

# Dutch Policies to Manage the Transition to Sustainable Energy

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## 1. Introduction

Many countries are committed to sustainability but are struggling with how to do this. Most countries opted for sustainability councils and the development of sustainability indicators. The Dutch government followed a different track. It believed that sustainability requires some fundamental changes in functional systems of for example energy, transport and agriculture. It conceptualised the quest towards sustainability as an issue of managing transitions in functional systems. In this paper we examine why the Dutch government became interested in transitions. We will see that transition management was attractive because it allowed different ministries to pursue their own agenda but in a different way: with more attention to innovation and learning. We will look at the model of transition management and the Dutch policies for managing the energy transition. The model is believed to be an interesting model of governance, employing an integrative and multi-scale framework for policy deliberation, choice of instruments, and actions by individuals, private and public organizations, helping society to escape lock-in while avoiding new evolutionary traps.

## 2. Why did the Dutch government become interested in sustainability transitions?

The term transition is a key term of the fourth national environmental policy plan (NMP4) which unlike past plans looked 30 years into the future and did not set goals but formulated ambitions which were believed to require transitions, fundamental changes, in functional systems. The government's interest in sustainability transitions stemmed from a learning process leading to a new perspective. It is an

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example of policy learning in which it was believed that sustainability requires some fundamental changes in functional systems, which in turn required changes in policy. Problems of climate change, loss of biodiversity, overexploitation of resources and several types of risks (health risks related to the use of dangerous, non-natural substances and risks of explosion and accident) were viewed as system-inherent, which meant that the answer to the problems was to be found in fundamental changes in underlying systems of production and consumption. They required what was called “system innovation”, a concept coming from people working on innovation issues (NRLO, 1999) and adopted by Dutch policy makers.

In the words of the 4th national environmental policy plan (NMP4, 2001, p. 6):

*There remain a number of environmental problems that policy has been unable to deal with satisfactorily. The solution to these problems requires fundamental societal changes, beyond national borders. (...) Climate change, the loss of biodiversity and depletion of natural resources threaten the basis of human existence, plants and animals life. Accumulating, harmful chemical substances, hormone-impairing substances and genetically modified organisms are another cause for concern. The recent disaster in Enschede [the explosion of a firework factory killing 28 people, K&L] furthermore calls for a rethink of the kind of risks society wants to accept.  
(...)*

The seriousness and magnitude of environmental problems make clear that extra efforts are needed, and that approaches and solutions along existing paths offer too little perspective.

The fourth national environmental policy plan (NMP4) constituted a discontinuity in Dutch environmental policy plans by looking 30 years into the future (instead of 4 years) and by taking stock of what had been achieved the past 30 years. It also looked different: It was a very colourful report of an unusual size (30 x 30 cm), with oddly-sized photos of plants, landscapes, and people from different countries spread over the pages, and the use of coloured rectangles in the text. The title “A world and a will” (Een wereld en een wil), highlighted the worldwide focus and emphasized determination and will-fulness.

A central message of the NMP4 is that policy has not been futile. At the end of the introductory chapter, it is stated that “policy matters” and that through a well-organised effort high ambitions can be reached.

According to the NMP4, there remained however seven big environmental problems society has been unable to handle, despite the fact that they are known for some time and are widely acknowledged (both nationally and internationally) as serious problems. These problems were: loss of biodiversity, climate change, depletion and overexploitation of natural resources, public health threats, nuisances impairing liveability, external safety, and future risks. It says that these problems are system inherent and that the solution lies in creating different systems or transforming existing ones.

The NMP4 identifies 7 barriers to sustainability. These are:

- Unequal distribution: poverty causing irresponsible environmental management
- Short-term thinking (in politics and business)
- Fragmented policies and institutional deficits
- Prices do not reflect external costs of environmental degradation
- Actors causing problems do not own the problem (they are not responsible for the solution of those problems)
- Solutions involving system changes are surrounded with great uncertainty
- Insufficient precaution.

All barriers identified relate to the perceived unsustainability of existing societal structures. The identification of the 6th barrier is evidence that government started to think about system innovation as a solution. This reflects a change in policy thinking. Whereas past policy was concerned with an upgrading of functional systems such as energy, transport and various product chains through the use of technology (technical fixes), now the systems themselves are seen in need of change. It is an example of policy learning, which occurred first within VROM (the Ministry responsible for the environment) and the Agriculture Ministry, and later spread to other Ministries: The Ministry of Economic Affairs and Ministry of Transport and Water.

System innovation, meaning a fundamental change in functional systems and product chains, thus became a new focus of policy, besides system improvement. It fitted with the idea of co-optimising economy and environment, an idea that was the topic of the government green paper “Environment and Economy” which came out in 1997. Policy became thus more concerned with development paths rather than with specific outcomes. The co-optimization through system innovation raised a number of fundamental questions regarding coordination and governance. It brought attention to transformation processes and the ability to steer or manage such processes.

Thinking about these issues did not start with the NMP4. Prior to the NMP4 there had been internal discussions on the topic of knowledge, technology and governance. A unique research programme for technological solutions, the DTO programme, had been instituted in 1993, followed by EET in 1996. DTO was an interdepartmental research programme for sustainable technologies offering factor 20 benefits, which ran from 1993-1997. From the DTO programme it became clear that such technologies required changes in culture and structure. A knowledge dissemination programme DTO-KOV followed it but did this not address the root problems.

To facilitate further interdepartmental co-operation on the issue of technology and environmental policy, in 1997 the task group Technology was established. It seems that this task group played an important role in the discussion of system innovation issues, but further research is needed to ascertain this. The task group was involved in the NMP4, operating under a new name, KETI (Kennis and Technologische Innovatie--Knowledge and Technological Innovation) looking not just at technology but also at knowledge and innovation and governance issues. The people involved in this group were not bonded by departmental rules; they were acting rather as free

individuals. The working group was not used as a platform for interdepartmental negotiations, which probably facilitated its functioning as a think tank within the government. Within this working group the term “transition” surfaced.

In December 1999, KETI organized a workshop about transitions, with innovation experts and social and cultural scientists (but curiously no political scientists). The central questions of the workshop were: what kind of new policy is needed for transitions and what knowledge is needed for transitions? The workshop focused on steering models, the roles for government and to a lesser extent on instruments and knowledge.

The notion of transition and possibilities for transition management were further explored in two studies commissioned by the NMP4 team. The first study titled “Transitions: can three people change the world?” was by Twynstra Gudde Management, STORRM and Hötte Milieu Management. First and principal author was Harry te Riele from STORRM, an engineer specialized in change issues. The study defined the transition concept and argued that societal change in principle could be steered, and that one should look for levers, to be identified through causality analysis looking at causality loops. The report was based on a flux model. It did not openly say that three persons can bring about a transition but indeed offered a suggestion to that effect.

The second study was a study by ICIS and MERIT, two Maastricht University research institutes. Jan Rotmans director of ICIS and René Kemp researcher at MERIT (and author of this paper) were asked to further investigate the notion of a transition and examine the possibilities for transition management. Both had done some work on transitions issues but from a different perspective. Rotmans, a professor of Integrative Assessment, had been involved in climate change assessments, holding a great expertise in dynamic system models. As an economist, René Kemp had worked on innovation and environmental policy issues. With a group of Norwegian historians and innovation experts from PREST in Manchester he had studied the issue of technological regime shifts in a project for the EU called “Technology and the Transition to Environmental Stability”, and he also had been involved in a EU project analysing experiments with sustainable transport called “Strategic Niche Management as a tool for Transition to a Sustainable Transport System”. The Maastricht team built on work by Frank Geels on technological transitions (described in Geels and Kemp (2000) and Geels (2002)), and the multilevel perspective of Rip and Kemp (1998) elaborated in Geels (2002ab), using examples of transitions from Geels and from Verbong (2000).

It is hard to tell which study was most important. If we look at the NMP4 the second study appears to be the most important as the wording of the NMP4 stayed very close to what had been written in the report. According to the NMP4: “To solve the big environmental problems we need system innovation which may take various forms. The [system] innovation may take the form of a societal transformation process that may take one generation or more. For the transformation to happen, economic, social-cultural and institutional changes are needed that reinforce each other. (...) New parties and innovative technologies play an important role. It is not a matter for the government alone but for the whole of society (...) management of transitions

requires a form of process management in which uncertainty, complexity and interdependencies are addressed. (NMP4, p. 107)”. Most of this was taken from the ICIS-MERIT report. The NMP4 also borrowed from the ICIS-MERIT report that management of transitions requires the following things:

- To deal with uncertainties, for instance through the use of scenarios.
- To keep open options and deal with fragmented policies: to stimulate knowledge and technological change, to pursue innovation and incremental improvements, to take a multi-domain view with attention to all relevant actors.
- To have a long-term orientation and to use this for short-term policies.
- To pay attention to the international aspects of change processes and find solutions at the right scale.
- A set of specific tasks for the government, namely to stimulate, mediate, engage in brokering services, create the right conditions, enforce its laws and engage in steering.

The almost verbatim use of sections of the ICIS-MERIT report was not accidental. There has been a close interaction between the NMP4 team and the writers of the report. In the 4-month period of the study, the authors of the report met 4 times with the interdepartmental group of the NMP4, and once with a bigger group of people from various ministries, to discuss the notion of transition and the possibilities for transition management. It was an example of government-science cooperation, in which the researchers had also a process role to play. The interaction helped to create support for the idea of transition management that through internal discussions within the team and with the NMP4 group, gradually took shape.

In the meetings the idea of transition management gained currency. The believed reasons for this are: First, the iterative aspects and in-built flexibility took away concerns about future control whilst maintaining an element of management, second, it was not directly threatening to existing policy, for example Kyoto policy or innovation policy, allowing the Ministries to pursue their own agendas, and third, it was difficult for sceptical people to argue against an approach focussing on innovation and learning. Further research is needed to confirm this but in my view they constitute the most important factors (of which it is hard to say which one was most important—the importance also differed between different ministries and different social actors. Some environmental NGO’s for example suspected that the government wanted to try to escape their responsibilities by engaging in long-term transition management. At the same time some companies, sometimes already familiar with the idea of transition management in their context, saw it immediately as an approach from which they could benefit).

Of the various Ministries the Ministry of Economic affairs became the strongest proponent of transition management. To many this was surprising because the Ministry’s main goal had been to serve the interests of business. They were mainly interested in sustainable energy for business reasons. Why then did this Ministry embrace the concept of transition management and was it so active in implementing it?

The reasons for why the Ministry of Economic Affairs got interested in transition management are described in the Ministry's policy white paper "Innovatie in Energiebeleid" (Innovation in Energy Policy) (MINEZ, 2004). The first, arguably foremost, reason is that they hoped to create sustainable energy business. They were hoping that the Netherlands would become a preferential location of innovative, sustainability-oriented companies. The second reason that is stated is that a sustainable energy system requires system innovations, which require a cooperative long-term approach such as transition management. Third, the energy transition would help the Ministry in changing its relationship with business, making it more interactive and participatory, co-aligning societal goals and business goals. As they write:

*A third reason for the transition approach is to be found in the changing relationship between market and government. Steering is no longer the province of government. This means that in the energy transition stakeholders should co-determine the directions with chances informing those directions. Policy goals should be broadened so that business, societal organisation and knowledge institutes recognise their own ambitions in them. The advantage of this is that a broadly shared sense of opportunity can emerge, creating chances for new products and systems in new corners of the market (MINEZ, 2004, p. 9).*

Each of the three reasons is interesting. They are not evidence-based but reflected judgement on the part of government. An important expectation was that the world-wide energy system based on fossil fuels was believed to be non-sustainable environmentally and economically. A transition to alternative fuels was viewed inevitable, by being a first mover the Netherlands wanted to benefit from this change.

The approach of Transition management developed by Rotmans and me as an iterative approach towards long-term change based on innovation and learning fitted the Ministry's vision of how to manage the transition process. In the words of the Minister of Economic Affairs Hans Weijers in 2001:

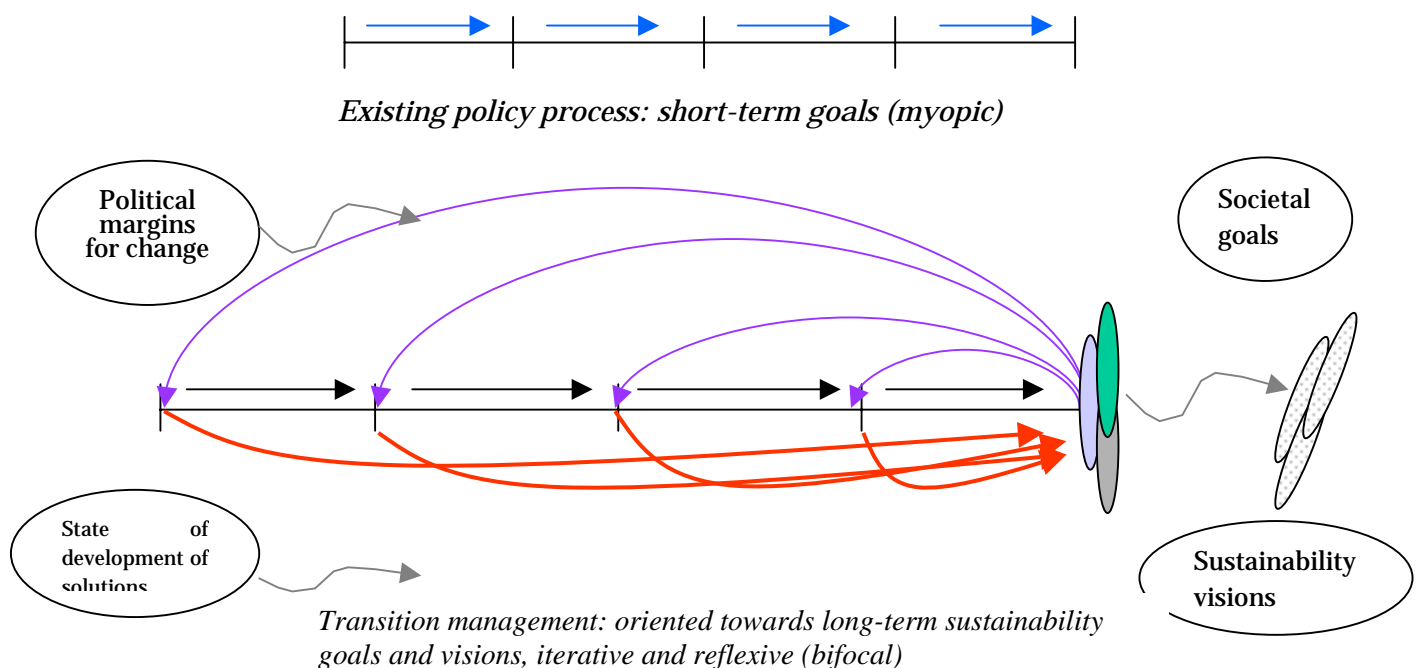
*In my opinion the government should not work from self-designed, predetermined future images that fix choices for a long time. What it should do instead is to stimulate and search for new initiatives in society that lie the basis for developments that help to go beyond existing energy policy objectives, starting from a shared concept of sustainability. The concept of transition management requires different ways of thinking and doing-things on the part of government, including the Ministry of Economic Affairs. I want to play an active part in this. I have asked people of the Department to work out the concept the coming half year (Brief Minister van Economische Zaken, 2001, P. 5, quoted in MINEZ, 2001).*

The transition approach is said to differ from existing energy and climate policy in the following respects: long-term orientation, system approach, collaboration between stakeholders who jointly formulate ambitions and take concrete steps to realize these ambitions (MINEZ, 2004). Section 3 will examine the differences in more detail.

### 3. Transition management

Transition management consists of a deliberate attempt to work towards a transition offering sustainability benefits, not just environmental benefits but also economic and social benefits. The basic steering philosophy is that of *modulation*, not dictatorship or planning-and-control. Transition management joins in with ongoing dynamics and builds on bottom-up initiatives. Ongoing developments are exploited strategically. Transition management for sustainability tries to orient societal dynamics to participatory defined sustainability goals for functional systems (energy, transport, agriculture). For transport the goals could be: reliable, safe, clean and cheap transport. A reduced need for transport could be another goal as the Netherlands is densely populated leading to high demands for space. To meet those transition goals, quantitative goals are needed. The goals may refer to the use of particular solutions (fuel cell vehicles, road pricing or multimodal transport) but better refer to performance such as non-congested transport that is safe, accessible, and minimises nuisance. The goals and policies to further the goals are not set into stone but constantly assessed and periodically adjusted in development rounds. Existing and possible policy actions are evaluated against two criteria: first, the immediate contribution to policy goals (for example in terms of kilotons of CO<sub>2</sub> reduction and reduced vulnerability through climate change adaptation measures), and second, the contribution of the policies to the overall transition process. Policies thus have a *content goal* and a *process goal*. Learning, maintaining variety and institutional change are important policy aims and policy goals are used as means. The use of development rounds brings flexibility to the process, without losing a long-term focus. Transition management is oriented towards achieving structural change in a stepwise manner. A schematic view of transition management is given in Figure 1.

Figure 1: Current policy versus transition management (Source: Kemp and Loorbach (2003))



It is important to note that transition management is based on a two-pronged strategy. It is oriented towards both system improvement (improvement of an existing trajectory) and system innovation (representing a new trajectory of development or transformation). Transition management breaks with the old planning-and-implementation model aimed at achieving particular outcomes. It is based on a different, more process-oriented philosophy, aimed at processes of variation and selection. Transition management is a form of process management against a set of goals set by society whose problem solving capabilities are mobilized and translated into a transition programme, which is legitimized through the political process. Transition management is iterative and adaptive. It does not aim to realize certain particular paths but sets out to explore new paths in a forward-looking, yet adaptive manner. It does not consist of a strategy of forced development, going against the grain but uses bottom-up initiatives and business ideas of alternative systems offering sustainability benefits besides user benefits.

Key elements of transition management are:

- Long-term thinking (at least 25 years) as a framework for short-term policy.
- Backcasting: the setting of short-term and longer-term goals based on long-term sustainability visions and short-term possibilities.
- Thinking in terms of more than one domain (multi-domain) and different scale levels (multi-level); how developments in one domain (level) gel with developments in other domains (levels); trying to change the strategic orientation of regime actors.
- A focus on learning and the use of a special learning philosophy of 'learning-by-doing'.
- An orientation towards system innovation.
- Learning about a variety of options (which requires a wide playing field).

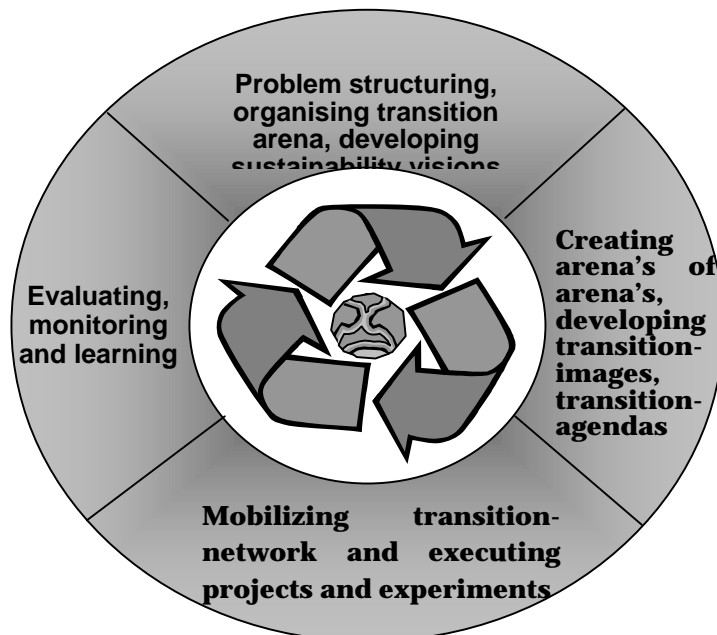
In practice, transition management has to result in the organization of societal change towards sustainable systems. Innovation and transfer of knowledge are critical components in this process. In the Netherlands, the approach of transition management is being translated by authors such as (Loorbach, 2002, Dirven et al. 2002, Loorbach and Rotmans, 2004) as a steering model to organize and structure transition management activities in so-called transition-arena's. The transition-arena is best viewed as a virtual arena or network, which provides room for long-term reflection and prolonged experimentation. Through the use of different steering instruments, ranging from scenario's studies, participatory methods and regular instruments such as pricing, subsidies and regulation, the initial arena has to evolve into a growing network based on a mutually defined direction for the future. The transition-arena in its first phase is explicitly placed outside the arenas of day-to-day politics and policies but has to be supported by political or regime-powers (but not dictated by it, for example through the support of a minister, director etc).

Within such a transition-network, each actor has to redefine their own role, their competences and their *modus operandi* in interaction and co-production with the other actors. Through such a process of co-production and co-ordination, actors at different levels will be able to formulate joint goals and develop common strategies



that involve societal uncertainties, power-relations, institutional barriers as well as ambitions, targets and desires. This way, a new structure of collective governance emerges whereby government is at the same time facilitator and one of the players. Because of the evolutionary nature of transitions, such an adaptive multi-level approach, whereby uncertainties and risk are acknowledged and dealt with, is better fit to develop policies on complex and structural societal problems. The model that is currently used in the Netherlands to implement transition management consists of 4 basic activity-clusters (Loorbach, 2002, Loorbach and Rotmans, 2004). Depending on the progress of the transition management process (process goals) as well as the development of the actual societal processes (content goals), the activities can be executed sequentially or in parallel, which emphasizes the importance of monitoring and evaluation throughout the process. In practice, transition management will take its shape based on the subject at hand, the actors involved and the competences of the organisation.

*Figure 2 Activities in transition management*



#### 4. Transition policy in the Netherlands: actions and plans

When the Ministries started implementing transition management, the concept itself was only roughly sketched. Especially the stakeholder process aspects were weakly developed. Several activities have been undertaken as part of transition management by the Ministry of Economic Affairs. Basic starting point for the Ministry was the general ambition of creating a sustainable energy-supply system in interaction with all societal stakeholders. A sustainable energy-supply systems was defined along the three dimensions of sustainability by the following three functional goals:

1. reliable provision of energy services;
2. low prices thanks to economic efficiency and market dynamism;
3. minimal negative environmental and social impacts.

Low-carbon was singled out as the most important environmental aspect, which means that the energy transition is about cheap, reliable and low-carbon energy.

*Apart from the functional goals – having to do with the way in which services are provided -- there are non-functional goals. Officially stated non-functional goals are the creation of energy business and contribution to policy renewal. It is also being stated that the use of biomass should not create environmental or social problems elsewhere (for instance in developing countries). A last goal is self-sufficiency but this applies more to the EU than to the Netherlands. It should be noted that none of the goals is quantified. The non-quantification is deliberate. Apart from the many uncertainties that make it difficult to set goals, it is believed that the formulation of qualitative ambitions instead of quantitative targets keeps open the process of change:*

*The past goals of energy and climate policy were sometimes narrow: a certain amount of cubic meters of natural gas saved, a certain share for renewables, and tons CO<sub>2</sub> emissions being avoided. In the transition approach the goals are much wider: they concern energy, supply security, climate and environment, industrial chances and innovation, knowledge development and policy renewal. In this broader approach, completely different parties may do something novel that befits their own interests. Different interests may thus collaborate and jointly create a force of change, which would not arise otherwise. In the energy transition we therefore prefer to talk about ambitions instead of targets (“doelstellingen”). (MINEZ, 2004, p. 12, original italics)*

The Ministry started with making an inventory of all relevant actors and activities related to sustainable energy nationally and internationally. Based on this inventory, supported by scientific data, the working group ‘lange-termijn visie energievoorziening’ (long-term vision for the energy supply-system), produced the scenario report ‘Energy and Society in 2050’. This report combined the analyses of different trends related to economic growth, energy consumption and industrial development with projections about yield and supply of (alternative) energy-resources ranging from fossil resources to biomass. In its analysis, the report distinguished four possible future-worlds along the axes long term (gain) versus short term (gain) and regional versus international. In each of these ‘worlds’ (scenario’s)- ‘Global solidarity’, ‘Global markets’, ‘Regional networks’ and ‘Regional isolation’—the need for and sources of energy were identified. Based on this analysis, the so-called robust elements of the future energy system were believed to be those that fit in all four scenario’s (in the Lange Termijn Visie Energie, LTVE, 2000). These were translated in “main routes” of the energy transition, which are:

1. Efficient and green gas
2. Chain efficiency (efficient energy and material use throughout production-use chains)
3. Biomass resources (for products, materials and energy)
4. Alternative motorfuels
5. Sustainable electricity.

The Energy and Society in 2050 report was evaluated by the Central Planning Agency (CPB) and an independent German institute (Fraunhofer Institute) and was presented at the website of the Ministry. In the Netherlands internal meetings, working groups, stakeholder meetings, a website-forum and a final conference were organized by the Ministry to discuss the report and at the same time create a platform and support for the approach of transition management. These discussions also showed that the choice for the main routes was recognized by the stakeholders and supported by the market. Although there were some discussions about the involvement of solar and wind-energy, the consensus was that these options were not innovative enough and should not be part of at least the first phases of the process.

*The first four routes selected are new strategic routes for policy, the last one – sustainable electricity – was already chosen as a strategic route. For these four new routes transition-arena's or platforms were set up to enable and facilitate discussions within the framework of the over-all ambition and the context set by the scenario-study. Within the different main routes (or sub-themes), paths were worked out by the transition teams "new gas", "biomass international", and "modernizing energy chains". In addition 80 ideas (70 proposals) for transition experiments have been collected in the areas of new gas, biomass, energy-efficiency and industrial ecology. The overall aim of the transition experiments and paths was to achieve an energy system characterized in the over-all vision through learning about different options, bottlenecks and uncertainties.*

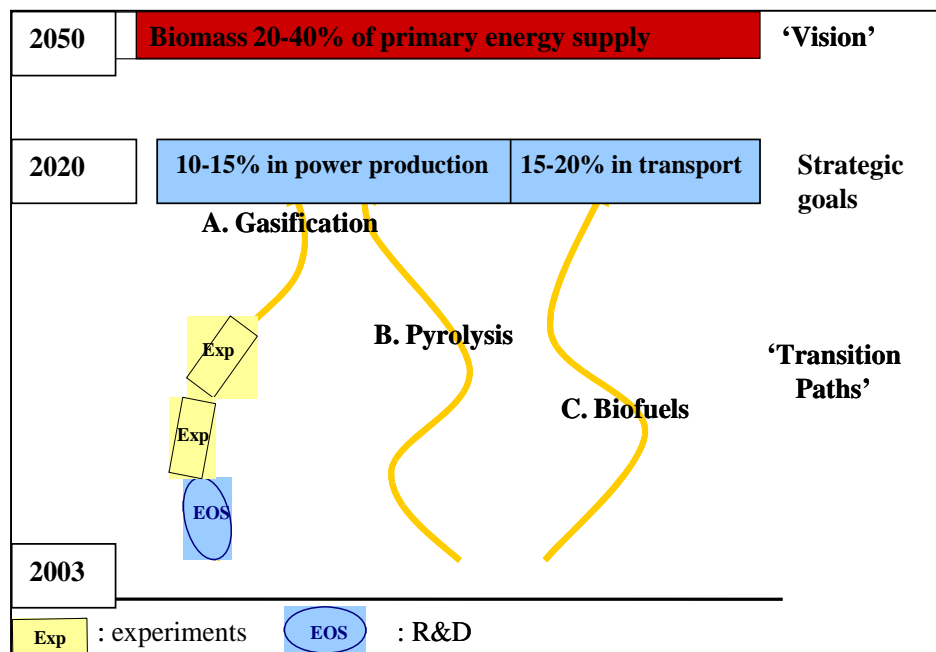
The general approach thus was to formulate general qualitative ambitions which served as a framework for similar discussions on the level of the different options (main routes). For each of these options "ambitions" were formulated by the transition teams based on stakeholder consultation and interaction with social groups. The general conditions within which the discussions should take place were set by the exploratory phase of the scenario-study and the participatory process underlying it. The real debates however about *how* specific options could or should be used and what their potential would be, were held on the sub-level of the main routes. This meant a bottom-up definition of options and sometimes an explicit choice for leaving different, competing, options open.

The discussions about biomass for example provided a new forum for interaction of a wide variety of stakeholders active in this field and for debates about different perspectives on the issue. It soon became clear that although there was a shared interest in developing the biomass-network and concrete ideas for application, there was much difference in the expectations of the yield of different sources of biomass

an the best way to process these forms of biomass. These discussions already were very functional in providing insight into the complexity of the issue and the variety of options. While not all actors agreed with the specifics, a more general level of understanding was created to enable convergence with regard to formulating ambitions and transition-paths.

The ambitions for biomass that were agreed on consist of a share of 10-15% for biomass in power production and a share of 15-20% in transport in 2020. For 2050 there is an ambition of 20-40% biomass in primary energy supply. The goals are set by industry, ngo's, the Ministry and scientists who also formulated possible routes to these outcomes. The strategic goals for 2020 were called 'ambitions', something to aspire to. In its own communication the Ministry uses the following slide for the biomass route.

*Figure 3. The biomass vision in the Netherlands (Source: presentation of Hugo Brouwer from Ministry of Economic Affairs in NL at final BLUEPRINT workshop in Brussels in 2003).*



It should be noted that the ambitions are not “hard goals” for policy; they will not be used for hard-nosed political evaluation. They are soft goals reflecting uncertainty about the options and the economic and political-administrative context. They will be adapted with time. A quintessential element of transition management is that no collective choice is made as to energy technologies and sources. The three transition paths are composed of 30 technological and societal options that will be explored in the so-called transition coalitions; coalitions between technology-developers, companies, researchers, ngo's and government.

One example of a coalition which was developed by the industry itself in the context of this process is the community on bioplastics (BCPN). Different actors developing different kinds of bioplastics (plastics based on biomass), ranging from flower-pots to plastic bags and pens, organized themselves into a branche organisation to develop a

community, facilitate debate and provide a communication channel for the community toward government and society. Within three years, they have developed a logo, website, a strategic agenda and some successful examples. During this time, discussions of the organisation with the government have led to progress which could not have been achieved by individual companies, such as the possibilities created by almost all municipalities to include bioplastics in the compost. This was for a long time not possible because of the lack of coherence in the sector, the fact that bioplastics could not be recognized, retail would not sell it, regulations prohibited it and consumers would be confused by it. Through the creation of a learning community including all the stakeholders, and slowly working towards a shared agenda, different conditions were slowly changed to enable the breakthrough of bioplastics on a larger scale.

Next to organising the stakeholder process, the Ministry has tried to undertake activities supporting the development of the transition-network. For example there has been an evaluation of existing policy programmes from the point of view of their contribution to the energy transition. One such programme is the GAVE programme, a chain demonstration programme for climate-neutral fuels, where it was concluded that it was too technology-focussed (NOVEM, 2003). Another policy integration exercise was the evaluation of the government energy RTD (EOS) where 63 projects have been analysed on the basis of two criteria: knowledge position of the Netherlands and contribution to sustainable energy system. This led to the identification of “arrowpoint” projects that scored high on both accounts. Projects with a positive contribution to a sustainable energy system and weak knowledge position of Dutch firms were labeled “knowledge import” themes whereas projects with opposite scores were labeled “export themes”. The EOS evaluation appears not to be a direct result of the government’s commitment to transition management, showing that the government was already using a strategic portfolio approach for energy R&D.

Three other visible initiatives are: the establishment of a so-called “service point transitions” at the Ministry responsible for the Environment (VROM) which is also responsible for overall coordination of sustainability policy; a transitions newsletter; and the establishment of an “interview group” advising the Ministry about its energy transition policy. The interview group consists of societal experts of high reputation which should make sure that policy is not exclusively supply oriented but also takes account of issues of acceptance and other societal concerns such as livability. The group consists of mostly non-energy experts. Most of them had been involved in politics and several had held Ministerial positions.

Two new instruments of transition management are the “Regeling Ondersteuning Transitie Coalities (OTC) for transition experiment coalitions and the “Unieke Kansen Regeling” of 35 million euro for transition experiments. In order to qualify for support the experiments should

- be part of an official transition path
- involve stakeholders in an important way
- have explicit learning goals for each of the actors of the consortium.

For transition experiment coalitions 1.5 million euro is available. This is for feasibility studies with a maximum support of 50,000 euro. Both instruments are on top of the 173 million euro for energy innovation. It is hard to tell how much money overall is involved in transition management projects. In 2003 the Dutch government allocated 226 million euro for project on sustainable system innovation, half of which were related to sustainable energy. By way of comparison, the Carbon Trust in the UK being the main instrument for the transition to a low-carbon energy system has committed £29.9 million (45 million euro) to the discovery and development of low carbon technologies and businesses.

Another noteworthy initiative is the establishment of the team “policy renewal” at the Ministry of Economic Affairs. The project should help the government to change its relationship with business. To this end the project team consulted with business and other stakeholders, seeking answers on 4 central questions:

- Do they agree with the ambition of the Ministry and approach of transition management?
- What would they like to get in return for their involvement?
- Does the energy transition require changes in policy; what changes in policy and instruments are needed?
- How may profit-opportunities be enhanced and risks be reduced through financial support and other types of measures?

From these consultations emerged that the Ministry should be trustworthy; manage its own affairs well; be consistent and create greater consistency between different policy domains; be able to bring together parties (match-making); not be too much technology-oriented but find a balance between technology and organization; be a partner of forerunners; offer financial support, and finally be committed to sustainability and the new approach of transition management (MINEZ, 2003b).

## 5. What’s new?

Does transition management constitute a break in policy? It is hard to answer this in a categorical way. There is a great deal of continuity but also some novel aspects. Novel aspects are: the commitment to a transition and identification of transition paths, the joint formulation with stakeholders of strategic goals, the use of learning goals and the open communication about progress. This has meant a far more integrated approach than was used before, thereby creating an integrative policy-framework that is slowly integrating existing policy options and approaches.

A great deal of things is therefore certainly not new: there existed already an innovation policy through which various options were supported financially and the government was already supporting collaboration between knowledge holders. Markets remain the main mechanism of coordination.

Taking a closer look at some of the changes that have occurred during the transition policies undertaken by the Ministry of Economic Affairs shows that there certainly is reason to believe that more integration, more investment and more attention has been achieved. The Ministry’s budget for transition-policies for example

rose from around EUR 200.000 in 2000 to roughly EUR 80 Million for 2005. Part of this budget is 'relabelled' money which would otherwise also have been invested, only in more traditional energy research and experiments. Part of the money however is in new funds such as the UKR and the OTC-funds. Besides these investments, the Ministry is also committing a growing number of officials to the process, creating an evolving learning-community within the Ministry. Two other funds noteworthy are the Bsik-funds, a national research fund of over EUR 800 million, out of which close to 200 million is spent on innovative energy-research, and the Energy Research Fund (EOS) which is now directly linked to the energy-transitionmanagement. Besides the direct investments, it seems, that the transitionmanagement approach is also leading to convergence and integration of existing funds, subsidies and investments.

With regard to the development of coalitions and networks, the approach also shows very concrete results in terms of the amount of actors involved in the process (from around 10 in 2000 to several hundreds by the end of 2004), the amount of multi-actor coalitions formed and supported around specific energy options (over 75) and the amount of societal groups engaged and societal debate stimulated. This has also led to initiatives taken up by societal actors themselves, such as the coalition mentioned before that drew up a manifest on market-policy interaction, cooperation between environmental NGO's and business, and projects between municipalities, technology developers and local businesses. There thus seems to be a constant interaction between societal dynamics, steering activities and the way in which policy-development is taking place, leading to all sorts of spin-off both in terms of traditional results such as reports, covenants and projects as in terms of network-development, (policy) learning, behavioral change and redirection of existing trajectories (mainly investments).

According to the Ministry the transition approach gives new impulses to the innovation system in three ways (MINEZ, 2004, p. 25):

- the process of visioning in the subtrajectories with active involvement of business, governments and societal organizations and knowledge institutes, resulting in shared sense of direction
- novel coalitions have been founded of parties who were previously each others enemies (an example being the biomass coalition of business and the environmental movement and the involvement of Greenpeace in offshore wind energy).
- Niche markets are being sought for a number of transition paths.

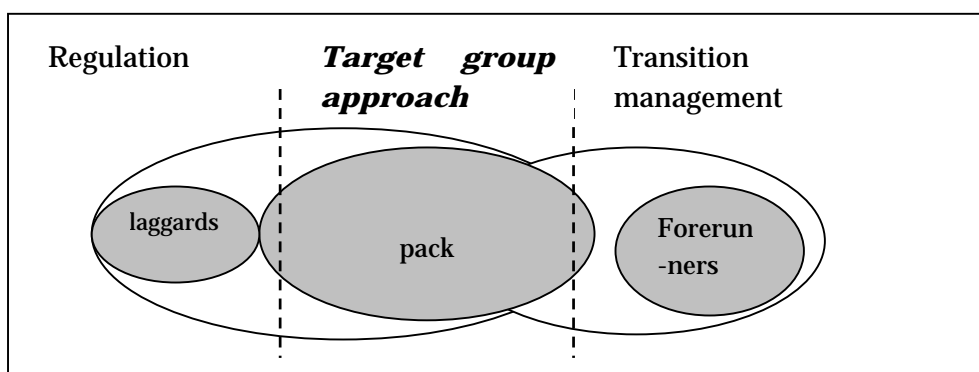
The use of the phrase "new impulses" by the Ministry shows that it is not altogether new. Perhaps the greatest change is that transition issues are being openly discussed not just within the government but also in society. Society is involved in it, which is visible in the following societal initiative. In 2003, a coalition of business and environmental groups published a manifest called "market and environment" about frame conditions. It believed that a transition could not happen without a change in frame conditions. The unusual coalition of green groups and business made a plea for the use of a (trans)European emission trading system for greenhouse emissions with clear long-term ceilings besides a forceful national innovation policy. It also made a plea for continuing the support of energy-efficiency besides the support of renewables

in Europe. They did not want the government to pick winners and wanted greater continuity in policy with would be better secured under generic policies. The manifest was concerned with transition issues and represented the view of proactive energy companies.

The coalition addressed a root problem for transitions, one that is often noted by economists that the economic frame conditions have to be right. This is a problem in any country and difficult to manage because of vested interests and the belief that these interests have to be seen to. Perhaps the commitment to transition helps to create a more level playing field for energy options in which the external costs -- in the form of economic damage from climate change and pollution -- are priced. It is too early to tell whether this will happen. The commitment to transitions did allow for certain reforms to be discussed but has not yet resulted in an adaptation of the policy framework. It is being realized by the administration that existing rules and regulations may create a barrier to system innovation. Transition experiments are allowed to depart from existing regulations. The details of this however are unclear.

There certainly is a greater orientation to innovation and to innovative firms. Whereas past policy was very much oriented to non-innovative firms, transition policy is oriented to forerunners. This is visualized in Figure 4.

Figure 4. Transition management and regular policy (Source: EZ (2001, p.15))



For the coming years the following things are on the policy agenda: revision of generic policy (for instance greening of the tax system) based on experiences with the energy transition; widening of the group of stakeholders involved in the energy transition; discussion of energy transition policy with other countries (in the EU and IEA); review of the energy research strategy (EOS); monitoring and evaluation of the energy transition process; active communication; investigation of the link between current policy and transition approach (MINEZ, 2004).

## 6. Evaluation

How do the policies compare with the model of transition management? The use of scenarios, formulation of ambitions, identification of transition paths by stakeholders and the planned support for transition experiments fits the original model of



transition management of Rotmans and Kemp described in (Rotmans et al, 2001; Kemp and Rotmans, 2002). No definitive choice is made as to the future energy system: different paths are explored in a bottom-up iterative manner. It is interesting to note that the government uses the metaphor of a “journey to the south” (with the South being a more sustainable energy system) in which the means of travel is not predetermined.

The changed decision-making and attention to innovation also fit with the transition management model. The energy transition policies are very much policies for innovation. It is more about support than about control. For market pull, the Ministry of Economic affairs (responsible for energy and innovation) which is in charge of the energy transition will rely on the greenhouse emission trading scheme of the European Union which should create pull for low-carbon technologies. The commitment to a low-carbon energy transition so far did not lead to important changes in frame conditions. Biomass actors are waiting for a tax exemption for biofuels, which should give biofuels a competitive edge. This has not happened yet, although discussions have reached other Ministries (of financial affairs and of the environment).

In a general sense, the community building, the discussions set in the context of the larger debate and the commitment of the Ministry of Economic Affairs to the process have set the conditions for convergence in the thinking about sustainable energy. It created an increased sense of urgency (with regard to government and NGO's) and increased sense of opportunity (for business, but NGO's as well). The conference on Innovation in Energy which presented the outcomes of the first phase of transition management in addition showed the growing attention of the regular policies and politics for the approach. Initial scepticism has waned, the Minister himself has shown great commitment and there is much discussion of the concept of transition management.

The policy has been successful in addressing innovators and creating attention and now has to make the shift focusing more on applications and involvement of the pack through embedding results of the transition processes into regular policies. The policy process in general has become more open, especially for innovators. Dominant players in the energy transition are energy companies but also the environmental movement is involved in it in a collaborative way. In the energy transition environmental NGOs are collaborating with business. This occurs especially in the biomass transition. This would not have happened without energy transition policies. Local communities are not really involved. Issues of acceptance are raised primarily through the intervention group. It can be argued there is too much support and too little attention to risks and problems of acceptance with energy innovations.

## 7. Conclusions

In the Netherlands sustainability is believed to require fundamental changes in functional systems. The solution is believed to lie in system innovation, a change in functional systems, not the improvement of the existing systems. Dutch policy makers got interested in transitions to alternative new functional systems in energy,

agriculture and transport . In this paper we described energy transition policies in the Netherlands. Energy is one of the subsystems in which the concept of transition management is being applied. Other areas in which transition management is applied are: transport (transition to sustainable mobility), agriculture, and natural resource use (biodiversity and natural resource transition).

The transition management approach is used in the energy area for both economic reasons and environmental reasons: it is believed that an innovation-oriented approach helps to create energy business. The fact that energy policy and innovation policy is the responsibility of the Ministry of Economic affairs was a factor here. Transition management allowed the Ministry to pursue its innovation agenda. Business creation in the name of sustainability is thus an important element but there is a genuine belief that sustainability requires system innovation and a different policy approach, which is the second reason for adopting transition management. A third reason is to make policy more open (new government-business relationship, reflecting a new view of the Ministry's own role.

The Dutch transition approach is innovation-oriented and bottom-up with long-term visions guiding societal experiments. Various paths are explored simultaneously to avoid lock in adherence to certain paths. This makes sense given the uncertainty about what option is best. In doing so Dutch authorities rely on the wisdom of variation and selection processes rather than the 'intelligence' of planning. A mechanism of self-correction based on policy learning and social learning is part of transition management. It offers a framework for policy integration, helping different Ministries to collaborate. Whereas other countries are engaged in managing transitions in an implicit way, the Netherlands does so in an explicit way. The commitment to transitions allows for cooperation between Ministries but also to make political choices which are needed for bringing production and consumption closer to sustainability. It is not a substitute for politics but a new framework for politics. .

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