergies to justify a joined-up, mini-mix approach. Monitoring and evaluations should be helpful in making such decisions, but it will be very difficult to evidence what the individual impact of the interlinked activities is. The Innovation Programmes will evolve, and in the user-driven mode of governance, the consortium members are likely to direct the evolution of this policy instrument by selecting the elements that suits the consortium members best. Here the public policy maker or it's representative should carefully monitor which 'public good' elements are being neglected by the Programme owners or even thrown out of the Mini-mix. The public policy maker should then decide if this causes a gap that should be taken up in another specific programme within the Omnibus of programmes or whether a generic tool in the basic-package is a better way of restoring the balance.

4.4 Conclusions

Both the examples of mini-mixes seem to be successful programmes. The strongest policy-mix dynamics in both cases is at the lower policy implementation level. And to a large extent this also corresponds with the regional level. The specific situations (the specific phase in a companies life-cycle or the specific technological area or region) calls for a bottom up initiative to tailor appropriate mixes of different but inter-related policy activities.

A first conclusion regarding the Innovation Programmes is that in a fairly short period of time a lot has been done. A major advantage of policy initiatives in well developed existing technological areas seems indeed the effectiveness and efficiency in stimulating focus and critical mass.

The key-areas approach is also criticized. Nootboom (2007) for instance, is not much in favour of the "backing winners" approach, because it will soon become a 'picking winners' approach, and he is afraid that the support of vested interests will lead to locked-in situations, and that new small promising developments would be missed. A risk is indeed that many new programmes will follow and this would reduce the focus. In the past many R&D related initiatives have mainly favoured the large companies, but, so far the Innovation Programmes seem to be able to involve quite reasonable shares of SMEs.

Many of the potential linkages between a programme and other parts of the Dutch innovation system are still in the phase of 'whishing it will become stronger'. Very important in this respect is how the Ministry of Education, Culture and Science and the institutes they fund (TNO, NWO and KNAW) will react to the present dynamics of the approach. A positive development in this respect was the decision of the Cabinet to also promote the establishment of 'innovation for society programmes', e.g. addressing problems regarding health care, energy, water, safety and education.

Such new Societal Innovation Programmes can be suggested by other Ministries, through the recently started inter-departmental project Nederland Ondernemend Innovatieland (NOI).

Regarding the Technopartner Programme the claimed mini-mix benefits are very convincing and the rationale for government intervention is very strong.

The consequences of the development of the Innovation Programmes are still not very clear. The impact of the programmes on the success of the selected key –areas will be positive. After so many years of generic instruments avoiding specific sectors or innovation policy, the key-areas and programmatic approach is a refreshing change to the innovation policy system, but, of course it should not lead to a policy support monopoly of the key-areas. It is also too soon to say which elements of the Innovation Programmes should stay in or should be added into the mini-mix, and which elements could perhaps be better resolved by generic policies.

5 Conclusions

A general strategic or conceptual element in the Dutch research policy (including the science and innovation policy) is the increased emphasis on “excellence” and the creation of “focus and critical mass” in the research and innovation system. The idea was that clear choices had to be made together with public and private stakeholders, in order to create critical mass in targeted “key areas and key technologies”. After many years of more and more generic policy, the concept of “focus and mass” is very refreshing and the concept matches the challenges of a small country in a European and globalising context. However, in many ways, the government did not apply this strategy of focus and mass to its research and innovation policy. E.g., a large part of the policy is based on ad-hoc budgetary decisions to increase the FES funds, and there is no focus or strategy in the large and very diverse mix of investment projects. Another example of the lack of focus and strategic policy-making is the observation made by the AWT that three of the largest institutions in the Dutch research structure, namely TNO, NWO, and KNAW, all have their own, different research themes. A major issue in the Dutch system remains the still rather limited coordination, cooperation or integration between the Ministry responsible for science and the one responsible for industry. Moreover, the ministry of Education, Culture and Science has a more ‘hands-off’ mode of governance towards its policy portfolio, with more responsibilities of organizations such as NWO, KNAW, Universities and TNO, but with too little coherence and interaction among them. The Innovation Platform serves, among others, to integrate both fields of science policy and innovation policy, and in some respect this has led to improvements, but there is still a (coordination) gap between research policy and innovation policy.

Over the last few years the Ministry of Economics Affairs has developed a new policy mix approach. Former streamlining operations were focused on reducing the number of firm-oriented policy instruments. In the new approach the mix consists of an ‘Omnibus’ of programmes that have a specific focus, e.g., the Peaks of the Delta programmes that targets a specific region (see the Regional case study on North Brabant); the Technopartner programme that supports a specific target group (see the themes mini-mixes and routes to increase R&D in this country case study of the Netherlands), and the Innovation Programmes that support specific technological domains (see also the sectoral case study of ICT in the Netherlands). There is also a generic set of mostly financial tools which are focused on providing support to SME’s in particular. We have seen that some of these generic instruments are also part of some specific programmes, such as the Technopartner mini mixes programme. The balance and mix between generic and specific instruments is a dynamic one, and evaluations will have to show for example which elements can best be addressed with generic tools and which elements are more appropriate to be taken up in the specific programmes.

The route of increasing R&D expenditures by promoting the establishment of new R&D performing firms is very important for the Dutch innovation system. The Technopartner Programme is a successful mini-mix instrument for this route, but maybe the CREST OMC reviewers are right in their advice to do much more to promote this route.

Both the examples of mini-mixes seem to be successful programmes, although there is no evidence from evaluations yet, and it will be difficult to proof anyhow. The strongest policy-mix dynamics in both cases is at the lower policy implementation level. And to a large extent this also corresponds with the regional level. The specific situations (the specific phase in a companies life-cycle or the specific technological area or region) calls for a bottom up initiative to tailor appropriate mixes of different but inter-related policy activities.

Regarding the Technopartner Programme the claimed mini-mix benefits are convincing and the rationale for government intervention is strong. However, the consequences of the development of the Innovation Programmes are still not very clear. The impact of the programmes on the success of the selected key –areas will be positive. After so many years of generic instruments avoiding specific sectors or innovation policy, the key-areas and programmatic approach is a refreshing change to the innovation policy system, but, of course it should not lead to a policy support monopoly of the key-areas. It is also too soon to say which elements of the Innovation Programmes should stay in or should be added into the mini-mix, and which elements could perhaps be better resolved by generic policies.

Monitoring and evaluations should be helpful in making such decisions, but it will be very difficult to provide evidence on the individual impact of the interlinked activities. The mini-mixes will evolve. Here the public policy maker or it's representative should carefully monitor and evaluate which 'public good' elements are being neglected by the Programme owners or even thrown out of the Mini-mix. The public policy maker should then decide if this causes a gap that should be taken up in another specific programme within the Omnibus of programmes, or that it calls for a generic tool in the basic-package, in order to restore the balance.

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