The Inconsistency in the Dutch Climate Transition Governance Approaches

An Analysis of the Climate Policy Development between 2001 and 2019

Elisa Vandermeer
1047918
7 March 2022

MSc Thesis Environmental Policy Group

Supervisor: Mattijs Smits

WAGENINGEN
UNIVERSITY & RESEARCH

(Trinomics CCUS Projects Network, 2020)

Abstract

Despite the range of climate transition policies implemented over the years, the Dutch greenhouse gas emission reductions have stagnated. Therefore, this study aims to explain the development of Dutch policies between 2001 and 2019 by analysing the integration of climate transition governance approaches. These approaches were multi-actor networks, long-term visions, and the practical approaches of experimenting, upscaling, and monitoring and evaluating. For the purpose of this study, a contextual analysis of four policies was performed, which were the National Environmental Policy Plan 4 (Dutch: *Nationaal Milieubeleidsplan 4*; NMP 4), the Work Programme Clean and Resource-efficient (Dutch: *Werkprogramma Schoon en Zuinig*; WSZ) the Energy Agreement (Dutch: *Energieakkoord*; EA), and the Climate Agreement (Dutch: *Klimaatakkoord*; KA). Additionally, semi-structured in-depth interviews were conducted with Dutch government officials, other included actors, and researchers. To comprehend the policies, transition management (TM), strategic niche management (SNM), and polycentric governance (PG) provided a research framework.

The results showed that the collaboration and design of multi-actor networks had an impact on the short- and long-term visions. Pathways towards experimenting and upscaling practices were developed through ambitious long-term visions. Simultaneously, monitoring and evaluating practices depended on the multi-actor networks, affected the long-term visions, and learning practices were based on experimenting and upscaling. Based on the research, it was concluded that the inconsistent integration of multi-actor networks, long-term visions, and the practical approaches of experimenting, upscaling, and learning, resulted in inconclusive policies. Moreover, it was found that the climate transition governance approaches were clearly interlinked, influenced each other, and were responsible for the way the approaches developed.

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Acknowledgements

First of all, the time and data offered by my interviewees were invaluable for the completion of my thesis, for which I would like to show my appreciation. Another group of people, I would like to express my gratitude to, is my family and friends, who supported me throughout the whole process of writing my thesis. I wish to extend special thanks to Jacqueline Vandermeer and Dirk Maas, who were discussion partners and proof read my thesis. Lastly, this thesis would not have been able to reach this level without the help of my supervisor, Mattijs Smits. He was always able to provide helpful feedback on what was written. More importantly, he lifted the level of my research by being a discussion partner, while providing consultation. For that, I would like to thank him.

Abbreviations and acronyms

ºC	degree Celsius
BANS	*Bestuursakkoord Nieuwe Stijl* (Administrative Agreement New Style)
CCS	carbon capture and storage
CO_2	carbon dioxide
EA	*Energieakkoord* (Energy Agreement)
EIA	*Energie-investeringsaftrek* (Energy Investment Deduction)
EOS	*Energie Onderzoek Subsidie* (Energy Research Subsidy)
EU	European Union
ETS	Emission Trading System
FET	*Formule E-Team*
FNV	*Federatie Nederlandse Vakbeweging* (Federation of Dutch Trade Unions)
GHG	greenhouse gas
IKIA	integral knowledge and innovation agenda
IPO	*Interprovinciaal Overleg* (Association of Dutch Provinces)
KA	*Klimaatakkoord* (Climate Agreement)
KEV	*Klimaat- en Energieverkenning* (Climate and Energy Exploration)
MMIP	multi-year mission-driven innovation programme
Mt	megatonnes
NEV	*Nationale Energieverkenning* (National Energy Exploration)
NMP	*Nationaal Milieubeleidsplan* (National Environmental Policy Plan)
PBL	*Planbureau voor de Leefomgeving* (Netherlands Environmental Assessment Agency)
PG	polycentric governance
SDE	*Stimulering Duurzame Energieproductie* (Stimulation Sustainable Energy Production)

SER	*Sociaal-Economische Raad* (Social and Economic Council)
SNM	strategic niche management
TM	transition management
VNG	*Vereniging van Nederlandse Gemeenten* (Association of Netherlands Municipalities)
VNO-NCW	*Verbond van Nederlandse Ondernemingen en het Nederlands Christelijk Werkgeversverbond* (Union of Dutch Companies and the Dutch Christian Employee Union)
WSZ	*Werkprogramma Schoon en Zuinig* (Work Programme Clean and Resource-efficient)

1. Introduction

This chapter introduces the thesis topic by describing the problem and explaining the research objective. From the research objective, the research question and sub-questions are derived. The introduction ends with an outline of this thesis.

1.1. Problem description

On 9 August 2021, the IPCC published its Sixth Assessment Report, in which it is, for the first time, explicitly stated that the current state of the climate has been influenced by human activity. It was, therefore, their call for strong reductions in greenhouse gas (GHG) emissions, specifically carbon dioxide (CO_2) (IPCC, 2021). Even though this report was published in 2021, it has already been known for several decades that reductions in CO_2-emissions were necessary. In 1992, the first global conference was held, and one of the objectives of the Rio Declaration was to limit anthropogenic GHG emissions (UN, 1993).

Since 1992, and even before that moment, there have been many international and national efforts to reduce the GHG emissions (Boot, 2020). Nationally, the required GHG emission reductions, according to the Dutch policies, have changed over the years, and have become increasingly ambitious. The most recent ambitions, coming from the coalition agreement of Rutte IV, require climate neutrality in 2050, and 55 per cent less CO_2 emissions in 2030, compared to 1990 levels (EZK et al., 2022). Internationally, two of the most important international agreements after 1992 were the Kyoto Protocol in 1997, and the Paris Agreement in 2015. The Netherlands ratified these agreements, respectively, on 31 May 2002, and 28 July 2017 (UNFCCC, 2017). The last national climate policy before ratification of the Kyoto Protocol was published by the Ministry of Housing, Spatial Planning and the Environment in June 2001, the National Environmental Policy Plan 4 (Dutch: *Nationaal Milieubeleidsplan 4*; NMP 4) (VROM et al., 2001). The first national climate policy after the Paris Agreement was published by the Ministry of Economic Affairs and Climate Policy in June 2019, the Climate

Agreement (Dutch: *Klimaatakkoord*; KA) (EZK et al., 2019). The KA aimed to reach a 49 per cent CO_2-emission reduction by focussing on reductions in five different sectors, among which the industry and mobility sector (EZK et al., 2019). These sectors were expected to reduce the CO_2-emissions by 14.3 and 7.3 megatonnes (Mt) respectively.

In 2019, the GHG emissions had dropped by 18 per cent compared to 1990 levels (IEA, 2020; Rijksoverheid, 2021). Nonetheless, in the last few years, the reductions in emissions have stagnated (IEA, 2020). Even though there has been a stagnation in reductions, several climate transition governance approaches (e.g. visioning, experimenting, etc.) have been used to reduce the GHG emissions between 2001 and 2019 (EZK et al., 2019; SER, 2013a; VROM et al., 2001; 2007). Moreover, in 2018, energy production accounted for 83 per cent of the CO_2-emissions in the Netherlands. This means that there is still a long way to go to reach the targets. This raises questions about how the Dutch climate transition governance approaches have been integrated into the climate transition policies from 2001 to 2019.

1.2. Research objective

The objective of this research is to gain insight into the integration of climate transition governance approaches in order to explain the development of Dutch climate policy. It aims to analyse these developments from 2001 to 2019, because the NMP 4 from 2001 was the last policy before ratification of the Kyoto Protocol, and the KA from 2019 was the first policy after ratification of the Paris Agreement. The climate policies published in between the NMP 4 and the KA were the Work Programme Clean and Resource-efficient (Dutch: *Werkprogramma Schoon en Zuinig*; WSZ) from 2007, and the Energy Agreement (Dutch: *Energieakkoord*; EA) from 2013 (Boot, 2020). Therefore, this thesis focusses on these four policies.

By analysing these four policies, the complete development of the Dutch climate policy, emerging from the two most important international agreements, are observed. The climate

transition governance approaches analysis of this thesis entail the multi-actor networks, the long-term visions, and the practical approaches of experimenting, upscaling, and monitoring and evaluating. Next to the four policy publications, the scope of this research is limited to the approaches in the Dutch climate policy related to the mobility and industry sector. These two are selected based on the size of their task, which were after the electricity sector the largest, but find themselves in different phases. The mobility sector focussed mostly on upscaling practices, whereas the industry sector concentrated on experimenting practices.

In the KA, the mobility sector agreed on commitments relating to energy carriers that are sustainable and renewable, electric transport, passenger mobility and logistics sustainability improvements, and shipping and aviation (EZK et al., 2019). The industry sector had a different approach: a set of instruments was introduced to target the five energy-intensive industrial regions: Noordzeekanaalgebied, Rotterdam/Moerdijk, Noord-Nederland, Zeeland, and Chemelot. In these five regions, the twelve largest emitters (who emit 60 per cent of the total industrial CO_2-emissions) were targeted as well.

1.3. Research questions

The previous objectives and aims provide the following main research question:

How have the climate transition governance approaches been integrated in the Dutch climate transition policies from 2001 to 2019?

To answer the main research question, the below-mentioned sub-questions will be answered first:

1. What multi-actor networks are included in the Dutch climate transition policies?
2. Which long-term visions can be identified in the Dutch climate transition policies?
3. Which practical approaches can be recognised in the Dutch climate transition policies?

1.4. Thesis structure

Following this, the conceptual framework gives an overview of the theories used, which provided the outline of the results. Next, the methodology of the research is explained. The results start with chapter 4 on the general policy development. This chapter introduces the four policies shortly, and explains some of the main developments. Afterwards, in chapter 5, the government's roles and the stakeholder inclusion in the policies are discussed. Chapter 6 shows what the long-term visions of the policies were, and what their functions entailed. The last results chapter, chapter 7, is on the experimenting, upscaling, and monitoring and evaluating approaches of the policies. In chapter 8, the discussion reflects on the findings, the theories, and the methodology. This thesis ends with a conclusion in chapter 9.

2. Conceptual framework

This chapter contains the conceptual framework of this thesis. First, a short introduction of the problem is provided, and transition is defined. Thereafter, the climate transition governance models are shortly explained. Next, the approaches in the climate transition governance models are analysed per theme: multi-actor networks, long-term visions, and practical approaches of experimenting, upscaling, and monitoring and evaluating.

Due to climate change, the global community is seeking a transition towards sustainability. This transition is receiving an increased sense of urgency. It was argued that the traditional governance approaches of the free market and top-down steering would not suffice (Loorbach, 2010). Loorbach et al. (2011) argued for a more exploratory and anticipatory governance approach because of the persistency and complexity of the problems that are faced. In this thesis, the governance approaches for the climate transition in the Netherlands are analysed.

Before going further into the different climate transition governance approaches, it is important to define transitions. Loorbach et al. (2017, p. 600) referred to a transition when there is a "nonlinear shift from one dynamic equilibrium to another." According to Rotmans et al. (2001, p. 16), transitions are "gradual, continuous process[es] of change where the structural character of a society (or a complex sub-system of society) transforms". When talking specifically about sustainability transitions, the societal changes are large-scale (Loorbach et al., 2017). Markard (2018) highlighted five characterises of such sustainability transitions: 1) public policies have a central role; 2) sustainability transitions concern wicked problems that have high levels of uncertainty and complexity; 3) these transitions carry certain values; 4) they are heavily disputed; and 5) sustainability transitions are context-depended. Closely interrelated to sustainability transitions are climate transitions, which are "processes in which both the technical and social parts of the system transform in order to tackle climate change" (Boyd & Juhola, 2015, p. 1239).

2.1. Climate transition governance models

For the purpose of this thesis, three climate transition governance models were observed: transition management (TM), strategic niche management (SNM), and polycentric governance (PG). These three models are shortly explained below.

TM has its roots in the Netherlands, and was implemented by the Dutch government in 2001 (Kern & Smith, 2008). The model was designed to enhance the direction and speed of structural change through coordination and facilitation of multi-level processes in an evolutionary and systemic manner by a set of coherent policy initiatives (Kern & Smith, 2008; Voß et al., 2006). TM includes long-term thinking on multiple levels and domains, with multiple actors to shape short-term decisions on policies in order to innovate and improve the system (Rotmans et al., 2001). The decisions should keep several options open, as TM theory highlights 'learning-by-doing' and 'doing-by-learning'.

SNM was defined by Kemp et al. (1998, p. 186) as "the creation, development and controlled phase-out of protected spaces for the development and use of promising technologies by means of experimentation." The SNM model was based on the principle that connected social and technical transitions are necessary for sustainable development (Schot & Geels, 2008). In the model, the value of niches and experiments, especially their ability to shift regimes, is highlighted. For niches and experiments to shift regimes, however, institutional adaptations and connections, and a learning process should accompany the new technology (Kemp et al., 1998).

PG is a system in which multiple governing authorities from different scales have a considerable amount of independence in a specific domain to create norms and rules (Ostrom, 2010). Since the independent authorities cooperate, interact, and compete together, and learn from each other, they create the opportunity to learn about the best options in a domain (Jordan et al., 2018). In a polycentric system, the authority of the different decision centres are overlapping, either geographically or functionally (Baldwin et al., 2018). These overlaps can

create redundancy, which, according to Baldwin et al. (2018), improves resiliency. Thus, PG is organised at multiple scales, in which self-governance is embraced (Bruns, 2019).

These short explanations show what is highlighted in the three theories. The explanations of TM and PG show the importance of multi-actor networks. According to Ingold and Fischer (2014), this is because collaboration is essential to the development of efficient and long-term mitigating solutions. In the explanation of TM, the long-term thinking is highlighted. Biermann (2005) argued that the credibility of climate policies depend on long-term visions, as they provide the foundation for long-term targets that are built on short-term targets. The explanation of SNM underlines the importance of experimenting and upscaling. Jalas et al. (2017) highlighted that experimentation enables the development of new sustainable solution through trial and error, continuous improvement, and co-creation. Moreover, according to Van Doren et al. (2016), to achieve climate neutrality, initiatives of experimenting have to be upscaled. All three theories' explanation mentioned a learning aspect. Wolfram et al. (2019) highlighted the importance of learning, i.e. monitoring and evaluating, due to the upcoming importance of experiments.

Thus, the different governance models results in a set of climate transition governance approaches: multi-actor networks, long-term visions, experimenting, upscaling, and monitoring and evaluation. The analysis provides the foundation of the thesis, as it determines the subjects for the contextual analysis of policy, and the questions for the interviews. The approaches are discussed in the remaining part of the conceptual framework.

2.2. Multi-actor networks

Multi-actor networks are a crucial part of transition governance, as the state does not dominate, but is involved in interventions (Docherty et al., 2018). Facilitation of actors organising themselves through the network society ensures the production of solutions to the issues at hand (Loorbach et al., 2017). Moreover, it is highlighted how important it is to consider the

‘who’, i.e. the positions, power, and objectives of actor networks, in governance of a transition, as collective actors are the driver of social change (Docherty et al., 2018; Welch & Yates, 2018). Since a transition brings new actors in the market, challenging the current regime, the state’s role changes the way it interacts with the actor networks. The interaction and actors themselves, however, are constrained and/or enabled by the structure and institutions in place (Warren et al., 2016). Meaning that the institutions facilitate change by empowering actors to experiment and learn, or by constraining behaviours (Andrews-Speed, 2016).

According to Meadowcraft (2009), the purpose of a multi-actor network in TM is to develop shared problem definitions, to appreciate multiple perspectives, and to develop practices. In SNM, the purpose of such networks is to facilitate cooperation between actors, to gain support behind new technology, and to contribute the required resources (Schot & Geels, 2008). The niche itself transpires as a result of interaction processes by many actors (Kemp et al., 1998). In the SNM model, these networks are considered to be more valuable when they are broad and deep (Schot & Geels, 2008). Broad means the inclusion of a wide range of stakeholders to bring multiple visions, and relative outsiders, such as consumers (i.e. third parties). Deep means that the representation should be able to mobilise the people they represent. SNM studies present the notion that more involved actors and intensive networking will result in a successful transition (Caniëls & Romijn, 2008). Support from this network creates a stable niche and helps diffusion (Mirzania et al., 2020). Whereas in TM the inclusion depends on the activity phase (Loorbach, 2010). In the strategy phase, a network involves 10 to 15 actors, and the people involved do not represent their institutions, but are engaged because of their perception, perspective, and background. During the creation of actors networks, the focus is on sustainable development frontrunners. PG includes by definition multiple governing authorities from differing levels (Ostrom, 2010). These units must have some form of authority within the domain they exercise in. The degree of PG depends on the interdependency of the

governance units (Pattberg et al., 2018). This means that linkages between the units are fundamental, especially since it can result in increased coherence of the governance landscape. These linkages can be categorised in cognitive linkages, linkages through commitment, behavioural linkages, and impact-level linkages.

The role distribution of the actors within the networks differ between the models. The multi-actor networks in PG are multiple institutions organised non-hierarchically (Pattberg et al., 2018). PG is associated with collective action, as a result of overlapping authorities with a shared interest (Baldwin et al., 2018). Whereas in TM, the state occupies a leading role through facilitation of a shared progress of learning and encouraging mobilisation (Rotmans et al., 2001). Also in SNM, there is a sense of dominancy present in the role of the actors. The government's role is to facilitate (Kemp et al., 1998). A SNM approach directs its attention to steering from within, through a process of learning or adding actors (Schot & Geels, 2008).

2.3. Long-term visions

Hajer and Pelzer (2018) highlighted the importance of the construction of the future's role in sustainability transitions. This is because of the long-term targets that are involved in the foreseen climate transitions (Neuvonen & Ache, 2017). Several techniques and approaches can be used for this, which are discussed below.

In TM and SNM, the creation of long-term visions, also called scenario-building, has important functions (Loorbach et al., 2017; Rotmans et al., 2001; Schot & Geels, 2008). In TM, through a vision (or multiple visions), a possibility space is mapped, a heuristic is created, a monitoring and target-setting framework is established, relevant actors (a network) are specified, and a guideline for resources is created (Hajer & Pelzer, 2018). Additionally, visions provide a framework to evaluate current policy and to mobilise other actors (Loorbach et al., 2017; Rotmans et al., 2001). In SNM, visioning is one of the three essential processes for success (Schot & Geels, 2008). Since visions and expectations provide direction, they are

crucial to the development of niches. They provide direction for second-order learning of actors, for nurturing and protection, and for attracting attention. In both TM and SNM backcasting is used to formulate short-term objectives (Hajer & Pelzer, 2018; Hoogma et al., 2005). Backcasting is the act of "looking back from a future where a desired goal has been met and creating decisive steps and pathways from that vision back to the present day" (Neuvonen & Ache, 2017, p. 77). According to Loorbach et al. (2015), the envisioning process enhances the reflection on the daily routines of the actors. This is supposed to create a deeper understanding of the complexity of the problem, because there will be a realisation that their own actions are perpetuating the problem. As a result, the short-term routines of the participating actors will change, and align with the long-term vision (Hoogma et al., 2005; Loorbach et al., 2015). In TM, the visions are produced within the multi-actor networks, which results in broadly supported visions (Rotmans et al., 2001). It was highlighted, however, by Gillard et al. (2016) that the visioning takes place in the strategic phase, which involves a limited amount of actors in the network. Visioning in the SNM model is most productive for niche development, and should be completed with policy recommendations (Kemp et al., 1998; Schot & Geels, 2008). Including visions in policies on niche development does bring a dilemma when visions are adjusted or persistent. Loorbach et al. (2017) also stated not to overestimate a vision's importance, as there are many uncertainties and other competing visions. Therefore, in TM, a vision can be adjusted along the way (Rotmans et al., 2001).

Long-term visioning is not an inherent part of PG. Sharp and Ramos (2018), however, did highlight the notion of vision mapping in polycentric co-governance, as a form of city governance. Nevertheless, on state level, no long-term vision links are found. The PG model does include trajectories for non-governmental actors set by the state (Setzer & Nachmany, 2018). This means that targets are defined to provide an action framework for other actors.

2.4. Practical approaches

Practical approaches, as understood here, are the approaches of certain practices that are actively promoted in the climate transition governance models. The approaches analysed are experimenting, upscaling, and monitoring and evaluating. These are based on what is found to be dominant practical approaches in the models.

Experimenting

Experimenting within sustainability transitions uses the society as a laboratory to investigate the transformations towards socio-technical system sustainability (Sengers et al., 2019). Material and social realities are changed by introducing alternative practices and technology. Sengers et al. (2019) differentiated between niche experiment, grassroot experiment, bounded socio-technical experiment, emerging contributions urban experimentation, transition experiment, and sustainability experiment.

Niche experiments have a crucial role in SNM (Kemp et al., 1998). These experiments focus on developing niches to eventually produce regime changes (Sengers et al., 2019). As per the definition of SNM, the created niches are protected through policies (Kemp et al., 1998). The difficulty in this, however, is to find the protection-selection pressure balance. Policies can include several elements, such as taxes and subsidies, but also the establishment of an actor network, or formulation of a long-term target. In niche experiments, the user requirements have an important role in SNM (Rip & Kemp, 1998; Sengers et al., 2019). Although often dismissed in real-life experiments, SNM approaches to experimenting should include co-evolutionary dynamics, and not only focus on pushing certain technologies (Schot & Geels, 2008).

Using Sengers et al.'s (2019) categorisation on experiments, TM includes transition experiments. These experiments aim for societal change, and are, according to Loorbach (2010), high risk due to the high costs and required time. Within TM, there should be a fit between experiments and the developed visions. For this, the formulation of selection criteria of experiments and ensuring the mutual coherency of experiments are important (Loorbach et

al., 2015). The experiments help to expose the relation and role requirements for the transition, and to unpack the complexity that accompanies the problems (Loorbach et al., 2017). Similar to the societal change that transition experiments aim to achieve, experimenting within PG also aims to change the world deliberately (Voß & Schroth, 2018). PG promotes opportunities for experimentation (Bruns, 2019; Ostrom, 2010). Nevertheless, social processes are neglected, while the focus is on the expected effects on innovations (Voß & Schroth, 2018). Classifying the experimenting in PG is less straightforward than in TM and SNM. Due to the multi-level authorities within PG, the experiments are often local and small-scale (Ostrom, 2001). This could indicate that PG involves grassroots experiments (Sengers et al., 2019).

Upscaling

Upscaling is essential in transitions, as it refers to the expansion and dissemination of technologies and practices. Some of the climate transition governance models involve the upscaling of experiments, while others involve capacity building or normalisation. This subchapter analyses the ways the climate transition governance models aim to roll out the technologies and practices.

In PG, entrenchment processes can have several forms, but aim to shape the intervention trajectories (Bernstein & Hoffmann, 2018). Normalisation can be one of those forms in PG, which contains the shifting of the expectations of which behaviour is appropriate. Capacity building is also an important tool in PG to advance mitigation measures (Biedenkopf & Wettestad, 2018). For many policy measures applies that many financial, knowledge, and technical resources are necessary to transform the current practices. Also, coalition building is mentioned by Bernstein and Hoffmann (2018) as an important policy tool for innovations to roll out in PG. In PG, horizontal and vertical diffusion of policies also play an important role (Tosun, 2018). Horizontal diffusion takes place in between states, regions, or cities, whereas vertical diffusion mostly refers to the upscaling of experiments, in which the learning process

is important. The upscaling of experiments can occur through the generation of political, and epistemic authority (Voß & Schroth, 2018). Upscaling within SNM is a protective process, in which preferential treatment is exhibited by policymakers (Kemp et al., 1998). Diffusion also takes place within SNM, called a bandwagon effect (Hoogma et al., 2005). Here, however, this effect is reached through the niche replication elsewhere. Moreover, in SNM, the development of a niche into the regime space is the upscaling practice (Hoogma et al., 2005; Kemp et al., 1998; Schot & Geels, 2008). Similarly, upscaling of experiments and diffusion also have a role in TM, as experiments are broadened (implemented elsewhere), and brought to the national level (Loorbach, 2010; Meadowcroft, 2009; Rotmans et al., 2001). The literature on TM does not provide any requirements of upscaling, or other forms of entrenchment.

Monitoring and evaluating

As already mentioned several times, learning has an important role in almost all of the models. Learning processes within climate transition governance involves the learning from practices, other actors, and past experiences through monitoring and evaluating.

To be able to adjust the actor networks, agenda and visions, monitoring and evaluating of practices should be present (Loorbach, 2010; Rotmans et al., 2001). This is the reflexive part of TM. The monitoring of transition process in the TM theory stimulates social learning processes. In TM, learning has a central role, as it uses a learning-by-doing, and a doing-by-learning approach (Loorbach, 2010; Meadowcroft, 2009). This enhances the explorative and experimental attitudes of actors. Thus, it is essential for stakeholders to participate and to interact in order to learn (Loorbach et al., 2015; Meadowcroft, 2009). The learning process of interaction in which information, experiences, and knowledge are exchanged, is also a fundamental part of SNM and PG (Bernstein & Hoffmann, 2018; Caniëls & Romijn, 2008; Kemp et al., 1998). In SNM, this means that the rate of successful learning is dependent on the functioning of the multi-actor networks. Hoogma et al. (2005) highlighted that niche

development depends on the quality of learning, which should include both first-order (i.e. learning processes directed at gathering data), and second-order learning (i.e. learning processes that enable alterations in cognitive assumptions and frames) (Schot & Geels, 2008). In the learning process, more information should be gained on the social desirability of the technology options (Kemp et al., 1998). In PG, the collective learning processes provide opportunities to evaluate the best options in different contexts, in which monitoring and evaluating play an important part (Jordan et al., 2018). Tosun (2018) highlighted that experimenting should facilitate learning in PG, and learning should, in turn, facilitate the diffusion.

Although the previous sections of this chapter highlight how the approaches in the different theories are similar to, or vary from each other, there are also foundational differences on how the theories provide a framework to understand reality. SNM, for instance, was developed as both a policy tool and a research model, and TM was presented as a policy model and a governance approach (Loorbach & Van Raak, 2006). However, SNM has been mostly used as an analytical tool, whereas TM has been operationalised. According to Loorbach and Van Raak (2006, p. 17), both TM and SNM cannot function as "an operational, fully founded and empirically verified policy tool". PG, on the other hand, is defined as a governance approach, and a framework for analysis (Ostrom, 2010; Thiel, 2017). Moreover, the theories differ in their focus area. The focus area of SNM study is niche and regime interaction, whereas TM studies are focussed on systems of society, and PG study's focus area is the interaction between overlapping decision-making centres (Heikkila et al., 2018; Loorbach & Van Raak, 2006; Rotmans et al., 2001; Schot & Geels, 2008).

As a result of the conceptual framework, table 2.1 shows how the different approaches are valued in the models. In this table, high implies a high importance of the approach in that model, and low implies a low approach importance. These indications are relative to the other models.

Table 2.1. Valuation of climate transition governance approaches in transition management (TM), strategic niche management (SNM), and polycentric governance (PG)

	Transition management	**Strategic niche management**	**Polycentric governance**
Multi-actor networks	High: to develop shared problem definitions, to develop practices, and to appreciate multiple perspectives. Network focus is on sustainable development frontrunners.	High: to facilitate cooperation between actors, to gain support behind new technology, and to contribute the required resources. Networks are valuable when broad and deep.	High: multiple institutions, with authority in certain domain, organised non-hierarchically. Overlap of authorities results in collective action.
Long-term visions	High: takes place in strategic phase. Helps to map a possibility space, create a heuristic, establish a monitoring and target-setting framework, specify relevant actors, and guides resources needs.	High: productive for niche development. Provide direction for second-order learning, nurturing and protection, and attracting attention.	Low: targets set by government for non-state actors, which provides an action framework.
Experimenting	High: transition experiments aim to change society, and help to expose the relations and roles requirements for transition, and to unpack the problem complexity.	High: niche experiments that focus on niches development to produce regime changes.	High: grassroots experiments that aim to change the world deliberately.
Upscaling	Medium: experiments are implemented in other contexts and scaled up.	Medium: focus is on upscaling niche developments into a regime change. Gaining ground also includes the replication of niches in other contexts.	High: focussing on policy diffusion in the form of upscaling, but also normalisation, capacity building, and coalition building are important policy tools for gaining ground.
Monitoring and evaluating	High: learning-by-doing and doing-by-learning approaches, in which reflexivity through monitoring, evaluating, and learning lessons are crucial. Interaction among actors is necessary.	High: both first-order en second-order learning should be included. Sharing of information (on social desirability), experiences, and knowledge is fundamental in learning.	High: monitoring and evaluation provide opportunities to evaluate the best options in certain contexts. Collective learning is a result of experimenting, and results in diffusion.

3. Methodology

This chapter describes the methodology used for this thesis. It is meant to provide an overview of how this research was developed to reach its objective. To obtain insight into the integration of the climate transition governance approaches, qualitative methods were be used. This qualitative research consisted of mixed methods. A contextual analysis of policy was performed and semi-structured in-depth interviews were conducted to obtain detailed information on the approaches that were used (Taskoh, 2014). Next, the two methods are explained. First, the contextual analysis of policy is explained. Second, the semi-structures in-depth interviews are elaborated upon. Thereafter, the limitations of this research are described.

3.1. Contextual analysis of policy

An analysis of policy seeks "to understand why a particular policy was developed at a particular time" (Taskoh, 2014, p. 49). This suited the purpose of this thesis, which was to explain the development of the climate policy. Taskoh (2014) continued that there are three phases for which the analysis of policy are suitable: contextual, textual, and outcomes. A contextual analysis was performed for the purpose of this thesis, as it is associated with policy creation, and which influences lead to the policy. Hence, a contextual analysis of policy was performed.

The following four Dutch policies were analysed: 1) National Environmental Policy Plan 4: A world and a will: working on sustainability (Dutch: *Nationaal Milieubeleidsplan 4: Een wereld en een wil: werken aan duurzaamheid*; NMP 4) from 2001; 2) New energy for the climate: Work Programme Clean and Resource-efficient (Dutch: *Nieuwe energie voor het klimaat: Werkprogramma Schoon en Zuinig*; WSZ) from 2007; 3) Energy Agreement for sustainable growth (Dutch: *Energieakkoord voor duurzame groei*; EA) from 2013; and 4) National Climate Agreement (Dutch: *Klimaatakkoord*; KA) from 2019. The focus of this research was on the mobility and industry sector. Thus, only the general, mobility, and industry chapters were analysed. In the NMP 4, the industry sector was not included.

Before performing the analysis, the conceptual framework provided a number of climate transition governance approaches: multi-actor networks, long-term visions, experimenting, upscaling, and monitoring and evaluating. This formed the foundation for the analysis. The analysis was performed by reading carefully through the policies, and while doing so, the data that showed aspects of the aforementioned climate transition governance approaches was highlighted with a marker. In a side note, the highlighted areas were accompanied by a descriptive code that fit the approaches. The codes were then provided the labels of the approaches, resulting in table 3.1.

Table 3.1. Labels and descriptive codes used in the contextual analysis of policy

Labels	Descriptive codes
Multi-actor networks	actor, actor network, actor role, frontrunner
Long-term visions	backcasting, long-term, objectives, scenario building, short-term, visioning
Experimenting	experimenting, innovation, niche, pilots
Upscaling	capacity building, instruments, market focus, obligation, regulation, stimulating, upscaling
Learning	Evaluating, learning, monitoring

The KA was the only policy that was also translated into English. Hence, all quotes of the other policies were translated by the researcher, and the original policy quotes are included in the footnotes. There were no fixed page number in the NMP 4, hence, in the case of quotations, the page numbers of the PDF programme (Adobe Acrobat Reader DC) are used.

3.2. Semi-structured in-depth interviews

The semi-structured in-depth interviews were conducted to obtain detailed information on the approaches used. The policy analysis provided the foundation for interview questions, as certain approaches were confirmed, or elaborated upon. Semi-structured interviews provided the opportunity to ask questions that were left open by the policies, and to ask the questions of how certain decisions came to be. Additionally, the semi-structured interviews left room for questions that came up during the interviews, and for the participants to elaborate further.

The interviewees for this thesis included Dutch government officials, other included actors, and researchers. The five (former) Dutch government officials added value to the research, because they had insights in the governmental processes, and why certain approaches developed over time, and why they were different for the mobility and industry sector. The four other included actors were identified through the analysis of policy, and were of interest to this research because they provided different perceptions on the policy-making processes. They provided different insights in the approaches and were able to evaluate their own role. Thus, their interviews created a more complete overview of the approaches. Lastly, the four researchers were experts in the field of transition management (TM), polycentric governance (PG), and/or strategic niche management (SNM), or in the field of (Dutch) policy analysis. They were able to provide insights on how certain policy approaches fit one of the climate transition models, or analytical perceptions on the Dutch policies. In this thesis, the interviewees are referred to by their last name and the complete date of the interview. In table 3.2, an overview of all the interviewees is provided.

All participants were found through LinkedIn, or their organisation's websites. Some of the policies stated which minister was responsible, and other policies stated the organisations or the people that were invited to participate. Thus, this provided names for whom to reach out to. Some of the participants were reached through referrals. In total, 37 potential participants were reached out to, of which 13 were willing to participate in the research. The total response rate was 35.1 per cent.

The interviewees were questioned on the inclusion of stakeholders, government levels, long-term visions, experimenting and pilots, upscaling, learning processes, and the changes and developments. To provide space, and to avoid influencing answers, the questions were asked in a generic way. The general structure of the interviews can be found in appendices 1a (English) and 1b (Dutch). There were two structures, one for the government officials and other

Table 3.2. Participants, their role or research focus, participated at which table for which policy, and date of interview

Participants	Role or research focus	Table/Policy	Date
Dutch government officials			
Jacqueline Cramer	Coordinating minister – ministry of Housing, Spatial Planning and the Environment	WSZ	10-12-2021
Arnout Mijs	Secretary – ministry of Economic Affairs and Climate Policy	KA	14-12-2021
Patrouschka Werther	Head of Department for Vehicle Emissions and Fuels – ministry of Infrastructure and Environment	Mobility table/EA	19-01-2022
Jan Pronk	Responsible minister – ministry of Housing, Spatial Planning and the Environment	NMP 4	20-01-2022
Niels Achterberg	Secretary – SER Coordinator Climate – ministry of Infrastructure and Water Management	Mobility table/EA+KA	21-01-2022
Other included actors			
Paul de Krom	Chair – SER	Mobility table/EA	21-12-2021
Ton van der Wijst	Secretary – SER	Mobility+ industry table /EA	23-12-2021
Frits de Groot	Policy secretary Energy and Climate – VNO-NCW	Industry table /EA + KA	07-01-2022
Jeroen van der Tang	Public policy manager sustainability – NLdigital	Industry table /EA	14-01-2022
Researchers			
Dave Huitema	Polycentric Governance	n/a	22-12-2021
Gert Spaargaren	Environmental policy and societal changes	n/a	23-12-2021
Daniel Petrovics	Polycentric Governance + Strategic Niche Management	n/a	14-01-2022
Stephan Slingerland	Environmental policy analytics	n/a	18-01-2022

included actors, and one for researchers. The interviews mostly took place via Teams, one was conducted via Zoom. At the beginning of the interviews, the interviewees were asked permission for the interview to be recorded and transcribed through the application used, to which they all agreed. The recordings and transcriptions were stored in the Wageningen One Drive, which was protected with a two-step authentication system. Most interviews were conducted in Dutch, one interview with a researcher was conducted in English. Hence, interview quotes in this thesis were translated by the researcher, the original quotes are included in the footnotes. The quotes were sent to the interviewees for approvement. The interviews took 30 to 75 minutes, depending on the time available, and the provided information.

3.3. Limitations

This research aimed to obtain more insights into the governance approaches of the Dutch government in the climate transition in order to explain the development in the climate policy. Therefore, this study focussed on the existing policies. Thus, it was not the aim to develop recommendations for policymakers. This research analysed the policies between 2001 and 2019. This choice was made, because the NMP 4 was the last policy developed before the ratification of the Kyoto Protocol, and because the KA was the first policy developed after the ratification of the Paris Agreement. Furthermore, only the four aforementioned policies were analysed, no other policies or developments were analysed in the creation of this thesis. Lastly, this research was limited to the mobility and industry sector. These sectors were selected based on their big tasks, and different current status. Other sectors were not considered in this study.

4. General policy development

To gain insight into general changes and development of climate transition policies between 2001 and 2019, this chapter shortly explains all policies, and how the general setup of those policies came to be.

In 2001, the fifth National Environment Policy Plan (NMP 4) was developed (VROM et al., 2001). Before this, the NMP (1989), NMP+ (1990), NMP 2 (1993), and NMP 3 (1998) had already been published. These policies focussed on environment, in the broadest sense of the word. The NMP 4 used an approach in which the lessons from the past were first established, then the major environmental challenges were stipulated. Subsequently, the ambitions and barriers of the environmental policies were discussed, and how this could be solved with system innovation. Afterwards, per topic, the required transitions with the necessary policies were explained. Only one of those topics discussed greenhouse gas (GHG) emissions, energy, and mobility. Industry, however, was rarely mentioned. When asked about this, Pronk (20 January 2022) said:

> I was chair, and of course, the Dutch representative, but I did not know where we were getting at [during the international climate negotiation]. How much reduction, and whether we would negotiate if that reduction would also apply to, for example, aviation or shipping. That was all decided, what was and what was not, in July/August 2001. So, we could not send anyone in that direction, yet.[1]

This shows, and it was also underlined by Pronk (20 January 2022) that the NMP 4 was not guiding for the climate policy, but the mandatory outcomes of the international negotiations were normative.

[1] Translated from Dutch: "Ik was voorzitter en natuurlijk ook de Nederlandse vertegenwoordiger, maar ik wist niet waar we op uit kwamen [tijdens de internationale klimaatonderhandelingen]. Hoeveel reductie en of we eruit zouden onderhandelen dat die reductie ook zou gelden voor bijvoorbeeld de luchtvaart, of voor de scheepvaart. Dus dat stond allemaal pas vast, wat wel en wat niet, in juli/augustus 2001. Dus je kon nog niemand al in die richting sturen" (Pronk, 20 January 2022).

Six years later, in 2007, the Work Programme Clean and Resource-efficient (WSZ) was published (VROM et al., 2007). This programme was focussed on the climate and energy challenges, which meant the reduction of GHG. Other environmental aspects were not included. First, the background and ideas behind the WSZ were discussed, after which targets and long-term visions were introduced. Afterwards, the plans for different sectors were discussed, of which industry, and traffic and transport are part. Then, the instruments planned to be used were reviewed, and finally, the results and expectations for the coming years were discussed. The WSZ changed completely compared to the NMP 4, because, as Cramer (10 December 2021) stated that she immediately said: "I will not make a new NMP 4. [It] is an excellent document. Why would I claim all that time of everyone to make a five, while we still have the fourth to execute? So let's put everything on execution."[2] Creating a NMP was indeed a time-consuming process, according to Pronk (20 January 2022). Even though Cramer (10 December 2021) had stated that she wanted to stress the execution, the outcome was not as practical as hoped, according to De Groot (7 January 2022). He explained: "looking back on the [WSZ], it contained […] all kinds of beautiful views and full of wishful thinking, but there was no execution programme. Everyone kept it on the bookshelf, and what everyone did with it, was completely arbitrary"[3] (De Groot, 7 January 2022).

In 2013, the Energy Agreement (EA) was established (SER, 2013a). The agreement focussed on a climate neutral energy provision by concentrating on the energy consumption, thus on its efficiency and resources (Van der Tang, 14 January 2022). To ensure the broad support for the EA, societal parties were invited to create the agreement (De Krom, 21

[2] Translated from Dutch: "ik ga geen nieuw NMP 4 maken. [Het] is een prima document. Waarom zou ik de hele tijd van iedereen claimen om weer een vijf te maken, terwijl we vier nog moet uitvoeren? Dus laten we gewoon alles zetten op uitvoeren" (Cramer, 10 December 2021).

[3] Translated from Dutch: "Als je nu terugkijkt op dat programma Schoon en Zuinig, dat waren […] boekjes met allemaal prachtige vergezichten en vol met wensdenken, maar er zat helemaal geen uitvoeringsprogramma onder. Iedereen had dat in de kast staan, maar ja, wat iedereen ermee deed, dat was volstrekt willekeurig" (De Groot, 7 January 2022).

December 2021; SER, 2013a; Van der Tang, 14 January 2022; Van der Wijst, 23 December 2021; Werther, 19 January 2022). In the EA, 10 pillars were created for parties to focus their ambitions on, which were divided among the sector tables (SER, 2013a). De Groot (7 January 2022) highlighted that this was part of the evolution of climate transition policies. At first, the parties at the table were convinced that they should focus on those 10 pillars, when they realised that a sector division was perfect. Thus, the parties were divided into four sector tables: 1) built environment; 2) industry, large-scale energy production and Emission Trading System (ETS); 3) commercialisation, innovation and clean energy technologies, and 4) mobility and transport (SER, 2013a).

The Climate Agreement (KA) was developed in 2019, after new negotiations with societal parties (EZK et al., 2019). In comparison to the EA, the KA focussed more on carbon dioxide (CO_2) reductions without focussing on the energy provision, even though it was still included. The KA was divided into five sector tables: 1) built environment; 2) mobility; 3) industry; 4) agriculture and land use; and 5) electricity. Next to this, it included a cross sectoral connection. Even though the KA was, similar to the EA, a product of negotiations, the approach was different. A reason for this could be the fact that the evolution of policies depended on the society and its development, according to De Groot (7 January 2022) and Van der Wijst (23 December 2021). The government officials and the House of Representatives were receiving an increasing pressure from the society, and thus, wanted to have more control over what was included in such an agreement.

This chapter showed how the policies were set up and what the general explanations were on the developments. The remaining results chapters focus on the climate transition governance approaches.

5. Government and stakeholders

In this chapter, the role of the government and stakeholder inclusion in the policies are discussed to obtain insights into the integration of multi-actor networks in the Dutch climate transition policies. The first subchapter highlights the role of the national government over the years. Thereafter, the assigned role of local and regional government levels in the policies are discussed. Afterwards, an explanation on the stakeholder inclusion is provided. Throughout the chapter, it is made clear that the multi-actor networks obtained an important role in the Dutch policies. How this role was fulfilled, however, differed per policy. This chapter finishes with an explanation on how the practices could be linked to the theory.

5.1. Role of the government

Multiple interviewees stressed that the role of the government in climate policy changed and developed over the years, depending on the parties in the Cabinet, and the responsible minister (Cramer, 10 December 2021; Pronk, 20 January 2022; Van der Wijst, 23 December 2021). This subchapter discusses how the government's role developed from 2001 to 2019 based on four roles, as defined in the National Environment Policy Plan 4 (NMP 4).

The NMP 4 recognised that the Dutch government had often acted reactively, when negative environmental consequences were already apparent and costs were high (VROM et al., 2001). To turn the tide, the precautionary principle was introduced on a national level, following the example of multiple international agreements. The precautionary principle was brought to life to enable "decision-makers to adopt precautionary measures when scientific evidence about an environmental or human health hazard is uncertain and the stakes are high" (European Parliament, 2016, p. 1). This meant that the government had to adapt its role when dealing with the climate and the environment, which resulted in four government roles in the NMP 4: 1) connector between parties to create a shared understanding; 2) stimulator of new technology development and implementation; 3) creator of a window of opportunity; and 4) director and enforcer (VROM et al., 2001). These four roles were also found in the other

policies. Below, the four roles are further explained, and the differences and similarities on these characteristics between the four policies are described.

The NMP 4 stated that the government should have a connector role (VROM et al., 2001). This meant that it should link parties together to ensure a shared understanding of the interests of the future, and to encourage the necessary market initiatives. In the policies, the shared understanding of the interests of the future was created in different ways by the government. Cramer (10 December 2021), coordinating minister of the Work Programme Clean and Resource-efficient (WSZ), stated that: "I noticed that the practice, the networks in which system change is required, that you have to steer those, and that […] network control is necessary. […] You have to bring a dynamic to it, which brings innovation"[4]. Thus, she used network control to create the shared understanding, as part of the connector role. In the NMP 4, it was highlighted that the government had the responsibility to determine a set of operational targets, which were consistent, to support the investing phase (VROM et al., 2001). Similar, at the mobility table of the Energy Agreement (EA), this approach was also used when the government representatives decided on the goal, based on the studies commissioned by the European Commission, which were then accepted by the other parties (Werther, 19 January 2022). For the Climate Agreement (KA), the government was responsible for bringing the sector tables together. Moreover, the targets per sector were set beforehand by the government (EZK et al., 2019). In the NMP 4, a sufficient sense of urgency was also mentioned as a prerequisite to create shared understanding among involving parties (VROM et al., 2001).

The government's role in the NMP 4 was also to stimulate the development and implementation of new technologies, as they could deliver solutions to major environmental issues (VROM et al., 2001). This included leading by example, which was also implemented

[4] Translated from Dutch: "ik merkte dat je de praktijk, de netwerken waarin het systeem moet veranderen, dat je die moet sturen en dat er […] netwerksturing nodig is. […] Je moet er een dynamiek in brengen, waardoor vernieuwing tot stand komt" (Cramer, 10 December 2021).

in the case of the KA (EZK et al., 2019). In the WSZ, the EA, and the KA, the government's role as a launching customer was highlighted, especially in the mobility section (EZK et al., 2019; SER, 2013a; VROM et al., 2007; Werther, 19 January 2022). Moreover, stimulation of the implementation of clean and sustainable vehicles by targeting the end user was also part of the government's role in the WSZ (VROM et al., 2007). Stimulation of new technologies was also done by bringing parties together to encourage them to solve issues using their capacities (VROM et al., 2001). The EA and KA were both built upon bringing parties together, and the WSZ also relied largely on stakeholder inclusion, which is further discussed in chapter 5.3.

Furthermore, the NMP 4 highlighted the government's task to create the right circumstances for other parties, i.e. other government levels, businesses, and citizens, in order to be able to fulfil their role (VROM et al., 2001). This included providing the necessities, reducing barriers, and preventing compartmentalised decision-making. Another way to create such circumstances was to introduce suitable instruments and institutions. In the WSZ, it was stated that restrictive regulations should be cleared by the government (VROM et al., 2007). In the mobility section of the KA, this included the additional tasks of the transformation of funds, fiscal stimulation, and facilitation (EZK et al., 2019). In the industry sector, the role of the government was also to facilitate and support in a targeted manner. For this, the KA stated that a more proactive, constructive, and unburdening governmental attitude was desired. Facilitation in the industry sector was directed at infrastructural facilities and regulation, which is simultaneously part of the next role.

The last government's role was to steer and enforce, according to the NMP 4 (VROM et al., 2001). This meant that government should set frameworks and its conditions, for example through laws and regulations. These had to be enforced throughout the Netherlands on an equal level. In the EA, comparable statements were included about the responsibility of the government (SER, 2013a). This overlapped the creator role, as it referred to legal frameworks

to create the right circumstances. Moreover, the following was included in the EA: "The government is responsible for devising, implementing, executing, and evaluating the policy measures mentioned in the agreement"[5] (SER, 2013a, p. 133). Several policy measures that required devising from the government were also included in the KA, for both the mobility and the industry sector (EZK et al., 2019). The WSZ included using options for standards and improved enforcement of the environmental legislation in the industry sector (VROM et al., 2007). In the mobility sector, the government's role was also to create frameworks of standards and regulations, which they preferred to do at a European level. This role was also included in

Table 5.1. Overview of government roles in the National Environmental Policy Plan 4 (NMP 4), the Work Programme Clean and Resource-efficient (WSZ), the Energy Agreement (EA), and the Climate Agreement (KA)

	Connector	**Stimulator**	**Creator**	**Director and enforcer**
NMP4	• link parties creating shared understanding of future, including sense of urgency; • encourage market initiatives; • determine operational targets.	• lead by example; • encourage combined parties to use capacities.	• provide necessities; • reduce barriers; • prevent compartmentalised decision-making; • introduce suitable instruments and institutions.	• set frameworks and its conditions; • use laws and regulation.
WSZ	• use network control to create shared understanding.	• launching customer; • target end user in mobility sector; • encourage combined parties to use their capacities.	• clear restrictive regulation.	• use standards; • improve enforcement of legislations; • create frameworks of standards and regulations.
EA	• decide goals for mobility sector.	• launching customer; • encourage combined parties to use their capacities.		• create legal frameworks; • devise policies;
KA	• bring sector tables together; • decide overall goals for sectors.	• lead by example; • launching customer; • encourage combined parties to use their capacities.	• transform funds; • stimulate fiscally; • facilitate; • support.	• create frameworks of standards and regulations; • devise and direct policies; • create climate law.

[5] Translated from Dutch: "De rijksoverheid is verantwoordelijk voor de uitwerking, implementatie, uitvoering en evaluatie van de in het akkoord benoemde beleidsmaatregelen" (SER, 2013a, p. 133).

the mobility sector strategy of the KA (EZK et al., 2019). Nonetheless, in the KA, the steering role of the government in the mobility sector went a step further, as it was also to direct. Lastly, with the KA, the Climate Act was adopted, which was the first Dutch law to secure carbon dioxide (CO_2) reductions. An overview of the government roles in the policies is provided in table 5.1 on the previous page.

5.2. Government levels

The previous section solely discussed the role of the national government, or the government in general. In this section, the role of the other government levels, i.e. provinces and municipalities, is discussed. This is analysed per policy, starting with the NMP 4, and followed by the WSZ. Next, the EA and KA are analysed.

For the NMP 4, Pronk (20 January 2022) stated that the other levels of government enter during the execution phase of the policy. This was visible in the policy, which included the contribution of the municipalities and provinces during the execution phase, as their direct involvement and closeness to citizens gave them a crucial role in the climate transition (VROM et al., 2001). Nonetheless, the inclusion of municipalities and provinces was on a voluntary basis through a to-be-signed covenant, the Administrative Agreement New Style (Dutch: *Bestuursakkoord Nieuwe Stijl*; BANS), which included a subsidy scheme. The allocation of the subsidies depended on the approvement of a plan, and on the ambition level (VROM et al., 2001). In 2002, this covenant came into force (Menkveld et al., 2002).

Similarly, in the WSZ, municipal and provincial involvement were mostly based on collaborations with ambitious parties (VROM et al., 2007). In this case, the most ambitious regions functioned as frontrunners. Cramer (10 December 2021) said that thematic learning communities were created, in which unexperienced regions could learn from the experienced. Compared to the NMP 4, the role of regions was more clearly stipulated in the WSZ, as the regional governments were decisive for the realisation of national goals and plans (VROM et

al., 2007). Municipalities had the role of a licensing authority and enforcer, educator and communicator, initiator, and role model (VROM et al., 2007). In the mobility sector, the lead-by-example role was also assigned to local authorities. Moreover, the WSZ included that the BANS covenant would be continued and adapted. Similar to the NMP 4, the collaboration with municipalities and provinces were on a voluntary basis. However, according to Cramer (10 December 2021), to ensure collaboration, goal agreements were made with the Association of Netherlands Municipalities (Dutch: *Vereniging van Nederlandse Gemeenten*; VNG) and the Association of Dutch Provinces (Dutch: *Interprovinciaal Overleg*; IPO). However, these agreements proved unnecessary, as all parties wanted to participate.

In the EA, the role of the local authorities was less clearly indicated (SER, 2013a). For the mobility sector, the parties aimed for a Green Deal for zero-emission city distribution. The municipality's role was to facilitate such outcomes. Additionally, the VNG's task was to reach regional agreements, together with other mobility actors. Thus, municipalities and provinces obtained an active supporter role. This was also the role in the industry sector, where the provincial and municipal authorities, together with the supplying and consuming sectors, had the task to develop a long-term heat plan. Both Achterberg (21 January 2022) and Werther (19 January 2022) stated that, similarly to the NMP 4, the role of the local authorities was to execute the agreements made in the EA.

In the KA, more tasks moved to regional authorities. Thus, the municipalities and provinces played a larger role in the KA compared to the EA, according to Van der Wijst (23 December 2021). Moreover, Mijs (14 December 2021) mentioned that the agreements about controversial issues were often transferred to local authorities, on top of the execution responsibilities. Similar to the executor role in the EA, VNG and IPO were also responsible for the execution of the mobility section of the KA, especially regarding the spatial measures (EZK et al., 2019; Van der Wijst, 23 December 2021). Additionally, they had a monitoring role to

ensure the progress (EZK et al., 2019). The Green Deal from the EA was supposed to extend to the 30 to 40 largest municipalities. Herein, they were responsible for the introduction and enforcement. Moreover, stimulating demand was also the task of the municipality. Outside of the Green Deal, local authorities also had an exemplary role. Achterberg (21 January 2022) said that in the KA, regional collaborations were established to support the municipalities, in which the experienced municipalities provided advice. In the case of industry, the provinces had a more important role, as they were responsible for the authorisation of licenses, enforcement, and supervision (EZK et al., 2019). Furthermore, the spatial decision-making on industrial heat network infrastructure belonged to the provinces (EZK et al., 2019; Van der Wijst, 23 December 2021). In the KA, the roles of regional governments in the sectors were more clearly indicated than before. Nonetheless, Achterberg (21 January 2022) stated that he had noticed that "it is still in development, the fine-tuning of task divisions between, and the involvement of different government layers, even though the ambition is to collaborate as one government."[6] In table 5.2, an overview of all the tasks and roles of provinces and municipalities is provided.

Table 5.2. Overview of tasks and roles of provinces and municipalities in the policies

Tasks/roles	**National Environmental Policy Plan 4**	**Work Programme Clean and Resource-efficient**	**Energy Agreement**	**Climate Agreement**
Active supporter			✓	
Decision-maker				✓
Educator and communicator		✓		
Enforcer		✓		✓
Execution	✓		✓	✓
Facilitator			✓	
Initiator		✓		✓
Licensing authority		✓		✓
Monitor				✓
Role model		✓		✓
Stimulator				✓

[6] Translated from Dutch: "…dat dat nog steeds in ontwikkeling is, de precieze afstemming en betrokkenheid tussen die verschillende overheidslagen. De ambities is wel om als één overheid samen te werken" (Achterberg, 21 January 2022).

5.3. Stakeholder inclusion

Over the years, the approach regarding stakeholder inclusion has changed drastically. This subchapter discusses these changes per policy. Each paragraph is accompanied with a visual summary of the stakeholder inclusion, including the local governments.

In the development of the NMP 4, there was no collaboration with other parties, such as NGOs or market parties. Pronk (20 January 2022), the responsible minister, was determined not to have societal parties influence the policy. During his time in office, there was room for conversations to share knowledge and information, as shown in figure 5.1, but he was "terrified of the corporate lobbying power"[7] (Pronk, 20 January 2022). Nonetheless, the NMP 4 still mentioned the societal wide responsibilities in the climate transition (VROM et al., 2001). Moreover, the importance of bringing parties together to boost the necessary initiatives was highlighted, because of the different interests of parties, in for example, environmental covenants. Nevertheless, it was mentioned that the setup and guidance must enhance the ability of parties to hold each other accountable. Additionally, the stakeholders participating in these covenants also had to be willing to stick their necks out. Nonetheless, Pronk's (20 January 2022) personal preference was to use laws and regulation, instead of agreements, while many

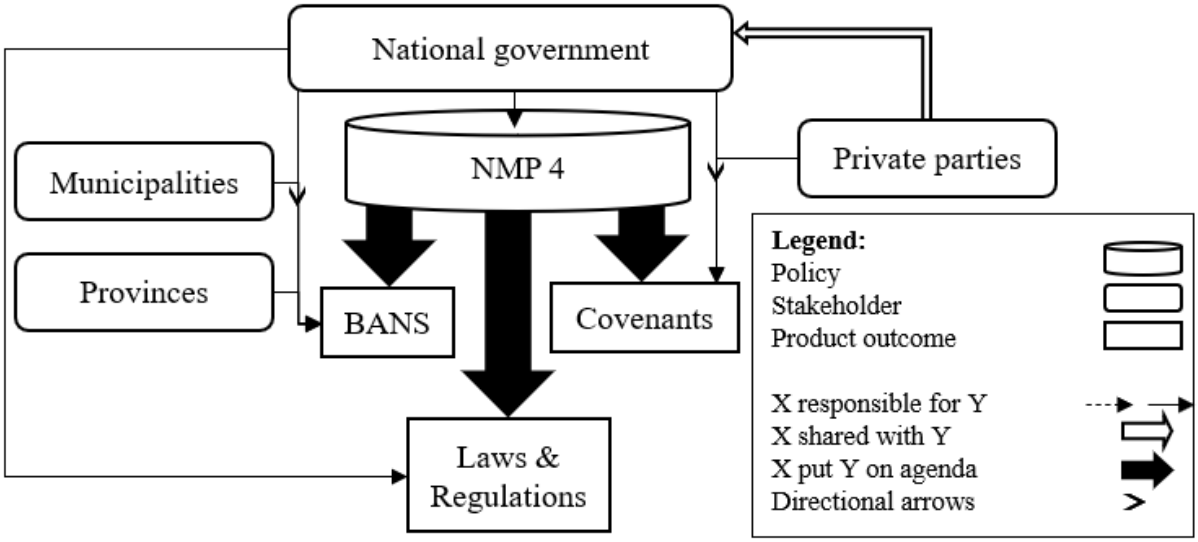

Figure 5.1. Visual summary stakeholder inclusion of the National Environmental Policy Plan 4 (NMP 4)

[7] Translated from Dutch: "…als de dood voor de lobbykracht van het bedrijfsleven" (Pronk, 20 January 2022).

of his successors, including Cramer, were in favour of covenants. This change in approach is noticeable when analysing the succeeding policies.

Leading up to the WSZ, economic and societal sectors had spoken with the government at length (VROM et al., 2007). According to Cramer (10 December 2021), the stakeholders were involved based on their importance. She continued that when stakeholders were resistant to agree on the goals, as they were not sure they would be able to achieve those goals, extra experts on in-field innovations would be invited to convince the stakeholders. The willingness to act was high among those stakeholders, providing the opportunity for the government to focus on development instead (VROM et al., 2007). These conversations were not solely to share knowledge and information, but also to formulate ambitions and to reach agreements. Following the WSZ, additional sustainability and administrative agreements, e.g. covenants, had to be made. For the industry sector, these ongoing accords were heavily relied upon. In the case of large, energy-intensive companies, the European Union (EU) Emission Trading System (ETS), which came into force in 2005, remained leading (Nederlandse Emissieautoriteit, 2014; VROM et al., 2007). Furthermore, the launch of a frontrunner energy transition programme for the industrial sector was proposed in the WSZ. This is also shown in figure 5.2. For the mobility

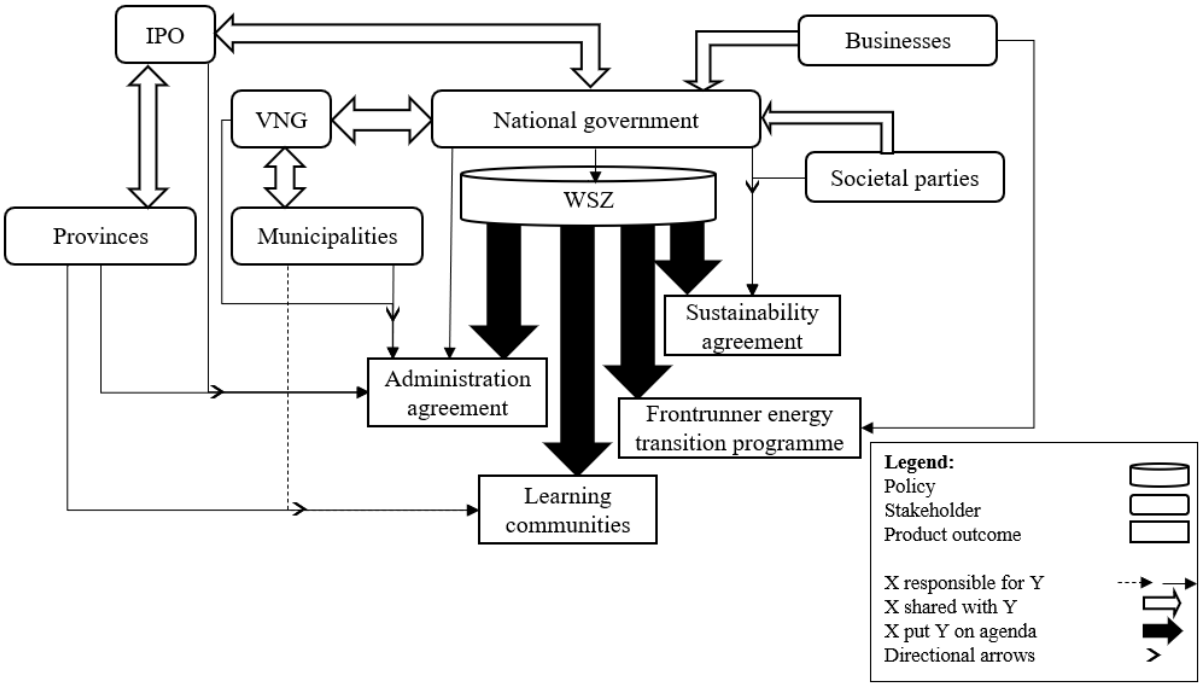

Figure 5.2. Visual summary stakeholder inclusion of the Work Programme Clean and Resource-efficient (WSZ)

sector, the WSZ recognised the need for a new kind of collaboration between the government, societal partners, and businesses (VROM et al., 2007). The ambitions formulated for the mobility sector, discussed in the next chapter, were preparatory to the WSZ discussed with, and widely supported by the sector parties. In the policy, it was also recognised that the next step would be to develop concrete plans for collaboration.

In the EA, stakeholder inclusion developed further. Although stakeholders were included in the development of the WSZ, Cramer (10 December 2021) said that the government still wrote the policy and there was no accord. This changed in 2012, when the Social and Economic Council (Dutch: *Sociaal-Economische Raad*; SER) gave the advice to the government to use a platform to come to an energy agreement (SER, personal communication, n.d.). A director's team, consisting of the chair and a secretary of the SER, and representatives of the Union of Dutch Companies and the Dutch Christian Employee Union (Dutch: *Verbond van Nederlandse Ondernemingen en het Nederlands Christelijk Werkgeversverbond*; VNO-NCW), the Federation of Dutch Trade Unions (Dutch: *Federatie Nederlandse Vakbeweging*; FNV), Nature and Environment (Dutch: *Natuur en Milieu*), and the ministry of Economic Affairs, decided on the structure of the agreement. De Krom (21 December 2021) and Werther (19 January 2022) highlighted that an agreement was to ensure broad support, and for this, all interests had to be represented (SER, personal communication, n.d.). The director's team also decided that participants at the sector tables had to be able to represent the interests of their members, and simultaneously, have the authority to ensure the execution of the agreement. At each table, a representative of the relevant ministry, and Nature and Environment were present. Purposefully, no businesses were invited to participate at the sector tables. Moreover, the maximum number of participants at a table was 20, and Van der Wijst (23 December 2021) said that all parties at the table were equal (SER, personal communication, n.d.). In the end, all 49 organisations that helped devising the agreement, signed the EA (SER, 2013a). Parties were

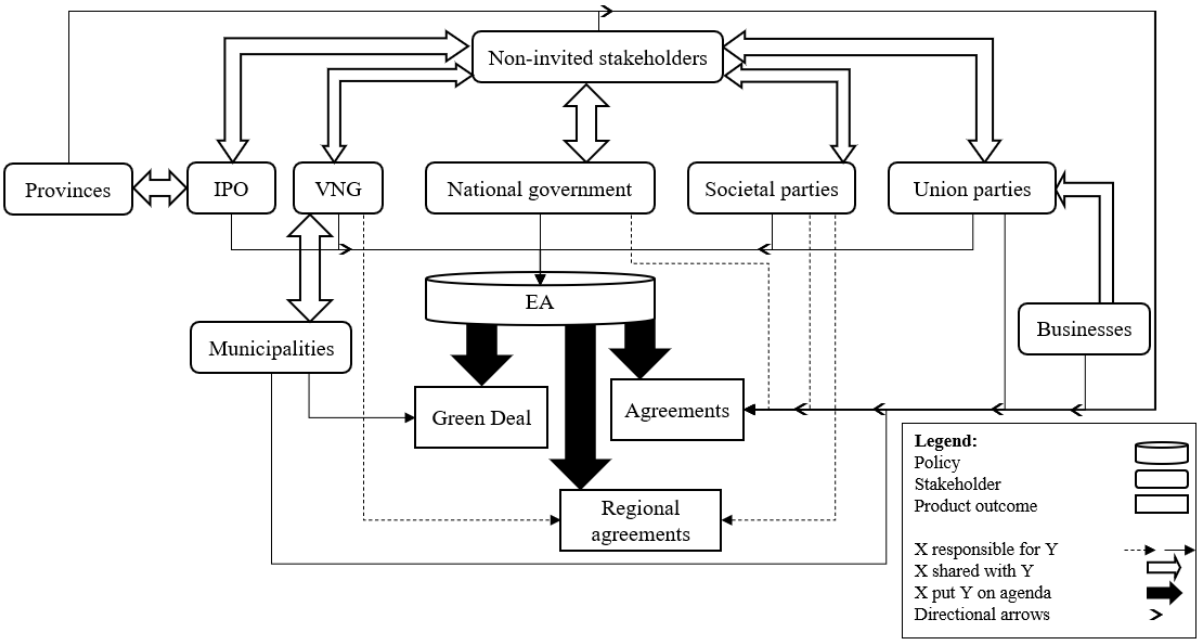

Figure 5.3. Visual summary stakeholder inclusion of the Energy Agreement (EA)

only at the relevant table. According to Werther (19 January 2022), this also depended on their capacity. For example, at the mobility table, FNV was invited, but did not participate. Van der Wijst (23 December 2021) added that additionally to the sector tables, there were regular discussions with stakeholder, who were not invited to the tables. In the EA, the parties had been assigned responsibilities to execute the measures that fit their abilities (SER, 2013a). In figure 5.3, the stakeholder inclusion in the EA is shown in a model.

Stakeholder inclusion changed when developing the KA. Multiple interviewees said this was due to parliamentary questions and double negotiations (Achterberg, 21 January 2022; De Groot, 7 January 2022; Van der Tang, 14 January 2022; Van der Wijst, 23 December 2021; Werther, 19 January 2022). The ministry of Economic Affairs was responsible, but negotiations among many stakeholders took place. Regional and local governments were also included, and according to Mijs (14 December 2021), their voice weighed heavier, because of their constituency. Nonetheless, he also said that this was not in proportion to their execution responsibility of the agreement. In general, there were more parties at the tables, sometimes even 30 to 35, bringing the total to over 100 parties (Achterberg, 21 January 2022; EZK et al., 2019). According to Mijs (14 December 2021), the supervision and composition differed per

sector table. The mobility sector was divided into four themes, and for each the most important stakeholders were invited (Achterberg, 21 January 2022; Mijs, 14 December 2021). The parties present were similar to those at the mobility table of the EA (Werther, 19 January 2022). At the industry table, the negotiations were among lobby organisations, representatives of the five industrial regions, the twelve largest emitters, and governmental representatives (EZK et al., 2019). Moreover, an industry frontrunner's programme was supposed to be developed, as shown in figure 5.4. Next to detailed differences between the EA and KA, the position of the ministries and ministers was also stronger. Last minute changes were made, resulting in a KA that was not fully supported by all participants (Van der Wijst, 23 December 2021). Still, similar to the EA, the KA stated: "the parties themselves bear primary responsibility for effective implementation of the agreements reached" (EZK et al., 2019, p. 9).

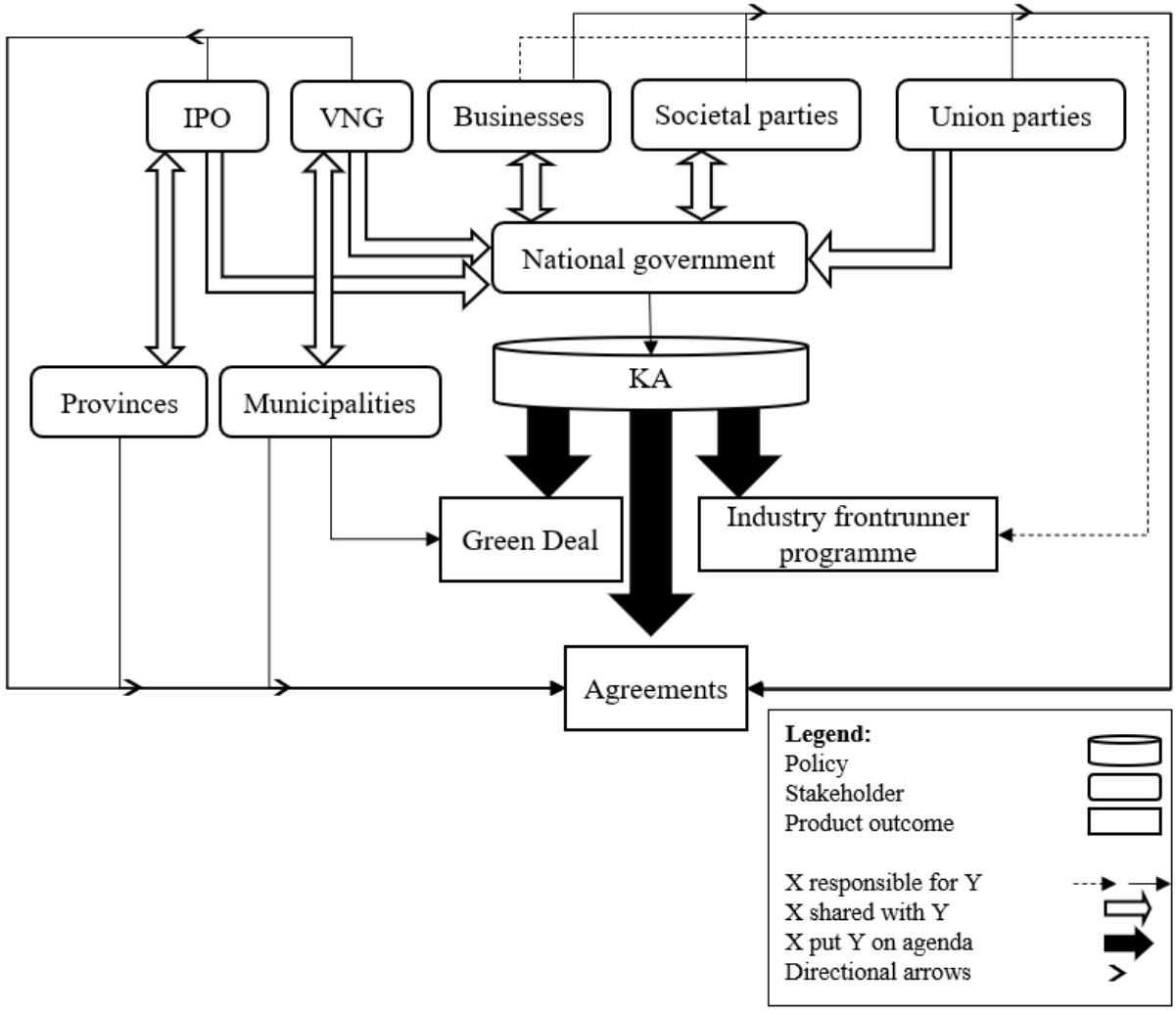

Figure 5.4. Visual summary stakeholder inclusion of the Climate Agreement (KA)

5.4. Linking practice and theory

This subchapter links the practice, as analysed above, to the theories of the conceptual framework. First, a short summary of the findings is provided. Then, the practices are linked to transition management (TM), strategic niche management (SNM), and polycentric governance (PG). Lastly, this subchapter finishes with concluding remarks on the integration of multi-actor networks in the Dutch policies.

The multi-actor networks in the policies developed over the years. First of all, the creation of the policies changed. For the NMP 4 and the WSZ, no other parties were invited to create of the policies. In the WSZ, however, more actors were able to provide information to the government, compared to the NMP 4. Nonetheless, there were some multi-actor networks created in the establishment of the NMP 4 through an administrative agreement and covenants. The WSZ had a similar outcome, but also created learning communities and a frontrunner energy transition programme. In the EA, the approach changed completely, and the multi-actor networks were the ones creating the policy. The multi-actor networks were created by developing sector tables, who were responsible for their respective parts. The government was part of those sector tables, but did not have a more important role than others. This changed, however, in the creation of the KA, because the government wanted its leadership position back. The outcomes of the KA and EA were similar, but the KA did also include a frontrunners programme.

Since the NMP 4 did not provide an explanation on how the agreements would be established, not much can be linked to the theories. Nevertheless, the fact that the participants to covenants had to be willing to stick their necks out could be classified as a TM characteristic, because of the focus on frontrunners (Loorbach, 2010; VROM et al., 2001). In the WSZ and the KA, there was also a focus on frontrunners (EZK et al., 2019; VROM et al., 2007). The role of local authorities was also highlighted in the WSZ (VROM et al., 2007). The inclusion of the multiple-level governing authorities is analysed in PG (Ostrom, 2010). In table 5.2, it is

visible that the roles and tasks of the local authorities were minimal in the NMP 4, but expanded in the WSZ. In the EA, the roles and tasks were reduced to a limited amount, only to be brought back to a record amount of roles and tasks in the KA. Hence, the degree of PG differed throughout the policies, due to the different levels of interdependency (Pattberg et al., 2018). This could implicate that the degree of PG in the KA was higher than in the other policies. In TM, the number of actors engaged in a network are ideally limited to 10 to 15 actors, whereas the SNM theory highlights that intensive networking among more actors would result in successful transitions (Caniëls & Romijn, 2008; Loorbach, 2010). The KA included a wider range of stakeholders, i.e. a broad network, without a limit to the actors at a sector table (Achterberg, 21 January 2022; EZK et al., 2019; Schot & Geels, 2008). For the EA, on the other hand, the mobilisation role of the actors, i.e. a deep network, was highlighted, and the limit of actors at a table was 20 (Schot & Geels, 2008; SER, personal communication, n.d.). Therefore, the broad network and no participant limit of SNM theory could be linked to the KA, whereas the EA could be linked to both SNM and TM, through the deep network and the limit on participants, respectively.

Regarding the government's role and the stakeholder's position, the EA could also be understood through the TM and PG theories. All actors were equal, in line with PG, and the role of the government was mostly to stimulate and mobilise, in line with TM (Pattberg et al., 2018; Rotmans et al., 2001). In the KA, the role of the government was to facilitate, and it directed to steer from within, which could be recognised as a characteristic of SNM (Kemp et al., 1998; Schot & Geels, 2008). Additionally, the importance of collective action that was highlighted in all policies, which is in line with PG (Pattberg et al., 2018).

This chapter showed that the number of stakeholders involved in the Dutch policy making increased between 2001 and 2019. However, how the multi-actor networks were integrated differed per policy. Therefore, the extent to which the integration of this climate transition governance approach could be understood through only one of the theories was limited. In this chapter, it was highlighted that the multi-actor networks affected the long-term visions, ambitions and targets. The next chapter analyses the development of long-term visions integrated in the Dutch climate policies.

6. Long-term visions

Visioning, ambition- and goal setting, and scenario-building are all activities that result in long-term visions. To gain insights into these activities, this chapter analyses the long-term visions that were included in the policies. This is done to obtain an understanding of the integration of the long-term visions that are identified in the Dutch climate transition policies. This chapter shows how visions and ambitions developed over the years, while their guiding function remained. This is done by exploring the visioning, the ambitions and goals, and the functions of these long-term visions in the policies. This chapter concludes by analysing how the long-term visions could be understood through the theories, as analysed in the conceptual framework.

6.1. Visioning

Visioning is the practice of creating future visions and scenarios. This subchapter describes how visions have been expressed in the policies analysed in this thesis. Moreover, the scenario-building practices in the National Environment Policy Plan 4 (NMP 4) are discussed.

The most elaborate way of describing a vision was done in the Work Programme Clean and Resource-efficient (WSZ). Here, a vision of 2020 was described through a futuristic guided tour with Google Earth to show how things could change from 2007 (VROM et al., 2007). In this vision, the spatial and visual changes were explained by what was decided in, and done since, 2007. The approach to visioning was different in the NMP 4, here, ambitions were used to determine requirements to fulfil these ambitions (VROM et al., 2001). The environmental ambition was summarised in a qualitative image: "The environmental policy must contribute to a healthy and safe life, […], without affecting the global biodiversity, nor depleting natural resources, here and now, and elsewhere and later"[8] (VROM et al., 2001, p. 96). In the Climate

[8] Translated from Dutch: "Het milieubeleid moet een bijdrage leveren aan een gezond en veilig leven, […], zonder de mondiale biodiversiteit aan te tasten dan wel natuurlijke hulpbronnen uit te putten, hier en nu en elders en later" (VROM et al., 2001, p. 96).

Agreement (KA), the visions for 2050 were created per sector, in which the mobility sector focussed on overall improvement of mobility, including zero emissions (EZK et al., 2019). The industry sector's vision, on the other hand, was focussed on the growth of a circular sector and decreasing carbon dioxide (CO_2) emissions. The final mission of the industry sector was to be climate neutral in 2050, and at least 80 per cent circular. The Energy Agreement (EA) did not have a descriptive vision, as the other policies had, but it was supposed "to give a powerful boost to the economy, and to create the possibility to take major steps towards an energy supply that is completely climate neutral by 2050"[9] (SER, 2013a, p. 29).

Additional to its vision, the NMP 4 also used a scenario-building strategy. Herein, it illustrated three different pathways towards sustainable energy management: 1) use of renewable energy sources; 2) enhancing energy efficiency; and 3) advanced energy technology (VROM et al., 2001). Depending on the technology, three scenarios were also developed for the energy infrastructure (status quo with renewable sources, hydrogen as the energy carrier, and an all-electric society). Additionally, six solution directions were explored for the reduction of CO_2. Thus, in the NMP 4, several options for all climate-related challenges were explored without deciding.

6.2. Ambitions and targets

All policies defined ambitions and targets within a certain timeframe. Additionally, all the policies, except the NMP 4, assigned targets to certain sectors. This subchapter discusses these ambitions and targets.

For 2030, the NMP 4 described an image of a world in balance, which included a maximum change of two degrees Celsius (ºC) above pre-industrial levels in the worldwide temperature (VROM et al., 2001). This maximum change was also included in the KA (EZK

[9] Translated from Dutch: "een krachtige impuls geven aan de economie en het mogelijk maken om grote stappen te zetten richting een energievoorziening die in 2050 volledig klimaatneutraal is" (SER, 2013a, p. 29).

et al., 2019). The NMP 4 continued that the temperature increase could not exceed 0.1 ºC per decade (VROM et al., 2001). Moreover, the sea level rise caused by climate change was supposed to be limited to 50 cm. The goal for 2030 was to reduce the CO_2 emissions by 30 to 60 per cent compared to 1990 levels in the NMP 4. In the WSZ, the lower percentage of this range, 30 per cent, was set as a reduction goal for 2020 (VROM et al., 2007). The ambitions for the industry (together with the energy) sector and mobility sector were, respectively, to reduce CO_2 emissions with 56 to 61 megatonnes (Mt), and 13 to 17 Mt per year by 2020, compared to not changing the policies. As mentioned in the previous subchapter, in the EA, the ambition for 2050 was to have a fully climate neutral energy supply (SER, 2013a). This meant a CO_2 emission reduction of 80 to 95 per cent. For the industry sector, the ambitions were to reduce CO_2 emissions with 15 Mt per year by 2030. The mobility sector aimed to reduce the emissions to a maximum of 25 Mt CO_2 (-17 per cent compared to 1990) on an annual basis by 2030, and with 60 per cent by 2050. The vision in the KA for 2050 was to reduce the CO_2 emissions with 95 per cent, compared to 1990 levels, and with 49 percent by 2030 (EZK et al., 2019). The industry en mobility sector had set their ambitions to reduce their CO_2 emissions with 14.3 Mt and 7.3 Mt, respectively, on an annual basis by 2030. In the vision of the mobility sector, the ambition to reach zero CO_2 emissions in 2050 was included.

The past emissions, known at time of publications, and all targets of the policies are depicted in figure 6.1, on the next page (Rijksoverheid, 2021). Although the ambitions were rather aligned, the figure shows that, in general, the targets became more and more ambitious over time. Between 2001 and 2007, the ambitions shifted from 2030 to 2020, and the lower range target of 2030 was used as a target for 2020. In 2013, however, the target for 2030 was less ambitious than the target for 2030 of the NMP 4, and the target for 2020 of the WSZ. Yet, in the EA, a target for 2050 was mentioned for the first time. The KA was, regarding targets, a contrast to the EA. In 2019, the targets set for 2030 were considerably more ambitious than in

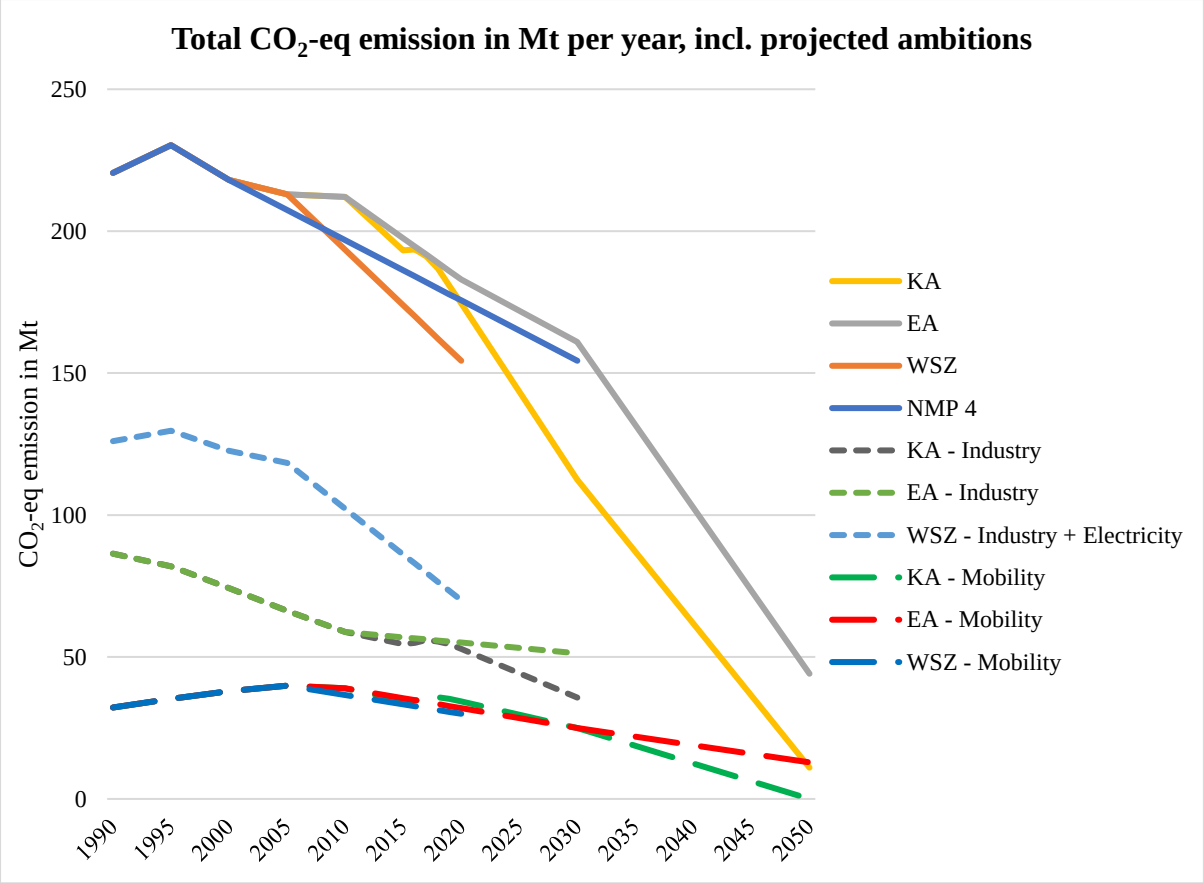

Figure 6.1. Total CO_2-eq emission in Mt per year, including projected targets of the National Environmental Policy Plan 4 (NMP 4), the Work Programme Clean and Resource-efficient (WSZ), the Energy Agreement (EA), and the Climate Agreement (KA) (EZK et al., 2019; Rijksoverheid, 2021; SER, 2013a; VROM et al., 2001; 2007)

2001 and 2013. For the mobility sector, the targets were generally in line with the overall targets of the policies. The industry sector had set more ambitious targets in 2019 than in 2013. For the industry sector targets in the WSZ, however, little can be said, as it included the electricity sector in its targets as well.

6.3. Functions of long-term visions

The functions of long-term visions show why the visions developed in a certain way. This subchapter reviews the functions of long-term visions and ambitions, discussed in the previous subchapters. Moreover, it also gives an insight into criticism of long-term ambitions, provided by the interviewees.

Not every interviewee agreed on the practical value of ambitious long-term visions. Pronk (20 January 2022) said that the long-term visions were used, because the challenges are long term, thus, the solutions must be too. Second, the policy-based approach takes years to

reach maturity and implementation. This is supported by Werther (19 January 2022), who stated that short-term, e.g. five-year, goals would create fickle policy. Therefore, short-term visions would be useless, according to Pronk (20 January 2022). However, not every interviewee supported this sentiment. Slingerland (18 January 2022) said that there should be a balance between long-term and short-term targets. With short-term targets, Slingerland meant targets that are reachable within one term of office. This last statement was supported by De Krom (21 December 2021), who said that failing to reach the targets was demotivating, and that the focus should be on the execution of the agreements instead of determining tough-to-reach targets.

Nonetheless, most interviewees shared the perspective that long-term visions provide guidance (De Groot, 7 January 2022; Mijs, 14 December 2021; Van der Tang, 14 January 2022; Van der Wijst, 23 December 2021; Werther, 19 January 2022). Mijs (14 December 2021) explained this with the following: "…it is very well possible that if you steer towards 2050, that your planning, and the things you need to do, look differently, and that you have different priorities than when you aim for 2030."[10] De Groot (7 January 2022) supported this regarding the industry sector, because large investments happen only every 15 to 20 years. Moreover, he explained that large transition investments could have major consequences for the production or electricity use. Thus, according to De Groot, the long-term vision was the determining factor for the industry sector to create system change. The sector started aiming for zero emissions, but the timeframe depended on the situation of organisations. Werther (19 January 2022) said that the mobility sector also welcomed long-term ambitions, as they provided the opportunity to set up the revenue model accordingly. Cramer (10 December 2021) added that the fundament of reaching the targets was that everyone responsible agreed on what their share was.

[10] Translated from Dutch: "…het is heel goed mogelijk dat als je stuurt op 2050, dat jouw planning en je dingen die je moet doen dat die er anders uit komen te zien en je andere prioriteiten dan als je het voor 2030 doet" (Mijs, 14 December 2021).

The international developments have also affected the long-term visions. Van der Wijst (23 December 2021) said that additional to the national agreements, the goals of the international agreements, i.e. the Paris Agreement, were leading for the government while developing the KA, which created a new phase for the energy transition. Van der Wijst (23 December 2021) and Spaargaren (23 December 2021) added that this also provided incentives for businesses to change their strategies, because Climate Acts throughout Europe created a level-playing field.

In the NMP 4, the functions of defining visions and ambition were extensively described. The long-term ambitions provided guidance, and with the determined requirements, the ambitions were made quantifiable (VROM et al., 2001). Since the ability to realise the ambitions was uncertain, scenario-building and backcasting were used to determine which processes could be initiated (Spaargaren, 23 December 2021). This was supposed to have resulted in quantitative, achievable targets for the short- to medium term, i.e. five to 10 years (VROM et al., 2001). The mobility sector table of the EA also used backcasting as a technique, as they decided to aim for newly bought cars to be completely CO_2-emission free in 2035 to ensure all cars would be CO_2-emission free in 2050 (SER, 2013a). In the KA, the intermediate target was set to 2030 instead of 2035, in accordance with the Cabinet's decision-making (EZK et al., 2019). Moreover, in the integral knowledge and innovation agenda (IKIA) of the KA, backcasting was used to create intermediate goals and practical targets for all sectors.

6.4. Linking practice and theory

This subchapter links the practices of long-term visions, as analysed above, to transition management (TM), strategic niche management (SNM), and polycentric governance (PG). It commences with a short summary of the findings. Then, the practices are linked to three aforementioned theories. In the end, some concluding remarks are made on the integration of long-term visions in the Dutch policies.

This chapter showed that long-term visions and targets were used, as they fitted the long-term challenges of climate change. Moreover, they provided guidance for the actors involved. In general, the long-term targets became more ambitious over time. Nevertheless, the targets for 2030 were more ambitious in 2001 than in 2013, whereas they were the most ambitious in 2019. For 2020, the WSZ included the most ambitious goals. A reason for the short-term inconsistency could be that in 2019, it was known that the targets for 2020 of the WSZ could not have been met anymore. Moreover, in the targets of the NMP 4, there were many uncertainties, as they were based on several scenarios, and consisted of a wide range.

The long-term visions in the NMP 4, the WSZ, and the KA were created to develop ambitions and targets (EZK et al., 2019; VROM et al., 2001; 2007). Through a TM lens, this can be understood as a target-setting framework, established through visions (Hajer & Pelzer, 2018). In the EA, however, also some TM characteristics can be recognised, as the targets were produced within the multi-actor networks (Rotmans et al., 2001; SER, 2013a). According to Huitema (22 December 2021), within PG, the role of the government should be to set the long-term targets, to which Setzer and Nachmany (2018) added that these long-term targets should provide an action framework for actors. In line with this PG characteristic were the ambitions and targets of the NMP 4, the WSZ, and the KA (EZK et al., 2019; VROM et al., 2001; 2007). In the NMP 4, the EA, and the KA, short-term objectives were derived of the long-term visions and targets, which is a technique called backcasting, which is featured in the SNM and TM theories (EZK et al., 2019; Hajer & Pelzer, 2018; Hoogma et al., 2005; SER, 2013a; VROM et al., 2001). Additionally, in the NMP 4, backcasting was also used to formulate multiple pathways (VROM et al., 2001). In SNM, it is described that long-term visions provide direction for second-order learning of actors, for nurturing and protection, and for attracting attention (Schot & Geels, 2008). In line with this, multiple interviewees stated that the long-term visions and ambitions of the EA and KA functioned as a guidance for the practical approaches, for

instance, experimenting and upscaling (De Groot, 7 January 2022; Mijs, 14 December 2021; Van der Tang, 14 January 2022; Van der Wijst, 23 December 2021; Werther, 19 January 2022).

This chapter demonstrated that long-term visions have been an inherent part of climate transition policies between 2001 and 2019. Over the years, the visions and targets became increasingly ambitious. Even though the way of integrating long-term visions had developed, the functions of those ambitions had not changed. This was mainly best understood through the TM and SNM theories. How the ambitions were proposed to be reached in each policy is analysed in the next chapter on instruments, measures and plans.

7. Instruments, measures and plans

To ensure the outcome of long-term visions, it is necessary to implement instruments, measures and plans. These can be divided into three categories: experimenting, upscaling, and learning, i.e. monitoring and evaluating. To gain insight into the integration of the practical approaches in the policies, this chapter reviews and explains the roles of experimenting, upscaling, and learning over the years related to the policies central in this thesis. This enlightens the development of the climate transition policies further. The analysis shows that the roles of these approaches have become more prominent over time. This chapter concludes by analysing how the experimenting, upscaling, and learning in the policies can be linked to the theories.

7.1. Experimenting

In this subchapter, experimenting includes the execution of experiments, pilots, trial projects and demonstrations. Here, the development of experimenting from the National Environment Policy Plan 4 (NMP 4) to the Climate Agreement (KA) is analysed. The instruments used for experimenting are discussed, and the resources set aside for experimenting are included.

In the NMP 4, experimenting with new technologies and enhancing their market introduction were proposed to solve climate-related problems (VROM et al., 2001). Additionally, strategies in the research, development, and demonstrations area were implemented to decrease long-term uncertainties. The government was mostly focussed on demonstrations of zero-emission technologies. However, none of these were made practical in the NMP 4, but they were planned to be launched in programmes in 2002. When Pronk (20 January 2022) discussed the trial projects in the NMP 4, he said that he continued the ‘City and Environment’ policy of his predecessor, which aimed to integrate spatial planning with environmental policy. Since location is important for many environmental issues, this provided the opportunity to prevent some activities from happening in some locations, and to make some activities happen in others. For the research, development, and demonstrations, a total amount of €545 million was budgeted (VROM et al., 2001).

The Work Programme Clean and Resource-efficient (WSZ) defined three waves of measures, one of which was 'To prepare meters' (VROM et al., 2007). This referred to accelerating the work on technological options, which still needed development. Thus, the wave included experimenting with innovations and policy instruments. An example of the latter was the development of the operational and economical demands of sustainable biofuel for the mobility sector. The experimenting with innovations was incorporated to solve growing pains that were encountered. For the experimenting phase, the existing instruments, e.g. Stimulation Sustainable Energy Production (Dutch: *Stimulering Duurzame Energieproductie*; SDE) and Energy Investment Deduction (Dutch: *Energie-investeringsaftrek*; EIA), were deemed efficient. In total, an amount of €85 million governmental subsidies was budgeted for pilots and demonstrations in 2007. For the research and development phase, the Energy Research Subsidy (Dutch: *Energie Onderzoek Subsidie*; EOS) was already in place. For research and development, the total amount of governmental subsidies was €148 million in 2007. Cramer (10 December 2021) discussed pilots that were set up by municipalities with the innovation budgets set aside in the WSZ. Thus, experimenting was not limited to the private sector.

As the Energy Agreement (EA) was divided into pillars, the use of pilots was specifically mentioned for some practices (SER, 2013a). For instance, in the industry sector, the optimal use of biobased materials was set out to be enhanced through pilots. According to De Groot (7 January 2022), the improvements of the industry sector were based on small elements (e.g. a more energy-efficient machine), and therefore, pilots with trial factories were unnecessary in response to the EA. Only the Energy Performance Examination (Dutch: *Energie Prestatie Keuring*; EPK) pilot was introduced for the industry, which was to examine whether organisations were complying to the energy savings obligation (SER, 2013a). For the mobility sector, more pilots were developed. A Green Deal for zero-emission city distribution to facilitate and direct regional pilots was planned. Werther (19 January 2022) said that those

regional pilots were decided on, because the sector was unwilling to create zero-emission trucks, as it would temper with their international competitive position. City distribution would not have the same negative effect on the competitive position, and thus, regional pilots were the outcome. Additional to experimenting with innovations, the EA used instrumental pilots, as it was mentioned that a fiscal pilot for mobility management and fuel saving would start in 2014 (SER, 2013a). Even though Werther (19 January 2022) highlighted that they used a technology neutral approach in the EA, the *Formule E-Team* (FET) was already founded in 2010, which focussed on experimenting with electric cars (EZ, 2011).

The KA included the integral knowledge and innovation agenda (IKIA), a cross-sectoral approach for research, development, pilots and demonstration, and implementation (EZK et al., 2019). The IKIA was invented to translate missions into multi-year mission-driven innovation programmes (MMIPs). Nonetheless, in his interview, Achterberg (21 January 2022) highlighted that compared to the EA, less pilots were announced for the mobility sector in the KA, because the focus was on actual reductions of carbon dioxide (CO_2) megatonnes (Mt). He said that an exception was the 'Pay According to Use' principle, which would be researched. Moreover, a few pilots were announced in the KA for the charging infrastructure (EZK et al., 2019). Relatively many experiments were mentioned for the logistics sector in the KA: medium zero-emission zones city distribution, zero-emission construction traffic and mobile equipment, CO_2-emission reduction of hinterland and continental transport, and for inland shipping. New innovations regarding 'Mobility as a Service' and autonomous train traffic were also proposed in the KA. De Groot (7 January 2022) said: "If you look at it simplistically, we are the ideal test country for electric driving, because we are small, everything is close together, we have a very good energy infrastructure, very granular."[11]

[11] Translated from Dutch: Als je heel simpel kijkt, wij zijn eigenlijk het ideale testland voor elektrisch rijden. Want we zijn een beetje klein, alles dicht op elkaar. We hebben een hele goeie energie-infrastructuur, heel fijnmazig (De Groot, 7 January 2022).

For the industry sector, the KA stipulated that the five regional clusters had to position themselves as testing grounds (EZK et al., 2019). Moreover, for a successful system transition, the development of new processes and technologies were essential. Hence, innovation, pilots, and demonstration projects were important. One of those projects is the inclusion of an ambitious innovation programme, which focussed on costs reduction of promising technologies. Another example was the hydrogen project, which included cohesive research, development, pilots, and demonstrations, for which an annual budget of €40 million was set aside. De Groot (7 January 2022), however, stated that the industry sector mostly had their own innovation policies and arrangements. This did not depend on the KA, as the industry would innovate integrally. He explained the following: "If you are going to change the production process in the industry, it starts in a laboratory, where it is all explored. When it works, you build a small-scale – Madurodam scale – reactor, and then you put everything in a trial factory"[12] (De Groot, 7 January 2022). Depending on the capacities of the organisation, it

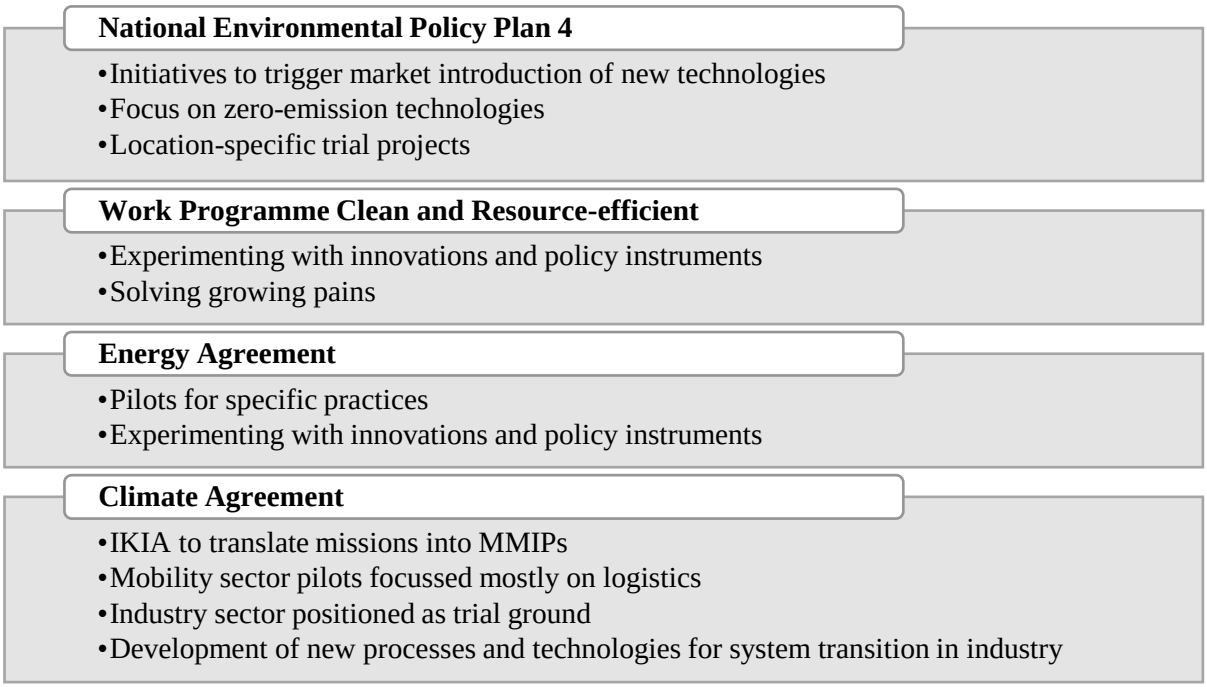

Figure 7.1. Experimenting in the policies from 2001 to 2019

[12] Translated from Dutch: "Als je een heel ander productieproces gaat doen in de industrie, dat begint in het laboratorium. Dan dokter je dat allemaal een beetje uit en dan denk je: dat werkt een beetje, dan bouw je een klein, heel kleinschalig Madurodam-schaal, bouw je een klein reactortje en dan doe je dat allemaal in je proeffabriekje" (De Groot, 7 January 2022).

would do this whole process themselves, or the organisation would outsource parts of this process. When comparing the KA to the EA, however, he continued: "The Energy Agreement consisted of elementary changes, and then there is no need for trial factories, et cetera. The Climate Agreement and Fit for 55[13], and eventually to zero, that makes that you really have to do something completely different"[14] (De Groot, 7 January 2022). In figure 7.1, on the previous page, the experimenting in the policies is summarised.

Different perspectives were provided by the interviews on whether there was enough focus on experimenting. De Krom (21 December 2021) said that in comparison to the targets, there was not enough attention for the execution, of which experimenting was an important part, in the policies. Instead, a lot of resources were allocated to unprofitable tops in the market. Slingerland (18 January 2022) and Pronk (20 January 2022), on the other hand, argued that experimenting might have been used as an excuse for not actually creating output. This was countered by Mijs (14 December 2021), who said there was a focus on short-term impacts on CO_2 emissions, because politicians were judged on the actual reductions. This was supported by Achterberg (21 January 2022) and Van der Tang (14 January 2022), who both highlighted the importance of outcomes, as research and experiments did not have any short-term impacts. Achterberg (21 January 2022) and Mijs (14 December 2021), however, emphasised that for the long term, there were a lot of unknowns, for which pilots could have the answers. This innovation focus, however, would be resource intensive, as Van der Wijst (23 December 2021) added that many pilots, he estimated 95 to 99 per cent, did not make the finish line. The WSZ highlighted that the balance between short and long term must be found, but this paragraph explains that this balance is a hard one to find (VROM et al., 2007).

[13] European Union binding target to reduce CO_2 emissions with 55 per cent by 2030 (European Council & Council of the European Union, 2021).
[14] Translated from Dutch: "Het Energieakkoord was elementaire verbeteringen en dan hoef je allemaal niet met proeffabrieken enzo te werken. Het Klimaatakkoord en Fit for 55 en uiteindelijk naar nul: dat zorgt ervoor dat je echt helemaal anders moet" (De Groot, 7 January 2022).

7.2. Upscaling

Upscaling, in this subchapter, includes all growth and rollout of the technologies and practices. In all policies, upscaling had a role. For instance, the first measure wave in the WSZ, 'Making metres' concentrated on upscaling of existing technologies, and the third wave 'Far-reaching innovation' centralised upscaling practices of the innovations piloted in the second wave (see previous chapter) (VROM et al., 2007). Upscaling requires removing financial, knowledge, and organisational barriers that complicate taking climate transition measures (EZK et al., 2019; SER, 2013a; VROM et al., 2001; 2007). Uncertainties and perceived risks were also mentioned as barriers in the EA (SER, 2013a). Reducing those barriers could be done by realising measures and instruments, or even removing measures that had proven to be barriers (VROM et al., 2007). To remove those barriers and enhance the upscaling of new technologies and practices, a set of approaches were introduced in the policies. The upscaling is discussed per approach. First, regulatory instruments are discussed, followed by market-based instruments. Next, capacity building practices of the policies are analysed. Lastly, the included influencing demand approaches are highlighted.

One of the upscaling approaches in the policies was the application of regulatory instruments, for example licensing requirements, injunctions and prohibitions (Pronk, 20 January 2022; VROM et al., 2001). In the NMP 4, these instruments were mostly meant for when other instruments were not sufficient. An example of where this kind of instrument was proposed, was the mandatory share of renewable energy in the NMP 4. However, no share was determined in the NMP 4, which they did do in the WSZ, namely 20 per cent (VROM et al., 2001; 2007). In the KA, regulatory instruments were also used (EZK et al., 2019). First, the Climate Act was an important regulatory instrument. Another regulation instrument was the sustainability framework for biomass that was disclosed in the KA. In the EA, a framework for approved measures was proposed to facilitate upscaling (SER, 2013a; Van der Tang, 14 January 2022).

In the policies, there were also more sector-specific regulations agreed upon. For instance, to enshrine the renewable energy in transport obligation in the Environmental Management Act, which was included in the KA (EZK et al., 2019). The same act was used to tighten standards for the industry sector in the WSZ, and in the EA, better enforcement of this act was proposed (SER, 2013a; VROM et al., 2007). The KA also included standards regarding electric transport, public charging points, and for organisations regarding commuting and business traffic (EZK et al., 2019). Standards were used for the mobility sector before 2019, for diesel engines in the NMP 4, for CO_2 emissions in the WSZ and the EA, and for sustainable biofuels in the WSZ (SER, 2013a; VROM et al., 2001; 2007). Another way of using regulatory instruments in the mobility section of the KA was to obligate zero-emission regions, which would increase the demand for zero-emission transport. In the industry section of the KA, regulation instruments were introduced to a limited extent. Only the standardisation, which made it compulsory to implement "reduction options with a payback period of five years or shorter", was clearly indicated (EZK et al., 2019, p. 93).

Another type of instrument commonly used were market-based instruments, which were the European Union (EU) Emission Trading System (ETS), subsidies, taxes and duties, and certificates. As mentioned before, since 2005, the EU ETS came into force, which was heavily relied upon for the industry sector in all policies after (EZK et al., 2019; SER, 2013a; VROM et al., 2007). Nonetheless, in the EA, the ambition to lobby for "a tightening of the reduction path of the ETS ceiling"[15] was proclaimed (SER, 2013a, p. 95). In the KA and WSZ, the focus of the industry sector was also on strengthening the EU ETS (EZK et al., 2019; VROM et al., 2007). Nonetheless, for the first time in the KA, an additional CO_2 tax for the industry sector was announced (EZK et al., 2019).

[15] Translated from Dutch: "een aanscherping van het reductiepad van het ETS-plafond" (SER, 2013a, p. 95).

The CO_2 tax highlighted another market-based instrument: taxes and duties. Taxes and duties were proposed in the NMP 4 as instruments to internalise environmental costs (VROM et al., 2001). One way to do this was 'greening' the tax system, which was discussed in both the WSZ and the NMP 4 (VROM et al., 2001; 2007). An example of this in the NMP 4 was the application of a regulating energy tax for major energy users (VROM et al., 2001). Here, the ambition was to create a variable tax scheme through a kilometre charge which could be differentiated to time, place, and environmental tax of the vehicle (VROM et al., 2001). In the WSZ, the ambitions to differentiate the mobility taxes, in multiple ways, was also proclaimed (VROM et al., 2007). Fiscal stimulation of zero-emission cars was also mentioned in the EA and KA (EZK et al., 2019; SER, 2013a).

A third market-based instrument that was also used in the policies was subsidies. The EIA was an important subsidy for the industry sector mentioned by all policies (EZK et al., 2019; SER, 2013a; VROM et al., 2001; 2007). Another popular subsidy scheme was the SDE, which came into force in 2008 (VROM et al., 2007). Both subsidy schemes were focussed on the large-scale market introduction of technologies. The SDE scheme was already broadened to SDE+ in 2011, and thus, for upscaling activities, the SDE+ was referred to in the EA (PBL, 2019; SER, 2013a). In the KA, a further broadened SDE++ scheme was announced to come into force in 2020 (EZK et al., 2019). Thus, the subsidy scheme remains important in the climate transition. In the KA, it was also mentioned that carbon capture and storage (CCS) could also be subsidised through SDE+, albeit limited. For the mobility sector, a temporal subsidy for purchasing an electric car was proposed in the KA, which was the first purchase subsidy in the mobility sector. Nevertheless, the premium for clean cars, as mentioned in the NMP 4, could also be classified as a subsidy (VROM et al., 2001). A last market-based instrument, used in the KA and the NMP 4, is the use of certificates (EZK et al., 2019; VROM et al., 2001).

Capacity building was also used to enhance upscaling. In the EA, the Guarantee Entrepreneurship Financing (Dutch: *Garantie-ondernemingsfinanciering*) was provided as an option for investments, thus, financial capacity was built (SER, 2013a). The conversion of the infrastructure fund into a mobility fund, an (inter)national co-financing of investments in the mobility sector, and an incentive programme to purchase zero-emission lorries and delivery vans were also ways to build financial capacity in the KA (EZK et al., 2019). Not only financial capacity was aimed to be built, some of the policies acknowledged the need to build human capital, and to respond to the changing labour requirements (EZK et al., 2019; SER, 2013a). Although closely related to experimenting (research, development, and demonstration), knowledge capacity by sharing knowledge among parties was also mentioned as a stimulation measure in the policies (EZK et al., 2019; SER, 2013a; VROM et al., 2001; 2007).

Especially in the mobility sections, influencing demand and changing behaviour was discussed as an important part of upscaling (EZK et al., 2019; SER, 2013a; VROM et al., 2001; 2007). For this, information provision was an important approach in the KA and the WSZ. In the KA and the EA, a central campaign about the possibilities, advantages, and experiences of electric cars was also announced (EZK et al., 2019; SER, 2013a). According to the NMP 4, changing to different modes of transport and mobility reduction could have reduced 10 Mt CO_2 emissions (VROM et al., 2001). This was supposed to be done by providing information and using campaigns to enhance public support. On the next page, table 7.1 summarises the upscaling measures and instruments in the policies.

Even though upscaling measures were discussed in all policies, interviewees argued that there were still too few upscaling practices in the policies and the execution (De Krom, 21 December 2021; Pronk, 20 January 2022; Van der Wijst, 23 December 2021). Van der Wijst (23 December 2021) explained this: “And the upscaling? Yes, that is indeed the big challenge in which you must deal with a lot of reluctance in the Netherlands, when it comes to industrial

Table 7.1. Upscaling measures and instrument in the National Environmental Policy Plan 4 (NMP 4), the Work Programme Clean and Resource-efficient (WSZ), the Energy Agreement (EA), and the Climate Agreement (KA)

	Regulatory instruments	**Market-based instruments**	**Capacity building**	**Influencing demand**
NMP 4	• licensing requirements; • injunctions and prohibitions; • standards.	• tradeable emissions; • EIA; • premium for clean cars; • 'greening' tax system; • regulating energy tax; • certificates.	• knowledge capacity.	• information provision; • campaigns.
WSZ	• injunctions and prohibitions; • standards.	• EU ETS; • EIA and SDE; • 'greening' tax system.	• knowledge capacity.	• information provision.
EA	• injunctions and prohibitions; • standards.	• EU ETS; • EIA and SDE+; • fiscal stimulation of zero-emission cars.	• knowledge capacity; • human capacity; • financial capacity.	• campaigns.
KA	• injunctions and prohibitions; • standards.	• EU ETS; • EIA, SDE+, SDE++; • subsidy in mobility; • fiscal stimulation of zero-emission cars; • CO_2 tax; • certificates.	• knowledge capacity; • human capacity; • financial capacity.	• information provision; • campaigns.

policy."[16] This was confirmed by De Groot (7 January 2022), who said that compared to the industry, upscaling practices played a bigger part in the mobility section of the KA. In 2016, the Netherlands Environmental Assessment Agency (Dutch: *Planbureau voor de Leefomgeving*; PBL) highlighted the noncommittal of the industry sector in the climate policies, and argued for more mandatory policy instruments (PBL, 2016). Moreover, it was pointed out that a large part of the industry emissions were subject to the EU ETS, which was not enough to accomplish the ambitions. In the KA, the most important addition was the CO_2 tax, besides the EIA and SDE+(+). Nonetheless, this subchapter showed that the earlier implemented measures affected future measures. In the case of industry, this was mostly negative, whereas it was positive for the mobility sector.

[16] Translated from Dutch: "En dat opschalen? Dat is inderdaad de grote uitdaging waarbij je in Nederland te maken hebt met heel veel terughoudendheid waar het gaat om industriebeleid" (Van der Wijst, 23 December 2021).

7.3. Monitoring and evaluating

Learning processes, such as monitoring and evaluating, are an inherent part of experimenting and upscaling. Therefore, this subchapter discusses the plans for the monitoring and evaluating approaches that were part of the policies. These practices are discussed per policy.

Learning processes were limitedly included in the NMP 4. However, monitoring and evaluating the progress agreed upon in covenants was highlighted (VROM et al., 2001). This was supposed to determine the function of covenants. Another monitoring system in the NMP 4 was set up to monitor several material flows, which would include the exhaustion rate of raw material and the CO_2 emissions. In 2007, learning processes had received a more prominent role. The WSZ included the following: "During the transition, but especially in the 'reference year' 2010, it will be tracked (monitoring) how the actual developments are progressing, how they relate to what has been recorded in [the WSZ], and the causes are analysed"[17] (VROM et al., 2007, p. 12). New instruments were supposed to be implemented when targets, or sub-targets, were not met (VROM et al., 2007). Moreover, the second wave of measures in the WSZ, focussing on experiments, included controlled development and learning paths. Additionally, there were subsidy requirements regarding learning effects, and sharing those learnings (Cramer, 10 December 2021; VROM et al., 2007). This did not only apply to private organisations, Cramer (10 December 2021) said that this also applied to municipalities, for whom learning communities were developed.

The EA highlighted that the effectiveness of the accord depended on guaranteeing the agreements made, and proper monitoring of its progress, including the incorporation of the learning effects (SER, 2013a). For that purpose, a yearly progress report was brought out by an assurance committee, and the yearly National Energy Exploration (Dutch: *Nationale*

[17] Translated from Dutch: "Tijdens de rit, maar met name in het 'peiljaar' 2010 wordt bijgehouden (monitoring) hoe de feitelijke ontwikkelingen lopen, hoe deze zich verhouden tot wat in Schoon en Zuinig is vastgelegd, en wordt geanalyseerd wat de oorzaken zijn" (VROM et al., 2007, p. 12).

Energieverkenning; NEV) was created (Van der Tang, 14 January 2022; Van der Wijst, 23 December 2021). Similar to the WSZ, in case the reductions were not on track to reach the goals, additional measures were supposed to be taken, for which the calibration moments were at the end of 2016 and 2018 (SER, 2013a). In these calibration moments, the effectiveness and efficiency of the instruments, the progress regarding energy saving, the further development of expenses as a result of the SDE+ resources, and the revitalisation of ETS would be evaluated. This was in line with what Werther (19 January 2022) said about how it is common practice to evaluate policy every three to four years. Moreover, also comparable to the WSZ, there were subsidy requirements regarding the learning curve (SER, 2013a). Furthermore, it was the ambition to effectively use evaluation instruments for EU ETS organisations by evaluating every four years, and resulting in sanctions when agreements were not met. The framework for approved measures was also updated every four years, and to be able to hold each other accountable on this, a duty to provide information was brought to life (Van der Tang, 14 January 2022). In the mobility sector, the fiscal pilots that were proposed would be evaluated (SER, 2013a). Werther (19 January 2022) explained that the evaluation of the fiscal pilots taught them how effective some schemes were, but also that electric second-hand cars were often transferred outside the Netherlands. Lastly, a transfer document was sent to the minister of Economic Affairs and Climate Policy after the KA was established (Nijpels, 2019). Herein, four lessons were shared on integration, the multi-stakeholder approach, anticipation of setbacks, and infrastructure.

In the KA, it was stipulated that an annual evaluation report would be published, the successor of the NEV, the Climate and Energy Exploration (Dutch: *Klimaat- en Energieverkenning*; KEV) (EZK et al., 2019). This was meant to report the expected CO_2 emissions in 2030 based on the measures taken, and to be taken. Recalibration of the remaining challenges would happen every five years, which could also result in additional measures.

Moreover, a Climate Plan was brought out, and would at least be assessed every five years. Also, an annual climate memorandum was brought to life in the KA. This included the appraisal of the government regarding targets, together with extra policy intentions. Additionally, to monitor at an individual measure level and to report intermediate results, a progress monitor was proposed. The monitor provided the opportunity to adjust when needed.

In the mobility section of the KA, adaptiveness was an inherent part of a goal-oriented transition. For example, the co-financing instruments were planned to be monitored every year to avoid overstimulation. Furthermore, for the charging infrastructure, a monitoring programme would be set up. All experiments and pilots were outlined to be monitored and evaluated, as they were developed to produce conclusions (Achterberg, 21 January 2022). Mijs (14 December 2021), however, stated that the monitoring and development of experiments and pilots were often neglected. In the industry sector, learning centres were developed between the regional levels (EZK et al., 2019). Nonetheless, learning among organisations depended, according to De Groot (7 January 2022), on the competitiveness of the technologies. Some organisations wanted to be the first with certain products, whereas for other technologies, e.g. electricity infrastructure, the public interest was more important. Although the monitoring and evaluating did also happen per sector table, Mijs (14 December 2021) said: "...but not as intensively as it happens on the whole, so you then have the climate policy monitor. That is also fed with information from those tables, and with more sectoral monitoring specialists."[18]

[18] Translated from Dutch: "Maar niet zo intensief als dat op het geheel gebeurt, dus je hebt dan de monitor klimaatbeleid. Dat wordt ook gevoed met informatie uit die tafels en met meer sectorale monitoring specialisten" (Mijs, 14 December 2021).

7.4. Linking practice and theory

This subchapter connects the practices of experimenting, upscaling, and learning, as analysed above, to transition management (TM), strategic niche management (SNM), and polycentric governance (PG). First, the experimenting practical approaches are shortly summarised, and followed by a section on how these approaches could be understood through the three theories. Second, the upscaling practical approaches are summarised, and linked to the theories. Third, a recap of the monitoring and evaluating practical approaches is provided with a section on the links with the theories. Finally, this subchapter finishes with concluding remarks on the integration of the practical approaches in the Dutch policies.

The emphasis on experimenting was barely present in the NMP 4, as it mostly focussed on the outcomes of the experiments, only zero-emission technologies experiments were mentioned. In 2007, the attention on experimenting was more extensive, as this was one of the 'waves' on which the whole policy was built. Moreover, the WSZ also stipulated more clearly how these experiments would be stimulated, which was mostly through subsidies. Nonetheless, the total amount budgeted for the research, development, pilot, and demonstrations was €233 million less than what was promised in the NMP 4. In the EA, experimenting was only mentioned for specific practices. How these experiments were stimulated was not specified, nor was there a budget allocated to experimenting. Six years later, a whole programme focussed on experimenting was developed in the KA. Thus, experimenting was emphasised more than in the EA. Next to the IKIA, there were also specific pilots and experiments announced for specific practices. In the KA, the main instrument to stimulate pilots was also subsidies, but no total budgets for experimenting were mentioned.

The subsidies focussed on one technology or practice, such as the hydrogen project in the KA, could be classified as a niche experiment (EZK et al., 2019; Petrovics, 14 January 2022; Sengers et al., 2019). Niche experiments, as described in SNM, were often used in the policies. The NMP 4 specifically mentioned market introduction, which were meant to

eventually change the regime (Sengers et al., 2019; VROM et al., 2001). Where Kemp et al. (1998) highlighted the challenges in the selection procedure, the NMP 4 focussed on zero-emission technologies. Thus, no technology selection was made beforehand. The trial projects, however, were location specific, and thus, could be categorised as grassroot experiments, which is best understood through PG (Ostrom, 2001; Sengers et al., 2019). In the WSZ and the EA, the pilots were focussed on the development of innovations, which could be classified as niche experiments (Sengers et al., 2019; SER, 2013a; VROM et al., 2007). Since matching the most appropriate government level to the requirements of a pilot could be in line with the PG theory, another way to understand the experimenting in the WSZ and the EA is through PG, as the municipalities were responsible for pilots within their cities (Cramer, 10 December 2021; Petrovics, 14 January 2022; SER, 2013a; VROM et al., 2007; Werther, 19 January 2022). In the WSZ, it was also explicitly stated that the pilots were there to solve growing pains, which was also stated by Loorbach et al. (2017) as a purpose of experiments in TM. Besides SNM, to understand the experimenting in the KA, the TM and PG theories also provide different insights. The industry sector innovating by themselves, and not with pilots announced in the KA, is best understood through PG, and could be classified as grassroots experiments (De Groot, 7 January 2022; Ostrom, 2001; Sengers et al., 2019). The KA, however, was the first policy to use a cross-sectoral approach, aiming for societal change (EZK et al., 2019; Loorbach, 2010; Sengers et al., 2019). The IKIA aimed to link the experiments to the visions that were developed, which could be linked to TM, because the experiments aimed to expose the role requirements for the transition (Loorbach et al., 2017).

If the number of measures and instruments introduced in a policy would be any kind of indication for the emphasis on upscaling, the KA ranks first, the NMP 4 would be second, the EA third, and the WSZ fourth. Nevertheless, the WSZ cannot be completely discredited, as it did focus two of its ‘waves’ on upscaling practices (VROM et al., 2007). It lacks, however, in

specifying how the upscaling would be stimulated. The EA was slightly more explicit on this, but the approach was similar to that of the WSZ (SER, 2013a). The largest difference was in the spectrum of capacity building, which also included human and financial capacity in the EA. Although the NMP 4 excluded these two kinds of capacity building, there were more regulatory, and market-based instruments included in the policy (VROM et al., 2001). In the KA, a wide range of market-based instruments were included, as well as capacity building (EZK et al., 2019). The focus in the KA was more on upscaling, which was caused by the focus on short-term impacts, according to Mijs (14 December 2021), Achterberg (21 January 2022), and Van der Tang (14 January 2022).

In most policies, the focus of the upscaling practices were on vertical diffusion, which is described in PG, SNM, and TM (Kemp et al., 1998; Rotmans et al., 2001; Tosun, 2018). Within SNM, upscaling is described as a protective process, for which market-based instruments are often used (Kemp et al., 1998). However, only the KA included a technology-specific instrument for electric cars (EZK et al., 2019). Capacity building, e.g. knowledge, human, and financial, is another form of stimulating the upscaling processes, as analysed in PG, which was used in all policies (Biedenkopf & Wettestad, 2018). The EA and KA did include a broader sense of capacity building than the NMP 4 and WSZ, which only included knowledge capacity (EZK et al., 2019; SER, 2013a; VROM et al., 2001; 2007). Moreover, PG describes normalisation, i.e. shifting expectations of appropriate behaviour, which could be linked to influencing demand (Bernstein & Hoffmann, 2018). Influencing demand, or normalisation, was most broadly used in the NMP 4 and the KA, whereas the WSZ only included information provision, and the EA only included campaigns (EZK et al., 2019; SER, 2013a; VROM et al., 2001; 2007). The WSZ did, however, use horizontal diffusion through its programme focussed on municipalities, which is understood best through PG, since a

polycentric system accelerates the replication between states, regions, and cities (Cramer, 10 December 2021; Tosun, 2018; VROM et al., 2007).

Over the years, the emphasis on monitoring and evaluating became heavier. The NMP 4 included limited amount of monitoring, and no evaluating at all (VROM et al., 2001). In the WSZ, this approach already changed (VROM et al., 2007). A calibration moment was introduced, which included both monitoring and evaluating. Furthermore, there were some subsidy requirements that contained learning paths (Cramer, 10 December 2021; VROM et al., 2007). The EA included the same measures as the WSZ, including two calibration moments (SER, 2013a). Furthermore, the EA was supposedly guaranteed through an assurance committee, and an annual progress report. Thus, monitoring and evaluating had a more prominent role in the EA. In the KA, calibration moments were also used, as well as an annual evaluation report (EZK et al., 2019). Additionally, the KA introduced two new approaches to monitoring and evaluating, as it presented a five yearly Climate Plan, an annual climate memorandum, and a progress monitor.

Monitoring the transition process, as described in TM, was included in all the policies (Loorbach, 2010; Rotmans et al., 2001). However, the stakeholders did not participate or interact with each other in all learning processes (Loorbach et al., 2015; Meadowcroft, 2009). Stakeholder interaction was included through the learning communities, which were based on shared learning, for municipalities in the WSZ (Cramer, 10 December 2021). This is best understood through PG, as the communities involved collective learning (Jordan et al., 2018). In the EA and KA, learning depended on the project, whether stakeholders were involved, and whether there was interaction between the stakeholders (De Groot, 7 January 2022). All three theories describe the interaction among stakeholders as fundamental for learning processes, and to share information, experience, and knowledge (Bernstein & Hoffmann, 2018; Caniëls & Romijn, 2008; Loorbach et al., 2015; Meadowcroft, 2009; Rip & Kemp, 1998). Thus, this

provides the insight that, in the EA and KA, the successful learning depended on the situation, and was not a given through the policy.

The analysis of this chapter provided the indication that experimenting, upscaling, monitoring, and evaluating were all integrated in the policies from 2001 to 2019. Nevertheless, in some policies, the emphasis was on experimenting, and in the other, it was more on upscaling, or monitoring and evaluating. Generally, the prominence of all practical approaches have grown over time. The next chapter reflects on these findings, and the findings of the previous chapters. Moreover, it reflects on the theories and methodology used.

8. Discussion

This discussion chapter reflects on the findings presented in the previous chapter, the theory in relation to the findings, and the methodology. This reflection is done thematically. First, the evolution in climate transition governance approaches is reflected upon. Here, it is highlighted how international trends have impacted the evolution of the Dutch approaches, or how it differed. Afterwards, a reflection on the development in the different sectors is provided, where it is argued how and why there were differences between the sectors. Furthermore, this chapter reflects on the theories versus the reality. This subchapter shows that the Dutch climate transition policies included increasingly complex approaches.

8.1. Evolution in climate transition policy

This subchapter reflects on the findings of this thesis and relates it to other evolutions found in climate transition policies. The other evolutions are mostly based on international evolutions found in the European Union (EU), and on a global level. First, the evolution of targets is discussed. Then, the evolution of multi-actor networks and instruments is discussed. This is followed by a discussion on the evolution of experimenting and monitoring. Finally, a short reflection on the methodology is provided.

The long-term visions and targets, as discussed in chapter 6, showed a temperature target, which was influenced by international trends. The two degrees Celsius (ºC) target was mentioned for the first time by Manabe and Wetherald (1967, as cited in Morseletto et al., 2017). However, after the Kyoto Protocol, it faded from the mainstream international political debate, and did not come back strongly until 2005 (Morseletto et al., 2017). This seems to be contradictory to what has been found in Dutch policies, where the 2 ºC target was part of the vision in 2001, but not in 2007 (VROM et al., 2001; 2007). By 2013, the target was internationally stable and solid, but lacked a mobilising role, which could explain the absence of this target in the Energy Agreement (EA) (Morseletto et al., 2017; SER, 2013a). The Climate Agreement (KA) included the 2 ºC target and referred to the Paris Agreement (EZK et al.,

2019). According to Morselleto et al. (2017), the Paris Agreement did stipulate a mobilising vision and robust global emission goals. Thus, the temperature target in the Dutch climate policies were, in general, influenced by global climate policy trends.

The temperature target was not the only type of target used in the policies, there were also relative greenhouse gas (GHG) reductions. Technological promises, modelling, and politics and policy have been co-evolutionary (McLaren and Markusson, 2020). Therefore, targets were influenced by technological promises, and vice versa. McLaren and Markusson (2020) argued that this also resulted in target formulation of relative GHG reductions, which were part of all Dutch policies analysed. International climate governance has influenced this process. The Kyoto Protocol was leading for the targets set in the National Environmental Policy Plan 4 (NMP 4) (VROM et al., 2001). The targets in the EA were in line with the EU targets set in 2009 (Oberthür & Dupont, 2021; SER, 2013a). For the KA, the targets were directly derived from the Paris Agreement (EZK et al., 2019). Only for the Work Programme Clean and Resource-efficient (WSZ), Boot (2020) highlighted that the policy was an ambitious target, which was not based on international targets. Nonetheless, in general, international targets were leading for the targets set in the Dutch policies.

National developments and societal changes also influenced the ambitions. Both Pronk (20 January 2022) and Cramer (10 December 2021) highlighted that little was done with the policies they were responsible for, the NMP 4 and WSZ, respectively, after they left the office. Bekkers et al. (2018) analysed the period between 1989 and 2011, and confirmed that the importance of environmental issues did decline on the public agenda in 2003, 2005, and 2006. The documentary of Al Gore and the formation of a centre-left cabinet in 2006, of which Cramer was part, were triggers for a new climate policy, the WSZ. 2010 kicked off with several errors of the 2007 IPCC report exposed, and in March the fall of the Cabinet Balkenende IV. This paved the way for a centre-right cabinet, and resulted in a less ambitious climate agenda.

Moreover, the fact that the Ministry of Economic Affairs was closely aligned with the fossil fuel companies whose influence was clearly visible in the EA (Liefferink et al., 2017). These national developments and societal changes provide further explanation on why the long-term visions developed in the way they did, and seemed inconsistent with previous policies.

Regarding multi-actor networks, the Dutch policies were also influenced by international developments in combination with the Dutch policy-making culture. The focus on network-based tools was an important policy trend from the 1990s (Howlett, 2014). This was supported by Ansell and Gash (2008), who highlighted that 'collaborative governance'[19] was an upcoming trend since the 1990s. This also had effects on the upcoming climate policies, and could explain the increase of stakeholder inclusion. This, and the fact that in the Netherlands, a policy-making culture of consultation, consensus and compromise prevailed, have impacted the way climate policy-making developed (Mickwitz et al., 2009). Indeed, the analysis on the multi-actor networks in the policies showed an increase in the number of actors involved.

In the Dutch climate policies, there was also a change noticeable in the roles of the actors. Internationally, roles of different actors have also developed. According to Bäckstrand et al. (2017), the non-state and state actors intensified their interplay after the Conference of the Parties (COP) 15 in Copenhagen in 2009 (Bäckstrand et al., 2017). This intensification was also apparent in the establishment of the EA, where non-state actors were directly involved and responsible for the policy (SER, 2013a). The following reasons for this approach were highlighted by the Social and Economic Council (SER): stakeholder involvement, EU commitments, and the inconsistency in past policy making (SER, 2013b). Moreover, most of the interviewees, when asked about the way the policies were established, mentioned that the

[19] Ansell and Gash (2008, p. 544) define collaborative governance as: "A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets."

broad societal support was a key argument for increasingly including more actors in the decision-making process of the policies (De Krom, 21 December 2021; Van der Tang, 14 January 2022; Van der Wijst, 23 December 2021; Werther, 19 January 2022).

The role change in the establishment of the KA could be found in the targets of the Paris Agreement, as Van Vuuren et al. (2016) highlighted that the existing policy would not meet the targets of the Paris Agreement, and that the Dutch climate policy needed tightening on the short term. Moreover, the Urgenda Climate Case, the first in its kind, also required the Dutch government to take more effective action in reducing GHG emissions (De Graaf & Jans, 2015; Urgenda, n.d.). Lastly, for collaborative governance, leadership is a crucial ingredient, according to Ansell and Gash (2008). However, Liefferink et al. (2017, p. 138) highlighted that the EA was "void of leadership". Wellstead and Biesbroek's (2022) developed a framework on the interplay between stakeholder engagement and the degree of bureaucratic autonomy. They stated that the state-society relation should be detrimental for how stakeholders should be engaged. Based on the inconsistent multi-network approaches throughout the years, the establishment of the Dutch policies has not been in its 'sweet spot'.

For the upscaling practical approaches, the policies relied upon a range of tools. The trends found in the Dutch policies can also be found in the international field. Meckling and Allen (2020) found that since the 1990s, economic growth has been the focus of climate policy. Howlett (2014) found that in the 1990s, there was also an upcoming trend of focussing on market-based tools. Nevertheless, Meckling and Allen (2020) also highlighted that the state has increasingly used its intervening role to drive the transition, instead of solely basing the climate policies on market-based instruments. This thesis showed that the Dutch climate policies did show a relatively high confidence in market-based instruments at the beginning of the century, which developed into a broader instrument package over the years. Thus, in this aspect, the findings of this study are in line with the literature. Busch et al. (2005) showed a

decline in regulatory instruments in environmental policy from the early 1990s, but that in 2001, the decline was still ongoing. However, regulatory instruments were relatively often mentioned in the NMP 4. An important factor here was the fact that the responsible minister had a personal preference for law and regulation (Pronk, 20 January 2022). Thus, this showed how international developments of instruments were also apparent in the Dutch policies.

The extent to which experimenting was included in the policies differed. These developments can also be found internationally. According to Åhman et al. (2017), the introduction of experimenting was a result of the UNFCCC and the Kyoto Protocol. Schmidt and Fleig (2018) have found that research and development have indeed been mentioned in an increasing amount of climate policies worldwide. In 2001, however, this number of countries was not even 20. Hence, spending a considerable amount of money, as was announced in the NMP 4, was progressive (VROM et al., 2001). Due to binding targets set for 2008 to 2012, and the long-term targets of the Protocol, research was emphasised in numerous national climate policies (Åhman et al., 2017). This could explain the increase in the emphasis on experiments between the NMP 4 and the WSZ.

Regarding experimenting, this thesis provides evidence that Dutch policies showed different levels of aiming to include municipalities and provinces throughout the past. An ongoing trend since the 1990s, in which cities showed high climate action ambitions through networked urban experimenting, could explain this development (Bulkeley & Castán Broto, 2013; Smeds & Acuto, 2018). Especially, in the WSZ, the ambition to create learning communities among municipalities was important. However, the extent of the regional governments' role in experimenting was not always clear in the other policies. According to Smeds and Acuto (2018), most of the upscaling practices among municipalities were limited to diffusion, instead of the upscaling of experiments. An indication of this in the Dutch policies could be the frontrunner focus, but no real evidence of this has been found. Bulkeley and Castán

Broto (2013) found that experiments are intervened by a multitude of actors, for whom experiments contest, signify, and strengthen authority. The international developments highlight a similar increasing focus on experimenting. However, the trend of an increasing role of cities in experimenting, although present, is not clearly increasing in the Dutch policies.

Monitoring and evaluating practices have become increasingly specific in the Dutch policies over time. International requirements have played an important role in this. A monitoring mechanism was created in an EU setting in 1993 "in order to compile annual data on GHG emissions" (Schoenefeld et al., 2018, p. 119), and in 2004, obligations to provide quantitative data on the effect of measures and policies on emissions were brought to life (Hildén et al., 2014). Although the European Commission and Parliament have aimed for hardening monitoring practices since the mid-2000s, e.g. publicising data, indirect sanctioning mechanisms, the Member States were opposed to this, in general. The Dutch policies did all include monitoring practices, but became more specific on this over time. Especially, the KA had a clear monitoring plan included, which would also be in line with the Paris Agreement, in which the Enhanced Transparency Framework was established (UNFCCC, n.d.). Herein, the countries were required to report on their GHG emissions (Schoenefeld et al., 2018).

This reflection on the findings has laid out some of the shortcomings of the methodology. Many of the climate transition governance approaches had integration trends since the 1990s. Therefore, analysing the period between 2001 and 2019 did not provide information on the initiation, and how the policies developed from zero to where they are now. Nonetheless, the focus change between the NMP 4 and the WSZ showed the development of going from general environmental policies to climate policies. Therefore, the research still provided insight into the initiation of climate policy, the focus of this thesis. Another shortcoming of this research was to only observe the four main policies published over a time span of 18 years, and not the developments in between those policies, as it did not provide

information on why certain approaches were integrated in the policies. Neither were many of the interviewees able to explain what triggered certain decision-making. Some of the interviewees, however, were able to highlight some of the triggers. Moreover, this subchapter provided more insight into some of the triggers. Furthermore, in this subchapter, it was made clear that including multi-actor networks was an upcoming practice in the 1990s, and the 2000s. Therefore, little information was available on who worked on the NMP 4 and the WSZ, as the policies mostly mentioned the different governments involved. Nevertheless, the two participants interviewed for these policies, the responsible ministers, provided high quality insights. Hence, the findings of this thesis are still valid to provide the answer of its research question, as the interviewees and the contextual analysis of the policies did provide insights into how the approaches used in the policies were integrated.

8.2. Sectoral differences

Throughout this thesis, approach examples of the industry and mobility sector were provided. This subchapter discusses the sectoral differences between these sectors. It uses the results to explain the differences in the policy development. Lastly, a short methodological reflection on using these two sectors is provided.

The biggest differences between the industry and the mobility sector were the ambitions since the beginning of the period observed. First, in the NMP 4, the industry was not even taken into account (VROM et al., 2001). After which, the objectives set for the industry in 2007 were combined with the electricity sector (VROM et al., 2007). Furthermore, the quantifiable long-term objectives set since 2013 were always on a shorter term for the industry than for the mobility sector (EZK et al., 2019; SER, 2013a). Where the mobility industry already focussed on large carbon dioxide (CO_2) reductions (17 per cent in 2035, and 60 per cent in 2050), the industry sector focussed on relatively small reductions through energy saving (De Groot, 7 January 2022; SER, 2013a). Therefore, pilots were not necessary for the industry sector, while

they were necessary for the mobility sector to reach their objectives. However, important to notice, in figure 6.1, a long-term decrease in the annual CO_2 emissions of the industry sector was already put in motion (from 86.4 Mt in 1990 to 58.8 Mt in 2010) (Rijksoverheid, 2021). The mobility sector, on the other hand, increased its emissions until 2005, meaning that the downwards sloping trend had barely established itself. Another reason for the industry staying relatively long out of harm's way was the reliance on the EU Emission Trading System (ETS) (PBL, 2016).

Although these trends in CO_2 emissions can provide an explanation for the difference in approaches, the past approaches still had effects on the policy approaches in 2019. While the mobility sector was able to shift its main focus towards the upscaling of its experiments, the industry sector had to position its five industrial clusters as a testing ground (EZK et al., 2019; De Groot, 7 January 2022). The question is whether the competitiveness between the experimenting organisations will enhance or slow down the process of transferring to upscaling practices.

In chapter 1 and 2, it was explained that the mobility and industry sector were selected to explain the development in the climate policy: the size of their task and their current phase. Nevertheless, excluding the energy, built environment, and the agriculture and land use sectors did have its effects. First of all, the industry sector was either not included, or combined with the energy sector in all policies except the KA. Hence, in some cases, it is likely that a small part of the approaches of the energy sector have been considered, or that some approaches of the industry sector have been overlooked. Moreover, as explained above, the approaches for the industry and mobility sector differed greatly. This could indicate vastly different, or overlapping, approaches in the other three sectors, and thus, research into these sectors could have provided interesting insights.

8.3. Reality versus theory

This subchapter reflects on the theories used in this thesis in relation to what has been observed in the existing literature. Here, a reflective analysis on the theory versus the reality is provided. In this subchapter, it is argued that the theory and reality are co-evolutionary. However, first, a reflection on the methodology is provided. Second, the existing literature is used to reflect on transition management (TM) in policies. Followed by an analysis on strategic niche management (SNM), and then, polycentric governance (PG). Lastly, these analyses are used to reflect on what has been found in the results, when linking the theories back to the practices.

The three theories that were used in this thesis were helpful in providing a framework for the analysis of the policies. However, the practical implications are less clear in the theories, and therefore, the climate transition approaches used in the policies that would fit the theories were not straightforward, but open to interpretation. Nevertheless, it is likely that all policy theories are open to interpretation, as not one specific approach was able to fit in all situations.

According to Kuss and Nicholas (2022), TM was meant to complement existing transition policies by introducing new activities of governance. Kern and Howlett (2009), however, found that the TM reforms of energy policy complicated the policy mix. They continued by stating that the inconsistency and incoherence of the policies would be likely to result unanticipated aims. Voß et al. (2009) highlighted that TM had the ability to provide alternatives to the market-liberalism that was short-term oriented. Moreover, they argued that model designs and conceptual frameworks provide guidance, and thus, "must co-evolve with implementation from concrete application contexts" (Voß et al., 2009, p. 296).

Where TM was meant to complement policies, SNM was meant to be additional according to Elzen et al. (2003). Moreover, it was stated that SNM should be targeted towards specific problems, and linked towards the application of new technologies. Lovell (2007) found that SNM should be broadened, as her findings suggested that niche-based policies were often implemented to steer clear from sector-wide changes. Moreover, in a research into the

suitability of SNM in emerging economies, Lovell (2007) argued that the SNM theory should be enriched with contributions of sustainable development theories, before it could be implemented in emerging economies. The notion that SNM would need to become more sensitive to context was supported by Mirzania et al. (2020).

In contrast to TM and SNM, PG was not meant as a policy tool (SNM), or a governance approach (TM) (Loorbach & Van Raak, 2006). Instead, it was proposed as a theory through which it could be explained how polycentric systems were emerging in global climate policy (Ostrom, 2010). Although most of the literature supports the perspective that a polycentric system facilitates CO_2 reductions, the findings of Fisher and Leifeld (2019) provide the insight that polycentricity could also be applied to prevent the implementation of measures. Nonetheless, it was argued that polycentric governance is a response to the lack of climate action (Peters et al., 2017).

The paragraphs on TM, SNM and PG provided insight into how the existing literature would argue that the theories would not be a suitable lens for increasing understanding of climate policy. Both the short analysis on SNM and TM in relation to policies in the existing literature showed that theories can be co-evolutionary with the reality. The analysis on PG, a relatively new theory in the field of climate governance, showed how some context produce other outcomes than initially expected, and seen in other situations.

When analysing through which theory the Dutch climate policies could be best understood, TM had a unique position. Not only was TM developed in the preparation phase of the NMP 4, it was also included directly in the policy (Rotmans et al., 2000; VROM et al., 2001). Additionally, Cramer (10 December 2021) said that TM was also a leading perspective for the WSZ. Besides these clear links between the theory and the policies, it is still relevant to reflect on how the theories relate to reality, as not all aspects of the framework were implemented in the NMP 4, and other aspects could be understood through the other policies.

Table 8.1. Transition management (TM), strategic niche management (SNM), and polycentric governance (PG) characteristics found in the National Environmental Policy Plan 4 (NMP 4), the Work Programme Clean and Resource-efficient (WSZ), the Energy Agreement (EA), and the Climate Agreement (KA)

	Multi-actor networks			***Long-term visions***			***Practical approaches***		
	TM	**SNM**	**PG**	**TM**	**SNM**	**PG**	**TM**	**SNM**	**PG**
NMP 4	1		1	2	1	1		1	3
WSZ	1		3	1		1	2		4
EA	2	1	2	2	2		1	1	4
KA		3	2	2	2	1	1	2	6

To analyse which of the policies were in line with the theories, table 8.1 was developed on the basis of the linking practice and theory sections of the empirical chapters. The table provides a clear overview to which extent the theories were apparent in the different policies. The darker the colour, the more characteristics were found.

Table 8.1 shows that, over the years, the mix of the approaches belonging to the three theories that can be recognised in the policies, became increasingly complex. First of all, the theories did not fully prescribe the climate transition governance approaches. Hence, they were complementary and additional to existing policies, e.g. protective niches or long-term visions, or a movement against the system, e.g. the more ambitious targets than the international targets in 2007. Additionally, the co-evolutionary aspect of theories and reality plays an important role. Not only were the approaches interlinked, but they were also subject to external factors. Thus, through co-evolvement and a blend of approaches, a complex policy mix was created.

Loorbach and Van Raak (2006) argued that the SNM and TM could be complementary to each other. Petrovics (14 January 2022) added in his interview that PG thinking is better suited to look at actor interactions, and agency, whereas sociotechnical theory is focussed on big structural changes. Thus, in that sense, the PG theory could also be complementary to SNM and TM. Using PG to analyse the actor interactions provides insights to TM, as the multi-actor network is responsible for the development of long-term visions. These actor interactions and development of long-term visions provide information for the niche development, and protection thereof, as best understood through SNM.

9. Conclusion and recommendations

This chapter aims to answer the research question proposed at the beginning of this thesis. Next, recommendations for future research are made. Lastly, this chapter shows how the knowledge contributes to the existing literature on this topic.

The purpose of this thesis was to gain insight into the integration of climate transition governance approaches in order to explain the development of Dutch climate policy. To reach this, the following research question was aimed to be answered: 'How have the climate transition governance approaches been integrated in the Dutch climate transition policies from 2001 to 2019?'

Based on the results retrieved from the contextual analysis of the policies and the semi-structured in-depth interviews, it can be concluded that the inconsistent integration of the approaches resulted in inconclusive policies, such as the differences between the sectors and the changing targets over the various policies. However, despite an inconsistent integration, the approaches, i.e. multi-actor networks, long-term visions, and the practical approaches of experimenting, upscaling, and monitoring and evaluating, were clearly interlinked, influenced each other, and were responsible for the way the approaches developed. These climate transition governance approaches depended highly on each other. More (or less) ambitious long-term visions provided a pathway towards more (or less) experimenting and upscaling practices. Monitoring and evaluating practices were based on the experimenting and upscaling, depended on the multi-actor networks, and influenced the long-term visions. Simultaneously, the design of multi-actor networks, and how they were collaborating, affected the short- and long-term visions. Past decision-making, the political landscape, international developments, and societal pressures have also played a role in the inconsistent integration of the approaches, and therefore, the inconclusive policies.

Further research is necessary to understand the extent to which the climate transition governance approaches affect each other. Moreover, it is likely that the connections between the approaches differ in other settings and countries. Thus, a similar research in another country, or for different sectors, would add value to the existing literature. Another recommendation for future research is the role of external factors on each of the approaches discussed in this thesis.

Using strategic niche management (SNM), transition management (TM) and polycentric governance (PG), simultaneously, to analyse the climate transition governance approaches is unconventional. Nevertheless, this research showed that it is useful to understand climate transition policies through all three theories, as the theories were able to provide a more complete framework. Lastly, in the problem statement, it was mentioned that the carbon dioxide (CO_2) reductions have stagnated over the last two decades. The results of this thesis have demonstrated how interlinked all the climate transition approaches have been, but also how inconsistent integration of these approaches resulted in inconclusive policies between 2001 and 2019, which is a likely cause of the stagnation in CO_2 reductions in the Netherlands.

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Appendix 1a. General interview questions (English)

Dutch government officials/other included actors

1. What was your function/role in the policy development?
2. On what basis were the parties invited/chosen to join the sector tables?
3. Which changes did you notice over the years in the type of parties that were invited?
4. How were the different levels of government involved in the policy?
5. What was the function of the long-term visions that were part of the policy?
6. How has the function of long-term visions developed over the years?
7. How has the role of experiments and pilots changed over the years?
8. What place did scaling up of the experiments and pilots have in the policy?
9. Which learning processes (monitoring, evaluating, etc.) were important in the policy?
10. What were important motives for organising the policy in this way, and not in the way of the previous policy?
11. Were there any encounters in creating and implementing this policy that were learned from, and changed in the next policy?

Researchers

1. How familiar are you with the Dutch climate policy? – Depending on this answer, the questions were on the policies, or on the ideal form in the theory.
2. In case of collaboration between the government and stakeholders, how would this ideally be arranged according to transition management (TM)/polycentric governance (PG)/strategic niche management (SNM)?
    a. What expression was given to TM/PG/SNM when inviting/choosing the parties to join the sector tables?
3. What changes do you see over the years in the type of parties that were invited?
4. In TM/PG/SNM, how would the different government levels be involved in the policy?

    a. How were the different levels of government involved in the policy, and do you see any specific application of TM/PG/SNM?
5. What form would long-term visions be given in policy, in TM/PG/SNM?
    a. How were the long-term visions as in TM/SNM/PG applied in the policies, and how has this been developed over the years?
6. What role would experiments and pilots have, in TM/PG/SNM?
    a. How did the role of experiments and pilots change over the years, and was the role of TM/PG/SNM visible in this?
7. How would upscaling practices be shaped in policies, according to TM/PG/SNM?
    a. In what way could TM/PG/SNM be recognised in the upscaling of experiments and pilots in the policy?
8. Which learning processes (monitoring, evaluating, etc.), which were also part of TM/PG/SNM, would also be important in policies?
9. Were the policy changes over the years due to a different emphasis on TM/PG/SNM? Or were there other factors?

Appendix 1b. Algemene interviewvragen (Dutch)

Nederlandse ambtenaren/andere betrokkenen

1. Wat was uw functie/rol in het ontwikkelen van het beleid?
2. Op basis waarvan worden de partijen uitgenodigd/gekozen om deel te nemen aan de sectortafels?
3. Welke veranderingen ziet u over de jaren heen in de soort partijen die worden uitgenodigd?
4. Hoe worden de verschillende overheidsniveaus betrokken in het beleid?
5. Wat is de functie van de lange termijn visies die onderdeel uitmaken van het beleid?
6. Hoe is de functie van de lange termijn visies ontwikkeld door de jaren heen?
7. Hoe is de rol van experimenten en pilots veranderd door de jaren heen?
8. Wat voor ruimte neemt het opschalen van de experimenten en pilots in het beleid in?
9. Welke leerprocessen (monitoring, evalueren, etc.) zijn van belang in het beleid?
10. Wat zijn belangrijke beweegredenen geweest om het beleid op deze manier in te delen en niet op de manier van het voorgaande beleid?
11. Ziet u veranderingen die zijn gemaakt bij het volgende beleid waarbij is geleerd van zaken die jullie zijn tegengekomen bij het maken en uitvoeren van dit beleid?

Onderzoekers

1. Hoe bekend bent u met het klimaatbeleid van Nederland? – Afhankelijk van het antwoord waren de vragen gericht op het beleid of op de ideale invulling in de theorie.
2. Als het gaat om samenwerken van de overheid met belanghebbenden, hoe zou dat idealiter worden ingedeeld volgens transition management (TM)/polycentric governance (PG)/strategic niche management (SNM)?
    a. Welke uiting wordt gegeven aan TM/SNM/PG bij het uitnodigen/kiezen van de partijen om deel te nemen aan de sectortafels?

3. Welke veranderingen ziet u over de jaren heen in de soort partijen die worden uitgenodigd?
4. Hoe zouden de verschillende overheidsniveaus betrokken worden in het beleid volgens TM/SNM/PG?
    a. Hoe worden de verschillende overheidsniveaus betrokken in het beleid en ziet u hierbij een specifieke toepassing van TM/SNM/PG?
5. Wat voor invulling zouden de lange termijn visies krijgen in het beleid volgens TM/SNM/PG?
    a. Hoe worden de lange termijn visies zoals in TM/SNM/PG toegepast in het beleid en hoe is dit door de jaren heen ontwikkeld?
6. Wat voor rol hebben experimenten en pilots in TM/SNM/PG?
    a. Hoe is de rol van experimenten en pilots veranderd door de jaren heen en is hierbij de rol TM/SNM/PG zichtbaar?
7. Hoe wordt binnen TM/SNM/PG het opschalen vorm gegeven?
    a. Op wat voor manier speelt TM/SNM/PG een rol in de manier van opschalen van de experimenten en pilots in het beleid?
8. Welke leerprocessen (monitoring, evalueren, etc.), die ook onderdeel zijn van TM/SNM/PG, zijn van belang in het beleid?
9. De veranderingen die zijn doorgevoerd over de jaren heen, ziet u de oorzaken hiervan liggen bij een andere nadruk op TM/SNM/PG? Of zijn er andere factoren?