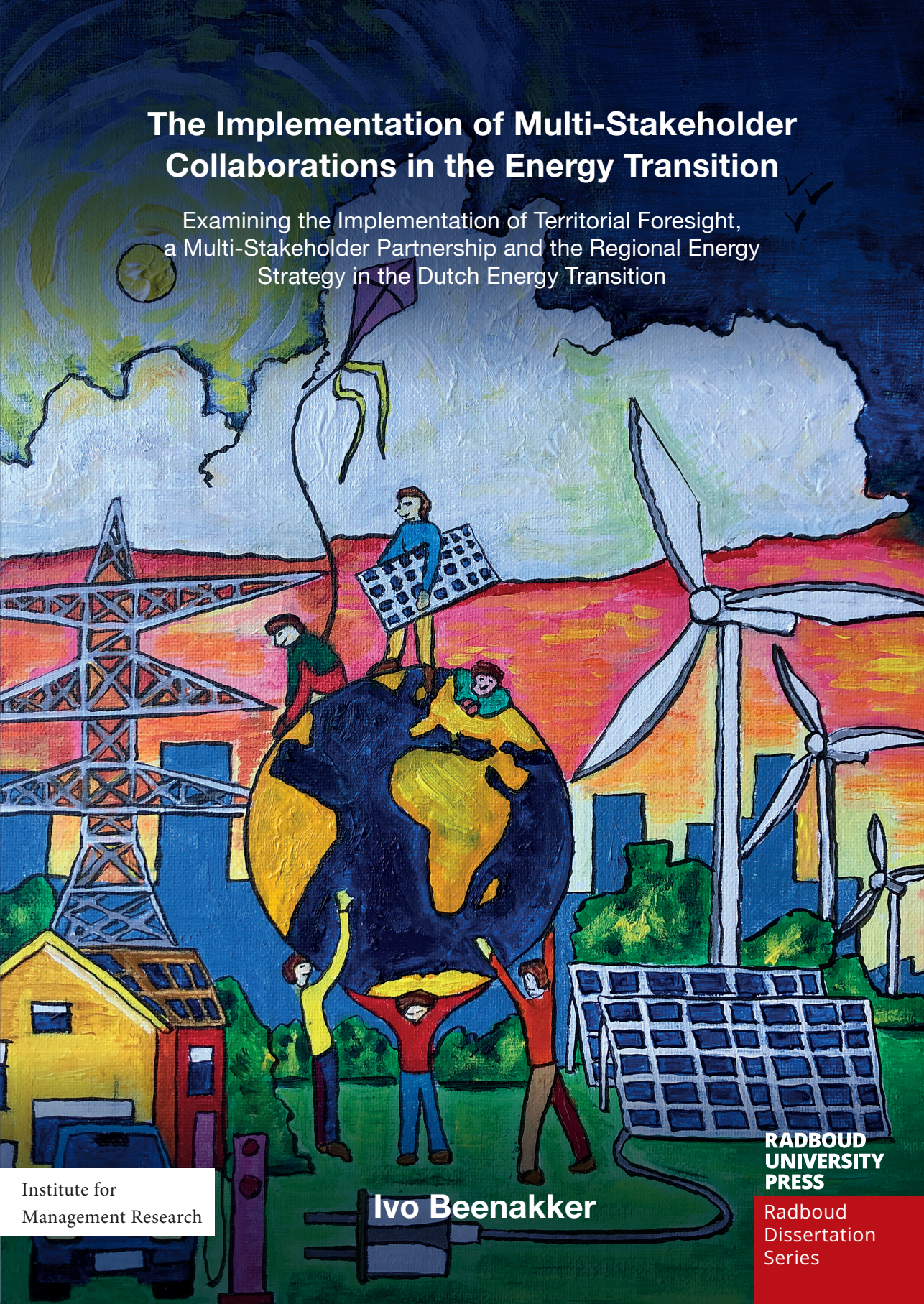
The Implementation of Multi-Stakeholder Collaborations in the Energy Transition

Examining the Implementation of Territorial Foresight, a Multi-Stakeholder Partnership and the Regional Energy Strategy in the Dutch Energy Transition



Ivo Beenakker

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Ivo Franciscus Beenakker

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Ivo Franciscus Beenakker
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Promotor:
Prof. dr. H.L. van Kranenburg

Copromotoren:
Dr. S.A. Veenman
Dr. ir. L. Carton

Manuscriptcommissie:
Prof. dr. S.A.C.M. Lavrijssen
Prof. dr. M. Cloodt *(Open Universiteit)*
Prof. dr. A. Lagendijk

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Ivo Franciscus Beenakker
born on January 6, 1984
in Huizen (the Netherlands)

Supervisor:
Prof. dr. H.L. van Kranenburg

Co-supervisors:
Dr. S.A. Veenman
Dr. ir. L. Carton

Manuscript Committee:
Prof. dr. S.A.C.M. Lavrijssen
Prof. dr. M. Cloodt *(Open University)*
Prof. dr. A. Lagendijk

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Introduction

1.1 Introduction

There is a broad scientific consensus that climate change presents significant challenges, with the burning of fossil fuels identified as its primary cause (Murphy, 2024; Perera & Nadeau, 2022; Soeder, 2021). To mitigate climate change, an energy transition is essential on both local and global scales. In the Netherlands, societal stakeholders voluntarily committed to accelerating this energy transition in 2013 through a national agreement known as the 'Energy Agreement' (Social Economic Council, 2013). By 2019, the strategies outlined in this agreement were incorporated into the national 'Climate Agreement' and the Climate Act (Anfinson et al., 2023; Ministry of Economic Affairs & Climate Policy, 2019). These agreements set clear climate goals and proposed a new legal framework to support the energy transition, making the pursuit of long-term energy objectives more manageable than it had been before their introduction. However, challenges persist in the implementation (Van Dijk et al., 2025).

Implementing long-term energy transition goals is a challenging process. For instance, one of the goals is disconnecting households from the gas network. Research shows that achieving the goal of disconnecting households from the gas network is a challenging process (Backhaus, 2019; Beauchampet & Walsh, 2021; Teladia & Van der Windt, 2024). One of the reasons is that alternatives to gas consumption are often perceived as expensive and uncertain (Jansma et al., 2020). Another example is the lack of space for renewables. Renewables are less efficient in terms of required space compared to fossil fuel plants because of the decentralized nature of renewable energy production. Much space for renewables is needed which may be particularly difficult in an urban environment with high population densities (Kaza & Curtis, 2014; Koelman et al., 2024). In addition, the long-term energy transition goals are difficult to achieve because of the lack of acceptance for renewables. Stakeholders tend to oppose the allocation of renewables if limited opportunities exist to benefit (Lindvall, 2023; Ziggers, 2024). Other issues also arise, such as congestion in energy networks, which hampers further electrification efforts in residential areas and businesses (De Winkel et al., 2025). Phase out policies are exposed to major geopolitical uncertainties and hence, are inconsistent. The Dutch government committed to the phase out of coal-power until the Russian aggression against Ukraine started, and coal power became again part of the energy mix to decrease energy dependency on Russia (Kuzemko et al., 2022). Uncertainty is inherent to any transition, which is characterized as a fundamental societal change involving economics, culture, technology, institutions, and the environment. Such transitions typically take at least one generation (25 to 50 years) to complete (Rotmans, 2005).

Recent studies show that the energy transition process would benefit from more and better collaborations between different groups of stakeholders (Bulmer & Yáñez-Araque, 2023; Casady et al., 2024). According to Freeman (2010: 46), a stakeholder is defined as '*any group or individual who can affect or is affected by the achievement of the organization's objectives*.' Different forms of multi-stakeholder coalitions emerge to accelerate the achievement of the long term energy transition goals (Gray & Purdy, 2018; Raghutla & Kolati, 2023; Zobel & Comello, 2025). Multi-stakeholder collaborations (MSCs) are coalitions formed by government entities, businesses, and community stakeholders who collaboratively identify public policy challenges to address the long-term energy transition goals (Partidário et al., 2023). MSCs play a crucial role in implementing public policies, as leading stakeholders not only set a strong example for the energy transition but also cultivate a shared vision of energy efficiency, enhance engagement and secure necessary resources (Borg & Yström, 2020). Furthermore, stakeholders engage in knowledge exchange pertaining to investment in sustainable energy systems (Wang et al., 2020). Finally, MSCs foster close collaborations with innovative, traditional and supportive partners. They expand their focus beyond the technological aspects of renewable energy systems to explore various roles stakeholders can play within MSCs (Bekirsky et al., 2022).

However, implementing MSCs can be challenging when stakeholders have differing goals, motivations, levels of involvement, and contributions of resources (Eweje et al., 2021; Sanderink & Nasiritousi, 2020). Each stakeholder typically pursues distinct objectives, such as energy efficiency, sustainability, and participation (Hoppe & Miedema, 2020; Hoppe, 2021; Wang et al., 2023). This plurality of goals complicates the process of aligning ambitions and fostering a shared commitment to MSC (Benford & Snow, 2000; Lindenberg & Steg, 2007). Moreover, ambiguities in goal-setting often result in unclear responsibilities due to strong dependency structures and high transaction costs (Van Dijk et al., 2022). In addition, stakeholders' roles are becoming increasingly hybrid, as various sectoral backgrounds and responsibilities converge. This hybridity refers to the merging of multiple roles and responsibilities within MSCs based on voluntary agreements, long-term commitments, and cross-boundary interactions. However, this hybrid nature can also lead to tensions between profit and non-profit motives, as well as conflicts between formal and informal roles, and public and private goals (Avelino & Wittmayer, 2016; Pinilla-De La Cruz et al., 2022). Furthermore, stakeholders are exposed to ineffective governmental rules and regulations from different policy fields (Van Kranenburg & Witjes, 2024). At the same time, stakeholders can have different perceptions of what constitutes an effective and efficient regulatory context for MSCs. Policy fragmentation is likely to emerge, and the distribution of costs and benefits associated with implementing the energy

transition often leads to contention (Anfinson et al., 2023; De Winkel et al., 2025; Veenman et al., 2024; Warbroek et al., 2023; Ziggers, 2024).

It is important to understand better how MSCs work and can contribute to the achievement of long-term energy transition goals because MSCs play a critical role in engaging governments, businesses, and community organizations to fulfill public policy objectives. A select group of leading stakeholders provides the necessary human, knowledge, and financial resources to support MSCs. By setting an example, they encourage other stakeholders from governmental, business, and community sectors to voluntarily commit to the partnership. These leading stakeholders promote the exchange of ideas and knowledge about sustainable energy solutions in the implementation. Stakeholders gain insights into the context-specific administrative, regulatory, and geographical requirements essential for investing in the energy transition. MSCs facilitate the collaborative efforts needed to achieve long-term energy transition goals at regional and local levels. They foster self-organization, network development, and provide space for experimenting with best practices that extend beyond technological solutions (Bekirsky et al., 2022; Bulmer & Yáñez-Araque, 2023; Pattberg & Widerberg, 2016).

1.2 Research question

This study aims to gain insights into the energy transition literature by examining how MSCs contribute to the achievement of long-term energy transition goals, thereby illuminating the social, organizational, and governance facets of the implementation process. Hence, the research question is: '*How do multi-stakeholder collaborations contribute to the implementation of long-term energy transition goals?*' This research primarily focuses on the 'phase in' of MSCs because we are particularly interested in the multi-stakeholder aspects involved in implementing sustainable energy technologies. This phase necessitates new social practices and innovative forms of collaboration. The phase in refers to the emergence of novel cross-boundary partnerships where progressive stakeholders enter MSCs. They adopt and upscale innovative energy solutions to facilitate systemic sustainability changes. Conversely, the phase out addresses the challenges faced by established partnerships, vested interests and institutional structures of the fossil energy system, due to their detrimental effects on the environment and their contribution to anthropocentric climate change (Markard, 2018; Rinscheid et al., 2023). The phase out is briefly examined in chapter 2 to establish the context for this dissertation, while the phase in is examined extensively in chapters 3-5.

1.3 Contributions

This study contributes to the scholarly discourse regarding MSC and the implementation of long-term objectives pertaining to the energy transition. The

first contribution delineates the various objectives as stakeholders typically agree on a territorial foresight (Camarena et al., 2022; Güell & Redondo, 2012); however, divergences often arise in the execution of these goals and commitments (Vargas-Lama & Osorio-Vera, 2020). Disagreements over the interpretations of events within the energy transition can magnify ambitions, concerns, or alternatively, present opportunities for MSC (Boin et al., 2009; Dewulf et al., 2009; Gray, 2004; Rosenbloom et al., 2016). It is imperative to map out stakeholders' objectives and ambitions as they are critical in determining their willingness to invest time, knowledge, and resources in MSC (Etienne, 2011; Lindenberg & Steg, 2013). This study shows how stakeholders can use different alignment strategies to overcome the differences between the frames and goals in their collaborations (Benford & Snow, 2000; Skovgaard, 2017).

The second contribution of this research focuses on elaborating on the various forms of MSC. Different types of MSCs exist, such as inter-organizational collaborations (Van Kranenburg et al., 2014; Spitz et al., 2021), multi-actor collaborations (Medina-García et al., 2021; Partidário et al., 2023), multi-stakeholder partnerships (Momen, 2020; Sanderink & Nasiritousi, 2020), boundary spanning organizations ((Van Meerkerk & Edelenbos, 2018a; Yström et al., 2021) and regional governance arrangements (Kempenaar et al., 2021; Gerritsen, 2024; Van Dijk et al., 2025). Each of these MSCs put different demands on building up the commitment among stakeholders and the provision of resources (Bekirsky et al., 2022; Borg & Yström, 2020; Klindt et al., 2024; Satheesh et al., 2024a). This study shows how stakeholders build up their commitment, provide knowledge and resources, and explore their roles within the various types of MSCs as knowledge sharing and relational investments are important to achieve long-term energy transition goals (Ruppert-Winkel, 2018;).

The third scientific contribution is to investigate which rules of the game enhance the performance of MSC to implement the long-term energy transition goals successfully. This pertains to regulations and arrangements aimed at the phase out of fossil energy and the phase in of renewables (Heldeweg & Saintier, 2020; Lavrijssen & Carillo Parra, 2017; Maurya & Rathore, 2023). This study shows the effects of different regulations and types of governance arrangements on the successful functioning of MSC to achieve the long-term energy transition goals. The application of appropriate rules can increase the willingness of stakeholders to assume shared responsibilities for strategic planning (Gerritsen, 2025; Koelman et al., 2024; Van Dijk et al., 2022; Warbroek et al., 2023).

This study aims to contribute to society by demonstrating that when stakeholders gain a better understanding of each other's goals, the implementation process of long-term energy transition objectives can be improved in MSCs. When stakeholders

recognize and understand one another's goals and interests, they are more adequately equipped to fulfill their roles in the energy transition and anticipate the decisions of their counterparts. Awareness of the diverse goals can enhance collaboration, as stakeholders become more attuned to their own objectives. At the same time, they can use alignment strategies to collaborate with other stakeholders and to build up the necessary commitment to achieve the long-term energy transition goals. Understanding these various goals is essential for effective MSC, given that significant relational, resource and material interdependencies exist in facilitating the energy transition (Gerritsen et al., 2022).

Secondly, this dissertation equips stakeholders with valuable insights into organizing the energy transition collaboratively by elucidating involvement practices, goal achievement and network strategies in MSCs. In practice, acquiring substantial 'social' knowledge about effective collaboration can encourage stakeholders to mobilize stakeholders and resources that extend beyond their individual goals. This understanding can aid in orchestrating joint practices necessary for achieving the 'public' sustainability and transition process goals of the MSC. By discovering how to implement the energy transition together, stakeholders can expedite the realization of the long-term energy transition objectives.

Thirdly, this research contributes to society by offering valuable insights into effective governance arrangements that can enhance MSCs. By understanding the appropriate governance arrangement for improving the implementation process, stakeholders can pinpoint where existing regulations surrounding energy network management are lacking. Awareness of the necessary adjustments to the dominant rules in use empowers practitioners to effectively prioritize spatial and energy resources in planning, make informed and efficient resource investments, and tackle issues related to network congestion (Koelman et al., 2024).

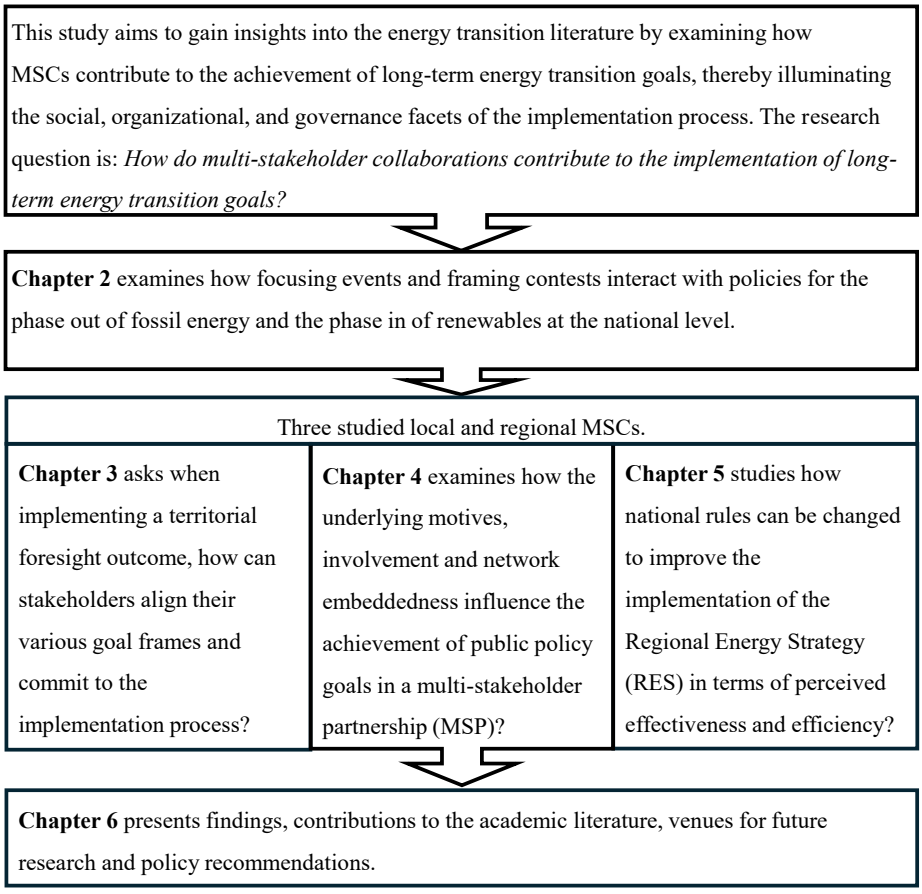

Figure 1: Relations between the studies, showing the implementation of three multi-stakeholder collaborations (MSCs) in the Dutch energy transition.

1.4 Outline

This dissertation consists of three studies aimed at understanding how local and regional MSCs implement long-term energy transition goals after agreement on climate targets has been achieved (chapters 3-5). Figure 1 illustrates the relationships among the studies.

Chapter 2: Navigating the phase out and phase in of the Dutch energy transition: Focusing events, framing contests, and policy instruments.

The phase out of fossil energy and the phase in of renewables often encounter substantial delays in achieving a successful energy transition. This is due to framing contests surrounding the interpretation of focusing events, which frequently

generate resistance (Birkmann et al., 2010; Kaufmann et al., 2016). The term 'phase out' refers to policies aimed at eliminating the fossil energy system (Rinscheid et al., 2023), while 'phase in' pertains to the introduction of policy instruments and renewable energy technologies that support the transition to a sustainable energy future (Markard, 2018). Focusing events are characterized as external shocks that prompt swift changes in policy attention (Birkland, 1998; Farley et al., 2007). Some stakeholders emphasize the repercussions of a climate crisis, whereas others remain indifferent, challenge the prevailing narrative, or view it as an opportunity for investment (Boin et al., 2009). Entrenched interests respond to these framing contests by optimizing the existing fossil fuel infrastructure and maintaining the status quo. In contrast, change-oriented stakeholders advocate for the achievement of long-term energy transition goals (Bekirsky et al., 2022). Despite this backdrop, there is still limited understanding of how the contentious framing of focusing events affects the phase out of fossil fuels and the phase in of renewable energy sources. It is essential to investigate the interplay between focusing events and framing contests, as this relationship may shed light on how these contests influence MSCs and the realization of long-term energy transition objectives. Therefore, the central research question emerges: '*How do focusing events and framing contests interact with policies for the phase out of fossil energy and the phase in of renewables?*'

Chapter 2 addresses the complex interactions between focusing events, framing contests, and delays in public policy implementation at the national level. It underscores the need for further research on MSCs in local and regional contexts to address the framing contests. This chapter reviews the existing academic literature on focusing events, framing contests, and policy development (Paul & Criado, 2020). This literature review is further enhanced by the collection and analysis of various media sources, policy documents, and research reports—an approach known as data triangulation. The comprehensive analysis aims to elucidate the historical dynamics involved in phase out and phase in policies (Altheide & Schneider, 2013; Bowen, 2009). We examine how differing framings of focusing events contribute to the inconsistent application of policy instruments during both phase out and phase in processes. Consequently, in chapter 3, we seek to understand how rules and financial policy instruments crafted at the national level translate into the implementation of a local MSC.

Chapter 3: The implementation of a territorial foresight outcome through aligning goal frames: a pilot case of the gas disconnection in the Netherlands.

This chapter explains how a local MSC employs goal frames and frame alignment strategies to implement territorial foresight. '*Territorial foresight is the way to structure*

long-term thinking for the achievement of national vision-strategy objectives that promote regional and sustainable development' (Vargas-Lama & Osorio-Vera, 2020, p. 3). However, the primary motivations of stakeholders often do not align with the goals of implementing territorial foresight (Mojica Sastoque et al., 2013). The key motivations that influence the implementation of territorial foresight are referred to as goal frames. These goal frames direct stakeholders' attention, mobilize sub goals, and make stakeholders more receptive to information relevant to achieving their goals (Lindenberg & Steg, 2013). Significant disparities in goal frames can lead to decreased commitment to territorial foresight implementation, as divergent sub goals may cause stakeholders to drift apart (Jansma et al., 2020). Often, stakeholders prioritize their own sub goals over the collective goal, or they may leave the local MSC if they feel their voices are not adequately acknowledged (Hirschman, 1974). Frame alignment enhances commitment by reconciling various goal frames to support the implementation of territorial foresight (Benford & Snow, 2000). Nevertheless, it remains unclear how a local MSC adopts goal frames and frame alignment strategies to influence the implementation of territorial foresight (Acosta-Prado et al., 2015; Vargas-Lama & Osorio-Vera, 2020). The question posed is: '*When implementing a territorial foresight outcome, how can stakeholders align their various goal frames and commit to the implementation process?*'

Chapter 3 investigates the differing goals of an urban municipality, an energy network company, a housing corporation, and a residents' association within a local MSC, situated in the Hengstdal neighbourhood, in the city of Nijmegen. This local MSC is selected because the case provides the opportunity to observe the collaborative process of implementing gas disconnection 'live' in an urban neighborhood. Evidence is presented from a pilot program focused on gas disconnection in Nijmegen, the Netherlands (Fokkema & Scholtens, 2017). Utilizing qualitative analysis (Beuving & De Vries, 2014) and grounded theory (Glaser & Strauss, 2017), this chapter illustrates how various goal frames, sub goals, and frame alignment strategies are used during the implementation of a local MSC. The qualitative analysis, which encompasses interviews, document reviews, and observation schemes from Communities of Practice, allows us to reconstruct the dominant goals, sub goals, and alignment strategies. Drawing inspiration from grounded theory, we employ open coding and interpret the qualitative data through content analysis (Henning et al., 2004). This approach helps us develop a coherent narrative about the implementation process in the subsequent stages of the gas disconnection pilot. The local MSC under study is in the Hengstdal neighbourhood, in the city of Nijmegen. The local MSC focuses on achieving gas disconnection in the urban residential environment by 2035 (Fokkema & Scholtens, 2017).

Chapter 4: Multi-stakeholder partnership as an instrument for energy transition: How motives, involvement, and network embeddedness contribute to sustainability and transition process goals.

A new type of regional MSC has emerged, the multi-stakeholder partnerships (MSPs). Such partnerships help build up a shared commitment to implementing the long-term energy transition goals. MSPs are often seen as more effective and efficient compared with market coordination and governmental hierarchy because of the opportunities for resource and knowledge sharing, organizing new forms of sustainable energy supply and demand, and leadership (Galan & Zuñiga-Vicente, 2023; Heldeweg, 2017; Heldeweg & Saintier, 2020). MSPs are defined as '*voluntary and collaborative relationships between various parties, both public and non-public, in which all participants agree to work together to achieve a common purpose or undertake a specific task and, as mutually agreed, to share risk and responsibilities, resources and benefits*' (Eweje et al, 2021: 7). MSPs are cross-boundary collaborations between public and private stakeholders at the regional level with the aim of implementing long-term energy transition goals. Process managers facilitate the knowledge and resource exchanges for sustainability measures and the involvement in the transition process (Bulmer & Yáñez-Araque, 2023; Pattberg & Widerberg, 2016). In accordance with the UN development goals, MSPs aim to mitigate climate change, invest in renewable energy, improve energy efficiency and build up partnerships (Eweje et al., 2021). In this context, governments, businesses, and community stakeholders collaborate to implement long-term energy transition goals within the regional environment (Gray & Purdy, 2018; Momen, 2020). The MSP represents a 'soft' form of regional MSC since informal rules and interactions are considered more significant than formal regulations and transactions (Bulmer & Yáñez-Araque, 2023; Sanderink & Nasiritousi, 2020). A critical aspect of MSPs lies in the motivations for involvement. Participatory engagement mobilizes stakeholders, the sharing of resources, and fosters awareness of the sustainability goals while also stimulating a supportive social infrastructure for the energy transition (Pinilla-De la Cruz et al., 2022).

Additionally, both internal and external network embeddedness can significantly impact the involvement of stakeholders and the achievement of goals within the MSP. Internal networks provide the MSP with essential human and financial resources, while external network embeddedness facilitates the sharing of knowledge regarding sustainability and the transition process from more distant stakeholders (Klindt et al., 2024; Satheesh et al., 2024b). However, understanding how underlying motives, stakeholder involvement, and network embeddedness affect the attainment of public policy goals is crucial for the successful implementation of an MSP. Stakeholders

often withdraw from a partnership prematurely if they feel their voices are not adequately heard (Greve & Hodge, 2022). Therefore, chapter 4 delves into how these motivational, participatory, and network factors influence the success of an MSP in achieving the energy transition. The research question is: '*How do motives, involvement practices, and embeddedness of stakeholders influence the public policy goals of an MSP for the energy transition?*'

We examine how the motives, engagement practices, and network embeddedness of public, private, and community stakeholders influence the achievement of sustainability and transition process goals in the regional MSC of the Gelderland Energy Agreement (GEA). This larger regional MSC is selected to gain a deeper understanding of the involvement practices, goal effectiveness and network embeddedness of stakeholders. GEA is a network organization with the aim of realizing carbon neutrality in the province of Gelderland by 2050. In 2013, energy network company Alliander, environmental organization Nature and Environment Gelderland ('Natuur en Milieu Gelderland') and the association for decentralized governments Climate Partnership Netherlands ('Klimaatverbond Nederland') established GEA to implement the sustainable energy goals of the national Energy Agreement (SER, 2013; Van der Ploeg et al., 2015). Today, around 250 organizations participate in GEA, focusing on connecting stakeholders, best practices of sustainability, and room for experimentation with local sustainable energy systems in the province of Gelderland. GEA supports governments, businesses and community organizations with guiding knowledge exchanges on energy savings measures, the development of clean, sustainable energy resources, and with ideas on the reduction of CO_2 emissions in organizational processes (GEA, 2025). The regional MSC will be studied as a single case study (Yin, 2003). The cooperation of the GEA network facilitates the distribution of a questionnaire among its numerous members about motives, involvement, goal attainment and network embeddedness. A quantitative survey was developed and executed following pilot interviews with key founding partners. The survey data were analyzed using descriptive statistics, factor and reliability analysis, linear regression, and t-tests, employing SPSS and Stata (Field, 2018; Hair et al., 1998).

Chapters 3 and 4 examine two local and regional MSCs for decentralized sustainable energy production, goal frame alignment, and cross-boundary collaboration. MSCs also require an adequate regulatory context (Baldwin, 2019; Milchram et al., 2019; Oteman et al., 2014). Without a supportive regulatory context, the implementation of long-term energy transition goals may be jeopardized due to rules hampering MSC. Consequently, chapter 5 examines how changes in the regulatory landscape impact

the implementation of the Renewable Energy Strategy (RES). Stakeholders encounter challenges such as network congestion, limited space for renewables, and disputes over perceived unfairness in the distribution of the benefits and burdens associated with the energy transition (Koelman et al., 2024; Veenman et al., 2024).

Chapter 5: Changing the Rules of the Game to encourage a Collaborative Arrangement: The Case of the Dutch Regional Energy Strategy (RES).

In the Netherlands, the RES is a recent governance approach that was initiated in 2019. It aims to experiment with the decentralized and integrated allocation of spatial resources in conjunction with energy network planning (Gerritsen, 2025). The RES began as a national policy framework in response to earlier protests to the top-down planning of onshore wind power by the national government. Municipalities and the provinces advocated for the bottom-up formation of thirty RES energy regions, which would facilitate more decentralized and experimental spatial energy planning (Gerritsen, 2024; Hoppe, 2021). In this context, the national government assigned provinces the task of implementing the RES and allowed 'energy regions' to experiment with the combined allocation of spatial and energy functions. As a result, the RES evolved into various regional MSCs aimed at planning space and sustainable energy in an integrated manner. This process involved participation from municipalities, energy network companies, energy cooperatives, housing associations, businesses, solar park developers, wind farm developers, and citizens (Hoppe & Miedema, 2020). To prevent zero-sum games, in which one municipality benefits at the expense of others, a regional approach was adopted to ensure that costs and benefits are shared fairly. Urban and rural municipalities often find themselves in zero-sum situations as they compete for the advantages of spatial development, such as housing and businesses, while externalizing the costs related to the installation of solar parks and wind farms onto neighboring communities. The provinces have played a crucial role as facilitators in this process, leveraging their democratic mandate in the absence of a dominant stakeholder during implementation (Anfinson et al., 2023).

The province of Gelderland is facing regulatory challenges related to cross-boundary planning issues among multiple municipalities. These challenges arise due to grid congestion, policy fragmentation, and a lack of space for renewable energy (De Winkel et al., 2025; Van Dijk et al., 2022). The province of Gelderland consists of six RES regions (out of 30 nationwide) including Arnhem-Nijmegen, Food Valley, Achterhoek, Noord-Veluwe, Fruitdelta Rivierenland and the Cleantech region (National Program Regional Energy Strategy, 2025). Within these regions, we analyze six siting areas in the intermunicipal territories of Duiven-Zevenaar, Doetinchem-Bronckhorst,

Hattem-Oldenbroek, Scherpenzeel-Renswoude, Tiel-Wadenoijen, and Zutphen-Lochem. The six intermunicipal siting areas showed similar planning dilemmas in terms of grid extension needs, planning of housing and businesses, and hesitation regarding the installation of large solar parks and wind farms. However, it remains unclear how rules should be modified to improve the implementation of the RES in terms of effectiveness and efficiency from the stakeholders' perspectives (Hoppe, 2021; Van Dijk et al., 2022). Therefore, the aim of chapter 5 is to examine which rules could enhance the RES and the underlying reasons for these improvements. The research question is: '*How can rules influence the implementation of the RES?*'

Chapter 5 looks at how new rules affect the RES in terms of perceived effectiveness and efficiency. This RES case enables the study of scenarios wherein regional collaboration and spatial energy planning occur under varying regimes of national regulation. The RES is a policy instrument in the Netherlands that requires local and regional governmental bodies to organize 'energy regions.' Stakeholders collaboratively develop plans for the spatial allocation of large-scale renewable energy sources, especially wind and solar, along with the necessary energy infrastructure and in alignment with spatial demands. Within the regional MSC of the RES, stakeholders, including the province, urban and rural municipalities, energy network company, energy cooperative, housing, businesses, as well as solar parks and wind farm developers, collaborate to realize integrated spatial energy planning. The RES stakeholders experiment with new forms of cross-boundary collaboration (Gerritsen, 2025). We adopt the intervention methodology of serious gaming to identify which rules are perceived as the most effective and efficient for organizing the regulatory context of MSCs. Serious gaming is a valuable approach as it fosters collaborative meaning-making and reveals often unexamined assumptions about the existing rules (Geurts et al., 2007; Mayer et al., 2004). Practitioners actively engage in the game construction process, contributing their ideas for rules to be tested in three distinct scenarios. This approach allows for the explanation of a regional MSC in a gamified context. The game simulation specifically focuses on the planning of potential 'siting areas.' These areas address the planning challenges related to energy network extension, housing and business developments, and the uncertainties surrounding the installation of solar parks and wind farms. The planning challenges are used as a basis for modelling our simulation game (Bekebrede et al., 2018; Gugerell & Zuidema, 2017). The six real cases thus represent one simplified 'implementation model' to simulate the early-stage RES interactions where changed rules create different circumstances for the implementation. To prepare for the serious game, we conduct interviews with respondents from government, energy network planning, business, and civil society across six RES regions in Gelderland. These interviews explore how

rule changes could enhance the implementation of the RES. These insights support the development of coherent scenarios for the serious game (De Wijse-Van Heeswijk, 2021). Following this, we conduct the serious game with planning practitioners and evaluate the proposed rule changes based on the criteria effectiveness, efficiency and fairness (Wang et al., 2023; Ziggers, 2024).

Chapter 6 summarizes the findings, highlights study limitations, suggests directions for future research, and offers policy recommendations. Table 1 provides an overview of the research questions, gaps, focus and methodology.

Table 1: Overview of the research questions, gaps, focus and methodology.

Research questions	Gaps	Focus	Methodology
Main question: '*How do multi-stakeholder collaborations contribute to the implementation of long-term energy transition goals?*'	The relational aspects of multi-stakeholder collaborations (MSCs)— and the interaction between their goals, participation practices, and regulatory context—remain unclear during the implementation of long-term energy transition goals.	Key themes include MSCs, goals, collaboration, regulatory context, implementation and energy transition.	A combination of qualitative and quantitative research methodologies will be employed. Methods include case studies, qualitative fieldwork, simulation studies with an interventionist approach, and a survey.
Chapter 2: '*How do focusing events and framing contests interact with policies for the phase out of fossil energy and the phase in of renewables?*'	There is a lack of insights into how framing contests interact with focusing events during the phase out of fossil energy and the phase in of renewable energy.	Key elements to consider include focusing events, framing contests, policies for the phase out and phase in, rules, financial incentives, and knowledge sharing.	A literature review and document analysis will provide further understanding of this topic.
Chapter 3: '*When implementing a territorial foresight outcome, how can stakeholders align their different goal frames and commit to the implementation process?*'	The influence of goal frames and frame alignment strategies on the implementation of territorial foresight has not been thoroughly examined.	Important topics include territorial foresight, implementation studies, goal framing, frame alignment, commitment, and inter-organizational collaboration.	A qualitative study consisting of case studies, interviews, observations, document analysis, and content analysis offers valuable insights.
Chapter 4: '*How do motives, involvement practices, and embeddedness of stakeholders in a multi-stakeholder partnership (MSP) influence the public policy goals for the energy transition?*'	The influence of motives, involvement practices, and network embeddedness on sustained commitment to sustainability and transition process goals in an MSP remains unclear.	This chapter will examine the connections between motivational theory, involvement practices, goal attainment, network embeddedness and MSPs.	To investigate these relationships, we will combine research methods, including survey research, case studies, descriptive analyses, factor and reliability analyses, linear regression, t-tests, and pilot interviews.
Chapter 5: '*How can rules influence the implementation of the Regional Energy Strategy (RES)?*'	It is still uncertain how the rules should be modified to enhance the RES.	We will explore the RES, focusing on collaborative arrangements, effectiveness and efficiency.	We will use multi-stakeholder policy analysis, interviews, game simulation, and scenario evaluations, including the Wilcoxon Signed Ranks Test.

2

Navigating the phase out and phase in of the Dutch Energy Transition: Focusing events, framing contests and policy instruments

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Abstract

The phase out of fossil energy and the phase in of renewable energy are necessary to achieve carbon neutrality in the Netherlands by 2050. Despite unexpected focusing events and climate policies, the phase out and phase in face resistance and significant delays. Focusing events play an important role, as they can influence how the framing of such events (de)legitimizes policies. The study aims to gain a better understanding of how the contested framing of focusing events influences the phase out of fossil energy and the phase in of renewable energy in the Netherlands. The results suggest that the contested framing of focusing events creates space for new policies. When actors recognize or downplay the focusing event, they first adopt the policy instrument of information sharing. Subsequently, information sharing enables the introduction of financial incentives and rules. When actors frame a focusing event as a crisis, they introduce rules to avert the disaster. However, the newly introduced rules are also the ones that face the most resistance, as these are the arenas where the interpretation of focusing events is most seriously contested.

Keywords: Phase out, phase in, focusing event, framing contest, policy instrument.

2.1 Introduction

The energy transition involves the phase out of fossil energy and the phase in of renewable energy (Markard, 2018; Rogge & Johnstone, 2017). The phase out and phase in processes occur simultaneously, each with different values, priorities, and preferred desires. In these phases, individuals or groups of actors constitute values, beliefs and shared narratives in social interactions (Van den Brink & Metze, 2006; Veenman et al., 2019). Actors' frames may be different or even contradictory. For example, Hess (2019) shows how divergent values, beliefs, and shared narratives lead to framing contests as different prioritizations of environmental sustainability, affordability, energy reliability, and democratic control drive actors apart. Framing contests are defined as activities in which social actors attempt to mobilize others around a particular frame (Kaplan, 2008). During framing contests, actors seek to delegitimize competing frames, not only because they are convinced of the correctness of their own frame, but also because opposing frames would impede the preferred course of action (Gray, 2004). For example, Wolsink (2020) shows a framing contest about 'clean coal' and biomass. The vested coal industry emphasizes the 'clean' aspect of coal and biomass, which clings to business as usual and profitability. This industry tries to develop and implement policy instruments to postpone the phase out of coal and biomass by presenting itself as sustainable. Others are concerned about the environmental risks associated with coal-fired power and biomass activities and characterize the coal industry as unsustainable. They emphasize that the burning of coal and biomass contributes to greenhouse gas (GHG) emissions and social opposition. They seek to implement policy instruments to phase out the coal and biomass industries as soon as possible.

Framing contests are politically sensitive because they represent power relations between actors (Kaplan, 2008; Vanhala & Hestbaek, 2016). Frames and power relations can change when an unplanned, unexpected, and unusual event occurs that (potentially) affects actors' interests. Focusing events are potentially critical events that can lead to significant changes in policy (Birkland, 1998; Kingdon, 2003). The impact can be direct and indirect, including short- and long-term consequences (Birkmann et al., 2010). Actors involved may attach different meanings to the problems, causes, desirable policy solutions, and impacts of the event (Resodihardjo, 2020). When actors do not agree on a common understanding of the focusing event, a framing contest can arise.

Although the phase out and phase in processes occur simultaneously, each has different underlying values, priorities, and desires (Hebinck et al., 2022), thus actors are expected to frame focusing events differently to achieve preferred

policy outcomes. These focusing events and related framing contests directly or indirectly lead to changes in the policy agenda, mobilization of actors or groups, and implementation of policy instruments (Birkland, 1998; Kingdon, 2003). While there are many studies on focusing events (Farley et al., 2007), framing contests (Boin et al., 2009; Kaplan, 2008; Fenger & Klok, 2014), and policies (Brukas & Sallnäs, 2012), little is yet known about how focusing events, framing contests and policy instruments interact in the energy transition (Kaufmann et al., 2016; Van der Schoor & Scholtens, 2015). Understanding the interactions contributes to the development and implementation of more appropriate and effective policy instruments to accelerate the energy transition. Therefore, the aim of this exploratory study is to investigate: '*How do focusing events and framing contests interact with policies for the phase out of fossil energy and the phase in of renewables?*'

The evidence in this study comes from the Dutch energy transition. In the Netherlands, many actors have been involved in the design and implementation of policy instruments for the phase out and phase in of the energy transition. The Dutch energy transition is famous for its culture of collaboration, widely known as the 'polder model'. The 'polder model' facilitates consensus, pragmatic decision-making, and recognition of differences (Voinea & Van Kranenburg, 2018). Despite the collaboration between government, business and labor unions and the ambition to achieve carbon neutrality in the Netherlands by 2050, there have been significant delays in achieving this ambition (Ministry of Economic Affairs & Climate Policy et al., 2019; SER, 2019). The case will show that the existence of different framing contests about the focusing events and the policy instruments developed and implemented have influenced the energy transition.

The next section provides a literature review on focusing events, framing contests, and policy instruments. Section three explains the research methodology. Section four analyzes the focusing events, framing contests, and policy instruments during the phase out, while section five presents the analysis for the phase in. Section six presents concluding remarks, limitations of the research, and venues for future research.

2.2 Literature overview about focusing events, framing contests and policy instruments

2.2.1 Focusing events and framing contests

Research shows that focusing events occur unexpectedly and have severe impacts on people and society (Farley et al., 2007). Focusing events cause significant impacts,

such as social disruption, ecosystem damage, material damage, public health degradation and trauma. These events can change the political agenda, contribute to group mobilization and force the implementation of new policy instruments (Birkland, 1998). An event can be defined as a focusing event if it meets the following five criteria: A focusing event should (1) occur at the national or international level, (2) have a societal impact at the national or international level, (3) receive media attention, (4) lead to (a) policy response(s), and (5) actors should contest the understanding of the event (Kaplan, 2008; Kingdon, 2003).

Actors frame a focusing event differently (Resodihardjo, 2020). Some actors believe that the focusing event is an isolated, low-probability, high-impact event that causes physical damage, health concerns, and demands for financial compensation. Others believe that the focusing event contributes to a pattern of weak signals (Kuosa, 2010). According to Boin et al. (2009), actors perceive a focusing event in three ways: As an unimportant event, as a threat, or as an opportunity to legitimize political action. First, actors may frame such an event as unimportant because trivialization keeps the crisis small and actors expect business as usual. Actors remain passive because of the lack of urgency. Existing policies remain intact because actors perceive the impact of the event as insignificant. However, the weakness of downsizing is that actors remain blind to the risks associated with the incident. As a result, the phase out and phase in remain small and incremental in terms of policy adoption and consequences.

Second, actors may deliberately frame a focusing event as a threat to the community (Boin et al., 2009). These actors become fearful and defend existing policies. They emphasize that a crisis is neither controllable nor predictable. These actors explain the causes of the incident externally. Opposing actors, however, perceive a policy failure because they believe that the focusing event could have been prevented. Opposing actors internalize the causes of the perceived threat. As a result, a blame game about the causality and impact of the critical situation ensues, with calls for more information, investigations, debates, and the resignation of ineffective incumbent actors (Farley et al., 2007; Resodihardjo, 2020).

Third, a focusing event can be an opportunity for change because the impact reveals the vulnerability of the community (Boin et al., 2009). Actors respond proactively with national coordination systems, new regulations, and financial support. They also mediate the corresponding social conflicts, inform others about the risks and uncertainties, and share information to prevent a recurrence (Birkmann et al., 2010). In the aftermath of a focusing event, resource mobilization and renewed political agenda-setting take place due to calls for immediate recovery and impact mitigation

(Giugni & Grasso, 2015). The perception of a focusing event as an opportunity stimulates actors to experiment and scale up renewable energy. This situation can even destabilize the fossil energy system and institutionalize the phase out and phase in (Hebinck et al., 2022; Markard, 2018).

Thus, actors may frame these focusing events, their impacts, and related policies differently. These different frames represent sets of meanings shared by people or groups within society (Goffman, 1974). According to Benford and Snow (2000, p. 614), frames are '*schemata of interpretation*' that '*organize experience and guide action*' by bringing to bear a coherent set of interpretations, ideas and beliefs. Framing contestation occurs when actors disagree about which frame provides an appropriate understanding of a focusing event. They can prevent actors from being open to alternative frames (Gray, 2004). Dewulf (2013) and Kaufmann et al. (2016) emphasize that framing contests become urgent and impactful when actors point to different technological, societal, or ecological causes of the focusing event and the consequences of these focusing events for the transition process.

2.2.2 Policy instruments

Actors respond to the contested interpretation of a focusing event with different policy instruments. Such instruments are regular ways of implementing the phase in and phase out, and therefore policies have a degree of predictability. A policy instrument is a planned, deliberate, and structured effort to pursue a policy goal (Fenger & Klok, 2014). In the case of the phase out of fossil energy and the phase in of renewables in the energy transition, policy instruments adapt the energy system and mitigate climate change (Dewulf, 2013). The policy instruments are diverse: Some resist the fossil energy agenda, reclaim public control over sustainable resources, or restructure the energy sector for greater democracy, inclusion, and sustainability (Burke & Stephens, 2017). According to Arts et al. (2006), policy instruments establish social arrangements between rules, resources, and discourses. As such, policy instruments have practical implications at the local level or target a specific set of actors at different scales (Fenger & Klok, 2014; Liefferink et al., 2021). Not only governments develop and implement policy instruments, but also multinational corporations, energy network companies and (local) communities (Giugni & Grasso, 2015; Kooij et al., 2018b). Transition processes require a mix of policy instruments, such as rules, financial incentives and information exchange (Bouwma et al., 2018).

The policy instrument of rules issues norms, restrictions, and prohibitions (Serbruyns & Luyssaert, 2006). Rules punish nonconforming or illegal behavior with sanctions and requirements. Examples of rules include legislation, emission limits, operating licenses

and policy guidelines (Meijer et al., 2019). Rules are known to be the most coercive because a legal authority upholds the rule. The policy instrument of financial incentives imposes monetary costs and benefits on energy production, trade, and consumption. Examples include taxes, subsidies, grants, cap-and-trade systems, investments in fixed assets and compensation schemes (Barnea et al., 2022; Kaufmann et al., 2016). Financial incentives are moderately coercive because the pursuit of profit is a voluntary act, but also necessary for economic survival (Liefferink et al., 2021).

The policy instrument of disseminating information refers to knowledge sharing, awareness-raising, advice, persuasion and negotiation about the phase out and phase in. Discursive participation, such as presenting technical or environmental arguments for the phase out or phase in, stimulates information sharing (Kaufmann et al., 2016). Examples of information sharing strategies include political campaigns, eco-labeling, social nudges, voluntary climate agreements and the creation of professional networks (Meijer et al., 2019). Information sharing is the least coercive policy instrument because accepting or rejecting the learning of new facts or social knowledge is mostly a voluntary act (Bouwma et al., 2018; Fenger & Klok, 2014).

When making policy, actors combine rules with financial incentives and information to respond to a focusing event. Actors impose norms when information campaigns do little to stimulate policy responses, thus combining rules and information (Liefferink et al., 2021). Rules and information are particularly effective in changing social norms because information sharing stimulates acceptance of the phase out and phase in. Actors also combine rules with financial incentives, such as the imposition of a levy, the provision of subsidies, or the reduction of taxes. In this way, actors influence the monetary valuation of different policy alternatives (Serbruyns & Luyssaert, 2006). When financial burdens and benefits are shifted on a larger scale - and over a longer time horizon - the entire economic playing field can change.

2.2.3 Interplay between policy making and focusing events

In the case of downplaying a focusing event, actors defend the existing rules because the causes and effects of the event are neglected (Boin et al., 2009). Downplaying delegitimizes new rules because the new norms are seen as unnecessary. The reasons for preventing a framing contest about the new rules are to keep political resistance passive and to secure the vested interests of fossil energy. Also, stakeholders do not question the current financial incentives because the existing business cases are not considered at risk. They are also not inclined to invest in eliminating the causes of the focusing event, and compensation schemes are usually not established. Actors also limit information sharing during an event that is not important enough. The interest

is to hide the contribution of fossil energy production, trade and consumption to the focusing event. Sharing information would only lead to difficult questions, unwanted scrutiny and negative publicity (Birkmann et al., 2010) (Table 2).

In contrast, interpreting a focusing event as a crisis contributes to framing contests over the existing rules because an incident reveals the vulnerability of the community (Liefferink et al., 2021). Actors contest the legitimacy of the rules and blame the perceived inability of policymakers to uphold the rules (Resodihardjo, 2020). The upholders have an interest in defending their positions and the rules in use. Disputes over the rules become fierce because fear and anger about another crisis prevail. Crisis framing also stimulates compensation claims for mitigation, as actors feel victimized by the impact of the disaster. Feelings of loss and injustice drive actors to make strong claims for compensation. In addition, actors distrust information about the focusing event because they did not receive early warnings. Suddenly, awareness of the potential causes, risks and consequences of the event is raised. Therefore, crisis framing requires the exchange of trustworthy information, as actors doubt the reliability of information (Boin et al., 2009).

Table 2: Overview of interplay between focusing events, framing contests and policy instruments.

Framing event / **Policy instruments**	**Downplaying the focusing event**	**Threat or crisis framing**	**Opportunity frame**
Rules	Actors conform to the existing rules and delegitimize the issuance of new rules because the event is not considered important enough.	Actors strongly contest the existing rules because the crisis framing reveals the regulatory gap and the vulnerability of the community.	Actors make new rules and abolish old ones because opportunity framing legitimizes the phase out and phase in.
Financial incentives	When actors perceive an unimportant event, they do not question the current financial incentives because the business case is not perceived to be at risk.	The perception of a focusing event as a threat stimulates strong framing contests with compensatory claims for impact mitigation.	Opportunity framing stimulates actors to set aside framing contests, make strong investments, and change tax, subsidy, and grant systems.
Information sharing	During a perceived unimportant event, actors limit information sharing by concealing the causes, risks, and impacts.	Actors contest current knowledge about the causes, risks, and effects of the event. Therefore, crisis framing requires reliable information.	An opportunity frame shares information on financial investments and new regulations, i.e., a policy mix.

When actors perceive the focusing event as an opportunity, mixed policies become useful (Salazar-Morales, 2018). Actors enact new policy rules because they have acquired information about the causes, risks, and consequences of the focusing event. Informed actors are better able to understand why new rules are needed (Fenger & Klok, 2014). As a result, the new rules may gain a higher level of acceptance (Serbruyns & Luyssaert, 2006). Subsidies, taxes, and grants stimulate actors to look for novel, profitable business models that address the underlying causes of a symptomatic event. Framing the event as an opportunity also supports the policy of information sharing, as actors openly question the causes, risks, and impacts of the event and actively seek solutions to prevent it from happening again. The fossil energy industry discourages information sharing, but well-informed actors can successfully resist because of their influence on financial incentives and regulations. Table 2 provides an overview of the interplay between focusing events, framing contests, and policy instruments.

2.3 Methodology

2.3.1 The Netherlands

We study the phase out of fossil energy and the phase in of renewables in the energy transition in the Netherlands between 2013 and 2022. Since 2013, the Netherlands has committed to several climate agreements. The first voluntary agreement is called the Energy Agreement and involved a compromise between 47 actors, including national, regional and local governments, employers' organizations, environmental organizations, civil society and financial institutions. The number of actors committed to this long-term perspective of a carbon-neutral energy system by 2050 makes it a fruitful case study for the analysis of framing contests of focusing events and related policy instruments. The Energy Agreement initiated a policy cycle with annual implementation agendas and monitoring to ensure policy consequences. Therefore, the 2013 Energy Agreement is the starting point for exploring focusing events, framing contests, and policy instruments because the Agreement was the first societal commitment to phase out and phase in (SER, 2013).

In 2018, the mandate of the Energy Agreement ended with the upcoming Climate Agreement (SER, 2019). The Climate Agreement is important because 76 actors from government, business, and civil society agreed to reduce CO_2 emissions by 49 percent by 2030 compared to the base year of 1990, thus focusing on the phase in. They also agreed to reduce CO_2 emissions by 95 percent by 2050 at the latest. The actors negotiated policy measures at five 'climate tables,' including electricity,

industry, mobility, agriculture and the built environment (Ministry of Economic Affairs & Climate Policy et al., 2019). Meanwhile, the climate targets have become more ambitious, with the European Union's (EU) Green Deal of President Ursula von der Leyen and former Commissioner Frans Timmermans aiming for a 55 percent reduction in CO_2 emissions by 2030. As one of the 27 EU members, the Netherlands is committed to implementing the policy instruments of the European Green Deal (European Commission, 2019).

Regarding the phase out, the Netherlands had abundant fossil energy, including natural gas. There is a strong business network between the oil and gas companies and the Dutch government. This cooperation is known as the 'gas building' (Parliamentary Committee of Inquiry into Natural Gas Extraction in Groningen, 2023a). Since the discovery of the Slochteren gas field in the province of Groningen in 1959, millions of households and businesses have consumed cheap natural gas from this field. The joint venture between the oil and gas companies Shell and ExxonMobil, known as the Dutch Petroleum Company (Nederlandse Aardolie Maatschappij, NAM), produces the natural gas. NAM participates in the dormant public-private 'Partnership Groningen' with Energy Management Netherlands (EBN) on behalf of the Dutch government. Shell, ExxonMobil, EBN and the Dutch government are also shareholders in GasTerra. GasTerra has a contractual obligation to purchase natural gas from the NAM.

Seven offshore wind farms on the Dutch continental shelf in the North Sea also played an important role in the introduction of renewable energy. The energy multinationals Vattenfall (formerly known in the Netherlands as Nuon), Shell and Eneco, the technology manufacturers Mitsubishi and Siemens, and the offshore company Van Oord developed the offshore wind farms because of their expertise in offshore drilling and energy transition (NEA, 2023a). The phase in of hydrogen, which could be linked to the offshore wind farms for electrolysis, involves the natural gas distributor Gasunie, the Ministry of Economic Affairs & Climate Policy, the port authorities of Amsterdam and Rotterdam, and the energy companies British Petroleum, ExxonMobil, Shell, and Vopak. In the industrial clusters of Amsterdam-IJmuiden, the Port of Rotterdam, Eemshaven, Chemelot and the Zeeland-Schelde region, steel, glass, ammonia and fertilizer producers and refineries demand hydrogen with a significant CO_2 reduction potential (Ministry of Economic Affairs & Climate Policy, 2022).

Various companies are involved in the development of onshore wind farms and solar parks during the deployment phase. The large energy companies Vattenfall (Nuon),

Essent and Eneco produce and trade gray and sustainable electricity, while local initiatives are increasingly involved in the local production of sustainable electricity (Hier Opgewekt, 2022; Straver, 2021). Six public energy network companies distribute electricity and gas through regional distribution networks, including Coteq, Enexis, Liander, Rendo, Stedin and Westland Infra. The public owners of the regional network companies are municipalities and provincial authorities. Two state-owned companies distribute electricity (Tennet) and gas (Gasunie) through the main energy networks (Network Management Netherlands, 2023). The production and sale of energy are legally separated from public distribution to prevent energy monopolies (Reijn, 2017).

Since the liberalization of the energy market in 1998, local energy cooperatives have been established as innovators for the phase in of renewable energy (Lagendijk et al., 2021). These energy cooperatives are grassroots initiatives committed to the production, distribution, and consumption of sustainable energy. The legal form of a cooperative allows for collective management and ownership of energy assets. Financial resources are typically shared among cooperative members. Initially, these cooperatives were conceived as novel organizational entities to support local, decentralized and community energy. In addition to the motivation to act sustainably, cooperatives have commercial reasons to participate in the phase in (De Bakker et al., 2020). Initiatives have also been taken at the regional or provincial level. For example, in 2013, the energy network company Alliander (Liander) and an environmental group decided to start the sustainability discourse in the province of Gelderland to implement the Energy Agreement (SER, 2013). Shortly thereafter, another environmental group joined the initiative. In 2015, around one hundred organizations signed a memorandum of understanding and launched the public-private partnership Gelderland Energy Agreement (GEA). The goal of this business network is to achieve climate neutrality in the Dutch province of Gelderland by 2050 at the latest (Van der Ploeg et al., 2015). In 2018, the provincial authorities of Gelderland added the goal of reducing CO_2 emissions 55 percent by 2030 to the goals of the GEA. Recently, the PPP adopted the program structure of the Climate Agreement (Ministry of Economic Affairs & Climate Policy et al., 2019), including the built environment, businesses, industry and institutions, mobility, sustainable energy, agriculture, and land use (GEA, 2021). GEA included a policy instrument of information exchange.

2.3.2 Data collection

For this study, we collected information from the scientific literature (Paul & Criado, 2020), a media analysis of Dutch newspapers (Altheide & Schneider, 2013), and a document analysis of policies (Bowen, 2009) for the period between the conclusion of

the Energy Agreement in 2013 and the peak in energy prices in 2022 (Persson, 2022; SER, 2013). The literature review examined the framing of focusing events and policy adoption in academic studies (Farley et al., 2007; Salazar-Morales, 2018). The media and document analyses allow data collection on focusing events, framing contests and policy instruments.

For the document analysis, we searched the corporate websites of key actors for research reports and climate policies. The main websites were the Social Economic Council (SER, 2013), the Ministry of Economic Affairs & Climate Policy et al. (2019), the Ministry of Economic Affairs & Climate Policy (2018, 2019, 2022), the Netherlands Enterprise Agency (2023a, b) and Statistics Netherlands (Statistics Netherlands, 2022a-c; 2023a-e). The document analysis enabled the mapping of rules, financial incentives and information, and a policy comparison between the phase out and phase in.

In addition, we identified an event as a focusing event if it (1) occurred at the national level (we excluded events at the international level), (2) had a societal impact at the national level, (3) received media attention, and (4) led to one or more policy responses. Another selection criterion was that (5) actors contested the understanding of the event (Kaplan, 2008; Kingdon, 2003). We also examined (6) different newspaper sources so that more authors emphasized the importance (Yin, 2003). The six criteria were discussed in the research team during the selection of the focusing events, thus contributing to the construct validity. We supported the reliability of the research with a media search in Dutch quality newspapers and we developed a database of 254 articles about the energy transition in the Netherlands. We used the LexisNexis database of Radboud University to collect the media articles. The inclusion criteria incorporated search terms such as 'energy taxation', Emissions Trading System', 'climate agreement', 'climate legislation', 'coal power', 'liberalization', 'network congestion', Postal Rose rule', 'hydrogen', 'energy balancing' 'SDE subsidy', 'gas-induced earthquakes', 'Urgenda', 'Milieudefensie versus Shell', 'heat', 'offshore wind power' and 'onshore wind power'. The articles have been selected pragmatically with thematic relevance for the Dutch energy transition. An exclusion criterion was environmental policy issues that did not relate to sustainable energy, such as water pollution and environmental degradation.

As part of a media analysis, we divided the media articles into 24 thematic categories according to a subdivision of topics relating to different energy sectors, distinguishing between coal, oil and gas, offshore wind, hydrogen, onshore wind and solar. Articles belonging to the same category have been archived in the same digital folder. We then cross-referenced the newspaper articles with research reports,

policies, and statistical data to support the reliability of the research (Bowen, 2009). We developed the 24 thematic categories inductively because the topics under study emerged from the articles themselves. As part of the single case study design, we developed a chronological overview of the phase out and phase in with the newspaper articles and secondary data sources, a research approach we derived from process tracing (Beach & Pedersen, 2013). From the chronological patterns, we identified focusing events and subsequent framing contests and policy instruments.

2.4 Phase out of fossil energy

2.4.1 Phase out of oil and gas

2.4.1.1 Natural gas extraction and distribution

At the time of the Energy Agreement in 2013, the Netherlands had abundant natural gas resources. The Agreement stipulated that 1.5 percent of final energy consumption should be saved. It also called for 16 percent of energy to come from renewable sources by 2023 and for 15,000 new jobs to be created in the sustainable energy sector. The voluntary pact supported Europe's climate goals of reducing carbon emissions by 80 to 95 percent by 2050. The agreement positioned natural gas as a 'clean' fossil fuel. As a result, the phase out of gas-fired power plants was not yet in question (SER, 2013).

In 1947, ExxonMobil and Shell formed a 50-50 joint venture called the Dutch Petroleum Company (NAM). In 1959, NAM discovered a gas field in Slochteren, in the northern part of the Netherlands. The field proved to be the largest gas field in Europe and one of the largest in the world. NAM became responsible for the gas production. Since 1963, the NAM has held a sixty percent stake in the dormant public-private 'Partnership Groningen' (PPP) for gas production, while the Dutch state held a forty percent stake (Parliamentary Committee of Inquiry into Natural Gas Extraction in Groningen, 2023a, b). Gas revenues have enabled the Dutch government to fund the welfare state, with revenues contributing 2.3 percent (2013) of gross domestic product (GDP) (Statistics Netherlands, 2022a).

Natural gas has been the main source of heating for Dutch households for decades (Statistics Netherlands, 2022b). Policy rules stipulate that Gasunie and the regional network companies operate the gas network and supply the low-calorific gas to households, companies and public utilities (Gasunie, 2022a). The gas network is more than 136,000 km long and connects almost 7.2 million Dutch households. The boilers of households, small businesses and public utilities consume only the low-

calorific gas from Slochteren, which contains 14 percent nitrogen. Natural gas also dominates electricity generation, accounting for 39.6 percent in 2022 (Statistics Netherlands, 2023a).

In addition to onshore gas production in Slochteren, the small gas field policy includes about 150 smaller fields on the continental shelf of the North Sea and the Waddenzee, which produce about 28 percent of Dutch domestic gas (NAM, 2023a). The smaller fields produce high-calorific gas for industry, such as steel and aluminum producers. The gas contains one to two percent nitrogen, which gives it a high calorific value. Gasunie feeds the high-calorific gas into the onshore gas network at three locations along the Dutch coast: Uithuizen, Callantsoog and IJmuiden. Gasunie pressurizes the gas and distributes it to industry. Between 2013 and 2021, the gas supply to the industry stabilized between 13 billion m^3 and 12.5 billion m^3 (Statistics Netherlands, 2022c).

2.4.1.2 Gas-induced earthquakes

Gas-induced earthquakes have been occurring in Groningen since 1976. Local communities believed that gas extraction was causing the earthquakes, threatening human health and material property. Since the 1980s, gas extraction has peaked at 53.8 billion Nm^3 in 2013, accompanied by 119 annual gas-induced earthquakes (Government of the Netherlands, 2022). In the first cabinet of Rutte II, the NAM and the petrochemical companies Shell and ExxonMobil framed gas extraction as obviously for profit, a reliable energy supply and the financing of the welfare state. The NAM continued with gas drilling as business as usual (Parliamentary Committee of Inquiry into Natural Gas Extraction in Groningen, 2023c). As a result, local communities felt increasingly subordinated, as very few actors took their concerns about the effects of the earthquakes seriously (Carton & Ache, 2017).

Cabinet Rutte II, eventually Rutte III, and the NAM framed the ongoing gas-induced earthquakes as unimportant, even though they expected more gas-induced earthquakes in the future. At the same time, they did not frame the continuing gas-induced earthquakes as critical enough for a major policy change. This framing allowed the Minister of Economic Affairs & Climate Policy, Henk Kamp, to legitimize an incremental policy of small-scale building reinforcement (Parliamentary Committee of Inquiry into Natural Gas Extraction in Groningen, 2023b). In 2017, local communities labeled the NAM as a criminal organization and threatened it with prosecution due to growing concerns about the effects of gas-induced earthquakes. However, the threat of prosecution did not accelerate negotiations between the local communities, the Rutte III cabinet, the NAM, Shell, and ExxonMobil.

In 2018, the focusing event of a gas-induced earthquake took place in Zeerijp, near Slochteren. This focusing event became a game changer. The event legitimized a major policy change, as the earthquake had a magnitude of 3.4 on the Richter scale, the strongest earthquake in five years and the highest soil replacement in the Groningen region ever. As a result of a fierce framing contest over responsibility for the event, Minister of Economic Affairs & Climate Policy Eric Wiebes decided that the Rutte III cabinet would take over responsibility from the NAM for determining the level of gas production. For safety reasons, Minister Wiebes set the maximum annual gas production level at 12 billion Nm^3. The minister also issued the rule that gas production would cease after 2022. As of today, the cabinet determines the production level, while the NAM carries out the drilling (Parliamentary Committee of Inquiry into Natural Gas Extraction in Groningen, 2023b).

The framing contest about the Zeerijp earthquake forced Minister Wiebes to initiate a policy of persuasion towards the industry. On behalf of the Rutte III Cabinet, he sent a letter to the 200 largest industrial gas consumers, demanding that industry disconnect from Groningen Gas by 2022. The industry had the choice between consuming high-calorific gas or disconnecting from the gas network (Ministry of Economic Affairs & Climate Policy, 2018). The letter supported the framing contest with the industry leaders, as the latter interpreted gas disconnection as financially damaging to the business climate and framed it as a threat to the economy rather than to health. As the communication strategy did not work sufficiently, Minister Wiebes issued the rule to force the nine largest industrial consumers to disconnect from the gas network (Brandsma & Zuidervaart, 2018). The industry resisted but also realized that investments in a nitrogen factory were unavoidable. The nitrogen factory could convert high-calorific gas from abroad and offshore installations into low-calorific gas. In this way, gas connection would remain an alternative for the industry, albeit more expensive than before (Reijn & Van Staalduine, 2018).

Minister Wiebes' policy led to a decline in gas production from 18.8 billion Nm^3 in 2018 to zero in 2023 (Levi, 2023; NAM, 2023b). At the same time, the annual number of earthquakes decreased from 89 in 2018 to 52 in 2022. However, gas-induced earthquakes are not expected to disappear because the ground has been depressurized for years (Government of the Netherlands, 2022). Since 2018, the closure of Slochteren has turned the Netherlands into a net gas importer, as offshore gas production cannot compensate for the closure (Gasterra, 2019).

Meanwhile, the Rutte III cabinet adopted the policy instrument of raising awareness about the impending closure of the Slochteren gas field. The Climate Agreement

stated that it was necessary to shut off the gas supply to seven million households and one million buildings by 2050 (Ministry of Economic Affairs & Climate Policy et al., 2019). Therefore, the cabinet initiated the new policy called 'Gas Free Neighborhoods'. This policy included an information campaign on gas disconnection in residential areas. The policy included a trajectory of voluntary learning and experimentation, as the cabinet stopped downplaying the focusing event of gas-induced earthquakes (Government of the Netherlands et al., 2023). The campaign was subsidized with 118.2 million euros (Ministry of Finance, 2023).

After the Zeerijp earthquake, the framing contest focused on the causes, risks and effects of gas extraction. The Rutte III cabinet responded by setting up a parliamentary committee to investigate gas extraction. The committee confirmed that various cabinets, NAM, Shell and ExxonMobil had structurally neglected the interests of local communities. By framing the earthquakes as unimportant, a policy of profit maximization took precedence for decades. In sixty years, the NAM extracted 2,246 billion Nm^3 of Slochteren gas, generating 363 billion euros for the national treasury. The gas extraction caused 1,615 earthquakes, 267,466 claims for damages and made at least 11,880 addresses unsafe. Gas extraction also caused health problems and stress among local communities. As a result, the parliamentary committee concluded that Dutch society owed a debt of honor to Groningen (Parliamentary Committee of Inquiry into Natural Gas Extraction in Groningen, 2023b). The Rutte IV cabinet reaffirmed the debt of honor and promised financial compensation (22 billion euros), regional investment, and a faster settlement of claims (Levy & Rutten, 2023; Van den Berg, 2023).

2.4.1.3 Bringing oil and gas to trial

In 2019, the Environmental Defense Force (Dutch: 'Milieudefensie') framed the oil and gas drilling of the oil and gas company Shell as a threat to the global climate because GHG contribute to global warming. Therefore, the environmental movement launched a climate lawsuit against Shell and initiated a framing contest. Shell perceived the company's oil and gas extraction activities as important to its business and performance. If Shell did not develop the oil and gas fields, its competitors would take over (Straver, 2020). The court ruled that Shell was responsible for dangerous climate change and required a 45 percent reduction in corporate CO_2 emissions by 2030 compared to 2019 (Hofman, 2021). In response to the lost climate lawsuit, Shell's shareholders began to see the climate lawsuit as an opportunity for change and agreed to a 50 percent reduction in carbon emissions by 2030 compared to 2016. They also approved a new corporate policy to achieve carbon neutrality by 2050 and a climate action plan (Economic Board, 2022).

Despite Shell's downplaying of the focusing event, the multinational decided to appeal to the judiciary (Hofman, 2021). Not all of Shell's shareholders agreed with the appeal, but the appeal intensified the framing contest (Van de Weijer, 2022a). The multinational highlighted its recent investment in a hydrogen plant in the port of Rotterdam (684 million euros) as an opportunity for the energy transition to win in court (Van der Veen, 2023). In contrast, Milieudefensie interpreted Shell's implementation of the climate court ruling as too slow, also because Shell has just initiated ten new oil and gas wells. As a result, Milieudefensie extended the framing contest against Shell by emphasizing the threat of Shell's oil and gas extraction policies to society, the global climate, and future generations (Straver, 2022a).

In the preamble to the appeal, Shell moved its headquarters from The Hague to London. Shell framed the movement as an opportunity to influence policy for a more efficient corporate structure. According to Shell, the lost climate case was irrelevant to the movement (Dekker, 2021). Opponents, however, saw the movement as a missed opportunity for the phase out because the cabinet can still have less influence on Shell's extraction policies. The framing contest over the movement may change Shell's corporate policy of negotiation, solidarity, and long-term strategy to maximize shareholder value in the future (Van Kranenburg, 2021).

In 2022, Russia attacked Ukraine, causing the focusing event of a skyrocketing gas price. Natural gas became about 12 times more expensive compared to the pre-war period. Shell earned the highest annual profit of 38.5 billion euros in the company's history from the production and refining of oil and natural gas. Shell framed the exorbitant returns as an opportunity to satisfy shareholders' demands for profit. Some actors, however, saw the company's exorbitant profits as a threat because consumers risked falling into energy poverty. Others perceived Shell's exorbitant profits as a threat because the company's limited investments in sustainable energy ranged from 1.5 to three percent. These profits would not encourage Shell to invest more in corporate sustainability. Because corporate sustainability investments were scarce and difficult to track, Milieudefensie perceived Shell as a threat to society, the environment, and future generations (Schwartz, 2023; Straver, 2022a). Figure 2 shows the phase out of oil and gas in the Netherlands between 2013 and 2022.

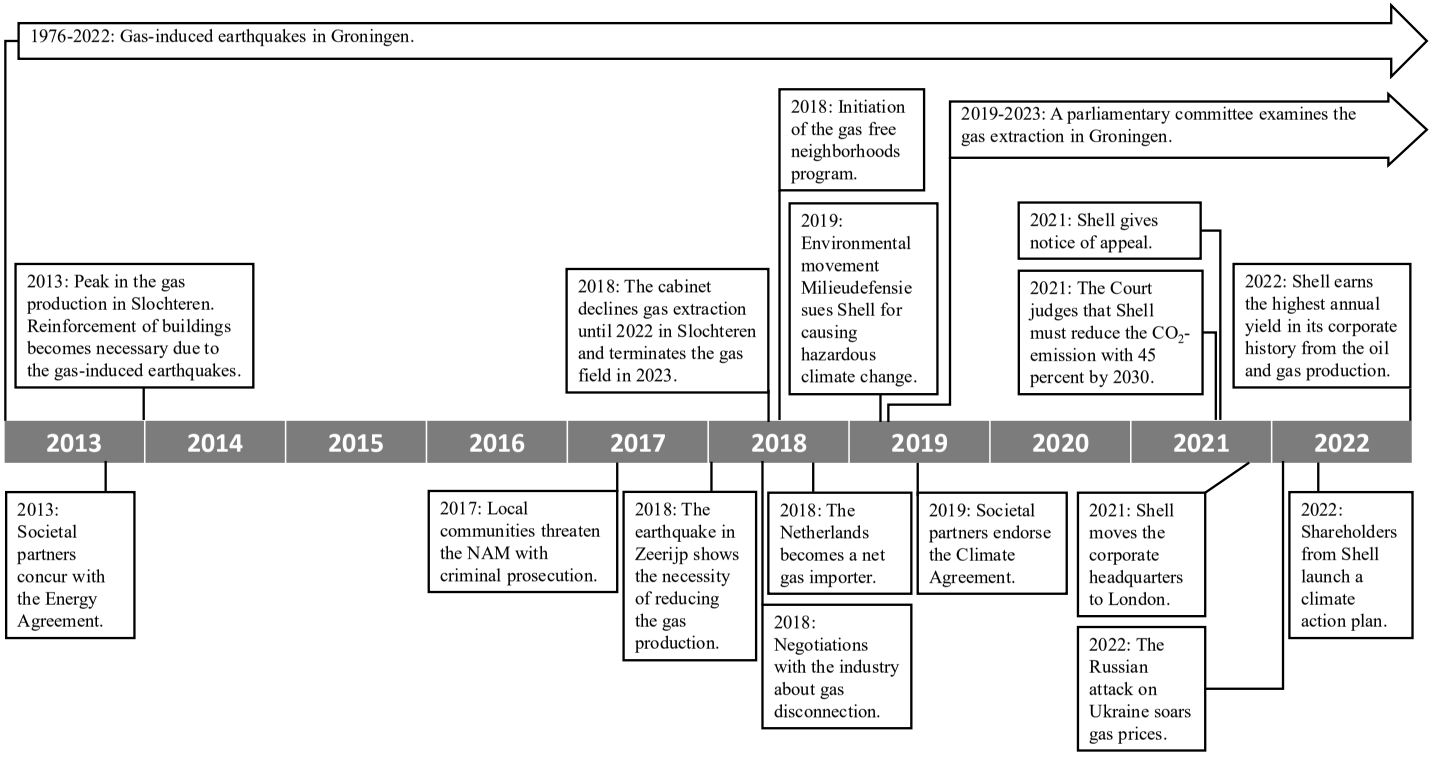

Figure 2: Phase out of oil and gas.

2.4.2 Phase out of coal power

2.4.2.1 Two generations of coal-fired power

GHG emissions from coal-fired power are imminent, as coal-fired power accounted for 13.9 percent of total electricity generation in 2022 (Statistics Netherlands, 2023a). Coal-fired power emits significant amounts of particulate matter, soot and CO_2. As early as 2013, a framing contest arose because the signatories to the Energy Agreement framed coal-fired power as a threat to the environment. They agreed to phase out five coal-fired power plants from the 1980s, including Borssele, Amer 8, Gelderland I, Maasvlakte I and II (SER, 2013). However, the coal-fired power industry framed the phase out as a threat to its economic survival. In accordance with the Energy Agreement, the Minister of Economic Affairs, Henk Kamp, started to phase out five coal-fired power plants from the 1980s. However, there was no legal basis for issuing rules on the closure of coal-fired power plants from the 1980s. Therefore, on the SER's recommendation, the Minister issued the rule to increase the required efficiency rate to 40 percent. The five coal-fired power plants from the 1980s could not meet the efficiency requirement and had to be shut down by 2017 (SER, 2019).

Five other more efficient coal-fired power plants remained open: Maasvlakte, Onyx, Eemshaven, Amer 9 and Hemweg. Of these five modern plants, a new generation of three had just been commissioned in the Port of Rotterdam and Eemshaven. The efficiency of this new generation of coal-fired power plants was the subject of another framing contest. The coal-fired power sector framed efficient coal-fired power as an opportunity for the energy transition, while critics such as the environmental movement Urgenda highlighted the environmental threats associated with coal combustion (Dekker, 2023; Persson, 2022; Van Santen, 2019).

2.4.2.2 Co-firing of biomass

In addition to increased combustion efficiency, the coal-fired power sector saw biomass co-firing as an opportunity for energy transition and economic survival. Previously, the Energy Agreement limited biomass co-firing to 25 PJ due to the climate impact. However, in 2015, 36.4 percent of the gross electricity production was coal-fired (Statistics Netherlands, 2023b). Therefore, a framing contest arose about the carbon neutrality of co-firing. The coal-fired power sector saw co-firing as an opportunity because it would only emit CO_2 from the organic life cycle, presenting a 'clean coal' frame (Wolsink, 2020). Critics did not perceive co-firing as carbon neutral and saw it as a threat to the environment because of carbon debt, shrinking forests, biodiversity loss, land use, emissions, spatial displacement and lack of innovation (Salet, 2021; Van de Weijer & Dekkers, 2023). Even an arbitration panel

could not resolve the framing contest during the implementation of the Agreement. In the end, co-firing remained eligible for the 'Stimulation for Sustainable Energy Production' (SDE+) subsidy (SER, 2013 & 2019). Despite the resistance, the financial policy instrument, including the SDE+ subsidy scheme, invested 9.5 billion euros in biomass co-firing between 2013 and 2019 (NEA, 2023b; SER, 2019).

The Energy Agreement was a voluntary pact between 47 stakeholders to phase out coal-fired power. During the term of the Energy Agreement, the Rutte II cabinet committed to the Paris Agreement. The Paris Agreement committed 195 countries, including the Netherlands, to limit the global average temperature increase to two degrees Celsius above pre-industrial levels, including efforts to limit the increase to 1.5 degrees (UNFCCC, 2015 & 2023). In response to the Paris Agreement, Members of Parliament Klaver and Samson initiated a focusing event by proposing a Climate Act (Hendrickx, 2018). In Parliament, the Climate Act triggered a framing contest, as the political parties PvdA, GroenLinks and D66, and ChristenUnie pursued the legal enforcement of climate policy in response to the Paris Agreement. The liberal-conservative parties VVD and CDA, on the other hand, feared a deterioration of the business climate due to higher environmental costs. After lengthy negotiations, the House of Representatives and the Senate passed the Climate Act by consensus. The main objective of the Climate Act was to reduce greenhouse gas emissions by 49 percent by 2030 and by 95 percent by 2050. It also sets a goal of carbon-neutral electricity generation by 2050. The Climate Act prescribed a policy plan to achieve the climate targets and monitoring (Hofs, 2019a). The Climate Agreement included the policy plan and elaborated on the monitoring rules to implement the Climate Act (Ministry of Economic Affairs & Climate Policy et al., 2019).

After the introduction of the Climate Act, the Energy Agreement became an integral part of the Climate Agreement (SER, 2019). The Climate Agreement continued the framing contest on biomass co-firing. Signatories framed co-firing as a threat and called for cascading adoption, sustainability criteria, annual monitoring, and flexibility in coal-fired electricity production. The signatories supported less SDE+ subsidies due to the negative impact of biomass burning on air quality (Ministry of Economic Affairs & Climate Policy et al., 2019). Finally, in 2022, the Rutte IV cabinet abolished biomass subsidies for co-firing, due to societal concerns about particulate matter emissions. There were also concerns about the deforestation of virgin forests and the violation of human rights for biomass production (NRC, 2022a). However, unlike the Rutte IV cabinet, the EU framed biomass co-firing to reduce CO_2 emissions and limit energy dependence on Russia. Today, the EU subsidizes biomass to the tune of 17 billion euros. As a result, biomass accounts for sixty percent of sustainable energy production in Europe (Frost & Swart, 2023). So far, the EU and the Rutte IV cabinet

have been able to partially align their policies. The EU tightened the subsidy criteria for biomass combustion, while the cabinet abolished the subsidies. Nevertheless, the co-firing of biomass remains an ongoing framing contest in the coal-fired power sector (Van de Wiel, 2023). As a result, co-firing biomass in electricity production amounted to 7.2 percent in 2022 (Statistics Netherlands, 2023a).

2.4.2.3 Climate lawsuit against coal-fired power

In 2013, the environmental movement Urgenda started a framing contest with the preparation of a climate lawsuit against cabinet Rutte II due to the allegedly slow implementation of the coal phase out. According to the EU 2020 climate targets, cabinet Rutte II intended to limit CO_2 emissions by 20 percent compared to 1990 by 2020 (European Parliament, 2018). However, Urgenda demanded that the cabinet reduce CO_2 emissions by 25 percent in 2020 to speed up the implementation of the climate policy. For the first time, an environmental movement sued a national government over a weak climate policy commitment (Hofs, 2019b). Urgenda framed the dispute in such a way that the Rutte II cabinet breached its duty of care to present and future generations because GHG emissions from the coal-fired power sector were harmful to public health. The continuation of coal-fired power plants was also unlawful because of the lack of protective measures to save people and the environment. Urgenda also stated that it would be more cost-effective to act now than to impose more radical and expensive climate measures on coal-fired power production in the future (The Hague District Court, 2015).

During the framing contest, the Rutte II cabinet recognized the importance of protecting current and future generations from climate change. At the same time, the cabinet defended that it was already implementing an adequate climate policy in line with European policy. As a result, the government supported reasonable policies and did not violate the duty of care. The government could not be forced by law to change its climate policy because of the separation of powers between the judiciary and the legislature. A higher emission reduction would violate the competitive position of Dutch companies. Moreover, the Dutch contribution to global climate change is negligible, so the government should not pursue a stronger climate policy. Finally, a focusing event occurred because the court ruled that a faster implementation of climate policy was possible without disproportionately high investments. The focusing event forced the cabinet to reduce carbon emissions by at least 25 percent from 1990 levels by 2020. Urgenda thus won this first climate case (The Hague District Court, 2015).

Instead of implementing the climate ruling, however, the new Rutte III cabinet decided to continue the framing contest and appealed to the judiciary against Urgenda. In

doing so, the cabinet supported the coal-fired power sector. This time, the cabinet framed climate policy as a matter of political and not legal decision-making, so that the climate judgment would be an illegitimate legal intervention (Hofs, 2019b). Urgenda defended that it was not asking for a substantial change in climate policy, but for faster implementation. The cabinet had also voluntarily agreed on climate policy, so it was reasonable for the government to uphold its own climate commitment. Finally, a new focusing event took place because the Court of Appeal reaffirmed the Urgenda rule from 2015. The cabinet had not yet taken sufficient climate action. The cabinet violated the duty of care because climate change violates the human right to life and the protection of one's own sphere of life. Therefore, the government had to reduce greenhouse gas emissions 25 percent by 2020 (The Hague Court of Appeal, 2018).

However, despite the focusing event of a lost appeal, the Rutte III cabinet believed that it could win the framing contest at the Supreme Court. The reason for this conviction was that the cabinet was pursuing the EU policy of reducing greenhouse gas emissions by 20 percent by 2020. This reduction target would be sufficient. However, unexpectedly for the cabinet, the Supreme Court confirmed the decision of the courts. It confirmed the GHG reduction target of 25 percent by 2020. The Supreme Court also ruled that the judiciary did not interfere in political decision-making because the judge did not determine the content of the climate policy. The court only stated that the achievement of the climate target was obvious (Supreme Court, 2019). The Rutte III cabinet experienced a crisis, with only one year left before the 2020 deadline and few climate policies in place. The cabinet had to react quickly because CO_2 emissions had only decreased by 7 percent in 2019 compared to 1990 (Statistics Netherlands, 2023c; Van Santen, 2020). The cabinet therefore quickly decided to close all coal-fired power plants by 2030 (Hofs, 2021). In addition, the Hemweg coal-fired power plant already ceased production in 2019 (Schwartz, 2019). As a result, the Rutte III cabinet barely met the CO_2 reduction target of 25.5 percent in 2020, but the Corona pandemic, lower economic activity, and a warm year may have supported the achievement of the climate target (NRC, 2022b).

In response to Urgenda's three focusing events, Dutch coal-fired power plants demanded compensation for the ban on coal-fired power by 2030. According to this energy sector, a predicted closure before the end of the economic life cycle would lead to lower revenues in the long term. The coal-fired power sector decided to sue the Rutte III cabinet and demanded compensation totaling 3.6 billion euros (Hofs, 2021; Van Gestel, 2023). This led to a framing contest between the coal-fired power sector, the cabinet and environmental organizations. The coal-fired power sector framed the potential lack of compensation as a violation of property rights. The Rutte III cabinet

and environmental movements framed the dispute as an unreasonable demand for overcompensation from a polluting and dying energy industry (Persson, 2022). The coal-fired power sector lost its legal claim for compensation because the court ruled that Cabinet Rutte III had not violated property rights and had acted in accordance with climate legislation. Furthermore, a foreseeable closure in 2030 did not impose disproportionate political measures on the coal-fired power plants. The plant owners could have known that the cabinet would ban coal-fired power in the future, even during the planning and construction of a new generation of coal-fired power plants in the Port of Rotterdam and Eemshaven (ANP/Bloomberg, 2022).

2.4.2.4 Wavering phase out policies

In 2022, the Rutte III cabinet issued a rule that the coal-fired power sector had to run at 35 percent of total production capacity, thus addressing the Urgenda focusing events (Van der Walle, 2021; Dekker, 2023). Coal-fired power plants were just running at 35 percent of capacity (Schwartz, 2022a) when a new focusing event emerged. A soaring gas price following the Russian attack on Ukraine forced the new Rutte IV cabinet to restart the coal-fired plants at full capacity to ensure energy security for the time being. The high gas price made gas-fired power generation too expensive, as the gas price rose from around 75 euros per MWh before the attack to 330 euros in August 2022. Thereafter, the gas price dropped significantly and returned to pre-war levels (NOS, 2023). Despite the Urgenda ruling, the cabinet reframed coal-fired power as unavoidable to ensure energy security for households and businesses (Bremmer, 2022).

The return of coal-fired power temporarily squeezed gas-fired power out of the market, but this was necessary to conserve natural gas. The reserve was needed to ensure that residents could heat their homes in the winter of 2022-2023. In addition, the gas-fired plants were easier to turn on and off than the inflexible coal-fired plants. Four coal-fired power plants continued to operate at full capacity, accounting for about 13.6 percent of gross electricity production (2021) and emitting two to four percent of total Dutch emissions (Statistics Netherlands, 2023b; Van Gestel, 2023). The uneven phase out of coal-fired power shows that a focusing event can radically overturn policy rules. Despite the repetition, bereavement occurs because the coal-fired power sector becomes increasingly aware that it is becoming a declining industry.

Until recently, the European Emissions Trading System (ETS) has also been a wavering phase out policy due to the free allocation of emission allowances. The ETS monetizes CO_2 emissions from the coal-fired power sector. The system provides a financial platform on which coal-fired power companies trade emission allowances.

The ETS is based on European legislation and the rules have a direct impact on the Dutch coal-fired power sector. According to the ETS rules, companies in the coal-fired power sector with a minimum operating capacity of 20 MW are required to participate. The four current coal-fired power plants easily exceed this threshold. The ETS provides financial incentives to decarbonize, as an emissions cap combined with the issuance of scarcer allowances over the years stimulates a higher ETS price. Coal-fired power plants that exceed the cap must purchase additional ETS allowances to continue emitting CO_2. Plants with CO_2 emissions below the cap can sell allowances and profit from investments in low-carbon technologies (Straver, 2023). For years, the ETS price remained low due to the free issuance of ETS allowances by various cabinets, providing little incentive to decarbonize. More recently, the ETS price has risen from around 10 euros in 2015 to 80 euros in 2022, as the Rutte III and IV cabinets restricted the free issuance of ETS allowances (DEA, 2023). Fewer allowances and the corresponding higher ETS price increased the financial pressure on coal-fired power plants to decarbonize and stimulate investment in low-carbon technologies. Figure 3 shows the phase out of coal power in the Netherlands between 2013 and 2022.

2.4.3 Overview of focusing events on the phase out of fossil energy

Figure 4 provides an overview of the focusing events on fossil energy phase out. The unplanned focusing events, framing contests, and policy instruments interact. Focusing events overturn rules and financial incentives, especially when the events are unexpected and have a significant impact. For years, the government and the oil and gas companies framed gas production policy in terms of profit maximization and energy security. Gas revenues were prioritized at the expense of the safety and health of local communities. The sudden focusing event of a strong gas-induced earthquake initiated a strong framing contest against the gas extraction, so that the Rutte III cabinet had to change the policy, reduce and finally stop the gas extraction. For a long time, the policy of profit maximization had neglected earthquakes as a powerful non-human actor. Since the Zeerijp earthquake, the cabinet has become aware that policies can be overturned when actors perceive a focusing event as critical.

The Rutte III cabinet also decided to gradually phase out coal-fired electricity (Figure 4). Urgenda was an unpleasant surprise for the government, as the Rutte III cabinet believed that the EU's 20 percent emissions reduction target would be sufficient. The three focusing events on the Urgenda court rulings showed that this climate policy was too ineffective and slow in implementation (The Hague District Court, 2015; The Hague Court of Appeal, 2018; Supreme Court, 2019). Urgenda expected to win, and it did, as the judges ruled that a climate target of a 20 percent reduction in greenhouse gas emissions was insufficient to mitigate climate change.

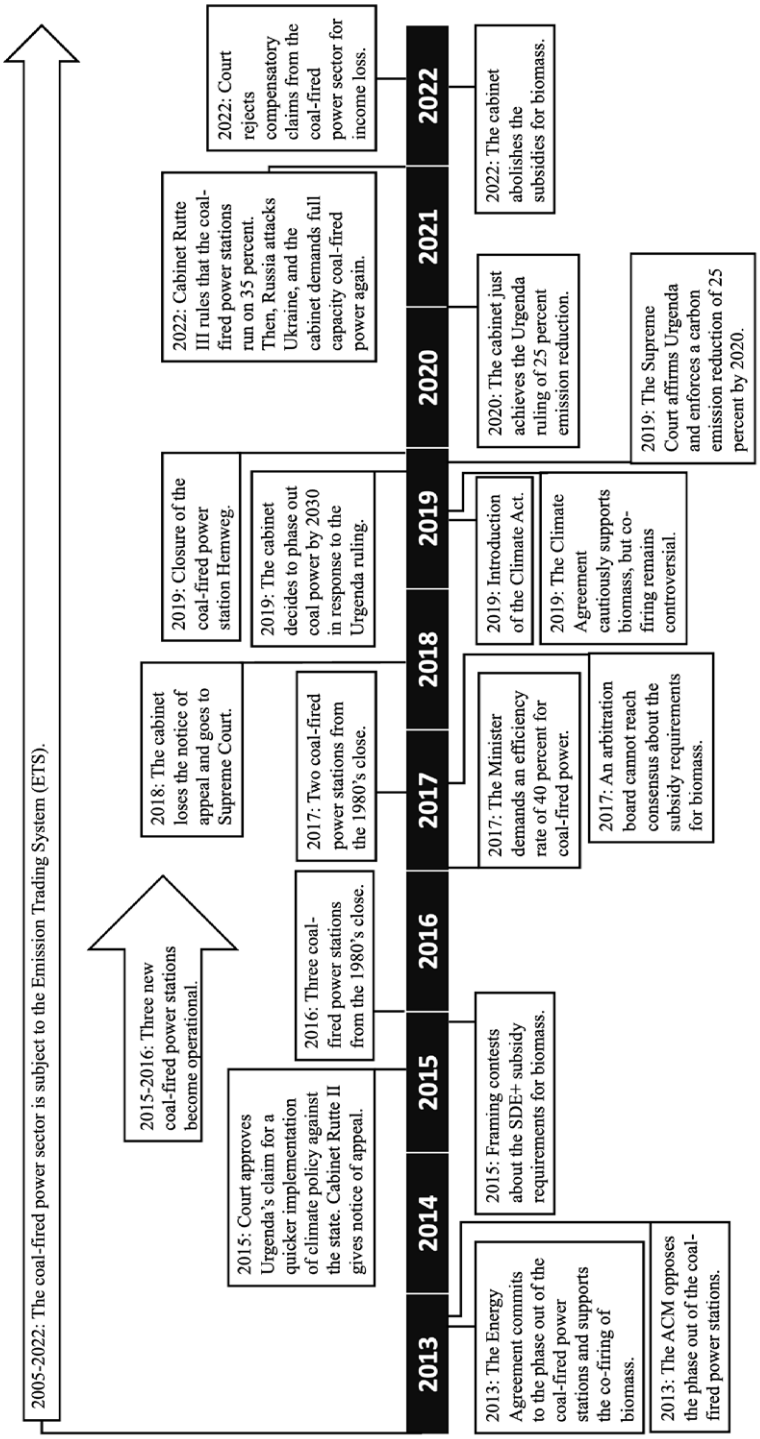

Figure 3: Phase out of coal power.

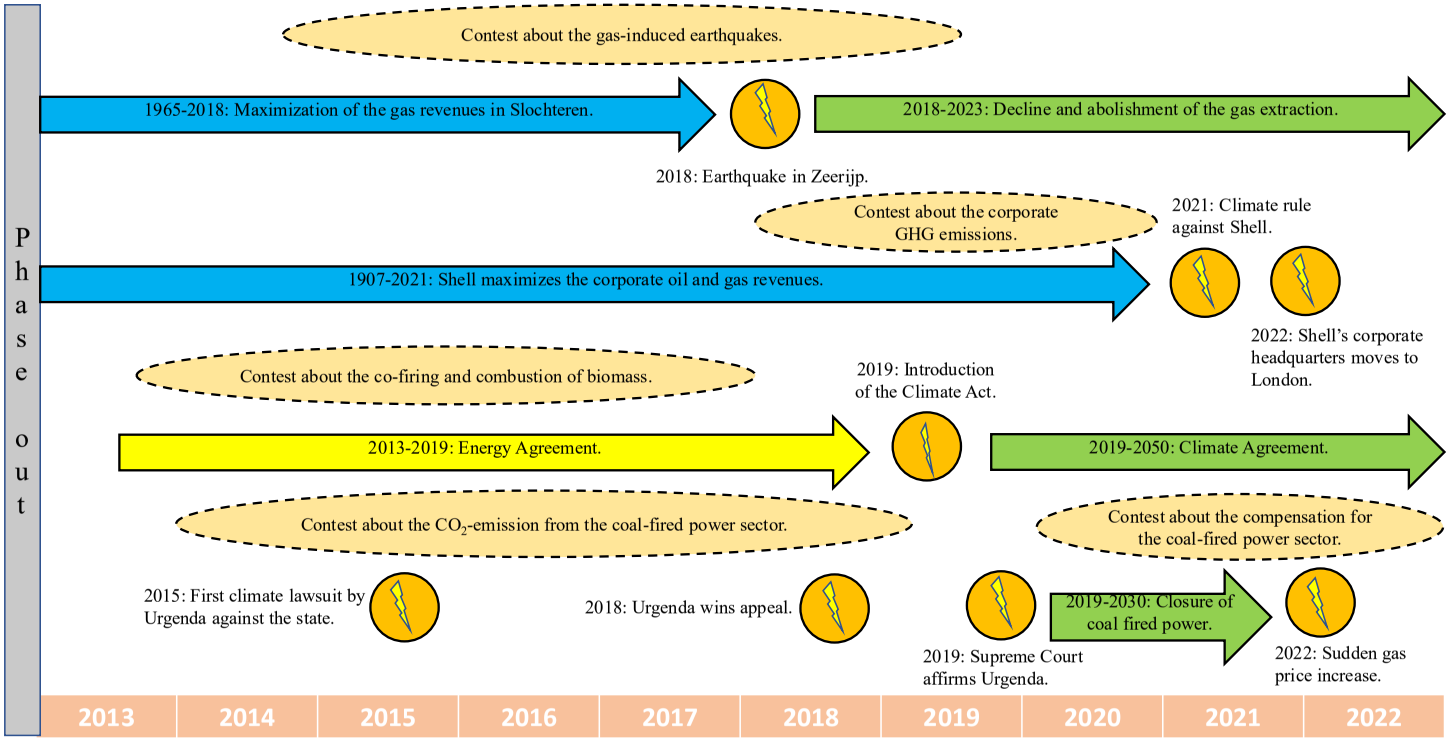

Figure 4: Focusing events, framing contests and policies in the phase out of fossil energy in the Netherlands between 2013 and 2022. The circles (with a lightning bolt) represent the focusing events. The ellipses show framing contests. The arrows indicate the duration of the phase out policies. The green arrows refer to the use of rules, the blue arrows incorporate financial incentives, and the yellow arrow includes the policy instrument of sharing information.

After the focusing event of the Supreme Court ruling, the Rutte III cabinet moved quickly to address the urgency, introducing new rules and financial incentives. The cabinet decided to phase out coal-fired electricity by 2030. Cabinet Rutte III also issued the rule to maximize coal-fired electricity production at 35 percent of total capacity (Dekker, 2023). It reserved the financial incentive of a compensation scheme for the departing coal-fired power industry in the amount of 3.6 billion euros. However, a framing contest ensued because the coal-fired power sector considered the compensation to be insufficient. The cabinet and environmentalists, on the other hand, perceived the risk of overcompensation and of not meeting the Urgenda deadline. Cabinet Rutte III and the coal-fired power sector challenged the compensation in court. The court ruled that the coal-fired power sector had to withdraw the compensation claim (Hofs, 2021). Shortly thereafter, the coal phase out was overturned by the focusing event of rising gas prices. The high gas price forced the Rutte IV cabinet to renegotiate with the coal-fired power sector to produce electricity at full capacity. The sector agreed to maximize production. However, the focusing event emphasized that the coal-fired power sector was still needed to ensure energy reliability (Bremmer, 2022).

2.5 Phase in of renewables

2.5.1 Phase in of offshore and onshore wind energy

2.5.1.1 Offshore wind energy

Wind energy played an important role in the Netherlands even before the Energy Agreement was signed. Investments were made in onshore and offshore wind turbines. The first offshore wind farms, Egmond aan Zee and Princess Amalia, became operational in 2007 and 2008. The two wind farms produce 228 MW. The commissioning took place five to six years before the Energy Agreement was negotiated. The companies Shell and Nuon invested in Egmond aan Zee, while Eneco invested in Princess Amalia (NEA, 2023a; Netherlands Court of Audit, 2018). For the first phase, the Energy Agreement aimed to expand wind farms and targeted the development of 4,450 MW of offshore wind power by 2023. The financial incentives from the SDE+ subsidy supported the expansion of offshore wind farms, for which investors could apply. Between 2013 and 2023, the government granted 11.5 billion euros in SDE+ subsidies for the development of the offshore wind farms (Netherlands Court of Audit, 2018). Economies of scale and technical standardization of the wind farms made it possible to reduce costs by forty percent. As a result of the cost reduction, public subsidies would no longer be necessary in the medium term. The Energy Agreement also enabled more efficient permitting, shorter lead times, consensus, and coastal economic development (SER, 2013).

The upscaling of the offshore wind farms occurred with a relative lack of framing contests, as only a few actors were involved. The main actors included various cabinets, the national water board, ministries, the national energy grid company Tennet and investors. As a result, decision-making was efficient and there were few concerns about nuisance. The rules of the new Offshore Wind Energy Act enabled efficient maritime parceling for offshore development (Ministers of Economic Affairs, Infrastructure and Environment, 2015). The Rutte II cabinet planned the offshore wind farms programmatically with reserved maritime locations. The cabinet also decided that the fishing and gas drilling permits were invalid. In this way, large companies developed the offshore wind farms without significant procedural delays. As a result of the procedural acceleration and financial investments, the Luchterduinen and Gemini offshore wind farms became operational in the mid-2010s, adding 729 MW to the total offshore wind capacity. Eneco and Mitsubishi took over the investment policy for Luchterduinen, while Northland Power, Siemens, Van Oord and HVC invested in Gemini (NEA, 2023a). The Rutte II cabinet also decided that the state-owned company Tennet would have the authority to distribute electricity and develop onshore grid connections (SER, 2019; Netherlands Court of Audit, 2018).

During the construction of the offshore wind farms, the Climate Agreement increased the ambition to 49 TWh by 2030 (Ministry of Economic Affairs & Climate Policy et al., 2019). In 2020 and 2021, the offshore wind farms Borssele I-V with a capacity of 1,484 MW will be commissioned. The energy company Ørsted invested in the offshore wind farms Borssele I and II. The Blauwwind II consortium, including Shell, Van Oord, Eneco and Mitsubishi, invested in the Borssele III and IV wind farms. The consortium consisting of Van Oord Renewable Finance, Investri Offshore and Green Giraffe Holding developed Borssele V (NEA, 2023a). In 2022, the Dutch Coast South I and II wind farms were commissioned, adding 740 MW. In 2023, the wind farms Dutch Coast-South III and IV and Dutch Coast-North contributed 1,440 MW. Dutch Coast South is expected to be the first commercially viable offshore wind farm, owned by Vattenfall, BASF and Allianz (Van Weezel & Van de Weijer, 2022; Schwartz, 2022b). Shell and Eneco have also invested in the Dutch Coast North wind farm (NRC, 2021).

Various cabinets and investors framed offshore wind farms as a business opportunity for marginal cost reduction, economies of scale, and technology standardization (Van de Weijer, 2022b; Netherlands Court of Audit, 2018). On average, the development time from permit to completion was reduced to four years (National Water Board, 2023). In 2025, the SDE+ subsidy for offshore wind farms is expected to disappear due to increasing commercial viability (Ministry of Economic Affairs & Climate Policy et al., 2019). The information sharing in the Energy Agreement, the financial incentives

from the SDE+ subsidy, and the new rules for permitting and grid distribution have become possible due to the lack of framing contests, allowing for effective upscaling.

2.5.1.2 Onshore wind energy

In 2013, the Energy Agreement set a target of 16 percent sustainable energy by 2023. The signatories proposed to invest in 6,000 MW of onshore wind farms by 2020. Participation and cooperative ownership contributed to local consensus on resource allocation. It also accelerated the process of allocating onshore wind farms. Faster local planning allowed onshore wind farms to be developed along with infrastructure. The financial incentives from the SDE+ subsidy supported the investments (SER, 2013). Between 2013 and 2020, the government invested 11.6 billion euros of SDE+ subsidies in onshore wind farms (NEA, 2023b). Provincial and regional initiatives also stimulated onshore wind development. For example, the GEA adopted the policy instrument of information exchange to achieve a carbon-neutral society in Gelderland by 2050. The regional signatories had the ambition to realize 230.5 MW of wind power. The public, private and community sectors sought consensus on the phase in of onshore wind farms. The GEA proposed the financial incentives for cooperative ownership and subordinated loans for the implementation of onshore wind power. The developers could repay the subordinated loans with the exploitation of the onshore wind farms. The regional signatories also agreed that municipalities should support onshore wind energy by identifying allocation areas. These areas could become potential sites for onshore wind energy allocation if the current wind energy policy is slowed down. Finally, the GEA adopted rules from the 'Code of Conduct on Consensus and Participation in Onshore Wind Power' to enable local consensus (Van der Ploeg et al., 2015).

The Energy Agreement partners expected 6,867 MW of onshore wind power by 2020. This would be sufficient to meet the onshore wind target of 6,000 MW (SER, 2019). Due to a lack of local consensus, only 4,188 MW became operational in 2020 (Statistics Netherlands, 2023d). The local energy cooperatives exceeded the expectations of the Energy Agreement with the production of 40 PJ of sustainable energy. In 2022, 87 cooperatives, or 12 percent of the cooperative sector, participated in onshore wind farms. The onshore wind farms produced 315.6 MW and delivered 1,010 kWh, which is equivalent to the energy consumption of 337,000 households (Hier Opgewekt, 2022). The focusing event of the Climate Act presented an even more ambiguous goal of achieving carbon-neutral electricity production by 2050 (Hofs, 2019a). To address the Climate Act, the Climate Agreement increased the ambition for sustainable electricity production to 35 TWh by 2030. Negotiators considered local ownership and regional cooperation necessary to achieve consensus. The Regional Energy Strategy (RES) facilitates regional collaboration between local communities, municipal and provincial

authorities, developers, energy cooperatives, and energy grid companies to allocate onshore wind farms in spatial planning. The RES identifies bottlenecks in energy grid planning, thereby increasing grid efficiency. Furthermore, the Climate Agreement introduced the financial incentives of the SDE++ subsidy (Ministry of Economic Affairs & Climate Policy et al., 2019). Between 2020 and 2022, the SDE++ subsidy scheme invested 301 million euros in the installation of onshore wind farms (NEA, 2023b).

Although the Climate Act and the Climate Agreement present onshore wind energy as an opportunity, local communities often perceive the installations as an environmental threat. In their view, onshore wind farms cause nuisance, interfere with radar, harm bird life, cast shadows and degrade the environment (SER, 2019). In Delfzijl, local communities looked for a loophole in the environmental legislation to stop the development. They found that the environmental legislation had never been subject to an environmental impact assessment (EIA) and went to court. The court ruled that before new building permits could be issued, the environmental legislation had to be subject to an EIA, according to the Belgian 'Nevele decree' (Council of State, 2021). As a result, for years, many onshore wind developers had received illegal building permits (except for a few that were subject to municipal spatial norms). The court ruling stopped the development of onshore wind farms in, for example, Delfzijl, Oss and Houten, and further initiatives will be delayed in the future. Since then, the framing contest for onshore wind farms has continued (Koers, 2021; Van Lieshout, 2021). Figure 5 shows the phase in of wind energy in the Netherlands between 2013 and 2022.

2.5.2 Phase in of hydrogen

The offshore wind farms can provide the future green electricity for hydrogen production (Ministry of Economy and Climate, 2022). The electrolysis of water (H2O) with green electricity produces oxygen (O) and hydrogen (H) without the emission of greenhouse gases. The idea of a hydrogen phase in arose during the two oil crises in the 1970s, when politicians had to react to the oil embargo of the Arab countries. In the Netherlands, however, the hydrogen phase in never reached maturity because of the long period of low gas prices. The industry bought abundant and cheap natural gas from the Slochteren gas field. As a result, the business case for hydrogen was difficult to make. Most of the process industries require hydrogen to produce ammonia, steel, glass, refrigeration generators and fuel desulphurization because of the high temperatures required. The industrial demand for hydrogen was about 100 PJ. Connecting the business sector, light industry and households to a hydrogen network remained inefficient due to the need for low-temperature heating (Ministry of Economic Affairs & Climate Policy et al., 2019). Thus, prior to the focusing event of a skyrocketing gas price, there were few financial incentives for industry to invest in hydrogen.

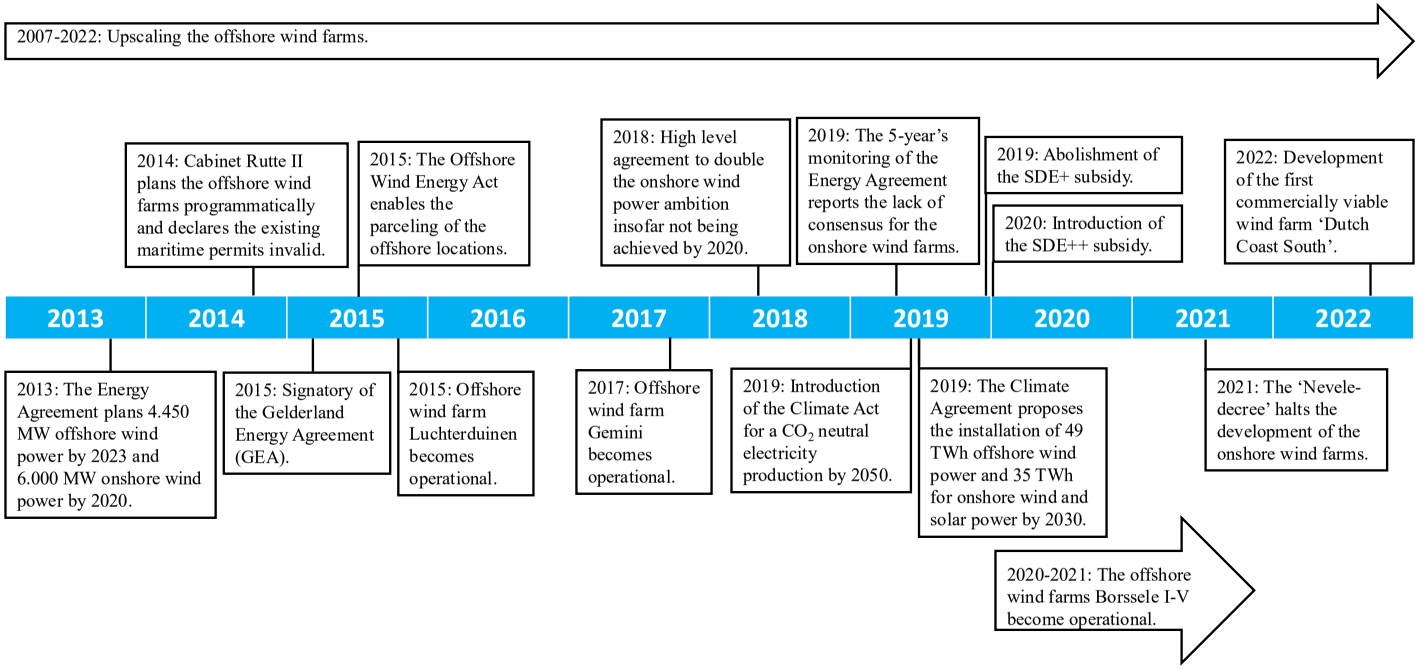

Figure 5: Overview of wind energy phase in.

In the Energy Agreement, the policy instrument of information exchange has renewed public attention to hydrogen. A hydrogen economy would be the ultimate long-term goal because of its heat and zero emission potential. The signatories shared information about power-to-gas and the use of the current gas network for hydrogen distribution. However, no new financial incentives for hydrogen deployment were introduced (NEA, 2023b; SER, 2013).

The Climate Agreement considered hydrogen as a feedstock for producing high temperatures in industry. Electrolysis of hydrogen with green electricity could provide temporary storage of electricity during periods of surplus, such as sunny or windy weather. In this way, hydrogen could mitigate the imbalance between the supply and demand for green electricity. In addition, sustainable mobility and households looking for an alternative to gas connections could increase the demand for hydrogen in the future. The Climate Agreement proposed financial incentives for the hydrogen phase in the form of the SDE++ subsidy ('Stimulering Duurzame Energieproductie en Klimaattransitie' or Stimulus for Sustainable Energy and Climate Transition), the successor to the SDE+ subsidy. The government granted 167.8 million euros in SDE++ subsidies to hydrogen investors. The companies Groenleven and Volth2 received most of these subsidies (NEA, 2023b). According to the Climate Agreement, the SDE++ subsidy can be granted if the hydrogen initiative promises low societal costs, high investment security, and guarantees a reliable and flexible energy system (Ministry of Economic Affairs & Climate Policy et al., 2019). In contrast to SDE+, the SDE++ subsidy uses the potential for CO_2 reduction as a criterion for application (Ministry of Economic Affairs & Climate Policy, 2019). No serious framing contests have arisen about the phase in of hydrogen, as actors have not yet contested the interpretation of a focusing event (Ministry of Economic Affairs & Climate Policy et al., 2019).

Following the Climate Agreement, the Ministry of Economic Affairs & Climate Policy (2022) developed a national long-term plan for infrastructure, energy and climate (MIEK) on hydrogen. A future hydrogen network can connect the major industrial clusters in the Netherlands, thus supporting the competitiveness and sustainability of the industry. Recently, the national gas distributor Gasunie started to implement the national hydrogen network (Gasunie, 2022b).

A complicating factor, however, was that the industry was taxed 22 times less on fossil fuels than households, resulting in an indirect subsidy of 30 billion euros to the industry. The low taxation did not stimulate the industry to invest in hydrogen because it was difficult to make a viable business case for hydrogen (Van Lonkhuyzen, 2023). Recently, a fierce framing contest about the low taxation for the industry arose because the recent

focusing event of a rising gas price showed the large tax inequality between households and industry. Climate activists supported a higher fossil energy tax for industry to fund the SDE++ subsidies for hydrogen. In this way, new tax rules and financial incentives could improve the business case for hydrogen (Kervers & Sloot, 2022).

The recent focusing event on expensive gas prompted Shell to invest 684 million euros in a hydrogen plant in the Port of Rotterdam. The plant will be the largest hydrogen facility in Europe. The Dutch Coast offshore wind farm, partly owned by Shell, will provide the green electricity for the plant. Shell's oil refinery in the Port of Rotterdam consumes the hydrogen, although it meets only 20 percent of the refinery's needs (Benjamin, 2023; Van der Walle, 2022). In 2022, Dutch Prime Minister Mark Rutte supported Shell's corporate hydrogen ambitions. During the subsidy application, the prime minister encouraged the flexible adoption of the application criteria to grant Shell 150 million euros for the construction of the plant (Van der Veen, 2023). The prime minister supported Shell because the company's board of directors did not feel welcome in the Netherlands due to the controversy surrounding the company's greenhouse gas emissions (Van de Weijer, 2023). In this way, Prime Minister Rutte hoped to improve the attractiveness of the Netherlands as a business location for the oil and gas multinational and to support the phase in of hydrogen. However, the prime minister received much criticism for his illegitimate involvement in the subsidy application (Van der Veen, 2023).

Recently, the Russian attack on Ukraine stimulated the focusing event of a high gas price. For households, the average variable gas price increased from EUR 0.28 per Nm^3 in 2020 to EUR 1.78 in 2022 (Statistics Netherlands, 2023e). The Rutte IV cabinet framed the high gas price as an economic threat, with many households at risk of falling into energy poverty. The high gas price stimulated policy actors to share information about the phase in of hydrogen as an alternative to gas consumption, but this policy did not materialize in rules or financial incentives (Straver, 2022b). Despite the improved business case for hydrogen, the Rutte IV cabinet stimulated financial incentives to increase the affordability of natural gas. The cabinet introduced a price cap of 1.45 euro per Nm^3 for a maximum of 1,200 Nm^3 per year. Above the cap, households paid the market price for natural gas, as the cabinet believed that these households were mostly well-off. Thus, the Rutte IV cabinet framed the focusing event of a high gas price as a threat to enable a price cap on natural gas rather than to promote hydrogen (Van Weezel, 2022).

2.5.3 Phase in of solar power

The goal of the Energy Agreement was to achieve 16 percent sustainable energy by 2023. The signatories did not specify the percentage of planned solar power (SER,

2013). The phase in of solar power has become increasingly popular due to the financial incentives provided by the Postal Rose rule, solar energy balancing, and SDE+ subsidies. Finally, the Postal Rose rule included a tax rebate of 7.5 euro cents per kWh for energy cooperatives, excluding value-added tax (VAT). Households participate in a solar cooperative within the Postal Rose (SER, 2013). Various cabinets have invested 16.4 billion euros of SDE+(+) subsidies in solar energy between 2013 and 2022 (Ministry of Economic Affairs & Climate Policy et al., 2019; NEA, 2023b).

In the province of Gelderland, according to the Energy Agreement (SER, 2013), the regional parties, which had joined forces to accelerate the energy transition in their region, supported the public-private partnership GEA with the planned allocation of solar parks. The regional agreement supported the joint financing of solar parks by proposing single loan applications. The regional signatories also asked the provincial authorities to support crowd funding. Priority was given to the planning, development and maintenance of grid connections between solar parks and onshore wind farms to maintain grid balance and increase the network efficiency. The GEA also supported the examination of potential sites for the allocation of solar parks (Van der Ploeg et al., 2015).

After the Energy Agreement, a business network of energy cooperatives launched a framing contest on the Postal Rose rule in 2014. Tax certainty was important because it would improve the predictability of returns on investments. The energy cooperatives framed the high VAT, the short period of tax certainty, the narrow geographical demarcation, the costly second grid connection and the uncertain business model as problematic for the phase in. A high VAT resulted in lower profits for the energy cooperatives. A shorter tax period created more uncertainty for the long-term return on investment. A narrow geographical demarcation limited the number of households that could participate in a postal rose. In addition, a second expensive network connection increases the fixed costs for the energy cooperatives. As a result, negotiations with members of parliament, the Ministries of Economic Affairs and Finance, and the tax authority led to a change in the Postal Rose rule. In the end, the parliament approved a tax rebate of 9 euro cents per kWh, excluding VAT, and the freedom to place solar installations in adjacent postal code areas (hence the 'rose' metaphor). Subsequently, in 2016, the new Postal Rose was included in the national tax plan (Kooij et al., 2018b). As a result of the regulatory change in the Postal Rose, households received a tax rebate of 11 million euros only in 2019 and 2020 (Ministry of Finance, 2023).

In 2019, the Climate Agreement proposed to replace the Postal Rose tax rebate with a subsidy because the Postal Rose had become an escape route for households

to balance solar energy instead of actively participating in an energy cooperative (Ministry of Economic Affairs & Climate Policy et al., 2019). In 2021, the new Postal Rose became an exploitation subsidy because the amount of the subsidy since then depends on the amount of solar electricity produced ('Subsidy Cooperative Energy Production', SCEP). In the SCEP, the solar system feeds electricity into the grid, while the price difference between the market price and the base amount is financed by the subsidy. Households must belong to a cooperative with an installed capacity of between 15 and 500 KW of sustainable electricity to be eligible. Households must live in the Postal Rose or adjacent areas, like the criteria for the Postal Rose tax rebate (Van den Boom, 2022). Since 2021, the SCEP has granted a total amount of 2.2 million euros to households participating in a cooperative (Ministry of Finance, 2023).

Second, the financial incentive for balancing solar power gives households with panels that do not belong to a cooperative the right to balance electricity behind the meter. Households receive compensation for feeding their own solar power into the grid (Hier Opgewekt, 2022). They only pay energy tax on the net difference between the solar electricity they produce and the total electricity they consume. Between 2019 and 2022, the financial incentive for balancing solar power will provide households with a total tax reduction of 1.2 billion euros (Ministry of Finance, 2023). Nevertheless, the financial incentive created a significant framing contest. The Climate Agreement framed the balancing as a risk of financial overstimulation (Ministry of Economic Affairs & Climate Policy et al., 2019). Other actors stated that the financial incentive would disadvantage low-income households, which usually do not own solar panels (Nauta, 2023). Furthermore, the regional energy network companies were legally obliged to store the electricity fed into the energy network and to socialize the storage costs, regardless of household income. In this way, the energy network companies provided a 'free' battery to the most affluent households that owned solar panels.

In response to the framing contest, Minister of Climate and Energy Rob Jetten proposed the gradual abolition of the solar feed-in tariff between 2025 and 2031 (Van de Weijer, 2022c). At the time of writing, the Dutch parliament has yet to decide on the financial incentive, as the Rutte IV cabinet and the opposition disagree on the pace of the phase out. The opposition will only agree to the abolition if the Rutte IV cabinet guarantees the installation of solar panels for rental housing in the future (Van Weezel, 2023a; Markus, 2023). The framing contest was further politicized when the Authority for Consumers and Markets (ACM) recommended a gradual phase out. The ACM warned against subsidizing higher incomes and increasing grid congestion by balancing solar power, while critics argued that the market regulator had no authority to make such a political statement (Van Weezel, 2023b).

The Climate Agreement aims to install 35 TWh of renewable energy by 2030. Onshore solar parks need to be developed because rooftops can only accommodate 7 TWh of solar panels (Ministry of Economic Affairs & Climate Policy et al., 2019). Meanwhile, the installation of solar parks has become the subject of framing contests due to a lack of local consensus. Local communities frame solar parks as contributors to landscape pollution and nuisance, while policymakers perceive solar energy as a significant accelerator of the phase in (Straver, 2017).

The focusing event of network congestion complicates the phase in of solar energy because the electricity grid cannot facilitate the abundant supply of solar energy, especially during sunny weather. The energy network companies have not yet upgraded the power grid sufficiently. At the same time, solar power accounted for 14.9 percent of total electricity production in 2022, but this number is expected to increase in the future (Statistics Netherlands, 2023a). By 2030, solar parks will have to wait years to be connected to the grid, as the energy network companies need to upgrade the overloaded grid. In 2022, almost one-third of the top 100 industrial CO_2 emitters were not connected to the grid due to grid congestion, even with high corporate sustainability ambitions (Van der Borst et al., 2022). The ACM and the energy network companies contest the prevailing 'first come, first served' rule because of the long waiting times. Furthermore, this rule does not provide the regulatory leeway to prioritize key societal functions with a network connection. Neither solar parks nor public utilities receive preferential treatment (Van Weezel, 2023a). The framing contest about network congestion forced the ACM to propose three new policy rules in 2023. The proposed new rules stipulate that energy network companies may not supply additional electricity during peak hours. The reserved network capacity for companies can be reduced if the capacity has not been used. Finally, the ACM recommends preferential treatment for clearly public utilities due to their social importance. However, it is not known whether solar parks will receive preferential treatment in the future (Van Weezel, 2023c). Figure 6 shows the phase in of hydrogen and solar power in the Netherlands between 2013 and 2022.

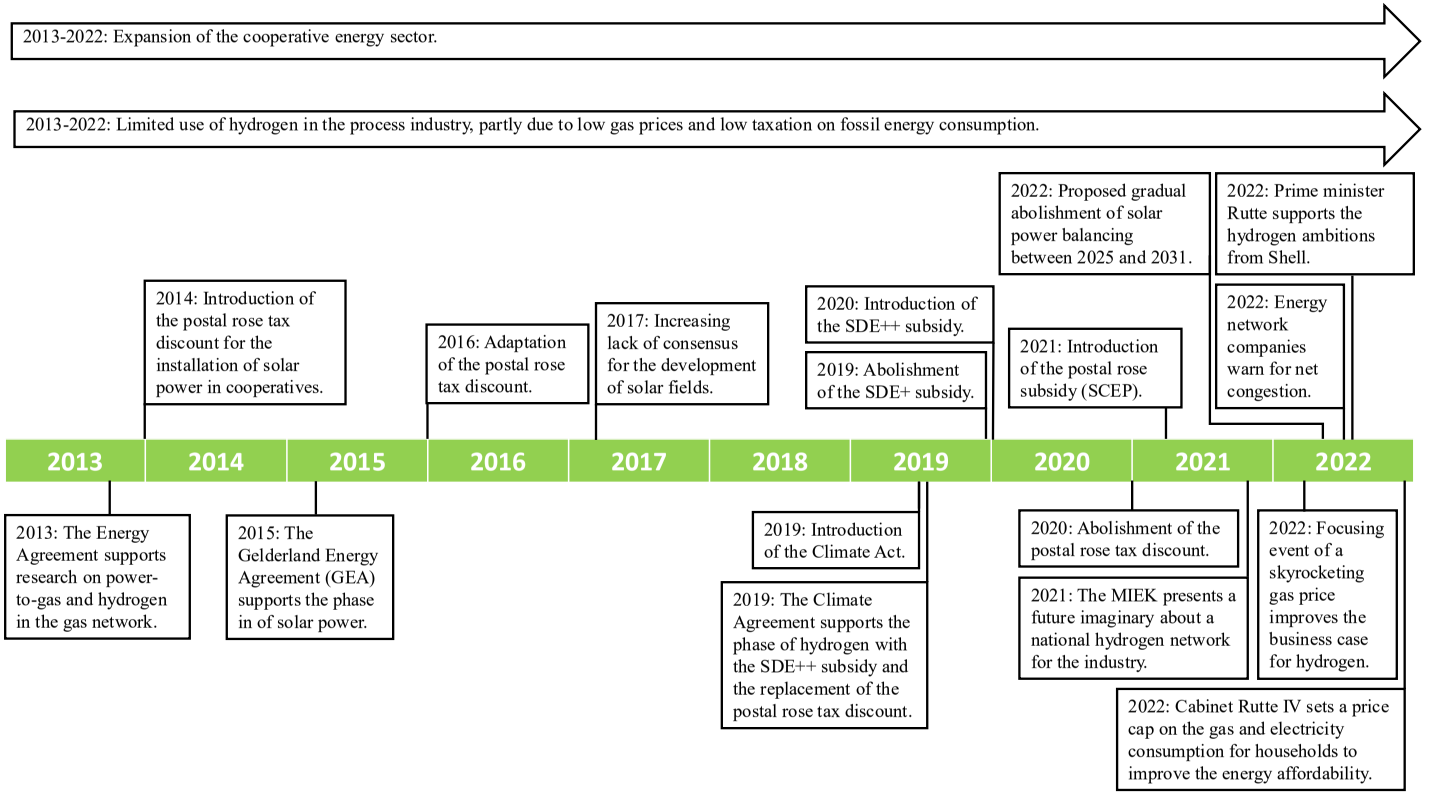

Figure 6: Overview of the phase in of hydrogen and solar power.

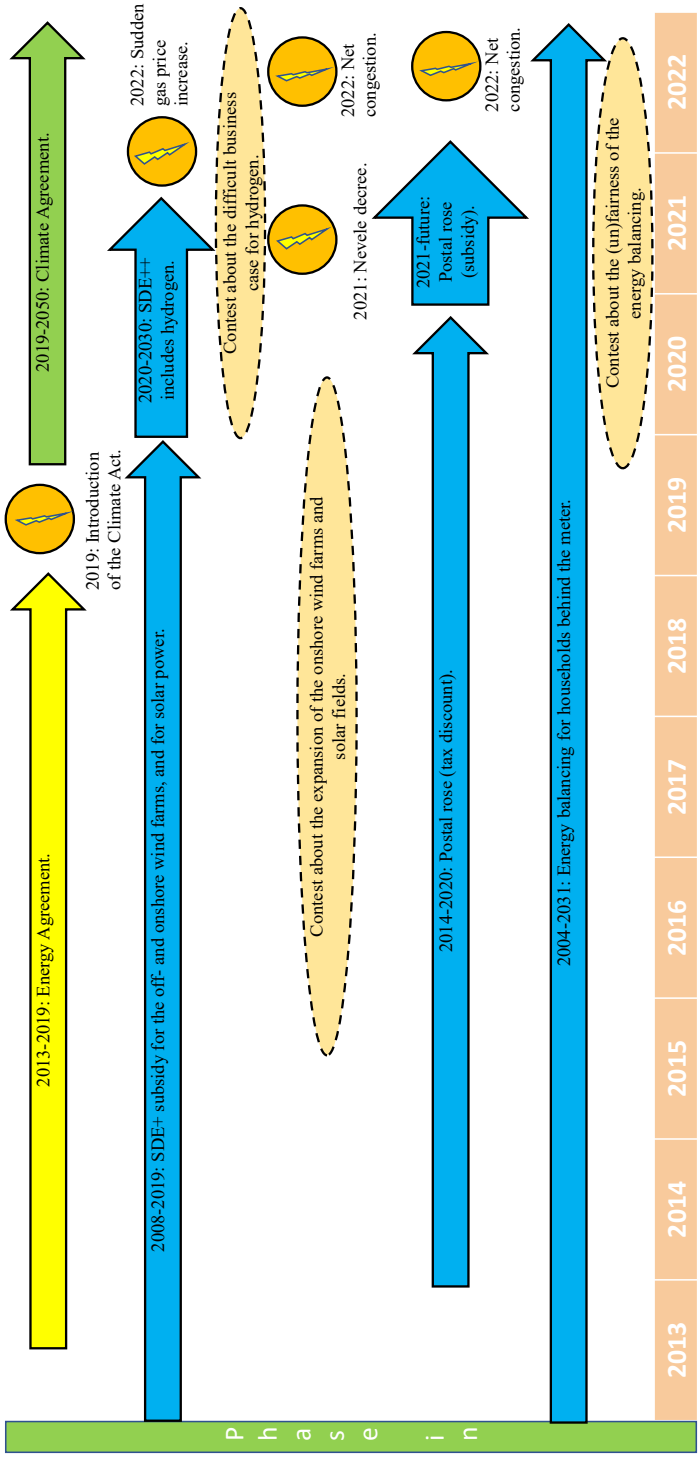

Figure 7: Focusing events, framing contests and policies in the phase in of sustainable energy in the Netherlands between 2013 and 2022. The circles (with a lightning bolt) represent the focusing events. The ellipses show framing contests. The arrows indicate the duration of the phase in policies. The green arrow refers to the use of rules, the blue arrows incorporate financial incentives, and the yellow arrow includes the policy instrument of sharing information.

2.5.4 Overview of focusing events on the phase in of renewables

Figure 7 provides an overview of focusing events, framing contests and policies in the phase in of renewables in the Netherlands between 2013 and 2022. When actors do not deny or downplay the focusing event as unimportant during the phase in, information exchange can be effective, for example with the Energy Agreement and the Climate Agreement (SER, 2013; Ministry of Economic Affairs & Climate Policy et al., 2019). Subsequently, information campaigns effectively introduce new rules and financial incentives, such as the Postal Rose and the SDE++ subsidy. Financial incentives also accelerate the phase in, as shown by the high gas price focusing event. Recently, the higher gas price has made hydrogen increasingly attractive compared to natural gas. However, in contrast to information and financial incentives, the focusing event of the Nevele decree showed that newly introduced environmental rules are met with fierce resistance. Municipalities challenge the Nevele decree, causing a significant delay in the implementation of onshore wind farms. When actors contest the interpretation of a focusing event, rules hinder the phase in.

2.6 Concluding remarks

2.6.1 Discussion

The study provides insights into how framing contests about focusing events interact with policy instruments during the phase out and phase in. Focusing events lead to intense framing contests as actors contest the causes and consequences of gas-induced earthquakes, climate lawsuits, the introduction of the Climate Act, rising gas prices, the Nevele decree and network congestion. Actors respond with different policies depending on whether they perceive the event as irrelevant, as a threat, or as an opportunity (Boin et al., 2009). Our study shows that actors' different framing of a focusing event led to framing contests. Depending on the interpretation, urgency, and power position, actors try to use different policy instruments, such as information exchange, financial incentives, and rules, or a mix of instruments, to protect their interests and achieve their goals. Our findings are consistent with those of other studies, such as Birkmann et al. (2010), Kaufmann et al. (2016) and Salazar-Morales (2018).

This study shows that actors contest the framing of focusing events and subsequently the adoption of policies. For a long time, actors interpret an event as not obvious and continue with existing policies. After an unexpected focusing event, however, actors contest the causes and effects and begin to negotiate new policies (Boin et al., 2009). In our case study of the Netherlands, gas-induced earthquakes were initially denied or downplayed, and gas producers shared limited information. Lengthy negotiations

took place between the Rutte II cabinet, the NAM and local communities to settle claims for damages. Despite opposition from local communities (Carton & Ache, 2017), the claim settlements barely progressed because cabinet Rutte II and the NAM did not consider the gas-induced earthquakes important enough. They trivialized the earthquakes because they had strong financial interests in maximizing gas revenues and securing the gas supply. Suddenly, in 2018, the focusing event of a strong gas-induced earthquake occurred in Zeerijp. The local community framed the earthquake as a crisis, emphasizing the physical, psychological, and financial damage to the environment and residents. Crisis framing opened a window of opportunity for policy change (Kingdon, 2003).

Due to the severe impact of the focusing event and the crisis framing of the local communities, the Minister of Economic Affairs & Climate Policy, Eric Wiebes, could no longer consider the gas-induced earthquakes as unimportant. Local communities pressed for new rules to reduce gas extraction and financial incentives to compensate for the damage. From now on, the Minister issued the rule to determine the maximum gas production instead of the NAM and to reduce the gas production. He also lobbied large industrial gas consumers to cut off gas to limit demand. The Rutte III cabinet launched a compensation scheme for the damage, including regional investments, as the total number of damage reports was more than 267,000. In 2019, Parliament decided that a parliamentary committee should investigate the decision on gas extraction and its impact on local communities. In 2023, the committee concluded that various cabinets and the NAM had structurally neglected the local communities. The findings raised awareness that more could be done to compensate the local communities in Groningen (The Parliamentary Committee of Inquiry into Natural Gas Extraction in Groningen, 2023b). In this way, the crisis framing of the gas-induced earthquake in Zeerijp created space for new policies. New rules and financial policy instruments were legitimized to compensate for the effects of the gas-induced earthquakes.

A framing contest over a focusing event becomes particularly strong when the dispute concerns the implementation of new policy rules during the phase out. The fiercest opposition arises against new rules because the rules are mandatory and create arenas where the interpretation of the event is hotly debated (Brukas & Sallnäs, 2012). Urgenda surprised the Rutte II cabinet because the small non-governmental actor won the climate lawsuit against the state (The Hague District Court, 2015). Initially, the focusing event did not lead to the implementation of new climate rules, because the government did not consider the climate lawsuit to be obvious. However, Urgenda's claim became an irreversible policy through a Supreme Court ruling after

the government appealed (The Hague Court of Appeal, 2018; Supreme Court, 2019). The court ruling was unexpected for cabinet Rutte III, but for Urgenda it was the expected consequence of the legal process it had initiated. As a result, cabinet Rutte III had to respond to a crisis event and issued the rule that coal-fired power plants could only operate at a maximum of 35 percent of capacity (Schwartz, 2022a).

In this way, the focusing event of the climate process triggered a fierce framing contest about the rules for the coal-fired power industry. The reason for this framing contest may be that the Rutte III cabinet promised business as usual to the coal-fired power plants, although this was not the case. At the same time, the cabinet did not want to lose face with the industry (Farley et al., 2007). A lost climate case for the Rutte III cabinet would lead to strong opposition. Now that the cabinet has lost the case, it fears being sued for the rule that all Dutch coal-fired power plants should be closed by 2030 (Van Santen, 2019 & 2020). The coal-fired power sector complained about the broken ownership rules and appealed. As a result, the sector initiated a framing contest about financial compensation, but lost in court (Van Gestel, 2023).

In addition to the phase out, rules also lead to fierce framing contests during the phase in, as actors have conflicting interpretations of a focusing event (Liefferink et al., 2021). The 'Nevele decree' showed fierce framing contests between local communities and municipal governments. The local communities opposed the emergence of onshore wind farms and did not accept new environmental rules, while the municipal governments searched for suitable regulations to break the deadlock. The framing contests turned out to be highly political, with actors deliberately looking for loopholes in the EIA rules (Kaplan, 2008; Resodihardjo, 2020). However, the framing contest jeopardized the rules that could facilitate a future decentralized energy system, energy prosumers, and investment in onshore wind farms (Wolsink, 2020).

The policy instrument of information sharing is effective when actors recognize or do not downplay a focusing event as unimportant. The interaction between a focusing event, framing contests and policy instruments causes this effect: In the case of an unimportant event, limited or no framing contests occur, and actors adopt information sharing in the first place. Information sharing contributes to the acceptance of financial instruments and rules (Fenger & Klok, 2014). An information campaign facilitates financing, which also reduces the need for rules (Bouwma et al., 2018; Brukas & Sallnäs, 2012). In our case study of the energy transition in the Netherlands, the Energy Agreement provided information on the phase in of renewable energy. Subsequently, the Agreement introduced financial incentives with the SDE+ subsidy and the Postal Rose tax rebate (Kooij et al., 2018b; SER, 2013).

Subsequently, the Climate Act prescribed rules about the achievement of climate targets, monitoring, and the legal provision for the development of a climate program in accordance with the Climate Agreement (Ministry of Economic Affairs & Climate Policy et al., 2019; Hofs, 2019a).

At the same time, the emerging congestion in the electricity grid shows that information exchange and financial incentives are not sufficient (Serbruyns & Luyssaert, 2006). The stimulation of solar power is complex in this respect, as various cabinets have subsidized solar power with the Postal Rose tax rebate, subsidies and the balancing of solar power. The focusing event of the introduction of the Climate Act and the rules from the Climate Agreement supported the phase in of wind and solar power. However, the energy network companies communicated about the network congestion, delaying the future development of new homes, businesses and sustainable energy. Since then, there has been a growing demand to change the current non-discriminatory rules for grid connection (Van der Borst et al., 2022).

This study supports the framing of a focusing event creates space for the phase in of new policies (Boin et al., 2009; Kingdon, 2003). When actors perceive a focusing event as not important enough, they share limited information or no information at all. Downplaying the event encourages actors not to change financial incentives and rules. However, if the downplaying of a focusing event continues, the likelihood of a new focusing event increases because business as usual has not removed the causes of another focusing event. After a new event has occurred that the vested interests did not expect, but the opposition did, the actors begin to challenge the existing rules even more. The opposing actors begin to make compensatory claims and demand reliable information in a crisis frame. The crisis frame legitimizes the introduction of new political rules to prevent a new disaster. At the same time, the vested interests deepen the framing contests because the actors with deep vested interests fear a loss of power. However, if the actors do not downplay the focusing event, or even see it as an opportunity, they adopt information sharing in the first place. Subsequently, they begin to understand why new financial incentives and rules are needed and contribute to the phase out and phase in policies. Thus, rules are mostly enacted and contested during a crisis, while the mixed adoption of information sharing, financial incentives, and rules become effective when actors recognize the importance of an event (Liefferink et al., 2021).

2.6.2 Limitations and future research

Despite our in-depth media and document analysis, we believe that this study has two research limitations. Selection bias may have occurred in the case study design because we identified the focusing events, framing contests, and policy instruments

in a chronological order. However, recent focusing events may be better remembered by researchers than older events. As a result, the most recent occurrences may have received the most research attention. In addition, selection bias may have occurred because the researchers' cognitive frames influence the case analysis (Starman, 2013). In this study, we analyzed the phase out and phase in with a mostly sectoral understanding of the events. Therefore, we may have missed cross-sectoral timelines with relevant focusing events, framing contests and policy instruments. Both biases could lead to the systemic error of omitting relevant facts (Adcock & Collier, 2001). Therefore, we mitigated selection bias by examining multiple data sources. Data triangulation allows for cross-checking of facts and a more contextual understanding of the focusing events (Beach & Pedersen, 2013).

Another research limitation is that a focusing event with national media coverage is difficult to define. In fact, we observed a gradation of focusing events from the international to the local scale. An international event such as the Paris Climate Agreement (UNFCCC, 2015) influences a national focusing event such as the introduction of the Climate Act (Hendrickx, 2018), but also local framing contests about onshore wind power. Therefore, we adopted six criteria to define focusing events more consistently (see Methodology). Furthermore, the case study design allowed for the delineation of focusing events while allowing for unclear boundaries between the phenomenon under study and the context (Yin, 2003). Nevertheless, in our view, focusing events remain closely related to different scales (Van Lieshout et al., 2012).

As this study narrowed down specifically on focusing events with national media coverage, future research could investigate framing processes in local initiatives. As local initiatives are known to be innovative and collaborative, they may contest framing processes differently compared to actors with national coverage and professional responsibilities (Van der Schoor & Scholtens, 2015). Therefore, studying framing processes in regional public-private partnerships (PPPs) (Heldeweg et al., 2015), regional governance (Emerson et al., 2012) and local foresight implementation (Vargas-Lama & Osorio-Vera, 2020) deserves future research attention.

Future research is also needed on the framing of natural disasters (Birkmann et al., 2010). The gas-induced earthquakes highlighted the narrow cognitive frames of policy makers about the subsurface, even though they were deeply involved in the claims settlement process (The Parliamentary Committee of Inquiry into Natural Gas Extraction in Groningen, 2023b). More knowledge about natural disasters can improve policy effectiveness because a better understanding of the natural causes of a focusing event can guide framing contests and contribute to policy solutions.

The practical implication of this study is that early preparation of new rules, focusing on new ways to legally differentiate network connections, can alleviate current network congestion. Scenario studies can be used to examine how different rules for a future energy network redirect long-term investments and policy decisions (Thaler, 2022). For example, scenarios can identify the maximum capacity of the energy network under different regulatory conditions. This, in turn, could encourage energy-intensive sectors to communicate about desirable rules to meet their growing energy needs. In this way, timely adaptation of rules can avoid future framing contests.

3

The implementation of a territorial foresight outcome through aligning goal frames: A pilot case of the gas disconnection in the Netherlands

Beenakker, I., Van Kranenburg, H., Veenman, S., Carton, L. & Fokkinga, B. (2022). The implementation of a territorial foresight outcome through aligning goal frames: a pilot case of the gas disconnection in the Netherlands. *Futures*, *135*, 1-10. https://doi.org/10.1016/j.futures.2021.102861

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Abstract

In the Netherlands, as gas disconnection has become a central issue in the transition to alternative energy sources, actors have conducted exercises to agree on a foresight outcome to disconnect households from the gas network. The implementation of these outcomes, however, has been hampered. Using evidence from a pilot program in the Dutch city of Nijmegen, this study explores the struggle to align different (dominant) motivations, so-called goal frames, to secure a commitment to implementation. The study distinguishes between normative, gain, and hedonic motivations and various strategies to align the goals. Results show that dominant normative motivations bring actors together as they begin to implement a territorial foresight. As implementation proceeds, gain motivations dominate, yet present a fragile commitment, for example, when energy alternatives turn out to be costly. Our findings also reveal that among four alignment strategies, frame bridging is most important because it allows actors to address their own goals, to create commitment, and to conduct joint actions to implement territorial foresight.

Keywords: Territorial foresight, commitment, goal frames, frame alignment, implementation

3.1 Introduction

In the Dutch province of Gelderland, an energy network company, municipalities, and housing corporations conducted a territorial foresight process to join forces on the energy transition (Van der Ploeg et al., 2015). As they jointly envisioned Gelderland's future, they agreed on the foresight outcome of disconnecting households from the gas network by 2035. Accordingly, pilot neighborhoods were established to implement the gas disconnection agreement (Fokkema & Scholtens, 2017).

However, implementation of the future goal of gas disconnection proved difficult to achieve (Netherlands Court of Audit, 2020). As the literature describes, problems can arise in the relationship between a foresight outcome and actors' commitment to implementation (Barre, 2014; Güell & Redondo, 2012). Indeed, where Havas et al. (2010) emphasized that implementation depends on the outcome's executive potential, Meyer et al. (2004) went one step further, stating that executive potential depends on the willingness of actors to commit to achieve the long-term future. They showed that the commitment to implementation relates to the actors' different or even conflicting motivations.

In this paper, we focus on the multiple motivations of actors (Ryan & Deci, 2000) as one reason for problems during implementation, even after achieving a successful foresight outcome. Whereas the advantages of participation may not be clear in advance, motivation influences commitment during an implementation, and difficulties may arise (Salancik, 1977). Hirschman (1974) showed that committed actors are often loyal or raise their voices, but without continued commitment, tend to leave the implementation process. We use a goal frame approach to explain why actors commit to an implementation, because a goal frame presents the actor's dominant motivation (Lindenberg & Steg, 2007 & 2013) and outlines their near-term future commitment to implement a long-term foresight outcome. Although each actor has multiple motivations for committing to the implementation (Meyer et al., 2004), one often dominates, known as the goal frame (Dóci & Vasileiadou, 2015). This goal frame presents the actor's rationale for making choices in line with the foresight outcome and pinpoints why the actor commits or not. So, although actors may agree with the long-term future, their goal frames can differ and even conflict.

As such, during implementation, the challenge is to align actors' various goal frames to support a joint commitment, in this case gas disconnection. This frame alignment constructs a shared reality to legitimize the activities of one or more organizational actors (Benford & Snow, 2000). Depending on the actor's focus, frame alignment can be an inter- or intra-organizational strategy to bolster joint commitment, as actors

can align their different goal frames between and within organizations (Löfström, 2010). Actors can use various strategies to merge their goal frames and increase their commitment (Benford & Snow, 2000).

Currently, little is known about how actors' goal frames and alignment strategies may influence implementation of a territorial foresight outcome (Vargas-Lama & Osorio-Vera, 2020). But if we understand the influence of underlying goal frames and alignment strategies, we may be able to improve the implementation of such an outcome (Acosta-Prado et al., 2015; Chakraborty et al., 2017; Van Eerd et al, 2018). Therefore, our research question is: *When implementing a territorial foresight outcome, how can actors align their various goal frames and commit to the implementation process?*

The evidence for this study comes from a local initiative in the Hengstdal neighborhood in the city of Nijmegen, located in the Dutch province of Gelderland. Hengstdal operates one of the first pilots to disconnect residences from the gas network (Municipality of Nijmegen, 2018). Four actors worked together to implement the project: the municipality, an energy network company, housing corporations, and a residents' association. We studied how these actors implemented the foresight outcome.

In the next section of this paper, we explain the theory of implementation, commitment, goal frames, and frame alignment, and then elaborate on our specific research methodology in section three. In section four, we analyze the commitments, goal frames, and frame alignment strategies of the actors in three consecutive implementation stages of the gas disconnection. Finally, in section five, we reflect upon the theory and suggest future research.

3.2 Implementing the territorial foresight outcome through goal framing and alignment strategies

Territorial foresight is the process of developing a long-term sustainability vision that combines goals and joint actions among actors and focuses upon a specific territory of various spatial scales (Barre, 2014; Havas, 2003; Vargas-Lama & Osorio-Vera, 2020). Territorial foresights prepare a geographical area for the future, and researchers provide examples at the national (Georghiou & Keenan, 2006), regional (Keenan & Popper, 2008), and municipal (Ravetz & Miles, 2016) levels.

But after a foresight is achieved, how can actors implement the developed sustainability vision? Less research has been conducted on this next step, that is, the implementation,

and this lack of impact studies is an urgent issue to be addressed (Ryan, 2015). Despite a successful territorial foresight process (Lestrelin et al., 2017), actors may have different interpretations of the foresight outcome (Vargas-Lama & Osorio-Vera, 2020). During implementation, each actor is also driven by multiple motivations (Meyer et al., 2004), which may continue to deviate after the foresight process has concluded.

Among the various theories on implementation, we selected Goal-Framing Theory (GFT) to explain how various motivations may guide actor behavior and contribute to either long-term pro-environmental action (collaborative goal) or to quick short-term wins (individual goal) (Lindenberg & Steg, 2007). A series of small wins is important to achieve, because dividing the implementation into different short-term goals gives actors the confidence to commit to executing the wider foresight outcome (Bryson, 1988). GFT can explain how commitment is created, which we consider necessary for the implementation of a foresight outcome.

3.2.1 Goal-Framing Theory (GFT)

GFT explains how actors balance goals during an implementation, thereby describing the fault lines between individual versus collective, and short-term versus long-term orientations (Lindenberg & Steg, 2007). According to GFT, actors use overarching goals to govern their subgoals. An overarching goal influences how an actor processes information, their thoughts, sensitivity to specific information, the evaluation of events, the perceived alternatives, and the actual action. This goal with its cognitive and evaluative consequences is called a goal frame. For the actor, the goal frame functions as a lens to interpret events considering the goal (Lindenberg, 2008). Goal frames can either align or conflict between actors. When conflicting, they delay implementation (Ryan, 2015); therefore, alignment among various goal frames is important after reaching agreement on a territorial foresight outcome (Etienne, 2011; Van Eerd et al., 2018).

3.2.2 Normative, gain, and hedonic goal frames

Lindenberg & Steg (2007) divided goal-oriented frames into three types: normative, gain, and hedonic. A normative goal frame activates perceptions of problems, causality, judgment, and solutions to discern appropriate actions according to social norms. In general, actors in the normative goal frame are concerned with how they ought to act toward others and the environment (Lindenberg & Steg, 2013). Arroyo & Carrete (2018) indicated that the experienced social obligation to reduce one's carbon footprint is particularly important for pro-environmental behavior. Apart from the pro-environmental norm, the normative goal frame refers to a shared ideological goal of sustainability that may bring people together for community activities (Seyfang

et al., 2013). In addition, a normative goal frame entails legitimacy standards and judgments about the "right" procedure (Suchman, 1995). In this respect, participation supports a legitimate implementation, because actors value the right to be continuously involved in a normative goal frame (Vitéz & Lavrijssen, 2020).

A gain goal frame sensitizes actors to changes in their personal resources (Etienne, 2011). Actors with a gain goal frame participate for reasons of self-interest because they expect favorable exchanges. For example, actors collect information, pursue resources or efficiency (Geng et al., 2016), upscale (Van Lieshout et al., 2012) or intend to maximize their personal resources with the least effort (Lindenberg & Steg, 2007). Actors with a gain goal frame also have affordability concerns and may act only at a reasonable cost (Arroyo & Carrete, 2018).

A hedonic goal frame aims to improve an actor's feelings. Actors with this goal frame seek enjoyment and avoid negative thoughts and uncertainty (Dóci & Vasileiadou, 2015). They also pursue quality of life, comfort, and well-being (Backhaus, 2019). Chakraborty et al. (2017) concluded that a hedonic goal frame could support an implementation if actors had a normative orientation and experienced the executive strategy as comfortable.

3.2.3 Frame alignment strategies

During implementation of a territorial foresight outcome, actors with normative, gain, and hedonic goal frames (Lindenberg & Steg, 2013) can interpret goals differently, and therefore, make different commitments. As a result, they may not be able to establish a shared implementation (Backhaus, 2019), unless they can connect their goal frames to find a joint commitment for a shared implementation, thus overcoming the tensions between goal frames (Sandeep & Ravishankar, 2015). This frame alignment could also be effective to solve goal frame conflicts through increasing affiliation and interdependency (Donohue, 1998), and thus, greater joint commitment for implementation (Hirschman, 1974; Lestrelin et al., 2017).

Prior research describes frame alignment in distinct ways. For instance, frame alignment may refer to the extent that the beliefs of members and organizers of a social movement merge, as these individuals experience different degrees of alignment (Ketelaars et al., 2017). Frame alignment can also include a strategy to urge potential adherents to stand up against institutional pressures (Cornfield & Fletcher, 1998). Brooks et al. (2017) distinguished between internal and external frame alignment, with the former referring to the expressed ideology of one single organization and the latter including the (dis)congruence between the media coverage

and an organization's self-presentation. Finally, frame alignment is also associated with international negotiations to mitigate market failures and climate funding on the one hand, and austerity goals in budget frames on the other (Skovgaard, 2017).

We use the definition of frame alignment from Benford & Snow (2000), who perceived frame alignment as the capability of actors to build commitment for an implementation process. They showed how actors can adapt frames strategically, particularly in social movements, to accelerate an implementation. Drawing upon these ideas, Sandeep & Ravishankar (2015) explained that frame alignment can make vulnerable initiatives resilient.

Benford & Snow (2000) distinguished four frame alignment strategies: bridging, amplification, extension, and transformation. Firstly, frame bridging refers to "*the linking of two or more ideologically congruent but structurally unconnected frames regarding a particular issue or problem*" (Benford & Snow, 2000: 624). For instance, in European water governance, actors pursue frame bridging with best practices in line with ecological interests (Van Eerd et al., 2018). Secondly, frame amplification idealizes events, beliefs, or values (Benford & Snow, 2000). For example, McCammon et al. (2004) perceived frame amplification as the strategic use of justice and reform frames. A justice frame underlines equal opportunities for participation, while a reform frame stresses transformative change. Actors can adopt frame amplification to highlight goal frames. Thirdly, frame extension broadens a frame to involve more adherents in implementation (Heery & Conley, 2007). Benford and Snow (2000: 625) noted, "*Frame extension entails depicting* (…) *interests and frame(s) as extending beyond its primary interests to include issues and concerns that are presumed to be of importance to potential adherents*." For instance, actors can use frame extension to include the goal frames of prospective actors (Heery & Conley, 2007). Fourthly, frame transformation "(…) *refers to changing old understandings and meanings and/or generating new ones*" (Benford & Snow, 2000: 625). Kaufmann et al. (2016: 51) exemplified frame transformation with "(…) *framing a dike, not in terms of safety, but in terms of adverse ecological impacts to delegitimize engineering approaches*." These four alignment strategies show how actors may collaboratively perceive each other's goal frames as they search for implementation.

Actors make intertwined use of these four alignment strategies to connect goal frames (Sandeep & Ravishankar, 2015); however, alignment of goal frames depends on commitment (Meyer et al., 2004), interests (Acosta-Prado et al., 2015), and the interpretation of foresight outcomes (Ryan, 2015). Reflection on frame alignment is important because conflicting goal frames may lead to intractable frame controversies (Schön & Rein, 1994). For instance, an intractable frame controversy within an

organization can contribute to insufficient frame alignment among organizations, because communicating the organizational goal frame externally proves difficult when internal inconsistencies blur the intra-organizational goal (Brooks et al., 2017; Mena et al., 2009).

3.3 Methodology

3.3.1 Case context

We selected the urban neighborhood, Hengstdal—a pilot neighborhood for gas disconnection—in Nijmegen, the Netherlands, as a single case study (Yin, 2003). In 2016, the pilot started as the provincial authorities and the network organization Gelderland Energy Agreement (GEA) searched for neighborhoods to experiment with the gas disconnection (Fokkema & Scholtens, 2017). In response, Nijmegen presented Hengstdal as a pilot neighborhood because of its depreciated gas network, active residents, and an energy network company that faced a difficult investment decision about the future energy network (Alliander, 2017; Municipality of Nijmegen, 2018). The network organization agreed. The pilot project provided us with the opportunity to observe the implementation process as the actors learned about their goals, motivations, commitments, and alignments in communities of practice (Appendix A) (Wenger & Snyder, 2000).

Figure 8 depicts a chronological overview of the three implementation stages in Hengstdal between 2016 and 2020. The first stage included the project setup, as GEA searched for experimental neighborhoods, and Nijmegen proposed Hengstdal for the pilot. During this stage, a residents' association emerged as an actor in the pilot; however, the goal frames of the project initiators and the residents' association did not align. In response in the second stage, the parties established a project group to jointly develop a district heating plan for Hengstdal. Although the group proposed alternatives for gas disconnection, the involved actors could not agree on one. In the meantime, the two housing corporations announced their merger and signed an intentional agreement. In the third stage, the energy network company emerged as a trailblazer, taking the initiative to approach the municipality, housing corporation, and the residents' association with a plan for modular district heating (technical solution), combined with a new non-profit cooperative in the neighborhood (organizational solution). In this stage, all parties effectively aligned the goals and received experimental funding to implement the pilot.

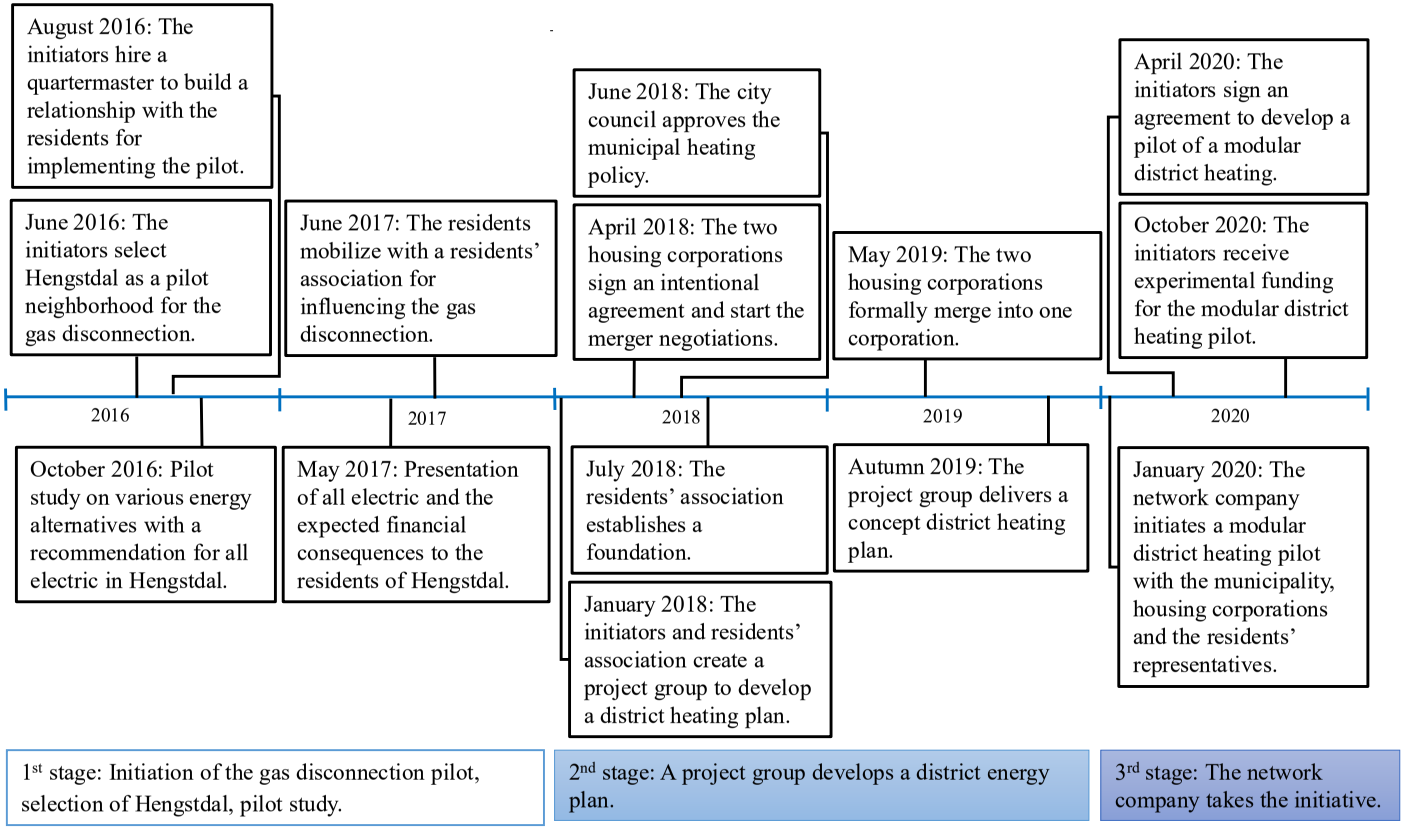

Figure 8: Implementation of gas disconnection in Hengstdal between 2016 and 2020.
Sources: Fokkema & Scholtens (2017); Municipality of Nijmegen (2018).

3.3.2 Data collection

Our single case study included three data sources—documents, observations, and interviews—a triangulation method that improved research validity. First, we used documents from GEA and its program, "Neighborhoods for the Future," as secondary data sources to elaborate on the implementation. Neighborhoods for the Future is a provincewide innovation program to share knowledge among various pilots about gas disconnection. The secondary sources included strategy documents (Fokkema & Scholtens, 2017), spatial programs (Kuipers & Maessen, 2020; Municipality of Nijmegen et al., 2020), and evaluations (Netherlands Court of Audit, 2020). From these sources, we developed a chronological overview of the local initiative in Hengstdal. We also retrieved some of these secondary sources from the corporate websites of the actors involved.

Second, we made nine observations in the Neighborhoods for the Future, consisting of six Communities of Practice (Wenger & Snyder, 2000), two knowledge sessions, and one general board meeting (Appendix A). The first author attended these meetings and drafted reports regarding actors' commitments, goal frames, alignment, and implementation strategies. Representatives from the Hengstdal initiative participated in the meetings and shared their knowledge about gas disconnection with those from elsewhere in Gelderland.

Third, we used semi-structured interviews to collect data about actors' motivations, goal frames, alignment, and implementation strategies. We held seventeen 60- to 120-minute interviews between September 2018 and January 2021. We selected the interviewees on theoretical and empirical grounds: The theoretical grounds were that respondents could explain the dominant motivations and alignment strategies for implementation, and the empirical reasons were that respondents were affiliated with the gas disconnection initiative in Hengstdal. Representing either the government, private companies, or the community, the respondents had a position at GEA, were process managers or advisors in government, housing corporations or firms, or worked as coordinators in the local initiative (Appendix B).

3.3.3 Data analysis

We thematically transcribed, coded, and interpreted three strategy documents and the interview transcripts. We chose to code only three strategy documents because coding these documents provided enough explanation of the goal frames and alignment strategies of the larger-scale GEA program, Neighborhoods for the Future. As the unit of analysis focused on implementation in one neighborhood, the Neighborhoods for the Future strategy documents were relevant because they shaped the framework

in which Hengstdal was selected as a pilot neighborhood. The first author coded the implementation strategies adopted in Hengstdal in a straightforward way, assigning codes to sentences, in which the respondent clearly addressed the different goal frames, alignments, and implementation. With the help of Atlas.ti, we made a qualitative content analysis to determine text segments with a similar meaning that we categorized into code groups. Then, we elaborated on the relations between the code groups and the thematic patterns concerning commitment, goal frames, frame alignment, and implementation (Henning et al., 2004).

3.4 Analysis

In this section, we analyze the actors' goal frames and frame alignment strategies in each of the three consecutive implementation stages of gas disconnection in Hengstdal, as shown on the timeline in Figure 8.

3.4.1 Stage one: Gas disconnection pilot

The mayor and the city council of Nijmegen embraced the territorial foresight outcome for the municipality at the beginning of 2016. The city council decided that citizens should participate in implementation of the foresight outcome to support alternative energy solutions. According to the municipality (resp. 8): "*To develop a heating plan for the neighborhood should be a joint effort with the residents, energy network company, housing corporations, and businesses.*" Thus, the main reason for the municipality to join the pilot was to guide participation in a normative goal frame. The municipality also pursued gas disconnection as part of a wider aim to become a climate-neutral city before 2050 (Municipality of Nijmegen, 2018).

The energy network company joined the pilot because it had to decide whether to replace the partially depreciated gas network in Hengstdal or propose an alternative. The company explored sustainable alternatives for distributing affordable, reliable, and sustainable energy in accordance with heating legislation in a normative goal frame (Alliander, 2017). As part of its mission, and within a gain goal frame, the company pursued gas disconnection at the lowest societal costs and to prevent too early depreciation of the gas network. The company also aspired to make efficient investments in the electricity grid and the development of an open grid. Therefore, this pilot was an interesting learning experiment for the company. If the pilot could provide an interesting alternative to the existing gas network, the company could avoid the high-risk investment of improvements to the network.

For the housing corporations, joining the pilot presented an opportunity to realize a lower energy loss for their houses. In accord with social housing legislation, these corporations provide affordable housing to low-income tenants and seek to invest in a sustainable environment (Ministry of the Interior and Kingdom Relations, 2015). They had committed to the sector agreement of realizing an average of an economical and sustainable energy label before 2020. However, the two housing corporations had distinct perspectives on sustainability. Corporation A was ideologically committed to sustainability in a normative goal frame but viewed the technical impact and investments of gas disconnection in a gain goal frame (Housing Corporation A). Corporation B was more critical of the goal because of the expected costs and affordability concerns in a gain goal frame (independent advisor).

After selecting Hengstdal, the municipality hired, in consultation with the energy network company and the housing corporations, a quartermaster to stimulate residents' participation in the pilot. Adopting a strategy of frame amplification to make the pilot more visible, the quartermaster proposed a collective solar roof, a neighborhood garden, and the establishment of a residents' association, and on behalf of the municipality, urged residents to participate (Quartermaster, resp. 4). Another initiative from the municipality was an independent external study of alternative energy solutions for the neighborhoods in Nijmegen, including Hengstdal. As an example of a frame transformation strategy, the study proposed a radical new energy alternative, based on the new values of sustainability and gas disconnection. The study indicated that all-electric would be the best technical solution for Hengstdal due to a lack of residual heat in proximity to the neighborhood (Schepers et al., 2016); however, the study did not provide insights into the financial impact of all-electric.

Therefore, Housing Corporation A utilized frame transformation, as it computed the financial impact of all-electric for social housing in Hengstdal, in collaboration with the energy network company (Housing Corporation A, resp. 10). Jointly with the quartermaster, the actors presented the all-electric solution to the residents. Although eventually normatively motivated toward sustainability, the residents, in a gain goal frame, were unpleasantly surprised by the per household investment costs. Therefore, they opposed all-electric but sought an energy alternative to support the aim of a sustainable neighborhood. As one of the residents emphasized, "*Then, we decided to take the initiative … Almost immediately, we heard that Hengstdal should disconnect from the gas network as the first neighborhood in the Netherlands. … Should we take this initiative with the risk of becoming the wrongdoer? … Then, I thought, we embrace this issue, because it is the best vehicle for sustainability*' (Residents' Foundation, resp. 7).

To avoid unexpected surprises and to take part in the negotiations about an alternative energy solution, the residents mobilized to establish a residents' association and selected a few residents to negotiate on their behalf with the other actors.

3.4.2 Stage two: Project group for a district heating plan

In the months after the all-electric presentation, representatives from the municipality and the residents' association met several times to discuss alternative energy solutions that all actors—particularly the residents—could support. Next, the municipality decided to initiate a project group to develop a joint district heating plan for Hengstdal that would align the goal frames among actors and thus accelerate implementation. In this way, the municipality was utilizing frame bridging as it stimulated the energy network company, housing corporations, and residents' association, who were sympathetic to the initiative, to develop a joint plan.

In a normative goal frame, the municipality also requested that the residents' association establish a legal vehicle, a foundation (Residents' Foundation, resp. 15), to increase participation and provide financial support for residents (Residents' Foundation, resp. 7). This way, the municipality supported the residents with their self-organization.

In the project group, the energy network company examined the efficient phaseout of the gas network and forecasted grid reinforcement for an all-electric system (Municipality of Nijmegen et al., 2020). Housing Corporation A continued to support all-electric in line with the earlier study (Schepers et al., 2016); however, as neither Housing Corporation B nor the residents' association agreed with all-electric, after some time, Housing Corporation A decided to leave the project group. In a gain goal frame, Housing Corporation B then studied small and large adjustments to reduce energy loss and to maintain the affordability of a local district heating solution (Housing Corporation B, resp. 14). Based on the results, Corporation B recommended first to make some small, inexpensive, efficiency improvements, before deciding on a future energy system (Atriensis, 2018).

When the residents' association found that the other actors could not align their goal frames in the project group, it utilized a normative and gain goal frame to explore the sustainability, affordability, and investments in another (radically new) alternative: local district heating with geothermal energy (Residents' Foundation, resp. 12). In autumn 2019, the project group delivered a concept for the district heating plan that outlined all-electric, local district heating with a medium and low temperature including geothermal energy, and renewable gas as alternatives. The project group did not select a specific energy alternative, because none was yet sustainable, affordable,

and reliable. Thus, the project group recommended insulation first (Municipality of Nijmegen et al., 2020). As the pilot actors could not agree on an energy alternative, implementation decelerated.

During the period that the project group was active, the two housing corporations experienced different underlying normative and gain goal frames as well as pressure to deal with gas disconnection. The corporations discussed their disagreement about a sustainable alternative for Hengstdal, but also the consequences of a failure to collaborate. Collaboration served both corporations' interests. Housing Corporation A proposed a merger, believing the move would provide the best opportunity to achieve energy sustainability goals (Housing Corporation A, resp. 10; Housing Corporation B, resp. 14). Corporation B assumed that a merger would facilitate the legal and sector obligation to provide affordable housing. Therefore, in May 2019, the two corporations merged, an action that represented frame bridging, because both corporations were committed to intensifying their collaboration. The new corporation's mission included both energy sustainability and provision of affordable housing (De Gemeenschap & Standvast Wonen, 2018).

3.4.3 Stage three: The energy network company takes the initiative

Once the district heating plan could not align the pilot actors' goal frames concerning a sustainable energy alternative, the process was stuck, and the energy network company stepped up to take the initiative. The company intended to invest in a modular district heating system that included novel organizational and technical solutions. The pilot would incorporate a neighborhood scale cooperative that could arrange shared ownership and increased influence for residents (an important goal for the residents' foundation). In this way, the energy network company used frame bridging to address the different commitments as all actors could partake in a best practice. Such an innovation could serve as an acceptable alternative while allowing the company to comply with legal requirements to provide affordable, reliable, and sustainable energy (Alliander, 2017).

The pilot provided the energy network company with an opportunity to gain experience with system modularity and upscale the system in other neighborhoods—a gain goal frame—contributing to efficient, affordable energy provision (Kroon, 2020). According to the residents' foundation (resp. 17): "*The company's interest is to experience and to learn from the implementation of the modular district heating. The intention is to develop these systems throughout the Netherlands.*" The pilot also included organizational and technical innovation because all actors could potentially connect their own energy sources to the modular system. In this way, the pilot enabled the

housing corporation to efficiently maintain its energy B labels in a gain goal frame: "*The current insulation should fit the system. Sufficient heating without major adaptations to the insulation level*" (Housing Corporation B, resp. 14).

The residents were enthusiastic about participating in the pilot because modular district heating could provide an alternative to the expensive all-electric option. Drawing on both a normative and gain goal frame, the residents committed to participate in the pilot, but noted, "*We will not make the participatory case for the large organizations. That is not our task. We intend to do things together*" (Residents' Foundation, resp. 17). The municipality also supported implementation of modular district heating in a normative goal frame because the system would facilitate participation in cooperative ownership (Municipality, resp. 16).

The four pilot actors then signed an intentional agreement committing to collaboration and emphasizing participation. A few months later, the municipality, energy network company, and the housing corporation signed another agreement concerning the feasibility, concept development, and implementation of modular district heating (Kuipers & Maessen, 2020). The residents' foundation lacked the financial resources to sign this agreement despite its commitment to the concept. As a result, the influence of the residents' foundation in the subsequent implementation was diminished (Residents' Foundation, resp. 17).

In a gain goal frame, the municipality successfully applied on behalf of all actors for experimental government funding and received almost five million euro to enable the pilot actors to proceed with implementation of modular district heating (Ministry of the Interior and Kingdom Relations, 2020). The funding bridged the municipality's goal of participation, the energy network company's desire to gain experience with upscaling, the housing corporation's ambition to use insulation measures efficiently, and the residents' foundation's willingness to participate in an affordable energy alternative.

3.5 Discussion and conclusion

In this paper, we explored the research question: *When implementing a territorial foresight outcome, how can actors align their various goal frames and commit to the implementation process?* To answer this question, we applied the framework of GFT in combination with four different alignment strategies to analyze a pilot neighborhood project in the Netherlands to implement the territorial foresight outcome of gas disconnection.

The case study shows that in the first two implementation stages, the actors emphasized different gain goal frames on affordability, efficiency, and investments. When these gain goal frames about a suitable energy alternative did not sufficiently align, the actors fell back on their normative goal frames to act in accordance with legislative and sector obligations, participation, and sustainability. They continued to recognize the obligation to pursue the territorial foresight outcome of gas disconnection, but because they could not align their gain goal frames, implementation was hampered. In the third stage, the energy network company took the initiative to break the deadlock: A dynamic modular district heating system could address the actors' differing normative and gain goal frames concerning legislative and sector obligations, participation, sustainability, affordability, efficiency, investments, and upscaling. Appendix C provides an overview of these differing goal frames.

The actors adopted four frame alignment strategies for their various goal frames in the implementation process (Appendix D). In the first stage, the municipality and the housing corporations embraced frame amplification and transformation to emphasize the gas disconnection pilot and to propose a radically new all-electric alternative. In opposition to the costly all-electric alternative, the residents' association responded with a frame extension to mobilize the residents for sustainability. Thus, the process decelerated as the actors could not agree on an energy alternative and returned to their own normative goal frames. Then, in the second stage, the municipality used frame bridging to propose different options for replacing gas. Again, the actors could not decide on a final energy alternative in the plan because of their differing concerns, such as sustainability, efficiency, and investment. Consequently, a deadlock followed.

In the third stage, the energy network company used a frame bridging strategy to overcome the impasse with its proposal of a modular district heating. This idea served as a best practice to align the actors' normative and gain goal frames. With its proposal of a radical new organizational and technological setup of cooperative ownership and system modularity, the company utilized a transformation strategy. Thus, the expectation of a future decision trajectory with a new organizational entity—a neighborhood cooperative—transformed the alignment of the four actors' various goal frames. The strategies of frame amplification and extension were less evident in this stage because all actors were already mobilized and aware of the necessity of implementing the vision from the territorial foresight outcome to become climate neutral as a (pilot) neighborhood. Thus, amplifying or extending the goal frames had been sufficiently accomplished in the early stages of the case study.

Also achieved in the third stage was a bridging of the various normative and gain goal frames of the residents, the merged housing corporation, and the energy network company. At this point, the municipality could inform the national government about the remaining financial gap in the pilot, which was clarified and described in the new neighborhood-scale solution the energy network company had designed. With the national government's grant of large experimental funding to the pilot neighborhood, the normative and gain goal frames were finally united.

In summary, our study shows that after engaging in a foresight process, the actors began with a reminder of their agreement on the foresight outcome. Using an amplification strategy, they joined forces to implement the outcome. However, the amplification strategy was not sufficient, and the actors adopted other alignment strategies simultaneously. To attract adherents, they used frame extension, a strategy that was not used in subsequent implementation stages. Frame bridging strategy was the most common alignment strategy: As actors learned about others' additional goal frames, they sought to make connections. When frame bridging proved insufficient to break a deadlock, the actors looked for other alignment strategies. Frame transformation arose as an interesting strategy when the actors could not agree on a preferred energy alternative. They found they could propose new energy alternatives and keep redesigning a more modular solution for meeting various goal frames to achieve the long-term goal.

Territorial foresights are made to prepare a geographical area for the future, often on a national, regional, or city scale; however, implementation frequently occurs in more local pilot studies, in our case, on a neighborhood scale. This local level has been an unexplored research domain in foresight studies (Barre, 2014; Havas, 2003; Havas et al., 2010). Local implementation may draw in other actors from those participating in the wider territorial foresight process, and consequently these actors may not be able to use the full executive potential to achieve a long-term goal (Havas et al, 2010; Ravetz & Miles, 2016). In our case, residents became involved only locally, and their perspectives only entered in the implementation stage. If residents had been included in an earlier stage, their participation could have increased the executive potential to accelerate the implementation. Furthermore, our research shows that actors may oppose implementation after a territorial foresight process (Vargas-Lama & Osorio-Vera, 2020). Such opposition arose several times in this pilot because of different or even conflicting gain goal frames among actors. In this case, actors adopted various alignment strategies to overcome impasses to implementation. To reduce deadlocks, it is important to make gain goal frames explicit at the start of implementation, and actors can enlarge the potential of a foresight if they anticipate how the implementation may proceed (Acosta-Prado et al., 2015; Ryan, 2015).

The results of this study could be strengthened with a cross-case comparison and, for example, the mapping of necessary and sufficient conditions for frame alignment. In such a way, we could test whether frame bridging was particular to Hengstdal, or whether it is a more general phenomenon in the implementation of territorial foresight outcomes concerning gas disconnection (Schneider & Wagemann, 2012). In addition, this research indicated that intra-organizational dynamics matter in the process of merging the two housing corporations. Also, the goal frames of individuals, intra-organizational communities, or departments do not necessarily align with the larger organization's corporate mission or goal frame. Thus, intra-organizational alignment could be an interesting focus for future research because internal controversies may hinder actors from consistent inter-organizational frame alignment (Schön & Rein, 1994). Additional understanding of the relationship between foresight processes and their implementation is also necessary because otherwise, implementation may lack future thinking and/or sufficient resources (Barre, 2014). Foresight processes need to fit implementation cycles to be effective (Van der Steen & Van Twist, 2013). As such, more implementation studies are necessary to evaluate the impact of territorial foresight (Güell & Redondo, 2012; Keenan & Popper, 2008).

4

Multi-stakeholder partnership as an instrument for the energy transition: How motives, involvement, and network embeddedness contribute to sustainability and transition process goals

Abstract

A new generation of multi-stakeholder partnerships (MSP) has evolved in the energy transition to mitigate climate change, to make investments in renewable energy, to improve energy efficiency and sustainability, and to empower stakeholders. Critical to the MSP are the motives of stakeholders to engage in the partnerships and their actual involvement. The internal and external network embeddedness of stakeholders also influences the performance of an MSP. However, it is unclear how the spanning of internal and external networks influences the involvement and the goal achievement of an MSP. This explorative study analyses how these underlying factors influence MSPs in the energy transition. The evidence comes from GEA, an MSP committed to the achievement of sustainability and transition process goals. The findings show that the motive to participate in an MSP is based on sharing knowledge. The mobilizing, resource and supportive involvement contribute to the goal achievement of the MSP and the stakeholder's own goals. The stakeholders' internal network embeddedness is important and provides the MSP with the necessary resources. At the same time, the external network embeddedness does not influence involvement and goal achievement significantly. Based on this explorative study of one regional MSP, recommendations are formulated for future research and for policy regarding MSPs.

Keywords: Multi-stakeholder partnerships (MSPs), motives, involvement, network embeddedness, goal achievement, energy transition

4.1 Introduction

The energy transition is a complex policy problem and one of the greatest challenges of our time. Public and private stakeholders work together to achieve the common goals in the policy process of energy transition (Heldeweg et al., 2015; Pinilla-De La Cruz et al., 2022). As no sole stakeholder has sufficient knowledge, information and resources to guide the energy transition (Cheng et al., 2021), a widely accepted insight from the energy transition literature holds that the transition process and the attainment of public policy goals benefit from partnerships between public, private and civil society stakeholders (Hueskes et al, 2019). These partnerships establish a new form of partnership governance, the multi-stakeholder partnership (MSP). In MSPs, the involved stakeholders are committed to implementing public policy and to take ownership in all stages of decision making (Momen, 2020). For instance, Velotti et al. (2012) have researched how various public, private and civil society organizations have dealt with the attainment of public policy goals for the energy transition in (various forms of) partnerships.

MSPs are collaborative forms of governance in which various stakeholders share information, technologies, resources, and responsibilities and work toward the implementation of public policy goals (Clarke & MacDonald, 2019; Eweje et al., 2021; Rasche, 2012). MSPs have evolved in the energy transition for various reasons, such as to mitigate climate change, to make investments in renewable energy (Casady et al., 2024; Raghutla & Kolati, 2023), to improve energy efficiency and sustainability (Cheng et al., 2021), and to empower stakeholders (Maraña et al., 2020). Moreover, diversity in stakeholders helps to identify what works and what does not work in the policy process and generate innovations and ideas (Momen, 2020).

Although involved stakeholders in MSPs do agree on the public policy goals of the energy transition, i.e., being climate neutral in 2050, they also have different, complementary or even competing motives to engage into the policy process (Cedrick & Long, 2017; Pinilla-De La Cruz et al., 2022). The motives of stakeholders determine their involvement and thus influence the goal achievement of the MSP (Alexander, 2012; Cruz & Sarmento, 2017; Hodge & Greve, 2019; Wang et al., 2019). In general, the deeper the involvement, the higher the sustainability and transition process performance, because stakeholders express a stronger commitment to MSP, are more inclined to share information and resources, and become more aware of the importance of participating in the transition process and making the environment sustainable (Boyer et al., 2016; Wang & Ma, 2021).

Network relationships support the motives and involvement practices and give substance to goal achievement. This is because network ties provide the social structure that gives shape to the intentions and commitments of stakeholders in an MSP, as well as providing information and resources that facilitate collaborative practices. These ties stimulate stakeholders to take action and provide the social capital needed to implement climate goals. For example, networks are recognized as effective channels for the exchange of valuable tacit knowledge and resources (Burt et al., 2013; Van Meerkerk et al., 2018a). The extent to which stakeholders are embedded in such networks is relevant to how the MSP functions, because the strength of social ties influences stakeholders' performance (Granovetter, 1983). Network embeddedness '*refers to the process by which social relations shape economic action*' (Uzzi, 1996: 674). Cyr et al. (2023: 494) state that network embeddedness includes '*social relations in organizations —that is, the conditioning of relationships by their social context*.' Hence, understanding how the underlying motives, involvement, and network embeddedness influence the achievement of public policy goals is important for gaining insights into the dynamics of MSPs. Therefore, this study examines the relationships between these factors on MSPs in the energy transition. The research question is: '*How do motives, involvement practices, and embeddedness of stakeholders in an MSP influence the public policy goals for the energy transition?*'

The evidence comes from the Netherlands. We analyzed the MSP Gelderland Energy Agreement (GEA) in the province of Gelderland. The public, private, and community sectors look for sustainability solutions in the energy transition process. GEA uses MSP to achieve sustainability and transition process goals, including a carbon emission reduction of 55 per cent by 2030 and climate neutrality by 2050 (GEA, 2025). The MSP under study provides valuable insights into the relationships between motives, network embeddedness, involvement and goal achievement, as GEA is the first network of its kind with a long-term commitment to sustainability in the Netherlands. The case provides a contextual understanding of an MSP aiming at carbon neutrality. GEA encourages cross-sector collaboration and knowledge sharing in Communities of Practice and pilots. These Communities of Practice and pilots provide an opportunity to deliberate about the energy transition and inform each other about proposed resource allocations. Key network participants, such as the Province and the energy network company, contribute time and resources to assist in regional planning and the expansion of the energy network. Furthermore, stakeholders develop professional relationships and have the ambition to move forward together. GEA does not have the mandate to take all steps in the implementation because it is not a democratically elected institution. Stakeholders need to collaborate voluntarily to achieve sustainability and transition process goals. This study shows how the implementation works in practice.

The structure of this explorative study is as follows: Section 4.2 introduces a conceptual framework for understanding the relationships between motives, stakeholder involvement, network embeddedness and goal achievement of MSPs. Section 4.3 explains the case study, data collection, and methodology. Section 3.3 presents the results, while section 4.5 discusses the findings, limitations and directions for future research.

4.2 Theory on motives, involvement, goal achievement and network embeddedness

The MSP literature examines the process dynamics of motives, involvement practices, and goal achievement within a network of public and private stakeholders. Literature shows that the network relations of MSP members may influence, stimulate or hinder motivation, involvement and the ability to achieve goals. The strength of network ties, the nature of social relationships, and the stakeholder's position within a network all have influence on involvement and goal achievement (Burt et al., 2013; Granovetter, 1983). The spanning of the stakeholders' internal networks and the external MSP network is also evident for the goal achievement because of the ability to provide resources, to exchange information and to connect with important others (Klindt et al., 2024; Williams, 2002). Figure 9 shows the relationships between the motives, involvement, and network embeddedness on organizational stakeholder and MSP goal achievement. These relationships are discussed in more detail below.

4.2.1 Motives

There are different motives to engage in MSPs that have been founded for accelerating the energy transition, such as knowledge, collaborative and business motives (Boyer et al., 2016; Vecchi et al., 2022). The purpose of the knowledge motive is to gain information about the energy transition from others (Akomea-Frimpong et al., 2022; Greve & Hodge, 2020; Valkenburg & Cotella, 2016). Stakeholders do not have all information and information asymmetry exists (Quintane & Carnabuci, 2016). The MSP addresses information asymmetries by sharing knowledge, which helps to overcome barriers as well as address newly emerging issues of the energy transition (Boyer, 2016). Involvement in MSPs provides opportunities to learn about innovative community practices to contribute to a carbon neutral society (Maraña et al., 2020; Li & Lange, 2023). This holds not only for technical issues, such as smart grid technology (Waddell et al., 2015), but also new institutional structures for cross-sector collaboration (Callens et al., 2021; Greve & Hodge, 2020; Lammers & Heldeweg, 2016). Based on the acquired knowledge and learning from others about innovative institutional structures within the energy transition, stakeholders develop solutions

that fit in specific local and regional settings (Ahmad & Raza, 2020; Carbonara & Pellegrino, 2020; Casady et al., 2024). Increasing the innovation power, learning about climate change, gaining knowledge about the energy transition, acquiring sustainability and networking skills illustrate the knowledge motive.

Another motive, besides the knowledge motive, to engage in MSPs is the collaboration motive. Although stakeholders connect to each other and bring different expertise, resources, and professional experience on the energy transition (Choi, 2018), cross-sector collaboration is difficult because reciprocity, i.e., a balance between giving and receiving, cannot be taken for granted in a competitive environment. Stakeholders show a collaboration motive when they are looking for suitable partners in their professional network for cross-sector collaboration. Hence, the collaboration motive stimulates reciprocity as stakeholders may seek win-win situations (Jones & Noble, 2008; Warsen et al., 2020). In addition, the collaboration motive aims to bring stakeholders together to experiment with new partnerships because they may not be familiar yet with the joint use of sustainable energy technologies in the local environment, and they believe that this collaboration helps in realizing a sustainable society (Li & Lange, 2023). Stakeholder management and connecting people are also illustrative of the collaboration motive.

Finally, there are business reasons to engage in MSPs. The business motive refers to the achievement of individual interests and goals. For instance, businesses tend to increase their profits which is a challenge for investors as the energy market changes from a centralized fossil energy system into a networked arrangement (Hessevik, 2022; Vezzoni, 2024). It is important to connect with investors to acquire the necessary financial capital to invest in renewable energy (Larosa et al., 2022; Raghutla & Kolati, 2023). Exemplary for the business motive is also fulfilling an employment position, increasing one's market share and gaining a sustainable image for one's company. Although participating in an MSP can improve the corporate sustainability image (Hong & Kim, 2018), a business motive seeks to optimize the benefit. Stakeholders may therefore be incentivized to act opportunistically and are less oriented towards the attainment of the public policy goals of the energy transition (Warsen et al., 2020). Therefore, a business motive may be less inclined to commit to the goals of MSPs compared to stakeholders with a knowledge or collaboration motive. Hypothesis 1 is as follows: *Stakeholders with a stronger focus on knowledge and collaboration motives are more inclined to involve in MSPs than those with a dominant business motive.*

4.2.2 Involvement practices

Involvement practices refer to the participation in the MSP for the promotion of sustainability and the transition processes. In this study, involvement practices

of the MPS are classified into mobilizing, resource, sustainability and supportive involvement to deepen participation and promote goal alignment. The reason for this conceptual distinction is that MSPs can attain their goals if stakeholders make relational investments into the network, exchange valuable information and resources, and are committed to sustainability goals. A supportive social infrastructure guides the network interactions (Patil et al., 2016; Pinilla-De la Cruz et al., 2022; Verhoest et al., 2015).

First, the mobilizing involvement means that stakeholders make relational investments to increase shared commitment and reciprocity. They invest time and energy in organizing and participating in activities (Revez et al., 2022). For instance, stakeholders give in-person presentations on allocation proposals, present community ideas in public meetings and distribute project information through web-based platforms (Boyer et al., 2016). With the mobilizing involvement, stakeholders build legitimacy for and express the willingness to attain the goals on climate neutrality of the MSP (Hessevik, 2022; Van Meerkerk & Edelenbos, 2018a). Examples of the mobilizing involvement include making MSP members aware of their impact on a better world, the empowerment of pioneers and gaining political support for achieving carbon neutrality. In this way, the mobilizing involvement raises the awareness of how and when to contribute to the sustainability and transition process goals of the MSP.

Stakeholders may have unique resources, expertise and knowledge that are needed for supporting the MSP, but no stakeholder has the sole ownership of these resources. The distribution of resources is unequal in the transition process, in which large resource inequalities exist between stakeholders. In addition, the investments in the energy transition are made in an uncertain and complex setting. Therefore, secondly, resource involvement is a prerequisite for achieving sustainability and transition goals (Dinica, 2008; Maraña et al., 2020), referring to the willingness to make resource investments in the MSP (Ahmad & Raza, 2020). Jointly owned pilots attract resource investments to attain the MSP goals because these projects reduce the investment risks of stakeholders (Holstenkamp, 2018). The resource involvement also entails the investment in strategic partnerships, the investment in financial resources, sharing knowledge about sustainability and sending employees to the MSP to represent the home organization. Finally, the resource involvement usually demands transparent and fair capability exchanges, such as the provision of funding, the sharing of investment power and strategic information (Larosa et al., 2022; Wentworth & Grant Makokera, 2015).

Third, 'sustainability involvement' is needed to achieve a form of 'collective action' because sustainability is typically an interest of the next generations and of 'the

environment' or 'the planet'. When stakeholders have a strong transactional orientation or are highly self-interested, the required balance between social, economic and environmental needs is violated and hinders the achievement of MSP goals (Maurya & Srivastava, 2020; Patil et al., 2016; Warsen et al., 2020). Sustainability involvement is about the monitoring and improvement of the balance between social, economic, and environmental needs. This can be established through Energy Service Companies (ESCOs). ESCOs support sustainability involvement through contractual arrangements, energy audits, use of sustainable energy technologies, and performance-based fees to achieve energy savings (Cebekhulu et al., 2024; Martiniello et al., 2020). In this way, ESCOs contribute to the development of policies that shift the balance toward greater social and environmental sustainability (Casady et al., 2024). Other examples of sustainability involvement incorporate the development of Smart Neighbourhoods, climate adaptation on business parks, Neighbourhoods for the Future, sustainable public real estate and organizing a societal tender on local property ownership.

A final type of involvement practice is the supportive involvement. It focuses on the use of a stimulative social infrastructure to keep stakeholders engaged over a longer period (Klindt et al., 2024; Verhoest et al., 2015). A supportive involvement cannot be taken for granted because stakeholders may be confronted with short-term political or market developments they need to anticipate. An MSP is exposed to the period of office of usually four years, after which new policy goals are formulated that can be detrimental to the supportive involvement. Market developments interfere with the supportive involvement when the private sector does not make financial investments in the MSP anymore due to unfavorable market conditions. Hence, a supportive social network infrastructure is needed to limit market uncertainty and to prevent short-termism (Uzzi, 1996). In addition, the structure of decision-making is unclear in networks due to the diffusion of authority. The decision authority is often not known in advance because the MSP members are not familiar with a member's position in the decision hierarchy of the home organization. As a result, they are not sure whether they ask the right person about the supportive involvement. The decision authority also tends to be diffused because stakeholders depend on their social relations to gain strategic information and resource for making the decision. However, MSP members differ in their disposal over social relations to attract the necessary information and resources to implement the decision. The supportive involvement helps to govern the MSP with the encouragement of initiative, joint task allocation, finding the right partners, provision of organizational capacity and monitoring (Brogaard, 2019; Hueskes et al., 2019; Van den Hurk et al., 2016). Examples of the supportive involvement are contributions to the board and the secretary of the MSP, involvement in program development, and the development of financial instruments.

4.2.3 Goal achievement

MSPs are used as instruments for achieving the public policy goal of sustainability in the energy transition (Bäckstrand, 2006; Greve & Hodge, 2022; Van Meerkerk et al., 2024). The energy transition requires systemic change to support a more sustainable society (Waddock et al., 2015), focusing on the balance between economic, social and environmental needs of current and future generations (Pinz et al., 2018; Wang & Ma, 2021). As Zobel & Comello (2025) suggest, MSPs require collective projections of desirable sustainability goals because effective transformative changes necessitate stakeholders looking beyond themselves and constructing pathways into the future. At the same time, stakeholders demand a present-day transition process that facilitates knowledge and resource sharing, since an energy transition is inherently complex and uncertain. Consequently, stakeholders aim to learn how to collectively anticipate such a complex and uncertain process (Groves, 2017). Consequently, a balance is needed between the MSP achieving projected sustainability goals and stakeholders' implementation concerns. Otherwise, the MSPs will not meet sustainability expectations, as stakeholders will exit the partnership if their individual goals are not sufficiently addressed or conflicts arise regarding the organization of an effective transition process.

Examples of sustainability goals include contributing to a climate neutral society, building a circular economy, waste management, energy efficiency and climate adaptation (Akomea-Frimpong et al., 2022; Campitelli et al., 2023). On the one hand, sustainability goals are receiving increasing attention in the energy transition because, as time passes, the 2050 carbon neutrality target is approaching, and urgent action is increasingly needed. On the other hand, competing policy objectives, such as urban development and the need for housing, are vying for societal attention alongside sustainability targets. The lack of space for renewables and a dominant sectoral approach in planning also make the sustainability goal achievement more uncertain (De Winkel et al., 2025; Hoppe & Van Bueren, 2015; Koelman et al., 2024).

Long-term goals are also essential in guiding the complex transition process, complementing the sustainability goals with supportive goals, i.e., specific goals of guiding the transition process (Beenakker et al., 2022). The transition process goals aim at business community development (Achterbergh & Vriens, 2019), i.e., the involvement of the business community in organizing a sustainable regional economy where a large variety of sectors, businesses and households benefit from without putting a mortgage on social and environmental development (Wang & Ma, 2021). The transition process targets also engage stakeholders in inclusive, participatory and democratic processes to align internal ambitions with the goals of the MSP. An example of such an inclusive, participatory and democratic transition process is

the professionalization of energy cooperatives because cooperatives tend to share sustainable energy expertise with the MSP members based on a non-profit motive (Casady et al., 2024). Other examples of transition process goals are the energy goal achievement of the MSP, putting energy savings on the political agenda, and pointing out the legal obligation to save energy.

Supportive goals guide the transition process through voluntary agreements, cross-sector collaboration (Pinilla-De La Cruz et al., 2022) and the validation of knowledge from different fields of expertise (Van Drooge & Spaapen, 2022). An example of a voluntary agreement is the signing of a memorandum of understanding, as such a public statement commits key stakeholders to provide resources to the MSP. Another example of a voluntary agreement is a declaration of intent, which is an agreement that links strategic actions from the government, business, and cooperative sectors to the long-term implementation of the energy transition. Cross-sector collaboration is evident for the attainment of supportive goals because change processes include 'gray areas' that are not regulated yet, and there is still no clarity about the overlapping and competing roles in organizing the energy network of the future (Heldeweg et al., 2015; Pinilla-De La Cruz et al., 2022). As part of the supportive goal setting, stakeholders also need to validate knowledge by formatively evaluating the progress of the energy transition (Van Drooge & Spaapen, 2022). The more complex the attainment of supportive goals is, the greater the need for cross-sector collaboration between different sectors and stakeholders because siloed solutions are unfit to address a wicked energy transition (Waddock et al., 2015). The goal achievement does not only depend on this kind of collaboration, but also on the intensity and type of involvement in an MSP (Boyer et al., 2016).

Although the involved stakeholders share the same public policy goals for energy transition in an MSP, their sub interests and subgoals deviate from public policy (Beenakker et al., 2022). Stakeholders also participate in achieving their own goals such as learning from others, acquiring knowledge and expertise, finding partners for developing joint projects, reducing investment risks, or increasing legitimacy for organizational actions, products and services. Involvement in an MSP is a strategic way for a stakeholder to achieve their own goals related to sustainability and the energy transition. Hence, the following hypotheses are formulated:

Hypothesis 2a: *Stakeholder involvement in an MSP has a positive relationship with the achievement of sustainability and transition process goals of an MSP*.

Hypothesis 2b: *Stakeholder involvement in an MSP has a positive relationship with the achievement of individual sustainability and transition process goals*.

4.2.4 Network embeddedness

Network embeddedness converts network ties into valuable resources because reciprocal ties and network density lead to the better identification of the reputation of network members, improved information processing and a higher performance (Lee et al., 2014). Therefore, network embeddedness refers to the degree to which a stakeholder relates to others in a network, including different relational processes and network outcomes (Granovetter, 1983; Uzzi, 1996). The network relationships account for a great deal the motives, involvement practices and goal achievement of the stakeholders and the MSP (Cheng et al., 2021; Cyr et al., 2023; Eweje et al., 2021). In accordance with Klindt et al. (2024), this study distinguishes internal and external network embeddedness.

The internal network embeddedness refers to the use of expertise, resources and social capital within the organizational stakeholder (Satheesh et al., 2023; Tushman & Scanlan, 1981). When more internal representatives of a stakeholder are participating in the MSP, the larger the impact on the network. A large internal network embeddedness mobilizes much social capital internally to ensure power, legitimacy, trust and involvement in the MSP. A stakeholder with a large internal network therefore provides more resources and mediates the flow of information in the MSP (Van Meerkerk & Edelenbos, 2018a, b). Furthermore, when a stakeholder has a large internal network, the lobbying power and relational capital increase and improve the performance of the MSP and their own performance (Hessevik, 2022). With a strong internal network embeddedness, a stakeholder positions itself better in the MSP and enhances its corporate status (Hogan, 2015).

According to Klindt et al. (2024), Borgatti & Halgin (2011) and Burt et al. (2013), the external network embeddedness influences involvement and goal achievement because it exposes external partners from outside the stakeholder's organization, but from within the MSP network, to innovative ideas about sustainability and the transition process. Of course, the stakeholder shares information and knowledge about other stakeholders, the process and goal achievement of the MSP. In general, a stakeholder with a strong external network has potentially more access to resources, information and knowledge from the MSP to foster innovation and new ideas. A large external embeddedness leads to the intelligent recombination of sustainability and transition process ideas and the higher performance of the MSP (Satheesh et al., 2024b).

A stakeholder becomes a boundary spanner in the MSP when it generates, mediates and coordinates the information flow of the MSP, with support from the resource provisions of the internal networks (Klindt et al., 2024; Van Meerkerk & Edelenbos, 2018a). In this way, a boundary spanner connects social, societal, or cultural silos

(Satheesh et al., 2023; Tushman & Scanlan, 1981), shares information and resources across sectoral and organizational boundaries and connects stakeholders within the MSP (Van Meerkerk et al., 2024; Klindt et al., 2024; Williams, 2002). However, it is unclear how the spanning of internal and external networks influences the involvement and goal achievement of an MSP (Satheesh et al., 2024b). Therefore, the following hypotheses are formulated (Figure 9):

Hypothesis 3: *The strength of the internal and external network embeddedness has a positive influence on the involvement in the MSP.*

Hypothesis 4: *The strength of the internal and external network embeddedness has a positive influence on the goal achievement of the stakeholder and the MSP.*

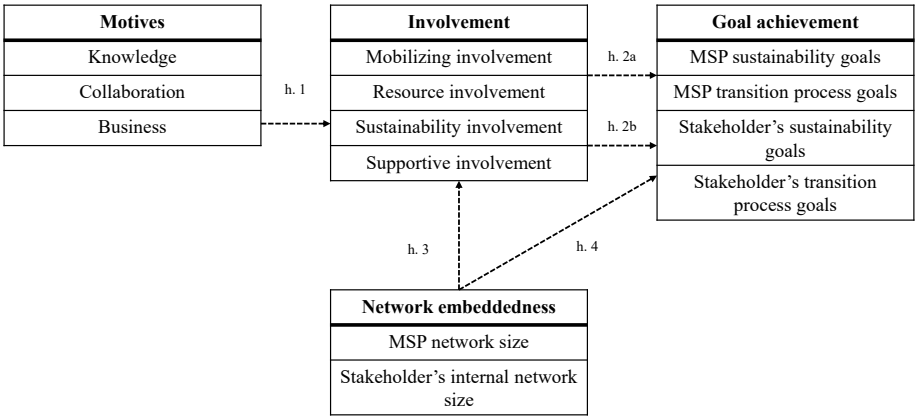

Figure 9: The conceptual model of the relationship between motives, involvement and network embeddedness of stakeholders on the goal achievement of an MSP.

4.3 Methodology

4.3.1 Case study context

A case study approach (Swanborn, 2003; Yin, 2003) was adopted to test the hypotheses. In the Netherlands, government, business and the civil society sectors commit to the climate goals of the Paris Agreement (UNFCCC, 2015), the Dutch Climate Agreement (Climate Council, 2019) and the National Energy Agreement (SER, 2013). As a response, the energy network company Alliander N.V. and the environmental group 'De Gelderse Natuur en Milieufederatie' launched a networking initiative to implement the National Energy Agreement (SER, 2013) in the province of Gelderland

in the Netherlands. After a period of finding network partners, 100 partners signed an intentional agreement and the MSP Gelderland Energy Agreement ('Gelders Energieakkoord', GEA) was launched in 2015 (Van der Ploeg et al., 2015). In 2018, the MSP GEA added the target of reducing CO_2 emissions by 55 per cent by 2030 and 100 per cent by 2050 (GEA, 2025). The MSP organizes the involvement and networking practices to engage government, businesses and local communities in achieving a carbon neutral society. The MSP addresses sustainability and the transition process regarding the energy transition. As of today, the MSP consists of approximately 250 stakeholders that are committed to realizing a climate neutral province. The network maintains intensive contact with the Gelderland (RES) regions. Each region is working on the RES, the Regional Energy Strategy. The MSP supports stakeholders in finding the opportunities to use renewable sources. The aim is to make a real contribution to the national target of 35 TWh of emission-free energy.

4.3.2 Survey

We developed a questionnaire based on the literature of MSPs. The stakeholders of the GEA MSP were invited to check the survey items on motives, involvement practices, network embeddedness and goals. This discussion stimulated mutual learning about social change, the development of a narrative and the sharing of socially robust knowledge about the network embeddedness. Furthermore, we conducted pilot interviews to test the questionnaire with five GEA stakeholders. These pilot interviews provided the context for the dominant motives, involvement practices, goals and indicators of network embeddedness in the survey. The interviews were transcribed. In this way, the pilot supported the content validity of the items included in the survey (Spector, 2013; Yin, 2003). The pilot study was used to develop the final questionnaire.

The questionnaire consisted of four sections. Section A included questions about the respondent's background characteristics, network embeddedness and involvement. Section B asked about motives and involvement and the respondents answered on a 7-point scale from strongly disagree to strongly agree. Section C measured the size of the network within the stakeholders. On a nominal scale, the respondent indicated whether colleagues, managers or the board decided about involvement in the MSP. Part D measured the achievement of sustainability and transition process goals for the MSP and the individual stakeholder. On an ordinal scale, the possible marks ranged from one (extremely poor) to ten (excellent).

4.3.3 Method

We ran the analysis in two phases. First, factor and reliability analyses have been adopted to identify latent and manifest variables based on item correlations (Field,

2018; Hair et al., 1998). We conducted exploratory factor analyses to extract relevant dimensions underlying specific motives, involvement practices and goals as explained in the pilot interviews with key GEA representatives. Second, regression analysis examined the direction and strength of the relationships. In study one, we focused on the relationships between motives, involvement and network embeddedness. Study two examined the relationships between involvement, intended goals achieved and network embeddedness. Stata v17.1 was used for the analyses.

4.3.4 Sample

To construct the sample, we listed everyone who claimed to be a member of the MSP, using the GEA digital platform as a reference point. In this respect, a sampling design is relevant to our research (Swanborn, 1999). After completing the list, an email invitation was sent to 215 GEA members. In this invitation we assured the confidentiality of the information, guaranteed the anonymity of the responses and explained the goals of the survey. To increase the response rate, we sent a reminder twice and contacted potential respondents by telephone. At the end of the survey, we gave respondents the option of providing an email address if they were interested in receiving the results of the study.

Table 3: Descriptive statistics of the sample, N=76-81.

Variable	Mean/prop.	St.dev.	Min	Max
Sector				
Government (base)	0.42			
Private	0.21		0.00	1.00
Public services	0.06		0.00	1.00
Civil society	0.31		0,00	1.00
Function of the participant				
Management (base)	0.22			
Staff	0.57		0.00	1.00
Civil function	0.21		0.00	1.00
Size (log)	3.59	2.54	0.00	8.92
Size (median employees in fte)	17.50		0.00	7,500.00
Years active in the MSP	5.20	2.33	1.00	9.00
Time spent on the MSP (log)	1.63	1.29	0.00	5.08
Time spent (median monthly hours)	12.49		0.00	160.00

The fieldwork took two months and a maximum of 113 respondents completed the questionnaire (a response rate of 53 per cent), representing 81 stakeholders involved in the MSP, of which 57 completed the questionnaire. In the case of multiple respondents per stakeholder, a central statistic (mean, mode) was computed for the stakeholder. Focusing on the stakeholder instead of individual respondents may limit the sample size but given the exploratory nature of the research and the larger number of determinants in the regression models, we do not consider this to be a serious drawback. The 81 stakeholders represent nicely the heterogeneity of the sample supporting the study of the MSP mechanisms. A chi-square test assesses the representativeness of the sample relative to the GEA target population (Field, 2018; Hair et al., 1998), i.e., along with the sectoral background of the MSP participants. The sample does not deviate from the target population in terms of sector, as $p=0.93$ with $\alpha=0.10$ under the condition that $p>\alpha$. The sample is therefore representative.

Table 3 presents the descriptive statistics of the sample, showing the sectoral background, function of the participant, size, years active in the GEA and time spent in the MSP. The sample is moderately skewed towards government respondents: 42 per cent of respondents engage in this sector, while 21 per cent work for companies. In addition, 31 per cent work in civil society and 6 per cent in public services. The most prominent function is staff (57 per cent), followed by management (22 per cent) and civil society (21 per cent). The sample shows that a considerable number of respondents hold more than one function, on average 1.17.

The size of the stakeholder (measured in full-time equivalents) and the time spent on the MSP show significant outliers. Therefore, a log transformation was used to report the median for these two variables, as the middle observation is more informative than the mean. There are stakeholders with thousands of employees, but smaller ones such as energy cooperatives, tenants' associations and freelancers also participated. The median size of the organizational stakeholder is 17.5 employees. The maximum number of employees is 7,500. The median (Md) time spent on the MSP is 12.49 hours per month, showing a heterogeneous MSP (Table 3).

The sample characteristics are used as control variables in the regression analyses. We tested the effects of those control variables separately from the hypothesized effects with size of the organizational stakeholder as an exception. The separately tested control variables included sector, participant role, years active and time spent in the MSP. These control variables were tested separately because of the limited number of cases (Table 3). Almost none of the separate analyses are significant. In an additional analysis, the size of the stakeholder (in full time equivalent) was included

in the hypothesized models because this variable can influence the involvement in the MSP and internal networks. The additional analysis only shows insignificant effects on the hypothesized models. The control variables do not significantly alter the relationships of interest in the regression analyses (Tables 5 & 6).

4.4 Findings

The results are presented in three sections. First, the construct measures are discussed using factor and reliability analyses. An overview of the descriptive statistics of the construct measures is given. Finally, the hypotheses related to motives, involvement, network embeddedness and perceived goal achievement are assessed.

4.4.1 Factor- and reliability analysis

An exploratory factor analysis was conducted on the 25 motives from the survey. We identified three factors with an eigenvalue greater than one, which summarized 21 motives. Reliability analysis identified a knowledge motive (α=0.835), a collaboration motive (α=0.800) and a dimension capturing a business motive (α=0.753) (Appendix E).

We also conducted an exploratory factor analysis on 14 survey items related to involvement. The analysis yielded two factors with eigenvalues greater than one: Mobilizing and resource involvement. The Cronbach's alphas are well above the threshold of 0.700, i.e., for mobilizing others (α=0.866) and resources (α=0.809), so these constructs are reliable (Appendix F).

No factor analyses have been adopted on a sustainability and supportive involvement because the measures are on a nominal scale level, and not an interval or ratio level. Regarding the areas of involvement, the reliability analysis shows two distinct MSP areas, i.e., those with a sustainability focus and those with a network support focus. Sustainability involvement is a statistically reliable construct given α=0.744 (Appendix G). The construct of supportive involvement is also statistically reliable, as α=0.769 (Appendix H).

The survey made a substantive distinction between sustainability and transition process goals of the MSP. Respondents rated various goals on a scale of one to ten. The sustainability goal is trustworthy given α=0.927 (Appendix I). The transition process goals have a reliable scale, as α=0.908 (Appendix J). In addition, the survey distinguished between the sustainability and transition process goals of the stakeholders. The construct of the stakeholder's sustainability goals is reliable given

α=0.876 (Appendix K). The construct of the transition process goals of the stakeholder is also reliable given α=0.949 (Appendix L).

The MSP network size is a single-item measure, while the internal network size of the stakeholder consists of the counting of dichotomous responses. As a result, the network variables did not meet the requirements for factor and reliability analyses.

4.4.2 Descriptive statistics of the main determinants

An overview of the main determinants is given in Appendix M. The collaboration motive is seen as the most prominent motive ($\bar{x}$=5.59, sd=0.84). The collaboration motive is of significantly higher value than the knowledge motive ($\bar{x}$=4.62, sd=1.09; t=8.649 and p<0.000). Subsequently, the knowledge motive is significantly more present than the business motive ($\bar{x}$=3.03, sd=1.26; t=10.913 and p<0.000). In terms of involvement, mobilizing involvement ($\bar{x}$=4.67, sd=1.06) is significantly less pronounced than resource involvement ($\bar{x}$=4.93, sd=0.93; t=-2.323 with p<0.023). Sustainability involvement is significantly more pronounced than supportive involvement ($\bar{x}$=3.02, sd=2.37 versus $\bar{x}$=1.26, sd=1.69). The t-test for this pair of involvement areas is t=8.309 with p<0.000. The MSP's sustainability goal achievement has a significantly lower average ($\bar{x}$=5.46, sd=1.44) in comparison with the MSP's transition process goals ($\bar{x}$=5.87, sd=1.49). A t-test indicates that t=-4.497 with p<0.000, i.e., the MSP's transition process goal achievement is more prominent. The mean difference between the sustainability and transition process goal achievement of the stakeholders is not significant (t=-1.290, p<0.202) (Appendix N).

Based on the t-test results, the collaboration motive and the internal network embeddedness have positive influence on the involvement, foremostly the resource involvement, and these factors have the most influence on the goal achievement, especially on the transition process goals of both the stakeholder and the MSP. The goal achievement could be stimulated by the collaboration motive and by making sure the stakeholders with a large internal network embeddedness stay committed, foremostly continuing their resource involvement. Hence, it is necessary to organize pilots and Communities of Practice in which collaboration is paramount and in which smaller stakeholders participate, and the major supporting energy network company Alliander and the province of Gelderland provide resources.

Table 4 shows that the median of the external network embeddedness is 2.56 relations in the MSP network. A log transformation was applied due to its skewed distribution. Regarding the size of the internal networks, the number of relationships between colleagues, supervisors and the board of directors was counted. The mean number of internal relationships is 6.07 (sd=6.61), ranging from zero (minimum) to 21 (maximum).

Table 4: Descriptive statistics of the MSP model constructs, N=57-81.

Variable	Mean /perc.	St.dev.	Min	Max	Median (M)
Motives					
Knowledge motive	4.62	1.09	1.43	6.80	4.86
Collaboration motive	5.59	0.84	3.57	7.00	5.71
Business motive	3.03	1.26	1.00	6.00	3.00
Involvement practices					
Mobilizing involvement	4.67	1.06	1.00	7.00	4.63
Resource involvement	4.93	0.93	2.43	7.00	5.00
Involvement areas					
Sustainability involvement	3.02	2.37	0.00	11.00	3.00
Supportive involvement	1.26	1.69	0.00	7.00	1.00
MSP goals					
MSP sustainability goals	5.46	1.44	2.00	8.88	5.63
MSP transition process goals	5.87	1.49	2.00	9.63	6.06
Stakeholder's goals					
Stakeholder's sustainability goals	5.22	1.78	1.00	9.00	5.33
Stakeholder's transition process goals	5.30	1.52	1.00	8.91	5.36
Network embeddedness					
MSP network size (log)	2.33	1.32	0.69	4.83	2.56
Stakeholder's internal network size	6.07	6.61	0.00	21.00	4.00

4.4.3 Regression results

For type of involvement, hypotheses are tested (Table 5; Figure 10). Resource involvement shows the highest explanatory power (R^2=34.9 per cent), followed by the mobilizing involvement (R^2=32.7 per cent). Mobilizing and resource involvement show an adequate model fit with F=4.859 and F=6.919, respectively. Sustainability and supportive involvement show a weaker model fit because of the lower explained variance (R^2=12.1 per cent and R^2=14.0 per cent respectively). The F-values are also lower: F=2.350 and F=2.468.

Table 6 shows that the stakeholder's sustainability goal has the highest explanatory power (R^2=40.0 per cent). The MSP sustainability and transition process goals, and the stakeholder's transition process goals, also have significant explanatory power (R^2=21.9 per cent, R^2=19.1 per cent, and R^2=28.6 per cent respectively).

The models examine the impact of the motives and network embeddedness on the subsequent involvement and goal achievement (Tables 5 & 6). A knowledge motive

significantly mobilizes others (β=0.253; p<0.05), but it does not significantly influence the resource, sustainability and supportive involvement. The collaboration and business motives do not relate significantly to any type of involvement (Table 5; Figure 10). Hypothesis 1 is thus partially accepted.

The mobilizing involvement contributes significantly to the stakeholder's sustainability (β=0.620, p<0.01) and transition process goals (β=0.368, p<0.10). Resource involvement supports the MSP's sustainability (β=0.506, p<0.05) and transition process goal achievement (β=0.343, p<0.10). The supportive involvement significantly enlarges the stakeholder's sustainability goal achievement (β=0.279, p<0.05). Although the sustainability involvement does not significantly increase any goal achievement (Table 6; Figure 10), the other types of involvement (mobilizing, resource and supportive involvement) do have an impact on goal achievement that is significant. Thus, hypothesis 2a and 2b are accepted, because the mobilizing, resource and supportive involvement are significantly of influence on goal achievement.

Table 5: Standardized regression (betas) results on stakeholder's involvement in GEA, N=63-65.

Determinant	Mobilizing involvement	Resource involvement	Sustainability involvement	Supportive involvement
Motives				
Knowledge motive	0.253*	0.084	0.429	0.071
Collaboration motive	0.349	0.261	0.548	-0.115
Business motive	0.067	0.105	-0.132	0.266
Network embeddedness				
MSP network size	-0.238	-0.142	0.254	0.074
Stakeholder's internal network size	0.063**	0.077**	-0.036	0.097*
Model statistics				
R^2	0.327	0.349	0.121	0.140
F-value	4.859	6.919	2.350	2.468

Note: **p<0.01, *p<0.05, +p<0.10. Organizational size is included as a control variable.

The external network embeddedness does not significantly influence any involvement practice. Though, the internal networks have a significant positive impact on mobilizing (β=0.063, p<0.01), resource (β=0.077, p<0.01) and supportive involvement (β=0.097, p<0.05). At the same time, there is an insignificant negative relationship with the sustainability involvement (Table 5; Figure 10). As the internal networks do have a significant positive impact on involvement in terms of mobilizing, resource and supportive involvement, hypothesis 3 is partially accepted.

The outcomes of external and internal networks are negative and statistically insignificant related to any goal achievement (Table 6; Figure 10). Thereby hypothesis 4 is rejected.

Table 6: Standardized regression (betas) results on goal achievement in GEA, N=54-59.

	Sustainability goals		**Transition process goals**	
Determinant	*MSP*	*Stakeholder*	*MSP*	*Stakeholder*
Involvement				
Mobilizing involvement	0.063	0.620**	0.045	0.368+
Resource involvement	0.506*	0.319	0.343+	0.331
Sustainability involvement	0.015	-0.043	0.063	-0.001
Supportive involvement	0.166	0.279*	0.182	0.159
Network embeddedness				
MSP network size	-0.260	-0.198	-0.180	-0.190
Stakeholder's internal network size	-0.042	-0.008	-0.041	-0.001
Model statistics				
R^2	0.219	0.400	0.191	0.286
F-value	3.356	6.638	3.261	3.329

Note: **p<0.01, *p<0.05, +p<0.10. Organizational size is included as a control variable.

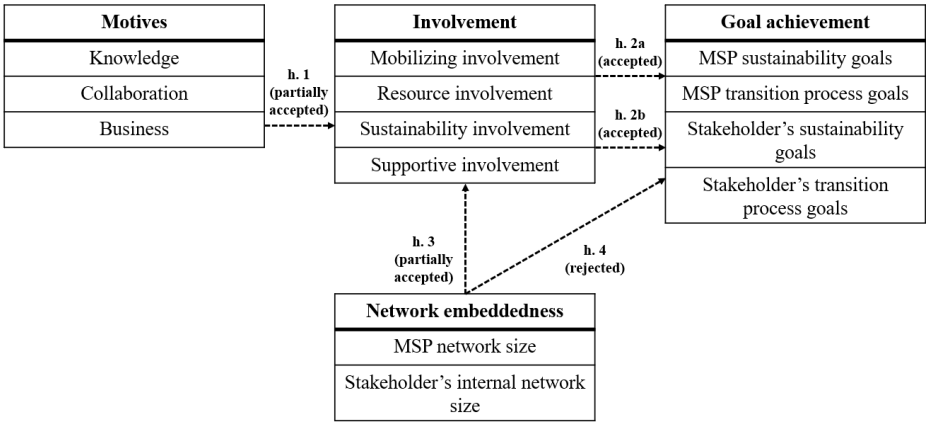

Figure 10: An overview of the findings of the regression analyses.

4.5 Discussion and concluding remarks

MSPs are a new emerging governance form bringing together public, private and civil society stakeholders to jointly address complex public policy challenges of the energy transition. These MSPs can be seen as instruments to accelerate the transition and to achieve the public policy of sustainability. They bring together stakeholders from different sectors to share information, knowledge, resources, responsibilities and involvement practices to achieve sustainability and transition process goals. This explorative study analyzed the underlying factors in participating in MSPs and how stakeholders contribute to the sustainability and transition process goal achievement. The research question was: '*How do motives, involvement practices, and embeddedness of stakeholders in an MSP influence the public policy goals for the energy transition?*'

We analyzed the GEA MSP in the Dutch province of Gelderland to investigate the relationships between the underlying factors that support the MSP. The results show that stakeholders have different motives to participate in the MSP, but that those with a knowledge motive are more engaged in involvement practices than stakeholders with collaboration or business motives. The knowledge motive is positively related to the mobilizing involvement because stakeholders are increasingly committed to gaining knowledge about the energy transition and climate change, and to acquiring sustainability and networking skills. The importance of the knowledge motive for an MSP involved in the energy transition is in line with the findings from other studies, yet adds a broader dimension, categorizing previously indicated motives. Carbonara & Pellegrino (2020) state that the acquisition of networking and sustainability skills are influential motives to increase the innovation power. Greve & Hodge (2020) show that knowledge is important for an MSP, not only to participate, but also because of its consequential effects on the performance of the network in terms of technical and experimental learning. In addition, 'social knowledge' acquisition and know-who in coalition building professionalize stakeholders and increase their expertise.

Stakeholders with stronger collaboration or business motives do not show a statistically significant relationship with the involvement. As suggested by Solheim-Kile et al. (2019) and Warsen et al. (2019), stakeholders with a strong business motive tend to act opportunistically. The quest for economic survival usually supports opportunism, as stakeholders may seek strategic information without giving anything in return. They may see the MSP as a market arrangement where they focus on creating value for money to survive economically. Reciprocity is then likely to be violated as self-interest takes precedence over sustainability and transition process goals. The MSP may then turn into a weak cross-sector partnership, where the desire to compete outweighs the willingness to collaborate (Brogaard, 2019; Greve & Hodge, 2022; Vecchi et al., 2022).

Our findings show a positive relationship between the mobilizing, resource and supportive involvement, and the sustainability and transition process goal achievement of MSP and individual stakeholders. The mobilizing involvement supports the attainment of the stakeholder's sustainability and transition process goals because MSP members feel empowered and have personal ambitions to make a sustainability contribution on behalf of their home organization, such as raising the awareness on previous agreements on carbon neutrality and the potential impact one can have on realizing a better world. Resource involvement practices contribute to the goal achievement of the MSP because stakeholders look for investment opportunities in sustainability and the transition process. In the province of Gelderland alone, the demand for investments in the energy network amounts to 793 million euro for the period 2022-2024. The stakeholders can see the MSP as an instrument for developing resource proposals for joint projects in housing, business and renewables in accordance with the GEA agreement and the investment policy of the energy network company (Van der Ploeg et al., 2015; Liander, 2024). Holstenkamp (2018) shows that pilot studies on co-ownership can attract investments in the energy transition.

More specifically, the findings show that the mobilizing and supportive involvement practices contribute to the goal achievement of the stakeholders. This indicates that an important reason to be involved in practices within the MSP is to achieve the sustainability goals of the home organization and to support the energy transition process. It turns out that GEA provides stakeholders with a supportive environment for the exchange of information and learning opportunities such as programs on solar and wind power, energy cooperatives, and renewable energy. Involvement in these programs seems important to achieve individual long-term goals, particularly sustainability goals. The GEA thus adds value as social infrastructure for those stakeholders who have set sustainability goals on the level of the individual organization.

This study responds to the call for future research examining how an MSP can balance its own collective goals with those of the individual stakeholders (Zobel & Comello, 2025). Failing to consider collective sustainability and transition process goals may result in the MSP falling short of sustainability expectations and lacking future guidance. Conversely, if the MSP neglects individual goals, stakeholders will not feel heard and may withdraw from the implementation process. Our study adds that achieving a balance between collective MSP goals and individual stakeholder goals requires the MSP to stimulate mobilization and resource involvement. Mobilized stakeholders can address their individual ambitions relating to sustainability and the transition process due to their relational investments in the implementation process. They are well equipped to invest time, gather political support, and raise awareness

among partners about previous agreements on achieving carbon neutrality. At the same time, the MSP can achieve its collective sustainability and transition process goals if resources and best practices about the implementation process are shared. The opportunity to gather new knowledge about the energy transition attracts stakeholders and encourages continued involvement. Thus, the mobilizing and resource involvement complement each other, contributing to the achievement of sustainability and transition process goals for the MSP and its stakeholders alike.

In response to the boundary spanning literature (Klindt et al., 2024; Satheesh et al., 2023; Van Meerkerk & Edelenbos, 2018a, b), this study finds a statistically significant relationship between the internal network embeddedness of stakeholders and their involvement practices. The internal and external embeddedness do not seem to impact the goal achievement of the MSP or the stakeholder's goals on sustainability and the transition process. Hence, the more individuals from one organizational stakeholder participate in GEA, the more the stakeholder contributes to the involvement and thus to the public policy goals of the MSP. A stakeholder with a large internal network is better positioned to act as a boundary spanner compared to those with a large external network in the MSP because of the potential to provide a significant amount of resources. When they have a larger internal network embeddedness, they can also develop a better strategic position in the MSP, share information with other stakeholders, and stimulate cooperation in joint projects.

We see two ways for further research. First, the interesting results of this explorative case study in the underlying factors that contribute to the public policy goals of an MSP should not be generalized. To allow a full process analysis of the proposed framework about the MSP process to achieve the public policy goals of the energy transition, we recommend more case studies of MSPs. Analysis of more MSPs will allow the testing of a complete process model of motives and involvement with internal and external network embeddedness as a moderator to measure the combined impact with the involvement on the goal achievement. Second, the analysis of MSP is based on cross-sectional rather than a longitudinal approach. Hence, the assessment of causality is underdeveloped due to a lack of chronological order in measurement. Longitudinal research would allow for the examination of causalities between motives, involvement, goals and internal and external network embeddedness. Therefore, further research is needed to understand the relationships between the motives of stakeholders and their engagement in an MSP.

We can make two policy recommendations based on the findings. The first policy recommendation is to stimulate the knowledge motive. This study shows that

stakeholders are willing to learn about the energy transition, climate change, and to acquire sustainability and networking skills. Stimulating the knowledge motive increases the involvement in the MSP. Therefore, we recommend organizing more Communities of Practice and pilot studies to enable knowledge exchange on sustainability and the transition process. Addressing the collaboration and business motives may be less fruitful, as stakeholders may have network connections outside the MSP, with customers, suppliers and/or investors, to address ambitions not related to the energy transition.

A second policy recommendation is that the long-term commitment of a few key stakeholders with a high level of authority, much expertise, and large internal networks can contribute significantly to the achievement of the public policy goals of an MSP. For the future, the energy network company Alliander and the province of Gelderland need to continue their long-term commitment to GEA by providing information, resources, and organizational capacity from their internal networks, as this can stimulate companies, governments, and community organizations to do the same. In this way, the two key players act as role models, while smaller businesses, municipal governments and community organizations seize windows of opportunity to make relational investments. As suggested by Ramirez Camargo & Stoeglehner (2018), the smaller stakeholders can then present proposals for the integration of spatial and energy resources in conjunction with the investment planning of the energy network company and the environmental planning of the province.

5

Changing the rules of the game to encourage a collaborative arrangement: The case of the Dutch Regional Energy Strategy

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Abstract

Background: In the Netherlands, a Regional Energy Strategy (RES) has been introduced to foster collaboration in allocating spatial and energy resources to meet climate goals. However, the market-based rules guiding the RES are often perceived as ineffective, unfair, and inefficient, resulting in limited participation and poor information sharing. Planning currently follows a 'first come, first served' principle. National legislative changes are being prepared to improve the RES. Yet, it remains unclear how these might improve the process. This study aims to explore, through a serious game, whether changes in rules can enhance the RES and, if so, how this improvement is achieved. Three scenarios are evaluated: (1) a business-as-usual situation with existing market rules; (2) a government-led scenario in which provinces play a stronger role by prioritizing spatial needs; and (3) a governance-led scenario in which energy planners are allowed to manage the grid more flexibly, giving grid planning a central role in steering spatial energy decisions.

Results: The findings show that altering the rules of the game allowed more flexible grid management, based on a governance rationale and collaborative decision-making. The changes in rules produced spatial energy planning outcomes perceived as much more effective, efficient, and fair. These simulated rule changes created better conditions for spatial and energy planners to interact and make decisions that optimize both spatial and energy needs.

Conclusions: The simulation results suggest that the RES can achieve better outcomes when specific rules are adjusted, particularly in relation to energy network planning, with key actors taking the lead under a governance-oriented approach.

Keywords: Collaborative arrangements, Regional Energy Strategy (RES), renewable energy production, game simulation.

5.1 Background

5.1.1 Introduction

The Regional Energy Strategy (RES) was initiated as a national policy in the Netherlands to accelerate the energy transition, as a response to earlier protests against top-down wind energy planning by the national government, and because of the stagnation of the energy transition process (Gerritsen, 2024). The RES is an effort aimed at integrating spatial and sustainable energy planning at the regional level, involving provinces, municipalities, energy network companies, energy cooperatives, and housing, business, solar park, and wind farm developers (Hoppe & Miedema, 2020). The RES seeks to coordinate the development of solar parks and wind farms with spatial demands for housing, businesses, nature reserves, and available grid capacity (Hoppe, 2021).

Despite the good intentions of the RES, the guiding rules of the game (hereafter: the rules) are seen as ineffective, unfair, and inefficient, resulting in limited participation and poor information sharing (Anfinson et al., 2023; Kempenaar et al., 2021; Lelieveldt & Schram, 2023). Current rules, which grant network connections on a 'first come, first served' basis, foster competition for resources and further fragment spatial and energy planning (Warbroek et al., 2023). This hampers strategic collaboration and information exchange, particularly regarding resource connections at specific locations (ACM, 2023; ACM, 2025; Gerritsen et al., 2022; Standal et al., 2023). Consequently, actors are increasingly reluctant to collaborate, undermining the integration of spatial and energy planning (Van Dijk et al., 2025). To meet the RES's objectives, adjustments to the rules are needed. While it is assumed that alternative rules could improve effectiveness, efficiency, and fairness in resource allocation, it is unclear which changes would be most beneficial (Ernst, 2019; Hoppe, 2021; Veenman et al., 2024; Ziggers, 2024). This study aims to examine the impact of rules on the implementation of the RES. The research question therefore is: How can rules influence the implementation of the RES?

Drawing on the literature, we distinguish between three types of rules: market-based rules, government-based rules, and governance-based rules (Ansell & Gash, 2008; Heldeweg & Saintier, 2020; Maurya & Rathore, 2023). We examine how altering these rules affects the process and outcomes of spatial and energy planning through three scenarios: (1) a business-as-usual scenario with existing market rules; (2) a government scenario in which provinces play a stronger role by prioritizing spatial needs; and (3) a governance scenario in which energy planners manage the grid more flexibly, giving grid planning a central role in steering spatial energy decisions.

To address the research question, we use a serious game to simulate how rule changes may improve the RES in terms of effectiveness, efficiency, and fairness (Duke, 1980; Mayer et al., 2004). This gaming methodology is particularly suited to studying how interdependent actors anticipate one another's choices within collaborative arrangements under different rule sets (Alf et al., 2023; Gugerell & Zuidema, 2017). Our serious game replicates the RES process in the province of Gelderland, involving the province, municipalities, an energy network company, an energy cooperative, and housing, business, solar park, and wind farm developers. This case provides a useful setting to simulate futures for the RES under varying rule conditions.

The article is structured as follows: Section 1 introduces the background and theoretical framework for evaluating the RES. Section 2 outlines the game simulation methodology. Section 3 presents the results. Section 4 discusses implications for both research and practice, and Section 5 offers the conclusion.

5.1.2 Rules

How collaborative dynamics unfold depends on how the regional energy transition is implemented: who holds the mandate to lead, which rules apply, and how the government shapes collaborative dynamics (Heldeweg & Saintier, 2020). The literature identifies three types of rules that are often employed to guide collaboration and decision-making: market rules, government rules, and governance rules.

The first type, *market rules*, refers to collaborative dynamics in which the government regulates competition for allocating spatial and energy resources. Market competition can, in some cases, support effectiveness and efficiency, as for-profit developers account for demands for housing, businesses, and renewable energy to secure future contracts and remain competitive (Friedman, 2007; Gosens et al., 2021; Oteman et al., 2024). To maintain an advantage, developers often submit permit requests rapidly, which requires a loose collaborative arrangement. They also weigh expected benefits, losses, and risks before participating. Some actors perceive market rules as fair if the government functions as an impartial regulator, ensuring that all parties have a reasonable chance to benefit from resource allocation (Heldeweg, 2017). However, market rules can be undermined by opportunism. The pursuit of individual gain may harm collective interests, such as shared investments in energy networks, where one party bears costs while others benefit. These rules often respond ineffectively and inefficiently to shocks, given the high costs of resilience measures (Maurya & Rathore, 2023). Fairness can also be compromised: burdens like pollution, noise, or climate risks may be shifted onto other populations, locations, or future generations.

Furthermore, less resourceful actors may be outcompeted, leading to unequal partner selection and potential resource exploitation (Mazzucato, 2024).

The second type, *government rules*, describes collaborative dynamics in which the government takes unilateral decisions. Here, the government holds primary responsibility for spatial and environmental planning (Van der Valk, 2002). While government rules typically allow a variety of stakeholders to participate (Agger & Sørensen, 2018), it is crucial that the government fairly represents interests to maintain public support for large-scale solar and wind projects (Westerlund, 2020). In this sense, government rules provide a strong rationale for government intervention (Fossheim & Andersen, 2022; Heldeweg, 2017). Yet they are also prone to ineffectiveness, as planning expertise is often fragmented across departments, complicating collaboration (Agger & Sørensen, 2018; De Pascali & Bagaini, 2019). Unilateral planning may also limit efficiency since it tends to exclude bottom-up initiatives. Local actors—including network companies, cooperatives, and developers—often possess valuable local knowledge but may lack opportunities to contribute. Perceptions of unfairness can also arise, especially when distant provincial authorities appear disconnected from local interests (Lindvall, 2023). Collaboration may further be constrained by a focus on intra-organizational rather than inter-organizational coordination (Lægreid & Rykkja, 2022; Zhou & Dai, 2023).

The third type, *governance rules*, enables a RES in which provinces, municipalities, and the energy network company jointly allocate resources (Van Dijk et al., 2022). Governance rules are grounded in horizontal relationships and professional networks (Heldeweg, 2017; Avelino & Wittmayer, 2016), increasing the likelihood of effective, efficient, and fair outcomes. They encourage creativity, experimentation, and context-sensitive resource allocation. Engagement usually occurs at the lowest feasible scale, building sustainable relationships with local stakeholders (Lavrijssen & Carrillo Parra, 2017). At the same time, governance rules can increase transaction costs due to intensive communication, which may hinder efficient information exchange (Vivona et al., 2023). Moreover, housing, business, and renewable energy developers are often selected for professional expertise and strong business networks, raising the risk that non-business interests are overlooked (Heldeweg & Saintier, 2020). It is expected that integral spatial energy planning can benefit from governance rules, especially when the energy grid is being allowed more flexibility in relying on the local exchange of energy between different stakeholders directly (Stoeglehner, 2020). By a different way of planning, namely by 'social prioritization' meaning that stakeholders with activities of social value gain priority on waiting lists for grid capacity, the grid capacity can be 'exploited' to the fullest societal value,

instead of adhering to the strict policy of 'first come, first served' under the current energy law (De Winkel et al., 2025). More strategically, when planning collaboratively for future energy infrastructure as well as spatial functions (that will consume energy) in a synchronized manner, making a regional match between local energy production and consumption patterns, together, stakeholders can anticipate future energy-related ambitions of each other (Gerritsen, 2025). In such a governance scenario, we would expect that a leadership role for the regional energy network company would be logical, as this stakeholder has the primary responsibility, authority, and expertise for long-term planning, maintaining, and safeguarding the technical and organizational operation of the energy grid.

5.1.3 Evaluating the RES

Previous studies have established criteria for evaluating the RES. Drawing from the literature, three criteria are particularly relevant: effectiveness, efficiency, and fairness (Campbell, 2006; Ernst, 2019; Fainstein, 2010; Ziggers, 2024).

1. Effectiveness: Effectiveness refers to the extent to which an activity fulfils its intended purpose or function (Hobday, 2000). For the RES, effectiveness means that investment planning is goal-oriented, well-organized, and flexible, ensuring that the process is both predictable and adaptive. An effective RES fosters collaboration among actors, as collective action often produces better outcomes than individual efforts. Achieving this requires balancing relational investments with individual gains (Ansell & Gash, 2008; Emerson & Nabatchi, 2015; Sørensen & Torfing, 2017). Effectiveness also depends on integrating resources from different organizations, sectors, and locations, as pooling diverse expertise tends to improve planning outcomes (Van Dijk et al., 2022; Warbroek et al., 2023).
2. Efficiency: Efficiency concerns achieving desired results with fewer resources. It can be distinguished between economic efficiency and technological efficiency. Economic efficiency relates to the costs of inputs, emphasizing economies of scale and profitability; investments are made based on expected gains, losses, and risks to maximize utility (Lahat & Sher-Hadar, 2021; Wang et al., 2023). Technological efficiency, by contrast, relates to the quantity and optimization of inputs, focusing on energy-saving technologies, reduced transmission losses, and lower energy consumption. Because spatial configurations directly affect energy demand and transmission, technological efficiency links closely to spatial-energy interactions (Ramirez Camargo & Stoeglehner, 2018; Lavrijssen & Carrillo Parra, 2017). Efficiency also extends to optimal land use in conjunction with the energy network (Stoeglehner, 2020).

3. Fairness: Fairness, often examined under the umbrella of energy justice (Jørgensen et al., 2020; Van Uffelen, 2022; Wittmayer et al., 2021; Ziggers, 2024), is a key concern in spatial planning. Following the spatial planning literature, fairness is understood here as the inclusion of justice-related values in the evaluation, consistent with the collaborative and communicative planning paradigm (Campbell, 2006; Healey, 2006). In addition, the focus is on fairness requiring equitable distribution of costs and benefits to mitigate conflict and foster acceptance of renewable energy (Fainstein, 2010; Wolsink, 2007). This is particularly relevant as households and businesses frequently bear environmental costs—such as landscape pollution, biodiversity loss, nuisance, and cast shadow—without sharing equally in the benefits of solar and wind installations nearby. Ensuring fair allocation raises social acceptance of the energy transition (Veenman et al., 2024; Westerlund, 2020; Davoudi & Brooks, 2014).

5.2 Methods

5.2.1 Game simulation

We used a game simulation to study the RES under different scenarios, testing three sets of rules in which the actors behaved strategically in response to others (Bekebrede et al., 2018; Gugerell & Zuidema, 2017). Geurts et al. [58] outline four steps for developing a serious game: (1) setting the stage, (2) clarifying the problem, (3) designing and developing the game exercise, and (4) applying and evaluating the game. We followed these steps in our study.

According to the gaming methodology (Kuit et al., 2005), the respondents participated in the game's construction by providing input on which rules should be tested in the scenarios. This allowed collaborative dynamics, as they unfolded in different scenarios, to be explained and compared in a gamified setting. To achieve this, we established a collaboration between Radboud University and the province of Gelderland.

The RES process was modelled at the level of regional collaboration between professional organizations. In practice, this involved provinces, municipalities, and public and private actors coming together at an early stage to explore potential 'siting areas' for spatial and energy needs. In the real cases studied in Gelderland, these deliberations among professional actors took place before citizens were consulted. Later, once potential sites were identified, municipalities would consult residents in their local areas. This later stage was not included in our simulation, as the focus was on early-phase dynamics among professional actors. Both the province and our

field interviews emphasized that this strategic early phase of regional planning could be improved. Challenges were especially noted in negotiations around siting areas located in the cross-border zones of neighboring municipalities.

Table 7: Overview of the interview respondents

	Organization	Profession	Interview date
1	Wind energy association	Policy advisor	November 21, 2022
2	Wind energy association	Sector expert	November 21, 2022
3	Commercial energy developer	Project developer	November 21, 2022
4	Province	Project leader	November 24, 2022
5	Energy network company	Program manager	November 29, 2022
6	Commercial energy developer	Director	December 2, 2022
7	Commercial energy developer	Director	December 6, 2022
8	Province	Strategist	December 9, 2022
9	Energy network company	Manager	December 9, 2022
10	Urban municipality	Policy advisor	January 9, 2023
11	Rural municipality	Policy advisor	January 13, 2023
12	Urban municipality	Energy planner	January 16, 2023
13	Province	Program manager	January 16, 2023
14	Province	Trainee	January 16, 2023
15	Rural municipality	Program manager	January 19, 2023
16	Rural municipality; RES	Alderman	January 20, 2023
17	RES	Advisor	January 25, 2023
18	Commercial energy developer	Planner	January 26, 2023
19	RES	Manager	January 30, 2023
20	Energy network company	Advisor	February 10, 2023
21	Energy network company	Manager	February 10, 2023

*The authors generalized the organizations and positions to avoid identification.

The province of Gelderland comprises six RES regions (out of 30 nationwide): Arnhem-Nijmegen, Food Valley, Achterhoek, Noord-Veluwe, Fruitdelta Rivierenland, and the Cleantech Region (National Program Regional Energy Strategy, 2022). Within these, we analyzed six siting areas in cross-border territories—Duiven-Zevenaar, Doetinchem-Bronckhorst, Hattem-Oldenbroek, Scherpenzeel-Renswoude, Tiel-

Wadenoijen, and Zutphen-Lochem—using multi-actor policy analysis as described by Enserink et al. (2022). These areas exhibited similar dilemmas around grid extension, housing and business development, and hesitation regarding large solar parks and wind farms. These dilemmas formed the basis for modelling our simulation game. The six real cases were represented in one simplified model to simulate early-stage RES interactions and negotiations under future scenarios with different regulatory conditions.

Interviewees were selected using snowball sampling, targeting individuals with direct experience in RES planning in Gelderland. We interviewed 21 respondents from government, energy grid infrastructure, business, and civil society (Table 7). They elaborated on reasons for planning slowdowns and reflected on how rule changes might improve the RES.

5.2.2 Game design, simulating three sets of rules

In general, the game centered on a regional map (abstracted from real-world cases mentioned in Section 2.1), depicting existing urban and rural areas (houses and business districts), nature reserves, and energy infrastructure. For the energy infrastructure, substations were visualized where additional spatial functions could be connected if there was availability for an extra grid connection. However, many existing substations had limited or no availability for additional grid connections. Additionally, a search area was marked where wind and solar power could be allocated. The territorial boundaries of two neighboring municipalities were drawn because the game emphasizes cross-boundary collaboration.

The participants were tasked with allocating the maximum number of spatial and energy resources. Each participant received an explicit assignment on a role card that differentiated the individual goal of each stakeholder. The municipalities aimed to develop housing and business areas; the energy network company aimed to plan extra substations; and the energy developers aimed to plan large wind and solar fields. This assignment remained the same throughout three successive game scenarios. We observed and evaluated the collaboration and negotiation dynamics that unfolded among the players under the regime laid out by specific rules in three different scenarios.

Designing scenarios with specific rule sets was an important part of the study. We analyzed the interviews for ideas about rule changes and combined them into three coherent scenarios (De Wijse-Van Heeswijk, 2021). We developed three scenarios to represent three sets of rules in the RES: one with market rules, one with government rules, and one with governance rules. Each scenario was simulated as realistically

as possible. The market rules reflected the period after the RES was introduced in 2019, when the energy network company was legally required to issue connections on a "first come, first served" basis (ACM, 2023; Liander, 2024). The government and governance rules represented two future-oriented scenarios. Theories about the RES were aligned with field-based ideas about desirable rule changes to be tested in the serious game. Each scenario compressed a maximum of ten years into a 30-minute game round. The scenarios were played at separate tables, with new rules introduced at the start of each round via a read-aloud letter.

Market scenario

The RES with market rules served as the reference case. Here, the province and municipalities would act primarily as market regulators. Simply put, these were the rules for the market scenario: The province and municipalities would issue development permits while intervening in the free market as little as possible. The developers (energy cooperatives, housing, business, solar, and wind developers) would pursue their own ambitions and seek to secure as many resources as possible by applying for permits. The energy network company should issue connections on a 'first come, first served' basis (ACM, 2023). This last rule was the most important feature in the market scenario.

Government scenario

In the government rules scenario, the province would guide the RES unilaterally, including the allocation of 'complex' businesses, large-scale renewables, and nature reserves. The rules for this scenario were: actors could negotiate, but without agreement, the province would overrule municipalities and developers. Resources would be allocated by the province according to the following priorities: energy demand over energy supply; housing over businesses; and spatial concentration of housing and businesses over spatial deconcentration. The province would be considered to represent the public interest within the RES region and would hold authority to decide unilaterally when municipalities could not agree.

Governance scenario

The governance rules scenario was designed to address future electrification needs, with rules that prioritized synchronization between spatial and energy planning, and to stimulate strategic investment in the energy infrastructure. We formulated the rules for this scenario with these goals in mind. In this future scenario, the energy law was assumed to be changed. The energy network company would issue the energy network connections based on a 'most efficient, first served' rule, meaning that it would decide what functions received (societal) priority in getting the scarce connections

first. In addition, the energy network company received authority from the national government to experiment with so-called 'group connections.' Group connections enabled exchanges of renewable energy through a single supply connection, for example when solar parks were adjacent to wind farms or when demand (housing, businesses) was close to supply (renewables), and vice versa (ACM, 2024 & 2025). In this scenario, the province no longer had authority to overrule municipalities.

5.2.3 Playing the game with stakeholders from practice

The game was played with real stakeholders on February 16, 2023, in the Game Lab of Radboud University, Nijmegen School of Management. Eleven participants attended: representatives from the province, the energy network company, an urban and a rural municipality, a commercial wind and solar developer, and three housing and business developers. The participants partly differed from those we interviewed. During our fieldwork, we interviewed the game players who represented the energy network company, the sustainable energy developer, and the urban municipality. The players who represented the province and housing and business developers were not interviewed; they only participated in the serious game.

Two researchers facilitated the game, while two others observed the dynamics, discussions, and interim questionnaires. Each scenario was evaluated during the game session. After each round, the players completed a questionnaire assessing the perceived effectiveness, efficiency, and fairness of the rules, as well as the quality of the collaborative process. The outcomes of each scenario were also assessed by counting the allocated tokens, representing housing, businesses, solar parks, wind farms, and substations on the game map. The participants played their own roles in the serious game as they used to have in practice.

The main objective was to create spatial plans that provided sufficient space for energy infrastructure and renewable generation in a resource-scarce environment, while also accommodating housing, business parks, and nature reserves. After the game, the players rated the scenarios as realistic, with a mean score of 4.9 on a seven-point scale, though variation was considerable (SD = 1.97).

5.3 Results

5.3.1 Game results

The simulated rule changes produced distinct process and outcome dynamics across the scenarios.

In the market scenario, no housing, business, or energy locations were planned. Strategic planning was absent, as the energy network was not used efficiently. The municipalities were reluctant to plan solar parks and wind farms due to low social acceptance, instead prioritizing ambitions for housing and business development. The participants focused on their own goals, guided by the 'first come, first served' principle. As a result, collaborative capacity for collective strategic planning was missing. In the dynamics that unfolded, the participants focused on their own individual goals, and they did not share strategic information during the negotiations for acquiring permits. The proposed housing and business areas did not get an energy grid connection, while the proposed wind farms and solar parks did not receive an environment permit from the municipalities.

In the government scenario, two housing locations and one business area were planned, but no energy locations were included in the final plan. In the unilateral decision-making process that unfolded, the province prioritized spatial development—particularly housing and businesses—over renewable energy investments. While this enabled the stakeholders to coordinate housing and business planning more effectively under provincial leadership, energy planning remained absent.

In the governance scenario, the participants successfully agreed on additional energy locations and infrastructure, which also created opportunities to plan more housing and business areas. The energy network company led the process, allowing the participants to plan the grid more effectively. The energy network company posed questions to the other players about what they considered the most desirable spatial functions (for the allocation of grid connections). This led to a discussion about social prioritization: which functions deserve priority in the order in which grid connections are allocated. In the resulting group debate, the energy network company emphasized the need for greater technical flexibility and they 'educated' the other players that the energy network could be exploited more efficiently to address limited space for renewables and reduce grid congestion. The implemented new Dutch energy law in this scenario, which permits local exchange of renewable energy between supply and demand, was seen to improve collaboration and grid efficiency. In this scenario, two solar parks were developed, plus two housing areas and two business areas. Thanks to the two solar parks, nearby spatial functions could be connected through a "group connection," allowing for the realization of more spatial functions in this scenario. One participant put it this way during the gameplay: "*If you plan something 'sour,' you have to compensate for it with something 'sweet.'*" This means that municipalities could accept the development of solar parks within their municipal territory if this would enable them to realize spatial functions such as housing and business areas.

In the questionnaire handed out after each round, responses were collected on a seven-point ordinal scale, ranging from one ('strongly disagree') to seven ('strongly agree'). Mean scores and standard deviations were computed in SPSS. Table 8 presents the results of the three questionnaires.

Table 8: Descriptive statistics of the market, government, and governance scenarios

	Effectiveness	**Efficiency**	**Fairness**
Market scenario	$\mu = 1.9$ $\sigma = 1.4$	$\mu = 3.0$ $\sigma = 2.1$	$\mu = 3.4$ $\sigma = 0.7$
Government scenario	$\mu = 5.8$ $\sigma = 0.9$	$\mu = 4.9$ $\sigma = 1.1$	$\mu = 4.3$ $\sigma = 1.4$
Governance scenario	$\mu = 6.3$ $\sigma = 0.7$	$\mu = 6.0$ $\sigma = 0.8$	$\mu = 5.5$ $\sigma = 1.2$

Note: The μ refers to the mean score of effectiveness, efficiency, and fairness, an average that lies between one (minimum) and seven (maximum). The standard deviation (σ) refers to average variability of the responses around the mean (Field, 2018).

Table 8 shows that the governance scenario achieved the highest perceived effectiveness ($\mu = 6.3$), efficiency ($\mu = 6.0$), and fairness ($\mu = 5.5$), compared with the government and market scenarios. The government scenario ranked second, with effectiveness ($\mu = 5.8$), efficiency ($\mu = 4.9$), and fairness ($\mu = 4.3$). The market scenario was rated lowest, with low effectiveness ($\mu = 1.9$), efficiency ($\mu = 3.0$), and fairness ($\mu = 3.4$). Standard deviations indicate the degree of agreement among the participants. In the governance scenario, low deviations for effectiveness ($\sigma = 0.7$) and efficiency ($\sigma = 0.8$) reflect strong consensus, while fairness showed slightly more variation. In the government scenario, the participants moderately agreed on fairness ($\sigma = 1.4$). The market scenario showed the greatest disagreement, particularly regarding its low effectiveness ($\sigma = 1.4$) and efficiency ($\sigma = 2.1$).

To compare evaluations across the three scenarios, we applied a Wilcoxon Signed Ranks Test. This non-parametric test is appropriate for small samples and ordinal data, such as Likert scale responses (0–7). Eleven respondents participated in the game, collectively playing eight roles. Two players represented the energy network company; two played as housing developers; and two presented the role of the urban municipality. The province, rural municipality, energy cooperative, business area developer, and renewable energy developer were each represented by one participant. The respondents rated the perceived effectiveness, efficiency, and fairness on an ordinal scale. The Wilcoxon test produced z-scores (standard deviation units) and statistical significance levels (p-values) (Field, 2018).

Table 9 presents the results. The governance scenario was rated as significantly more effective (α = 0.011), efficient (α = 0.016), and fair (α = 0.017) than the market scenario. The government scenario also scored significantly higher than the market scenario in effectiveness (α = 0.011) and efficiency (α = 0.027), though not in fairness (α = 0.227). Furthermore, the participants rated the governance scenario as significantly more efficient than the government scenario (α = 0.047). However, differences between governance and government in effectiveness (α = 0.234) and fairness (α = 0.121) were not statistically significant.

Table 9: Evaluation based on effectiveness, efficiency, and fairness according to the participants of the RES simulation game regarding the market, government, and governance scenarios.

Differences between scenarios	z-score	p-value
Effectiveness between government – market	2.536	*0.011**
Effectiveness between governance – market	2.539	*0.011**
Effectiveness between governance – government	1.190	0.234
Efficiency between government – market	2.214	*0.027**
Efficiency between governance – market	2.413	*0.016**
Efficiency between governance – government	1.983	*0.047**
Fairness between government – market	1.207	0.227
Fairness between governance – market	2.388	*0.017**
Fairness between governance – government	1.549	0.121

Note: Significant differences are indicated in *italics** ($p < 0.05$).

In sum, the game simulation shows that the governance scenario comes to the fore as the most suitable way to organize the RES. We will now explain the game results with a deeper analysis of the RES using field interviews on the criteria of effectiveness, efficiency, and fairness.

5.3.2 Effectiveness

The quantitative analysis of the game scenarios aligns with the views on effectiveness expressed by interviewees during fieldwork. Interview data indicate that effectiveness is most strongly associated with the governance scenario. Collaboration was widely regarded as essential for building the capacity needed for spatial energy planning (rural municipality 15, RES 19). As one respondent from the energy network company explained: "We focus on collaboration and look for common interests. Of course, we have interests as an energy network company, but I know that if I only defend my own interests and every organization does that, then you will not get anywhere" (energy network company 9).

Collaboration was seen as critical for aligning resource interdependencies, since spatial resources cannot be connected without sufficient energy supply, while energy resources require proximity to sufficient demand (urban municipality 10, province 14). Another respondent stressed: "There is no longer an abundance of energy and that is not coming back for the time being. So, it means more interdependence to get things done. That is nice but it is also difficult and exciting now" (energy network company 20). Effectiveness was perceived to increase substantially when resource integration linked energy demand and supply across multiple sectors (province 4, rural municipality 16). As one interviewee suggested: "We are working to get everyone to understand resource integration because it is a novel approach. Everybody perceives it differently. The integrated part is about looking at different sectors and forms of energy: housing, mobility, industry, agriculture, and horticulture" (RES 17).

The interviewees also viewed the government scenario as more effective than the market scenario. Here, the province's planning role in allocating space and energy enabled municipalities, the energy network company, energy cooperatives, and housing, business, and renewable developers to jointly participate in resource allocation (urban municipality 12, province 14). One provincial respondent noted: "It is about what projects are important in the collaboration? What agreements do we make? It is about the commitment of different parties" (province 13). The province's mandate promoted resource integration by linking energy network planning to spatial economic development. This dual role of reinforcing the grid while promoting urbanization was seen as particularly effective. When additional grid capacity becomes available after 2029, the province can operationalize housing, business, and renewable energy projects (Province of Gelderland, 2023). In this way, substations can be planned to align with new grid capacity, accelerating implementation compared with the market scenario.

In practice, the RES has functioned according to what we call the market scenario in our simulation. It was designed as a policy response to market uncertainties by aligning spatial and sustainable energy ambitions. However, stakeholders indicated that collaboration under market rules is insufficient. Our qualitative fieldwork underscored the need for a new set of rules. The designation of siting areas often intensifies competition, as space becomes increasingly scarce within specific boundaries, while development outside these areas is restricted (commercial energy developer 7). As one developer observed: "As a commercial enterprise, we sometimes drive ourselves a bit crazy. The planning of siting areas is completely disadvantageous. If you designate a siting area in the RES, everyone jumps on it" (commercial energy developer 3). This market dynamic reflects one of the recurring problems in practice and was also dominant in the simulated market scenario. The legal principle of 'first come, first

served' fuels competition for land, which in the game resulted in no successful planning for housing, businesses, or energy infrastructure. The participants considered this outcome both plausible and representative of current planning practices.

5.3.3 Efficiency

Perceptions of efficiency under the market rules were not notably high. Opportunities to improve efficiency were seen in connecting energy supply and demand locally—an option requested by several interviewees (province 4, urban municipality 10) and incorporated into the governance scenario. As one respondent explained: "Ideally, we bring supply and demand together. Then you can make optimal use of the energy network" (energy network company 5). Another respondent emphasized: "The ambition is to offer companies a group connection for resource optimization. Then the system moves towards more efficient energy management compared to one-to-one cable connections" (energy network company 20). Group connections increase the carrying capacity of the network by enabling peer-to-peer power transmission, while also lowering costs for individual users, as expenses are shared among group members and no public network fees apply (Liander, 2024).

Currently, energy and spatial planning are managed in separate policy silos, and no actor has an overview of both. Yet such an overview is viewed as necessary to anticipate the decisions of other stakeholders (commercial energy developer 6, energy network company 20). One interviewee noted: "Can't we get an overview of investments? The province has the mandate. We spoke to Liander and Alliander. They would like to be informed about the future location of housing so that they can plan their investments accordingly" (RES 19). The energy network company's planning focuses primarily on substations and pylons near urban centers to improve network efficiency (Province of Gelderland, 2022).

As a publicly owned company, the energy network company is obliged to invest resources efficiently on behalf of its shareholders—the province and municipalities (Liander, 2024). Nevertheless, inefficiencies persist, for example in the electrification of rural businesses, where transmission losses are often accepted (energy network company 20). At the same time, rural electrification is considered necessary to sustain quality of life. One respondent reflected: "Now you see exactly where the investments are going to be: those are the big urbanization areas. The question is whether we should pay more attention to the allocation of resources in other places. Then I come to the question of quality of life. The vitality of the countryside is also important" (province 8).

Investing in long-distance electricity cables for rural areas is particularly inefficient, as one-to-one connections are costly for businesses and providers of renewable

energy (energy network company 21). As a developer explained: "These are large investments, millions of euros to acquire a network connection. A wind project can bear that because of its high generating capacity. Solar parks between five and ten hectares are already difficult to finance. Especially now with the excessive cost of solar panels. Then it is quite difficult to get the funding. The network connection weighs heavily on the business case" (commercial energy developer 18).

However, under the market rules, planners are required by law to follow the 'first come, first served' principle, meaning urban areas cannot be prioritized over rural ones, or vice versa. In our simulation, we tested what would happen if this rule was deleted. While the market scenario kept the rule in place, the government and governance scenarios deleted it. In both cases, efficiency increased—confirming that altering the law allows collaboration between energy and spatial planners and would enhance efficiency.

5.3.4 Fairness

In response to our question about the (un)fairness of spatial programming for future housing, business, and renewable energy locations, spatial planners emphasized the value of retaining political freedom to evaluate and weigh their decisions (urban municipality 12, rural municipality 16). Resource prioritization was described as difficult, as current practices emphasize procedural speed rather than addressing housing shortages and climate goals in a fair manner (urban municipality 12). One respondent noted: "In the allocation of connections, the procedure is in the order of entry, with eyes closed, according to 'first come, first served'" (energy network company 9).

Energy planners are trained to avoid cost increases in their operations, but this often comes at the expense of community involvement. As one commercial developer observed: "The focus is on developing the project as cheaply and efficiently as possible. This means a lack of involvement" (commercial energy developer 7). In practice, economic considerations dominate project management, while participatory processes are avoided due to the perceived risk of critical opinions and potential project delays. As one interviewee indicated: "Fairness is subordinated to economic considerations" (rural municipality 11).

All planners interviewed acknowledged the growing scarcity of energy supply. Addressing this scarcity fairly requires better information exchange in the planning process. Interviewees stressed that such exchange is needed not merely for procedural fairness, but because it leads to better and fairer outcomes overall. Earlier community involvement in long-term investment planning by energy and spatial planners was seen as critical (wind energy association 1 & 2, province 13, rural municipality 15).

However, Dutch legislation currently limits early involvement, as energy network companies hold a regulated monopoly position. As one RES respondent explained: "The energy network companies are not allowed to indicate where there is room for resource allocation, because then you immediately get strategic behavior. They are not officially allowed to give strategic advice" (RES 17).

The dilemmas identified in the interviews—concerning effectiveness, efficiency, and fairness—were used to inform the scenarios in the serious game. At the end of the game, the participants suggested that new national policies should incorporate rule changes like the simulated government and governance scenarios. By contrast, the simulation of the market scenario vividly demonstrated how the current organization of energy and spatial planning hinders the transition to a renewable energy system. In addition to being ineffective, the participants rated the market scenario as only moderately fair, and less fair than either the government or governance scenarios.

5.4 Discussion

5.4.1 Reflection

The gaming simulation shows that the market rules are perceived as ineffective, inefficient, and unfair compared to the government and governance rules. Market rules fail to stimulate resource integration effectively, as competition reinforces sectoral responsibilities and limits interaction. Competition prevails over collaboration, making it difficult to build the collaborative capacity needed for integration. Furthermore, network connections are not prioritized but allocated strictly in order of request, limiting the ability to balance diverse interests. Efficiency is evaluated narrowly in terms of cost reduction, with resources developed without participatory processes (that are perceived as costly).

The market rules are also not perceived as fair because success depends on winning the competition for resources, not on the quality of collaborative relationships. Limited opportunities exist to understand each other's perspectives, reducing the recognition of ambitions necessary for fairness (Van Uffelen, 2022). In addition, information sharing is constrained: the energy network company, with its public mandate, provides only basic information about the order of requests to avoid accusations of preferential treatment. While this ensures competition (Friedman, 2007), it prevents strategic information exchange needed for coordinated planning. To enhance fairness, connection requests should be complemented with the right to receive meaningful information for specific resource allocation (Ziggers, 2024).

The government rules are perceived as significantly more effective than the market rules because the province's strong mandate prioritizes housing and business development over free market allocation. This mandate reduces market uncertainty and fosters collective action. However, it also risks sectoral fragmentation and insufficient attention to sustainable energy (Warbroek et al., 2023). Efficiency improves under government rules, as provincial guidance supports the investment planning of the energy network company. Aligning energy network investments with spatial requirements can reduce demand, enable renewables, promote mixed-use areas, and encourage compact development (Stoeglehner, 2020). Still, compared to governance rules, government rules are less efficient because supporting rural development often leads to higher transmission losses (Abart-Heriszt et al., 2020; Ramirez Camargo & Stoeglehner, 2018).

In terms of fairness, the government rules occupy an intermediate position. The provincial democratic mandate supports housing and business allocation, but solar and wind projects are often sidelined, limiting acceptance of the energy transition (Lindvall, 2023). The province's dominance may also privilege its own interests, undermining fair representation (Sovacool & Dworkin, 2015). While, compared to market rules, government rules marginally improve fairness, broader participation is still lacking. Expanding participation could help reduce resistance by building shared perspectives and ensuring stakeholders feel heard (Davoudi & Brooks, 2014). Fairness is further limited by the absence of detailed specifications of municipal and developer ambitions, which the energy network company requires to assess potential impacts at an early stage (De Pascali & Bagaini, 2019). Overall, government rules provide intermediate levels of effectiveness, efficiency, and fairness due to their unilateral and sectoral approach.

The governance rules, in contrast, are perceived as significantly more effective than the market rules. By spanning geographic, administrative, and functional boundaries, the RES better integrates energy demand and supply within the regional network. This focus on effectiveness encourages shared responsibility, relational investments, and open interaction (Bodin, 2017; Van Dijk et al., 2022; Warbroek et al., 2023). Governance rules also enhance efficiency: the energy network company is given a stronger mandate to experiment and to raise utilization rates through technical combinations. Local group connections facilitate energy exchange between housing, businesses, and renewable energy projects, relieving pressure on the public network and reducing per-resource costs compared to one-to-one connections (Heldeweg, 2017; Lavrijssen & Carrillo Parra, 2017). As the main investor, the energy network company is also able to incentivize others to co-invest and limit transmission losses.

Fairness is significantly higher under governance rules than under market rules. Allowing group connections encourages negotiation over resource priorities, broadening representation and turning potential opponents into supporters (Ziggers, 2024). Fairness is further enhanced by greater transparency: the energy network company acknowledges its responsibility to create integrated energy solutions (Lavrijssen & Carrillo Parra, 2017) and shares investment plans, enabling informed decisions by the province and municipalities (Fainstein, 2010; Sovacool & Dworkin, 2015).

5.4.2 Future research

Designing a serious game is always a simplification of the real-world case. The focus of this study was on the negotiation and development of a vision for energy infrastructure and spatial development, guided by market, government, and governance rules. This focus could be made more in depth, as well as more broadly. First, a more detailed serious game could provide a better detailed representation of the RES and explore a wider variety of sets of rules and how they encourage the formation of collaborative arrangements. In future research, in-depth case studies designed for more concrete simulations could help to achieve a more detailed representation of the infrastructural challenges and urban/rural local needs.

Second, another recommendation is to play the serious game multiple times and in different settings. Playing the game more often would increase the reliability of the outcomes. More participants from different regions and in different settings could be involved, each with their own expertise and experience of spatial energy planning.

Finally, this research focused on early-phase implementation dynamics among the province, municipalities, and public as well as private developers. Therefore, this study has simulated the deliberations among professional stakeholders before citizens are consulted. Our respondents indicated that the involvement of citizens in the early phase of collaboration and decision-making could positively affect the perceived fairness among them. In future research, it would be interesting to expand the simulation involving citizens in earlier stages of the policy-making process.

5.4.3 Practical implications

In summary, the increase in perceived effectiveness, efficiency, and fairness stems from a stronger spatial planning mandate for the province and a more prominent role for the energy network company in implementing technically optimal solutions in collaboration with other actors. Governance rules foster effective resource allocation, efficient investment, and participatory involvement. It is therefore necessary to gradually shift away from market rules towards governance rules, which require spatial

and energy planning organizations to collaborate more explicitly—leading to a societal prioritization of energy infrastructure planning (ACM, 2024; De Winkel et al., 2025).

In line with governance rules, it is useful to explore logical combinations of spatial functions from the perspective of the energy network, such as aligning energy demand and supply. This can help alleviate grid congestion by reducing the volume of electricity transmitted. If the energy network company provides technical advice on infrastructure implementation, and the province uses its democratic mandate to decide on resource allocation, urban and rural municipalities could assume the role of mediators. They would communicate to local communities that allocating energy resources in designated siting areas is necessary in exchange for realizing locally desired housing and business ambitions.

Finally, the renewable energy system requires coordinated infrastructure planning on a decentral, regional level. A supralocal government body—such as the province in our simulation—is often best positioned to decide on long-term regional trade-offs between energy and space, given that much of the energy network's coverage falls within its administrative boundaries. For this reason, the energy network company and the province should share leadership under governance rules, jointly seeking logical combinations of spatial functions and energy to advance integrated planning in the RES. While we conducted our gaming research, the Dutch government initiated multi-year policy programs to invest in energy infrastructure that includes a leading role for the provincial level (Dowling et al., 2023).

5.5 Conclusion

The aim of this study was to examine the impact of rules on the implementation of the RES. The guiding question was: How can rules influence the implementation of the RES? Effectiveness, efficiency, and fairness were all perceived as higher under governance rules compared to government and market rules. This is explained by stronger promotion of collaboration, resource integration, and increased planning capacity. Governance rules also emphasize both economic and technological efficiency by aligning spatial planning with energy network investments. They are perceived as fairer because network intelligence is tailored and applied strategically, and because participatory negotiations around group connections address diverse needs in balancing energy demand and supply. The contribution of this study lies in demonstrating how rule changes help to improve the Dutch energy transition.

6

Conclusion

6.1 Introduction

The long-term goal of achieving a carbon-neutral society by 2050 is widely recognized (Anfinson et al., 2023; Kooij et al., 2018). However, social, organizational, and governance barriers hinder the implementation process and the achievement of the long-term energy transition goals in multi-stakeholder collaborations (MSC) (De Winkel et al., 2025; Koelman et al., 2024; Van Kranenburg & Witjes, 2024). This study aims to gain insights into the energy transition literature by examining how MSCs contribute to the achievement of long-term energy transition goals, thereby illuminating the social, organizational, and governance facets of the implementation process. The research question posed is: '*How do multi-stakeholder collaborations contribute to the implementation of long-term energy transition goals?*'

In this concluding chapter, we will first examine the implementation at the national level, followed by an analysis of three local or regional case studies. We will derive emergent findings that extend beyond the individual results of each case. These findings will be discussed after we provide a detailed overview of the case-specific outcomes. Section 6.1 presents the findings from each case study, beginning with the national level and then moving on to the results from the three local and regional case studies of MSCs. Section 6.2 will highlight the emergent findings identified through our analysis. Section 6.3 will discuss the contributions made to academic literature and propose avenues for future research. Lastly, Section 6.4 will offer recommendations for practitioners on how MSCs can contribute to the achievement of long-term energy transition goals.

6.2 Summary of the findings per chapter

Chapter 2: Navigating the phase out and phase in of the Dutch energy transition: focusing events, framing contests, and policy instruments

Chapter 2 studies how focusing events and framing contests interact with the possibility to come to a public policy agreement. The research question is: '*How do focusing events and framing contests interact with policies for the phase out of fossil energy and the phase in of renewables?*' This chapter identifies several ways to frame focusing events that influence the phase out of fossil energy and the phase in of renewables. As suggested by Boin et al. (2009), when the causes and impacts of focusing events are highly contested, policy responses often lack consistency, hindering both phase out and phase in strategies. During such times, claims for compensation arise, and

the demand for reliable information increases. Simultaneously, newly introduced rules encounter significant resistance, as the government typically provides little opportunity for non-governmental stakeholders to influence public policy. The tendency to downplay a focusing event is ineffective for achieving long-term energy transition goals since stakeholders may not grasp the necessity of introducing new policy instruments. To effectively issue rules, focusing events should be framed as opportunity structures. This framing promotes knowledge sharing, stakeholder involvement, and resource integration. If the rules create an interactive space for learning about each other's goals and ambitions, more effective anticipatory strategies can emerge. Following a period of knowledge sharing, financial incentives can then be introduced to encourage strategic investments, as stakeholders will be more informed about the costs and benefits associated with the energy transition. Furthermore, this process fosters a better understanding of the rules in use, making stakeholders more aware of desirable regulatory changes. However, despite its potential, the strategic framing of focusing events is often insufficient for advancing implementation processes because it can create a disconnect with MSCs when pursuing long-term energy transition goals. Therefore, the next chapter examines framing strategies in relation to the implementation of territorial foresight in a local MSC.

Chapter 3: The implementation of a territorial foresight outcome through aligning goal frames: a pilot case of the gas disconnection in the Netherlands

Chapter 3 examines how different goal frames influence the commitment for the implementation of a territorial foresight. The question posed is: '*When implementing a territorial foresight outcome, how can stakeholders align their various goal frames and commit to the implementation process?*' During a pilot project focused on gas disconnection in an urban residential area, several subgoals emerged as key normative and gain goal frames, including legislation, participation, sustainability, energy affordability, efficiency, investment, and scaling up. To harmonize these diverse goal frames, the energy network company Alliander has taken the initiative by proposing a modular heating system that integrates various individual goals and energy concepts into a collective solution. This proposal for a modular heating system addresses the normative and gain goals expressed by the municipality, the housing corporation, and the residents' association. All stakeholders share a commitment to adhere to the principles of legislation, participation, and sustainability within a normative goal frame. However, they also face the realities of the gain goal frame. As the implementation advances, the gain goal frame starts to take precedence. This shift represents a fragile commitment, as the associated costs and risks increase, while the economic benefits remain unclear. The urban municipality has informed the national government about the financial

shortfall in the project's implementation and has successfully secured experimental funding, aided by the innovative neighborhood-scale solution proposed by Alliander. The approval of this funding helps to rejuvenate stakeholder commitment, encouraging the exchange of technical and organizational expertise while fostering alignment of goal frames. Primarily, frame bridging techniques are employed to facilitate knowledge sharing, addressing challenges related to financial deficits and insufficient investment and commitment. Goal frame alignment is achieved, due to a small wins strategy that motivates stakeholders to persist in the implementation process.

Chapter 4: Multi-stakeholder partnership (MSP) as an instrument for energy transition: How motives, involvement, and network embeddedness contribute to sustainability and transition process goals

Chapter 4 studies how motives, engagement practices, and network embeddedness influence the achievement of sustainability and transition process goals in an MSP. The question is: '*How do motives, involvement practices, and embeddedness of stakeholders influence the public policy goals of an MSP for the energy transition?*' An MSP can be defined as a new type of collaboration that brings together stakeholders from government, business, and civil society to share knowledge, technologies, and resources in pursuit of common policy solutions (Momen, 2020). The implementation of an MSP fosters interactions among stakeholders, allowing them to understand who can contribute to achieving long-term energy transition goals. These interactions are referred to as 'relational investments', which are essential for achieving these goals and facilitating knowledge sharing (Clarke & MacDonald, 2019; Grimm & Reinecke, 2024; Steenkamp, 2022). The evidence suggests that key factors such as the knowledge motive, stakeholder mobilization, resource involvement, and supportive engagement play significant roles in attaining sustainability and transition process objectives. The knowledge motive encourages stakeholders to learn how to effectively organize the long-term energy transition. As knowledge is disseminated, it raises awareness about climate change and the urgency for sustainability, prompting stakeholders to take action. This process also fosters innovation, as stakeholders discover best practices for effective implementation and investment strategies. Moreover, mobilization enhances collaboration among stakeholders, as they dedicate time to the implementation process. Additionally, this involvement raises awareness of prior agreements regarding carbon neutrality, motivating stakeholders to contribute towards a better world. Resource involvement further facilitates goal achievement by encouraging stakeholders to seek strategic investment opportunities, organize co-ownership pilots, and allocate financial resources. Supportive engagement, characterized by a permanent network organization and secretariat, provides the

necessary institutional structure for fostering relational investments and knowledge sharing. Together, the mobilizing, resource, and supportive involvements enhance the likelihood of achieving sustainability and transition goals. The deeper the engagement, the greater the resource investment, and the higher the chances of success. The internal networks of stakeholders offer essential knowledge, relational, and financial resources to support the MSP, with a focus on acquiring 'social knowledge', networking, and coalition building. This collective effort not only helps stakeholders develop professionally but also solidifies their commitment to implementing long-term energy transition goals.

Chapter 5: Changing the Rules of the Game to encourage a Collaborative Arrangement: the Case of the Dutch Regional Energy Strategy

Chapter 5 explores how changes in the rules of the game can support the effective, efficient, and fair implementation of long-term energy transition goals. These rules provide regulatory leeway for MSCs. The focus of this study is the implementation of the Renewable Energy Strategy (RES), a policy program established by the national government aimed at creating energy partnerships in thirty regions across the Netherlands. The goal of the RES is to develop a regional vision for large-scale production of renewable energy on land (Gerritsen, 2025; Hoppe, 2021). The question is: '*How can rules influence the implementation of the RES?*' Three scenarios have been simulated, with the main stakeholders embodying their professional roles in a simulation game. Together, they negotiated and developed a spatial vision for energy infrastructure and spatial development, guided by market, government, and governance rules. Among these, the governance rules were identified as the most effective, efficient, and fair for fostering collaboration, integrating resources, and enhancing planning capacity. These governance rules replace the market rules that previously dictated network connection issuance, shifting from a 'first come, first served' approach towards an arrangement that enables 'societal prioritization' of energy infrastructure planning. In the simulation game, the governance rules better facilitate the decentralized synchronization of energy production and consumption, prioritization of resources, and the establishment of connections between energy demand—such as housing and businesses—and energy supply sources like solar parks, wind farms, and substations. By aligning energy network planning with spatial ambitions, effective collaboration, along with economic and technological efficiency, becomes achievable. In the simulated scenario, the energy network company Alliander leads this initiative by proposing efficient energy solutions that align with the spatial goals of the province, urban and rural municipalities, energy cooperatives, and developers. This approach not only reduces transmission losses but also anticipates

fluctuations in energy demand and supply. Stakeholders can engage in the planning process under the regime of governance rules, representing their own interests while considering the aspirations of others, thereby enhancing social acceptance of the RES. This way integrated spatial energy planning is initiated early in the implementation process because the governance rules stimulate the timely communication of planned investments in the energy network, alongside spatial ambitions.

6.3 Emergent findings based on the empirical part of this study

MSCs support the successful implementation of long-term energy transition goals. This section presents further emergent findings that stand out at a broader level. These findings emphasize the leadership role of the energy network company, as well as the importance of relational investments and knowledge sharing. The findings extend beyond case-specific results, providing valuable insights into how MSCs can contribute to the implementation of long-term energy transition goals.

In the gas disconnection case discussed in chapter 3, the energy network company Alliander takes a leading role. This leadership emerges because the municipality, housing corporation, and residents' association emphasize goal frames related to energy affordability, efficiency, various legislative obligations, and sustainability. Alliander fosters commitment by initiating plans, offering visionary proposals, inviting stakeholders to participate, and investing time and resources. One significant barrier that leads to misalignment between these goal frames is the financial gap regarding the implementation of gas disconnection. To overcome this deadlock, Alliander has proposed a dynamic, modular district heating system. This innovative organizational and technological approach aims to bridge the normative and gain goal frames. Additionally, the municipality has notified the national government about the financial gap and has successfully secured experimental funding, supported by the new neighborhood-scale solution designed by Alliander. Through this professional leadership, the energy network company stimulates alignment of the goal frames. In the province-wide MSP described in chapter 4, Alliander is recognized as one of the founding members, playing a key role in its implementation. The company facilitates involvement by providing resources from its internal network to support the MSP. Alliander also leads the execution of the RES, setting an example for effective collaboration and economic and technological efficiency in energy network management as it relates to spatial planning. Furthermore, the company actively communicates with stakeholders to ensure fair participation in the planning process. By sharing its intentions regarding where and how to invest resources,

Alliander encourages stakeholders to present their own investment plans. When these investment plans align with the energy network planning as well as the spatial planning of the province and municipalities, developers are more likely to secure the necessary permits and grid connections. Additionally, Alliander takes the lead in applying for subsidies related to the RES. These subsidies enable the hiring of process facilitators to promote knowledge sharing and investment in desirable resource integration, as further examined in chapter 5.

The energy network company plays a significant role in fostering relational investments, as stakeholders need social knowledge to connect effectively. Relational investments refer to achieving public policy objectives through relational norms such as informal agreements, unwritten codes of conduct, and collaborative problem-solving (Tian et al., 2021). In the implementation of territorial foresight (discussed in chapter 3), these investments create the shared commitment necessary for developing a gas-free neighborhood. Deeper relationships facilitate a better understanding of each other's goals and ambitions. Relational investments are vital for engaging strategic key partners and aligning goals. The implementation of the MSP, detailed in chapter 4, also supports the cultivation of relational investments. When MSP partners reciprocate by sharing knowledge and resources and providing a supportive social infrastructure, the network evolves into a more stable structure. These investments encompass the allocation of time, effective communication regarding climate goals, and understanding how technical and organizational solutions can contribute to the energy transition. Such efforts promote communication and develop networking and sustainability skills, thereby increasing stakeholder involvement. Moreover, relational investments aimed at mobilizing resources and supporting engagement are essential for acquiring knowledge about sustainability and the goals of the transition process. By linking stakeholders' internal networks to the MSP, individuals representing these organizations gain insights into the latest developments in the energy transition and the available resources.

The three local and regional cases demonstrate that effective leadership and relational investments are linked to knowledge sharing. The primary stakeholder, the energy network company, offers proposals based on its expertise to facilitate implementation. This process relies on the sharing of relevant organizational and technological knowledge, as well as educating stakeholders about available investment opportunities. Stakeholders contribute their professional experiences related to investing in and scaling up the energy transition through Communities of Practice. In these settings, they engage in relational investments and learn how to align different objectives. Knowledge sharing helps the urban municipality, housing corporation, and residents' association understand compliance with environmental

legislation, encourages participation, and promotes energy efficiency. Equipped with expertise from the energy network company, these stakeholders successfully applied for an experimental grant from the national government. This funding was essential to address the financial gap in implementing modular district heating, as discussed in chapter 3. A financial gap refers to the lack of a profitable margin to benefit economically from gas disconnection. As a result, stakeholders believe that public subsidies or co-investments are needed to fund the unprofitable margin of the investments in gas disconnection (Herreras Martinez et al., 2023).

The implementation of a regional MSP demonstrates how disseminating knowledge can raise awareness about climate change and the necessity for sustainability, thereby creating a sense of urgency for involvement. Sharing knowledge enhances innovative capacity, as best practices emerge for organizing implementation and making efficient investments. In the gas disconnection case study, after a financial gap was identified in several sustainable solutions, with this knowledge a national subsidy application could be granted (chapter 3). The internal networks of stakeholders provide essential knowledge resources that raise awareness of sustainability and the goals of the transition process. In the GEA case, we see that the internal networks of the involved stakeholders contribute content for the MSP programs and share technological, organizational, and financial expertise. Internal stakeholders acknowledge the significance of acquiring 'social knowledge' for networking, coalition building, and experiential learning. This process aids MSP stakeholders in professional development while enabling them to implement long-term energy transition goals within their own organizational contexts (chapter 4). In the implementation of the RES, Alliander aims for more efficient energy network planning by facilitating the sharing of technical and organizational expertise. This enables the province, urban and rural municipalities, and developers to make effective and efficient investment decisions regarding housing, businesses, and renewable energy sources in alignment with the energy network (chapter 5). The case studies thus show how knowledge is shared in MSCs and how the actors are making relational investments to move the energy transition forward. The leadership of the energy network company is found to be an important aspect for implementing new energy infrastructures in practice.

6.4 Contributions to the academic literature on the energy transition

In response to the literature on territorial foresight (Camarena et al., 2022; Vargas-Lama & Osorio-Vera, 2020), goal-framing (Etienne, 2011; Lindenberg & Steg, 2013), and frame

alignment (Benford & Snow, 2000; Skovgaard, 2017), the first scientific contribution is to describe how the process of goal frame alignment works in the energy transition, by having studied how the objectives and ambitions of stakeholders have become aligned in the implementation process. The long-term goals of the Dutch energy transition focus on the phase out of fossil energy and the phase in of renewable energy (chapter 2). MSCs are characterized by normative objectives and economically rational motivations to implement the long-term energy transition goals. However, the emphasis on economic or gain motivation tends to slow down the process because stakeholders are hesitant to invest in expensive energy solutions. The implementation process tends to slow down as stakeholders are afraid of making disinvestments in inefficient sustainable energy technologies. To retake the initiative in the implementation process, stakeholders focus again on achieving shared normative objectives (sustainability, participation, and compliance with regulations) to rebuild a collective commitment during implementation. Frame bridging strategies assist stakeholders in jointly committing to implementing new infrastructure for heating homes in a neighbourhood once agreement has been reached on realizing a future disconnected from the gas network (chapter 3). Stakeholders also embrace a mobilizing and supportive engagement, as well as the provision of resources, to align sustainability and transition process goals within MSC (chapter 4). Aligning goals is also achieved in the governance scenario of the RES case study during the game play. The stakeholders in the game strategically communicate their long-term ambitions in the governance scenario, to enable the allocation of renewable energy production locations close to new areas for housing and businesses that will consume that energy (chapter 5). Goal alignment, or on a more fundamental level goal frame alignment, is a major aspect in the process of 'doing' multi-stakeholder collaboration for implementing the energy transition.

Contributing to the goal framing theory of Lindenberg & Steg (2013), stakeholders seem to consider the normative and gain goal frames important. The hedonic goal frame may be less evident in the energy transition. In the three examined case studies, public stakeholders seem to play an important role and defend the (normative) public interest. The theory about frame alignment (Benford & Snow, 2000) helped us to identify various frame bridging strategies that were employed by the stakeholders in various case studies; in our view this piece of theory is not only applicable in the context of social movements (as Benford & Snow have studied), but also in the context of MSCs, and that applying frame bridging strategies contributes to find 'small wins' (Bryson, 1988; Termeer & Dewulf, 2019) that move the energy transition forward.

In response to the literature concerning MSPs (Momen, 2020; Nasiritousi & Sanderink, 2020; Gray & Purdy, 2018; Eweje et al., 2021) and the RES (Van Dijk et al., 2022; Van Dijk

et al., 2025), the second scholarly contribution is that various forms of MSC contribute to the achievement of long-term energy transition objectives. The MSP established in the province of Gelderland, GEA (chapter 4), has demonstrated that such a territorial MSP has added value for a region. This type of a *regional partnership* mobilizes the internal networks of stakeholders, facilitating the sharing of knowledge, relational and financial resources to support the energy transition. We have observed that a regional MPS for the energy transition fits with the current challenges of building a more decentralized energy infrastructure. With this empirical research we have connected the MSP literature (referred to above) with the literature on renewable energy planning (Gerritsen, 2024; Stoeglehner, 2020). Furthermore, our research confirms that the MSP we have studied, GEA, has proven effective in employing boundary spanning strategies (Van Meerkerk & Edelenbos, 2018b; Ystrom et al., 2021), thereby connecting internal and external networks (chapter 4). The RES (Gerritsen, 2025; Hoppe, 2021) serves as a type of MSC that encourages stakeholders to assume joint responsibility for regional energy and spatial planning by combining their efforts (chapter 5).

In response to the literature on collaborative arrangements (Heldeweg & Saintier, 2020; Lavrijssen & Carillo Parra, 2017; Maurya & Rathore, 2023), the third scientific contribution is how governance rules can influence the establishment of collaborative arrangements, by stimulating stakeholders to take an integrated approach to sustainable energy and spatial planning (chapter 5) (Koelman et al., 2024; Warbroek et al., 2023). Our findings indicate that introduction of new governance rules can be particularly effective in achieving the long-term energy transition goals. In the current collaborative arrangements' literature, the dimension of rules as barriers is noted, particularly on the level of individual citizens and consumers (Lavrijssen & Carillo Parra, 2017). Our empirical study extends this research to the level where professional stakeholders need to collaborate. Rules determine the context in which collaborations can take shape. Changing rules is time-consuming and evokes resistance, however, both our national study (chapter 2) and our regional simulation game (chapter 5) show how rule changes can accelerate the phase in of renewable energy.

We identify three areas for future research. Firstly, the RES literature emphasizes broader stakeholder involvement to achieve long-term energy transition goals (Hoppe & Miedema, 2020; Lelieveldt & Schram, 2023). This study adds that the energy network company can effectively support the RES, leveraging the grid operator's capabilities in facilitating knowledge exchanges, as well as acting as a boundary spanner. In the current context, the energy network company is well-positioned to plan energy infrastructure with a long-term perspective, due to its professional experience in energy network planning. For future research, we are interested in whether the energy network

company is the only stakeholder capable of taking a leading role in the implementation process, or if other partners have the potential to assume this responsibility as well. The province may gain a stronger leadership position in the future owing to its significant expertise in regional planning and its democratic mandate. Unlike the energy network company, which is neither democratically elected nor directly accountable to the public, the province is subject to stronger democratic accountability. It is crucial to consider the role of the energy network company, which operates as a heavily regulated energy monopoly constrained by legal restrictions on resource differentiation and group formation (Van den Boom, 2023).

Secondly, the findings of this study, which are based on only three MSCs, may have limitations in their generalizability. As a result, future research could benefit from examining different types of MSC in a wider range of localities and regions. New types of MSC could build strong government-firm-society-customer relationships. By studying different types of MSCs from additional localities and regions, researchers can gain valuable insights into the essential conditions for organizing effective and efficient goal alignment, involvement practices and an adequate regulatory context. This can support the development of adequate industry policy, realistic strategic government objectives, democratic support and fairness among the stakeholders (Bosticco & Herranz-Surrallés, 2024; Ziggers, 2024). This can create willingness among the stakeholders to contribute to the energy transition.

Thirdly, when analyzing MSCs in the future, the literature highlights the essential role of boundary spanners (Van Meerkerk & Edelenbos, 2018b; Ystrom et al., 2021; Zobel et al., 2024). Boundary spanners facilitate engagement practices within MSCs that promote innovation, collaboration, and information exchange (Klindt et al., 2024; Satheesh et al., 2024a). We recommend further research into the role of boundary spanning within MSCs because the regional GEA MSC demonstrates that internal resource provision is crucial for stimulating stakeholder involvement. Investigating the social practices and various dimensions associated with boundary spanning in future studies can provide valuable insights into how these practices mobilize stakeholders and resources, as well as the sharing of knowledge necessary for implementing long-term energy transition goals.

6.5 Recommendations for planning practice

This study provides several overarching recommendations for planning practice. It demonstrates that the energy network company plays a crucial role in achieving

long-term energy transition goals, thanks to its strong expertise in energy network planning. Hence, the first planning recommendation is for the energy network company to maintain its long-term commitment to MSCs by offering knowledge, resources, and organizational capacity. By doing so, the energy network company can serve as a role model, encouraging the province, municipal governments, businesses and community organizations to make relational investments and share knowledge. As a result, developing stakeholders will be better equipped to present their investment proposals for space and energy, aligning their efforts with the investment planning of the energy network company.

Social relations are considered important because 'soft' commitments support MSCs and the achievement of long-term energy transition goals (Borg & Ystrom, 2020; Medina-García et al., 2021; Pinilla-De La Cruz et al., 2022). Consequently, the second recommendation for planning is to disseminate more 'social' knowledge to educate stakeholders on how to collaboratively organize the energy transition. We suggest organizing additional Communities of Practice and pilot studies, as well as hiring process managers to identify further opportunities for collaboration, relational investments, and knowledge sharing.

The third recommendation for planning is to replace market rules with governance rules to synchronize decentralized energy production and consumption, facilitate the safe and reliable exchange of renewable energy, and stabilize local, regional and national energy networks. Market rules are inadequate for addressing collective action problems, such as grid congestion and limited space for renewables, because they prioritize a 'first come, first served' approach, often at the expense of important public amenities (De Winkel et al., 2025; Koelman et al., 2024). Under governance rules, the role of the energy network company is likely to shift towards facilitating resource differentiation, integrating spatial and energy considerations, relational involvement, and knowledge sharing. Consequently, the province, urban and rural municipalities, and developers can propose initiatives that align with the planning of decentralized energy infrastructures while taking into account essential societal functions, such as housing and renewable energy. In this way, MSCs can contribute successfully to the achievement of long-term energy transition goals in the Netherlands.

6

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Data management statement

The data collected for this research includes interviews, observations, publicly available policy documents and reports, a survey and the intervention methodology of serious gaming. Because the interview discussions are sometimes confidential, relevant to the person and/or organization in question, data is anonymized before being analyzed. We explicitly asked for permission to record interviews and observations, to collect survey data and to take photos during observations and the serious game. The participation of the respondents was voluntary. They were fully informed of the purpose of this research and gave their consent to take part in the study. The confidentiality of the respondents is guaranteed. Once the results of the study are published, raw data will be archived internally for scientific integrity at the Radboud University's network storage for at least 10 years according to the RDM policy (www.ru.nl/rdm). Additionally, anonymized data will be made public via the DANS archive for an indefinite period, again in accordance with the Radboud University's RDM policy. Data is made available for open access as much as possible, in accordance with international standards. Radboud University's RDM support helps to store, share and reuse research data, as well as provides support with any legal and ethical questions that may raise. Safe and secure ICT and archive facilities are available for long term access and storage of the data.

Appendices

Chapter 3

Appendix A: Observation overview.

Obs.	Type	Stakeholders	Topic	Date
1	Program table	Municipality	Governance, energy models	December 13, 2018
2	Community of practice	Residents' foundation	Eco villages	February 4, 2019
3	Community of practice	Residents' foundation	Participation	May 7, 2019
4	Community of practice	Residents' foundation	Paid and voluntary activities	June 20, 2019
5	Community of practice	Residents' foundation	Environment Act	September 11, 2019
6	Knowledge session	Residents' foundation	Energy computation	September 23, 2019
7	Community of practice	Residents' foundation	Expertise selection	November 6, 2019
8	Community of practice	Residents' foundation	Social marketing	March 9, 2020
9	Knowledge session	Residents' foundation, energy network company	Collective heating systems	March 9, 2021

Appendix B: Respondent overview.

Resp.*	Position	Stakeholders	Interview date
1	General secretary	Environmental agency	September 3, 2018
2	General secretary	Energy network company	September 6, 2018
3	Manager	Consultancy firm A	September 18, 2018
4	Coordinator	Quartermaster	October 1, 2018
5	Coordinator	Province	October 2, 2018
6	Advisor	Independent	October 2, 2018
7	Coordinator**	Residents' foundation	October 12, 2018
8	Advisor	Municipality	October 15, 2018
9	Advisor	Consultancy firm B	October 22, 2018
10	Manager	Housing corporation A	November 6, 2018
11	Manager	Consultancy firm C	February 19, 2019
12	Coordinator	Residents' foundation	January 31, 2020
13	Manager	Independent	February 5, 2020
14	Manager	Housing corporation B	February 12, 2020
15	Participant	Residents' foundation	March 19, 2020
16	Manager	Municipality	March 20, 2020
17	Coordinator**	Residents' foundation	January 21, 2021

*The authors generalized the positions to avoid identification.
**We interviewed this respondent twice for the chronological overview of the initiative.

Appendix C: Goal frames during the implementation of the gas disconnection in Hengstdal.

		Stage 1: Gas disconnection pilot					**Stage 2: Project group district heating plan**				
Goal frames		*Municipality*	*Network company*	*Housing corp. A*	*Housing corp. B*	*Residents' association*	*Municipality*	*Network company*	*Housing corp. A*	*Housing corp. B*	*Residents' foundation*
Norm	1 Legislation		x	x	x					x	
	2 Participation	x		x		x	x				
	3 Sustainability	x		x		x			x		x
Gain	1 Affordability		x		x	x				x	x
	2 Efficiency	x	x					x		x	
	3 Investment		x	x					x		x
	4 Upscaling										
Hedonic	1 Heat comfort										

		Stage 3: The energy grid company takes initiative			
Goal frames		*Municipality*	*Network company*	*Merged corporation*	*Residents' foundation*
Norm	1 Legislation		x		
	2 Participation	x			x
	3 Sustainability		x		
Gain	1 Affordability		x		x
	2 Efficiency		x	x	
	3 Investment	x	x		
	4 Upscaling		x		
Hedonic	1 Heat comfort				

Appendix D: Frame alignment during the implementation of the gas disconnection in Hengstdal.

	Stage 1: Gas disconnection pilot					**Stage 2: Project group district heating plan**				
Alignment strategies	*Municipality*	*Network company*	*Housing corporation A*	*Housing corporation B*	*Residents' association*	*Municipality*	*Network company*	*Housing corporation A*	*Housing corporation B*	*Residents' foundation*
Bridging						**x**		**x**	**x**	
Amplification	**x**									
Extension					**x**					
Transformation	**x**		**x**							

	Stage 3: The energy grid company takes the initiative			
Alignment strategies	*Municipality*	*Network company*	*Merged housing corporation*	*Residents' foundation*
Bridging	**x**	**x**	**x**	**x**
Amplification				
Extension				
Transformation		**x**		

Chapter 4

Appendix E: Findings of the factor and reliability analyses of the motives.

The items of this study have not been examined simultaneously before. Therefore, we first ran an exploratory factor analysis using principal estimation on all the 25 motives. We identify three motivational factors with an eigenvalue greater than one that summarizes 21 motives. The knowledge dimension consists of nine motives relates to gaining knowledge about the energy transition, learning about climate change, acquiring networking and sustainability skills, increasing innovation power and exploring opportunities for subsidies. Other knowledge motives refer to doing good to the world, contributing to carbon neutrality by 2050 and solving problems in the heat transition. The collaborative dimension includes seven motives for expanding professional network, stakeholder management, reaching consensus, connecting people, participatory collaboration, pioneering together, and inspiring others to play a role in the sustainable society. The business dimension captures five motives of increasing one's market share, connecting with investors, fulfilling an employment position, gaining a sustainable image and assuming corporate social responsibility. Using reliability analyses, a motivational knowledge (α=0.835), collaboration (α=0.800), and business dimension (α=0.753) can be identified.

Appendix E: Findings of the factor and reliability analyses of the motives.

Motives	Variable	Knowledge dimension	Collaboration dimension	Business dimension
Gaining knowledge about the energy transition.	B1_1i	*0.490*		0.023
Learning about climate change.	B1_2i	*0.591*		0.247
Acquiring networking skills.	B1_3i	*0.483*		0.130
Acquiring sustainability skills.	B1_4i	*0.514*		0.078
Increasing innovation power.	B1_7i	*0.611*		0.125
Increasing one's market share.	B1_8i	0.301	0.260	*0.346*
Exploring opportunities for subsidies.	B1_9i	*0.416*		0.021
Connecting with investors.	B1_10i	0.523	0.091	*0.194*
Expanding the professional network.	B1_12i	0.484	*0.006*	
Fulfilling an employment position.	B1_13i	0.439	0.360	*0.499*
Gaining a sustainable image.	B1_14i	0.470	0.288	*0.310*
Stakeholder management.	B1_15i	0.457	*0.547*	0.020
Reaching consensus.	B1_16i	0.607	*0.249*	
Doing good to the world.	B1_17i	*0.579*		0.110
Assuming corporate social responsibility.	B1_18i	0.590	0.176	*0.159*
Connecting people.	B1_19i	0.485	*0.216*	
Participatory collaboration.	B1_20i	0.554	*0.124*	
Pioneering together.	B1_21i	0.495	*0.227*	
Contributing to carbon neutrality by 2050.	B1_23i	*0.544*		
Inspiring others to play a role in a sustainable society.	B1_24i	0.461	*0.295*	
Solving problems in the heat transition.	B1_25i	*0.538*		
Eigenvalues		5.490	1.823	1.361
% of variance		3.277	2.871	2.526
Cronbach's alfa		0.835	0.800	0.753

Note: Blank fields represent factor loadings <0.000. The motivational dimensions are constructed based on positive factor loadings and substantive interpretation (item selection in *italics*).

Appendix F: Findings of the factor and reliability analyses of the involvement practices.
Appendix F shows an exploratory factor analysis on 14 survey items related to involvement practices. We set the cutoff of the factor loadings at 0.4. The analysis yielded two factors with eigenvalues greater than one that summarized 14 involvement practices: Mobilizing and resource involvement. The factor that captures mobilizing involvement includes investing time in the GEA network, making GEA members aware of previous agreements on carbon neutrality, making GEA members aware of their impact on a better world, empowering pioneers, political support for GEA's goal of a carbon neutral Gelderland before 2050 and advising on obtaining subsidies. The other factor captures the engagement activities aimed at providing resources: Publicizing the GEA network to a wider audience, investing resources in strategic partnerships, co-ownership of pilots, professionalism, investing financial resources, communication support, sharing knowledge about sustainability and sending employees to the GEA network. The Cronbach's alpha is well above the threshold of 0.700, i.e., for mobilizing (α=0.866) and resource involvement (α=0.809), so both constructs can be considered reliable.

Appendix F: Findings of the factor and reliability analyses of the involvement practices.

Involvement practices	Variable	Mobilizing involvement	Resource involvement
Publicizing the GEA network to a wider audience.	B3_1i		*0.602*
Investing time in the GEA network.	B3_2i	*0.684*	0.452
Investing resources in strategic partnerships.	B3_3i		*0.650*
Co-ownership of pilots.	B3_6i		*0.844*
Making GEA members aware of previous agreements on carbon neutrality.	B3_7i	*0.668*	0.479
Making GEA members aware of their impact on a better world.	B3_8i	*0.815*	
Empowering pioneers.	B3_9i	*0.654*	0.556
Political support for GEA's goal of a carbon neutral Gelderland before 2050.	B3_10i	*0.787*	
Professionalism.	B3_11i	0.496	*0.697*
Investing financial resources.	B3_12i	0.574	*0.607*
Communication support.	B3_13i		*0.551*
Sharing knowledge about sustainability.	B3_14i		*0.882*
Advising on obtaining subsidies.	B3_17i	*0.600*	
Sending employees to the GEA network.	B3_19i	0.414	*0.661*
Eigenvalues		5.266	1.076
% of variance		3.745	2.597
Cronbach's alfa		0.866	0.809

Note: Blank fields represent factor loadings <0.400. The mobilizing and resource involvement variables are constructed based on factor loadings >=0.400 and substantive interpretation (item selection in *italics*).

Appendix G: Findings of the reliability analysis of the sustainability involvement.

In terms of involvement areas, two distinct GEA areas emerge, focusing on sustainability and supportive involvement. Proportionally, Smart Neighborhoods is the most popular sustainability involvement (max. prop.=0.571), followed by climate adaptation on business parks and Energy Service Companies (ESCOs). The least prominent sustainability involvement is participating in electric driving lessons (min. prop.=0.079). The sustainability involvement is a statistically reliable construct because α=0.744>0.700 (Appendix G).

Appendix G: Findings of the reliability analysis of the sustainability involvement.

Sustainability involvement	**Item**	**Prop.**
Societal tender on local property ownership.	dA6_1	0.220
Neighborhoods for the Future.	dA6_2	0.364
Smart Neighborhoods.	dA6_3	0.571
Sustainable public real estate.	dA6_4	0.477
Energy service companies (ESCO's).	dA6_5	0.518
One stop shopping.	dA6_6	0.391
Carbon credit opportunities.	dA6_7	0.265
Exemplary government.	dA6_8	0.415
Electric driving lessons.	dA6_9	0.079
Energy counters.	dA6_10	0.319
Climate adaptation on business parks.	dA6_11	0.558
Cronbach's alpha		0.744

Appendix H: Findings of the reliability analysis of the supportive involvement.

Regarding the supportive involvement, most stakeholders participate in the GEA secretary (max. prop.=0.680). After that, stakeholders join the GEA support and board teams. Program development has the least involvement (min. prop.=0.414). The construct of the supportive involvement is statistically reliable because α=0.769>0.700 (Appendix H).

Appendix H: Findings of the reliability analysis of the supportive involvement.

Supportive involvement	**Item**	**Prop.**
Financial instruments.	dA6_12	0.463
Consultation on supra regional collaborative arrangements.	dA6_13	0.424
Program development.	dA6_14	0.414
GEA dashboard.	dA6_15	0.429
GEA board.	dA6_16	0.509
GEA support.	dA6_17	0.588
GEA secretary.	dA6_18	0.680
Cronbach's alpha		0.769

Appendix I: Findings of the reliability analysis of the MSP sustainability goals.

The survey made a substantive distinction between the MSP's sustainability and transition process goals. Stakeholders rated each objective on a scale of one to ten. Implementing the energy transition receives the highest score from the MSP sustainability goals (max.=0.891). The implementation of clean energy in mobility and transport receives the lowest score (min.=0.754). The MSP fit with the sustainability goals can be considered reliable, since α=0.927>0.700 (Appendix I).

Appendix I: Findings of the reliability analysis of the MSP sustainability goals.

MSP sustainability goals	**Item**	**Mark**
Contributing to carbon neutrality by 2050.	D1_1i	0.851
Implementing the energy transition.	D1_2i	0.891
Building a circular economy.	D1_3i	0.836
Transforming waste into resources.	D1_4i	0.778
Green employment.	D1_5i	0.812
More efficient use of infrastructures.	D1_15i	0.816
Implementing clean energy in mobility and transport.	D1_16i	0.754
Cronbach's alpha		0.927

Appendix J: Findings of the reliability analysis of the MSP transition process goals.

Among the MSP's transition process goals, pointing out the legal obligation to save energy ranks highest (max.=0.828). Putting energy savings on the political agenda and managing the Regional Energy Strategy (RES) also receive high marks. The monitoring of GEA's contribution to the national climate goals has the minimum score (min.=0.739). The GEA's transition process goals have a reliable scale, as α=0.908>0.700 (Appendix J).

Appendix J: Findings of the reliability analysis of the MSP transition process goals.

MSP transition process goals	**Item**	**Mark**
Monitoring the energy goal achievement of the GEA members.	D1_7i	0.748
Monitoring GEA's contribution to the national climate goals.	D1_8i	0.739
Joint pioneering.	D1_9i	0.791
Professionalization of the energy cooperatives.	D1_10i	0.742
Putting energy savings on the political agenda.	D1_11i	0.820
Pointing out the legal obligation to save energy.	D1_12i	0.828
Managing the Regional Energy Strategy (RES).	D1_13i	0.805
Cronbach's alpha		0.908

Appendix K: Findings of the reliability analysis of the stakeholder's sustainability goals.

The survey also distinguished the stakeholder's sustainability and transition process goals. Concerning the stakeholder's fit with the sustainability goals, reducing unnecessary mobility movements includes the highest reliability score (max.=0.917). Preventing unnecessary waste disposal has the lowest reliability score (min.=0.860). The construct of the stakeholder's sustainability goals is reliable because α=0.876>0.700 (Appendix K).

Appendix K: Findings of the reliability analysis of the stakeholder's sustainability goals.

Stakeholder's sustainability goals	**Item**	**Mark**
Preventing unnecessary waste disposal.	D2_4i	0.860
Adopting sustainable energy sources.	D2_13i	0.901
Reducing unnecessary mobility movements.	D2_15i	0.917
Cronbach's alpha		0.876

Appendix L: Findings of the reliability analysis of the stakeholder's transition process goals.

From the stakeholder's transition process goals, the development of circular business models has the highest reliability score (max.=0.867). Monitoring energy efficiency in operations management and the availability of study contracts in sustainable construction also have high scores. Communicating GEA's goal of achieving CO_2 neutrality by 2050 has the lowest score (min.=0.735). The scale is reliable because α=0.949>0.700 (Appendix L).

Appendix L: Findings of the reliability analysis of the stakeholder's transition process goals.

Stakeholder's transition process goals	**Item**	**Mark**
Communicating GEA's goal of achieving CO_2 neutrality by 2050.	D2_1i	0.735
Exerting influence on the decision-making about the energy transition.	D2_2i	0.804
Development of circular business models.	D2_3i	0.867
Availability of study contracts in sustainable construction.	D2_5i	0.850
Monitoring energy efficiency in operations management.	D2_7i	0.855
Publication of the energy goal achievement from operational management.	D2_8i	0.759
Participating in pilot studies.	D2_9i	0.843
Cooperative ownership of sustainable energy production.	D2_10i	0.833
Certification of the energy saving measures in operational management.	D2_11i	0.838
Connecting with investors in sustainable industrial production.	D2_12i	0.816
Involvement of stakeholders in energy efficient operational management.	D2_14i	0.765
Cronbach's alpha		0.949

The size of the MSP is a single-item measure, while the internal network of a stakeholder consists of the counting of dichotomous responses on internal relationships. As a result, these variables did not meet the requirements for factor and reliability analyses.

Appendix M: Correlation table of the main determinants

Appendix M presents the correlation table of the main determinants, showcasing possible positive relationships between the variables. The significant correlations above 0.232 have an asterisk. In general, the knowledge, collaboration and business motives correlate with mobilizing involvement, sustainability and transition process goals of the stakeholders. Sustainability and supportive involvement correlate with the mobilizing involvement, MSP transition process goals and the stakeholder's sustainability goals. Mobilizing and resource involvement correlate with collaboration and business motives, supportive involvement, stakeholder's internal network size, MSP and stakeholder's sustainability and transition process goals. The MSP and stakeholder's internal network sizes correlate with the collaboration motive. The MSP goals correlate with the supportive, mobilizing and resource involvement. Finally, the goals of the stakeholders correlate with the knowledge and collaboration motives, supportive, mobilizing and resource involvement, and the MSP's sustainability and transition process goals.

Appendix M: Correlation table of the main determinants.

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Knowledge motive	1.00												
2	Collaboration motive	0.472*	1.00											
3	Business motive	0.384*	0.423*	1.00										
4	Sustainability involvement	0.277*	0.321*	0.149	1.00									
5	Supportive involvement	0.074	0.168	0.120	0.600*	1.00								
6	Mobilizing involvement	0.365*	0.484*	0.371*	0.233*	0.319*	1.00							
7	Resource involvement	0.195	0.497*	0.309*	0.123	0.269*	0.595*	1.00						
8	MSP network size (log)	0.051	0.389*	-0.062	0.086	0.190	0.054	0.153	1.00					
9	Stakeholder's internal network size	-0.096	0.275*	-0.005	-0.029	0.347*	0.249*	0.410*	0.658*	1.00				
10	MSP sustainability goals	0.273*	0.129	0.193	0.187	0.242*	0.313*	0.349*	-0.181	0,005	1.00			
11	MSP transition process goals	0.133	0.091	0.090	0.245*	0.302*	0.235*	0.260*	-0.084	0,049	0.874*	1.00		
12	Stakeholder's sustainability goals	0.434*	0.308*	0.250*	0.258*	0.371*	0.569*	0.434*	-0.086	0,114	0.731*	0.657*	1.00	
13	Stakeholder's transition process goals	0.332*	0.244*	0.180	0.224	0.299*	0.441*	0.401*	-0.104	0,108	0.794*	0.797*	0.908*	1.00

Note: N=81. Correlations >0.232 are significant (p<0.050).

Appendix N: T-tests of the MSP model constructs

Appendix N shows the significant paired sample differences between the MSP model constructs, except for the stakeholder's difference between sustainability and transition process goals. The collaboration motive is significantly more prominent than the knowledge motive, as demonstrated by t(80) = 8.649, p = 0.000. The knowledge motive is significantly stronger than the business motive, given t(80) = 10.913, p = 0.000. Subsequently, t(71) = -2.323, p = 0.023 shows that the mobilizing involvement is significantly weaker than the resource involvement. The sustainability focused involvement is significantly larger than supportive involvement as t(80) = 8.309, p = 0.000. Achieving MSP sustainability goals is significantly less pronounced than MSP transition process goals, t(65) = -4.497, p = 0.000. Finally, stakeholder's sustainability goals are insignificantly less prominent than transition process goals, as t(56) = -1.290, p = 0.202 shows.

Appendix N: T-test results of the MSP model constructs.

	t	df	p
Pair collaboration-knowledge motives	8.649*	80	0.000
Pair knowledge-business motives	10.913*	80	0.000
Pair mobilizing-resource involvement	-2.323*	71	0.023
Pair sustainability focused-supportive involvement	8.309*	80	0.000
Pair MSP sustainability-transition process goals	-4.497*	65	0.000
Pair stakeholder's sustainability-transition process goals	-1.290	56	0.202

English summary

Introduction

There is a broad scientific consensus that climate change presents significant challenges, with the burning of fossil fuels identified as its primary cause (Murphy, 2024; Perera & Nadeau, 2022; Soeder, 2021). In response to the United Nations Climate Change Conference in Paris (2015), the Dutch Climate Agreement has consequently established the long-term objective of transitioning society to carbon neutrality by 2050 (Ministry of Economic Affairs & Climate Policy et al., 2019). However, achieving the long-term energy transition goal of carbon neutrality is proving to be more difficult than anticipated. Once this long-term energy transition goal has been established, it becomes essential to study multi-stakeholder collaborations (MSCs) during the implementation (Bulmer & Yáñez-Araque, 2023; Casady et al., 2024; Gray & Purdy, 2018) because frame misalignment, policy fragmentation and network congestion are likely to emerge (De Winkel et al., 2025; Rosenbloom et al., 2016; Warbroek et al., 2023). Implementing MSCs can be challenging when stakeholders have differing goals, motivations, levels of involvement, and contribute different resources (Eweje et al., 2021; Sanderink & Nasiritousi, 2020). Furthermore, various perceptions exist of what constitutes an effective and efficient regulatory context for MSCs.

Research aim, question and methods

Hence, this study aims to contribute to the energy transition literature by examining how MSCs support the achievement of long-term energy transition goals, thereby illuminating the social, organizational, and governance facets of the implementation process. Hence, the research question is: '*How do multi-stakeholder collaborations contribute to the implementation of long-term energy transition goals?*'

To answer this question, chapter 2 addresses the complex interactions between focusing events, framing contests, and delays in public policy implementation. This chapter reviews the existing academic literature on focusing events, framing contests, and policy development (Paul & Criado, 2020). This literature review is enhanced by the collection and analysis of various media sources, policy documents, and research reports. It underscores the need for further research on MSCs in local and regional contexts. Therefore, three studies are presented aimed at understanding how local and regional MSCs implement long-term energy transition goals after agreement on climate targets has been achieved (chapters 3-5). Utilizing qualitative analysis (Beuving & De Vries, 2014) and grounded theory (Glaser & Strauss, 2017), chapter 3 illustrates how goal frames, sub goals, and frame alignment strategies are used during the implementation of a local MSC. In chapter 4, a quantitative survey

is executed on how motivational, participatory, and network factors influence the success of a multi-stakeholder partnership (MSP) in achieving the energy transition (Field, 2018). Finally, chapter 5 adopts the intervention methodology of serious gaming to identify which rules are perceived as the most effective and efficient for organizing the regulatory context of MSCs.

Results

The results provide valuable insights into how MSCs can effectively contribute to the implementation of long-term energy transition goals. Chapter 2 identifies several ways to frame focusing events that influence the phase out of fossil energy and the phase in of renewables. To effectively issue policy instruments, focusing events should be framed as opportunity structures. This framing promotes knowledge sharing, stakeholder involvement, and resource integration. Following a period of knowledge sharing, financial incentives can then be introduced to encourage strategic investments, as stakeholders will be more informed about the costs and benefits associated with the energy transition. Furthermore, this process fosters a better understanding of the rules in use, making stakeholders more aware of desirable regulatory changes. However, despite its potential, strategic framing is often insufficient for advancing the implementation because the contested framing of focusing events often leads to opposition against the rules. Hence, MSCs require opportunity framing to proceed with the implementation of long-term energy transition goals.

Chapter 3 examines how different goal frames influence the commitment for the implementation of a territorial foresight. During a pilot project focused on gas disconnection in the urban residential environment, several subgoals emerged as key normative and gain goal frames, including legislation, participation, sustainability, energy affordability, efficiency, investment, and scaling up. To harmonize these diverse goal frames, the energy network company Alliander takes the initiative by proposing a modular heating system that integrates various individual goals and energy concepts into a collective solution. This proposal for a modular heating system addresses the normative and gain goals expressed by the municipality, the housing corporation, and the residents' association. The stakeholders adhere to the principles of legislation, participation, and sustainability within a normative goal frame. However, they also face the realities of the gain goal frame. As the implementation advances, the gain goal frame starts to take precedence. This shift in goal framing represents a fragile commitment, as the associated costs and risks increase, while the economic benefits remain unclear. Primarily, frame bridging is employed to facilitate knowledge sharing, addressing challenges related to financial deficits and insufficient investment. Finally, goal frame alignment is achieved, due to a small wins strategy that supports the implementation.

Chapter 4 studies how motives, engagement practices, and network embeddedness influence the achievement of sustainability and transition process goals in a multi-stakeholder partnership (MSP). The evidence suggests that the knowledge motive, stakeholder mobilization, resource involvement, and supportive engagement play significant roles in attaining sustainability and transition process objectives. The knowledge motive encourages stakeholders to learn how to effectively organize the long-term energy transition. Mobilization enhances collaboration among stakeholders, as they dedicate time to the implementation process. Resource involvement further facilitates goal achievement by encouraging stakeholders to seek strategic investments, organize co-ownership pilots, and allocate financial resources. Supportive engagement, characterized by a permanent network organization and secretariat, provides the necessary institutional structure for fostering relational investments and knowledge sharing. Together, the mobilizing, resource, and supportive involvements enhance the likelihood of achieving sustainability and transition goals. The internal networks of stakeholders offer essential knowledge, relational, and financial resources to support the MSP, with a focus on acquiring 'social knowledge.'

Chapter 5 explores how changes in the rules of the game can support the effective, efficient, and fair implementation of long-term energy transition goals. The focus of this study is on the implementation of the Renewable Energy Strategy (RES), a policy program established by the national government aimed at creating energy partnerships in thirty regions across the Netherlands. The governance rules are identified as the most effective, efficient, and fair for fostering collaboration, integrating resources, and enhancing planning capacity. These governance rules replace the market rules that previously dictated network connection issuance on a 'first come, first served' basis. Governance rules facilitate the decentralized synchronization of energy production and consumption, prioritize resources, and establish connections between energy demand—such as housing and businesses—and energy supply sources like solar parks, wind farms, and substations. By aligning energy network planning with spatial ambitions, effective collaboration, along with economic and technological efficiency, becomes achievable. Integrated spatial energy planning is initiated early in the implementation process, and timely communication of planned investments in the energy network, alongside spatial ambitions, ensures that governance rules acknowledge the unique participatory and resource needs of each stakeholder.

Academic contribution and recommendations for planning practice

In response to the literature on territorial foresight (Camarena et al., 2021; Vargas-Lama & Osorio-Vera, 2020), goal-framing (Etienne, 2011), and frame alignment (Benford & Snow, 2000; Skovgaard, 2017), the first scientific contribution is to

describe how the process of goal frame alignment works in MSC, by having studied how the objectives of stakeholders have become aligned in the implementation process. Contributing to the goal framing theory of Lindenberg & Steg (2013), stakeholders seem to consider the normative and gain goal frames important. The hedonic goal frame may be less evident in the energy transition. In the three examined case studies, public stakeholders seem to play an important role and defend the (normative) public interest. The theory about frame alignment (Benford & Snow, 2000) helped us to identify various frame bridging strategies that were employed by the stakeholders in various case studies; in our view this piece of theory is not only applicable in the context of social movements (as Benford & Snow have studied), but also in the context of MSCs, and that applying frame bridging strategies contributes to find 'small wins' (Bryson, 1988; Termeer & Dewulf, 2019) that move the energy transition forward. Goal alignment, or on a more fundamental level goal frame alignment, is a major aspect in the process of 'doing' MSC for implementing the energy transition.

In response to the literature concerning MSPs (Momen, 2020; Nasiritousi & Sanderink, 2020; Gray & Purdy, 2018; Eweje et al., 2021) and the RES (Van Dijk et al., 2022; Van Dijk et al., 2025), the second scholarly contribution is that various forms of MSC contribute to the achievement of long-term energy transition objectives. The MSP established in the province of Gelderland, GEA (chapter 4), has demonstrated that such a territorial MSP has added value for a region. This type of a *regional partnership* mobilizes the internal networks of stakeholders, facilitating the sharing of knowledge, relational and financial resources to support the energy transition. We have observed that a regional MPS for the energy transition fits with the current challenges of building a more decentralized energy infrastructure. With this empirical research we have connected the MSP literature (referred to above) with the literature on renewable energy planning (Gerritsen, 2024; Stoeglehner, 2020). Furthermore, our research confirms that the MSP we have studied, GEA, has proven effective in employing boundary spanning strategies (Van Meerkerk & Edelenbos, 2018b; Ystrom et al., 2021), thereby connecting internal and external networks (chapter 4). The RES (Gerritsen, 2025; Hoppe, 2021) serves as a type of MSC that encourages stakeholders to assume joint responsibility for regional energy and spatial planning by combining their efforts (chapter 5).

In response to the literature on collaborative arrangements (Heldeweg & Saintier, 2020; Lavrijssen & Carillo Parra, 2017; Maurya & Rathore, 2023), the third scientific contribution is how governance rules can influence the establishment of collaborative arrangements, by stimulating stakeholders to take an integrated approach to

sustainable energy and spatial planning (chapter 5) (Koelman et al., 2024; Warbroek et al., 2023). Our findings indicate that introduction of new governance rules can be particularly effective in achieving the long-term energy transition goals. In the current collaborative arrangements' literature, the dimension of rules as barriers is noted, particularly on the level of individual citizens and consumers (Lavrijssen & Carillo Parra, 2017). Our empirical study extends this research to the level where professional stakeholders need to collaborate. Rules determine the context in which collaborations can take shape. Changing rules is time-consuming and evokes resistance, however, both our national study (chapter 2) and our regional simulation game (chapter 5) show how rule changes can accelerate the phase in of renewable energy.

Based on these findings, we have three recommendations for planning. This study shows that the energy network company plays a crucial role in achieving long-term energy transition goals, due to its strong expertise in energy network planning. Hence, the first planning recommendation is for the energy network company to maintain its long-term commitment to MSCs by offering knowledge, resources, and organizational capacity. Social relations are important to develop and maintain among stakeholders because 'soft' commitments support MSCs and the achievement of long-term energy transition goals. Consequently, the second recommendation for planning is to disseminate more 'social' knowledge to educate stakeholders on how to collaboratively organize the energy transition. The third recommendation for planning is to replace market rules with governance rules to synchronize decentralized energy production and consumption, facilitate the safe and reliable exchange of renewable energy, and stabilize local, regional and national energy networks.

Samenvatting

Introductie

Er is een brede wetenschappelijke consensus dat de uitstoot van fossiele energie leidt tot klimaatverandering (Murphy, 2024; Perera & Nadeau, 2022; Soeder, 2021). In reactie op de Klimaatconferentie van de Verenigde Naties in Parijs (2015) is er in het Nederlandse Klimaatakkoord het langetermijndoel vastgesteld om uiterlijk in 2050 klimaatneutraliteit te realiseren (Ministerie van Economische Zaken & Klimaatbeleid et al., 2019). Het blijkt echter moeilijker dan verwacht om het langetermijndoel van klimaatneutraliteit te realiseren. Gezien de vaststelling van dit langetermijndoel, is het essentieel om multi-stakeholder samenwerking tijdens de implementatie te bestuderen (Bulmer & Yáñez-Araque, 2023; Casady et al., 2024; Gray & Purdy, 2018), omdat conflicten tussen doelen en beleidsfragmentatie vaak optreden (De Winkel et al., 2025; Rosenbloom et al., 2016; Warbroek et al., 2023). Multi-stakeholder samenwerking kan een uitdaging zijn wanneer belanghebbenden verschillende doelen en vormen van betrokkenheid hebben. Bovendien verschillen belanghebbenden in de bereidheid om hulpbronnen te investeren in lokale en regionale partnerschappen (Eweje et al., 2021; Sanderink & Nasiritousi, 2020).

Onderzoeksdoel, -vraag en methoden

Deze studie heeft tot doel bij te dragen aan de energietransitie literatuur door wetenschappelijke inzichten te verkrijgen in hoe multi-stakeholder samenwerking het behalen van de langetermijn energietransitiedoelen ondersteunt, om daarmee de sociale, organisatorische en overheidsaspecten van het implementatieproces te bestuderen. De onderzoeksvraag luidt: '*Hoe draagt multi-stakeholder samenwerking bij aan de implementatie van de langetermijndoelstellingen van de energietransitie?*'

Om deze vraag te beantwoorden, behandelt hoofdstuk 2 de complexe interacties tussen belangrijke gebeurtenissen in de energietransitie, onenigheid over de interpretatiekaders en vertraging in de uitvoering. De literatuurstudie richt zich op het verzamelen en analyseren van verschillende mediabronnen, beleidsdocumenten en onderzoeksrapporten (Paul & Criado, 2020). Hoofdstuk 2 benadrukt de noodzaak tot verder onderzoek naar multi-stakeholder samenwerking in lokale en regionale contexten. Daarom worden drie studies gepresenteerd die gericht zijn op het begrijpen van hoe lokale en regionale vormen van multi-stakeholder samenwerking de uitvoering van de energietransitie beïnvloeden nadat overeenstemming is bereikt over de klimaatdoelen (hoofdstukken 3-5). Door gebruik te maken van kwalitatieve analyse (Beuving & De Vries, 2014) en de methode van gefundeerde theorie ('grounded theory') (Glaser & Strauss, 2017), illustreert hoofdstuk 3 hoe motivaties,

subdoelen en afstemmingsstrategieën de uitvoering van een lokale multi-stakeholder samenwerking beïnvloeden. In hoofdstuk 4 wordt een kwantitatieve enquête uitgevoerd over hoe motivationele, participatieve en netwerkfactoren het succes van een multi-stakeholder partnerschap (MSP) beïnvloeden in de energietransitie. Ten slotte hanteert hoofdstuk 5 de interventiemethodologie van 'serious gaming' om na te gaan welke regels als meest effectief en efficiënt worden ervaren om multi-stakeholder samenwerking te reguleren.

Resultaten

De resultaten bieden waardevolle inzichten in hoe lokale en regionale vormen van multi-stakeholder samenwerking bijdragen aan de implementatie van de langetermijndoelen voor de energietransitie. Hoofdstuk 2 laat zien hoe verschillende percepties van belangrijke gebeurtenissen de uitfasering van fossiele energie en de infasering van hernieuwbare energie beïnvloeden. Om beleidsinstrumenten effectief in te zetten, dienen belangrijke gebeurtenissen te worden gepercipieerd als kansen op (progressieve) verandering. Deze interpretatie bevordert kennisuitwisseling, de betrokkenheid van belanghebbenden en de gezamenlijke inzet van middelen. Na een periode van kennisuitwisseling kunnen financiële beleidsinstrumenten worden geïntroduceerd om strategische investeringen aan te moedigen, aangezien belanghebbenden beter geïnformeerd zullen zijn over de verdeling van de kosten en de baten. Bovendien bevordert dit proces een beter begrip van de geldende regels, waardoor belanghebbenden zich meer bewust worden van gewenste veranderingen in de regelgeving. Echter, ondanks het potentieel is het strategisch positioneren van belangrijke gebeurtenissen vaak onvoldoende om de implementatie vooruit te helpen, omdat regels vaak ook oppositie creëren. Multi-stakeholder samenwerking, gericht op kennisuitwisseling en samenwerking, kan bijdragen aan de implementatie van de langetermijndoelen voor de energietransitie.

Hoofdstuk 3 onderzoekt hoe verschillende dominante motivaties ('goal frames') de betrokkenheid bij de implementatie van een toekomstvisie voor een gebied beïnvloeden. Tijdens een pilotproject gericht op gasafkoppeling in de stedelijke woonomgeving komen verschillende doelen naar voren, waaronder wetgeving, participatie, duurzaamheid, betaalbaarheid, energie-efficiëntie, investering en opschaling. Om deze motivaties met elkaar in overeenstemming te brengen stelde de netbeheerder voor een modulair verwarmingssysteem te ontwikkelen dat verschillende individuele doelen en energieconcepten integreert in een collectieve oplossing. Dit ontwerp adresseert de normatieve en investeringsdoelen van de gemeente, de woningcorporatie en de bewonersvereniging. De belanghebbenden hechten veel belang aan het voldoen aan (energie-)wetgeving, participatie en duurzaamheid binnen een

normatieve motivatie. Echter, de deelnemers worden geconfronteerd met de realiteit van de dominante economische motivatie. Naarmate de implementatie vordert, krijgen economische motieven de overhand. Deze verschuiving verzwakt de betrokkenheid, aangezien de afweging van de kosten en risico's meer op de voorgrond treedt, terwijl de economische voordelen ongewis blijven. Bijeenkomsten voor kennisuitwisseling worden georganiseerd om doelen beter op elkaar af te stemmen. Daarbij is het behalen van kleine overwinningen in het uitvoeringsproces evident.

Hoofdstuk 4 bestudeert hoe motivaties, vormen van betrokkenheid en de inbedding in netwerken de realisatie van duurzaamheids- en transitieprocesdoelen in een multi-stakeholder partnerschap (MSP) beïnvloeden. De motivatie om kennis te delen, het mobiliseren van stakeholders, het leveren van hulpbronnen en betrokkenheid, spelen een significante rol in het behalen van duurzaamheids- en transitieprocesdoelen. Het mobiliseren van stakeholders versterkt de regionale samenwerking, aangezien betrokkenen tijd investeren in het implementatieproces. Het leveren van hulpbronnen vergemakkelijkt het behalen van de duurzaamheids- en transitieprocesdoelen door stakeholders aan te moedigen strategische investeringsmogelijkheden te doen, gedeeld eigenaarschap te organiseren en financiële middelen toe te wijzen c.q. aan te schrijven. Een regionale MSP, gekarakteriseerd door een permanente netwerkorganisatie en secretariaat, biedt de noodzakelijke institutionele structuur voor multi-stakeholder samenwerking. De interne netwerken van stakeholders bieden essentiële kennis, relationele investeringen en financiële middelen ter ondersteuning van de MSP, met een focus op het verwerven van 'sociale kennis'. Een grotere betrokkenheid vergroot de kans op het bereiken van duurzaamheids- en transitieprocesdoelen.

Hoofdstuk 5 onderzoekt hoe veranderingen in de spelregels een effectieve en efficiënte uitvoering van de regionale energietransitie ondersteunen. De focus van deze studie ligt op de Regionale Energie Strategie (RES), een beleidsprogramma dat door de nationale overheid is ingesteld om de energietransitie in dertig regio's in Nederland te ondersteunen. De toepassing van governance regels wordt gezien als meest effectief en efficiënt voor multi-stakeholder samenwerking, het integreren van hulpbronnen en het vergroten van de plancapaciteit. Deze governance regels stimuleren de gedecentraliseerde synchronisatie van energieproductie en -verbruik, het prioriteren van netwerkaansluitingen en verbinden van energievraag en aanbod. Door de investeringen in het elektriciteitsnet af te stemmen op de ruimtelijke ambities, worden effectieve samenwerking, economische en technologische efficiëntie, haalbaar. De geïntegreerde ruimtelijke energieplanning wordt eerder in het implementatieproces geïnitieerd. De governance regels erkennen ook de participatieve behoeften van de stakeholders.

Wetenschappelijke bijdragen

In reactie op de literatuur over territoriale toekomstvisies (Camarena et al., 2021; Vargas-Lama & Osorio-Vera, 2020), doelperspectieven (Etienne, 2011; Lindenberg & Steg, 2013) en processen van afstemming van de verschillende perspectieven (Benford & Snow, 2000; Skovgaard, 2017), is de eerste wetenschappelijke bijdrage het beschrijven hoe belanghebbenden doelen afstemmen in het implementatieproces. Als bijdrage aan de doelperspectief-theorie van Lindenberg & Steg (2013) lijken belanghebbenden de normatieve en economische perspectieven belangrijk te vinden. Het hedonistische doelperspectief is wellicht minder duidelijk aanwezig in de energietransitie (in termen van comfort). Publieke belanghebbenden lijken bovenal het (normatieve) publieke belang te verdedigen. De theorie over het afstemmen van perspectieven (Benford & Snow, 2000) helpt om verschillende overbruggingsstrategieën te identificeren. De theorie van 'frame alignment' is niet alleen van toepassing op sociale bewegingen (zoals Benford & Snow hebben onderzocht), maar ook op multi-stakeholder samenwerking. Overbruggingsstrategieën dragen bij aan het halen van 'kleine overwinningen' (Bryson, 1988; Termeer & Dewulf, 2019) die de energietransitie vooruit helpen.

In reactie op de literatuur over MSP (Momen, 2020; Nasiritousi & Sanderink, 2020; Gray & Purdy, 2018; Eweje et al., 2021) en de RES (Van Dijk et al., 2022; Van Dijk et al., 2025) is de tweede wetenschappelijke bijdrage dat verschillende vormen van multi-stakeholder samenwerking bijdragen aan het bereiken van langetermijndoelstellingen op het gebied van de energietransitie. Het MSP dat in de provincie Gelderland is opgericht, Gelders Energie Akkoord (GEA) (hoofdstuk 4), heeft aangetoond dat een gebiedsgeoriënteerde MSP toegevoegde waarde heeft. Dit type regionaal partnerschap mobiliseert de interne netwerken van belanghebbenden en faciliteert het delen van kennis en de uitwisseling van relationele en financiële middelen om de energietransitie te ondersteunen. Met dit empirische onderzoek hebben we de MSP literatuur bestudeerd in het licht van de literatuur over de planning van hernieuwbare energie (Gerritsen, 2024; Stoeglehner, 2020). Bovendien bevestigt ons onderzoek dat de MSP die we hebben bestudeerd, GEA, effectief is in het verbinden van interne en externe netwerken (Van Meerkerk & Edelenbos, 2018b; Ystrom et al., 2021) (hoofdstuk 4). De RES (Gerritsen, 2025; Hoppe, 2021) fungeert ook als een multi-stakeholder samenwerking die de belanghebbenden aanmoedigt om gezamenlijk verantwoordelijkheid te nemen voor regionale energie- en ruimtelijke planning (hoofdstuk 5).

In reactie op de literatuur over multi-stakeholder samenwerking (Heldeweg & Saintier, 2020; Lavrijssen & Carillo Parra, 2017; Maurya & Rathore, 2023) is de derde wetenschappelijke bijdrage hoe regels dergelijke samenwerkingen beïnvloeden door stakeholders te stimuleren duurzame energie en ruimtelijke ordening integraal

te plannen (hoofdstuk 5) (Koelman et al., 2024; Warbroek et al., 2023). Onze bevindingen wijzen erop dat nieuwe 'governance' regels bijzonder effectief kunnen zijn om de langetermijndoelen van de energietransitie te verwezenlijken. In de literatuur over samenwerking worden regels vaak gezien als belemmeringen voor individuele burgers (Lavrijssen & Carillo Parra, 2017). Onze empirische studie breidt dit onderzoek uit naar professionele belanghebbenden die moeten samenwerken. Regels bepalen de context waarin multi-stakeholder samenwerking vorm krijgt. Het veranderen van regels is tijdrovend en roept weerstand op, maar de nationale energietransitie (hoofdstuk 2) en het regionale simulatiespel (hoofdstuk 5) laten ook zien hoe regelwijzigingen de invoering van hernieuwbare energie kunnen versnellen.

Op basis van deze bevindingen hebben we drie aanbevelingen voor beleid. Ten eerste toont deze studie aan dat de netbeheerder een cruciale rol speelt bij het bereiken van langetermijndoelen voor de energietransitie, dankzij de sterke expertise op het gebied van het doen van investeringen in het energienet. Daarom is de eerste aanbeveling dat de netbeheerder multi-samenwerking ondersteunt door kennis, middelen en organisatorische capaciteit aan te bieden. De tweede aanbeveling is om meer 'sociale' kennis te verspreiden door belanghebbenden voor te lichten over hoe zij de energietransitie gezamenlijk kunnen organiseren en uitvoeren. De derde aanbeveling is om marktregels te vervangen door 'governance' regels om gedecentraliseerde energieproductie en -consumptie te bevorderen.

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About the author

Ivo Beenakker is an academic researcher at Radboud University in Nijmegen, the Netherlands, where he is affiliated with the Departments of Business Administration and Geography, Planning, and Environment. His research centers on multi-stakeholder collaborations in the energy transition, with a focus on the relationships between the stakeholders' goals, engagement practices, and regulatory contexts. Before starting his PhD research, Ivo earned degrees in Urban and Regional Planning (BSc) and Metropolitan Studies (MSc (Res)), University of Amsterdam (UvA). He also completed the Initial Teacher Training Program in Geography (MSc (Ed)) at the UvA. Furthermore, Ivo participated in study exchange programs at Humboldt University in Berlin from 2004 to 2005 and at New York University from 2006 to 2007. Ivo is eager to conduct research into multi-stakeholder collaborations together with students, academics and professionals involved in the energy transition. Currently, Ivo teaches human and physical geography in general secondary education and pre-university education in the Dutch school system.

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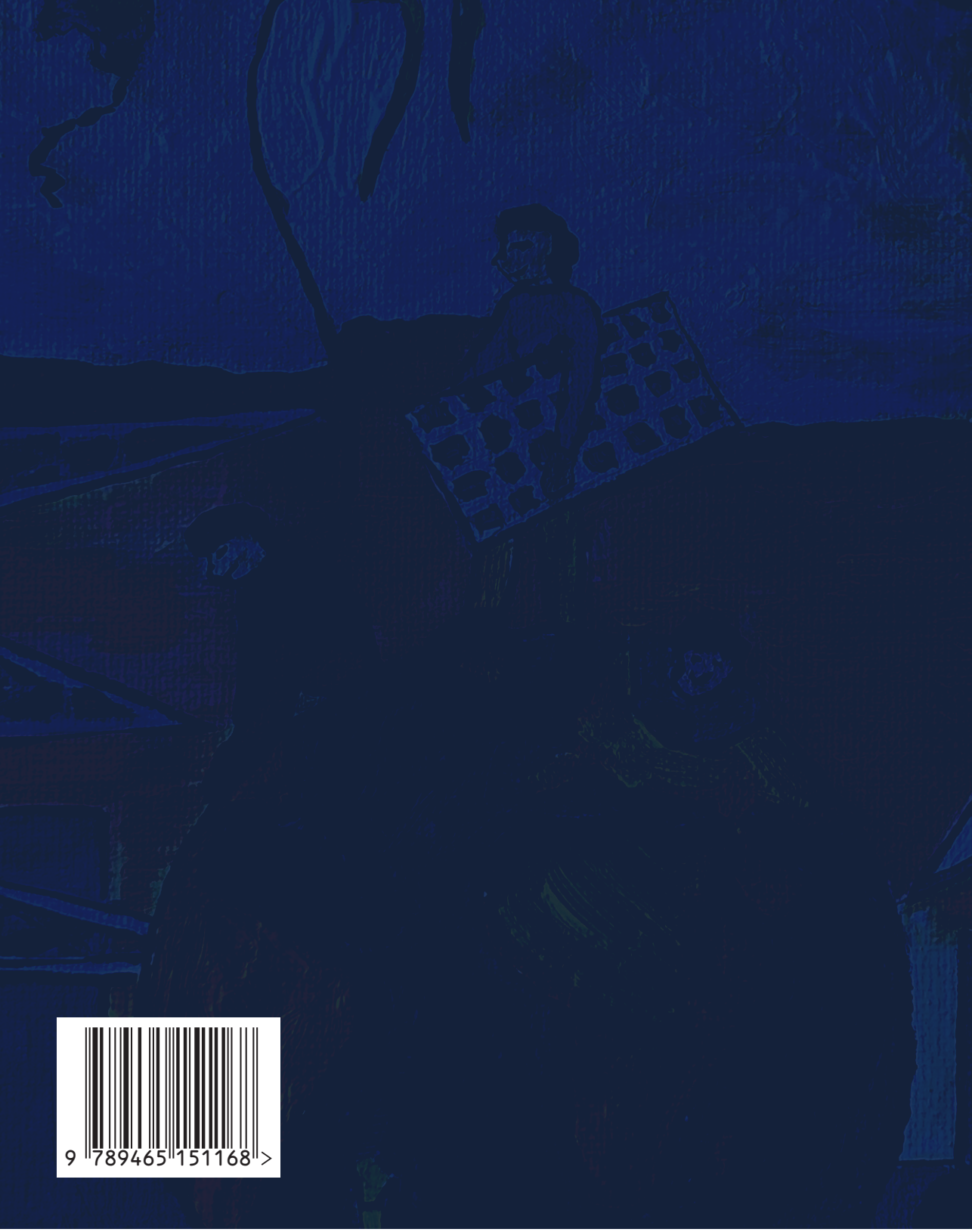

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