STI OUTLOOK 2002 – COUNTRY RESPONSE TO POLICY QUESTIONNAIRE

THE NETHERLANDS

1. General framework and trends in science, technology and industry policy

1.1. Overview and assessment of policies for science, technology, and industry

Science policy

In 1999 the Minister for Education, Culture and Science published the white paper “Nothing ventured, nothing gained, Science Budget 2000”. In this document he described the focal points of his research and science policy for the coming four years. These focal points are: room for accountability of the research system, research as a career opportunity, investing in knowledge for the future, social responsibility, and new forms of co-operation.

In the “Progress Report Science Policy 2002”, published in November 2001, the Minister for Education, Science and Policy describes how the Science Budget 2000 has been implemented so far.

One result is extra investments in the science sector. In total in the years 2000-2005 EUR 575 million are being invested. This is a growing structural increase that per 2005 amounts to EUR 93 million per year, besides incidental investments of EUR 109 million. In addition, EUR 418 million are being invested into education at universities (incidental amounts of altogether EUR 45 million and a structural increase which per 2005 amounts to EUR 103 million per year). The extra money for education makes it possible for universities to fulfil their research tasks in spite of a growing number of students.

The Cabinet has also decided for extra investments of a total of EUR 189 million for a special programme for genomics research. (See under “major shifts or changes in the balance of the use of different types of policy instruments etc.”).

Other examples of implementation of the Science Budget 2000 are: a new incentive scheme to increase career possibilities for creative young researchers, investigation of the employment possibilities and difficulties for researchers, and a new scheme for promoting women researchers to higher positions.

(See also section 2.1).

With a view to the coming elections (May 2002) the Dutch Cabinet published five Foresight reports in September 2001 covering main issues and policy options. The Foresight study on Education and Research, "Learning without boundaries", presents three main paradigms for the development of an effective system of public research, responsive to the needs of the XXI Century: taking respectively the researcher, the research institution and the user of public research as the main object of research policy.

Each paradigm leads to different policy objectives and options. For instance the paradigm "creating more scope for the best researchers" leads to the policy option of strengthening the "second flow" of government investment in basic research, that is via the Research Council (NWO). The Foresight report signals several majors challenges for the Dutch research system, such as attracting and keeping talented you researchers so as to safeguard the current high quality of Dutch research, revitalising basic research and improving interaction between the research system and industry.

RAND Europe was asked to do an in-depth analysis of which structural elements of the research system are crucial to maintaining the current high quality of Dutch research. RAND involved stakeholders in this analysis. Their report, "View on the future of scientific research" (also published September 2001), concludes that major changes in the mission of Dutch science policy are not necessary. However stakeholders crave for more transparency and co-ordination in this policy area.

In the wake of these reports policy options for a more quality based allocation of government funds to the universities (the so-called "first flow") are being studied.

Also, thought is being given to how the role of the Netherlands Research Council (NWO) in co-ordinating government funding from various government departments can be enhanced. The objective is that more synergy between research efforts taking place on different time scales *(i.e.* basic research, strategic research and applied research) and with possibilities for practical application could be achieved. This approach is described in the NWO Strategic Plan 2002-2005. It will be put in practice on a substantial scale for the new Genomics Research Program, which will start in 2002. Other initiatives will be started in due time.

The aim is that the new Cabinet, which will probably enter office in summer 2002, will publish its Science Budget with new policy directions between autumn 2002 and spring 2003.

Industry and technology policy:

It is increasingly recognised that the more interventionist forms of industrial policy, which are often associated with large government budgets and market distortions, are not effective. Current Dutch industrial policy that was formulated in the policy document “Scope for Industrial Innovation”, from June 1999, can be summarised in terms of five basic principles:

- Facilitative *e.g.* concerning the availability of industrial estates, infrastructure, corporate governance etc.
- No blueprints or interventionist sector structure policy.
- Predominantly generic.
- Designed to promote competition, eliminate shortcomings and (inter)national distortions of competition and to realise external effects of knowledge and technology.
- Dynamic and flexible policies with regular testing of the effects.

Because of the key public importance of R&D, government pursues an active policy designed to correct the market failure of under-investment in private R&D, in addition to its facilitative economic policy. However, the existence of market failure does not, by definition, mean that government can always do better. Continual assessment of the costs and benefits of government action is necessary.

The NIS-framework played an important role in the (re)formulation of Dutch industry and technology policy. The insight that interaction, co-operation and exchange of knowledge between the different actors within the innovation system are crucial has led to a shift in policy-orientation. This stimulated choosing an integral approach: taking into account all aspects relevant for the functioning of innovation systems. As a consequence system imperfections, caused by imperfections in the Dutch innovation system, received a higher place on the policy agenda. Cluster policy, adopted in the Netherlands in the early 1990's, is an example of an integral approach. Over the years the cluster concept has grown into a concrete range of policies covering a broad set of instruments. The role of government is dependent on the characteristics of the cluster. There's no "one-size-fits-all"-approach (for more information see question 4). Lessons learned over the years will be used to formulate a second-generation cluster policy in the course of 2002.

The shift away from an industrial, sectoral policy approach to a cluster-based NIS approach in a way was completed in April 2001 when the organisational structure of the Ministry of Economic Affairs with regard to policy concerning the market sector was changed. The directorates for Industry, Energy and Economic Structure were transferred into directorates for Business Environment, for Innovation and for Competition and Energy. The major issues for the directorate for Innovation will be knowledge and technology, human resources and innovative entrepreneurship.

The Foresight Study on the Economic Structure contains ingredients for the strategic policy agenda to enhance the economic structure. It summarises bottlenecks in the knowledge and physical infrastructure in relation to trends in the development of the economic structure and explores challenges and options for policy making in this field. The Foresight Study will be used to compose a strategic policy agenda that will be send to parliament in the first half of 2002.

Science Industry Relations

Stimulating Science Industry Relations, also a topic accentuated by the NIS-approach continues to be one of the priorities of the Netherlands innovation policy (and also in science policy). Improving the interaction between public research and industry and providing public research organisations with incentives to become more market orientated are the more specific aims in this field (see section 2.2 and 4 for specific information on policy measures).

- Major changes in the legislative, administrative, organisational, institutional, or budgetary framework for the formulation, implementation, and evaluation of science, technology, and industry-related policies.

In order to increase transparency in the governance of the science sector and to decrease the administrative burden, the Cabinet has decided to streamline the system of strategic plans of research organisations and government itself. This entails that the Royal Netherlands Academy of Arts and Sciences, the Royal Library, and the Netherlands Research Organisation (NWO) are to adapt a cycle in which strategic plans are published every four years. The Science Budget of the Cabinet also appears every four years, and the same is true of the strategic plans of TNO.

A better system of accountability has also been put on the agenda, coinciding with a Cabinet broad effort to improve monitoring and impact assessment of government policy (see section 2.1).

The involvement of civil society and non-governmental organisations has always been an important objective of Dutch Science Policy. One mechanism that has proven to be successful is the so-called "Sector Councils". These bodies, consisting of members selected from the scientific community, the users of research (including civil society and non governmental organisations) and government, play an important

role in setting priorities in various fields of research. In 2001 possibilities to create four new sector councils have been explored in the areas of "governance and justice", "labour and health", "transport" and "education". Initiatives to set up such councils for "governance and justice" and "education" are in the final stages of decision making.

To attract creative young researchers to a career in the research system a new incentive scheme was introduced (see section 2.1).

The research area of "Genomics" was targeted by the Dutch Cabinet as very important for science, industry and society. On the basis of an advisory report of a heavy weight committee it was decided to invest a total of at least EUR 189 million for the years 2001-2006. The Genomics programme will target the complete innovation chain, from basic research to applications. Objective is among others to bring about five centres of excellence, and to focus on four different areas of expertise, such as food and health and mechanisms of infectious diseases. Bio-informatics is considered to be a crucial aspect. A special temporary organisation within NWO will direct the programme.

As a second high priority field of research the Cabinet has chosen ICT research in its various dimensions. A special "task force" advised (Summer 2001) to double the volume of Dutch ICT research, to develop a strategy and to strengthen science-industry relations for this area of research in which the Netherlands' research happens to be of very good quality. In the report "The Digital Delta, beyond e-Europe" (2001) policy options for the new Cabinet were presented. The activities of the Task Force are one of results of the Plan of Action Competing with ICT Competences (CIC). This Plan of Action is the result of an analysis of the technology field ICT in the Netherlands, using a National Innovation Systems framework. It deals with all forms of ICT research (basic research, strategic research and applied research), with innovation processes and with the dynamics in the ICT industry. The project was carried out and is being implemented by the Ministry of Economic Affairs, the Ministry of Education, Culture and Science in consultation with other relevant actors (like ICT firms, public research institutes, NWO).

The increased attention for genomics and ICT is partly financed out of an increase of the budget for Innovation Oriented Research Programmes (IOP's) from EUR 5 to 13,6 mln. per year. Part of this budget has also been used to start an IOP on Electric-magnetic capacity technology.

1.2. Features and changes in the nature and process of policy evaluation

Increased focus on monitoring and impact assessment

Monitoring and impact assessments are high on the policy agenda in the Netherlands. The publication of the Government bill "From policy budget to policy accountability" (VBTB) in May 1999, introduced the idea of increasing the transparency of the relation between policy, impacts and funding. As a consequence of VBTB ministries are forced to answer questions like: "What do we want to achieve?", "What are we going to do to achieve these goals?", "When is our policy successful?" and "How much are we willing to spend?". This also has consequences for science, technology and industry policy. In their 2002 budget proposals (presented in September 2001) ministries for the first time used this new approach. Furthermore ministries are required to report on these matters to Parliament on a yearly basis. Each year in May these reports are discussed in Parliament.

From January 2002 Ministries also are required to give more attention to policy evaluation. The Ministry of Economic Affairs has done so and developed a special monitoring and evaluation unit. Until recently, the Ministry generally assessed the impact of the instruments once every four years. Recently a monitoring system was developed, using a number of specific indicators, to make more regular assessment of the

impact possible and - if necessary - to adjust policy-instruments. This approach also makes it possible to obtain more quantitative information about the policy instruments and will help the Ministry to develop a modern and effective range of instruments.

Intensified attention for this topic also led to a reconsideration of evaluation techniques. In a recent policy document (Monitoring Assessing the Impact of the Economic Affairs Technology Instruments, MAIT 2001) the Ministry has formulated the following key actions:

- Assessing the impact of the technology policy portfolio using a NIS-approach. This means that each instrument should be considered in the context of the wider policy portfolio and the innovation system in which it operates. Synergy and interaction with other instruments should be taken into consideration.

- Put more emphasis on ex-ante evaluations (what is likely going to happen as result of introducing an instrument?) when considering the introduction of new policy instruments. This also includes formulating clear policy goals and alternatives.

- Allocate more effort to studies into the bottlenecks of the innovation system and the wider international context in which innovation takes place.

- Allocate more effort to using econometric methods in evaluations and data collection.

The VBTB accountability system also has consequences for the way in which organisations receiving money from government should account for their activities and expenses. The Ministry of Education, Culture and Science is developing a set of relevant indicators with major research organisations, such as NWO and the Royal Netherlands Academy of Sciences, and the Royal Library. These indicators are to be a means by which a more transparent relationship of accountability of those organisations with Government is established.

2. Public sector research and public research organisations

2.1. Policy changes and background/rationale related to public sector R&D

Science Policy

Major policy changes in Innovation policy have not taken place in the current Cabinet period. However, important developments are:

- Extra short and long term investments in the scientific research sector were brought about. For the period 2000-2005 the total figure is 575 million Euro (see section 1.1).

- A new (3rd) Science & Technology Investment Impulse was formed under the direction of the Interdepartmental Commission for Economic Structure (EUR 0,8 bn. from 2002 to 2008); eight themes with a high significance for science and innovation policy have been identified: Systems innovation, ICT, Competences in Information Society, Integrated systems for multifunctional and high quality use of scarce space in the Netherlands, Use of knowledge in SMEs, Sustainability in economy, technology, ecology & culture and Breakthroughs in heath, food and gene- and biotechnology.

- In 2000 a new incentive scheme was introduced by the Ministry of Education, Culture and Science to support young researchers to carry out innovative research ideas. Another objective of this scheme is to increase the supply of researchers in order to counteract the large decrease in supply due to expected retirement of a large number of researchers in the next decade. In 2001 the funding of this initiative has been substantially enlarged. Its total budget rose to about 70 million Euro in 2003. This total encompasses extra funds provided by the Ministry of Education, Culture and Science (about 18 million Euro) and existing funds from NWO and university budgets, which are earmarked for this scheme.

- NWO has published its new strategic plan 2002-2005 ("Themes with Talent") in which nine priority fields for research are targeted with highest relevance for society: Cultural Heritage, Ethical and Social Aspects of Research, Administration in Motion, Cognition and Behaviour, Fundaments of Life Processes, System Earth, Digitalisation and Informatisation, Nanosciences and Emerging Technologies. NWO has claimed at least 100 million Euro extra investment to fulfil the objectives in its Strategic Plan. This increase was not possible in 2001.

- A National Genomics Initiative has been established (EUR 189 mln. from 2001 to 2005, see section 1) and ICT research has been targeted as a priority area (also section 1).

- Major policy initiatives to enhance the efficiency and effectiveness of public sector R&D, including changes in the procedure for policy evaluation, establishment of national criteria and priorities for government support (*e.g.* use of new methods in technology foresight and its application), or the creation of new organisational structures, such as centres of excellence.

- See section 1.2 about VBTB and the development of indicators as one of the means for improving accountability in the research system.

- The system of foresight studies concerning new priorities for science is being re-evaluated.

- Initiatives for enhancement and effective use of public research infrastructure such as large-scale research facilities and R&D related database.

- ICT-facilities for research presume sufficient access to such facilities and to data-infrastructures. At the same time data-infrastructures paid from public funds should be accessible to all, guaranteed trough well-balanced international arrangements. Therefore the Netherlands proposed, on the basis of the Third Global Village Conference (2000) organised by OECD/CSTP and The Netherlands, to set up a working group to explore these issues. The Working Group will present its report to the OECD in March 2003 and give preliminary findings at the Fourth Global Research Village Conference in Poland (2002) and the CODATA Conference in Canada (2002).

2.2. Initiatives to reform the organisation and governance of universities and public research organisations

In 2001 an important new mechanism to increase the effective use of the public research infrastructure has been investigated. This mechanism concerns relating part of the university budgets to research performance. The outcome of quality assessments of research output would determine the increase or decrease of the university budgets. This is considered one of the options to improve the quality of

university research by improving the conditions to carry out excellent research work. A report about such options will be prepared in 2002 to be considered by the next Cabinet for implementation.

Reform initiatives in science policy may emerge from the above-mentioned Foresight Education and Research. No Regret-measures that are mentioned in this document are:

- stimulation of transparency of the research system as a precondition for effective science policy;
- stimulation of interaction between the private sector and public research;
- stimulation of entrepreneurship amongst researchers;
- creation of more opportunities for young research talents;
- investment in European research networks.

In addition to that, a good policy mix of the policy options mentioned under 1.1 needs to be developed.

3. Government support for private-sector R&D and innovation

3.1. Changes to enhance the effectiveness of policy instruments used to provide public support for private sector R&D and innovation

Strengthening research carried out by companies continued to be the key pillar of innovation policy in the period under review. The 'WBSO', a fiscal allowance for wage costs directly relating to R&D, remained the single most important instrument in the area of taxation. The budget of the WBSO was in 2001 336,7 million Euro (which is about two thirds of the total budget for stimulating business R&D). The allowance is well used by SMEs (about 65% of total budget). In 2001 there were some changes in the rates to stimulate the use by techno-starters and SMEs. In addition to this the height of the allowances was made independent of the number of firms using the instrument. This has reduced uncertainty for firms. At the moment the government has started an evaluation of the instrument.

With the aim to increase the transparency and accessibility of the firm-oriented technology policy instruments for potential users, there has been a streamline of these instruments. This has led to the introduction of four 'new' instruments on 1 May 2001 that will be more compliant with the changing market environment. In the area of innovation finance, a new payback subsidy, TOP (Technological Development Projects) has replaced the TOK (Technological Development Credits). The TOP is largely similar to TOK. The main difference is the mode of delivery of the two instruments. In the case of the TOK, financial support was committed in the form of loans, while the TOP involves a subsidy with a conditional payback arrangement (excluding interest). The two credit facilities MPO (for sustainable product development) and Kredo (for the development of electronic services) were terminated at the end of 2000. On average, the streamlining involves a great deal of merging of instruments into a single scheme. Three existing instruments (BIT, BTS, and SMO) were merged into a new instrument for Technological Co-operation. In the area of knowledge transfer, the Feasibility Studies SMEs and KIM Knowledge Carriers in SMEs were merged into a new firm-oriented knowledge transfer facility, Knowledge Transfer Entrepreneurs SMEs.

In December 1999 a Plan for action 'Professional procurement policy' was published. An interdepartmental project organisation has been set up to put this plan into operation, the first results of which are becoming visible in the form of innovative contracts. Parliament has recently been informed on progress in this field.

The main actor fostering innovative organisational and management practices in enterprises remains Syntens, the innovation network with regional centres, that provide support and advice to SMEs on technology and innovation. Previously Syntens was more or less the only national scheme to incorporate this policy issue. Yet, the newly launched firm-oriented knowledge-transfer facility, Knowledge Transfer Entrepreneurs SMEs, also addresses this issue. The measure supports the development of a strategic plan by an external person or organisation. The aim is to improve strategy formation in firms.

In addition to this more attention was given to promoting techno-starters (see section 4.2).

3.2. Changes in the balance and/or priority of public support of business R&D and innovation

More than before attention is given to promoting R&D and innovation in SMEs. The same holds for strengthening the ability of SMEs to absorb technologies and know how (see section 3.1).

3.3. Assessments of the relative effectiveness of different policy measures

As described in section 3.1 the Ministry of Economic Affairs has streamlined its technology policy instruments. Prior to this streamlining operation all concerned instruments were evaluated. Evaluations will start shortly on the largest scheme WBSO and on cluster policy. The evaluation of WBSO will make use of econometric methods. In this evaluation a newly created data-set will be used that connects data from the implementation agency (Senter) to that of our Statistical office (CBS). In this way more quantitative effects can be established (8000 firms are connected).

As a result of a public debate a resolution in Parliament was accepted which asked for a comparison of the effectiveness of different instruments. In reaction to this resolution Dutch assessment practices were benchmarked with countries regarded to have a strong evaluation tradition, by an independent bureau. The aim was to identify good practices in measuring the (relative) effectiveness of innovation policy instruments. The benchmark showed that measuring the relative effectiveness of different instruments is very difficult, because of the differential aims of the instruments.

At this moment an interdepartmental policy investigation is under way that looks into the effectiveness of firm-oriented technology policy instruments as a whole from a systems perspective. The results of this operation may lead to – minor or major – adjustments of the existing policy mix.

4. Enhancing collaboration and networking among innovating organisations

4.1. Initiatives to promote collaboration and networking among innovating organisations

The Ministry of Economic Affairs remains very active in the area of innovative cluster policy. The Ministry has taken various actions aimed at supporting, facilitating and even improving clusters. In some technology field governments the problem is a lack of interaction between the relevant actors in the innovation system. Therefore government has a role to help actors find each other and thus stimulate innovation processes. In other fields there is too much interaction between the (limited number of) actors,

leading to system lock ins. In that case a strict competition policy is the most effective government policy to stimulate innovation processes.

In 2001 cluster monitors and technology roadmap were used to intensify the formation and exchange of strategic information. Cluster monitors are foresight studies into specific sectors performed in close co-operation with all relevant actors. Clusters that have been studied are multimedia, construction and EMVT. Technology Roadmaps have been performed in the fields of catalysis, electronics/mechatronics as well as around supplying and subcontracting. Implementation of these roadmaps together with industry and public sector organisations has started or will start in 2002. In December 2000 a Cluster Conference was organised to help firms, research institutes and intermediate organisations to find interesting cluster projects.

4.2. Initiatives to promote stronger industry-science relations

Intensified co-operation between research, universities and companies remains one of the key priority areas in Dutch innovation policy. Because of this continued emphasis, the measures introduced before continue to be operated. These include:

- The Leading Technological Institutes
- Innovation-oriented Research Programmes (IOP)
- R&D subsidy schemes which promote collaboration, such as BTS, SMO and EET.

A good example of collaboration among private and public sector organisations are the Leading Technological Institutes (LTIs) that were founded in 1997. The four LTIs are virtual yet recognisable institutes that concentrate on specific areas of study in the field of fundamental research. The areas of study are selected in close co-operation between the Dutch government and Dutch business and industry. At this moment there are four LTIs (the Dutch Polymer Institute in Eindhoven, the Wageningen Centre for Food Sciences, Telematics Institute in Enschede and the Netherlands Institute for Metals Research in Delft). Recently an interim evaluation was held, during which the institutes were assessed on their own merits. The main conclusion was that the LTIs are well under way in becoming leading institutes in their specific area of research and therefore deserve to subsidised for at least four more years.

Other initiatives that promote co-operation between science and industry are the Technology Foundation STW and ICES/KIS. The Ministry of Economic Affairs and the Ministry of Education, Culture and Science through the Research Council NWO contribute jointly to the Technology Foundation STW. The aim of their contribution is to promote high-quality technical-scientific research and its application by business in particular. Finally, projects in the context of ICES/KIS also involve private-public co-operation, since this interdepartmental working group stimulates companies and research institutes to develop joint investment plans that must lead to an additional investment package for the knowledge infrastructure for the years after 2002.

The changes that have occurred in this area in the period under review involve the launch of a new instrument Technological Co-operation (see section 3.1).

No major new policy initiatives or regulations to promote licensing have been developed in the period under review. The National Bureau of Industrial Property however, pursues an active IPR advisory policy towards the universities. Recently, a new pilot study has been launched to stimulate IPR-awareness of

senior officers of university faculties. Also digital IPR education programmes are available to teach (technical and law) students of a large number of faculties to create further awareness at universities.

In 2001 a policy brief was sent to Parliament concerning Patents and University Research. It sets the stage for future policymaking, which is still in its infancy. Some elements of such a policy have been formulated in the policy brief. These elements are:

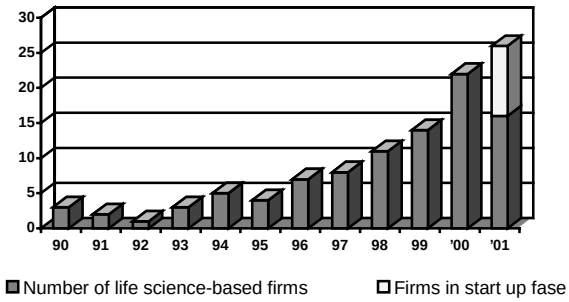
- Patent activities by universities have to be part of an explicit policy of technology transfer.
- The rights to patents belong to the universities; they can decide however to sell these rights to private enterprises or to license these rights.
- There will be no new legislation on patenting by universities in the near future.
- First of all there is a need to provide the universities with more information about the usefulness of patents and how an effective patent policy can be developed in practice.
- Specific mechanisms to support the exchange of information and know-how will be developed (*e.g.* the creation of a national network of patent experts of universities and research institutes).

An important outcome of the increased attention for patenting results of university research will also be an increased co-operation with the private sector and an increase in the creation of spin off companies, which provides opportunities to substantial new economic activities.

There are no instruments directed directly to the enhancement of the mobility of human resources between sectors. Of course policy is aiming to increase structural linkages between the public and private sector. Yet, enhancement of mobility is a 'by-product' of this policy and not the primary goal. On the other hand there are no formal restrictions to enhance the availability of human resources between sectors and there are some good practices (financing of chairs by industry, development of skills for university personnel in industrial awareness).

From 2002 onwards the Ministry of Economic Affairs will have in place a subsidy scheme for public knowledge institutions to enhance new technology based firms. This scheme will complement the sectoral schemes already existing for ICT- (Twinning) and life sciences-based start ups (Bio Partner). The scheme provides a subsidy of 40% of the project related costs for universities and public research institutions in providing accommodation, equipment and advice/support to new technology based firms. Not included in the scheme is the provision of seed capital (for this there is the existing market for seed capital), but assistance for starting individuals in setting up a good business plan is part of the scheme. During the implementation of the scheme two tendering periods are foreseen, in which the institutes can apply for subsidy. The applications will be ranked by a independent advisory committee. The scheme is meant to increase the number of new technology based firms from 1100 to 1650 every year.

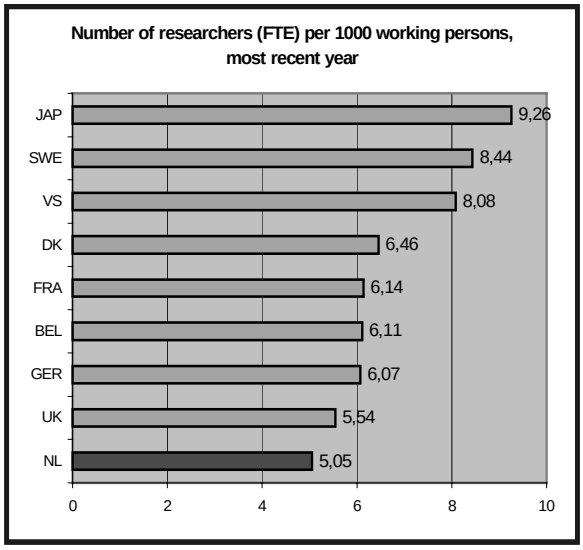
Bio Partner is operational since the end of 2000. The aim of the programme of the Ministry of Economic Affairs for which around EUR 45 mln. is available for 2000-2005, is to increase the number of life sciences-based start ups. Recently parliament was informed about the first results of the programme: a structural increase in the number of life sciences-based firms in the Netherlands (see figure).



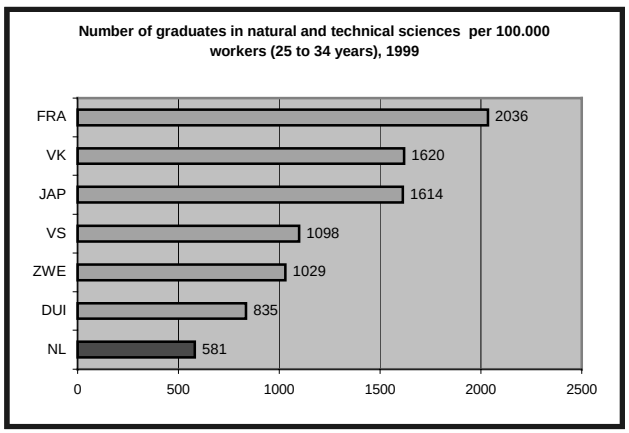
5. S&T human resources

5.1. Policy initiatives in response to real or perceived shortages of scientists and engineers

Compared to other countries the Netherlands has a very low number of scientists and students in natural and technical sciences. See the added figures.



Source: European Committee, 2001.



Source: OESO, 2001

It is clear that the coming decade will show severe shortages of good researchers in a host of areas. This is due for a large part to a high retirement number in that period (see the article of Van Dijk and Webbink on Shortages of scientists in the appendix). Therefore achieving a sufficient influx of researchers (Dutch and from abroad) and retaining them within the research sector are priority policy objectives. This was already stated in the Science Budget 2000 ("Nothing ventured, nothing gained").

Since then several studies were undertaken at the request of the Minister of Education, Culture and Science. The first ("Talent for the Future, the Future for Talent", 2000) described the problem in general. In 2001 two reports analysed the work climate for researchers ("Science: calling or job") and ways in which the private sectors attracts and retains scientific personnel ("Young academics in professional organisations"). These studies portray the dilemma's concerning the manpower for scientific research. Options for policy initiatives will be formulated on the basis of these.

Emphasis is also on initiatives to improve the position of young researchers. In the period 2001-2010 government will invest an annual sum of EUR 26 million Euro for the funding of 20 positions per year to enable talented researchers to start up a career in science. For the years 2000 and 2001 an additional start-up impulse is given that enables the funding of about 40 positions. Another measure to improve the position of young researchers is the appointment of young talented scientist as professor in areas of science in which professors will retire in a few years time ('roof tile construction').

Reason for special concern is the small percentage of women in especially the higher positions in the research communities. In reaction to this:

- A special stimulation programme has been established to further promotion of women researchers to sub-professoral level. This programme is run by NWO. For the programme, called "Aspasia", the Minister for Education,. Culture and Science, NWO and the universities have put together a budget of at least 7.7 million Euro.

- A proposal for a so-called expertise centre for "women and scientific research" is being developed by the scientific community. This centre should bundle and make available insights gained in why women are underrepresented in science and what can be done about that.

- NWO takes care that there is no gender bias in granting researchers money from the new incentive scheme for creative young researchers.

5.2. Changes in training and education programmes for scientists and engineers

National policies are formulated to boost interest in scientific and technological studies:

- AXIS, an organisation set up by Government, higher (vocational) education and industry in 1997, to implement projects between industry and primary or secondary educational institutions and to improve the intake to technical vocational training courses. At this stage over 50 projects have started financed by Axis;

- A so-called foster-plan for research institutes has been developed by the Dutch Association for the Advancement of Science and Technology (WeTeN), fostering upper secondary educational institutes to encourage the interest among youngsters for the research or designing process;

- Policies for informal education (science and technology communication through musea, science centres or events) have been developed to raise awareness of the public for science and technology.

5.3. Policy changes related to the international migration and mobility of S&T personnel

- As a new instrument to facilitate mobility of researchers a web-site has been set up by universities, which includes information for Dutch researchers wishing to work abroad (www.academictransfer.nl). Collaboration with existing initiatives in UK, Germany and France as a nucleus for a European Internet Infrastructure for career opportunities.

6. International co-operation and globalisation

6.1. Initiatives to promote international co-operation in science, technology and innovation

6.2. Policies and programmes to foster international collaboration in research and development

6.3. Initiatives to attract foreign direct investment into local high-tech industries and R&D activities

No fundamental changes in this field have taken place. The Netherlands Foreign Investment Agency Network (NFIA), a division of the Ministry of Economic Affairs, continued its activities: it facilitates foreign companies' direct investments in the Netherlands by providing extensive information and practical assistance. The same holds for the activities of the network of Technical Scientific Attachés, that enhance accessibility of relevant foreign technological knowledge to Dutch firms, government and knowledge institutes.

The streamlining of technology policy instruments of the Ministry of Economic Affairs (see section 3.1), however, did have consequences for the policy to promote international co-operation in science, technology and innovation. Activities that used to be covered by the BIT-instrument, now are covered by the Technological Co-operation instrument. It subsidises activities like:

- Eureka projects (max. subsidy EUR 1,5 mln. per project).

- Bilateral co-operation with other industrialised countries like the USA, Japan and Singapore (max. subsidy EUR 1,5 mln. per project).

- Bilateral co-operation with emerging markets (max. subsidy EUR 1 mln. per project).

Furthermore the Dutch government also subsidises Dutch partners that participate in very large Eureka projects, such as ITEA (Information Technology for European Advancement) and MEDEA.

In 2000 the bilateral co-operation programmes of the Ministry of Education, Culture and Science with Russia, Hungary, China and Indonesia were evaluated. This evaluation made clear that these programmes have positive results, so that it was concluded to continue these programmes. The subsidies given within those programmes fall under the Framework Regulation for Subsidies for Bilateral Scientific and Technological Research Co-operation (May 2001).

7. Industry-related policies

7.1 Globalisation

The trend towards globalisation is undeniable. Adapting to this trend primarily is the responsibility of firms. They should take up new possibilities and anticipate threats. The role of government is to monitor and – if necessary - improve business environment. In addition to that government has a role in preparing firms to adapt to changing circumstances. Helping firms to operate on international markets is one aspect of this. Special attention in this respect is given to impediments for entering emerging markets in Latin America, Africa, Asia and Middle and Eastern Europe. This is done by means of financial instruments, economic and trade missions and diplomatic contacts.

7.2 Manufacturing

There is no specific policy for the manufacturing industry in general. The manufacturing industry is covered by the generic policy instruments *e.g.* with regard to innovation or the business environment (see section 1). However for two sectors of the manufacturing industry a specific policy is still in place: defence related industries because of its public interest and shipbuilding because of existing trade distortions caused by state aid that enable foreign competitors to operate well below cost price. In the case of shipbuilding, Dutch policy attempts to abolish state aid that distorts competition and treat shipbuilding as other manufacturing industries.

Special attention is also given to enabling technologies like ICT and life sciences.

7.3 Services

Like the manufacturing industry, the service industry is covered by the generic policy instruments and is not supported by specific initiatives. There is however, growing attention for the increases of productivity in service industries, since these are substantially lagging behind. At the end of 2001 a benchmark report will be published which addresses the productivity problem in Business Services.

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7.4 Intangible Investment

The importance of managerial or organisational changes and employee training has become widely recognised. To stimulate firms to invest in these immaterial aspects of management, a new instrument has been developed by the Ministry of Economic Affairs and the organisation of registered accountants (NIVRA). The instrument in the form of web-site (www.mkbalans.ez.nl) is intended to help managers, accountants and financial organisations gain insight in these immaterial aspects. Managers for instance that fill in a questionnaire on their firm receive a digital report on the weaknesses and strengths of their conduct of business. They also can ask for an advice (Syntens) and have their position compared with those of firms in the same line of business.

7.5 Corporate Responsibility

Corporate social responsibility, *i.e.* individual enterprises with care for domestic and foreign social effects — is a government priority in The Netherlands. The Dutch government wishes to actively support this priority however without the use of separate government programs. Corporate social responsibility should develop bottom up in individual companies and the Dutch government has opted in this process for specific support, *i.e.* bringing parties together, develop and disseminate know-how and above all, promote transparency so that stakeholders can have a clear impression of the corporate social responsibility. As part of the current activities, the government is planning to take a number of new initiatives at local, national and international levels, such as:

- Encouragement of partnerships to strengthen the regional role of local government.
- The formation of an independent national knowledge and information centre to collect and disseminate information and where necessary, make adequate referrals to specific institutions.
- The integration of social aspects in corporate annual reports.
- Publication of a guide for international government procurement and tenders.
- A request for contributions from companies in solving major environmental national and international problems.