BLOSSOM: Support to analysis for long-term governance and institutional arrangements - Annex 6 — Netherlands country case studyNetherlands case study

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European Environment Agency

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Contents

Acronyms

AZ	Ministry of General Affairs
BLOSSOM	**B**ridging **LO**ng-term **S**cenarios and **S**trategic analysis — **O**rganisation and **M**ethods
BZK	Internal Affairs & Kingdom Relations
CBS	Central Bureau for Statistics
CCB	Climate Change and Biosphere Research Centre
CCVUA	Netherlands Research Programme on Climate Change Centre of the Free University of Amsterdam
CCT	Competencies Centre for Transitions
COS	Central Consultancy Organ of Sector Councils
CPB	Netherlands Bureau for Economic Policy Analysis
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
ECN	Netherlands Energy Research Foundation
EEA	European Environment Agency
EU	European Union
EZ	Economic Affairs
GaMON	Behavioural and social programme on the environment and nature
IAC	InterAcademy Council
I&M	Ministry of Infrastructure and Environment
IMP	PBL Department for Information Management and Methodology
IP	Innovation Platform
IPCC	International Panel on Climate Change
IPO	Inter-Provincial Consultation
KADO	The cabinet's broad approach to sustainable development

KNAW	Royal Netherlands Academy of Arts and Sciences
KMD	PBL Department for Climate and Global Sustainability
KNMI	Royal Dutch Meteorological Institute
KSI	Dutch Knowledge Network on system innovations and transitions
LNV	Ministry for Agriculture, Nature and Food Quality
LTI	Large technological institute
L&I	Ministry of Agriculture and Innovation
MA	Millennium Ecosystem Assessment
MNP	former Environmental Assessment Agency
NMD	National Environmental Policy Evaluation and Sustainability
NMP	National Environmental Policy Plan
NTV	Network Foresights
NWO	Netherlands Organisation for Scientific Research
OCW	Education, Culture and Science
OECD	Organisation for Economic Cooperation and Development
PBL	Environmental Assessment Agency
PCCC	Platform Communication on Climate change (The PCCC is a cooperation between the larger climate knowledge institutions in the Netherlands (PBL, KNMI, WUR, ECN, Free University, University Utrecht, Deltares and NWO).
RIVM	National Institute for Public Health and the Environment
RIZA	Water Service
RLG	Council for the Rural Environment
RLI	Council for the Environment and Infrastructure
RMNO	Advisory Council for research on spatial planning, nature and the environment
RPB	National Institute for Spatial Research
SCP	Social and Cultural Planning Office
SER	Social and Economic Council

UM/ICIS	International Centre for Integrative Studies of the University of Maastricht
UNEP	United Nations Environment Programme
UNEP — GEO	United Nations Environment Programme — Global Environmental Outlook
UU	Utrecht University
UvA	University of Amsterdam
VAM	Behavioural and social research programme on vulnerability, adaptation, mitigation
V&W	Ministry of Transport, Public Works and Water Management
VNG	Union of Dutch Municipalities
VROM	Ministry of Housing, Physical Planning and Environment
VWS	Ministry of Health, Welfare and Sport
WAB	Research Programme on Scientific Assessment and Policy Analysis for Climate Change
WINN	WaterINNovation
WLO	Long-term scenarios on well-being and the environment
WRR	Scientific Council for Governmental Policy
WUR	Wageningen University and Research Centre
WWI	Department of Housing, Neighbourhoods and Integration

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- Aldert Hanemaaijer MSc, Senior Researcher Sustainable Development, and project leader/ team member for a number of high-profile outlooks for Dutch policymakers, Netherlands Environmental Assessment Agency (PBL)
- Simône Huys PhD, Advisor Strategy of the Executive Board Office of the Dutch Ministry for Agriculture, Nature and Food Quality (LNV)
- Dr Sietske Veenman, researcher in the WRR study on practices of foresights and Assistant Professor in the Department of Social and Political Studies of the Environment, Management Faculty, Radboud University Nijmegen

This case study report is one of 12 reports completed for the following EU Member States: Germany, Spain, France, Hungary, Netherlands, Austria, Poland, Portugal, Slovenia, Finland, Sweden, United Kingdom.

The opinions and conclusions presented here are the sole responsibility of the consultants and do not necessarily reflect those of EEA.

1 Introduction

1.1 Introduction

This report sets out the current status of the main institutional and governance arrangements for futures thinking in the Netherlands with respect to environmental — and environment-related — policymaking. It is an update of the case study report completed under the previous Blossom project in October 2009 and is based on a review of changes in documentation and other available resources, and a set of interviews with high-level officials and experts in relevant government departments, agencies and institutions. The aim has been to understand how futures thinking is undertaken in the Netherlands, the relationships between different futures programmes, and how these relate to, and influence, environmental policymaking. The report particularly tries to identify the success factors in ensuring futures thinking is embedded in environmental policymaking; however, barriers to success are also identified. It does not seek to explore the whole range of futures work, only those aspects of most relevance to environmental policymaking, and is focused on the institutional and governance structures, not the details of the futures studies or the quality of those studies. Further details can be found in the Appendices.

In 2009, the previous version of this report, along with similar reports for seven other EU Member States, formed the basis for further cross-country analysis during the summer of 2009 to identify common themes and issues in institutional and governance arrangements, as well as distinctive aspects of different cultural and administrative traditions and approaches to futures thinking. This updated report has been used to inform a revised cross-country analysis, which has also drawn upon new case studies in four additional countries: Germany, Hungary, Austria and Portugal.

This study presents the results of an attempt to synthesise and evaluate current practices: it is meant to shed light on important developments and stimulate discussion but it is not meant to be understood as a comprehensive and concluding assessment of futures-oriented studies or their impacts on decision-making.

Furthermore, the examples of current and historic futures thinking in the Netherlands identified in this report have been selected to illustrate key aspects of the approach and they should not be seen as an exhaustive list or full representation of practice.

2 The landscape for long-term thinking and governance in the Netherlands

2.1 Background

The Netherlands has a strong and long-standing tradition in long-term planning due, in large measure, to the country's tradition of 'creating' its environment — in particular gaining land from water — and then protecting this low-lying land. The large-scale investments made after the massive flooding in 1953 required a long-term perspective, and they have lead to a unique governance culture with water district boards (polder boards), i.e. elected bodies that have a strong planning role outside the parliamentary setting and that reinforce the country's corporatist structures. Consequently, the Netherlands now has some 60 years' experience of long-term policy planning.

With its well-known polder model, the Netherlands is traditionally strongly oriented towards consensus, though this consensus certainly did not always come easy within the old polder or water boards, whose origins date to the Middle Ages, (Te Velde, 2007) and probably still doesn't. Characterised by a corporatist system and extensive consultation structure, the Netherlands has developed a system of institutions that creates possibilities for long-term policies and, hopefully, helps to better prepare for future developments and willingness to invest in the future. Both government and national agencies have extensive experience of using futures thinking. Besides the ministerial departments that develop long-term policies, there are numerous councils and planning bureaus that perform forward-looking activities and conduct futures-oriented research. Most of them are permanent organisations set up by the Dutch Government, the roots of which go a long way back. Whereas the planning bureaus mainly have the task to monitor developments (e.g. research with regard to environment and sustainability, making up the *Environmental Balance* and performing futures-oriented research), the councils generally have the function to provide mid to long-term strategies that are in line with European policies and that take into consideration global trends.

The Netherlands has also played a prominent role at international level, sharing its expertise in long-term analysis to support work at the Organisation for Economic Cooperation and Development (OECD), the United Nations Environment Programme (UNEP) and other organisations.

2.2 Responsibilities

To characterise the Dutch setting, it is first of all important to introduce the main ministries involved in environmental planning: the Ministry for Agriculture, Nature and Food Quality (LNV), the Ministry for Housing, Physical Planning and Environment (VROM) and the Ministry for Traffic, Public Works and Water Management (V&W) ([1]). These three ministries turn to the councils, agencies and assessment institutes that are installed to support them in formulating long-term policies for advice. There is a considerable amount of cross-fertilisation across government and statutory agencies with responsibility for environmental policy in terms of shared futures thinking and approaches, helped by a number of growing networks of practitioners and advisors.

Each of the three ministries has its own main advisory bodies and assessment institutes. For the LNV, these include the Council for the Rural Area (Raad voor het Landelijk Gebied, RLG) and this ministry works closely with a large research organisation, Wageningen University and Research

([1]) In October 2010, the Ministry for Agriculture, Nature and Food Quality (LNV) and the Ministry of Economic Affairs (EZ) merged to form the Ministry of Agriculture and Innovation (L&I), and the Ministry of Housing, Physical Planning and Environment (VROM) and the Ministry of Transport, Public Works and Water Management (V&W) merged to form the Ministry of Infrastructure and Environment (I&M). As this analysis pertains to the situation before that date, we will use the names of the old ministries in the remainder of this chapter.

Centre (WUR/DLO). An example of futures work on agriculture is the Eururalis project (Box 1). The V&W turns for support to the Advisory Council for Transport, Public Works and Water Management (Raad voor Verkeer en Waterstaat) and the Water Service (Waterdienst, RIZA). The VROM has its own VROM Council that advises government and parliament on sustainable policies in the domains of housing, spatial planning and environment.

In addition to these councils and services, there are dedicated evaluation and planning agencies that have an advisory function with regard to the protection of the environment for all three ministries (as well as some others), such as the National Institute for Public Health and the Environment (RIVM), the Environmental Assessment Agency (PBL) and — up until January 2010 (Section 2.2.3) — the Advisory Council for Research on Spatial Planning, Nature and the Environment (RMNO). These three bodies are described in the following sections.

Most futures studies mainly focus on the specific ministerial domain, (i.e. they are sectoral) though the need for more general, government-wide futures work is, on occasion, felt. Such broader research is usually produced by general councils that have an important function with regard to environmental planning, such as the Scientific Council for Governmental Policy (WRR), the Central Planning Bureau (CPB) and the Social Cultural Planning office (SCP). These councils and planning bureaus produce the background information that forms the basis for more specific, departmental futures work. Thus, the departments rely on these institutions and their established reputations. The work of the WRR and the CPB is described in greater detail below.

The following sections describe important institutions and planning bureaus for futures thinking, and also describe two key forward-looking environmental studies, one on sustainability and the other on water issues. There are many councils and planning agencies involved, so it is inevitable that a selection must be made. The councils and planning bureaus described here have a broad role, i.e. an advisory function for more than one ministry.

2.2.1 National Institute for Public Health and the Environment

This institute (RIVM by its Dutch initials) conducts research, gives advice and supports government departments and professionals in the fields of health, nutrition and environmental protection. The RIVM mainly works for the Dutch Government but also the Ministry of Health, Welfare and Sport (VWS) under which it resides, the Ministry of Housing, Physical Planning and Environment, and the Ministry of Agriculture, Nature and Food Quality. It also shares its knowledge with governments and supranational bodies around the world (e.g. EU institutions and United Nation's bodies). Every four years, the RIVM sets its new strategic research programme. The research programme has to be approved by the ministers of the three ministries involved (VWS, VROM and LNV). The results of its research, monitoring, modelling and risk assessment are used to underpin policies on the environment, food, safety and public health. The RIVM produces annual scientific reports.

The RIVM previously published an annual *Environmental Balance* as well as an *Environmental Outlook* every four years. This responsibility has now transferred to the PBL (more information in Section 2.2.2). Both of these outputs serve as the scientific basis for the development of the National Environmental Policy Plan (NMP). Within this framework, the role of the *Environmental Balance* and the *Environmental Outlook* is outlined as providing feedback on environmental quality for environmental policymakers, as a means to develop efficient environmental policies, and to monitor and adjust current policies in view of actual or anticipated developments.

In general, the procedure is that the *Environmental Balance* is presented to the minister after it is has been presented to the Permanent Chamber Committee for the Environment of the Dutch Senate *(Eerste Kamer)*. The report is often cited in debates in parliament, and used as background for proposals for policy change, for example to improve success with regard to the formulated objectives.

The same can be said about the *Environmental Outlook* and the recent *Sustainability Monitor*, though these usually elicit somewhat less strong reactions in the policy and political sphere. On the other hand, the reactions and discussion related to these two reports seem to continue for a longer period of time than those incited by the *Environmental Balance*. In fact, the publication of the *Balance* and the *Outlook* almost always lead to reactions from the cabinet and to discussions in parliament ([2]).

([2]) Simône Huys PhD, Strategy Advisor to the Executive Board Office of the Ministry for Agriculture, Nature and Food Quality (personal communication).

2.2.2 *Netherlands Environmental Assessment Agency*

In 2002, part of the environmental research at the RIVM was positioned separately in the Netherlands Environmental Assessment Agency (MNP). In January 2006, this agency became an independent organisation its independence being laid down in the law on the RIVM. In May 2008, a revision of the Dutch advisory system resulted in the fusion of the National Institute for Spatial Research (RPB) and the former Environmental Assessment Agency (MNP) into a new Environmental Assessment Agency (PBL). The PBL resides under the VROM and is now the national institute for strategic policy analysis in the field of environment, nature and spatial planning (besides the VROM, also the LNV, the V&W, Economic Affairs and External Affairs). It contributes to improving the quality of political and administrative decision-making by conducting outlook studies, analyses and evaluations in which an integrated approach is considered paramount. Policy relevance is the prime concern in all studies, but it is laid down in law that the PBL can maintain an independent position in its advice to the government. The PBL is autonomous in defining its research questions as well as in the choice of its research methods and how to report results, for both solicited and unsolicited advice. Core tasks of the PBL are:

- to investigate and document current environmental, ecological and spatial quality;
- to explore future social trends that influence environmental, ecological and spatial quality, and evaluate possible policy options;
- to identify social issues of importance to environmental, ecological and spatial quality and raise them for discussion;
- to identify possible strategic options for achieving government objectives in the field of environmental, nature and spatial policy.

The Environmental Assessment Agency cooperates closely with other independent Dutch scientific and advisory councils, planning agencies and research institutions.

In the relationships between the RIVM, the PBL and the government we see a systematic policy cycle at work in which evaluative research, futures-oriented research and policymaking go hand in hand: the *Environmental Balances* and *Environmental Outlooks* (now produced by the PBL) serve as the scientific basis for the development of the National Environmental Policy Plan (NMP). The National Environmental Policy Evaluation and Sustainability Department (NMD) of the PBL coordinates the exchange of information with policymakers.

Box 1 Eururalis

The Eururalis project sought to answer a series of questions about the future of Europe's rural areas, including the effects of accession, the impacts of biofuels policy, and possible future developments of global and European markets. The study was undertaken by the Alterra Institute and the Land Dynamics Group, both at Wageningen University, together with the national Environmental Assessment Agency and the Agricultural Economics Institute.

The study looks to 2030 and develops four scenarios, closely based on IPCC scenarios: Global Economy, Global Cooperation, Continental Market, and Regional Communities. Among its conclusions, the study notes that global forces — including population and economic growth — will play a key role in shaping the future of Europe's rural areas.

The project has so far had two iterations: Eururalis 1.0, released in 2004 under the Dutch Presidency of the EU, and Eururalis 2.0, released in 2007. A third version is currently underway.

Source: www.eururalis.nl.

In 2006, instead of a fifth environmental policy plan following the sixth *Outlook*, the State Secretary of the Ministry of Housing, Physical Planning and Environment prepared a different document: an agenda for the future. This future agenda for environmental policy is primarily an instrumental agenda; it doesn't question the objectives proposed by *Environmental Outlook 5* and set in the NMP4, but it presents a new, 'business-like' approach of environmental policy. According to the state secretary, a new approach was much needed, for the available instruments appeared to form an insufficient base to get the implementation of the fourth national environmental policy plan (NMP4) off the ground. Moreover, the economic recession was forcing the government to formulate priorities: not all the plans could be achieved immediately. With its new 'improved' instruments and concrete plans, the future agenda maintains the objectives previously set and seeks to realise them.

In 2009, it was decided that the Environmental, Nature and Spatial Balances should be integrated into one Balance for the living environment

(*Leefomgevingsbalans*) which will be published every two years. The first was scheduled for September 2010. In the alternating years, the PBL will publish a Signals report (*Signalenrapport*), to keep track of relevant important developments that take place in the meanwhile. There seems to be some tension with regard to the integrated balance in the sense that the ministers would still like to see 'their' domain clearly distinguished in separate paragraphs. The future will tell how this new Balance will develop, and whether and how this will effect the collaboration between the ministries involved ([3]).

Within the PBL, the department for Information Management and Methodology (IMP) manages much of the PBL's information on environment and nature. This information is processed via the online *Environmental and nature compendium* (a joint publication of the Central Bureau for Statistics (CBS) and the RIVM) that also provides the necessary information for the annual Environmental Balance and Nature Balance. Another example is the information system of emissions registration. The IMP team advises on the methods and techniques that can be used to analyse and present information and with the exploration of future developments. Important products are the guidelines 'Dealing with uncertainties' and the catalogues with information on all the quantitative models that are used by the PBL.

Another department, the team for Climate and Global Sustainability (KMD) makes evaluations and casts forward-looking analysis on the possibilities and opportunities for the national energy and climate policies. The team supports the Dutch Government in its policy position with regard to the international climate policies both on a European and global level. The KMD uses models for analysis of global sustainability issues, mainly focuses on the EU and broader international institutions like the UN environmental programme, the World Bank and OECD.

Thus, the PBL is also an important actor from the international perspective: it contributes to outlooks and future studies on a European and international level. The PBL was involved in the preparation of the OECD *Environmental outlook*, the scenarios for UNEP's *Global environmental outlook (UNEP-GEO)*, the scenarios for the *Millennium ecosystem assessment (MA)*, and also the scenarios for recent IPCC reports.

In February 2010, some mistakes were identified in the IPCC Climate report of 2007. Immediately after the media had labelled this as 'climate-gate', approximately 50 Dutch climate researchers reacted with an open letter to counter the commotion and underline the legitimacy of the main conclusions of the IPCC report (Turkenburg et al., 2010). The scientists are worried about the way the climate debate is currently developing within society. Qualifications such as 'traitors' and 'climate mafia' distract attention from the heart of the matter: charting the impact of the climate problem (by science), and collaboratively looking for solutions (by the government, policymakers, business and industry, and science). By subsequently addressing, in their open letter, the climate problem itself (What do we know for sure?), the working methods of the IPCC (How stringent, open and transparent are these methods?), and the way the quality of the IPCC reports is guaranteed (How does it work at the moment and how can this still be improved in the near future?), the scientists hope to be able to adjust the public's opinion on science.

Nevertheless, in accordance with the request of the minister of the VROM (Cramer, 2010), the PBL decided to investigate whether the report contains more inadequacies and, if so, whether this has implications for the main conclusions (which form the basis for the national and international climate policies). The Royal Scientific Academy (KNAW) has been asked to safeguard the quality of the investigation. In April 2010, the PBL opened a website where interested parties can report any inadequacies they find ([4]). In July, the report with the results of the investigation was presented, stating that the main conclusions of the UN Climate

([3]) Besides the RMNO, another sectoral organ, i.e. the Central Consultancy Organ of Sector Councils (COS) was also discontinued.
([4]) http://www.pbl.nl/meldpunt.

panel on regional consequences of climate change remain unchallenged (PBL, 2010) ([5]).

2.2.3 *Advisory Council for Research on Spatial Planning, Nature and the Environment*

Until its discontinuation in January 2010, the Advisory Council for Research on Spatial Planning, Nature and the Environment (RMNO) provided advice on the form and content of the relations between knowledge and policy in the domains of space, nature and the environment. The discontinuation of the RMNO was another consequence of the revision of the advisory system in 2008 ([6]). The scientific staff of the RMNO has been taken over by the VROM. Various other tasks that were previously performed by the RMNO, are presumed to have been taken over by the PBL and a new Council for the Environment and Infrastructure (RLI). The RMNO operated under the VROM as an independent, service-oriented adviser. The Council had 15 members, both researchers and users of research, and four advising members from the ministries. In its operational activities, the RMNO used to look at up to 15 years ahead in the future. Within its last work programme, projects can be divided into three related themes: knowledge strategies, governance and the physical living environment. Each category had its own appointed council member as its leader.

The RMNO proved to have a strong capacity to blend methodological and domain-oriented expertise. This can be seen in its 2001 report, *Reappraisal for Cassandra — a methodological elaboration on future research for environmental policy* ([7]). In the process of formulating knowledge for policy purposes, the RMNO follows a specific approach and methodology: putting the issue in question on the agenda, setting a programme, implementing the programme and using the knowledge acquired. Each of the tracks in this course can be managed in processes. The participants in each process include experts chosen for their relevant knowledge and policymakers. The application of this methodology leads to an unorthodox process of scientific research, both interdisciplinary and trans-disciplinary, together with advanced proposals for policy development. The results are laid down in documents on themes such as sustainable development and the governance of long-term decisions, the roles of knowledge about nature and the environment in policy processes, how to achieve sustainable transitions, risk governance, environmental governance in Europe, alternative sources of energy, biotechnology and food.

2.2.4 *Scientific Council for Governmental Policy*

The Scientific Council for Governmental Policy (WRR) is an independent think tank residing under the Ministry of General Affairs (AZ). Its aim is to advise the government about future developments of public interest using a scientific approach. Some of its reports are prepared at the government's request: others it undertakes independently (e.g. the study Toward new ways in environmental policy, 2003). Among other things, it is the task of the Council to:

- present new perspectives and long-term directions for solutions;
- indicate conflicts and contradictions in government policy;
- flag future bottlenecks;
- identify new problems; and,
- make proposals for integrated strategies for problems.

The government can use these advisory opinions in decision-making, for example to adjust existing policy and develop new policy directions. The Council also tries to stimulate scientific debate.

([5]) The Secretary-General of the United Nations, Ban Ki-Moon, installed a committee of scientists that will also study the currently debated IPCC Climate report. Robbert Dijkgraaf, chairman of the Royal Dutch Academy of Science (KNAW), University Professor at the University of Amsterdam (UvA), and co-chair of the InterAcademy Council (IAC) under whose flag the committee operates, took the lead in this project. Prof. Harold T. Shapiro, economist and former president of Princeton University and the University of Michigan, will chair the 12-member committee; Louise Fresco, another university professor at the UvA, will also be member of the evaluation committee. The InterAcademy Council, created in 2000, produces reports on scientific, technological, and health issues related to the great global challenges of our time, providing knowledge and advice to national governments and international organisations. The 18-member InterAcademy Council Board is composed of presidents of 15 academies of science and equivalent organis ations — representing Argentina, Australia, Brazil, China, France, Germany, India, Indonesia, Japan, South Africa, Turkey, the United Kingdom, and the United States of America, plus the African Academy of Sciences and the Academy of Sciences for the Developing World (TWAS) — and representatives of the InterAcademy Panel (IAP) of scientific academies, the International Council of Academies of Engineering and Technological Sciences (CAETS), and the InterAcademy Medical Panel (IAMP) of medical academies. It was expected that by August 2010, the research into the IPCC report would be concluded.

([6]) Besides the RMNO, another sectoral organ, i.e. the Central Consultancy Organ of Sector Councils (COS) was also discontinued.

([7]) http://www.rmno.nl/files_content/oude%20publicaties/Eerherstel%20voor%20Cassandra_3.pdf

On the basis of scientific knowledge, preconceived assumptions are subjected to discussion, possible alternative policies are analysed, and solutions with an eye to future developments are presented. This way, the WRR forms a bridge between scientific expertise and policy. The members of the Council are appointed for a period of five years, and it is advised by high-level representatives of the RIVM, PBL, CPB, SCP and CBS.

In its 2008 report *Climate strategy — between ambition and realism*, the WRR puts forward three solution pathways for addressing the climate problem: adaptation to a changing climate; selection of promising global mitigation routes up to the year 2050; and the international coordination that is needed in order to exploit those routes successfully. In this report to the government, complicating factors and uncertainties for policy were described and, taking these into account, a strategy for climate policy was proposed. This proposed strategy is intended to provide the direction for future Dutch climate policy within the EU and of the EU in a global context. Recent programme topics —besides more social topics — include the practice of futures thinking (see the analysis in Chapter 3) and the future of public administration and its constitutional setting.

The WRR, the Innovation Network Green Space and Agrocluster and the RMNO have jointly studied methodologies for future research and strategic environmental policy. For example, they built on RMNO's publication on future research for environmental policy, *Reappraisal for Cassandra* (Section 2.2.3) to prepare a *Hand oracle for future research* (2001) ([8]), in which both knowledge and process requirements for future research concerning strategic environmental policy are described. Along with the publication, a *digital blikopener* (can-opener) ([9]) was provided, with the intention of enabling users to open the potential of future research for strategic environmental policymaking.

2.2.5 The Netherlands Bureau for Economic Policy Analysis

The Central Planning Bureau (CPB) — now called the Netherlands Bureau for Economic Policy Analysis — also conducts futures-oriented research and prepares forecasts in the fields of mobility, infrastructure, spatial economics, agriculture, housing, nature, energy and the environment. The CPB is under the Ministry of Economic Affairs and is financed from the general budget. The CPB also has its own external advisory body, the Central Planning Committee, which advises the board of the CPB.

The Bureau's long-term scenarios sketch strongly differing, but plausible and internally consistent futures of the Dutch economy in the coming 20 to 40 years — and sometimes for longer terms. These scenarios are meant as a contribution to policy development in the Netherlands as well as to the debate regarding the strategic choices for the long term. In November 2004, the study *Four Futures of the Netherlands* was published, including four new scenarios for the Dutch economy based on the Bureau's international study *Four Futures of Europe*.

The Netherlands Bureau for Economic Policy Analysis is very influential regarding long-term policy advice. It performs cost-benefit analyses of all long-term infrastructure investments proposed by Dutch ministries, including those on water and transport. Other agencies such as the PBL often work with the Bureau: the PBL's environmental analyses are used by the CPB in its integrated assessments.

As an example, the CPB, the PBL and two other agencies — the Central Bureau of Statistics and the Sociocultural Planning Office — worked together on the *Sustainability Monitor* for the Netherlands (Box 2).

2.2.6 The Delta Committee

The Netherlands faces many new challenges where water is concerned, in particular due to climate change impacts. In the coming decades, the country will be confronted not only with an increasing risk of flooding, but also by challenges to water quality, droughts and salinisation. To advise the cabinet on water policy for the next century and beyond, in September 2007, a (second) Delta Committee was appointed (the first Delta Committee was created after the devastating floods that hit the Netherlands in 1953). This section describes the creation of this temporary committee and the links between its work and the policy decisions concerning water and flood management.

([8]) http://www.habiforum.nl/upload/documents/habi/Habi062%20Handorakel%20voor%20toekomstonderzoek.pdf
([9]) Besides 'can', 'blik' in Dutch also means 'view', 'vision', 'perspective'.

Box 2 The Sustainability Monitor

To gain an insight to the core question as to whether the Netherlands is developing in a sustainable direction, the Cabinet Balkenende IV has asked the Central Bureau for Statistics (CBS) and the planning agencies (Netherlands Bureau for Economic Policy Analysis (CPB), the PBL and the Social Cultural Planning Office (SCP)) to develop a Sustainability Monitor for the Netherlands. After a first *Outlook on Sustainability* (2004): *Quality and Future* and a second *Outlook on Sustainability* (2007): *the Netherlands Later on (Part 1) and the Netherlands and a sustainable world: Poverty, climate and biodiversity (Part 2)*, the Monitor was delivered in 2009 and has been reviewed and a second edition of the Monitor is expected in 2011. The PBL/NEAA were responsible for the production of the Sustainability Monitor,

This initiative took place in the context of the cabinet's broad approach towards sustainable development (KADO, *Kabinetsbrede Aanpak Duurzame Ontwikkeling*). In its broad approach towards sustainable development (KADO), the cabinet chose to work on the implementation of six themes coherent with global solidarity and directly related to climate change and biodiversity. Each of these themes is seen to offer opportunities. But to actually realise the goals, policy choices will have to be made. This is illustrated for each of the themes with an example.

1. *Water and climate adaptation:* spatial planning can limit vulnerability for flooding.

2. *Air pollution emissions:* based on the working programme 'Clean and Economical' *(Schoon en Zuinig)* for 2020, stringent European policies on technical equipment and cars are necessary.

3. *Biofuels*: identify indirect effects on land use, prices and development.

4. Investment for *carbon-capture and storage*, and identify the roles of government and industry.

5. *Biodiversity, food and meat*: the effects of changes in diet and the production chain on the meat and dairy sector and the country's international competitive position — as well as health.

6. *Sustainable construction and urban development* that will be energy-neutral in 2050.

The Sustainability Monitor shows the areas where things are going well and where there is reason for concern. It is meant as a contribution to the discussion with politicians, policymakers and scientists about sustainable development for Dutch society.

The Monitor presents a collection of indicators, the scores of which give a good description of sustainable development of Dutch society through time and compared to other European countries. On the basis of these indicators, the Monitor identifies and analyses future concerns.

As sustainability is a broad concept, the set of indicators focuses on 12 themes:

- climate and energy
- biodiversity
- soil, air and water
- Social participation
- trust
- employing labour
- education
- health
- physical capital
- knowledge
- distribution and inequality
- international dimension (the effects of Dutch actions globally).

It is expected that further elaboration of the KADO themes will shed light on other opportunities and, at the same time, on difficult choices to be made. These insights can help create more coherence in the policies and reduce the chance of unnecessary losses in other themes. Moreover, it can lead to 'flank protection', i.e. to additional policies that compensate substantial negative effects for other themes and specific social economic groups.

In May 2008, the cabinet submitted details of its approach to the lower house of the Dutch parliament and in February 2009 saw the publication of the report on sustainability in the Netherlands: Monitor Duurzaam Nederland.

In its vision of national water policy, *Safeguarding our future (Outlook on water/Watervisie*, 2007), the government describes the direction that policy developments should take in the coming years in order to make and keep the Netherlands climate-proof in the long term (up to and beyond 2100). For example, this Water Vision emphasises the need to cooperate in order to adapt water policy to expected changes in climate. Another reason for reinvigorating water policy is the need to achieve a greater degree of policy coherence. Projects will be more robust, more effective and relatively less expensive if they are more interconnected. In addition, it will be necessary to work out sustainable water policy in greater detail by allowing more room for water and restoring natural processes.

The Water Vision features five areas, highlighting the spearheads of water policy.

- To climate-proof the Netherlands together — collaboration with other parties, such as managers, the general public, companies and civil society organisations.
- The Dutch use water to reinforce their economy — the government wants to utilise economic opportunities by combining different functions in water management. In dealing with the

Afsluitdijk closure dam, for example, it can also invest in energy generation, recreation, transport or housing.

- The Dutch live with water in a sustainable way — measures preventing floods, water-logging and deteriorating water quality should be combined with improvement of ecological features. In addition, the government wants to invest further in relationships with other countries with which the Netherlands shares the management of rivers and seas.
- The Netherlands uses its knowledge of water to help other countries around the world — the government wants to make a greater contribution to solving water-related problems in developing countries. The Netherlands has already concluded agreements to share water knowledge with several countries ([10]).
- The Dutch rediscover living with water — the government wants to involve people more closely in the opportunities offered by climate change and the expected volume of excess water a particular area will have to accommodate. This can be achieved by increasing attention to water in education.

Under the theme 'Reclaiming the Netherlands from the future', the Water Vision was, in 2007, the starting point of a process that eventually led to a plan for climate-proof water management in the Netherlands: the National Water Plan. The Water Vision built on a series of work — the fourth National Policy Document on Water Management (*Vierde Nota Waterhuishouding*), the Water Management in the 21st Century Advisory Committee (*Commissie Waterbeheer 21e eeuw*) ([11]) and the National Administrative Agreement on Water (*Nationaal Bestuursakkoord Water*) — that provided important impulses for water management. The first National Water Plan, which is a framework vision based on the new Water Act (Waterwet) and the Spatial Planning Act (*Wet Ruimtelijke Ordening*) drafted for the 2009–2015 planning period, represented a new phase in the process. With its National Water Plan, presented at the end of 2007, the cabinet has opted for a future-driven national water policy based on concrete measures that can be taken now. The National Water Plan appears once every six years and lays down the main points of the national water policy.

In the Water Vision (i.e. Outlook on Water), the cabinet set out the aim of stepping up its ambitions and pursuing sustainable and climate-resistant water management. To achieve this aim, the cabinet established the second Delta Committee

([10]) The cabinet wants the Netherlands to cooperate actively with countries in low-lying delta areas, protecting them against floods and ensuring sufficient and clean water. Central to this are climate adaptation and contributing towards achieving the Millennium Development Goals. From a number of deltas, the cabinet has chosen the Mekong delta and decided to enter into long-term cooperation agreements with the government of Vietnam. This partnership will be based on the existing Partners for Water (*Partners voor Water*) programme, which is to be extended for a period of six years to 2015. In addition, where opportunities arise and a demand for Dutch technology and knowledge is made known, the cabinet supports an approach based on a global positioning of the water and delta technology sectors of industry. An international 'water sector marketing programme' (*Marketing Programma Watersector*) is to be developed in 2012.

([11]) This Water Management in the 21st Century Advisory Committee was installed because of the concern for the expected increasing water level of rivers and sea. In 2000, the Committee issued advice on how to structure water management in the Netherlands. The essence of the advice was that water should be given enough space. This has lead to all kinds of activities concerning 'water management in the 21st century'. In its standpoint 'Dealing with water differently' (Anders omgaan met water), the cabinet formulated its water policy according to this advice.

(*Deltacommissie*) to advise on water policy for the next century and beyond. The 'new' Delta Committee, officially called the Sustainable Coastal Development Committee, was appointed September 2007 to formulate an integrated vision on the long-term protection of the Dutch coast and its low-lying hinterland. In 2008, the Delta Committee proposed increasing flood protection and securing freshwater supplies in the long term, an advice it embedded in 12 recommendations.

The cabinet endorsed this cohesive vision and decided to use it as a starting point for further elaboration. The first policy-based detailing of the vision forms part of the national water plan. In an appendix, it is explained how each of the 12 recommendations are incorporated into the plan.

To guarantee the continuity and cohesion of the approach recommended by the Delta Committee in the long term, the cabinet introduced a Delta Act (*Deltawet*) in 2009, addressing the legal basis for the Delta programme (*Deltaprogramma*), the tasks and powers of the Delta manager, and the way in which a solid financial base can be laid. The central government's ambition is to invest in flood protection and defence and in freshwater supply in the next decades. Expenditure is not included in the draft national water plan but will be detailed in the context of the Delta Act and the Delta programme. The funds the central government put at disposal for the planning period suffice to carry out the planned measures for which the central government bears responsibility. The intention was to introduce the European Directive on Flood Risks (*Europese Richtlijn Overstromingsrisico's*) ([12]) into Dutch legislation during the planning period. Risk maps and flood risk management plans are to be jointly developed with neighbouring countries.

Alongside the plans for ensuring the future safety and liveability of the Netherlands, the implementation of measures is already in full swing. The flood protection programme (*Hoogwater-beschermingsprogramma*), the weak links along the Dutch coast (Zwakke Schakels Kust) action plans and the programmes for river widening, 'Room for the River' (*Ruimte voor de Rivier*), and the Meuse projects (*Maaswerken*) are making good progress. The National Administrative Agreement on Water, updated in 2008, is being used to improve water systems by 2015, especially in terms of flooding and water shortages.

To implement the Delta Plan and the Delta programme, the cabinet has installed a ministerial steering group, with representatives of the VROM, LNV, Internal Affairs and Kingdom Relations (BZK), Economic Affairs (EZ) and Finance. The prime minister is the chair and the State Secretary of the Ministry of Transport, Public Works and Water Management (V&W) will be the coordinator and hold primary political responsibility. Cooperation between government bodies is being intensified. Examples include the links between work on the Water Framework Directive, reinforcing a river-basin approach, and the national 'Space for the river' programme. It is being considered whether collaboration between the river basin authorities can be made more effective.

The central government is encouraging water managers and safety regions to draft cooperation agreements, in addition to their existing statutory obligations, establishing the role they are to fulfil in disaster mitigation during an actual or impending flood. The results of the work done by the Flood Management Taskforce (*Taskforce Management Overstromingen*) and the outcome of the 'Waterproof' (*Waterproef*) operation will be embedded in policy. This multilayered approach to safety requires custom area-based work. In association with regional parties, the cabinet will be expounding this approach in area pilot schemes.

However, in February 2010, after some mistakes were identified in the IPCC Climate report 2007, the Delta Law became controversial. When on top of that the cabinet fell ([13]), the opposition in government insisted that the debate on the Delta Law would be postponed to follow the results of elections held in June 2010. At the time of writing (November 2010), a decision has not been made as to the newly formed government's intentions in this matter.

([12]) Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks.

([13]) Formally, the reason that the cabinet fell was said to be that the parties forming the government strongly disagreed on the question as to whether to prolong the Dutch contribution to the UN mission in the Afghan province of Uruzgan or not. In fact, the coalition broke down because of a lack of mutual trust.

2.3 Resources, staffing involved in future programmes

Several government bodies work extensively on long-term studies and thinking. However, it is not possible to identify the resources specifically in this area. Table 1 presents an overview of five key institutions described in Section 2.1, and describes their total staff and resources.

Every year, government bodies produce about 30 futures-oriented studies: dozens, and sometimes even hundreds of people, are involved in their preparation. The staffing and resources used for two major futures-oriented programmes described in this study are presented in Table 2.

2.4 Nature of engagement with stakeholders

The Netherlands is characterised by a strong tradition of decentralised and corporatist decision-making processes. Within such a tradition, active involvement of a broad range of stakeholders seems appropriate, as is reflected in the participative nature of future programmes' developments. The water bodies especially play an important role here, as they are elected participative bodies that actually shape long-term perspective and investments on the environment. They were traditionally set up as stakeholder bodies, but in a reform of this system in 1997 the new, or re-established, councils were set up as expert bodies. This situation is still underlined, but over time the councils — at least those that encompass sustainable development — have appointed more 'experts', e.g. societal and communication 'experts'.

A unique phenomenon is used at the policy level. The actual strategic knowledge agendas for the mid and long term are being developed within the so-called **Knowledge Rooms**. Here, tripartite consultancy takes place in which policymakers (i.e. the departments themselves), social organisations (e.g. the foundation for nature and environment, the united provinces (IPO) and municipalities (VNG), but also companies like Unilever), and the councils, planning bureaus and scientific institutions (e.g. WUR) work together

Table 1 Institutional and historical embedding of advisory councils in the Netherlands

Institution	Ministry	Established	Staff and resources
National Institute for Public Health and Environment (RIVM)	Ministry of Health, Welfare and Sport (VWS)	Since 1909	The RIVM employs over 1 500 employees, many of whom work in multidisciplinary fields
Environmental Assessment Agency (MNP/PBL)	Ministry of Housing, Physical Planning and Environment (VROM)	MNP: since 2002 PBL: since 2008 but going back to 1909 (see RIVM)	The PBL employs about 250 people spread over 12 departments and two staff bureaux The PBL is financed by the VROM (75 %) and the LNV (25 %). It also seeks financing from W&V too, since it also performs structural tasks for this ministry.
Advisory Council for Research on Spatial Planning, Nature and Environment (RMNO)	Ministry of Housing, Physical Planning and Environment (VROM)	Since 1981 Termination in 2010	The RMNO used to have 15 members and four advising members. The scientific staff has been taken over by the VROM.
Scientific Council for Governmental Policy (WRR)	Ministry of General Affairs (AZ)	1972 temporary 1976 definitive	Min. five, max. 11 members (temporary members can be appointed to support certain projects) + 20 scientific staff
Netherlands Bureau for Economic Policy Analysis (CPB)	Ministry of Economical Affairs	1947	The CPB employs 170 people, the majority of whom are researchers or information analysts. Budget: EUR 11 million

Table 2 Resource allocation for two examples of key environment-related futures work in the Netherlands

Programme	Established	Resources
Monitor Sustainable Netherlands	Since the De Brundtland report of 1987, the Dutch Government has tried to take up the concept of sustainability concretely: First and Second Outlook on Sustainability in 2004 and 2007 Sustainability Exploration 2007	Steering group Monitor: six members (2 KADO, 1 CBS, 1 CPB, 1 PBL, 1 SCP) Two project leaders (CBS) 20 Staff
Delta projects	Delta Plan 1 1953–1985/1997 Delta Plan 2 2008–2100	Costs: ± NLG 15 billion (= ± EUR 6.5 billion). Delta Committee: 9 Administrative staff: 10

to articulate the socially and strategically relevant knowledge questions. Knowledge Rooms are a dynamic concept and can differ in approach and structure depending on the issues being considered and can perhaps, therefore, be considered an ad hoc institutional arrangement. Both the departments and the councils and planning bureaus try and see how their working programmes can be optimally harmonised, without losing the independent position of the advisory councils and bureaus. Though particularly this last aspect of the process is a difficult one, it is anticipated that the harmonisation of the working programmes (Section 3.2.1) will enhance the impact of the advices that are being offered.

In addition, individual research organisations have developed their own strategies for stakeholder engagement: these are closely linked to their methodologies for futures work.

The **RMNO** has proliferated itself in the relations between science and policy through its specifically developed inter or trans-disciplinary methodology directing the design and structure of processes relating to knowledge for policy. This methodology is explicitly designed to enhance the policy relevance of scientific research (see: *Interdisciplinarity and policy relevance in research programmes — Taking stance*, 2005). Within trans-disciplinary research, the relationship between science and policy is actually redefined. The context in which knowledge is developed and 'applied' is emphasised much more than in traditional mono-disciplinary and fundamental research. In fact, research takes on the form of a learning process in which knowledge is (co-)created (both by scientists and other relevant stakeholders) and constantly evaluated while implementing the knowledge in practice, leading to adjustments and further development of the knowledge until it is validated within the specific context. The participants in the knowledge creation processes initiated by the RMNO are those who hold relevant knowledge and those who implement policy. Since complex issues like sustainable development require a comprehensive approach, unavoidably many parties must play a role in helping to find adequate solutions for such issues. Therefore, the structure of these processes of co-creation of knowledge must be based on a robust methodology. The application of this methodology leads to unorthodox processes of scientific research, both interdisciplinary and trans-disciplinary, and to the resultant advanced policy development. The questions that arise when it comes to trans-disciplinary research include the following.

- How can we use relevant knowledge from various disciplines and stakeholders?
- How can we integrate these different kinds of knowledge which might contain contrasting points of view?
- Which barriers arise within problem focused projects that are implemented in continuous interaction with stakeholders?
- How can this type of research be enhanced and how can methodological problems be transcended?

The RMNO, in joint cooperation with the Central Consultancy Organ of Sector Councils (COS) and the scientific organisations the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Netherlands Organisation for Scientific Research (now), have laid down their preliminary findings in the publications *Building Bridges: Researchers on their experiences with interdisciplinary research in the Netherlands* (De Boer et al., 2006) and *Knowledge co-creation: cooperation between science and practice.*

Complex, societal issues approached in a trans-disciplinary way (COS and RMNO, 2007). In August 2009, the RMNO also initiated an international conference 'Towards Knowledge Democracy', which was one of the last activities of the council before it ceased to exist ([14]).

The **WRR** seeks to engage in dialogue with politicians, policymakers and social organisations, and to include their experiences in its research. To enhance this, there is an increasing tendency to organise workshops, expert meetings and conferences before actual research is started. The WRR considers it important to make the knowledge acquired available for policy, science, social organisations and the interested public: in order to stimulate debate, the WRR makes the results of its research public. This is done by organising symposia, by publishing concise advisory opinions or surveys based on the acquired knowledge, or by stimulating an exchange of ideas between policymakers, scientists and representatives of social organisations. Such exchanges of ideas concern the recommendations and the manner in which these recommendations have been arrived at. In this way, the WRR gains insight whether its advisory opinions are convincing enough, and how the link with practice can be streamlined. The WRR is convinced that these activities will also improve the chances that conclusions and insights find their way into policymaking.

Stakeholder engagement can also be found in the research processes surrounding the specific 'futures' programmes that lie at the core of this analysis of the Dutch situation.

The first and second *Outlook on Sustainability* were realised through an active participative process with people from government, public works and water management and the water district boards. For Part I of the second *Outlook on Sustainability: The Netherlands Later On*, stakeholders from both government and societal organisations were invited to help and sketch four possible future scenarios for the Dutch physical environment. In July 2005, State Secretary Van Geel (VROM) and Prime Minister Balkenende opened a series of debates on the future of the environment. The debates were meant as a preparation of the cabinet's future agenda for the environment. The first debate focused on the increasing role of the European Union in the Dutch environment policy. The other debates, held later that same year, carried the following themes.

Do citizens still believe in environment policy?
- Why is innovation of the environment policy necessary?
- What would you do if you where a member of government, responsible for the environment?
- What is: environment as a chance?

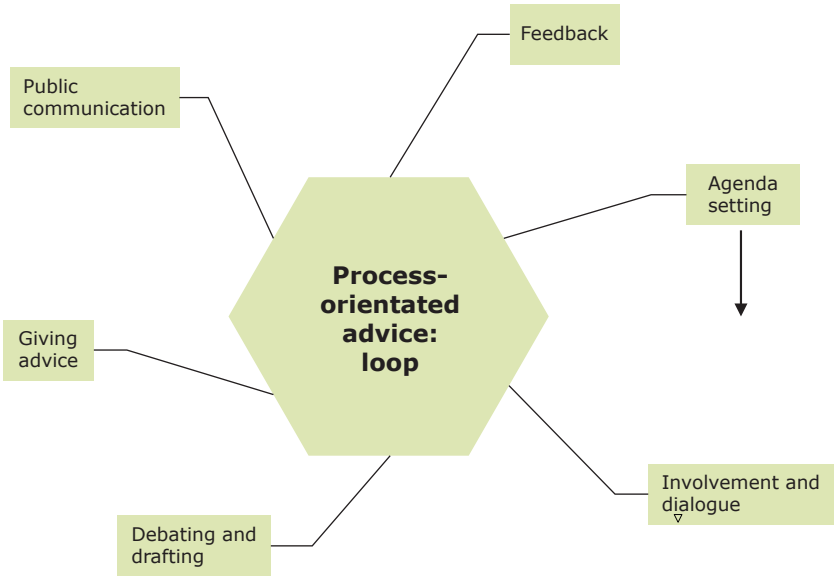
The state secretary wished to make an inventory of 'fresh new insights' and solutions for environmental problems via surveys under citizens and dialogues with representatives of private companies, knowledge institutes, public organisations and government.

The **Delta Committee** has worked with both science-based and stakeholder-informed processes. National and international scientific experts from the IPCC's network and Dutch experts on flood security and water management were consulted; they supplemented the latest insights into climate scenarios and came up with new estimates of extreme values. The Committee also asked for expert advice on the social, ecological and economic impacts of climate change and sea level rise, as well as on financial, governmental and constitutional issues. It also consulted Belgium and Germany. Besides that, many stakeholders were heard, varying from citizens and lay experts to policymakers and governmental institutions. In March 2008, the Delta Committee organised a series of workshops to exchange knowledge, insights and ideas with the most important stakeholders, including water way users, interest groups, market players and experts. These meetings with stakeholders explicitly involved young professionals, which later gave rise to a 'Young Delta Committee' (see the background report on this initiative mentioned below). The Committee has used these dialogues to find inspiration, to test presuppositions and to listen to people's views on the Delta in 2100, the challenges it poses upon the Netherlands and possible solutions to these challenges. The aim of the workshops was not to reach consensus: the idea was that diversity will lead to a rich yield of information and ideas. The results are laid down in the report *Delta Committee listens to stakeholders* (Leeuwis Harm and Zanting, March 2008).

The *Monitor Sustainable Netherlands* is a co-production of several planning agencies and is meant as a contribution to the discussion with policymakers in order to enhance the coherence of the sustainability policies. Apparently, no

([14]) http://www.knowledgedemocracy.nl.

Figure 1 The recommendation loop (ideally)



Source: Niestroy, 2007, p.23).

stakeholders were involved in producing the Monitor.

According to Niestroy (2007, p. 15) (Figure 1), the developments in the Netherlands are interesting to illustrate an apparent underlying striving towards a distinctive perception of representativeness, in which various forms are combined:

- 'mandated representation', i.e. incorporating representatives from civil society organisations, including usually also academic council members which do not 'represent' in the narrow sense, and are perceived in a way as 'de-polarising' the debate;
- 'soft representation', i.e. incorporating representatives with senior positions in a civil society organisation (CSO), the private sector or similar (academia is usually also included), with the idea that a council member is 'allowed' to deliberate freely, but that his or her provenance is in the back of the mind; and,
- 'expert representation', i.e. representation *ad personam*, as experts for the dimensions and aspects at issue.

The first two stand for the idea that already via the council's membership links to civil society can and should be provided, i.e. assuming that the council members have a 'resonating room', where ideas developed in the council may spread. Thus, by combining these various types of representation and adopting a related work style, the link to civil society is enhanced.

The example of how the Delta Law suddenly became controversial shows us how important it is to have public support based on clear and honest communication by government and science. Climate sceptics are all too keen to claim that the policies are based on mistakes, lies and scandals (Smeets, 2010). This may have been an important motivation for the PBL to open a website (http://www.pbl.nl/meldpunt) where interested parties can report any inadequacies they have found in the IPCC report that the PBL is critically reviewing. By involving people from outside the institute in their investigation, even non-scientists and lay people, the PBL concomitantly wants to experiment with a more open form of research. The adduced comments will be analysed by the PBL and, where useful, incorporated in the report of the results to the Minister and offered to the IPCC ([15]).

Another way to guarantee an open, transparent and unbiased perspective is the prohibition of any direct contact between the employees of the PBL and politicians. This imperative that the minister has to

([15]) From the lecture by Dr Olav-Jan van Gerwen, 3 June 2010.

be notified before there is any communication with representatives of a political party stems from the *trias politica*, i.e. the conviction that the powers of the state need to remain independent.

2.5 Relative balance between quantitative and qualitative approaches

As is clear in the examples reviewed here, an integrated approach is often considered paramount in conducting future studies since it is essential to formulate proposals for integrated problem strategies. Therefore, it's probably more appropriate to speak of a combination of quantitative and qualitative approaches used by the councils and planning agencies in the Netherlands, rather than presenting these as alternatives.

The development of the *Environmental Outlook* involved research, monitoring, modelling, risk assessment, analyses and evaluations. The data and analyses from the *Environmental Balance*, which can be viewed as the 'thermometer' of how the environment is doing and of the performance of the government with regard to the environment, provides useful information for the *Outlook*. Besides the *Environmental Balance*, the necessary quantitative backing is also derived from other relevant background studies. The same can be said about the Delta Plan. The various aspects that are being researched to produce an overall view on the environment, climate change and on living in the Dutch delta are laid down in numerous background studies (at least eight for the Outlook and 15 for the Delta Plan). The *Sustainable Netherlands Monitor* involved extensive work on statistical background information, which helped to legitimise the overall report. The results are recommendations with a qualitative component (answers to long-term questions the country is facing), based on quantitatively sound information. Though the imaginative character of studies may increase as the future-horizon expands, even in those long-term scenarios, quantitative studies still play an important role within the narratives.

Within the PBL, the Department for Climate and Global Sustainability (KMD) makes evaluations and forecasts on the possibilities and opportunities for the national energy and climate policies. The team supports the Dutch Government in its positioning with regard to international climate policies both on a European and global level. The KMD uses models for the analysis of global sustainability issues, mainly focusing on the EU and on broader international institutions like the UN environmental programme, the World Bank and the OECD. Another department, the team for Information Management and Methodology (IMP), manages much of the PBL information on environment and nature. This information is processed in the online *Environmental and Nature Compendium* (a joint publication of the CBS and the RIVM) that also provides an information base for the annual *Environmental Balance* and *Nature Balance*. Another example is the information system of the Emissions Register. The IMP team advises on the methods and techniques that can be used to analyse and present information and with the exploration of future developments. Important products are the guidelines on *Dealing with uncertainties* and the catalogues with information on all models that are being used by the PBL.

2.5.1 Methodologies for futures analysis

The Netherlands is prominent in disseminating the use of methodologies for futures thinking and in developing new methodologies. A wide range of methods are used, such as outlooks, scenarios, foresights (including organisational foresights), backcasting, and horizon scanning but also innovation networks and platforms. The methods and lessons from their use have been reviewed and are made accessible for a broader audience in publications.

The Ministry of Justice has produced a handbook on carrying out forward-looking studies in government: *Governing is looking forward! Making and using scenarios for policy development, legislation and preservation* (Jansen, et al. 2004). This handbook describes a method of how to organise scenario projects; how to explore the external environment; how to develop scenarios and use them to develop robust, 'future-proof' policies and legislation, and assess these policies. It also contains recommendations on how to involve stakeholders in the policy process.

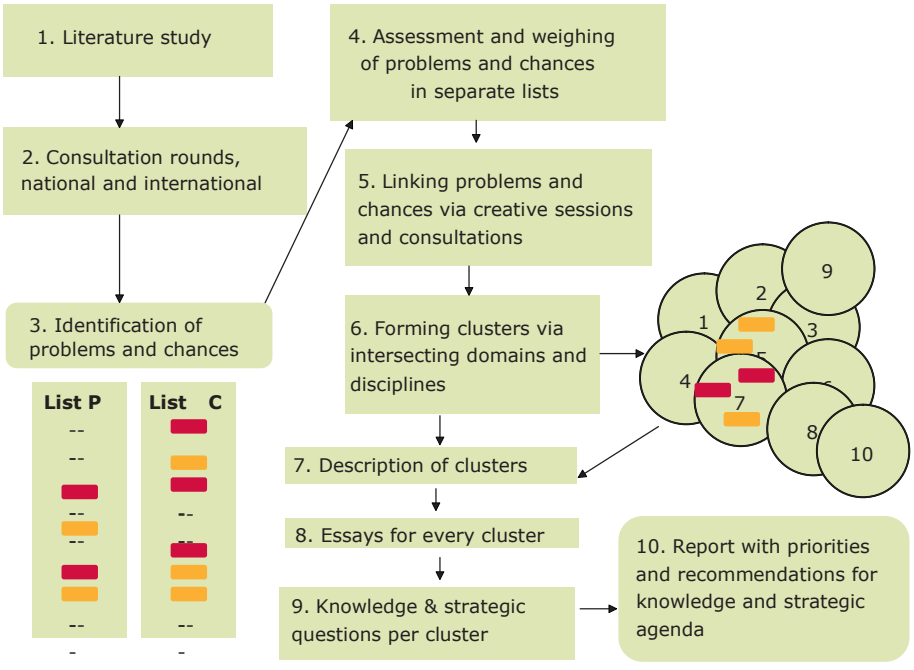
One new method that has recently been introduced is the National Horizon Scan. The first Netherlands Horizon Scan was published in 2007 and was carried out by a specially established team that operated under the collective responsibility of the COS, the Central Consultancy Organ of Sector Councils. The *Horizon Scan Report 2007: Towards*

a Future-Oriented Policy and Knowledge Agenda (Veld et al., 2008) contained a broad range of subjects, including climate change. The report also provides a schematic overview of the process of horizon scanning (Figure 2).

In 2010, a set of theoretical aspects of horizon scanning were presented, based on the comparison of three national scans that took place within the ERA-Net For Society (besides the Netherlands, the countries involved were Denmark and the United Kingdom). The publication focuses on the way in which issues are selected and prioritised as well as the use of horizon scanning for multiple purposes in a democratic society and its close relationships with this society (In 't Veld, 2010, p. 227).

Recent publications have highlighted new and innovative methods developed in the Netherlands. For example, in his foreword for *Working on Systems Innovations* (Grin and Van Staveren, 2007), Professor Veerman ([16]) claims that the concepts for boundary-transcending innovations that the innovation network 'Green Space and Agrocluster' has developed are important instruments to help mobilise stakeholders and organisations and to gain a clear insight in possible barriers for further development and implementation of such innovative concepts. Though such innovations usually do not concern the far future, they can be viewed as important drivers to bring about fundamental transitions with great impact on the nearby and far-in-the-distance future. These ideas and insights have been further elaborated and worked out in numerous pilot projects in various sectors (e.g. agriculture, the energy sector and care sector), and are being laid down in a comprehensive series on systems innovations and transition management, the first volume of which appeared May this year: *Transitions to Sustainable Development, New Directions in the Study of Long-Term Transformative Change* (Grin et al., 2010).

Figure 2 Schematic presentation of process of horizon scanning



Source: http://www.horizonscan.nl/uploads/File/NetherlandsHorizonscan.doc.

([16]) Prof. Veerman is the former minister of Agriculture, Nature and Food Quality (2003–2007) and chairman of the Delta Committee.

One further example of an advanced methodology is the work on science assessment and policy analysis for climate change (Box 3) ([17]).

Last but not least, a new generation climate scenarios are currently being developed by an international team of scientists (including PBL researchers) to better understand the influence of greenhouse gases on our climate. What is new in these scenarios is that they focus on various climate policy goals, varying from 'no climate policy' to 'very ambitious climate policy'. Moreover, the scenarios integrate the knowledge stemming from the various disciplines that are involved in climate science. The results of the calculations with these complex climate models of (the pros and cons of) various climate policy goals are expected by the end of 2010. The scenarios will also be used in the fifth climate report of the IPCC, due to appear in 2013.

Box 3 The research programme on scientific assessment and policy analysis for climate change

One initiative that is not embedded in the regular institutional structure is the Netherlands Research Programme on Scientific Assessment and Policy Analysis for Climate Change (WAB). The programme is carried out by PBL with other partners and has the following objectives:

- collection and evaluation of relevant scientific information for policy development and decision–making in the field of climate change;
- analysis of resolutions and decisions in the framework of international climate negotiations and their implications.

The WAB is concerned with analyses and assessments intended for a balanced evaluation of the state of the art for underpinning policy choices. These analyses and assessment activities are carried out in periods of several months to about a year, depending on the complexity and the urgency of the policy issue. Assessment teams organised to handle the various topics consist of the best Dutch experts in their fields. Teams work on incidental and additionally financed activities, as opposed to the regular, structurally financed activities of the climate research consortium. The work should reflect the current state of science on the relevant topic.

([17]) The main commissioning bodies for this work are the National Environmental Policy Plan departments, with the Ministry of Housing, Spatial Planning and the Environment assuming a coordinating role. The initiative is also commissioned by organisations in society playing an important role in the decision making process concerned with and the implementation of the climate policy. A consortium consisting of the Netherlands Environmental Assessment Agency (RIVM), the Royal Dutch Meteorological Institute (KNMI), the Climate Change and Biosphere Research Centre (CCB) of the Wageningen University and Research Centre (WUR), the Netherlands Energy Research Foundation (ECN), the Netherlands research programme on climate change centre of the Free University of Amsterdam (CCVUA), the International Centre for Integrative Studies of the University of Maastricht (UM/ICIS) and the Copernicus Institute of the Utrecht University (UU) is responsible for the implementation. The Netherlands Environmental Assessment Agency as main contracting body assumes the final responsibility.

3 Analysis

3.1 Relationship between futures programme

3.1.1. The policy cycle in the Netherlands

The *Environmental Outlooks* and specifically the Delta Plans are in themselves already quite cohesive and comprehensive programmes. Various studies, based on different kinds of futures-oriented methods, form the basis for these programmes. So even on their own, the *Outlooks* and the Delta Plan 2 can be considered expressions of the existing relations between the various future programmes that are being developed in the Netherlands.

Even though Delta Plan 2 is a product of a temporary commission, it is firmly embedded within the national institutional structure. Considering the fact that Delta Plan 1 took about 35 years to be implemented and Delta Plan 2 contains visions and projects stretching up to at least 2050, these plans cannot be considered ad hoc policies. The Delta Plan's long-term analysis takes as its point of departure a desirable long term future and has a threefold aim: changes in the environment (living with the water in a safe and sustainable way); changes in policies (a new approach to governance on the basis of the Delta programme, Delta Law, Delta Fund and area-based policy development); and organisational changes (cf. the ministerial steering group, Delta manager).

In the *Sustainable Netherlands Monitor*, looking backwards and looking forward are combined. On the one hand, the *Monitor* looks back to see how the Netherlands has actually developed with regard to a sustainable approach to the environment. On the other hand, scenarios and forecasts from a broad set of research areas (including the physical environment, climate change and water management) are used to illustrate what the effects of certain problematic developments could be. With the *Monitor*, the government aims to present a coherent approach to a sustainable development of 'our' environment (i.e. both in the Netherlands itself and in the rest of our planet) and, at the same time, to set up concrete working programmes to implement the policies that are being monitored. There are important parallels here with the policy cycle of the Environmental Balances and Environmental Outlooks that are used to design the National Environmental Plans, described in Chapter 2.

Notwithstanding the importance and fruitfulness of such an institutionally embedded policy cycle, it must be said that the increasing complexity and uncertainty of developments regarding environmental issues also demand new forms of cooperation. Thus, work to address long-term challenges has encouraged a debate on new forms of government structures in the Netherlands — and has, in some cases, led to the introduction of new structures. What is needed is a variety and variability in action, perspectives and forms for different types of issues and policy processes. One way to create this kind of flexibility is to install temporary, theme-focused initiatives, as seen in the Delta Committee and in the research programme on scientific assessment and policy analysis for climate change. Another way, an approach currently taken by the Ministries for Agriculture, Nature and Food Quality and Economic Affairs, is to install interdepartmental boards (Dirven et al., 2009).

When the problem at hand is cross-sectoral and thus department-transcending, as is mostly the case with issues concerning the long-term future, the necessity to involve other departments in the study and to form alliances is evident. With regard to overarching programmes (e.g. 'Working with water' and 'More with energy') it is suggested that the compartmentalisation of the government should be reduced by enhancing the horizontal connections between the ministries at the cost of the vertical relations between the ministries (Dirven et al., 2009). To restrict compartmentalisation, a limited number of ministries should operate as function focused divisions (e.g. governing core functions with regard to finances, economy, justice and education). These are to be lead by 'division ministers' with the necessary expertise. Besides these 'political columns' also 'societal columns' should be developed in which social organisations function as 'directive target

groups'. To prevent these columns only operating vertically, national task forces could be installed that set up department transcending projects aimed at the core tasks of the state service. These projects should not fall victim to only making detailed analyses but should offer practical solutions and would have to operate for at least one election cycle. The quick scan of organisational foresights carried out within the State Service showed that such task forces are already at work.

Furthermore, it can be questioned whether it is preferable to have an independent unit within a department or whether units for future studies should be brought under a central strategy development office. A too tight relationship with a department will carry the danger that forward-looking studies too easily remain focused on the issues at hand and that there will be insufficient attention for alternative insights in external and internal internal developments. However, when a study has been brought about by 'free-floating forces', there is the risk that it is not attuned to the discourse of the organisation and its direct environment and consequently is not taken seriously. This problem is particularly real in the case of studies regarding *expected futures*, since this kind of work focuses on the predictive character rather than on the creative imaginary power of the forward-looking study. In the case of *desirable futures* this threat will be less severe, for these studies actually rely on captivating and inspiring future images that demand creativity and out-of-the-box thinking. The type of studies that are concerned with *possible futures* can be positioned in between both of the other types (Dirven et al., 2009).

3.1.2. Social research programmes on environmental and sustainability issues

In April 2010, the Netherlands Organisation for Scientific Research (NWO) organised the conference *Improved Living Climate? Improved Research — Improved Policy* (Beter Leefklimaat? Beter Onderzoek — Beter Beleid) to enable scientists and policymakers to exchange knowledge, experiences and share their conclusions with regard to the scientific programmes 'Behavioural and social research on the environment and nature' (GaMON: Gamma-onderzoek milieu, omgeving, natuur) on the one hand, and 'Vulnerability, adaptation, mitigation' (VAM) on the other. The VAM and GaMON research programmes are considered to be the indispensable counterpart, counterweight and co-actor of the natural scientific and technological research programmes concerning environmental and sustainability issues.

Between 2003 and 2009, about 30 research projects were developed under the flag of GaMON and the VAM (implied subsidies: around EUR 7 million). Several ministries were involved in this extensive research programme: the trailblazers of the programmes, plan assessments, project implementations, reports and evaluation (have) work(ed) at the VROM, LNV, OCW, EZ and V&W, and also at the RMNO (the latter developed most of the research themes for GaMON). The VAM programme was instigated by the VROM and supported by the National Research Programme on Global Air Pollution and Climate Change (Nationale Onderzoeksprogramma Mondiale Luchtverontreiniging en Klimaatverandering/ NOP-MLK, 1991/2000).

Within the GaMON programme, research themes included:

- effectiveness of partnerships for sustainable development;
- effects of 'green environments' on well-being and health;
- landscape planning in metropolitan areas (e.g. Randstad);
- social practices and sustainable consumption.

Within the VAM programme, research themes included:

- consequences of climate change for Dutch inland freight shippers;
- company policies with regard to CO_2 emissions and climate change;
- influence of weather and climate on tourism in coastal areas;
- reactions of the general public on warnings about climate change.

The interaction between scientists and policymakers formed an important thread through both programmes: their experiences and wishes, what persistent problems do they encounter, how can the interaction between both parties be improved, which kinds of cooperation are useful and possible? During the conference, these questions and the answers provided by the GaMON and VAM research projects were elaborated upon under two thematic headings:

1. Spatial planning and decision-making
2. More sustainable production and consumption.

Specific questions related the first theme, Spatial planning and decision-making, are for instance: Is decentralisation of responsibilities to the level of the provinces a good idea or not? If it is, what kind

of responsibilities should or could be delegated? Is the central government able to resist or counteract avid project developers? The GaMON research programme concludes that external experts, when involved at the right time (i.e. early in the process, not too late), can fruitfully support the development of local planning. The VAM research programme teaches us that acceptation of climate adaptation is difficult when it is not supported by a broad social awareness of the importance and impact of such long term problems.

The second theme, More sustainable production and consumption, dates back to the first National Environmental Policy Plan of 1989 (NMP-1 Kiezen of Verliezen, i.e. Making a choice or losing it). The aim was, and still is, that more sustainable production and consumption should lead to a more economic use of natural resources, space and ecosystems and less waste, emissions and discharges. Twenty-five years later, the European Environment Agency stated in *Household Consumption and the Environment* (2005) that:

> '… while efficiency is improving, growth in the total levels of consumption of goods and services has been so high that in many cases it has outweighed these technological improvements.'

This conclusion is regularly shared in the annual Environmental Balances produced by the PBL. The GaMON research projects show that a regulating national government has only a limited influence on more sustainable production and consumption, though it is possible to realise more sustainability via the market supply of goods and services. In addition, the VAM research projects indicate that Corporate Social Responsibility (CSR) can lead to an enhanced awareness of the importance of the environment and a reduction of the human impact on the environment. The conclusion is that breakthroughs in sustainable production and consumption demand a clear view on the problems — including of vision on the future — better cooperation between behavioural and social researchers and scientists studying nature, as well as well-regulated consultation of researchers by policymakers and vice versa.

3.2 Impact on environmental policymaking

As the description of the position and functions of the Dutch councils and planning agencies show, there is a close link between futures-related research and the policymaking process. The institutional set up is such that forward-looking analysis carried out by the councils and planning agencies form the input for the futures-oriented environmental policies that are being developed.

One important element is the independence of the planning agencies and councils, which regularly conduct research not 'demanded' by policymakers, and report on results that the experts consider relevant or necessary, even when politicians and policymakers might not approve, and might not be happy with it ([18]). The independence of the planning agencies and the councils, whose budgets are not related to specific issues or dependent on the dynamics of party politics, seems to be unique to the Netherlands.

On the other hand, since the councils and planning agencies are subsidised by the government, their degree of independence is uncertain when it comes to:

- the setting of their agendas (what will happen when one of the planning agencies or councils puts a subject on their research list that government actually does not want as a priority);
- the timing of the presentation of reports (results can be withheld or presented at such a time that it is convenient for the government);
- the presentation of the results themselves (very pronounced or moderately pronounced threats, higher estimations or lower estimations).

It could be said that the Dutch institutional set-up enhances a rational approach to risks, because it allows scientific researchers and other expert advisors to consider the situation independently and away from direct political pressures. Scientists often give a much starker opinion when asked for their personal advice on matters like risk estimation than when they have to produce a group decision though.

([18]) Based on communications with Aldert Hanemaaijer, May and July 2009.

When one has to decide on whether the policies with regard to see level rise should be protecting against a 2 m or a 4 m rise, the precautionary principle would enhance the tendency to opt for the 4 m level. For if the water only rises 2.30 m, all the money spent on the protection measures focused on a rise of only 2 m will literally be submerged. But when scientists have to give an official governmental advice, they may tend to be more reticent ([19]). The risk levels the planning agencies and councils use are usually the ones generally used within the specific scientific research field though (e.g. by the IPCC or by the Royal Dutch Meteorological Institute (KNMI)). In their efforts to build bridges between the world of science and the world of policymaking, they will try and sketch both advantages and disadvantages of certain solutions for the environmental problems we are facing, so that the cabinet can make sound decisions.

It could be claimed that the plans to enhance the match between the need for knowledge on the part of the ministries and knowledge development by the councils and planning bureaus (Section 2.4) can decrease the independence. However, the 80/20 rule, indicating here the percentages of requested as compared to non-requested advice, still remains the same. These plans resulted from the observation that the exchange between science and policy was not optimal, and needed improvement. The reorganisation and clustering of the existing councils and planning bureaus are focused on eliminating the weak points the advisory system was suffering from:

- a suboptimal match between demand and supply;
- compartmentalisation in knowledge and advice, despite the need for intersectional advice;
- unclear definition of the council's role, resulting from the combination of developing knowledge and giving strategic advice as well as having a consultancy function and representing stakeholders ([20]);
- a lack of fresh, new insights, resulting — amongst other causes — from the fact that the staffing is permanent.

The reports to the government, as the advisory opinions of the WRR are called, usually concern developments over a period of 10 to 20 years. They reach beyond the borders of a term of office of one single cabinet. The same can be said about the advisory reports of the RMNO and the CPB. Therefore, the direct influence of these advisory reports on policy is hard to measure. It is stipulated by law though that the government must give a public response to reports of the councils, which ensures that governments cannot simply disregard the reports, or set them aside without reading them. This way, the reports play an important role in political-administrative decision-making and policy formation. Other publications of the councils, such as surveys, can also influence the political agenda or give direction to debates in society.

With regard to the planning agency (PBL), its core task is to provide strategic policy analysis in the field of environment, nature and spatial planning. The policies that will at least partly be based on this analysis are then monitored, the results of which are reviewed in subsequent research, which also contains the latest scientific insights. This way, a policy cycle operates in a way in which science and policymaking go hand in hand.

The Netherlands and, in particular the PBL, play a strong international role in policy-related futures research. They have been involved centrally in most large, international future assessments, including the *OECD Environment Outlook*, the UNEP-GEO scenarios work, the MA and IPCC work. No other country is so active in supporting international future assessment processes. Recently, however, this support has been reduced considerably due to political doubts about its added value.

We have also seen how futures programmes can be delivered outside the permanent institutional structure. In the domain of water policies, a multilayered, area-based custom approach seems to have become the standard for developing and implementing measures, which means not only deciding what is needed from the perspective of the water system but more specifically, working with all stakeholders in applying a development-geared approach and seizing opportunities. The institutional structure is subsequently adjusted so as to accommodate for the necessary investments and transitions (cf. the Delta Law, Delta Fund, Delta manager and steering group).

([19]) According to Prof. Dr Paul Rademaker, interview, 27 May 2009.
([20]) Though their role is now defined such as to clearly emphasise the former role (i.e. knowledge development and strategic advice), the latter role has not completely disappeared, since consultancy of stakeholders is still regarded necessary to certify the legitimacy of their findings (Section 2.4).

Table 3 Estimated costs for Delta Plan 2, additional funding (billion EUR per annum)

(Advice of the Delta Commission, *Working with Water,* 2008, p. 11)

	Period		Average
	2010–2050	**2050–2100**	**2010–2100**
Delta programme	1.2– .6	0.9–1.5	1.0–1.5
Delta programme plus extra multi-functional space at the shoreline ([21])	1.3–1.9	1.2–1.8	1.2–1.8

Note: Amounts in euro at 2007 price levels, including Value Added Tax (BTW).

The recognition of the need for forward-looking analysis by politicians themselves can be considered a desirable, though not sufficient, condition for successful implementation of futures studies. Within some departments, the relation with politics in the context of futures work is close, but this does not imply that the outcomes are immediately supported by politics. Other departments do acknowledge the political dimension of forward-looking studies and consider them as a means to exert influence on politics. But, at the same time, they feel that civil servants themselves should also take initiatives to develop these studies. They would rather not see their own position exaggerated though: no matter how important a politician or members of government think forward-looking analysis may be, the only thing civil servants can do is to prepare the studies and suggest policy options (Dirven et al., 2009, p. 11).

Despite the close link between futures work and policy, difficulties remain. Most studies focus on a time span period of 15 to 25 years. Only studies related to water management tend to have much broader horizons, reaching out 50 to 200 years. This is related to the duration and costs of the projects: dykes are not built overnight and they have to hold back the water for decades. A horizon shorter than five years is generally considered undesirable, since this could directly threaten the current positions and interests of officials and institutions and could hinder unprejudiced opinions. Substantial changes in the institutional and organisational dimensions of government, institutions and societal organisations are usually easier when they concern a longer time span. But then again, in the political dimension, governmental leaders will only be in power for a maximum of four years, and often even shorter. Since politicians are more focused on the short rather than the longer term, a substantial effort is needed to gain support at the top of departments for projects that concern longer periods of time (Dirven et al., 2009, p. 37).

Just like all other policies, developing futures-oriented policies for sustainability involves making choices. Specifically, in the current situation of increasing uncertainty and scarcity, there's the realisation that a choice of more on the one hand, implies less on the other.

An example can be seen in the questions that have been raised — by the Royal Dutch Meteorological Institute amongst others — concerning the Delta Committee's choice to take as point of departure for their analysis and policy recommendations the worst case scenarios instead of the most plausible scenarios for climate change. This choice has huge implications for finances, as the billions of euro per annum spent on Delta Plan 2 is money that can't be invested elsewhere, e.g. on sustainable innovations to enhance a 'future economy' (Table 3). Thus, compromises will have to be made in the political realm. Compromises that can be hard to establish since different parties will make various estimations of what the effects of the policies will be.

This became all the more clear after the 'climate-gate' and the fall of the cabinet, when Delta Plan 2 became controversial and the opposition insisted that the debate on the Delta Law would be postponed. The first party (VVD, the liberals) openly vented their doubts on the reliability of the research that is supposed to support the law. The second party (PVV, the far-right People's Party for Freedom of Geert Wilders) is convinced that sea level rise will

([21]) Coastal flood protection in the Delta programme is mainly achieved by beach nourishment. If this method is intensified so that the coasts of the Netherlands grow for instance 1 km in a seawards direction, thus creating new land for such functions as recreation and nature, it will involve an additional cost of EUR 0.1–0.3 billion per annum.

not extend above 18 cm, implying that maintenance of the dykes will suffice. The third party (SP, the socialists) does not approve of a cabinet under resignation to decide on such a costly issue, in spite of the Union of Polder Boards (Unie van Waterschappen) fierce claim that we cannot wait to make the investments in our safety.

The Delta programme design is rather flexible, and able to deal with the unpredictability of climate change — or the unpredictability of politics for that matter. This means that the implementation can either be slowed down (as will be done now) or speeded up (which might be necessary later) (Smeets, 2010). But now that the *Partij voor de Vrijheid* (PVV) headed by Geert Wilders has become one of the biggest political parties and will therefore perform a 'permitting role' in government, not only the future studies underlying Delta Plan 2, but the role of futures thinking to inform policymaking in general could be drastically changed.

3.2.1 Initiatives to strengthen links between futures thinking and policy

Recently, a quick scan was made of the current use of organisational foresights within the State Service, consisting mainly of ministries but also executive organisations (Dirven et al., 2009). In an organisational foresight, the future of the organisation undertaking the foresight is itself incorporated in the study. The research was conducted at the request of the State Service of the Future Project, which forms part of the 'Renewal State Service' programme. Because the State Service wants to develop more systematic future visions and, consequently, think through the organisational consequences and implement the findings, their need for organisational foresight increases. It is generally acknowledged that the State Service has to operate in an ever more dynamic and complex environment and that there is or should be coherence between changes in the environment, changes in policy and changes in the organisation.

A year earlier, the Ministry of Internal Affairs prepared a report on the quality of the connection (De kwaliteit van de verbinding, 2008), with recommendations to enhance the integration of the activities of the various councils and planning bureaus and reduce overlap ([22]). The recommendations also suggested that the VROM Council, the Advisory Council for Transport, Public Works and Water Management, and the Council for the Rural Environment (RLG, Raad voor het landelijk gebied) could be integrated to form a single, new council in 2010: the Council for the Environment and Infrastructure (RLI, Raad voor de Leefomgeving and Infrastructuur). Though the secretaries have already been merged, the RLI hasn't actually come into existence yet. The reason being that, after the fall of the cabinet, the working programme of the new RLI has been declared 'controversial' and decisions about this new council have been postponed until after the election of a new cabinet.

The report also recommended that the match between knowledge demands by the ministerial departments on the one hand, and knowledge development by the councils and planning bureaus on the other hand should be improved. The goal is to enhance the implementation of the available knowledge in practice so as to also profit from recommendations in the mid and long term.

In 2008, the WRR started a study 'Practices of futures thinking', in which the latest scientific insights with regard to (the meaning of) futures thinking are gathered. The research consists of a literature study (including international studies), international work visits and empirical research in the form of explorative interviews, systematic analysis of the types and practices of futures thinking that have been developed up until now, and several case studies. The focus of the study lies explicitly on policy-oriented futures thinking; the final investigation report will be aimed at promoting 'sound reflection' on future research in the context of government policy and contributing to an attitude towards the future that allows for uncertainty. It is also intended that an up-to-date conceptual framework will be presented for this and a number of traps and challenges will be identified ([23]).

The main conclusion is that futures thinking is not yet integrated in the policy process ([24]). An important explanatory factor behind this lack of integration appears to be that there exist certain tensions between the conventional view on the

([22]) The restructuring of the RPB and the MNP into the PLB (Section 2.2) was also induced by this report.
([23]) The project was intended to report in September 2010; however, at the time of writing, the final report has not been published (http://www.wrr.nl/english/content.jsp?objectid=5001).
([24]) This paragraph is based on the preliminary findings of the WRR study 'Practices of future studies' as presented by researcher Dr Sietske Veenman at the Network Foresights (The Hague, 26.3.2010, and in an interview, 26.5.2010). The definitive report was presented 27 September 2010 (Van Asselt et al., 2010).

production of knowledge and its use, and the role that futures thinking plays with regard to the creation of knowledge. In the linear viewpoint of the model in which science is viewed as 'speaking truth to power' (Bauman, 1987), science is associated with the production of 'hard' facts and the deliverance of certainties. Policymakers and politicians tend to regard futures studies as a hard science: this is a misperception as there are no certainties in regards to the future. In the alternative view, the exchange between science and the policy domain is conceptualised more as an 'arena' in which different stakeholders try and gain as much support and approval as they can with their claims on what is the actual case and what would be the right thing to do about it. The first view still appears to be the most preferred view, both within the academic and in the policy domain.

Outside the scientific domain, the uncertainty intolerance hinders the transfer to and proper use of information produced by futures thinking within the policy domain; decision-makers, who have to decide what amount of the limited national budget goes to what projects, do not cope very well with messages that contain levels of probability and significance and cannot be put forward as claims that are 100 % for sure. The controversy around the IPCC report is a clear example of how things can go wrong in the knowledge implementation process: though it is indicated that the findings go paired with uncertainties, only the first half of the message (i.e. the findings which are consequently regarded as (at least semi) 'hard facts') is picked up. This cannot solely be attributed to selective hearing by the receivers though; it is equally a result of the way the findings are presented by the scientists ([25]). For instance, there is a view that the conclusions could have been more transparent and potential positive effects of climate change could have been raised. By emphasising the quantitative approach and presenting their data as if they were nothing but 'hard' facts, the uncertainties are suppressed and disappear out of sight. This tension particularly applies to forecasts and, to a somewhat lesser extent, to foresights which, compared to other future methods such as back casting or critical futures, are more vulnerable to what the council calls the deterministic pitfall, i.e. the tendency to think of a future method as if it holds the promise to guarantee continuity and stability while actually, many uncertainties can corrode its presuppositions, parameters or the expected future outcomes ([26]).

Another reason for a limited use of futures thinking in policymaking may be that the focus on methods dominating the field sometimes frightens potential users, even though the methods aren't actually that complicated. Further possible caveats expressed by the WRR are related to the normative component that is inherent, either implicitly or explicitly ([27]), in futures thinking. For instance, one can sometimes question whether a scenario that is presented as being 'neutral' isn't actually 'flawed' from the start because of the chosen focus (e.g. the long-term scenarios on well-being and the environment — WLO. Controversy has also arisen around the worst case scenarios put forward in Delta Plan 2, so that one can question whether there really was a normative consensus with regard to the need for a super-safe future or that some stakeholders might have preferred more moderate, thus less expensive scenarios (Van Asselt et al., 2010).

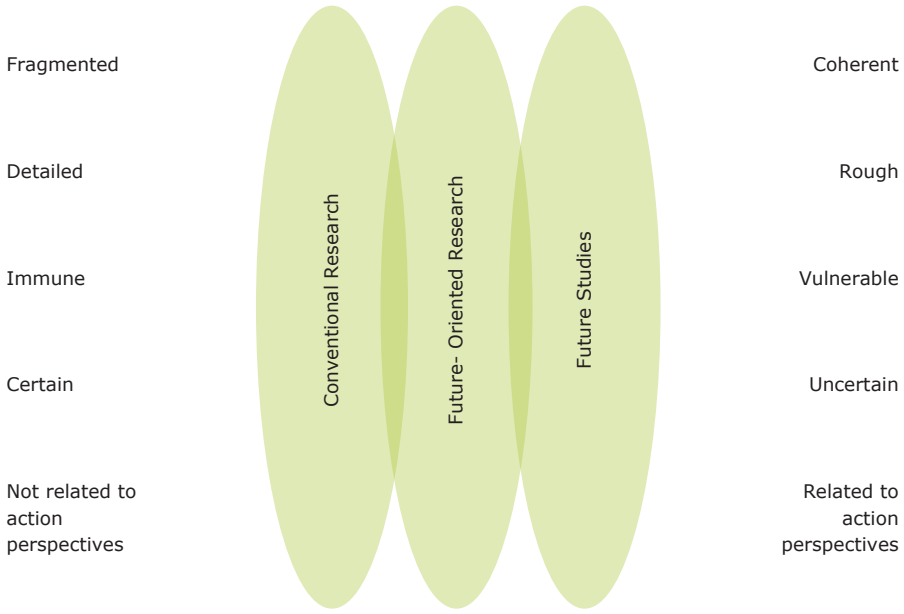
In spite of these barriers to a good use of future methods within the policy domain, the council thinks it would be exaggerated to speak of a gap between futures thinking and policymaking. If given proper consideration, i.e. when the right questions are addressed, when the explanation of presuppositions is transparent and when used in a way that takes into account the inevitable uncertainties, forecasting and foresights form good futures methods. According to the WRR, a proper use of futures methods would mean that reference to the word 'prediction' be avoided as it seems to imply a kind of certainty that futures methods cannot guarantee — nor is it the aim of futures thinking to do so. For futures-oriented science, the challenge is to present a clear picture by referring to its variable character for which it provides useful tools, by approaching it as visionary theories of change, and

([25]) For example, a study on the Environmental Assessment Agency showed that all respondents used the 'speaking truth to power' and the information deficit model to describe their role and position as a translator of scientific knowledge into usable knowledge (Huiteman and Turnhout 2009, in In 't Veld, 2010, p. 26). Cf. with the letter published by 50 renowned scientists in reaction to the media hype around the so-called climate-gate, in which they hold a plea to develop a more nuanced view on science.

([26]) Forecasts are especially liable to becoming trapped in the deterministic pitfall, since it presupposes that particular patterns and trends that we know from the past and the present, will also hold for the future. This is contrary to the image of an uncertain future in which complexity, reflexive action and innovation are taken into consideration, thus increasing the chance that current patterns and trends will not remain stable in the future.

([27]) The WRR makes a distinction between forecasts and foresights on the hand, and explicitly normative future methods such as backcasting and critical futures on the other. The study shows that this last category is not used much yet. Besides this 'blind spot', the council also regards insufficient diversity, i.e. the lack of variety in used types of future methods, as a point for improvement.

Figure 3 Characteristics of Future Studies



Source: (In´t Veld, 2010,p.137).

by making good use of its inspiring and learning potential in the form of suggested analogies. These last two aspects point to a complementary function that is often neglected but is actually an interesting and, in some cases, even crucial asset for its use: futures thinking can play an important role in processes of transition and change by enhancing creative, out-of-the-box thinking and bringing into view new, innovative solutions (Figure 3), which depicts the different functions of futures-oriented research and future studies as compared to more conventional research.

To enhance the use of the new conceptual tool kit, the WRR now actively shares their new-gained insights with planning agencies, local and national government, bureaus of political parties, and the Union of Dutch Municipalities (VNG). This seems not only a laudable but also quite necessary step, since the study's main aim is to provide clear concepts and useful tools to think about the future, while the needs of the most important user group, i.e. policymakers, were, up until now, hardly consulted or involved in the study.

All three reports can be viewed as efforts to further improve the interactions between the ministries, their statutory agencies and other relevant partners to reach an optimal exchange between futures-oriented research and policymaking. To act adaptively with regard to the demand for knowledge, the cabinet annually visits the departments to get a clear view on relevant questions. These are then brought together and, where possible, integrated so as to formulate optimally strategic knowledge questions to the councils and planning bureaus. This process is recorded in the Framework Letters (Kaderbrieven). This approach helps to improve the match between knowledge needs on the policy side and the analysis that is undertaken on the research side. Moreover, the practice in principle should strengthen interdepartmental learning.

4 Conclusions

4.1 Success factors

With regard to the question when innovative policies based on futures-oriented research are actually being implemented, the following factors appear to be important.

- Futures thinking is strongly embedded in government institutions in the Netherlands: on the one hand, the planning agencies and the councils are independent, i.e. their budgets are not related to specific issues or dependent on the dynamics of party politics. On the other hand, the relation of the councils and planning agencies with the ministerial departments is strong and firmly rooted. Combined, these features can be considered as some of the most important factors in the successful interaction between futures-related research and sustainable environmental policymaking.
- The 'window of opportunity' for long-term planning on flood protection and climate change adaptation: the fact that the Netherlands has known serious flooding in the last decade has enhanced the sense of urgency and thus governments' willingness to spend money on the ambitious Delta Plan ([28]). But now that some mistakes have been identified in the IPCC Climate Report of 2007 and the cabinet has fallen, the Delta Law has become controversial. This highlights the fact that good timing is a key factor for any long-term study, in terms of influencing policy.
- Involvement of stakeholders: consultation with and the input of stakeholders are widely used to create support for new, futures-oriented policies. The principle of an alliance strategy or transition model in which stakeholders from outside are involved appears to be a promising instrument from a governmental point of view. Stakeholder involvement can enhance the links to civil society by combining various types of representation (besides 'expert representation' also 'soft representation' and 'mandated representation') in major councils and adopting a related work style.
- Advanced development of futures methodologies: government bodies in the Netherlands have taken a leading role in developing futures techniques. As a result, more systematic methods and tools are available. The use of systematic methods renders futures thinking transparent for the general public. Moreover, it enhances the verifiability of the results ([29]).
- Influence on the international agenda-setting: Dutch agencies are heavily involved in international assessment processes. They have helped support the use of futures techniques in international forums and have had considerable influence in the assessment processes that actually frame the agenda-setting and problem-definitions on the European and international agenda. This reflects the fact that many of the forces influencing the future of the Netherlands are at global and European level, and compensates for the fact that otherwise the Netherlands are a small country with limited political power. (Recently, however, support for these international initiatives has been reduced.)
- The personal factor: at the political level, there is recognition of the need for futures-oriented analysis, at least at some places within the political domain. This is a factor for success, as the implementation of insights is enhanced when there is direct personal contact with influential people in important places. Without such contacts, recommendations and plans easily end on a shelf instead of high on the political agenda. Just like any other project or policy process, exploring the future is to an important extent a matter of 'the right man in the right place'. Implementing a study requires courage

([28]) From the interview with Prof. Dr Rademaker, 27.5.2009 and Dirven et al., 2009, pp. 45–46.

([29]) This is the best we can strive for since the standard scientific criterion of falsifiability often does not apply in case of futures methods because of the inherent 'self-fulfilling prophecy' incorporated in futures thinking, especially when it concerns possible or desirable futures. But, even when predictive futures are concerned, this phenomenon is likely to occur.

and perseverance. To ensure a good connection between a forward-looking analysis and policy and decisions, it is necessary to have some kind of 'ambassador' with the necessary connections and with sufficient status within the policy arena. Support of such an 'ambassador' for futures analysis counts as a quality mark that will enhance the chances of it actually having a significant impact ([30]).

Other factors that may be important for success, identified by Dirven et al. (2009, p. 4) include the following.

- 'Institutional memory' — the quality of futures analysis — and organisational foresight in particular — can increase when there is the possibility to build upon accumulated and well-documented knowledge and experience ([31]).
- Regular contact between scientists involved in futures studies and policymakers with respect for each other's responsibility and world view (this also is seen in the regular cabinet visits to departments — these help to match the knowledge needs of policymakers with knowledge development).
- Flexible units for forward-looking analysis that know how to engage the necessary new, not yet existing networks, accustomed to what is needed for the issue at hand.
- Strong metaphors, convincing rhetoric and appealing story lines to picture a future world that does not yet exist, but for which policies and strategies have to be designed to make it come true. If the potential of futures studies is to be realised, i.e. if they are to be used as a framework to place all kinds of policy questions in a broader perspective, they need to inspire policymakers and high-level officials, just as scenarios need to enhance the creative imaginative capacity of the departments.

4.2 Barriers to success

While the use of futures thinking across government and its integration with policymaking are quite advanced in the Netherlands, improvements and challenges can be addressed in several areas.

- The WRR study on practices of futures thinking in the Netherlands (2010) provides various explanatory factors for the suboptimal integration: varying conceptions of the relation between the production of scientific knowledge and the use of it, unfamiliarity of working with future studies, and the uncertainties and normative dimensions related to future studies, be it of a quantitative or qualitative nature.
- While there is close cooperation across government bodies, this can be further improved. In particular, a more integrated and cross-disciplinary approach to complex issues is recognised as being valuable and even necessary. While the experiences with cross-departmental activities are positive, far more could be done: the compartmentalisation of activities is still dominant (Dirven et al., 2009, p. 47).
- The full potential of organisational foresight is not yet recognised: its potential to help determine the position of future organisations is as yet underestimated. Since the government has to learn and function in times of fundamental changes, uncertainty and increased complexity, futures thinking should be structurally embedded in the organisation. This is one of the tasks of the new departmental Knowledge Rooms (Dirven et al., 2009, pp. 47–48).
- Moreover, existing future studies are effective in their description of well-known mega trends, but show less insight in their review of sectoral trends and of specifically weak signals within these trends (Dirven et al., 2009, p. 4).
- In the current economic crisis, the Dutch Government has been cutting its budget and this has reduced futures work as well. Decisions about Delta Plan 2 were postponed until a new government is installed (which is expected to take place in October 2010).

While the Dutch model of independent councils and planning is unique and has been an important success factor in terms of developing futures thinking and disseminating its results to the policy level, some observers have identified weaknesses.

- The close relations among the councils, planning agencies and the government could carry the danger that the former are actually not that

([30]) Prof. Rademaker and Dr. Lydia Sterrenberg, in a personal conversation 26 may 2009, Dirven et al. (2009, p. 13).

([31]) On the one hand, it would appear that this success factor will be enhanced by a stable government. In this regard, the question of how much (re)organisation is going on within the government can be regarded as a concomitant inhibiting or enhancing factor in the fruitful exchange between science and policy, as was mentioned by Prof. dr. Cees Midden (Technical University Eindhoven) at the NWO conference *Improved Living Climate? Improved Research ‹–› Improved Policy*, The Hague, 7 April 2010. It is not immediately clear, however, how this need for stability relates to the equally apparent need to make the necessary organisational adjustments to meet current and future requirements for proper governance, a process the organisational foresight mentioned by Driven is explicitly meant to enhance.

independent after all; as these councils and agencies grow more embedded into policy processes, they risk adjusting their research themes and results to the needs and wishes of the government ([32]).

- The fact that many councils and planning agencies have a permanent staffing may hinder the introduction of new insights.
- Over and against the apparent benefits of the integration of tasks of formerly separately organised councils (e.g. the RLG, the VROM Council and the V&W Council merging into the RLI) and planning bureaus (e.g. the RPB and the MNP merging into the PBL) one could also argue ([33]) that a system of checks and balances is lost.
- Although the role of the councils is now more clearly defined, there still remains a tension between offering strategic advice on the basis of 'objective' scientific knowledge on the one hand, and the involvement and taking serious stakeholders on the other. A related difficulty is the need to avoid incongruence in problem definitions, i.e. a tension between different possible outlooks that can be taken as point of departure; for instance, does the research put the (economical) perspective of the consumer in central position or rather the (political) perspective of the citizen? ([34]) A similar tension can be identified between the pressure put on scientists to come up with a strong story and 'hard facts' if politicians are able to get support for costly innovative policies, while particularly futures thinking inherently carries many uncertainties with it. These challenges are inherent in all trans-disciplinary research and need to be thought about more in depth.

([32]) This downside of the strong relationship between future-related research and policymaking is clearly put forward by Prof. Dr Van Egmond (*Trouw*, 12.3.2009). According to Van Egmond, the polder model is hindering a transition towards a sustainable society and he is concerned about the effects of the Dutch consensual culture because it leads to a stalemate: the good relations between employers and employees that forms the key to the polder model is bad for the environment since the relation will only remain good when the economy grows, more profit is made and more jobs are being created. The environment was never given priority the last three decades, which has led to the problems we are currently facing. 'The Netherlands needs a vision on the future that transcends the negotiations; a firm line that everybody is committed to, even when it means we have to settle for less', says Van Egmond. He views the economic crisis as the litmus test to see whether the government is still investing in the old economy or that it will finally start stimulating a future oriented, sustainable economy. Up till now, the government has reserved EUR 2 billion to invest in a sustainable economy. It can be questioned whether this will be sufficient to maintain a competitive international position in 'the future economy', i.e. in an economy where new innovations are to dominate the market. On the contrary, it could be said that consultation does not necessarily lead to a stalemate. If organised adequately, it can lead to an exchange of ideas and thus potentially to innovation. It is not consultation per se that leads to a stalemate, but the lack of leadership to distil a good vision and coherent strategy from all the information received.

([33]) As Simône Huys Phd does (interview, 26.5.2010).

([34]) One of the conclusions about possible tensions between science and policy brought forward by Prof. Dr Cees Midden (Technical University Eindhoven) at the NWO conference *Improved Living Climate? Improved Research — Improved Policy*, The Hague, 7 April 2010.

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Appendix 1
Approaches to futures studies

Country: the Netherlands		
Title of futures programme(s):		Monitor Sustainable Netherlands
1. Overall governance culture of country	***Description***	With its well-known polder model, the Netherlands is traditionally strongly oriented towards consensus. With a two-tier structure of the board, employee representatives in supervisory boards and a separate and managerial leadership style, it forms a typical example of the Rhineland model. According to Hofstede's classification, the Netherlands do not fit into a specific cluster. With a low score on the axe of Power distance, very high on Individualism, very low on Masculinity and high on Avoidance of Uncertainty, they form a category on their own. Still, they can be said to belong to the Nordic culture, which is characterised by non-hierarchical thinking and a more egalitarian management approach — decentralised and democratic (participative decision-making processes). The business organisational chart is generally horizontally structured, flexible and reasonable. The corporate governance structures can also said to be network oriented and focused on long-term strategies.
	Nature of futures organisation(s)	Councils and planning agencies: installed by but independent of the government, sectoral but with cross-sectoral themes, permanent Platforms: same but usually with a temporary character
	Date programme(s) introduced	First Outlook on Sustainability (2004): *Quality and Future* Second Outlook on Sustainability (2007): *the Netherlands Later on (Part 1)* and *The Netherlands and a sustainable world. Poverty, climate and biodiversity (Part 2)* Monitor Sustainable Netherlands (2009)
	Responsibility	The cabinet has asked the CBS and the planning agencies (CPB, PBL and SCP) to develop the Monitor Sustainable Netherlands in the context of its Broad Approach Sustainable Development (KADO Kabinetsbrede Aanpak Duurzame Ontwikkeling).
	Resources	Steering group: six members (2 KADO, 1 CBS, 1 CPB, 1 PBL, 1 SCP) Two project leaders (CBS) 20 Staff
	Tradition	Except for the PBL, which was formed only last year but, nevertheless, has its roots in long-standing traditions, the councils involved in futures thinking are all well established.
	Parliament	The programme underlying the Monitor Sustainable Netherlands is meant to bring about coherence between the policies of the various departments that are involved in broad environmental themes like climate change and sustainability. In 2008, the new interdepartmental programme board 'Clean and Economical' was installed to streamline and monitor the implementation of this particular working programme.
	Advisory council	The RIVM, RMNO, WRR, SER, SCP, CPB, CBS, PBL, etc.
	Legal framework	The formal requirement to produce Outlooks is laid down in the Environmental Law.

Country: the Netherlands		
	Political framework	In the Coalition Agreement of 2007, sustainable development was made the policy spearhead, which — so it was acknowledged — can only be realised by enhancing the coherence of (mid and long-term) policies developed in the various departments. Whereas, in the first Outlook on Sustainability, the focus lay on planet aspects, the second Outlook strived to also involve the people and profit aspects in the considerations. To enhance this, the MNP sought cooperation with the social and economic planning agencies (SCP, CBS, CPB). The effort to bring together the three Ps wasn't successful though, for it proved as yet impossible to come up with a practically useful operationalisation of the concept of sustainability for the other two areas. Thus, in the second Outlook, the physical aspects still prevail, be it that these are framed both within a spatial perspective (linking the Netherlands to the rest of the world) and in a temporal perspective (linking present and future of the Netherlands).
	Role of environmental research/ foresight programmes in providing futures thinking	Every year, about 30 foresights appear, the production of which requires the input of tens and, sometimes, even hundreds of people. The Network Foresights (Netwerk Toekomstverkenningen NTV) that was set up in 1974, has approximately 60 members from industry and private corporations, universities and public organisations. The development of the NTV site is in part sponsored by the Ministry of Internal Affairs and Kingdom Relations (BKZ). Members meet six to seven times a year. Among them are members of the councils, who often function as independent think tanks, and organisations of scientists and advisors who carry out extensive research on environment-related subjects and publish (scientific and policy) reports on the subject. All are involved with long-term research, like developing outlooks, scenarios and visions. There are also initiatives to establish a National Horizon Scan, whereby horizon scanning is defined as the systematic examination of potential threats, opportunities and likely future developments, including (but not restricted to) those at the margins of current thinking and planning. The first Netherlands Horizon Scan appeared in 2007 and was carried out by a specially established team that operated under the communal responsibility of the Central Consultancy Organ of Sector Councils (COS). It contained a broad range of subjects, including climate change. The team's work was supported by a number of sounding board groups. In February 2008, the tasks of the COS were transferred to the Knowledge Directorate of the Ministry of Education, Culture and Science (OCW). The Knowledge Directorate functions as a provisional facility for the continuation of the national scan and the European Horizon scanning activities. Innovation platforms and networks can also be said to play a role as long-term strategies, especially as means for the actual implementation of the changes proposed by outlooks and foresights. Though these are mostly focused on technological innovations, the trend is that all innovations need to be 'green' and sustainable so in that respect they could be said to be related to the environment. (The big question is, of course, whether this is mere window dressing and whether the overall objective isn't just more economic growth anyway.) Innovation platforms might use forward mapping, i.e. designing an analytically sound solution to problems, and/or backward mapping, i.e. evaluating the solution in terms of feasibility and acceptability in the views of those concerned, including stakeholders (Bos and Grin 2008, p. 495). The first Innovation Platform (IP) was set up in 2003, under guidance of Prime Minister Balkenende. The IP continued and expanded to include more sectors in 2007, but came to an end in June 2010. One of the projects was 'Winning with Water'. The IP aimed to play the role of icebreaker, catalyst and promoter of the opportunities related to delta technology, and to enhance breakthrough projects with a trans-sectional character and remove barriers to risk avoidance behaviour.

Country: the Netherlands		
		With WaterINNovation (WINN, 2007) the V&W also took up the Dutch water challenge for joint search for durable solutions for water. WINN investigates, designs, tests and demonstrates innovations such as new water control methods, innovative dyke reinforcements and conversion of sludge into raw materials. In 2001, the LNV set up the innovation network 'Green Space and Agrocluster' (formerly RNLO) whose aim it is to develop sustainable systems innovation in the policy domain of the LNV for the mid/long term. (Systems innovations are the central focus of attention in the fourth National Environmental Plan and are to lead to a transition towards a sustainable society.) In 2007, this innovation network laid down the lessons learned from practice in a book *Working on systems innovations*. The Dutch Knowledge Network System Innovations (KSI), comprising 10 universities and a Large Technological Institute (LTI), also plays an important role in this respect, as does the Competencies Centre for Transitions (CCT). In 2006, the LNV set up a Fisheries Innovation Platform (VIP) for three years. The VIP has developed four ambitions for the North Sea fisheries sector to adapt to changing environments, to generate opportunities, to come up with creative solutions and to take aim at goals in the more distant future. In November 2008, the LNV organised a 'Day of the Future' for entrepreneurs in the agro- and food sector with the theme 'Innoveren is vooruitzien' (Innovation is looking forward; vooruitzien = foresight).
	Actors	To get an idea of the actors involved in the totality of the working programmes that subside under the Monitor Sustainability, consider as an example, the working programme 'Clean and Economical'. This programme was developed through the intensive cooperation of seven departments (VROM, EZ, Finances, V&W, WWI, LNV and BZ). It consists of approximately 100 programmes and projects that the various departments have employed to realise the objectives. The minister of VROM coordinates the programme. For the implementation of the working programme, the government has chosen a joint approach of private corporations and colleague governmental organisations. The approach is laid down in a sustainability pact with private corporations and an administrative agreement with the municipalities. Every year, the government receives a letter on the progress of the implementation of the programme.
	Perceived institutional need	In 2008 the new interdepartmental programme board 'Clean and Economical' was installed to streamline and monitor the implementation of the working programme. Maybe there are more of such initiatives, but the main focus was to strengthen the existing institutional structure and bring more coherence to the various working programmes in which many ministries are involved. The NTV is currently finishing a research project 'the State Service in the Future' on the reorganisation of the departments commissioned by the secretary-general of the State Service.
2. Institutional structure for environmental policymaking	***Relevant government departments, ministers, agencies, etc.***	Sticking to the example of the working programme 'Clean and Economical': Ministries: VROM, EZ, Finances, V&W, WWI, LNV and BZ; Councils and planning agencies with environmentally focused assignments, like the PBL, RMNO; the new interdepartmental programme board was specifically installed to enhance the implementation of the programme.
3. Foresight/ scenario culture traditions	***Approach to futures thinking***	There is so much futures thinking going on that it is very hard to make a unequivocal statement here.
	Thematic or issue	Both sectors and themes. Within the sectoral issues, the ministries, councils and planning agencies are meant to focus on, thematic projects are organised and monitored.

Country: the Netherlands	
4. Summary of programme(s) as a whole, including within agencies	The Environmental Outlooks and specifically the Delta Plan are in themselves already quite encompassing programmes. Various studies, based on different kinds of futures-looking methods, form the basis for these programmes. Within the Monitor Sustainable Netherlands, looking backwards and looking forward are combined. On the one hand, the Monitor looks back to see how the Netherlands are actually developing with regard to a sustainable approach to the environment. On the other hand, scenarios and foresights from a broad research area (including the physical environment, climate change and water management) are being used to illustrate what the effects of certain problematic developments could be. Many ministries, councils and planning agencies are involved in the implementation of the working programmes that form the operationalisation of the Monitor.

Appendix 2
Examples of futures studies

Country: the Netherlands		
Futures programme(s): National Environmental Outlooks		
1. Description/ characteristics of future study	***Examples of specific studies***	Environmental Balances, which are preparations for the National Environmental Outlooks.
	Exploratory/ normative?	The Environmental Balance looks back (evaluates) and provides the necessary data and models to: the Environmental Outlook looks ahead and can be viewed as backcasting.
	Qualitative/ quantitative?	Both, an integrated approach is considered paramount in conducting outlook studies. The development of the Outlook implies research, monitoring, modelling, risk assessment, analyses and evaluations. A concrete and detailed design in the form of dummies was presented for both the Environmental Balance and Outlook, using a core set of indicators (target variables) to express the state of the environment. This design could serve as a coherent infrastructure of monitoring networks, models, databases and procedures to be developed in realisation of the Environmental Outlook and the Environmental Balance.
	Thematic focus?	Environmental
	Specific issue focus?	Climate change (cf. title of last report following on the National Environmental Outlook)
	Spatial/ temporal scale	National Environmental Outlook 1: Dates not known National Environmental Outlook 2:1990–2010 National Environmental Outlook 3:1993–2015 National Environmental Outlook 4 1997–2020 National Environmental Outlook 5 2000–2030 National Environmental Outlook 6 2006–2040.
	Ad hoc/ongoing established futures process?	The RIVM publishes an annual Environmental Balance and an Environmental Outlook every four years. Both of these were to serve as the objective scientific basis for the development of the National Environmental Policy Plan (NMP). Within this framework, the RIVM set up a short and long-term design. The role of the Environmental Outlook and the Environmental Balance was outlined as providing feedback on environmental quality for environmental policymakers, followed by a set of requirements. The systematic policy cycle, in which evaluative research, futures-oriented research and policymaking go hand in hand, seems to have come to a halt after Environmental Outlook 5 though (see below).
	Sector/cross-sector-based?	The design of the Environmental Balance and the Environmental Outlook was set up in global terms using the notion 'environmental state', which gives highly aggregated information in the form of indicators for six relevant priority areas for environmental policy. These indicators represent a section of the chain from source to sink, i.e. social developments (causes), use of resources, environmental pressures (e.g. emissions), abiotic environmental quality, effects on ecosystems, public health and functions (like agriculture, recreation and drinking water supply), and socio-economic effects of the environmental policy (including costs).
	Science-based/ multiple stakeholders?	Both the Environmental Balance and the Environmental Outlook are developed in cooperation with many scientific institutes and planning agencies. Before the deliverance of the Future Agenda, there were five meetings held with stakeholders.

Country: the Netherlands		
2. Original purpose and application	***For what purpose?***	Both the Environmental Balance and the Environmental Outlook were to serve as the objective scientific basis for the development of the National Environmental Policy Plan (NMP).
	Requested by a specific entity?	The Environmental Outlooks are made on commission of the Dutch Government. The first one by the General Director of Environmental Management, Director Strategic Planning. (In 1994, The RIVM was requested to publish an annual Environmental Balance and an Environmental Outlook by the minister of housing, physical planning and environment.)
	How used?	The Environmental Balances and Outlooks are used to develop efficient environmental policies, to monitor and adjust current policies in view of actual or anticipated developments. The NMD (National Environmental Policy Evaluation and Sustainability Department of the PBL) coordinates the exchange of information towards the policymakers. Systems innovations are the central focus of attention in the fourth National Environmental Plan and are to lead to a transition towards a sustainable society.
	By whom?	The NMD of the PBL takes care that legally required products like the annual Environmental Balance and the Environmental Outlook that is published every four years, are available on time for both policymakers and politicians.
3. Outcomes (immediate and long term)	***Where and how used in policy (if at all)***	The Environmental Balances and the Environmental Outlooks served as the objective scientific basis for the four National Environmental Policy Plans that were produced the last two decades.
4. Evaluation	***Any formal evaluation of effectiveness or updates***	Instead of a fifth Environmental Policy Plan following the sixth Outlook, State Secretary Van Geel of the Ministry of Housing, Physical Planning and Environment delivered an agenda for the future. The Future Agenda for Environmental Policy, presented in 2006, is primarily an instrumental agenda; it doesn't question the objectives proposed by Environmental Outlook 5 and NMP4, but it does entail a new, business-like approach of environmental policy. According to the state secretary, a new approach was much needed, for the developed instruments appeared to form an insufficient base to get the implementation of the fourth National Environmental Policy Plan (NMP4) off the ground. Moreover, the economic recession was forcing the government to appoint priorities: not all the plans could be realised immediately. With its new 'improved' instruments and concrete plans, the Future Agenda is to hold on to the set objectives and actually achieve them. The Future Agenda implies first and foremost a change in implementation style. But it also implies a change of style on the political level and organisational level in that it will lead to redistributions of tasks and responsibilities for departments and government officials. More responsibility is laid at the company level, which the government tries to make acceptable by: • making sustainable enterprising more attractive by emphasising the opportunities of sustainable production; • making it easier by removing bureaucratic barriers (e.g. cutting down on inspections which at the same time would mean a 10 % gain in efficiency for the government). The cabinet is closely monitoring the Future Agenda. In 2007, a report was presented with an update of the state of affairs and results of the planned actions.
	Success factors/drivers	In 1995, the RIVM formulated the 'yardstick-approach' since, in its own words, it was the best way of fulfilling the set of requirements and providing the desired feedback on the target variables. In view of the Future Agenda, this doesn't seem to have been a waterproof successful driver. The environment isn't merely considered as an economic burden, but also as an opportunity. Knowledge and experience in the fields of water purification and waste management, for instance, are already successful export products.
	Barriers to success	Will the government really succeed in making sustainable enterprising more easy by removing bureaucratic barriers?

Country: the Netherlands	
5. References	Ten Brink, B. J. E., van den Berg, R., 1994, *Designing the Environmental Balance and Environmental Outlook: from broad vision to concrete design* (in Dutch: *Ontwerp Milieubalans en Milieuverkenning, Van globale visie naar concreet ontwerp*), Bilthoven, RIVM. Van Geel, B., 2006, *Future Agenda for the Environment: clean, smart and strong*, The Hague: Ministry of Housing, Physical Planning and Environment (in Dutch: *Toekomstagenda Milieu: schoon, slim, sterk*) (http://www.vrom.nl/toekomstagenda). Van Geel, B., 2006, *Evaluation of climate policy 2005*, The Hague, Ministry of Housing, Physical Planning and Environment (in Dutch: *Evaluatienota klimaatbeleid 2005. Onderweg naar Kyoto*) (time frame 2012–2020). Ministry of Housing, Physical Planning and Environment and the National Environmental Policy Plan, 2000, *Fifth Environmental Outlook*, Alphen aan den Rijn: Samson (in Dutch: *Vijfde Milieu-verkenning*) (http://www.pbl.nl/nl/publicaties/mnp/2000/Milieuverkenning_5.html) (Dutch summary). The National Institute for Public Health and the Environment and the National Environmental Policy Plan, 2006, *Sixth Environmental Outlook*, Bilthoven: RIVM/Sdu (in Dutch: *Zesde Milieuverkenning*) (http://www.rivm.nl/bibliotheek/rapporten/500085001.pdf). The Central Bureau for Statistics and the National Institute for Public Health and the Environment, 'Environmental and Nature Compendium' (http://www.rivm.nl/milieucompendium).

Country: the Netherlands		
Futures programme(s): Delta programme (Delta Plan 2)		
1. Description/ haracteristics of future study	***Examples of specific studies***	Advice of the Delta Committee *Working together with water* (2008) Background studies to the 2008 advice (titles translated into English) • Attention for safety • Delta committee listens to stakeholders • Towards a new Delta Act • Sketches of spatial planning • New Waterway and North Sea channel • Group risks in case of flooding • Constituents for the Delta Committee • Head above the water • Research on upper limit scenarios • Report Young Delta Committee 'Getting to work' • Summary knowledge questions • Future for the Dutch polder concept • Scenarios for flood protection: An international assessment • Working on delta nature • Imponderabilia charted
	Exploratory/ normative?	Backcasting, extensive use of scenarios based on climate change, and socio-economic scenarios, under the normative guidance that safety and sustainability form the two pillars for the future strategy.
	Qualitative/ quantitative?	Quantitative in relation to changes in future flood risks (modelling on a safety level lying at least a factor 10 higher than the current level). Qualitative in relation to socio-economic visions on the future.
	Thematic focus?	Protection of the Netherlands against flooding and safeguarding the supply of fresh water. Delivering a sustainable, both environmentally and socio-economically, vision on living and working, agriculture, nature, recreation, landscape, infrastructure and energy in the Dutch delta.
	Specific issue focus?	The consequences of climate change, how to 'live with the water'.
	Spatial/ temporal scale	Netherlands 2010–2100, even looking to 2200.
	Ad hoc/ongoing established futures process?	The first Delta Committee was installed after the disastrous floods in the south of Holland in 1953. Back then, the committee was primarily concerned with hydraulic engineering works to counter an acute threat. The construction of numerous dams, sluices, locks, dykes and storm surge barriers was only in finished in 1997. The 'new' Delta Committee, officially called the Sustainable Coastal Development Committee, was appointed September 2007 to formulate an integrated vision on the long-term protection of the Dutch coast and its low-lying hinterland.
	Sector/cross-sector-based?	Sector (water management) and cross-sector (the effects of flooding affect many sectors)
	Science-based/ multiple stakeholders?	Both Science-based and stakeholder informed The Delta committee consulted (inter)national scientific experts from the IPCC-network and Dutch experts on flood security and water management, who have supplemented the latest insights into climate scenarios and come up with new estimates of extreme values. The Committee has also asked advice on the social, ecological and economical impact of climate change and sea level rise, as well as on financial, governmental and constitutional issues. Besides that, multiple stakeholders have been heard, varying from citizens and lay experts to policymakers and governmental institutions. The Committee has also consulted Belgium and Germany.

Country: the Netherlands		
2. Original purpose and application	***For what purpose?***	The mandate was to produce an advice on the protection of the Netherlands against the consequences of climate change and flooding, make it climate-proof over the very long term, and to safeguard the supply of fresh water. But the task at hand involved looking further than just flood protection, so the new Delta programme also contains a vision on sustainable living and working, agriculture, nature, recreation, landscape, infrastructure and energy.
	Requested by a specific entity?	The Dutch Cabinet
	How used?	The Delta advice is taken very seriously and will form part of the future policies that will be developed. The cabinet takes the vision and recommendations as its starting point for the decision-making process. Still, in 2009, a new Delta Act will be proposed which will form the constitutional basis for the Delta programme, the tasks and responsibilities of the Delta director and the financial planning.
	By whom?	A new steering group will be installed with representatives of the VROM, LNV, Internal Affairs and Kingdom Relations (BZK), Economic Affairs (EZ) and Finance. The prime minister will be chairman, the State Secretary of the Ministry of Transport, Public Works and Water Management (V&W) will be coordinator and politically responsible.
3. Outcomes (immediate and long term)	***Where and how used in policy (if at all)***	The norms on acceptable risks formulated by the first Delta project were put down in the Delta Act, requiring the government to keep risks of catastrophic flooding within these limits and to upgrade defences should new insights into risks require this. These limits are also put down in the new Water Act to be effected in 2009. So it is clear that the recommendations laid down in the advice will be institutionalised, just as happened with the first Delta Plan.
4. Evaluation	***Any formal evaluation of effectiveness or updates***	In the debate on the advice of the Delta committee, four topics dominate: • the actual level of urgency • the financing of Delta Plan 2 • the proposed increase of the water level in the IJsselmeer with 1.50 m • the used upper limits of the anticipated sea rise level (65 cm–1.30 m in 2100). The Royal Dutch Meteorological Institute (KNMI) has explained that, for their climate scenarios, they took as a starting point the most plausible scenarios instead of the worst case scenarios that formed the point of departure for the analysis and policy recommendations of the Delta committee, to clarify that the KNMI anticipations of 2006 were not already outdated in 2008.
	Success factors/drivers	Supported by the Dutch Government and people, driven by the historical struggle to live with the water and, specifically, the sentiment still felt referring to the flooding of 1953 (and revived by recent flooding in the 1990s and by Hurricane Katrina in 2005). Cross-sectoral approach — I expect (to be checked in interviews). Stakeholder consultancy — I expect (to be checked in interviews).
	Barriers to success	On the one hand, the economic crisis might put pressure on the national budget and form an impediment to the will to invest the needed billions in the future of the Netherlands. On the other hand, it might well be, as Prof. Dr Rademaker expects, that the government will use the ambitious Delta project as a provision of work in times of recession, in an effort to counter the crises.
5. References	Van Duijn, J., Fresco, L., Heidema, A., Kabat, P., Metz, T., van Oord, K., Parmet, B., Stive, M., Veerman, C., 2008, *Working together with water — A living land builds for its future*, Findings of the Delta committee 2008 (http://www.deltacommissie.com/doc/deltareport_full.pdf). There is an online film available supporting the 12 recommendations of the Delta committee (http://www.deltacommissie.com/en/film). http://www.knmi.nl/klimaatscenarios/aanvullend/DC/index.php	

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Annex 6 — Netherlands country case study
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