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COLLABORATING WITH DIFFERENT FUTURES IN MIND

A CASE STUDY CONCERNING THE DIFFERENT PREFERRED FUTURES AMONG THE ACTOR-TYPES INVOLVED IN THE LOCAL ENERGY TRANSITION

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Preface

This master thesis has been written to complete the Master Environment and Society Studies and has been part of my internship at Royal HaskoningDHV. I want to use this opportunity to thank the people that have helped me to write my thesis and to finish my degree. Even though I have been a bit longer engaged in my thesis than initially planned, I have been happily engaged in writing my thesis.

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Furthermore, I also wish to thank all the interviewees, with special thanks to Michiel van der Vight and the municipality official of Municipality X, without whose cooperation I would never have been able to conduct the study. I would like to point out the great learning opportunities that I have been provided with due to their honesty and interest in the research.

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Thank you for all your help and I hope you enjoy reading my thesis.

Britt Vonk
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Summary

In 2018, the Dutch government adopted a neighbourhood-based approach to deal with the local energy transition (built environment). With this new approach, the success of these local energy projects is vital. However, the projects struggle to establish long-term collaboration. To support this feature, experts recommendations are limited in formulating a shared vision to align actors in the long run. In practice, these shared visions are often ineffective because these are unable to align stakeholders. It turns out that actors interpret visions according to their own background, leading to actors collaborating while having different preferred futures in mind. Whereas this often works in the beginning, discrepancies are often revealed along the way, creating conflict and thereby risking the success of the project.

To avoid these conflicts and support local energy projects in creating long-term collaboration, this research works with the idea that aligning stakeholders requires recognising the different preferred futures. To do so, the first step was to investigate how these preferred futures differ among the various actor-types, leading to the following research question: *How do preferred futures differ among the various actor-types in the process of a local energy project in Municipality X with the aim to support long-term collaboration?*

The actor-types were categorised into state, market, non-profit and community actors. A more explorative framework has been developed to define the elements of a preferred future, leading to five elements: time horizon, sustainable outcome, social-, technological-, and economic- changes. To answer the main research question, this research focuses on an exemplifying case. By collecting qualitative data from both primary (interviews, documentation and observation) and secondary (literature and media) sources, the findings revealed the preferred futures for each actor-type. Interpreting the data relied on contextual information, among which two specific events that were highly suggestive of the differences in preferred futures. In order to present the findings, three approaches were used.

The first approach clarifies three terms used to describe a vision in energy projects: CO2-reduction, CO2-neutral and natural gas-free. These terms have different definitions, but different actor-types also have different associations with these terms. This means that if visions are communicated without detailed information, actors will interpret these terms intuitively.

The second approach describes the preferred futures for each actor-type. State actors have a preferred future characterised by their role as public agent. They want to make progress to reach their energy ambitions but are restricted due to the interest of citizens. The preferred future of market actors shows a technological focus in which they reason from market logic. The preferred future of

community actors is strongly formed by the practicalities the energy transition insinuates. The standpoint of housing corporations shows a strong overlap with the community actors. Simultaneously, their perspective also partially overlaps with the rest of the non-profit actors. Non-profit actors with a main focus on energy related activities have a preferred future consistent with their visionary standpoints.

The third approach compares the preferred futures of the various actor-types according to five elements, revealing the differences among them. The first element exposed differences in the preferred sustainable outcomes as motives only partially overlap. Secondly, by comparing the different time frames, it revealed how sector logic shapes their preferred pace of the transition. The third element revolved around the preferred technological composition of the future energy system. The findings explain the reasons for actors to rely on using existing or new technologies. The fourth element revealed how homeowners weigh the economic concern the most, while non-homeowners are confident about future solutions to overcome financial barriers. The last element explains how their position as an actor influences their perception regarding aesthetics and preference to act collectively. It also explains to what extent their preferred future depends on the activities of others. These findings revealed the influence of sector logic and the relation to the actor's activities.

The conclusion brings together the three different approaches to answer the research question. To explain the differences in preferred futures among the various actor-types, it elaborates to what extent preferred futures are influenced by sector logic. However, to better understand how preferred futures differ, it is important to take into account the activities of the various actors. Besides, for a more accurate understanding, homeowners, which are community actors and housing corporations, should be considered as a distinct actor group. The conclusion also provides a theoretical framework that helps to discover the section explains why the two events occurred in the case. Even as it explains how different actors try to collaborate while having different preferred futures in mind.

This thesis concludes with practical recommendations, suggestions for further research and a reflection on the research process. All local energy projects are recommended to consider different associations actors have with different terms. These terms should not be communicated simultaneously without further explanation to avoid miscommunications. Furthermore, special attention should be given to the initial premise of costs, definition of local and the motives to engage in natural gas-free. Follow-up research should focus on validating findings through empirical studies, take a critical look at the conceptualisation of preferred futures and study the effects of emphasising different standpoints in long-term collaboration.

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1. Introduction

Since June 2018, the energy transition is inevitably emerging in the Netherlands. The Dutch government agreed to combat climate change by accelerating and intensifying their efforts for a sustainable low carbon future in 2050 (Energieagenda, 2016; Rijksoverheid, 2018d).

Part of the energy transition is to move towards a low carbon-built environment in 2050, requiring a reduction of 3.4 billion-kilogram CO2-emmissions by 2030 (Klimaatakkoord, 2018b; Rijksoverheid, 2018e). For the sector concerning existing buildings, the transition entails renovating 7 million houses and an additional 1 million buildings. It requires reconditioning 50,000 buildings per year until 2021, while upscaling to about 200,000 per year before 2030. Estimated costs surpass 30,000 euro per house (Aedes, 2018b; Agenda stad, 2017; PBL, 2018; Rijksoverheid, 2018c). At the same time, the government strives to offset natural gas and has set its plans for '*aardgasvrije wijken'* (natural gas-free neighbourhoods) (Klimaatakkoord, 2018b: Rijksoverheid, 2018b, 2018c; VNG, 2018). Approximately 95 percent of residential areas are still dependent on natural gas supply (RVO, 2017). It requires reconditioning 30,000 to 50,000 houses to become natural gas-free before the end of the governing period (Klimaatakkoord, 2018a; PBL, 2018, 2018c). Considering these ambitions, it is evident that the sector-built environment will have to cope with some profound changes in the coming years.

To deal with the energy transition in the built environment, the Dutch government decided to adopt a neighbourhood-based approach (Rijksoverheid, 2018b, 2018c). It is a strategical approach to transform energy systems per neighbourhood. A strategy which embraces the pragmatic idea of focusing on a local level. Having such focus limits the decision-making process to the local context, reducing complexity while adhering to local needs and interests. With this new approach, local energy projects are given a central role to boost and accelerate the energy transition. The approach gives a key role to the success of those projects vital (Klimaatakkoord: wijkgerichte aanpak, 2018; PBL, 2018b; Platform31, 2018).

1.1 Research problem

Although the neighbourhood-based approach provides a structure to manage the transition, it does not help local energy projects in their process. It turns out that projects have difficulties in dealing with the social complexities of the energy transition (Agendastad, 2017; Geels et al., 2017; Kok, Vries, & Lugt, 2018; PBL, 2018; Platform 31, 2018).

The process of local energy projects: long-term collaboration

One of these problems is that projects struggle to establish long-term collaboration (Kok, Vries, & Lugt, 2018; PBL, 2018b). The struggle arises from two typical aspects of the energy transition. One is the multi-actor nature of the transition (Ascouh, Maier, Ravalico, & Strudley, 2008; Geels et al., 2017). This

means that multiple actors, having different backgrounds with varying ideas about the energy transition, need to collaborate. This diversity makes it difficult to align stakeholders (Smith, Stirling, & Berkhout, 205, p. 1508). The second is that transitions unfold over longer time periods which makes it difficult to create long-term commitment (Bai et al., 2016; Hoogma, Weber, & Elzen, 2005). This causes that *'transitions do not occur as smooth transformations but through a series of conflicts that change over time, the details involved in visions, aims and means that are crucial for the engagement of actors throughout the process*' (Jørgensen, 2012, p. 1009). Although it is unsurprisingly that these conflicts occur, it is problematic for a project's performance (idem).

Recommendations to improve the engagement of actors throughout the process and establish long-term collaboration are focused on developing shared visions (for example by Geels, 2010; Geels & Raven, 2006; Holtius & Malaska, 2004; Kok, Vries, & Lugt, 2018; Lamberigts & Schipper, 2015; Noppers, Keizer, Bolderdijk, & Steg, 2014). Formulating a vision would, at least in theory, create a common perspective about the desired outcome. In doing so, it helps to align stakeholders and can guide activities on the long run (Berkhout, 2006; Smith et al., 2005). A shared vision thus forms the basis for alignment and aids in dealing with long-term and multi-actor complexities (Pesch, 2015; Schot & Geels, 2008; Smith, Stirling, & Berkhout, 2017; Sondeijker, Geurts, Rotmans, & Tukker, 2006).

Although shared visions are suggested to be helpful, they are often ineffective in practice (IEA, 2014; Kok, Vries, & Lugt, 2018). Therefore, with the aim to improve long-term collaboration in local energy projects, this research studied the problem by means of an exemplifying case.

An exemplifying case: a local energy project in Municipality X

The exemplifying case is a local energy project in Municipality X. As recommended, the project started with a shared vision to offset natural gas before 2030 and CO2-neutral in 2040. But, in spite of this vision, the project had difficulties to create the necessary stakeholder engagement throughout the process. Even though the case seemed to progress promising in the beginning, eventually two events exposed the different interpretations of that 'shared' vision. It turned out that the vision was not that 'shared' after all. It created unwanted tensions in collaboration and eventually one of the project members withdrawn from the project, thereby risking the success of the project.

Questioning why these conflicts occurred, both the case and literature corroborate that the vision was too broad to align stakeholders (Schot & Geels, 2008; Wiek & Iwanic, 2014). As project members focused on aligning their activities, the shared vision was compromised. This led to a rather broad statement about the aim of the project (Trutnevyte & Stauffacher, 2012; Wiek & Iwaniec, 2016). The problem is that, if such vision is limited in explanation, it is interpreted differently by the various actors involved (Ascough, et al., 2008; Duijne & Bischop, 2018; Trutnevyte, Stauffacher, & Scholz,

2011). Consequentially, actors are collaborating with different preferred futures in mind. Whereas this strategy might work in the beginning, a change in situation will most likely reveal the differences at a later moment in time. The case has been an example of how a change in situation, which is likely with long-term local energy projects, exposed the conflicting views (Jørgensen, 2012). Moreover, it demonstrated that actors were unaware of the different interpretations of the vision. This means that the 'shared vision' was uncapable to align stakeholders as the vision was not truly 'shared'.

Research problem: recognising the different preferred futures among actor

Given this information, it brings the understanding that improving long-term collaboration starts with aligning stakeholders. The reason that shared visions are ineffective is due to the different interpretations of an unspecified vision. With a change in situation, these different interpretations are likely to be revealed, provoking a discussion which could have been avoided. This does not mean that it requires consensus or immediate agreement, but it does require mutual understanding (Van de Kerkhof, 2006; Wiek & Iwaniec, 2014). Therefore, a first step to align stakeholders is to recognise the different perspective among stakeholders. Since this research revolves around a 'shared vision', the focus should be with recognising the differences in preferred futures. Such information could avoid conflicts, even as it will help in findings ways to improve the alignment of stakeholders.

1.2. Research objective

With the aim to support local energy projects in creating long-term commitment, the first step is to recognise the differences in preferred futures among stakeholders. To do so, it requires an understanding of how these preferred futures might differ. As literature suggests that visions are interpret intuitively according to their background, this research studies how preferred futures differ among the various actor-types in a local energy project. These concepts (preferred future and actor-types) are combined into an exploratory research that focuses on an exemplifying case, which is a local energy project in Municipality X. Therefore, the research aim is as follows:

> *To gain insight into the different preferred futures among actor-types involved in the local energy transition, with the aim to inform local energy projects to help them to align stakeholders throughout the process, which is key to long-term collaboration.*

The main research question that follows from this aim is:

> *How do preferred futures differ among the various actor-types in the process of a local energy project in Municipality X with the aim to support long-term collaboration?*

To answer the main question, it requires answering the following sub-questions:

1. *Whom are the actor-types involved in the local energy transition?*

2. *What is the preferred future of each actor-type?*
3. *How do preferred futures differ among the various actor-types and how does that information enlarge our understanding of the events?*

1.3 Scientific relevance

Transition- and future studies equally stress the importance of long-term collaboration in dealing with sustainability issues (such as Jørgensen, 2012; Kemp, Schot, & Hoogma, 1998; Pesch, 2015; Smith, 2006; Wiek & Iwaniec, 2014). Both fields advocate that a shared vision helps in aligning stakeholders, thereby acknowledging the diversity among them.

Despite the importance given to the matter, there is a scientific gap in understanding those differences. The focus has been with developing shared visions to support long-term collaborations, such as establishing certain criteria (Schot & Geels, 2008; Wiek & Iwaniec, 2014). However, it is remarkable that no insights nor descriptions are given about how these preferred futures might differ. A first step in maturing this field is by gaining insight into the different standpoints and preferences (van de Kerkhof, 2006). Reviewing the literature reveals two critical concerns that limits current theoretical understanding about actors' preferred futures.

The first is the lack of understanding actors in transitions. Although transition actors have been thoroughly discussed from different angles, resulting in different concepts, these concepts are still limited in understanding these actors (Fischer & Newig, 2016). Scholars agree that the role of actors should be much more emphasised to get a more accurate understanding (for example Geels & Schot, 2007; Geels, 2011; Jørgensen, 2012; Markard, Raven, & Truffer, 2012; Smith, Stirling, & Berkhout, 2005; Wittmayer, Avelino, Steenbergen, & Loorbach, 2017). Pesch (2015) explains the deficiency as the role of agency being hidden in theory. Loorbach (2009) even argues that '*a focus on (social) learning about different actor perspectives […] is a necessary precondition for change*' (p. 168), which is exactly what this research aims for. Emphasising actors perspectives thus provides crucial insights for more in-depth understanding of actors in transition management.

The second scientific gap is with the understanding the differences in preferred futures. Theory development in transition studies is limited to the confirmation that a vision needs to be specific for it to function (Schot & Geels, 2008), with more recent development regarding quality assessment theory in future studies (van der Helm, 2009; Wiek & Iwaniec, 2014). However, transition- and future studies, nor literature on energy visions (Trutnevyte, 2014; Weber, 2003), give specific information on what a vision or preferred future refers to. Even though a general understanding exists about the role of visions in transition projects (Schot & Geels, 2008, p. 550), it remains limited to the assumption that

perspectives about the preferred future differ. This leads to the conclusion that literature lacks information about how preferred futures differ (van der Helm, 2009).

1.4 Societal relevance

The energy transition has received increasing attention over the years, pointing out the momentum for this research. Beginning with the multiple initiatives that arose with the aim to facilitate local energy projects in their process (such as Fakton, sd; RES, 2018; VNG, 2018). In 2018 alone, the Dutch government re-defined their ambition, or as called in this study a vision, surpassing their previous commitment. Since that moment, there has been an ongoing debate in both politics and media. With these new ambitions, municipalities are expected to define the municipal vision before 2021, pressuring initiation of local activities (Klimaatakkoord: wijkgerichte aanpak, 2018; PBL, 2016, 2018; Ros, 2015; RVO, 2017). To support these local energy projects, government invested 120 million euros in a learning-program starting in 2019, supporting '*natural gas-free neighbourhoods*' (Klimaatakkoord, 2018b; Ministry of Internal Affairs, 2018). Although the upcoming program exemplifies the current urge in society to improve the process of these projects (Gemeente van de toekomst, 2018; Kok, Vries, & Lugt, 2018), it does not provide any practical knowledge to help project in their process as it is initiating. Furthermore, media also illustrates the debate by posting articles regarding the diversity in standpoints (NOS, 2017, 2018, 2019). Altogether illustrates the momentum to find ways to manage the energy transition.

Focusing on the issue, previous initiatives confirm the struggle of creating long-term collaboration, even when formulating visions (Kok, Vries, & Lugt, 2018). These initiatives agree that the social complexities are the result of the diversity in stakeholders holding different interests, needs and abilities. Moreover, that same report argues that understanding eachothers preferred futures is fundamental for the project team *'to develop a strategy on how to start the energy transition on a microlevel'* (p. 36). Only with that knowledge a project can formulate a guiding vision, *'which is crucial for succes in the long-run'* (p. 15). Therefore, the report advices projects to outline the different interests of stakeholders, after which it can establish well-defined goals and align expectations (p. 25). Besides, the study even advocates the benefits of specifying a long-term ambitions (p. 29). Thus, the report clearly points out the societal relevance of this research through the lense of existing projects.

To answer the research question, the thesis is structured in a way that it creates a logical reasoning. The following chapter outlines the theoretical framework in which it operationalises the two main concepts, concluding with a conceptual framework. The third chapter is concerned with the methodology, explaining the research philosophy, design and ethics. To present the findings, it starts with chapter four, explaining how different terms used in energy-related projects are framed and

interpreted differently. The fifth chapter presents the findings by describing the preferred future for each actor-type. Chapter six analyses those findings by comparing the preferred futures of the actor-types according to the analytical framework. The last chapter concludes by drawing theoretical and practical conclusions.

2. Theoretical framework

This chapter outlines the theory relevant to understanding the main topic and concepts. To review the current understanding in literature, it begins with reviewing the academic field that directly speaks to transition management (transition studies in §2.1). This information enlarges the theoretical understanding of preferred futures and actor-types, after which it operationalises the latter (§2.2). Then, it moves to the literature that is connected to the concept of preferred futures (visions) (future studies in §2.3), followed by the operationalisation of the concept 'preferred future' (§2.4). The goal is to look across various research lenses to see how different studies identify the two main concepts. After providing an overview of the existing literature and operationalising the concepts, the conceptual framework is presented in the section (§2.5) that follows.

2.1 Transition studies: the (local) energy transition-built environment

The energy transition is one of the sustainability transitions studied in transition studies. It refers to a long-term structural change towards a sustainable or low-carbon energy system. In general, the rationale behind transition studies lies in dealing with sustainability issues. In the case of the energy transition, it means dealing with resource depletion and continuing greenhouse gas emissions inducing climate change (Grin, 2016). Considering the complexity of the transition and the profound changes it causes in multiple levels of society, it is not surprising that much attention has been given to understanding and managing transitions in literature (Loorbach, Frantzeskaki, & Avelino, 2017; Markard, Raven, & Truffer, 2012). Especially in the case of the energy transition, which is considered to be one of the biggest challenges in today's society (Armaroli & Balzani, 2007; Oteman, Wiering, Helderman, 2014).

In transition studies, the energy transition is referred to as a socio-technical transition. This means that the transition requires major changes in socio-technical regimes in which it needs more than a 'technological-push' alone (Geels, Sovacool, Schwanen, Sorrell, 2017). Typical for a socio-technical transition is that infrastructures and technologies play a central role, such as with the energy sector. However, energy is strongly embedded in societal practices (Hoogma, Weber, & Elzen, 2005). Hence technological changes occur in socio-economic context (Loorbach, Frantzeskaki, & Avelino, 2017, p. 609). In other words, changes are the result of an interplay of practices entailing social, economic and technological aspects (Geels, 2011; Geels & Schot, 2007; Grin, 2016).

When studying the energy transition, literature on socio-technical transitions shapes the theoretical framework by pointing out two strands of research. The first helps to understand the transition dynamics and the second elaborates on facilitating transitions on a local level (Chang, et al., 2017).

2.1.1. Transition dynamics

To understand the transition dynamics according to the social-technical approach, a prevalent framework is the multi-level perspective (MLP). It conceptualises the dynamics of socio-technical transitions. It focuses on how transitions occur and change the dominant regime in which practices are deeply rooted (Geels, 2011).

The MLP argues that the transitions come about through a combination of developments at three levels: landscape, regime, and niche. The regime level is of primary interest in this theory. As regime-level is the locus of established practices, a transition refers to the shift from one regime to another. This means that alternative practices become the new norm in the socio-technical regime. Existing structures at regime-level are replaced by these new ones. Such shift (transition) occurs when an interplay of developments takes place at landscape-, regime- and niche-level. The accumulations of these developments pressure the existing regime, inducing a transition (Geels, 2010, 2011; Grin, 2016). Landscape refers to exogenous factors, such as technological, environmental, economic aspects, that shape the external context in which regimes and niches function. Developments at landscape level can pressure the regime while creating opportunities for niches to breakthrough. Niches refers to 'protective spaces' in which innovations emerge. These innovations form the basis for alternative practices that deviate from the existing regime. In other words, niches are pilots or experiments. If these niches have proven to be successful, niche practices become the dominant practice at regime level and shapes the new structures of the regime (Geels, 2002, 2010).

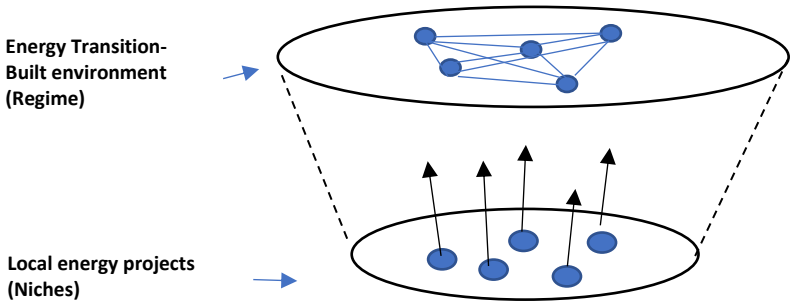


Figure 1: *Multi-level perspective: explaining the role of niches in the energy transition (adapted from Geels, 2002)*

The MLP helps to understand how the neighbourhood-based approach is a strategic means to 'steer the transition from the inside' (Loorbach, 2009). By means of this strategy, the government attempts to cope with the complexity of the energy transition by focusing on niche level. Local energy projects represent the niches in which they are bounded to the space of a neighbourhood for innovations to emerge. The accumulation of niches puts pressure on the dominant regime, contributing to stimulate the energy transition. This understanding explains why it is important that niches succeed (Geels, 2002,

2010; Schot & Geels, 2008: PBL, 2018). Thus, to support the success of niches, it also emphasises the importance to optimize the process of these local energy projects (Rotmans & Loorbach, 2009).

The elaboration of transition dynamics guides the focus of this research to niche-level. It provides an understanding of how niches influence transitions at regime level. Although literature shows multiple interpretations of what niches might refer to (Smith & Raven, 2012), niches are overall defined as 'protective spaces' for innovation to emerge. From this understanding, placing it in the context of this research, local energy projects are understood as niches. It is used as an analytical concept that guides the theoretical framework (Grin, 2016). As this research focuses on supporting local energy projects, it guides the theoretical framework to strategic niche management.

2.1.2. The role of visions

Strategic niche management (SNM) serves as an analytical framework to analyse the emergence of niches in the energy sector (Loorbach, Frantzeskaki, & Avelino, 2017). It is a theory that is concerned with facilitating the emergence of innovations in these niches. Linking it to the research question, this framework helps to get a theoretical understanding of the process taking place in local energy projects and the way in which visions contribute to long-term collaboration.

To create 'protectives spaces' (niches), SNM is focused on answering the question how and under what conditions innovations can successfully emerge (Schot & Geels, 2008). Because more than pressuring the existing regime, a niche can also protect novelties from adverse influences of the existing regime. In doing so, it supports structures which boost deviant practices (Grin, 2016; Hoogma, Weber, & Elzen, 2003). Hence it is important for niches to create optimal conditions for innovation. SNM answers the question by distinguishing three internal processes, offering niche actors managerial insights into the niche formation process. Stimulating these processes should then create the best conditions to optimize a niche's chances of success. In the early phases of SNM, the processes were described as follows (Kemp, Schot, & Hoogma, 1998):

(1) *The articulation of expectations and visions*. This process is essential for niche development as it provides direction to learning processes, attracts attention, and legitimates (continuing) protection and nurturing.

(2) *The building of social network*s. This process is vital to create constituency behind new technologies, facilitate interactions between stakeholders, and provide the resources (such as money, people, expertise).

(3) *Learning processes at multiple dimensions*. This process suggests gathering data in seven different domains. The domains differ from quantitative to qualitative data, such as technological

aspects, user preferences, cultural meaning, infrastructures, networks, policies, and societal and environmental effects.

The first internal process of articulating expectations and visions is related to the phenomena studied in this research. Although visioning is important at every level in society relevant to this research is that it is considered a first and fundamental step in niche building (Berkhout, 2006; Smith, 2006; Weber, 2003). It is an important '*driver for innovation and experimentation [as it] is the belief that actors have alternative futures [in mind] and fundamental values that they strive to realize'* (Loorbach, Frantzeskaki, & Avelino, 2017, p. 641). Therefore, the outcome of a niche depends on the extent to which activities become aligned, *'which relates to the degree in which actors' strategies, expectations, beliefs, practices, visions, and so on, run parallel'* (Pesch, 2015, p. 383). It requires, at least to a certain extent, consent to make changes. In other words, the success of a niche depends on the extent to which actors' (future) perspectives become aligned. Formulating a vision is then an important tool that helps in aligning stakeholders (see figure 2). An agreed upon long-term perspective can guide short-term niche activities and serves as alignment of collective action (Schot & Geels, 2008; Sondeijker, Geurts, Rotmans, & Tukker, 2006). This means it is useful in giving direction to the local energy project, but more important in aligning stakeholders by motivating and encouraging actors to pursue change (Loorbach, Frantzeskaki, Avelino, 2017; Pesch, 2015).

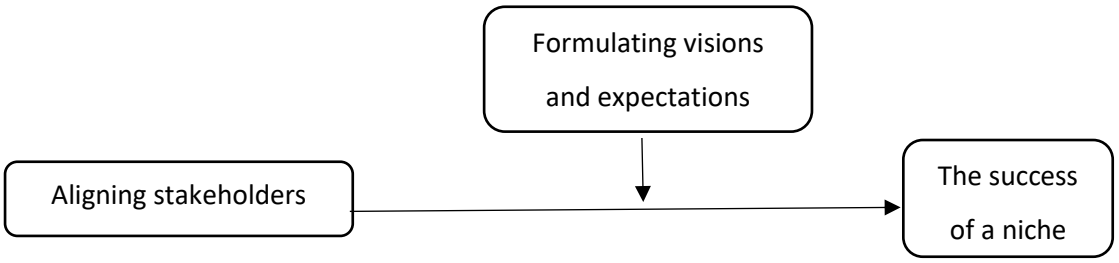


Figure 2: *The contribution of formulating visions in niche management*

Even though the positive contribution of formulating visions and expectations to the success of a niche (or at least in potential) was agreed upon in literature, little information is given about the actual process. In later academic work, a new hypothesis was formed regarding the functioning of visions. It was argued that *'expectations [or visions] would contribute to successful niche building if expectations were made: (a) more robust (shared by more actors), (b) more specific (if expectations are too general, they do not give guidance), and (c) have higher quality (the content of expectations is substantiated by ongoing projects)*' (Schot & Geels, 2008, p. 541). This hypothesis was proven to be true through multiple empirical studies. Further developments by SNM scholars (as cited in Schot & Geels, 2008, p. 541) suggest that visioning should be a structured and repeated process and emphasise the importance to start the process even before initiation of the project. Other discussions questioned

whether visions should be flexible or persistent (p. 549). Although extensive information was given over the years, in practice, visioning still showed little follow-up activities. And until today, the role of visions in niche formation processes, but also in transition studies in general, is an unfinished field of research (p. 550).

In sum, transition studies somewhat explains how visions contribute to the success of a niche or to sustainability transitions more broadly. However, more in-depth information about defining a (energy) vision or preferred future is clearly lacking. It does point out the different actors involved, bringing up the next question about whom the niche-level actors are.

2.1.3. The role of actors

In order to gain insight into the differences in preferred futures among these different actors requires a theoretical understanding of whom niche-level actors are. This section aims to conceptualise whom these (niche-level) actors are as discussed in transition studies.

To start with a more general understanding of (niche) actors in transitions is through the lens of agency and structure. This concept originates from the theory of structuration (Giddens, 1984). This theory explains how actors are embedded in transitions. For example, in MLP agents (actors) create and reproduce the existing structures in the socio-technical regime. The concept of agency then refers to the agents' ability to make changes that deviate from the existing structures. In the case of SNM, it advocates the active role of niche actors and their important role in making changes. They are the starting point for systemic change as they bring in new innovative ideas. Although influenced by the existing structures, the actors are the driving force behind the alternative practices, allowing innovation to emerge (Fischer & Newig, 20016; Markard, Raven, & Truffer, 2016).

The notion of agency helps to understand the role of niche-level actors but provides little information about whom these might be. Focussing on niche actors, literature describes that these actors can be individuals or groups with local practices. Whom these individuals or groups are differs per regime (Fischer & Newig, 2016). Another description regarding whom those actors might be at a project level is limited to 'local actors' (Hoogma, Weber, & Elzen, 2005, p. 233). The reason that the information is limited is that actors involved at niche-level are not restricted to activities at a certain level. Actors are joined on niche, regime, or landscape level and can even operate in multiple levels. This means that actors and their actions are only connected to a certain level for specific reasons but can operate in various levels simultaneously (Fischer & Newig, 2016; Geels, 2002). This means that, with the aim to conceptualise whom these actors are, this section proceeds by examining more general concepts of actors in transition studies.

Transition actors have been thoroughly discussed from different angles, resulting in different concepts. The reason is that scholars stress the complexity that derives from the multi-actor nature of sustainability transitions (Avelino & Wittmayer, 2016; Brauch & Spring, 2016; Loorbach, Frantzeskaki, & Avelino, 2017). A wide range of actors are involved in transitions, holding different backgrounds, roles and knowledge (e.g., market, science, government, civil society (Ascough et al., 2008; Bai et al., 2016; Geels et al., 2017). No wonder that different conceptual understandings (systemic, institutional, governance, and intermediaries) exist in transition studies (Fischer & Newig, 2016). More importantly, this also means that the actors involved at niche-level are different types of actors.

2.2 Operationalisation of actor-types

To find the appropriate framework to operationalise the actor-types, this study draws on the categorisations addressed in transition studies. When raising the question whom the actors are, a prevalent institutional framework to conceptualize the actor-types is through state, market and civil society (Avelino & Wittmayer, 2016; Fischer & Newig, 2016). Clustering the actors creates a certain conceptual understanding of these actors based on their background. Although this framework comes closer to understanding whom the actors might be, it is limited in understanding the niche-level actors in the case of the energy transition for two reasons.

The first reason is that civil society is increasingly participating in the energy transition. Civil society refers to those actors that do not belong to the market nor to government. Categorising according to this understanding underestimates the variety of actors belonging to that category. For example, there is increasing participation of grass-root initiatives, households, local non-profit organisations and energy cooperatives in energy-related activities (Avelino & Wittmayer, 2016; Seyfang & Haxeltine, 2012). Adopting the term civil society to refer to all these stakeholders would be problematic for understanding.

The second limitation arises in terms of understanding activities, roles and interests. The conventional framework of state, market and civil society does not do justice to the actual practices of actors. The multi-actor nature of the niche does not restrict their activities at a local scale. As argued earlier, actors are often active at multiple levels while being engaged in different types of activities. Allocating actors to a fixed category flattens their activities and motives, possibly causing vagueness and herewith decreasing the ability to get an accurate understanding of the actors (Avelino & Wittmayer, 2016). Thus, more interpretive flexibility is required that recognises the social construct and different gradations in which activities take place (Pesch, 2015).

Another framework to conceptualise the actor-types is the multi-actor perspective (MaP) developed by Avelino and Wittmayer (2016) (see figure 3). It draws on the same institutional typology and has proven to be more apt to conceptualise actors in the energy sector (p. 630). It is a heuristic framework developed '*to explore (1) how individuals, groups and organizations act and relate within different sector logics, (2) which sector logics tend to be 'dominant' in the actions and discourses of specific organizations, groups and individuals' (*Avelino & Wittmayer, 2016, p. 637). Employing this framework allows the research to look into the different backgrounds of the actors relevant to the energy sector.

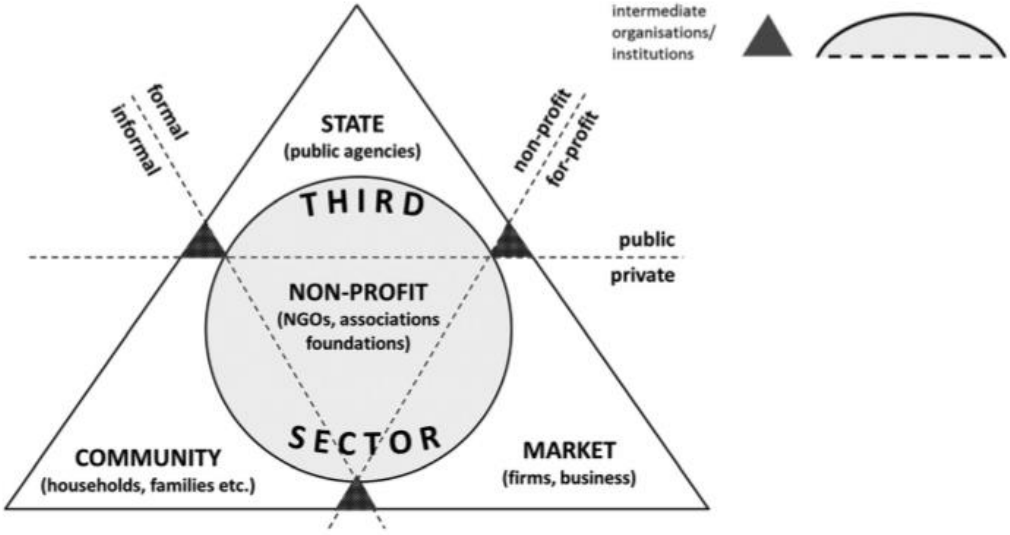


Figure 3: *Multi-Actor Perspective: sector level (Avelino & Wittmayer, 2016, p. 636)*

Comparing the MaP to the categorisation mentioned earlier (state, market, civil society), it specifies these three categories in respond to the above-mentioned criticism. The conceptual framework offers four features central to this research. The first is the distinction of civil society into non-profit actors and community actors, allowing the research to differentiate the formal and informal interest of actors. Linked to the latter, the second benefit is the interpretive flexibility based on their positioning in the project by means of three axes: (1) formal – informal, (2) for profit – non-profit, and (3) public-private. Furthermore, increasing flexibility occurs, partly due to these axes, but also by integrating the concept of intermediaries (Evers & Laville, 2004). This is argued to be important within transition management as intermediaries play a crucial role in multi-actor transition processes (Loorbach, 2007). Intermediaries provide and distribute knowledge between actors from different levels and priorities and mediate between production and consumption by means of a wide range of services (Fischer & Newig, 2016) Incorporating the concept would then allow a more accurate understanding of practices, thereby evading fixed categorisation. The last feature, cohering to the theoretical understanding, is the way in which it recognises the different levels of actors; individual or organisational (Avelino &

Wittmayer, 2016; Bergman et al., 2008; Fischer & Newig, 2016). For these reasons, the MaP allows a more accurate understanding of the actors in the energy transition.

To specify the niche actors active in local energy projects-built environment, MaP provides more elaborate information about whom the actors are. As posed in the literature on niche-level actors, the MaP elaborates on the distinction between individuals and organisations (Avelino & Wittmayer, 2016, p. 636-638). Drawing on this information helps to define whom the actors are in the case of the energy sector. The figure below outlines whom those actors might be, followed by a description explaining their positioning and role.

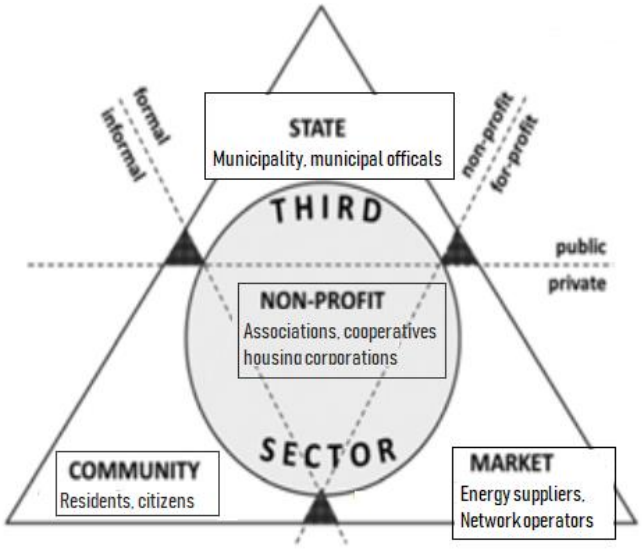


Figure 4: *Actors involved in the energy transition-built environment (adopted from Avelino & Wittmayer, 2016)*

2.2.1 State actors

The MaP describes state actors as public agencies that operate in governmental organisations. They are a formal and public non-profit actor, placing them on top of the pyramid. Translating the concept to the niche actors involved in the local energy transition, it refers to municipalities on an organisational level, and municipal officials on an individual level (Avelino & Wittmayer, 2016).

State actors can play an important role in supporting niches through policy, financial aids or take a more active role as niche manager. Even though policy can play an important role, their role as policy makers became increasingly complex in dealing with sustainability issues like the energy transition. The reason is that these issues entail many uncertainties and lacks clear solutions. State actors are also in the position to support niches in a more traditional way, which is by providing financial resources. However, over time, state actors became increasingly more active as niche managers. With this new and much more active role, municipalities are expected to create niche projects in which

'experimentation' can take place. The neighbourhood-based approach is an example thereof as it relies on the municipal response to initiate, facilitate and support local energy projects (Farla, Markard, Raven, & Coenen, 2012; Fischer & Newig, 2016; Wittmayer, Avelino, Steenbergen, & Loorbach, 2017).

2.2.2 Market actors

Actors in the market sector are formal, private businesses that operate for-profit. These actors operate according to supply and demand, requiring a strategic market position in which they strive to have a competitive advantage (Holstius & Malaska, 2004; Loorbach & Wijsman, 2013). In the case of the local energy transition, prevailing market actors are energy companies and network providers on an organisational level (Hielscher, 2011; Royal HaskoningDHV, 2018).

Market actors are considered key to innovation and thus to niche innovation. This is because market actors bring competitive products and services to the market (Fischer & Newig, 2016). However, companies are at the same time influenced by dominant market structures, patterns of consumer demand, existing infrastructures or policies (Smith, Stirling, & Berkhout, 2005). In this way, these structures can create opportunities or limit current practices (Loorbach & Wijsman, 2013). The way in which market actors make use of innovation strongly depends on the type of company. A company can be visionary or proactive depending on its strategy and interpretation of certain situations, which tells about the way the company works with innovation (Avelino & Wittmayer, 2016; Beckert, 2013; Holtius & Malaska, 2004; Loorbach & Wijsman, 2013).

2.2.3 Non-profit actors

Non-profit actors are formal of legal status and hold an intermediate position placing them between community, state or market. Similar to their activities, non-profit actors strongly differ in organisational forms, resources, and contextual situations (Avelino & Wittmayer, 2016). The actors are distinctive when questioning whether a non-profit organisation is a grass-root initiative or not. If so, the organisation is likely to be driven by social or environmental needs in the case of the energy transition. Examples of these organisation vary from cooperatives to voluntary organisations or communities. Especially energy cooperatives are an upcoming organisational form in the energy sector (Hargreaves, Hielscher, Seyfang, & Smith, 2013). But this sector also takes in non-profit organisations without energy activities as their main concern, nor do they have to be grass-root initiatives. This means local associations (communities) involving citizens living in the area of concern or housing associations also belong to this group (Avelino & Wittmayer, 2016; PBL, 2018b; Seyfang, et al., 2014).

In both cases, non-profit actors have become increasingly important in terms of providing knowledge, coordinating action and creating structures (Geels & Deuten, 2006; Hargreaves, Hielscher, Seyfang, & Smith, 2013). For example, energy cooperatives aim to provide reliable and sustainable

energy for their members without having the goal to make profit, placing them in between profit and non-profit. In doing so, it combines market-logic with community interest by providing alternative energy supply. As these non-profit organisations are not economically driven but are instead driven by a strong motivational drive to change, the actors are given a crucial role in facilitating the energy transition (Seyfang, et al., 2014). Nonetheless, non-profit actors that do not have energy activities as their main concern are considered equally important. Niches need their involvement as changes directly affect their practices. These actors need to cooperate for changes to occur (Avelino & Wittmayer, 2016; PBL, 2018b; Seyfang, et al., 2014).

2.2.4 Community actors

The community sector refers to the actors which are an informal entity with non-profit intentions, acting upon private interest. When looking at the organisational level, the community is referred to as households and families, at an individual level a citizen or resident. The actors are linked to the project for practical reason, such as their property being located in the area of concern. This means that community actors informally participate, placing them in the left bottom of the triangle (Avelino & Wittmayer, 2016).

For that same reason, a community actor has no formal interest in participating but is a stakeholder as measures affect their ways of living (Höjer, Gullberg, & Pettersson, 2011; PBL, 2018b). Whereas state, market or non-profit actors' capability is limited to setting regulations or incentives for the community to adopt the technologies. Homeowners are in charge of taking the actual measures, making their participation in the project crucial. The same goes for tenants. Although these are indirectly involved in decision-making, measures directly affect their housing, making them an inevitable stakeholder. Even when technology offers the most promising solutions, it is the community that needs to accept the changes, giving them a crucial position in a niche. Besides, their involvement makes it possible to combine technological with behavioural changes. Combining the two allows innovations to emerge, as technological innovation requires a combination of social and economic changes (Höjer, Gullberg, & Pettersson, 2011; Hoogma, Weber, & Elzen, 2005; Loorbach, 2009). Literature recommends strategies to incorporate community actors into the process in order to create public acceptability (Steg, Perlaviciute, & van der Werff, 2015). It creates legitimacy since people feel they are empowered to exert influence on the decisions, making them more willing to accept the outcome (Larsena, Gunnarsson-Östling, & Westholm, 2011).

In sum, transition studies provided insight into the transition dynamics of the energy transition. These insights helped to get a theoretical understanding of how successful local energy projects can boost a transition. Followed by an explanation on how visions can contribute in aligning stakeholders on the

long run. Furthermore, theory has given a theoretical understanding of whom the actors are. Thereby, it gives a framework (MaP) for this research to build on in defining the actors.

2.3 Future studies: preferred futures

Although transition studies come a long way, it does not answer the question of what a vision entails. The concept of visions is studied in future studies, the academic field that is concerned with researching possible, probable and preferred futures. This section continues with examining this field to conceptualise (energy) visions, referring to the preferred future of the future energy system.

Starting with the definition, the concept of vision refers to implicit or explicit statements that describes a preferred future (van der Helm, 2009; Wiek & Iwaniec, 2014). Translating that definition to energy visions, it refers to a preferred future state of energy systems (Trutnevyte, 2014). It is a normative future that influences behaviour, whether conscious or unconsciously. To avoid misunderstandings, visions differ from expectations which is rather a presumption of a certain event or outcome. People then try to anticipate or work towards these expectations (Borup, Brown, Konrad, & Lente, 2006). The concept also differs from possible or probable futures, which are concerned with estimating or calculating futures. Nor should it be confused with methods such as foresight or backcasting (Asselt, et al., 2010; Buijne & Bischop, 2018; Dreborg, 1996; van der Helm, 2009). Thus, the concept of visions refers to (implicit or explicit) statements describing ideal, preferred or normative futures, and not to explorative or predictive futures.

When defining a vision, it reflects the way in which it refers to two different kind of visions: shared or individual. An individual vision is often composed of much more implicit statements, whereas a shared vision should be made explicit in order to guide activities (van der Helm, 2009). Relevant to this research is to distinct shared and individual visions to avoid conceptual misunderstanding and help to clarify the focus of this research.

2.3.1. Shared vision

A shared vision is equal to the concept of guiding visions in transition studies. Likewise, scholars emphasize that visioning is highly important in sustainability issues like the energy transition (Van der Helm, 2009; Weddfelt, Vacari, & Tudor, 2016; Holstius & Malaska, 2004; Trutnevyte, Stauffacher, & Scholz, 2011). Visions can positively contribute to long-term planning in transitions as it is a systematic way of thinking about the future in terms of both drivers and consequences of societal actions (Asselt, et al. 2010; Bai et al., 2016; Hoogma, Weber, & Elzen, 2005). It is a means to guide activities on the long run to reach the desired outcome.

More in-depth, Trutnevyte (2014) outlines five functions of a shared (energy) vision. The information shows a direct link to transition studies as it draws on the findings from Berkhout (2006) and Smith et al. (2005). Based on these scholars, Trutnevyte (2014) argues that the following functions of an energy vision helps actors of energy-related projects in their process to define a strategy (p. 213):

- Visions show the possibilities, shaping creative and innovative ideas for fundamental changes;
- defines problems in which it reflects values, concerns, fears and experiences of people;
- forms the basis for target setting and monitoring as it creates a common reference point;
- helps to mobilize actors by empowering stakeholders, create ownership and develop accountability (Wiek & Iwaniec, 2014);
- and to mobilize resources.

Vision can potentially enhance long-term management, including long-term collaboration. Though, as argued in transition studies, scholars equally stress that a vision needs to be of a certain quality level for these functions to work (Trutnevyte, 2014; Wiek & Iwaniec, 2014). The reason why is because visions often do not work because actors compromise visions and instead focus on aligning activities (IEA, 2014; Kok, Vries & Lugt, 2018; Trutnevyte & Stauffacher, 2012; Wiek & Iwaniec, 2016). In doing so, it allows actors to interpret vision intuitively, making such vision not truly 'shared' and incapable to align actors on the long run (Ascough, et al., 2008; Duijne & Bischop, 2018; Trutnevyte, Stauffacher, & Scholz, 2011). Although long-term collaboration does not require stakeholders to reach unanimous consensus or immediate agreement, it does require understanding between stakeholders (Van de Kerkhof, 2006; Wiek & Iwaniec, 2014). In contrast to transition management, future studies does provide more elaborate information on the quality of a vision.

Starting with Trutnevyte (2014), whom studied energy visions in terms of functioning. He raised the question whether some visions are better than others. By means of multiple studies, the aim was to find a method to develop well-functioning visions (Trutnevyte & Stauffacher, 2012; Trutnevyte, Stauffacher, & Scholz, 2011, 2012). However, the approach remained merely quantitative, focusing on the plausibility of the future. Therefore, the findings have been unable to conceptualise energy visions in a way relevant to study the different preferred futures.

Another and more applicable theory has been developed by Wiek and Iwaniec (2014). The theory outlines criteria for sustainability visions to function. A vision should be visionary, sustainable, systemic, coherent, plausible, tangible, relevant, nuanced, motivational and shared (p. 500). Reviewing

the criteria provides relevant insights into the characteristics of a well-developed shared vision, which are:

- It needs to matter to the people by outlining the context by addressing activities, roles and motives;
- A vision is composed of various elements to reflect the nuances in value-laden perspectives;
- And visions are to be shared among the actors.

From this understanding, it gives three insights vital for understanding visions. The first is that a vision is context-specific, suggesting that it requires a certain degree of specification to meet this criterion. Second, specification should be done by addressing the various elements. The third insight is indicative of the different (future) perspectives among actors (van de Kerkhof, 2006). Based on this information, a vision is a common perspective about the preferred future. This perspective describes a 'reality' which is a convincing story for actors to base their decisions on and to align stakeholders throughout the process.

But the more literature is examined, the more evident the role of individual visions becomes in developing shared visions. A shared vision is a common perspective shaped by multiple individual perspectives. The reason is that the complexity of the issue creates a playing field for interaction among actors. Actors discuss and debate their own perspective, according to their believes. Because Sustainability issues are too complex and unpredictable, leading to different (future) perspectives among actors of which none is a guarantee for success (Ascough, Maier, Ravalico, & Strudley, 2008). This concept of interaction in decision-making is referred to as the arena-perspective (Asselt, Faas, Molen, & Veenman, 2010). Therefore, agreeing on a common perspective describing the preferred future, strongly relates to the interaction among actors in which personal perspectives are brought into the discussion.

The notion of this process points out once again the differences in individual visions. Although the above-information enlarges our understanding and is suggestive of how a vision is constructed (*elements, context-specific, interaction*). It still does not inform this research about the factors that form a preferred future of an actor, which is essential to be able to study the different perspectives. Therefore, the following sections particularises individual visions.

2.3.2. Individual vision

Unlike shared visions, individual visions are often constructed of much more implicit than explicit views (van der Helm, 2009). The reason is that it is based on how people would like to see the future. It is by no means a guarantee for change but instead it is a socially constructed perspective, entailing many

uncertainties (Duijne & Bischop, 2018). This section seeks to discover what factors are at play in shaping this socially constructed perspective. This information forms the basis for the operationalisation of the term preferred future in section 2.3..

A vision is based on a subjective view of a person about society. It represents personal views constructed by norms, values and other contextual factors (Höjer, Gullberg, & Pettersson, 2011). These factors reflect upon personal skills, needs, fears, and dreams (Wiek & Iwaniec, 2014). In other words, backgrounds and experiences are entrenched within these views, even as nuances in the value-laden perspectives due to priority setting, risk perception or worldviews (van der Helm, 2009; Bai et al., 2016). The combination of these factors creates a logical story in which it describes the preferred future of a person. This preferred future which, despite the uncertainties of what the future might bring, is convincing and ambitious enough to inspire that person (Beckert, 2013; Duijne & Bischop, 2018). In this way, it holds the desire to make changes (van der Helm, 2009, p. 99). Given this information, it brings the understanding that a vision is a social construct shaped by a subjective view, making it different for each person.

Inherent to that subjective view is the influence of framing. Framing is the concept in which an individual's perception about 'reality' is shaped through claims about a certain phenomenon, such as technology or sustainability issue. These claims form a storyline to be used by individuals, (political) organisations or the media in discussions. Framing their standpoint in a way it might convince others (Lyytimäki et al., 2018; Djerf-Pierre, Cokley, & Kuchel, 2016). In doing so, it works as a discursive strategy to influence people's perspective. Whereas it can build legitimacy for socio-technical innovations and their niches, it can also be counterproductive (Rosenbloom, Berton, & Meadowcroft, 2016). Therefore, frames related to the energy transition, related activities or innovations, whether positive or negative, influences individual perspectives (Bai et al., 2016). This means it equally has an effect on their preferred future as it influences the subjective view.

In sum, reviewing the concept of visions in future studies has given extensive insight in the characteristics of a vision. Drawing on the information from a shared vision, a vision is composed of multiple context-specific elements. Reviewing individual visions explains how a preferred future is shaped by a subjective view. However, it fails to conceptualise a preferred future in a way apt to study the differences. The following section builds upon the above information to operationalise this concept and presents the conceptual framework applied in this research.

2.4 Operationalisation of a preferred future

The previous sections examined the literature to understand and defined the two main concepts: actor-types and preferred futures. The MaP framework of Avelino and Wittmayer (2016) helps to

define the actor-types (state, market, non-profit and community). This leads to the conceptual framework displayed below.

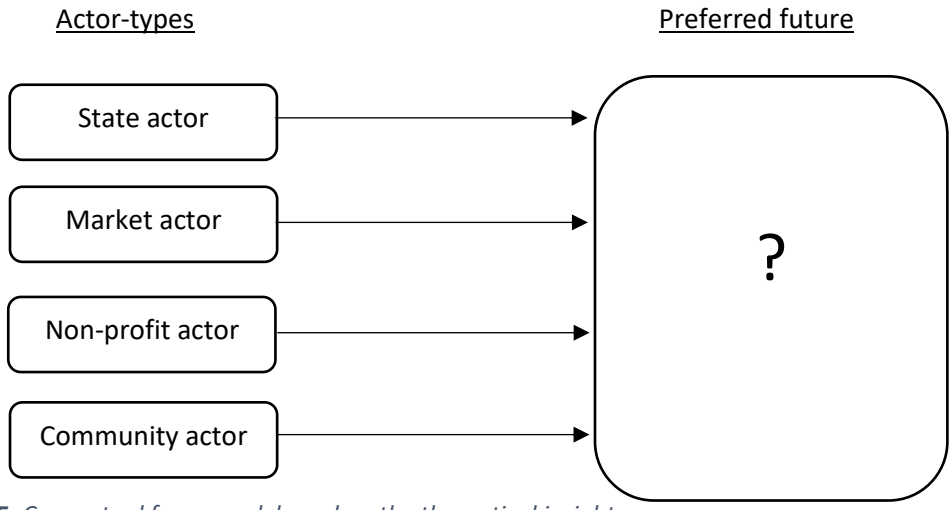


Figure 5: *Conceptual framework based on the theoretical insights*

As signposted in the figure, literature has not been able to provide a concrete framework that can be directly applied in studying preferred futures. Nevertheless, literature has been indicative of defining the term. Drawing on that information, a preferred future of a stakeholder is an individual vision composed of various context-specific elements. These elements form together a logical story in which it describes their preferred future of the energy system. It is an ideal future, which means it is no guarantee for these changes to happen. This understanding is the starting point to conceptualise a preferred future.

This section is concerned with developing a framework apt to analyse a preferred future. In developing that framework, the research builds upon the understanding derived from literature. A preferred future is composed of context-specific elements (energy transition) which, according to the actor, would be the ideal outcome of societal changes. Following that line of though, it makes sense to question what are the elements that describes those changes needed to create that preferred future. Thus, the main concern in this section is to define those elements relevant for an energy vision.

Reviewing the literature points out four elements relevant for an energy vision: sustainable outcome, technological-, social- and economic- changes. Starting with the literature on transitions, the energy transition is a sustainability transition, indicating the aim for a sustainable outcome (Geels, 2010; Grin, 2016). Meaning a preferred future describes the preferred future of a sustainable energy system (see also Trutnevyte, 2014). From this understanding, it brings up the first element questioning how an actor envisions the outcome. Then, to work towards that outcome, it requires (niche) innovation. Taking a socio-technical approach, innovation emerges through a combination of social, technological and economic changes (for example in Grin, 2016, p. 107; Kemp, Schot, & Hoogma,1998;

Markard, Raven, & Truffer, 2012; Rotmans & Loorbach, 2009; Smith, Stirling, & Berkhout, 2005). Similar drivers of change were identified in future studies (Duijne & Bischop, 2018, p. 28; Höjer, Gullberg, & Pettersson, 2011) and literature on frames in the energy transition (Djerf-Pierre, Cokley, & Kuchel, 2016). Literature on environmental decision-making also advocates integrating social, economic and technological aspects (Ascough, Maier, Ravalico, & Strudley, 2008; Swart, Raskin, & Robinson, 2004). Comparable categories were identified for developing energy related visions, which are again economic, social and environmental factors, while simultaneously arguing the important role of technology (Trutnevyte, 2014; Trutnevyte, Stauffacher, & Scholz, 2011). Given this knowledge, these four elements were selected as these were the dominant factors in various academic fields.

An additional element is time horizon. The reason is that a vision is inherently concerned with describing a moment (often long-term) in time (Grin, Rotmans, & Schot, 2010; Markard, Raven, & Truffer, 2012; van der Helm, 2009; Wiek & Iwaniec, 2014). In fact, the most important function is the way in which it can build a bridge towards the future (IEA, 2014). This function is described as a 'magnet' in which an idealised future influences activity by a pull-force towards that envisioned future (Van der Helm, 2009). That future holds a certain time horizon, but literature shows different time horizons in which endpoints and the preferred speed of change can differ among actors (Duijne & Bischop, 2018; Lyytimäki et al., 2018). The latter is suggestive of the different time horizons given to a preffered future, emphasizing its relevance for this study.

Note that literature also mentions other factors, such as cultural, political, law and institutional at times (Djerf-Pierre, et al., 2016; Duijne & Bischop, 2018; Markard, Raven, & Truffer, 2012; Schot & Geels, 2008). However, incorporating these would require a study of larger scale in which it reflects on multi-level perspective. Besides, as this study is the first step towards defining the elements and focuses on niche-level, adding the alternative elements would for now unnecessarily complicate the understanding. If alternative factors emerge in the findings, these can be allocated within the selected categories. Thus, for convenience reasons, this research embraces only five elements to reconstruct an actor's preferred future.

Based on that information, the research works with the following definition of an energy vision: *An energy vision describes the preferred future, which is the (sustainable) outcome at a certain moment in time in which it reflects the envisioned technological-, social- and economic- changes.* To operationalise the concept, this research adopts a framework consisting of five elements:

- Time horizon
- Sustainable outcome
- Technological change

- Social change
- Economic change

The following sections provides more detailed information regarding the elements. It underpins the choice of the elements, describes how the elements are understood in this research and provides operational indicators. Appendix 1 provides additional information, presenting the preferred future of the 5 elements sketched by the Dutch government regarding the energy transition. It functions as exemplifying and confirmative information to underpin the selected elements.

2.4.1 Time horizon

A preferred future describes a situation at a certain moment in time. 'S*omething that exists or occurs at a later time, which includes both near-time and long-term aspects*' (Bai et al., 2016, p. 354). It suggests that preferred futures equally hold long- and short-term time frames (van der helm, 2009). Questioning long-term and short-term time frames should then be indicative of the time frame given to the preferred future and at what pace the transition should unfold (as suggested in Slingerland, Terlouw, & Lohuis, 2016).

Long-term
An energy vision describes a preferred future which is the outcome of a long-term structural changes. It might take 40 to 50 years for a socio-technical regime to replace an old one (Brauch & Spring, 2016; Hoogma, Weber, & Elzen, 2005). In other words, such long-term time frame is the envisioned endpoint. In practice, those far futures are often described by means of scenario. The time frame given to this scenario, which can be presented for discussion to an individual, helps to discover long-term time horizons (Holstius & Malaska, 2004; Loorbach, 2009; Van der Helm, 2009).

Short-term
As a large timespan is impractical to work with, visions often encompass short-term goals and targets. The targets and goals reconcile with the long-term perspective but helps to guide short-term activities. In doing so, these objectives become an integral part to strategically work towards the desired future, providing a better operational framework (Höjer, Gullberg, & Pettersson, 2011, Loorbach, 2009; Van der Helm, 2009).

2.3.2 Sustainable outcome

Van der Helm (2009) states that a vision describes an endpoint of '*what it is supposed to foster*' (p. 102). This description points out the preferred outcome of change, but equally what should be preserved. The preferred outcome gives actors a well-focused direction that motivates them to pursue change (Pesch, 2015). From this understanding, questioning actors what motivates them can be used as an indicator to discover the preferred outcome.

Motives

As mentioned earlier, the energy transition is a sustainable transition suggesting it should lead to a sustainable outcome. This sustainable outcome refers to the environmental impact (resource depletion and greenhouse gas emissions) of the existing energy system (Grin, 2016). This suggests that a motive might be to mitigate climate change (Noppers, et al., 2014). However, motives should not be limited to environmental reasons. Looking into motivational domains reveals alternative drivers, such social, economic or technological (Axelrod, 1994; Jørgensen, 2012).

2.4.3 Technological changes

The energy transition is concerned with technological changes in the energy system. It requires a shift from fossil energies to more sustainable alternatives. Such shift requires alternative technologies and different infrastructures. Making it of no surprise that a vision describes the preferred future composition of energy technologies (Trutnevyte, 2014). However, the role of technologies in the future is not without doubts (Karlsson, 2005). '*The substantive nature of technological options themselves, may be seen different by actors as producing desirable or undesirable objectives'* (Smith, Stirling, & Berkhout, 2005, p. 1508). To discover these different perspectives, it is important to question their technological standpoint about how technology will play a role in the future. Because in the end, the future of niche-level technologies rests on the perception of actors (Lyytimäki, et al., 2018; Noppers, et al., 2014).

When questioning the preferred future composition of energy technologies, it requires enquiring three types of technologies: *fossil, nuclear* and *renewable energies* (Panwar, Kaushik, & Kothari, 2011). The preferred composition then depends on their perception about the technological *capabilities* and *limitations* regarding these different types. However, to study these elements, Borup et al. (2006) proposes a more indirect form of questioning. Instead, he explains that a preferred future concerning technologies strongly reflects their perception on the current situation and the potential of new technologies. Based on that information, it suggests questioning existing- and new-technologies as useful indicators to discover an actor's perspective on technology.

Existing technologies

The extent to which existing technologies are part of an actor's preferred future depends on their perception regarding the current situation. This perception relates to the perceived benefits, barriers and risks associated with existing technologies (Höjer, Gullberg, & Pettersson, 2011). These perceptions differ among actors as they relate to different information flows, a certain public perception, expectations or takes into account contextual factors (deLlano-Paz et al., 2015; Lyytimäki

et al., 2018; Noppers et al., 2014). The combination of these aspects shapes the extent to which an actor relies on the use of existing technologies in the future.

New technologies
Another factor at play is an actor's perspective about the opportunities of new technologies in the future (Smith, Stirling, Berkhout, 2005). New technologies refer to those technological developments that are currently not on the market. It speculates about technological advances of disruptive technologies. The reason is that, if an actor sees merely limitations in existing technologies, an actor might imagine a future that relies on currently non-existing technologies (Borup et al., 2006; Panwar, Kaushik, & Kothari, 2011).

2.4.4 Social changes

This element refers to social factors that influence an actors' willingness to make changes (Agenda stad, 2017; Wüstenhagen, Wolsink, & Bürer, 2007). Because defining the transition as socio-technical transition suggests the need for social changes (Geels et al. 2017). Reasoning from that perspective also explains that energy is strongly embedded in societal practices which necessitates societal acceptance. This involves more than technological features or economic incentives. This raises the question of what factors are important for people to engage in behaviour that supports or opposes the energy transition. Whereas the sustainable outcome describes the endpoint through normative reasoning, this element looks into more personal reasons that influences people's perception. Reviewing the literature leads to three indicators relevant to the local energy transition: values, knowledge and aesthetics (Shove & Warde, 2002; Steg, Perlaviciute, & van der Werff, 2015).

Values
A preferred future describes what a person values for the future (Höjer, Gullberg, & Pettersson, 2011). Those values relate to what is perceived important in today's and future life (Axelrod, 1994). Especially in the case of the energy transition as changes affect day-to-day practices. For that reason, their perception strongly depends on how, in their perception, changes in the energy system will impact their quality of living (Poortinga, Steg, & Vlek, 2004; Shove & Warde, 2002). Steg, Perlaviciute and van der Werff (2015) define four types of values relevant to the energy transition:

- *Hedonic values*. This type refers to individuals whom value pleasure and comfort.
- *Egoistic values.* This type refers to individuals whom work hard to meet their personal interest, such as status or financial benefits.
- *Social-altruistic values.* This type refers to those whom strongly value the well-being of people and society.
- *Biospheric values.* This type refers to those concerned with the consequences that affect nature and the environment.

Knowledge
Another social factor that affects willingness to change is knowledge. The concept of knowledge encompasses more than factual information. Whereas people might be well aware of the environmental impact, it is questionable to what extent they understand the impact of their behaviour. Actors might identify the causes of climate change more with distant activities and are unaware to what extent their behaviour and activities contributes (Beckert, 2013; Steg, et al., 2015). This raises the question of whom is perceived responsible to make changes. Such perception influences the way an actor sees oneself making changes in the future, therewith shaping their preferred future.

Aesthetics
The last factor identified relates to the aesthetic impact of the energy transition. It refers to an actors' perception about how the energy transition changes the aesthetics in the area (Poortinga, Steg, & Vlek, 2004). Alternative technologies might cause visual disturbance due to size, colour, patterns, noise or unintegrated position. An example of this factor is the not-in-my-backyard-problem which can hinder societal acceptance of specific technologies in certain areas (Devine-wright, 2005; Djerf-Pierre et al., 2016). This means that these objective factors are given a subjective assessment, shaping an actors perception about adopting certain technologies and thus their preferred future energy system.

2.4.5 Economic changes

A final theme to address is the need for economic changes. As energy is strongly embedded in economic context (Höjer, Gullberg, & Pettersson, 2011; Stern, 2006), it is not surprising that a preferred future encompasses economic concerns and goals (Hekkert et al., 2007; May, 2009). However, assuming that these are rational in economic context is incorrect. In fact, the complexity of the problem leads to actors developing different economic perspectives which, according to their knowledge, is believed to be true (Beckert, 2013). To identify indicators to describe an actors economic perspective, literature expresses economic obstacles and incentives to adopt innovations: economic viability, tax and energy prices, energy independence (Beckert, 2013; Curran, 2012; Djef-Perrre et al., 2016; Maurer & Ustinskaya, 2014; Trutnevyte et al., 2011).

Economic viability
A prevalent concern of the energy transition is the economic viability. This concern often relates to high investment costs to adopt new technologies (Jørgensen, 2012). This explains why decision-making in niches is often underpinned through economic reasoning (Maurer & Ustinskaya, 2014). This entails calculations such as return on investment, energy-saving, or even creating profits (see Maurer & Ustinskaya, 2014; Steg et al., 2015; Trutnevyte et al., 2011; Lyytimäki et al., 2018). This means that how

an actor envisions changes relates to the extent in which these changes are perceived as economically viable.

Tax and energy prices

The economic concern also leads to a speculation about the development of energy prices (Agenda stad, 2017). When reviewing the literature on price development, it suggests two possible developments. The first is that resource scarcity leads to a price increase of oil, following the reasoning of market supply and demand (Beckert, 2013). Second is through policy intervention. This refers to a change in taxes or regulations that aims to alter contextual factors to incentivise actors to make sustainable energy choices (Steg et al., 2015). Such speculation on price development forms an actors preferred future about what would be the ideal energy system apt for these developments.

Energy independence

Another economic argument in favour of renewable energy relates to local energy production. Energy visions are at times build on the idea that it can create energy independence as it moves towards a more decentralised energy system. This interest became of increasing interest over the past couple of years (Jørgensen, 2012; Trutnevyte, et al., 2011). Besides offering financial benefits, it might create a sense ownership or even support local employment. Because local energy production is suggested to stimulate local employment rates (Maurer & Ustinskaya, 2014; Noppers et al., 2014; Steg et al., 2015; Trutnevyte et al., 2011).

2.5. Conceptual framework

Before elaborating on the conceptual framework, the section starts with recapping the assumptions made throughout this research. The starting point has been the problem that local energy project struggle with establishing long-term collaboration, which is due to the multi-actor nature of the transition. With the aim to improve long-term collaboration, this study works with the idea that the first step is to recognise the differences for project members to be able to align stakeholders more accurately. Besides, it will most likely avoid conflicts that otherwise would occur with a change in situation. Although a shared vision is considered a useful tool, it often fails to succeed in aligning stakeholders in practice. Therefore, a shared vision might be helpful to align stakeholders, but it is no guarantee to do so. Therefore, turning back to the research question, this research revolves around understanding how preferred futures differ among the actor-types, building on the assumption illustrated in figure 5.

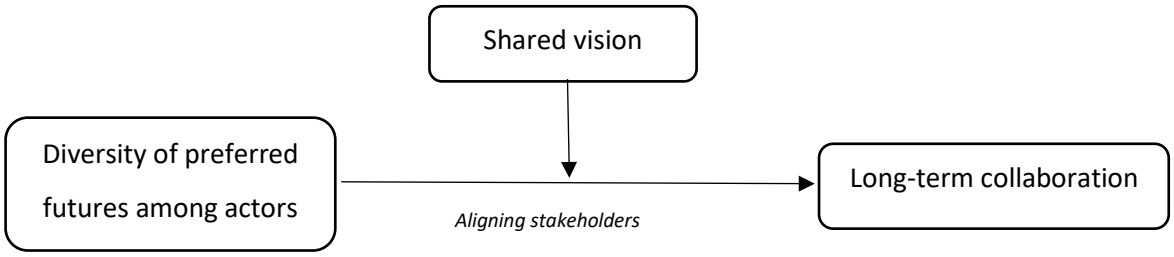


Figure 6: *The influence of the multi-actor nature on long-term collaboration*

The previous section, in which it conceptualises the term preferred future, provided the last information needed to finalize the conceptual framework (figure 7) suitable to answer the research question.

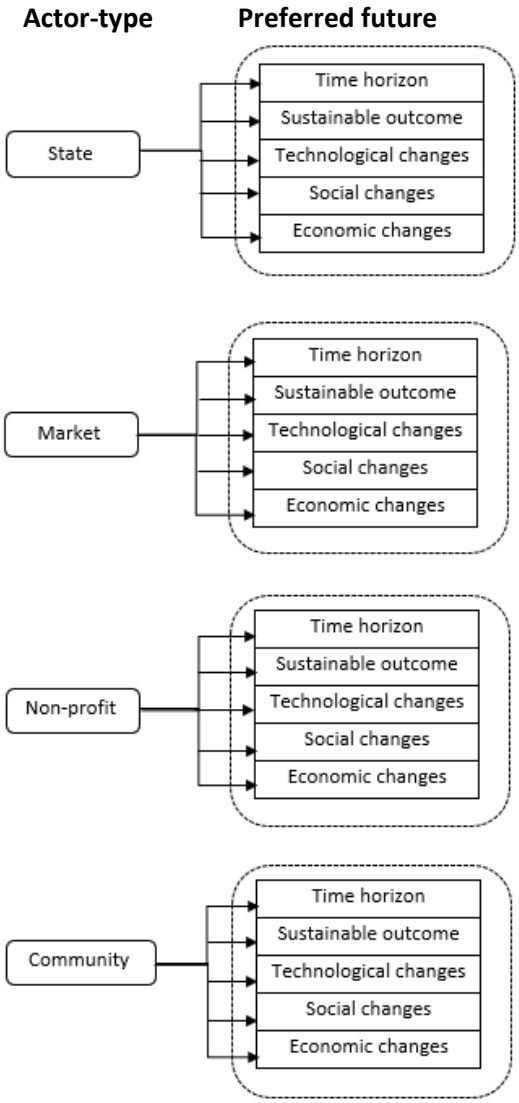


Figure 7: *Final conceptual framework*

The two main concepts in this research are actor-types and preferred future. Studying the actor-types is done by means of the MaP. This framework helps to understand actors activities and interest according to their sector logic (state, market, non-profit, community). A preferred future is studied according to the five elements. An overview of these five elements including the indicators is presented in table 1.

Preferred future: the five elements	Indicators	Description
Time horizon	*Long-term*	The time frame given to an end point for a certain *scenario* to unfold.
	Short-term	Practical *goals* and *targets* that reconcile with long-term ambition.
Sustainable outcome	*Motives*	What motivates an actor to pursue changes. A preferred environmental outcome can be *mitigation* or *adaptation*. However, other motives might be for *economic, technological* or *organisational* reasons.
Technological change		The perspective regarding *renewable, nuclear and fossil energy* in terms of their *capabilities* and *limitations*.
	Existing technologies	The extent to which today's technologies, such as solar- or wind- energy, are part of the future energy system.
	New technologies	The extent to which inexistent or upcoming technologies, that are not on the market today, will be part of the future energy system.
Social change	*Values*	This refers to what a person values for the future. These values might be *hedonic, egoistic, social-altruistic* or *biospheric* values.
	Knowledge	This refers to what extent an actor reflects on the impact of their activities and its *perceived responsibility* to make changes.
	Aesthetics	This refers to an actors perception about technologies causing *visual disturbance*.
Economic change	*Economic viability*	This refers to the economic concern whether it leads to a *cost increase or decrease*.
	Tax and energy prices	The expectation about how energy prices will develop in the future due to *market mechanism* or *policy interventions.*
	Energy independence	The idea of how a decentralised energy system can create energy independence in the future, leading to advantages such as *ownership* or *local employment*.

Table 1: *Operationalisation of the concept 'preferred future'*

3. Methodology

The first two chapters set ground for this research, forming the basis for the research design. In line with the theoretical framework, the following chapter describes the approach used to answer the research question. The chapter starts with explaining the research method from a more philosophical point of view (§3.1). The research philosophy justifies the methodological choices made throughout the research, which is explained in the section that follows (§3.2). The last section (§3.3) elaborates on the research ethics.

3.1 Research philosophy

The research question guides the ontological and epistemological stances taken. It explains how the social phenomenon, and thus the two main concepts (actor-types and preferred futures), is studied.

The ontological standpoint to understand the social phenomenon in this research is constructivism (Bryman, 2012; Yin,2018). The stance is best explained when reflecting upon the process of formulating guiding visions. A (shared) guiding vision is the result of interaction among actors (van Asselt et al., 2005). It is a social construct formed by different perceptions and actions of social actors (Geels, 2010). Besides, actors have an active role in transitions, referred to as agency (Giddens, 1984). Niche-level actors are capable to deviate from conventional structures, giving them power to act (Geels, 2010). Furthermore, studying actors' preferred futures in relation to structures of state, market, non-profit and community (agency and structure) confirms the constructivism (Flyvbjerg, 2001). Thus, the phenomenon is considered to be a social construct formed through subjectivity.

In sequence, the epistemological stance is interpretivism (Geels, 2010). The aim of the research is to find out the different preferred futures among actors. A preferred future is formed by a persons' background, knowledge and experience in which it reflects expectations, desires and interests (Van der Helm, 2009; Wiek & Iwaniec, 2014). This means it necessitates studying individual perspectives concerning what people think, their ideas, and interpretations. In other words, the main concept studied is fundamentally subjective. To be able to answer the research question, special attention was given to the diversity in preferred futures among the different actor-types. This explains why the research needed to interpret data in a way that it is logical in its context (Bryman, 2012).

3.2 Research design

The following section elaborates on the methods chosen in coherence to the research philosophy. Unlike the research philosophy, this section provides more specific and practical information about the

research strategy, data collection and analysis. It explains the logical plan to answer the research question according to the context and philosophical understanding of the phenomenon.

The research took an abductive approach which led to an iterative process. With abductive reasoning this research forms a theoretical understanding of the people and context studied. Although the approach is similar to inductive, the distinction lays with the reliance on explanation and understanding of participants' worldview (Bryman, 2016). The research started with practice demonstrating that projects without mutual understanding among stakeholders are likely to encounter conflicts. Theory suggests that conflicts occur as the result of stakeholders having different preferred futures in mind. A change in situation, which is likely with long-term projects, will reveal discrepancies. Even though literature repeatedly stresses the differences, an explanation is lacking. Therefore, this research draws on the assumption that preferred futures differ among various actor with different backgrounds. The relation of actor-type and preferred future is a likely assumption, yet not tested.

A qualitative approach has been employed in this research. Reflecting upon the nature of the research, drawing conclusions required extensive qualitative data to describe the preferred futures of the actors. This is necessary as a preferred future is a logical story entailing personal views and perceptions. Moreover, to understand and interpret the findings, it required an accurate flow of information that can describe a preferred future in-depth through the perception of the actor. Without qualitative data, the information would not have been as rich in its description.

In line with the qualitative approach, the strategy chosen was a case study to focus on niche-level activities (local energy projects) as proposed in the previous chapters. The case (local energy project) functions as an example of the phenomena in which it deals with the research problem. This means a case study allows studying an example in which preferred futures among the actors differ. Besides, interpreting data requires understanding the contextual settings of a case. By focusing on a case bounded by time and activity, it allowed collecting detailed information about the actors and context. The latter is especially important to interpret the findings as a preferred future is context dependent (Flyvbjerg, 2011; Yin, 2009, 2014, 2018).

The research is limited to a single case study for methodological viability. The type of data required a detailed examination of the case to gather context-dependent knowledge. Then, taking into account the scope of the study, it has limited the research to a single case. The research has been fully devoted to the case to build descriptive power. Besides, this research is a preliminary stage of investigations. A single case study is sufficient as a starting point in preparation for multiple case designs (Flyvbjerg, 2011; Yin, 2018).

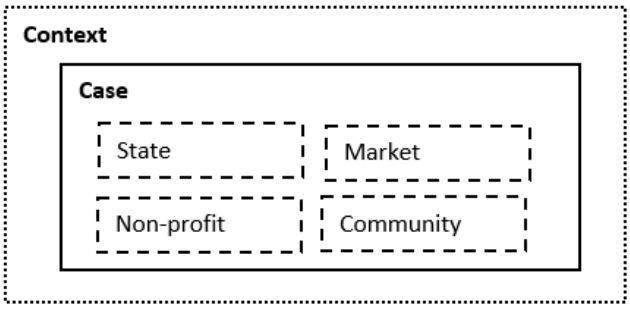


Figure 8: *Embedded case study*

The multi-actor nature of local energy projects suggests multiple units of analysis, leading to an embedded case study. More than one actor-type is studied (see §2.1.3). As more stakeholders are involved than actor-types, studying an actor-type meant analysing information from multiple stakeholders at times. Even though the case involves multiple units of analysis, these are still part of a single case (Yin, 2018).

3.2.1. Case selection

This research was setup as part of the Smart Energy Cities program (SEC) (2018). The program is one of the initiatives in the Netherlands that supports local energy projects. The program provides extensive information to help projects to cope with the local energy transition. The aim is to develop a roadmap to guide changes in the energy system in the long run. The working structure of the program is in line with the theoretical framework. Besides supporting niches (neighbourhoods) in their process, it recommends projects to pay attention to technical, social and economic aspects (socio-technical approach). In addition, the program also advice projects to work with a shared vision to guide their activities. For those reasons, selecting one of the SEC projects matched the theoretical understanding. More information on the program is provided in appendix 2.

Case selection was initially done according to theoretical propositions. Theory proposes under what circumstances the different perspectives can be studied at best. The first criterion was that the project should still be active. Otherwise, a finalised project managed, or at least partly, to align the perspectives of stakeholders. Thus, to discover the differences, it is important that the project has not come to a shared vision yet. Second, the project has correctly identified their stakeholders by means of a stakeholder analysis. This is important as the research studies the stakeholders identified by the project team. If stakeholders are missing, it would lead to inadequate conclusions. The last criterion is stakeholder engagement. According to Wiek and Iwaniec (2014), the best circumstances to create mutual understanding is by creating strong stakeholder engagement. To avoid that the lack thereof has been the reason that conflicts emerged, the case should focus on creating strong stakeholder

engagement. Based on these criteria, Municipality X has been selected as an appropriate case (Doornewaard, Schipper & Vight, personal communication, 2018).

However, during data collection, it turned out that the case was particularly interesting for alternative reasons. Even though the criteria remained relevant to reduce external factors, two events occurred that exposed the discrepancies in preferred futures among the stakeholders. As posed in the introduction, the case in Municipality X is an example of a project that faced conflicts due to a change in situation. These particular circumstances emphasised the relevance of studying Municipality X, making it an information-oriented case selection. In other words, the value of this particular case study became clear once collecting data. Case selection was initially based on criteria but turned out to be an exemplifying case upon closer study (Bryman, 2016; Flyvbjerg, 2001; Yin, 2009).

To explain the validity of the case, the following information describes relevant background information and the two events. The information is essential to interpret the data.

Background information

The municipality of Municipality X initiated the project in the summer of 2017. The case was one of the two neighbourhoods selected as a pilot project. The reason was that the municipality felt that they had insufficient knowledge to cope with the local energy transition. For that reason, two neighbourhoods were selected. One with an existing and one with a new infrastructure. The case studied is the existing neighbourhood. To maximize the learning experience, the municipality decided to participate in the SEC program (Smart Energy Cities, 2018).

To explain the two events, the starting point is to reflect on the motives for the municipality to select this particular neighbourhood (Project plan, 2017). The first reason was the initial assumption that the infrastructure was outdated. As the neighbourhood was built during the 70s, it was likely to assume that the infrastructure underground was dated too. The council was expecting to renew the sewerage and energy grid in the near future, which would create momentum to simultaneously shift towards an alternative and more sustainable energy system. The second reason was the active participation in energy-saving projects by residents living in the neighbourhood (energie congress, 2019, April 4th). The main argument was project Hoom (2014) which encouraged residents to partake in energy-saving measures. The success of the project gave the council the impression that residents were interested in sustainability activities. The active participation and expected momentum were the reasons for the municipality to select this neighbourhood (Smart Energy Cities, 2018; M1, personal communication, June 1, 2018; M2, personal communication, June 12, 2018).

The initial ambition of the project was to offset natural gas before 2030 and become CO2-neutral in 2040 (Duurzaam Municipality X 2016-2020, 2015; Municipality X, 2017; Project plan, 2017).

However, the ambition changed overtime due to a change in situation, making it more flexible ambition instead of a definite end-point.

First event

The first event refers to the unexpected interest of residents, revealing how the residents were inaccurately understood. The project team started with organising a resident meeting to inform them about the aim of the project. Residents were informed about the meeting by means of the local newspaper. The information briefly mentioned the aim of the project, while inviting them to join the meeting for more detailed information. The information stated that the aim of the project was '*developing a roadmap that enables the neighbourhood to make use of sustainable energy sources, and thus without the use of natural gas by 2030*' (Municipality X, 2018; M1, personal communication, May 25, 2018). It turned out that this statement spent quite a stir among the residents. Up to that moment, the municipality focused on becoming CO2-neutral with a CO2-reducing strategy. Even though the energy-saving project Hoom was a success, the number of residents interested right from the beginning was often few, receiving little attention until the moment the deal was economically interesting. The arrival of 300 residents at the first meeting, which was a much larger group than anticipated, surprised the project team. It turned out that residents were interested in the project for other reasons than with energy-saving projects.

With the curiosity to find out why, the project team discovered that reason for the sudden interest was due to the statement of becoming a natural gas-free neighbourhood (Project team report 1; SCP, personal communication, June 5, 2018; NO1, personal communication, June 25, 2018; Werkgroep, 2018). Whereas residents were interested in energy-saving projects, residents had different associations with the term natural gas-free, leading to a different motive for joining this particular project. Linking it to the main reasons for the council to select this neighbourhood, the unexpected interest revealed the differences in preferred futures between the residents and municipality.

Second event

Upon closer investigation, new technological insights about the infrastructure led to a second event. As part of the process, the project team was advised to investigate the social and technical features of the neighbourhood. Whereas initial information pointed out the outdated infrastructures, more in-depth information about the technical conditions revealed that both the drainage and energy network were good enough to last for another decade. It turned out that the energy grid was, despite the economic inefficiency, in good technical condition to well-function for a period up to 2030. The same accounted for the drainage system. Instead, maintenance for both would suffice. As this was one of the main reasons for selecting this area as a pilot, the situation changed and revealed differences in

preferred futures. In fact, the practical motive for selecting the case was no longer valid. Whereas the initial momentum would urge renewal and possibly facilitated certain technical solutions, the new information reduced the pressures to quickly progress (Sounding board meeting, personal communication, June 26, 2018; M2, personal communication, June 1, 2018). With the disappearance of the momentum, it was no longer a priority to change the energy grid nor drainage system in the neighbourhood.

Although the project team kept their promise to the residents that it strives to execute the project as soon as possible with the lowest costs. It did change the perspective of most stakeholders from taking prompt action to focusing on the learning opportunity. This led to impatience of one of the stakeholders with a visionary standpoint, and therefore still wanted to act as envisioned. Although more practicalities were involved, the stakeholder's organisation decided to no longer participate in the project team. Part of the reasons was the difference in preferred futures (News item, 2018; LA1a, personal communication, June 12, 2018; M2, personal communication, June 1, 2018).

The initial aim was to finish the project by the end of 2017, but social complexities postponed the deadline. In the summer of 2018, the project team decided to adopt a new approach due to the shift in situation. The approach was to facilitate 'front runners' as much as possible, while searching for long-term solutions. This strategy would allow the project to move forward with those residents willing to make changes, while finding more suitable solutions for the rest of the community (Werkgroep, 2018; M2, personal communication, September 2018).

3.2.2. Data collection

Describing the preferred futures of the actors requires qualitative data. It requires in-depth information about their standpoints and ideas of the actors studied. To do so, it requires case-specific information that is extensive enough to come to conclusions. However, case-specific information is backed up by using secondary data to ensure correct interpretations. Collecting these two types of data started in May 2018 and ended early 2019 until the moment of saturation (Bryman, 2012).

Primary data (case specific data)

The main source of information is case specific by collecting extensive information about the units of analysis. To discover whom the units of analysis are, the stakeholders identified by the project were studied. The project embraced a working method to incorporate stakeholders, a structure which best explains whom the actors are and their relation to the project.

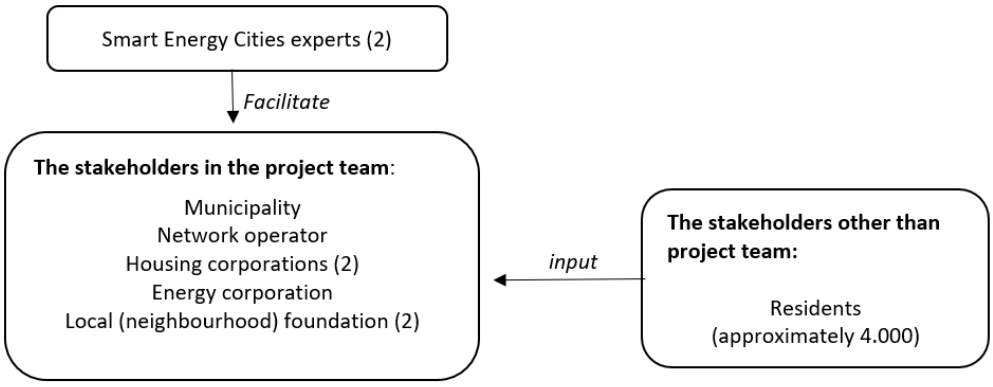


Figure 9: *Stakeholder analysis and their connection to the project*

According to this information, ten units of analysis have been identified. The project team consist of seven organisations. The project team members are one or more representatives of these organisations. The residents are another stakeholdergroup. As it is impossible to get all residents directly involved, their input has been gathered through informative meetings, sounding board meetings and face-to-face interviews conducted by the project team members. The project is facilitated by two Smart Energy Cities experts. The experts work on behalf of the SEC program and are employed by the municipality. This research also studies their perspectives as they are equally part of the process. Understanding their participation from the constructivist stance, the experts exert influence on developing visions and long-term collaboration, making them relevant to study. A description of these actors is given in chapter 5.

Information about those stakeholders has been gathered through different sources of evidence (Yin, 2009, 2018). The different sources of primary research are interviews, documentation and observations. Most of the primary data has been collected from May to September 2018. The case study is cross-sectional, meaning it focuses on a certain moment in time (idem). However, multiple sources provided insight into earlier meetings. Such information allowed bearing in mind the formation process, thereby enlarging the understanding of how perspectives are socially constructed.

	M	SIC	SCP	NO	EC	HC	LA	R	PT
Interviews	**2**	**1**	**1**	**2**	**1**	**2**	**3**	**2**	
Documentation									
- **internal**	**x**	**x**	**x**	**x**	**x**	**x**	**x**		**x**
- **external**		**x**	**x**		**x**	**x**		**x**	
Observations								**x**	**x**

State actor
M = Municipality

Market actor
SIC= Smart Energy Cities expert 'innovation coach'
SCP = Smart Energy Cities expert 'Creative producer'
NO = Network operator

Context & confirmative information
PT = Project team

Non-profit actor
EC = Energy cooperative
HC = Housing corporations
LA = Local associations

Community actor
R = Residents

***Table 2**: Sources of evidence with the abbreviations for referencing*

Interviews

Interviews have been an essential source. It allows a direct focus on stakeholders, creating the opportunity to gather extensive information. The interviews were semi-structured interviews with open-ended questions. This ensured the collection of comparable data, while the open-ended questions led to in-depth information. During the interviews, follow-up questions lead to explanations regarding their personal views and perceptions. In doing so, information was given in a natural sequence, revealing personal standpoints including the nuances and value-laden answers. These details are crucial for interpretations (Bryman, 2012; Creswell, 2012; Yin, 2018).

In total 14 interviews took place with the organisations' representatives involved in the project team, the two SEC experts and two residents. An overview of these interviews is presented in appendix 4, including the referencing that will be used in the chapters that follow. As this research was setup as part of the SEC program, it eased contacting the interviewees. The first two interviews took place with one of the SEC experts and the initiator of the project. These interviews were partly to test the quality of the questions, indeed leading to some adjustments in the interview guide. Another advantage was that these two interviewees helped contacting the rest of the interviewees. From the 12 interviews with the project team members, most interviews lasted approximately one up to one and a half hour except two. One interview with a local association (2) was limited in time due to complexities within their organisation. The other interview, which was an additional interview with the other local association (LA1b), took place during one of the meetings, constraining the time for practical reasons.

Whereas most interviews took place in an early phase, providing firsthand insights into the preferred futures. After which documents and observations were used as alternative sources to validate, deepen and add to the insights derived from interviews. This was not the case with the resident interviews. In contrast to the rest of the interviews, these interviews functioned as confirmative information. The reason was the size of the group (4.000 residents). For that reason, the main source of information was documents and observations, after which interviews were used to confirm adequate interpretation of data. The two respondents were selected with the help of the creative producer (SEC expert), which is responsible for collecting input from the residents. The respondents were selected based on their opposing perspectives. One was in favour of the energy transition; the other was more doubtful. This decision was made with the aim to discover the relation between their position as residents and their preferred future regardless of their believes and in this manner minimizing the response bias. These interviews lasted about 30 minutes and deviated somewhat from the standard interview guide in terms of structure.

Interviews were steered according to the interview guides (see appendix 3), which were strategically developed to allow story telling. The strategy derived from the theoretical understanding regarding the characteristics of a vision (§2.2). The interview guide was comprised of three sections: (1) introduction, (2) organisation, (3) comparing different ambitions. The interview started with a brief introduction on the organisation and its overall perspective on the energy transition. Followed by more specific questions regarding the organisations' activities, mission and vision. In the third section, questions were raised to trigger the discussion by reflecting upon the national ambition (see boxes in §2.3.1). This part was developed with the aim to reveal different standpoints, enabling the interviewee to give their perception by discussing, debating, accepting and rejecting the perspectives (Swart, Raskin, & Robinson, 2004). By means of the three sections, different approaches were used to discover the perspectives. With the interview guides providing the overall structures, additional questions were added for each interview based on the information available online.

Within these three sections, topics regarding the five elements of a preferred future were often implicitly asked for strategical reasons. Implicit asking helped to prevent reflexivity in the answers as questions might be suggestive (Yin, 2009). For example, the interview guide does not question aesthetic values directly as it might not be part of their considerations. Therefore, it was up to the interviewer to recognize indicators of these topics and to continue questioning until saturated. Another example is about their expectation of technological development. Direct questions might lead to answers that would argue the obvious, such as 'new technologies are always needed' or 'technologies always get better'. Because more than explicit standpoints, data should also reveal implicit perspectives (Van der Helm, 2009). Otherwise such answers would be short-sighted and not

add to answering the research question. Questioning topics indirectly allowed actors to answer according to their own interpretation, revealing their priorities, reasoning and focus. Thus, questions were formulated according to the theoretical framework, but words were chosen wisely to minimize biased responses.

Documentation

To strengthen information derived from the interviews, documents were used as an additional source. Whereas as interviews were directed at to the case, documents revealed more general information about stakeholders' perspectives (Yin, 2009). It also provided contextual information. Note that some of the documents are secondary data, however, these were the result of the snowball effect and give case specific information. To explain this source of evidence, the following information differentiates between internal and external documents to explain function and source.

Internal documents refer to those developed by the organisations themselves. Examples are governance and policy documents, business plans or annual reports. Although these documents are likely to have a reporting bias as words are selected carefully, assessing the reports according to the theoretical framework has been crucial to back-up interviews. Whereas most were available online, the energy cooperative provided a draft version of the internal document as it was still in progress. This source of evidence has not been used for the residents' group due to inexistence. An overview of these documents is presented in appendix 4.

External documents refer to those containing case-related information developed by third parties. An overview of these documents including references is presented in appendix 4. The documents provided additional information about the stakeholders and context.

Observation of meetings

The last source of evidence to mention concerning primary data is observations. Observing meetings have been useful to gather contextual information and provided data about residents.

Contextual information derived from project team meetings has been an essential source of evidence. Three meetings took place during the time of data collection, revealing the interaction among the stakeholders, providing mainly contextual information (Yin, 2009). Attending the meeting significantly enlarged the understanding of social interaction, even as illuminating different perspectives. Due to complications, two meeting were held private for confidential reasons. Alternatively, two reports containing the records of the meetings were made available for this research.

A sounding board meeting took place during the data collection period with the aim to update residents about the project. The group consists out of two representatives per street (total of 40).

Members hold diverse standpoints, making it a representative group for the neighbourhood. Observing this meeting allowed immediacy and revealed interaction between the project team and residents. During the meeting, standpoints of the project team were strongly discussed, debated, accepted and rejected. The situation created favourable circumstances to understand differences between the project team and residents.

Secondary data

To confirm and strengthen findings, primary data has been complemented by secondary data derived from literature and media. Most of the secondary data was collected in the time period after the interviews until early 2019.

Literature

Literature on energy visions has been essential for analytic generalisation (Yin, 2009, 2018). Those findings were suggestive of actors' perspectives and confirmed their way of thinking through sector logic. In this way, the information ensured adequate interpretations and explained how these findings might contrast with other cases. It thereby enhanced analytical generalisation of this single case study and improved the external validity of the study.

Media

In addition to the above-mentioned data, this research has been able to confirm insights from various media sources. While researching, multiple newspaper articles gave confirmative information that validated the findings. News items presented recent research findings or illuminated frames related to the energy transition (NOS, 2017, 2018, 2019).

3.2.3. Data analysis

After collecting the data, the analysis was performed in logical sequence of the theory and methodology (Yin, 2009). This section elaborates on practical measures and analytical process.

Practical measures were taken to ensure accurateness in the analysis. Managing data was done by transcribing the verbal line of inquiry, even as summarising attended meetings (Yin, 2018). Having the data available in written materials allows analysing data in detail, such as the use of words. This was vital for understanding as a single word could indicate a different standpoint. To assist this procedure, both interview transcripts, document and observation summaries were uploaded into a qualitative analysis software (Atlas.Ti) to organise information in a structured manner.

Analysing the data required word allocation by means of coding according to the theoretical framework, making it a key process for the analysis (Bryman, 2012). The coding scheme is displayed in the table below. Theoretical coding helped to structure data in line with the theoretical categories (Bryman, 2016, p. 574). The first step was coding according to the indicators. Thereafter, when revising

the data, those codes were allocated to family codes, both actor-type and five elements of preferred future.

		Multi-actor perspective			
	Family codes	**State**	**Market**	**Non-profit**	**Community**
Preferred future	**Time horizon**	*Long-term* *Short-term*			
	Sustainable outcome	*Motives*			
	Technological changes	*Existing technologies* *New technologies*			
	Social changes	*Values* *Knowledge* *Aesthetics*			
	Economic changes	*Economic viability* *Tax and energy prices* *Energy independence*			
		Codes			

***Table 3**: Coding scheme*

In line with abductive reasoning, interpreting data was a strong iterative process. It was an interplay between data collection and the analysis (Bryman, 2016). This means that coding took place as soon as possible to sharpen the understanding of data. This process of sense-making was a logical sequence, which is best explained as two different phases. The first phase focused on reconstructing the preferred futures for each actor-type. To do so, coding revealed reoccurring standpoints, creating empirical patterns relevant to an actor's preferred future. The second phase focused on comparing the different perspectives among actors according to the five elements. When playing with the data, frames were identified once analysing the data (Djerf-Pierre et al., 2016). This understanding lead to an additional and unexpected analytical path about how different terms are interpreted differently. These findings are presented in chapter 4. Identifying the frames enabled interpreting an actor's perspective through sector logic.

3.3. Research ethics

The last point to address is research ethics. In order to understand certain methodological choices, this section elaborates on interpreting data and the way in which it has been processed.

For this kind of interpretive research, it does not require the researcher to agree with the actors' different perspectives (Flyvbjerg, 2001). Instead, it requires an analytical understanding in which the starting point emphasises different standpoints. The perspectives are socially constructed, making them equally important in which none is perceived as incorrect. In fact, the voluntary participations, willingness to cooperate and openness about personal perspectives have been vital. Without their

openness, this research would not have been able to draw conclusions. Conclusions that illuminate preferred futures of specific reference groups (state, market, non-profit and community).

To respect the variety in standpoints and avoid undesirable judgements, data has been treated strictly confidential. References to documents, interviews and observations are anonymous. This decision has been made in close coordination with the project team.

4. Framing the future: the associations with different terms

This chapter outlines the frames identified after analysing the data (Djerf-Pierre et al., 2016). It starts with presenting the three terms used to describe the outcome of the energy transition (§4.1). Thereafter, the different associations with these terms are explained according to the five elements of a preferred future (time horizon, sustainable outcome, technological-, social- and economic- changes). The last section (§ 4.2) sums up the different associations. Discussing these differences provides fundamental information for interpreting the different preferred futures of each actors.

4.1 The three terms: CO2-reduction, CO2-neutral, natural gas-free

Reading through the data revealed three commonly used terms when discussing the energy transition: CO2-neutral, CO2-reduction, and natural gas-free. The case studied has been no exception in word use (PBL, 2018a). On paper, the terms are used to describe different aims in the project. However, the words are communicated simultaneously in reality. Using the words in such manner creates vagueness about the aim of the project. Consequentially, it allows actors to focus on different terms, thereby working towards different futures. This corroborates the idea that it allows actors to interpret the aim of the project intuitively (Trutnevyte et al., 2011). To explain how a different focus leads to a different preferred future, the following sections describe how these three terms are associated with different meanings.

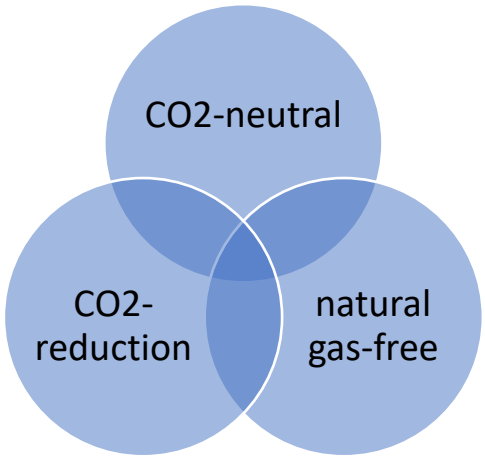


Figure 10: *The three different terms describing energy-related aims*

To explain the differences, the first step is to define the three terms. Defining the terms brings the understanding that these refer to different situations. CO2-reduction means reducing the CO2-emmisions. CO2-neutral is a situation in which emissions can be compensated. Natural gas-free refers to offsetting the use of natural gas. This means that the three terms are not substitutable. CO2-reduction is not a direct lead to CO2-neutral, and neither is CO2-neutrality a direct result from natural gas-free. Nevertheless, the related activities could be complementary to one another, but this strongly

depends on how these are executed. For example, CO2-reduction and natural gas-free could be used as a means to work towards a CO2-neutral future. However, these could also function as different ambitions.

The findings show even more variations between the terms upon closer study. Whereas some of these differences are evident when reflecting upon the formulated vision of the case studied, others were much more implicit. These implicit frames were exposed once relating them to contextual factors and when comparing the different narratives for each of these terms among the actors. Note that these frames are not as straight forward in reality but should instead be considered as tendencies. For example, an actor might be aware that the formal ambition is to become CO2-neutral but shows an implicit tendency towards natural gas-free as it triggers certain concerns or beliefs.

4.1.2 Time horizon

The most obvious difference that emerged from the data is the difference in time horizon. As the terms are used to describe a certain scenario, it shows that these different scenarios also hold different time horizons (Klimaatakkoord, 2018; PBL, 2018a). These are explicit statements that describe the time horizon of these preferred futures. The same accounts for the case studied.

CO2-Neutral
This term has been used to describe the preferred endpoint. It is the long-term perspective that describes the preferred outcome of the project, which is to become CO2-neutral by 2040 (Municipality X, 2017, 2018a).

Natural gas-free
Corresponding to the nationally defined ambition (Klimaatakkoord, 2018a), the case also defined a slightly shorter time frame to become natural gas-free (2030) (Municipality X, 2017, 2018a). In doing so, becoming natural gas-free is an ambition that reconciles with becoming CO2-neutral.

CO2-reduction
This term was used to describe shorter goals and targets in two different ways. Measuring the CO2-reduction functioned as a quantitative tool to keep track of the progress. For example, the municipality determined an intermediate target of reducing 100 kilotons of CO2-emissions by 2020 (Duurzaam Municipality X 2016-2020, 2015). The term was also used to describe the aim of particular projects (such as Hoom, 2014). Either way, the term functions to guide short-term activities.

4.1.2 Sustainable outcome

Another remarkable finding is how the different ambitions are associated with different (environmental) problems. Discussing the different scenarios with the respondents, exposed how the terms are considered to be solutions to different problems.

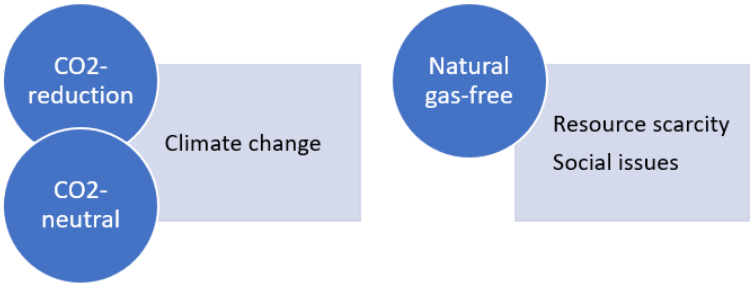


Figure 11: *The (environmental) issues associated with different terms*

CO2-neutral and CO2-reduction

Comparing the narratives of the different scenario's shows that these two terms are linked to climate change. Both terms relate to the issue of greenhouse gas (CO2) emissions, showing a direct link to the issue of climate change. The data revealed that these terms are consistently associated with climate change, most likely as the terminology is quite clear to what environmental problem it refers to.

Natural gas-free

This term is less indicative about the issue. The findings point out three different motives to work towards a natural gas-free energy system, which are climate change, resource depletion or social dilemmas caused by gas extraction. Whereas some actors considered natural gas-free as part of the solution to combat climate change (M1 & M2, personal communication, May 25, June 1, 2018). '*If we manage to replace natural gas by a sustainable source, we might have solved about 80 percent of the problem'* (SIC, personal communication, May 25, 2018). Others argued that it is used under the umbrella of CO2-neutral, but the actual motive to offset natural gas is for other reasons (R2, personal communication, September 13, 2018).

4.1.3 Technological changes

The different terms are associated with different technological limitations and capabilities. The main finding here is how the different situations rely on using existing or new technologies. This was discovered when reflecting upon earlier energy-related activities and the current situation as suggested in literature (Borup et al., 2006).

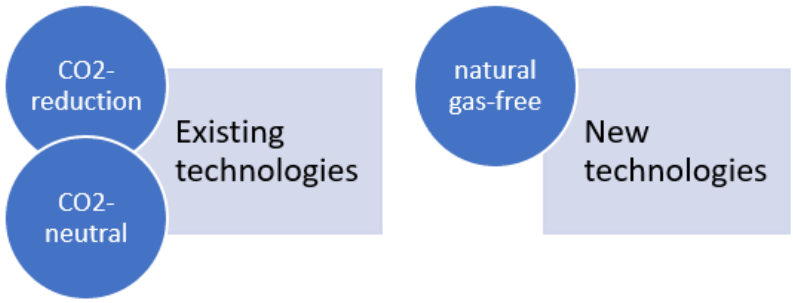


Figure 12: *The type of technologies associated with the different terms*

CO2-reduction
Since activities prior to the project focused on CO2-reduction, previous activities have been able to reduce emissions when adopting existing technologies. The data revealed how this term was often linked to the use of solar-panels, windmills or isolating. This means that existing technologies are considered apt for CO2-reduction. Even though technological development is expected to ease CO2-reduction even more in the coming years, reducing emissions is not considered to be dependent on new disruptive technologies.

CO2-neutral
This term is also associated with existing technologies. The reason is that neutral refers to the possibility to compensate. If one does not succeed to become CO2-neutral at a micro level, it can be compensated through alternative projects. Neutrality therefore allows the use of existing technologies for renovation. It builds on the assumption that new constructions are more promising in terms of environmental impact than renovating or adjusting older constructions. Those new construction might even become climate positive to compensate CO2-emissions of existing buildings.

Natural gas-free
The term natural gas free is associated with new technologies. When questioning the respondents, it shows that they are doubtful about how to replace natural gas with the existing technologies. Although there might be an opportunity with going all-electric, technologies to replace the natural gas supply are still in their early stages. Alternatives for heating systems are underdeveloped and require further technological advances (R2, personal communication, September 13, 2018; SCP, personal communication, June 5, 2018; SIC, personal communication, May 25, 2018).

4.1.4 Social changes

No specific frames were discovered in relation to aesthetics or knowledge. However, data did show how the different terms might indirectly affect personal values. The reason is that the terms are

associated with a certain freedom of choice. The extent in which it allows actors to take individual or collective measures.

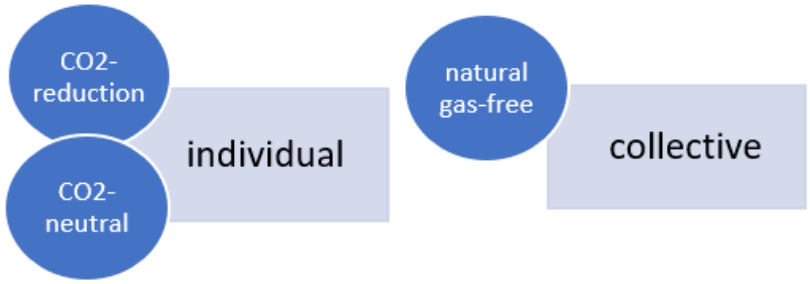


***Figure 13**: How the concepts insinuate to have a different effect on individual choices*

CO2-reduction

This term is perceived in a way that each organisation or household can reflect upon their own energy consumption. Individual measures can be taken to reduce their consumption (Steg et al., 21015). If one decides to act collectively, these measures are still reasoned as individual benefits or even installed individually. For example, individual actions that were taken under the pretext of CO2-reduction were buying solar panels or isolating houses. Even though the purchase thereof might be collective, these are still individual measures purchased collectively (Network operator B, personal communication, June 25, 2018).

CO2-neutral

The same accounts for the term CO2-neutrality in which an individual approach is still applicable. Considering the definition of neutral, it is suggestive of compensating. In other words, it would not require renovating each and every building as long as these are compensated. It allows actors to participate in those changes in line with their preferred future (SBM, June 26, 2018; R2, personal communication, September 13, 2018).

However, it raises the question on what scale compensation takes place. If an actor has the ambition to become CO2-neutral on a local level, it raises the question what area 'local' refers to. If one refers to a city as local, while the other refers to their own property, street or neighbourhood, it leads to conflicting perspectives. The reason is that on a city level, it might as well be that the neighbourhood should compensate for another area, which could means that it should become climate positive. Using a term 'neutral' without specifying the area leads to different interpretations.

Natural gas-free

This is not the case when becoming natural gas-free. If the gas supply stops, it would unquestionably have consequences for the entire neighbourhood. The infrastructure for gas supply will not be maintained for a minority of residents (HC1, personal communication, June 12, 2018; NO2, personal

communication, June 25, 2018). Although individual measures could still be taken, this scenario leaves no space for those that do not want to participate. This forces citizens to change, affecting their freedom of choice to a certain extent.

Another reason is that natural gas-free is associated with more practical limitations than energy-saving, such as cooking and heating (NOS, 2018d). This is likely why natural gas-free triggers the concern about comfort and quality of living (M2, personal communication, June 1, 2018; Project team reports 1 & 2; SBM, personal communication, June 26, 2018; SCP, personal communication, June 5, 2018; Steg et al., 2015).

4.1.5 Economic changes

The last point to raise is how different terms are associated with different economic implications. Although no references were made to energy independence or tax and energy prices, it turned out that dominant frames relate to economic viability.

Figure 14: *How the concepts are associated with different financial impacts*

CO2-neutral and CO2-reduction

The terms CO2-neutral and CO2-reduction are associated with a (possible) cost reduction. Starting with the term CO2-reduction, this term is associated with cost-saving. The reason is that the term 'reduction' hints at taking energy-saving measures. Energy-saving, or alternatively energy efficiency, is suggestive of a decrease in energy consumption. Consuming less energy is then associated with having lower costs for energy (NOS, 2018e; Steg et al., 2015).

Another reason is that CO2-reduction, but also CO2-neutral, are associated with the use of existing technologies. There is no need to rely on disruptive technologies as existing technologies can reduce CO2-emmissions. For example, solar panels or isolation measures are already effective to do so, even creating energy independence. Given this understanding, these existing technologies have proven to have a profitable return on investment in the long run at times (EC, personal communication, June 21, 2018; LA1, personal communication, June 12, 2018)

Natural gas-free

This term is associated with a cost increase (NOS, 2017, 2018d; Steg et al., 2015). Looking into the case revealed that the main concern to become natural gas-free is the heating system (SBM, personal communication, June 26, 2018). The technologies currently on the market that can replace those systems are still costly, which is why natural gas-free is associated with high investment costs. Adopting a term as natural gas-free would rather insinuate the aim to 'minimize' costs. This means that actors focusing on natural gas-free with the aim to minimize costs are likely to focus on avoiding unnecessary costs, effectiveness and no-regret measures.

4.2 Summary: overview of the different frames

To conclude the information in this chapter, this section presents a short overview of how the terms hold different frames in table 5. Followed by a brief description for each of the terms.

	CO2-reduction	**CO2-neutral**	**Natural gas-free**
Time horizon	Short-term	Long-term	Long-term
Sustainable outcome	Climate change	Climate change	Climate change Resource depletion Social issues
Technological changes	Existing technologies	Existing technologies	New technologies
Social changes (*impact on values)*	Individual	Individual	Collective
Economic changes (*economic viability*)	Cost reduction	Cost reduction or remains the same	Cost increase

***Table 4**: overview of how the terms are framed*

CO2-reduction

The term CO2-reduction is a short-term means to combat climate change. It involves energy-saving measures which can be achieved by using existing technologies. These measures can be taken individually in line with individual interests and is suggested to lead to cost reduction.

CO2-neutral

The term CO2-neutral describes the preferred sustainable outcome (long-term) in which it combats climate change. The term is merely associated with existing technologies, partly because neutral suggests the possibility to compensate. Although the term remains vague about the level on which it can compensate, it still allows individual choices. In line with these suggestions, CO2-neutral assumingly leads to cost reduction or costs remaining the same.

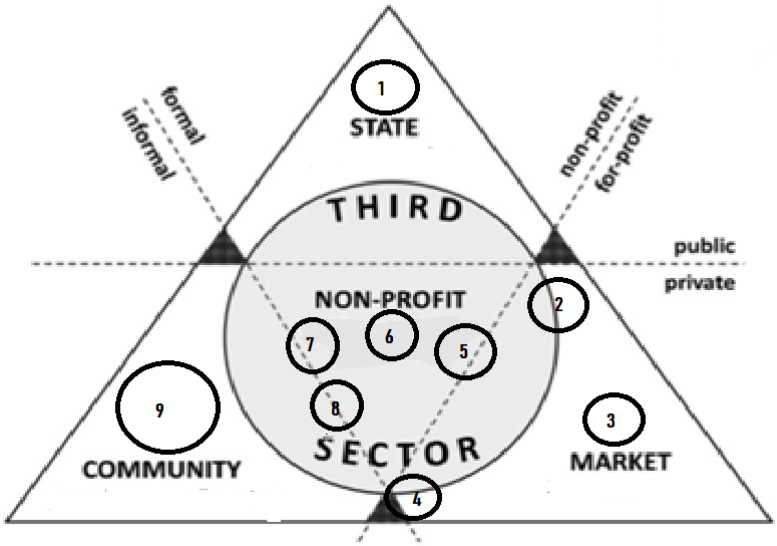
Natural gas-free

The term natural gas-free also describes a preferred sustainable outcome. The outcome might be part of the solution to combat climate change, but it can also be a solution to deal with resource depletion or to overcome the social issues caused by gas production. The term is associated with various practicalities (cooking, heating system) that affect the quality of living. Besides, offsetting natural gas would mean a cut off from the gas infrastructure. In doing so, it forces citizens to participate (collective), putting individual interest at risk. The term is also associated with a cost increase as it relies more on new disruptive technologies.

5. Findings: Preferred future per actor-type

This chapter describes the preferred future of each actor-type. It builds on the information provided in the previous chapter as the findings revealed that without specification, actors interpret these terms intuitively as suggest in literature (Trutnevyte, Stauffacher, & Scholz, 2011). Using a sector logic as suggested by Avelino and Wittmayer (2016) explains (to a certain extent) why actors hold certain standpoints. Note that the information presented below is case-specific. The preferred futures are described according to the findings in the case. However, the findings are consistent with data obtained through previous studies and media. This means that the main line of argumentation is built on the case study but complemented through secondary data.

The first step is to position each of the actors according to the MaP framework. Followed by describing the preferred futures for each actor-type. Describing starts with a brief introduction about whom the actors are, relevant contextual information and characterising their preferred future. After introducing, the section continues to narrate the perspective according to the five elements. Note that these are arranged differently to explain their perspective in a logical sequence, revealing nuances and value-laden perspectives. The chapter ends with an overview of the different perspectives by means of a short description and table (§5.5, p. 84).



Organisation (*reference to interviews*)

1 Municipality (*MO1 & MO2*)
2 Network operator (*NO1 & NO2*)
3 SEC Innovation coach (*SIC*)
4 SEC creative producer (*SCP*)
5 Housing Corporations 1 & 2 (*HC1 & HC2*)
6 Energy Cooperative (*EC*)
7 Local association 1 (*LA1a/b*)
8 Local association 2 (*LA2*)
9 Citizens (4,000 residents) (*R1 & R2*)

Figure 15: Positioning of actors according to the MaP framework

5.1 State actor

The municipality is the state actor identified in the case, placing them on top of the triangle (see figure 15). Data revealed that sector logic influences the actor's preferred future. Standpoints are strongly shaped by their role as a public agent. The findings corroborate with the findings of Weddfelt, Vacari and Tudor (2016), who argue a conflicting interest. As a public agent, one needs to adhere to the

bureaucratic command of the national government, while they equally act upon the interest of their citizens (Avelino & Wittmayer, 2016; Pesch, 2015). This conflicting interest was central in their preferred future.

To understand this political standing, necessitates an understanding of its context. As politics plays an important role, the first point to address is that the municipality of Municipality X is governed by the political party called 'GroenLinks' ("Greenleft"). The party addresses the need to move towards a more sustainable society and wants to set the example for other municipalities to follow. Over the past couple of years, the local energy transition became one of the key areas of focus (Duurzaam Municipality X, 2017; Jaarplan, 2018). The reason is that the built environment accounts for about 70 percent of the CO2-emmissions, indicating its significant contribution to reach their goals and targets. At the same time, Municipality X is rich in monuments and surrounded by nature, they also strive to safeguard the surrounding and preserve its cultural heritage (Duurzaam Municipality X 2016-2020; M1 & M2, personal communication, May 25, June 1, 2018).

5.1.1 Sustainable outcome

The starting point to explain their preferred future is describing the sustainable outcome. Studying their motives to engage in the local energy transition, reveals two motives.

Motives

The most prevalent finding is their intrinsic motivation to reduce their environmental impact. Evaluating the preferred sustainable outcome, the data strongly suggests the aim to combat climate change. The reason is that references are made to the Paris Climate agreement (Duurzaam Municipality X 2016-2020, 2015, p. 3). Correspondingly, it reasons the preferred endpoint of CO2-neutral. To work towards that endpoint, the municipality adopted a pragmatic approach of CO2-reduction. Activities focused on emission-reducing activities, making CO2-reduction a dominant term throughout discussions. In addition, the municipality also explicitly describes a future in which it will stop using natural gas. The latter is considered as an inevitable event, because '*everybody knows that the Netherlands will offset natural gas at one point'* (M1, personal communication, May 25, 2018). Thus, natural gas-free substantiates to the main concern of becoming CO2-neutral, whereas CO2-reduction is a practical means towards that sustainable outcome (Duurzaam Municipality X, 2016-2020, 2015; Municipality X Gasloos, 2019, April 5th).

Another motive was identified when considering their aim to be an example for other municipalities to follow. This corroborates with the ideas of Weddelfelt et al. (2016), who suggested that some municipalities are also motivated to market their municipality positively. These motivations are not exclusive, but instead seem to work in harmony. Municipality X describes a '*healthy, clean and*

safe living environment. Not only for today's generation, but also for the coming generations that will be living in Municipality X' (Duurzaam Municipality X 2016-2020, 2015, p. 3).

5.1.2 Time horizon

The time horizon given to the ambition of the city set ground for the time horizon of the project. The following section reflects on the pass-through of those ambitions to discover its sector logic.

Long-term

The long-term perspective is 2050 (Duurzaam Municipality X 2016-2020, 2015). This horizon is in line with the national ambition, signifying the direct link as a governmental institution (Klimaatakkoord, 2018a). Another link is the way in which the municipality has defined the time horizon to become natural gas free, which is slightly earlier in time (2040). As the initiator of the project, the ambitions of the project, CO2-neutral in 2040 and natural gas free in 2030, are in line with the ambitions of the city. Considering the ambition to set the example and maximize the learning experience, it is a logical reasoning to define shorter time horizons.

Moving towards a more implicit standpoint, they tend to be doubtful about the feasibility of the long-term time frame. Even when they have been preforming as anticipated, complexities are foreseen (Jaarplan, 2018; Duurzaam Municipality X, 2017; M1 & M2, personal communication, May 25, June 1, 2018). This standpoint is based on earlier evaluations assessing to what extent existing policies would lead to the envisioned outcome. The conclusions suggested that current efforts will not suffice. With this in mind, it is not surprising that, even when Municipality X puts forward their best efforts, they tend to be doubtful. '*We need to do everything we can, but even then, it remains difficult'* (M2, personal communication, June 1, 2018). This corroborates with the idea posed in media (NOS, 2019).

Short-term

Another interesting finding relates to the short-term perspective. The finding is in accord with Weddfelt et al. (2016) results, who states that municipal strategies for visions differ from 0-15 years. This is in line with the findings related to the pace of the project. Data revealed the hope to make significant progress in the coming 4-5 years, demonstrated by the ambition to start a new project in 2018 (M2, personal communication, June 1, 2018). Even though a new project was unfeasible, sector logic brings the understanding that the municipality wants to progress during their governing period.

5.1.3 Social changes

The municipality shows a strong concern about social complexities. The reason is that they values stakeholder engagement, but *'the more people are involved, the more complex the situation gets, risking long discussions without progressing'*, slowing down the pace of the project (M1 & M2, personal communication, May 25, June 1, 2018). This information demonstrates the struggle between their

ambition to quickly progress and their desire to involve their citizens, forming their perspective on social changes.

Knowledge
With the neighbourhood approach, local state actors (municipalities) are expected to take their responsibility by creating niches in which energy-related innovation can emerge. The case is a perfect example thereof. More than providing financial resources, they have been more actively involved in terms of initiating, facilitating and supporting the project (kadernotitie, sd). With this new and much more active role, it indicates the perceived responsibility of the municipality. However, questioning the perceived responsibility leads to an interesting finding. Being a public agent withholds them to enforce changes. No matter their interest to progress, municipalities are constraint by the interest of citizens. In fact, the findings revealed a strong interest to incorporate their citizens, more than obliged by the Social Support Act (Fenton et al., 2015; Duurzaam Municipality X 2016-2020, 2015; M1 & M2, personal communication, May 25, June 1, 2018). Given this understanding, their position as a public agent limits their ability to exert power and enforce changes. Instead, they consider their role as stimulating others, possibly through policy interventions, while supporting collaboration between stakeholders (Duurzaam Municipality X 2016-2020, 2015; Kadernotitie, sd; M2, personal communication, June 1, 2018).

Values
Another finding relates to the liveability of the city for their citizens. Liveability is indicative of the well-being of people (social-altruistic values) and hedonic values (comfort and pleasure). Furthermore, their policy to preserve nature relates to biospheric values. Reasoning through sector logic relates those values to the interest of their citizens. It underpins the idea that the wishes of residents determine the pace and outcome of the transition (Klimaatakkoord, 2018). It also reasons their preference to use the term CO2-neutral and initial approach to facilitate 'front runners', because enforcing citizens with changes might overrule citizens interest. Facilitating front runners allows them to proceed without imposing citizens with unwanted changes.

Aesthetics
Part of the liveability relates to the concern about aesthetics. Sustainability policies are suggestive of aesthetic values as policies aim to safeguard their direct environment and monumental properties. References were also made to using rooftops for solar panels to avoid visual disturbance (Duurzaam Municipality X 2016-2020, 2015; M2, personal communication, June 1, 2018).

5.1.4 Economic changes

Another important finding was their perspective about how economic changes will occur in the future. When questioning risks and barriers, the economic concern was evident. It has been a reoccurring

subject of discussion. No references were made to economic independence; however, economic viability and price development were discovered.

Economic viability
Societal costs are a prevailing concern in their perspective. As it is considered to be a barrier, they consider their role to develop alternative forms of financing. In fact, such discussions were taking place at a national level (Klimaatakkoord, 2018a). Municipal officials were fairly confident that upcoming financial constructions, such as building-related financing or mortgage-related financing, would emerge (M1 & M2, personal communication, May 25, June 1, 2018). Thereby lessening the financial burden for houseowners and easing innovation to emerge. The municipality placed trust that these, at least to some extent, would help to overcome financial barriers.

Tax and energy prices
Another finding concerns their expectation of price development as they expect a price increase in the future (NOS, 2018). Such changes might occur because of market mechanisms or induced by policy measures. This would make sustainable energy sources economically viable in the future. The information points out their interest to progress, while it also suggests that they do not wish to impose high costs to citizens.

5.1.5 Technological changes

The findings revolving around technological changes supports the idea of Borup et al. (2006), who suggests that a preferred future reflects on the current situation. Whereas existing technologies should be adopted to progress, potential new technologies bring better solutions. Given this information, their perspective shows a tendency towards new technologies to overcome problems that existing cannot solve.

New technologies
The first argument to rely on new technologies relates to aesthetics of existing technologies. Technologies such as solar panels on red rooftops or windmills do not meet their criteria. New technologies might have less aesthetic impact, such as geothermic solutions (M1 & M2, personal communication, May 25, June 1, 2018).

The second argument relates to the economic concern. Adopting existing technologies would lead to high costs, whereas further advances are likely to lower costs. Engaging in adaptive management allows them to stay open for technological advances (M2, personal communication, June 1, 2018).

5.2 Market actors

The market actors identified are the network operator and two SEC experts. Placing them according to the multi-actor perspective shows a variation in their positioning (see figure 15). The network operator (NO) is a government regulated company with a somewhat public obligation to provide their clients with a well-functioning energy supply. As recognised in the case, their role is a more facilitative role in which they cohere to market demand, optimizing convenience for both producer and consumer (Trutnevyte, Stauffacher, & Scholz, 2011). SEC experts provide social and technical insights. Even though the experts are strongly in favour of a more sustainable energy system, they work on behalf of the municipality, placing them in the private sector with a for-profit interest. Creative producer (SCP) is responsible to gather insight into the interest of citizens, positioning the actor closer to the community actors. The innovation coach (SIC) focusses on technical matters, giving the actor a full market position.

Even though the market actors differ in positioning according to the MaP framework, the findings still revealed a dominant preferred future. Reasoning through sector logic and taking into account their activities revealed a focus on technological challenges.

5.2.1 Sustainable outcome

To understand the business perspective, literature gives a first insight about how companies incorporate future thinking. Holtius & Malaska (2004) have done extensive research regarding the relation, explaining that *'when the environment changes in ways which the previous approaches to strategic management cannot cope with, the company needs to change'* (p. 35). Sustainable transitions, like the energy transition, are therefore key drivers for change, either creating opportunities or limiting their current practices (Loorbach & Wijsman, 2013). It requires companies to not only change their practices but affects the way in which organisations envision their future organisational state. This information helps to understand the motives identified in the case.

Motives

A remarkable finding is to see that the market actors refer to the national ambition of becoming CO2-neutral, while probing reveals a more implicit focus on natural gas-free. '*We obviously want to succeed in having natural gas free neighbourhoods, […] because if we manage to replace natural gas by a sustainable source, we might have solved about 80 percent of the problem*' (SIC, personal communication, May 25, 2018). The same driver is found with the network operator that states '*Netherlands wants to be CO2-neutral in 2050 […] which means a heat supply without natural gas*' (annual report NO). Offsetting natural gas is then considered as an inevitable event that supports mitigating climate change.

Probing for a more in-depth understanding of their perspective explains the focus. The reason is that this ambition has more impact on their activities, which supports the idea of Loorbach and Wijsman (2013) in the way practices are affected. For example, a central activity of the network operator is taking care of the gas network. Reasoning why it is not surprisingly that offsetting natural gas has major implications for the companies activities. It would require a change in practices, because maintaining the network would only be relevant if an alternative form of gas arises in the future. Besides, alternatives for natural gas might require improvements of the electricity grid, which is equally part of their business (NO1, personal communication, June 25, 2018). Another example is given by the creative producer (personal communication, June 5, 2018) as her role within the project is to focus on residents participation and to integrate their interest. Focusing on natural gas raises more questions among residents than CO2-reduction or CO2-neutral, making natural gas-free dominant in her perspective. But also, the innovation coach (personal communication, May 25, 2018) raises the technical challenge associated with becoming natural gas-free. Solutions to alternative heating systems are still in their early stages, necessitating technological development. This means that even though the market actors show the motivation to become CO2-neutral, the actor tend to focus on natural gas-free for more practical reasons.

5.2.2 Time horizon

In contrast to suggestions made in literature, the time horizon differ from the findings presented here.

Long-term

The findings of the case reveal an even longer time frame than suggested in literature. Holtius and Malaska (2004) point out that strategic management, which describes the preferred outcome, provides a long-term perspective. This perspective is ten years hence, depending on the type of company. Visionary companies have a time horizon twice as long proactive companies. Market actors refer to 2050, suggesting that they are visionary companies when taking into account their interpretation of the situation (Beckert, 2013; Loorbach & Wijsman, 2013).

Probing their perception about the feasibility of this envisioned endpoint, actors refer to a non-linear development. The market actors are well aware of complexity and raise the 2050 is rather challenging. Nevertheless, the respondents seem to remain optimistic, but stress that transitions do not unfold as linear developments. Considering innovations and adoption theories, it is interesting to see that market actors foresee an exponential growth around 2035. Corresponding to their technological focus, technological development plays an important role.

Short-term

Whereas literature argues that the long-term perspective helps to set more specific goals and drives an organisations core activity (Holtius & Malaska, 2004), making it a strategic way to guide short-term

activities. Data revealed a more implicit short-term time frame when questioning the pace of the project. Recapping the context, new technical insights on the infrastructure revoked momentum to renovate the energy system. Therefore, adopting certain innovations became less appealing. Respondents express their expectations about technological development in the coming 5, 10 to 20 years. Technological improvements would create new opportunities and momentum to adopt renewable technologies in the future. Therefore, reasoning from a market perspective, better opportunities are yet to come (NO2, personal communication, June 25, 2018; SCP, personal communication, June 5, 2018; SIC, personal communication, May 25, 2018). This argument shows how the actors work with a more implicit time frame than made explicit in the project.

5.2.3 Technological changes

Reconstructing the preferred future of market actors illustrated a technological focus. Actors are in favour of using existing technologies but are clearly aware of technological challenges to be solved in the future.

Existing technologies

The reason for actors to work with existing technologies derives from the potential of existing technologies and how it boosts innovation. 'W*e know about the current technology and what it can offer'* (SCP, personal communication, June 5, 2018). Besides, *'if we want to phase out fossil energy, then we would have to make use of solar- and wind energy'* (SIC, personal communication, May 25, 2018), referring to the capability of present technologies. Besides, adopting existing technologies also boosts technological development (SIC, personal communication, May 25, 2018). For new technologies to emerge, it requires the use of existing technologies to learn and improve.

New technologies

Actors are confident about the potential development of technologies to meet user demand *(*NO2, personal communication, June 25, 2018*;* SIC, personal communication, May 25, 2018). Technological development might not only enhance current technologies, such as energy storage or 3D printing requiring less manpower, it could also lead to innovative and (more) practical solutions that meet market demand and thus ease the transition. Examples given are future gas allowing the use of the current gas network or the use of an open system with an advanced two-way energy demand and supply flow (NO2, personal communication, May 25, 2018). Thus, while reckoning the ability of current technologies, it is of no doubt that future technologies will ease the process.

Another reason relates to their focus on becoming natural gas-free. Existing technologies to replace natural gas are still in the early stages. The downsides of these technologies are unable to cope with the wishes and needs of consumers. Therefore, technological development is considered key in offsetting natural gas, thereby accelerating the energy transition.

5.2.4 Economic changes

Another finding that is indicative of the technological focus relates to their economic concern. Data revealed that the actors are concerned with the economic viability of the energy transition. To overcome this barrier, they point out technological development and to the development of tax and energy prices. No references were made to energy independence.

Economic viability

Actors coherently assume that the energy transition in general puts a financial burden on citizens. '*People will need to invest'* (SCP, personal communication, June 5, 2018), raising the question on how to equalize the costs among society. They share the concern that *'it might not be economically feasible*' (NO2, personal communication, June 25, 2018; NO annual report, 2018).

The concern relates to the current situation in which technological change is associated with high financial costs. On the one hand, 'one does not want to go to fast and impose citizens with high costs, while on the other hand one does not want to go too slow either as that would lead to few innovations, nor will the costs decrease' (SIC, personal communication, May 25, 2018). To reduce the costs, it would require upscaling as normally with innovation trajectories. A similar perspective is seen with the network operator (NO1 & NO2, personal communication, June 25, 2018). The price of energy depends on the accumulated costs of their operations. Relating this financial model to their concern about how to minimize costs for their clients, their interest is to anticipate promptly to alterations in the energy system to avoid unnecessary high costs. For example, the costs of existing technologies are higher if an electric substation is further located from the electricity grid, making the investment less viable. To effectively oversee such costs, it requires an alignment of activities the nearby areas. Such information would lead to more efficiency and reduce costs.

Tax and energy prices

Market actors also take into account price developments in the future, because '*if the energy prices do not decrease, we might get energy poverty'* (SIC, personal communication, May 25, 2018) among the lower incomes in society. The actors show consensus about the concern, after which each of them mentions the need to equalize costs among society (NO1 & NO2, personal communication, June 25, 2018; SCP, personal communication, June 5, 2018; SIC, personal communication, May 25, 2018).

5.2.5 Social changes

In line with the previous elements, the last element shows a relation to technological implications and their positioning as a market actor. Their main concern relates to the wishes and demand of consumers (citizens mostly). Based on this information, the data tells that the market actors consider their role to optimize the situation for citizens to adopt new technologies. This means that the main concern relates

to the willingness to change of users, not that of the market actors themselves. For that reason, the three indicators are discussed simultaneously.

Values, knowledge and aesthetics

The starting point to understand their perspective is by reflecting upon their role in the project. The network operator holds a more facilitative role. It is their responsibility to alter their services according to the new demand. The creative producer is responsible to integrate the wishes and needs of citizens. The innovation coach is responsible to give technical insights to come to the best technological solution for the neighbourhood. This means that their activities are concerned with the interest of citizens (values and aesthetics) as they are the ones responsible to adopt new technologies (knowledge).

Nevertheless, the market actors discuss an interplay between the benefits and costs of technological choices. This perspective was mainly argued by the network operator. From their standing, they prefer a future system that operates on a single infrastructure. Although multiple networks might seem more interesting to meet the market demand, it would also lead to high costs, making it ineffective. Therefore, the network operator prefers collective decision-making on a single infrastructure (NO1 & NO2, personal communication, June 25, 2018). At the same time, they reckon the individual interest of resident, forming their expectations of a somewhat differentiated solution. This means that market actors prefer to go with collective pursuits in order to upscale, support innovation and minimize the costs of (future) technological solutions. Yet are limited as it might interfere with consumer interest.

5.3 Non-profit actors

The non-profit actors identified are two local associations (LA1 & LA2), the energy cooperative (EC) and the two social housing corporations (HC1 & HC2). When evaluating their activities, it shows that, according to the multi-actor perspective, their position within the non-profit triangle differs (see figure 15). Comparing the actors, the two local associations are located closer to the community actors, whereas the housing corporations are nearer to the market actors. Local association 1 is in favour of the energy transition and focuses on energy-related activities. Local association 2 is a resident union that represents interests of residents living in the neighbourhood. The energy cooperative is given a more central position as it is a grassroot initiative, providing an alternative energy supply without having the goal to make profit. They combine market-logic with community interest (Seyfang et al., 2013).

Analysing the perspectives of the non-profit actors revealed overlap even as differences. The differences lead to a division of two groups, those focusing on energy-related activities (energy cooperative and local association 1) and housing corporations. Analysing these two groups separately

turned out to be relevant for interpretation. The other local association (2) is merely concerned with raising the interest of citizens, which is why the organisation is cautious in taking a standpoint at times. The organisation shows similar standpoints at times but emphasise that they do not have an interest in the outcomes other than the residents.

5.3.1 Sustainable outcome

The findings revolving around the preferred sustainable outcome shows three motives. Actors likewise express that the main motive is for environmental reasons, but alternative motives relate to economic concerns and organisational improvements.

Motives

Data shows that actors reckon the need to move towards a more sustainable energy system (News item EC & LA1,2, 2017; websites HC1 & HC2). This indicates the environmental motive to mitigate climate change by becoming CO2-neutral. Even though some of the actors are more assertive towards the ambition than others, all actors are of no doubt that things will need change. The actors also agree that natural gas-free stimulates the overarching ambition of CO2-neutral. Either it will create conditions that encourages steps towards CO2-neutral in 2050 (LA1a, personal communication, June 21, 2018) or it might boost the interest in sustainable energies overtime (EC, personal communication, June 21, 2018). Another reason is that suggest it to be provocative in the political debate about CO2-neutrality (LA1, personal communication, September 13, 2018; HC1, personal communication, June 12, 2018). Although the argumentation somewhat differs, it is evident that actors consider a future without natural gas supportive of the end-point CO2-neutrality.

It is remarkable that, even though actors agree that natural gas-free contributes to CO2-neutral, the impact thereof on their activities clearly differs. Offsetting natural gas is likely to boost the activities of the energy cooperative and local association 1. The reason is that activities focus on providing alternative energy solutions (energy-saving and solar panels). Offsetting natural gas would likely increase the interest in these alternatives (EC, personal communication, June 21, 2018). This is in contrast to the impact on the housing corporations. Becoming natural gas-free has more implications than an ambition as CO2-neutral or reduction, such as replacing heating systems. Following that line of argumentation, it would also mean that if natural gas-free becomes the norm, it requires much more interventions for a housing corporation in their activities, than for other non-profit organisations (HC1, personal communication, June 12, 2018; HC2, personal communication, June 21, 2018). Reasoning why housing corporations, at least for now, work with the ambition of CO2-neutral in mind.

Elaborating on their activities reveals once again a different focus, which is CO2-reduction. Whereas the endpoint is described as CO2-neutral, activities prior to the project show a clear focus on

CO2-reduction. Both local associations have been involved in the energy-saving project Hoom (2014). Also housing corporations have been taking energy-saving measures to comply to the covenant of Aedes (2018a), which is to work towards an average energy label B by 2020. This suggests a more implicit focus on CO2-reduction as part of becoming CO2-neutral.

The second motive identified was to improve social cohesion in the neighbourhood by organising collectively regarding energy-related activities. It is interesting to note that all the organisations express this motivation. The reason that non-profit organisations have a direct interest in improving social cohesion is that it would improve the services (housing corporations) or as it improves liveability of their direct surroundings (local associations and energy cooperative). Given this insight, creating new organisational forms motivates them to engage in energy-related activities.

The last motive relates to the economic concern of housing corporations. Reflecting upon the covenant of Aedes (2018a), part of the aim was to reduce the cost for energy of their tenants. Upgrading the energy label of houses would lessen their monthly spending on energy. As the housing corporations relevant to this case have a focus on lower income groups, keeping the costs of living of those residents is a principal concern.

5.3.2 Time horizon

Questioning the time horizon reveals how energy-focused organisations hold a different perspective than those that do not have energy activities as their main concern. The difference is best explained through their activities.

Long-term

The first noticeable discrepancy is found when reflecting upon the long-term perspective, which becomes even more apparent when questioning their standpoint about its feasibility. Whereas the energy-focused organisations tend to be opportunistic, other organisations are fairly cautious. With the aim to understand the differences, reasoning from their activities helps to comprehend.

Companies focusing on energy-related activities were initiated with the idea to boost the energy transition, making them visionary organisations. These actors are strongly driven to attain the ambition, leading to a preferred endpoint earlier in time. For example, the energy cooperative works with the ambition to make the city energy-neutral before 2030. Such actor is surrounded by and confronted with expanding interest in renewable energies. Even if the increasing interest is minimal, these organisations see the change (EC, personal communication, June 21, 2018). Given this understanding, optimism about the feasibility is comprehendible considering their motives and activities.

This is in contrast to the perspective of the housing corporations. Houses are built to last about 50 years with a major maintenance after 25 years. Envisioning an endpoint in 2050, which is 30 years from now, is rather short on time. This means that even when housing corporations are in favour of making changes, the challenge is evident. Besides, the housing corporations currently focus on CO2-reduction as campaigned for in the Aedes covenant (2018a). Those activities might contribute, but it is unlikely that their current approach will lead to CO2-neutrality nor becoming natural gas-free in time. It is therefore not surprisingly that housing corporations consider a time horizon of 2050 rather implausible (HC1, personal communication, June 12, 2018; HC2, personal communication, June 21, 2018).

Short-term

More than the short-term ambition defined by each organisation, the most interesting finding was regarding the pace of the project. Even though the actors work with a different long-term horizon, all actors hope that the project will be executed '*in the coming years'* as the problem urges (EC, personal communication, June 21, 2018), referring to a time period of approximately 5 years (LA1a, June 21, 2018; HC1, personal communication, June 12, 2018; HC2, personal communication, June 21, 2018). While for the housing corporations, they are committed to ambition of 2021 (Aedes covenant). It is therefore not surprisingly that these actors want to quickly progress. This means that the doubtfulness about the feasibility does not seem to affect the participation of housing corporations in the project team. Instead, both organisations strongly hold on to the short-term goal as outlined by the covenant of Aedes in 2020.

5.3.3 Social changes

A dominant standpoint of non-profit actors relates to social changes. This standpoint forms the bases for technological and economic changes.

Knowledge

Data reveals that non-profit actors perceive themselves responsible to make a change. Both housing corporations point out their role in the energy transition. The same accounts for the organisations focusing on energy-related activities. Their reason of existence is even to boost the energy transition, exemplifying their perceived responsibility to act.

Values

The non-profit actors are strongly concerned with hedonic and social-altruistic values while increasing social cohesion. The members of the local associations live within the area, which explains their interest is to improve the quality of living, such as comfortable living (hedonic), in their own neighbourhood (LA1a, personal communication, June 21, 2018; LA2, personal communication, September 13, 2018). The same accounts for the energy cooperative which main aim is to support local

energy-activities, boost local independence while stimulating social cohesion (social-altruistic) in the city (EC, personal communication, June 21, 2018). As the liveability of tenants is a fundamental basis for the services of the housing corporations, their interest to improve quality of living is alike (HC1, personal communication, June 12, 2018). Part of that improvement is increasing social cohesion among citizens. Given this insight, non-profit actors have a direct interest in the area.

Although for different reasons, non-profit actors point out their preference for collective pursues. As the energy-focused are visionary organisations, acting collectively would lead to a faster pace of the project. '*The sooner, the better*' (LA1a, personal communication, June 21, 2018). The housing corporations are also in favour of making collective changes. Their reason is that it would be more effective to adjust multiple properties at the same time, reducing cost and nuisance. Besides, among their properties are apartment blocks for which regulations oblige an approval of at least 70 percent before they are allowed to make changes (HC1, personal communication, June 12, 2018; HC, personal communication, June 12, 2018; Rijksoverheid, 2018).

Aesthetics

Even though non-profit actors agree about the liveability of the neighbourhood, questioning the meaning of the concept according to the definition of social change revealed a discrepancy. Housing corporations point out the importance of aesthetics as it is part of their dwellings services. A decay in the appealing affects the (economic) value of their services and properties. This is in contrast with the energy-focused companies in which aesthetics was not pointedly mentioned. Instead, they focus on making progress and less concern about aesthetics.

5.3.4 Technological changes

Findings on technological change show a clear difference between the two distinct groups identified. Data revealed a tendency towards the use of existing technologies, although hope is given to new technologies for aesthetic reasons and to replace natural gas.

New technologies

Discussing the aesthetics during the interviews also reveals the different perceptions about technological change. Data revealed how the limitations of current technologies were strongly argued to their appealing. Examples that pointed out the limitations of current technologies were described as rooftops filled with solar panels, nuisance due to heating systems and unappealing windmills. Their strategy is therefore '*to be alert for upcoming technical solutions […] within the financial possibilities*' (HC1, personal communication, June 12, 2018). Furthermore, according to the housing corporations, the existing technologies to replace natural gas are of relatively little potential. The costs are high, and the perceived benefits are few. Considering their activities, it makes sense that the organisation put

faith in the potential of future technologies, more than existing technologies (idem; HC2, personal communication, June 21, 2018).

Another finding reveals how the housing corporations rely on new technologies when discussing the ambition to become natural gas-free. As natural gas-free is associated with more technological challenges, housing corporations would need to adjust their activities. Instead of energy-saving, offsetting natural gas would require substantial adjustments. As existing technologies still offer limited benefits, housing corporation hope for better alternatives in the future.

Existing technologies

In spite of the technical limitations associated with natural gas-free, data does show a stronger tendency towards the use of existing technologies. The reason is that both are eager to progress. In the case of housing corporations, it could be easily argued that new technologies might reduce costs or provide better solutions. Technological advances would make it interesting to wait for innovation to emerge. But in spite of this awareness, their commitment of Aedes takes the overhand. The same reasoning is found with the energy-focused organisations. They are mostly occupied with the current technologies while placing confidence in the development of even more promising technologies in the future. Taking their standpoint, in order to progress it requires society to act now and thus with the available technologies. It equally justifies their activities in which they support the use of existing technologies, focusing on their capabilities instead of limitations. At the same time, encouraging and persuading citizens to act is solely cogent when focusing on current technologies as 'imaginative' technologies are inexistent.

5.3.5 Economic changes

The last point to raise concerns the different perspectives regarding economic changes. Findings pointed out arguments concerning economic viability and energy independence. No clear references were made to tax and energy prices.

Economic viability

Although the actors agree that energy transition the is a collective concern that affects everyone in society, but the burden on citizens and housing corporations is much more apparent (PBL, 2018). The economic concern of housing corporations was evident throughout the data. It is therefore not surprisingly that the covenant of Aedes (2018a) was partly driven by reducing energy-costs for tenants. This economic concern was equally raised during the interviews with the local associations and energy cooperative. In fact, their activities have focused on the financial benefits deriving from renewable energies or energy-saving measures. These organisations advocate the economic opportunities the transition creates (Brochure LA, 2015; News item EC & LA1,2, 2017).

Energy independence
Both the energy cooperative and local association 1 were initiated with the aim to encourage bottom-up activities in Municipality X. They envision '*a future in which a local energy system is the norm'* (EC, personal communication, June 21, 2018). These actors specifically argue their interest to create energy independence. It allows them to generate a win-win situation in which it enlarges social cohesion neighbourhood while creating financial benefits. It creates ownership, boosts local independence, improves social cohesion while creating opportunities to reduce costs through energy production and effectiveness (LA1a, June 21, 2018; LA2, personal communication, September 13, 2018).

5.4 Community actors

Community actors are the residents of the area. This group consists of almost 4,000 residents. Relevant for interpreting the preferred future is that the average age is between 55 and 65 years. About 63 percent of the residents has been living in the area for over 15 years. Residents rated the neighbourhood with an 8.3 for pleasant living and most do not plan on leaving any time soon (Monitor, 2017).

Allocating the community actors according to the multi-actor perspective positions them the same (see figure 15). Though, reconstructing a preferred future of almost 4,000 residents seems to be close to impossible. Even though this section gives no complete overview of the existing preferred futures, data did find remarkable overlap among elements. The main reason relates to the practicalities as changes in the energy system might have a direct impact on their ways of living.

5.4.1 Sustainable outcome

When questioning their motivation to engage in the project, different motives were discovered with CO2-neutral, CO2-reduction and natural gas-free.

Motives
A select group of residents participates in energy-related projects to reduce their environmental impact. These residents consider natural gas-free as a step towards CO2-neutral and avoid resource depletion. Describing these residents is best by using the term 'front runners'. Their main concern is to contribute towards a more sustainable society (Sounding board meeting, personal communication, June 26, 2018).

Yet, the dominant term is natural gas-free. It is commonly mentioned throughout discussions, mostly referring to practicalities (Project team reports 1 & 2; Sounding board meeting, personal communication, June 26, 2018). However, residents associate it with different motives as presented in chapter 4, such as the social issues in Groningen or resource depletion. Others suggest that natural

gas-free is a ‘political’ or ‘emotional’ debate and question the motive for sudden decision-making. If so, alternative solution such as climate adaptation should be taken into consideration as well.

Another remarkable finding was the motive to engage in CO2-reduction. Prior to the project, activities in the neighbourhood were focused on CO2-reduction. Although these were initiated under the pretext of reducing environmental impact, findings revealed that residents mainly participated for financial reasons (NOS, 2018e; Project team report 1 & 2; SCP, personal communication, June 5, 2018; Research neighbourhood incentives, 2016).

5.4.2 Time horizon

A remarkable finding was that the perspectives revealed the sector logic of the community actor.

Long-term
Although not all residents share the same optimism, ‘*2050 should be feasible I think, that gives us still 30 years, that should be doable’ (*R1, personal communication, June 28, 2018). The longer the time horizon (25 years), the easier it is to imagine changes (Höjer, Gullberg, & Pettersson, 2011). Especially when changes directly impacts their activities while carrying the financial burden. Residents referred to a certain momentum, such as ‘once I move’ or ‘when I pass away’ or ‘my children’. The sooner changes will take place, the sooner it will have an impact on their lives (Sounding board meeting, personal communication, June 26, 2018; R1, personal communication, June 28, 2018; R2, personal communication, July 4, 2018; creative producer, 2017).

Short-term
Data shows a variety of short-term horizons, varying from 5 to 20 years. Whereas front runners are eager to act, many are guided by risks. As ‘wrong’ decision-making affects every-day activities, residents speculate about the negative consequences of quick decision-making and being an early adapter. Waiting a couple of years for technology to develop, thereby calmly consider the alternatives and wait for momentum is less risky (Sounding board meeting, personal communication, June 26, 2018; R2, personal communication, June 28, 2018). The larger the perceived risk, the less likely a community actor will consider making changes any time soon. Part of this consideration also relates to their age. Without environmental motives for future generations and considering that return on investment exceeds for some their life expectancy, these community actors do not envision change in the near future (Löckenhoff & Rutt, 2015; R2, personal communication, June 28, 208).

5.4.3 Social changes

Their willingness to make changes in their properties depends on the perceived impact to their quality of living. This points out the weigh of individual implications, explaining the focus on natural gas

(project team reports 1 & 2). It functions as a starting point to understand their standpoint regarding social changes.

Values

It turned out that that the quality of living is a prevailing concern, which is why the preferred future is reasoned according to their individual interest. Participating in collective activities prior to the project often led to individual benefits. For example, energy-saving projects were perceived to increase comfort (hedonic values) and improved the economic situation (egoistic values). In other words, joining those projects was associated with personal benefits (EC, personal communication, June 21, 2018; LA1a, personal communication, June 12, 2018; R2, personal communication, July 4, 2018). In line with the findings posed earlier, the survey (Monitor, 2017) underpins the assumption as the majority was unaware of their property's energy label. It suggests that residents were not concerned with reducing energy consumption for environmental reasons. This also explain the focus of residents on natural gas. This ambition is associated with much more practical concerns, such as alternative heating systems with low temperature might be uncomfortable (project team reports 1 & 2; SCP, personal communication, June 5, 2018).

Besides, residents prefer individual choices over collective measures unless collective measure offers individual benefits such as cost reduction. Collective pursuits should not oblige residents to join as it might overrule individual interest. Whereas the terms CO2-neutral and -reduction insinuate a freedom of choice, natural gas-free does not. Even though the focus lays with natural gas, residents expect the project to employ a differentiation approach to allow individual choices (Project team reports 1 & 2; R1, personal communication, June 28, 2018; R2, personal communication, July 4, 2018; Sounding board meeting, personal communication, June 26, 2018).

Aesthetics

Aesthetics is considered as part of quality of living. Modifications in the energy system should not cause noises, decrease the value of the property, nor impact the scenery. For instance, alternative heating systems being noisy and windmills leading to unsightly neighbourhoods, city or even sea views (Sounding board meeting, personal communication, June 26, 2018, R1, personal communication, June 28, 2018; R2, personal communication, July 4, 2018; project team reports 1 & 2).

Knowledge

Findings revealed that some residents raised questions about the 'true' interest of the government to pursue these activities. This corroborates with earlier findings (Monitor, 2017), which revealed that around 60 percent of the population distrusts the government. This distrust was evident when discussing offsetting natural gas, which they perceived as sudden decision-making. If the Netherlands still profits from the natural gas supply, why not wait while alternative energy technologies can develop

in the meantime? '*Because what happens if the economy is turbulent and we just cut-off the cheapest form of energy? What about the industry? Wouldn't it be more effective to invest our money abroad?*' (R1 & R2, personal communication, June 28, July 4, 2018; project team reports 1 & 2). Although this shared among a selective group, the finding confirms the association between their positioning as an actor as suggested by Steg et al. (2015).

5.4.4 Economic changes

The economic impact is also a dominant concern in the preferred future of community actors.

Economic viability

Considering that the community actors are the ones accountable for the costs, no wonder the financial burden has been raised as one of their main concerns. Even when having strong environmental motives, if sustainable energies lead to high prices, it creates a dilemma. According to their knowledge, alternative technologies to replace gas are either expensive or fail to comply with the current living standard. But even the findings on existing technologies with proven benefits are discussed from an economic standpoint. The energy transition '*will cost a lot and as the Dutch always take an economic standpoint, they will always consider how they can benefit the most'* (R1, personal communication, June 28, 2018). Another example relates to the average age of residents (55+) (Löckenhoff & Rutt, 2015). For those of older age, there is no economic incentive to invest in renewables when the payback time exceeds their life expectancy (20 years hence) (Project team reports 1 & 2; R2, personal communication, July 4, 2018; SCP, personal communication, June 5, 2018). This line of argumentation shows that the costs overrule the future environmental impact. This brings the understanding that citizens are motivated to reduce energy consumption as it suggests cost reduction but are less prompted with a project that strives to stop using natural gas because it is associated with increasing costs.

Tax and energy prices

Even though media suggests future price developments (NOS, 2017), community actors tend to be disbelieving. Argued through historical reasoning, distrust in the government, and inability to oversee externalities. A prevailing argument was that switching to natural gas in the past was an affordable and even cheaper alternative. Besides, natural gas has been a national income over the past couple of years. Considering that European countries continue to use natural gas, it is perceived unlikely that renewable energy will become a cheaper alternative (R1 & R2, personal communication, June 28, July 4, 2018). This suggests that community actors are unlikely to take price developments into account when investing in renewable energies.

Energy independence

Even though residents are at times doubtful about the project's activities, it is noteworthy that they did participate in prior energy projects. Apart from economic incentives, energy independence was raised as an alternative reason to invest in solar panels (R1, personal communication, June 28, 2018; R2, personal communication, July 4, 2018; Project team 1). This information is suggestive of energy independence being solely applicable with CO2-ambitions and not with natural gas-free ambitions.

5.4.5 Technological changes

The fear of high costs also echoes in the expectations of community actors regarding technological changes. Residents are positive about existing technologies that lead to economic benefits but tend to be doubtful about existing technologies that should replace natural gas, giving hope to technological developments.

Existing technologies

'Front runners' find that the urging problem simply leaves no alternative, making each effort valuable (Sounding board meeting, June 26, 2018; Steg et al. 2015). For this reason, investing in a property is always an improvement. If residents take this standpoint, one is much more willing to invest in properties by using existing technologies (Sounding board meeting, June 26, 2018). Besides, they associate these technologies with life quality improvements, feel ownership to reduce environmental impact and focus on economic opportunities. In contrast to those with strong economic concerns, these residents are more willing to adopt technologies that have proven to be efficient, such as solar energy (R1, personal communication, June 28, 2018; R2, personal communication, July 4, 2018).

New technologies

Generally speaking, *'technology will continue to improve and become more efficient'* (R1, personal communication, June 28, 2018), thereby reducing risks and costs (sounding board meeting, personal communication, June 26, 2018). However, as this group focuses on natural gas, prevailing arguments to rely on new technologies relate to alternatives being too costly with few benefits. Therefore, optimism is given to the potential of technological advances to either mitigate or adapt to climate change. Waiting another 5 years for potential technologies to develop, improving their efficiency and lowering the investment costs is common among residents (sounding board meeting, personal communication, June 26, 2018). '*If the industry would come up with a technology for sustainable heating system that is easy to implement and affordable, that would be great*' (R2, personal communication, July 4, 2018).

5.5 Summary: overview of the preferred futures for each actor-type

Reconstructing the preferred futures for each actor-type revealed a strong sector logic. As this is an important finding before comparing the different preferred futures, this section briefly summarises

the different perspectives. The section ends by providing an overview of the preferred future for each actor-type in table 6 (p. 84).

State actor
Their role as a public agent leads to a double interest: Working towards a more sustainable society while improving liveability for their citizens. With a focus on CO2-neutral, it allows compensation to avoid overruling certain interest. Even though they are confident about incentives that help to overcome financial barriers, which eases the emerge of innovation. But in the end, the pace of the project depends on the wishes of the residents, withholding them to carry out changes without societal acceptance.

Market actor
Market actors strongly relate to technological challenges. In a formal setting, actors work with the ambition of CO2-neutral to mitigate climate change but show a more implicit focus on natural gas-free looking at their concerns. The reason is that offsetting natural gas is associated with more technological challenges, requiring technological advances in the coming 5, 10 or 20 years. Besides, with the disappearing of momentum, it is more interesting to wait for new developments to lower costs and better alternatives from the consumers point of view. At the same time, boosting innovation requires the upscaling existing technologies. They prefer collective pursuits for technical and economic convenience, but equally point out the consumer demand for differentiation.

Non-profit actor
Non-profit actors work towards CO2-neutral in 2050. Reflecting on their activities, they strongly act upon their perceived responsibility and want to make significant progress in the coming 3 to 5 years. Both benefit from clustering technological adjustments to make it economically viable, while enlarging social cohesion in the neighbourhood.

The energy-focused organisations are strongly driven for environmental reasons. Their activities revolve around sustainable energies, create economic opportunities and envision a local energy system in the future.

For now, *the housing corporations* focus on improving the energy efficiency of their properties according to the covenant of Aedes (2018a). Most of the activities focus on energy-saving measures by means of existing technologies. Offsetting natural gas requires alternative interventions, necessitating technological advances, leading to a decrease in costs and to improve the aesthetics of those technologies.

The other local association (2) takes similar standpoints such as improving liveability and social cohesion. However, they are also more reluctant to take standpoints as their aim is to remain representative for the different standpoints among residents.

Community actor

The community actor's perspective is strongly formed by practicalities. Whereas actors participated in CO2-reduction for economic reasons, this is no longer the case with natural gas-free. Actors focus on the latter as it is associated with cost increase, affecting their quality of living and aesthetics of the neighbourhood.

	State actor	Market actor	Non-profit actor Energy-focus	Non-profit actor Housing corporations	Community actor
Characteristics	Public role	Technology focus	Visionary	Homeowners	Practicalities
Sustainable outcome *Implicit/activities* *Other*	CO2-neutral *CO2-reduction* Market city positively	CO2-neutral *Natural gas-free*	CO2-neutral Organisational	CO2-neutral *CO2-reduction* Organisational Economic (service)	Natural gas-free Economic
Time horizon *Short-term*	2050 ⟶ Project's ambition Governing period	2050 ⟶ 5, 10, 20 years (momentum)	⟵ 2040 3-5 years	2050 ⟶ 3-5 years	25 years hence 5 – 20 years
Social change	Facilitative role Individual interest (*of citizens*) Biospheric, Social-altruistic values Aesthetics	Facilitative role Collective action	Act upon responsibility Collective action Social cohesion (social-altruistic value)	Act upon responsibility Collective action Social cohesion (social altruistic value) Aesthetics	'front runners' act Individual interest Hedonic, biospheric, egoistic values Aesthetics
Technological change	 New technologies	Existing technologies *(boost innovation)* New technologies *(Natural gas-free)*	Existing technologies (*to progress*)	Existing technologies (*to progress*) New technologies *(natural gas-free)*	Existing technologies *(financial benefits)* New technologies *(natural gas-free)*
Economic change	Alternative forms of financing Tax and price development	Technological development Tax and price development	Subsidies & economic opportunities Energy independence	Economic concern	Economic concern

Table 5: *Overview of the dominant perspectives for each actor-type*

6. Analysis: Comparing the preferred futures

The following chapter compares the different preferred futures of the various actor-types presented in chapter 5 according to five elements (sustainable outcome, time horizon, technological-, economic- and social- changes). In addition, the data has been analysed in relation to the findings presented in chapter 4 (framing of the terms) and reflect upon the events presented in section 3.2.1. The comparison revealed more in-depth information about how the different preferred futures differ as it revealed nuances and value-laden standpoints. However, note that the information presents tendencies which are strongly emphasised to reveal the differences in preferred futures, but these different standpoints are not necessarily conflicting.

6.1 Sustainable outcome

Although the project was initiated in line with the energy transition, it is striking to see that motives only partially overlap. Differences are seen in both explicit and implicit statements, giving first insights in explaining the sudden interest of community actors when using the term natural gas-free.

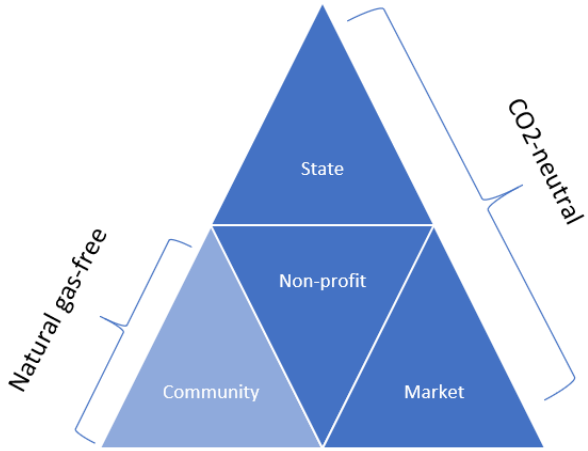
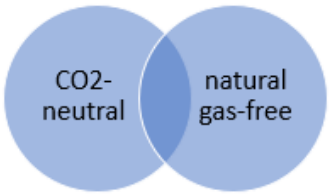


Figure 16: *Formal and informal actor-types focusing on different terms*

Linking the findings to the MaP framework (see figure 16) reveals that formal actors relate to a different ambition than informal actors (community). Not surprisingly, actors formally involved relate to the ambition of the project (CO2-neutral). Even though the project team formulates natural gas-free as part of CO2-neutral, community actors focus on natural gas-free. Having an informal position does not require actors to agree with the projects activities, but instead are compelled to the project for geographical reasons. Linking this understanding to the frames presented in chapter 4, a project aiming to become co2-neutral is not the same as natural gas-free. If the aim is to combat climate change, then why suddenly decide to offset natural gas? It confuses those informal actors that relate natural gas-free to a different (environmental) problem. Problems that could potentially be solved

otherwise, such as climate adaptation. This means that actors are trying to solve different problems. In other words, actors have different motives to work towards natural gas-free, shaping a different preferred future. To give an example, if actors relate natural gas-free to the issue of the social dilemma caused by natural gas extraction. Their preferred future might still involve the use of natural gas, but extracted elsewhere (R2, personal communication, June 28, 2018). While those trying to solve resource depletion, are likely to prioritise their activities differently. The difference between formal and informal interest is therefore important to when describing different preferred futures.



- State actor
- Non-profit (energy-focused) actors

- Market actors
- Homeowners (community and housing corporations)

Figure 17: *Interpreting the different terms according to the actors' activities*

Analysing the preferred sustainable outcome according to their activities, the actor-types interpret the terms differently. The activities of the state and non-profit (energy-focused) actors are concerned with CO2-reduction as part of CO2-neutral. Offsetting natural gas has limited impact on their activities. In fact, it might even favour their activities. This impact contrasts with the activities of homeowners, demonstrating the different interpretations. Housing corporations are currently working with CO2-neutral in mind. Offsetting natural gas would require other kinds of interventions. This exemplifies how these ambitions are considered as separate aims. This same line of thought is found with the community actors who have similar activities. While market actors do consider natural gas-free as part of CO2-neutral, related activities differ. Natural gas-free has a significant impact on the activities of the network operator. As well as it is associated with many technological challenges to meet market demand (SIC & SCP). Based on this information, market actors and homeowners interpret the two ambitions differently than state and non-profit (energy-focus) actors (see figure 17).

Noteworthy is that a different focus leads to different priority setting. An actor considering natural gas-free as an inevitable event prioritizes activities differently than those who consider it as provocative. If natural gas-free is inevitable, discussions focus on finding alternatives. While discussions with those having CO2-neutral in mind focus on boosting other activities, such as energy-saving or solar panels (EC, personal communication, June 21, 2018). These different interpretations were initially unknown, but the case discovered this discrepancy over time. After which the project

team preferred to use the term CO2-neutal over natural gas-free to avoid such miscommunication (M2, personal communication, June 1, 2018).

6.2 Time horizon

To explain how actor-types work with different time horizons in mind, outcomes are presented in line with the two indicators: long-term and short-term.

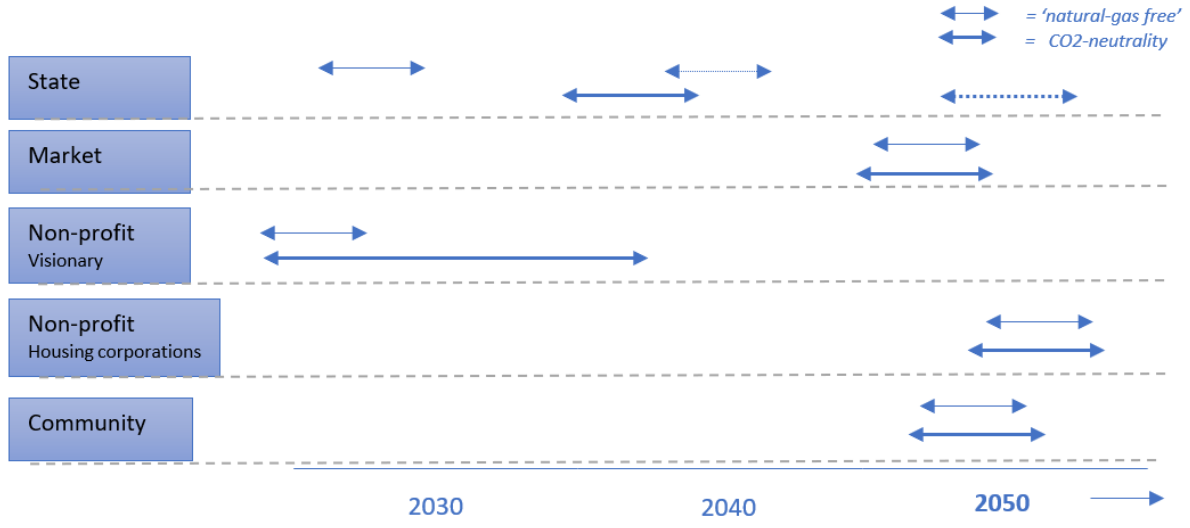


Figure 18: *Comparing the long-term time horizons of the different actor-types*

Long-term

In contrast to earlier findings in section 4.1.1, suggesting that the terms are associated with different time frames, it appears that time horizons are not as straight forward in practice. Only the state actors, which is the initiator of the project, clearly works with the projects formulated time horizon, which reconciles with the city's ambition (dotted arrows). This explains why the figure shows two different time frames. Other actors do not make a clear distinction between the ambition of natural gas-free and CO2-neutral, nor do they refer to the projects ambition throughout discussions. Instead, actors mention the time horizon relevant for them as an organisation or individual.

At first sight, figure 18 suggests that most actors relate to the national ambition of 2050. Reading the description in chapter 5 brings the understanding that most frames, except the housing corporations, are defined according to their sector logic. The pass-through of the national ambition is evidently seen with the municipality. Likewise, both local and national governments tend to be doubtful about the feasibility. This is why their arrows slightly surpasses 2050. Market actors do consider 2050 feasible. They expect a non-linear development as often with innovation trajectories. This development is indicative of the market logic. Community actors consider 2050 more or less feasible as it takes one generation (25 years), creating enough time for the right moment to occur. It

reflects their reasoning from a practical point of view. Although with different explanations, the housing corporations equally reason from a practical point of view. They explain that constructions are normally renovated after 25 years, which is why a time period of 30 years (2050) is rather short. Given this insight, homeowners define their long-term horizon based on practicalities. This contradicts the sector logic of non-profit actors, as identified with the energy-focused (visionary) organisations. They are optimistic and defined an endpoint earlier in time. The reason is that the housing corporations do not focus on energy-related activities, but on their dwelling services. This means that even when a housing corporation is ambitious in their energy goals, it still needs to fit their main activities.

It is interesting to see how figure 18 visualises why the project encountered discrepancies regarding the pace of the project. Unlike most actors, the visionary non-profit actors work with the shortest time frame. State actors come closest to the preferred pace of the project but foresee complexities. Postponing the deadline clearly conflicts with the preferred future of the visionary non-profit actors. This finding supports the idea that the long-term time frames influence the preferred pace of the transition (Duijne & Bischop, 2018; Lyytimäki et al., 2018).

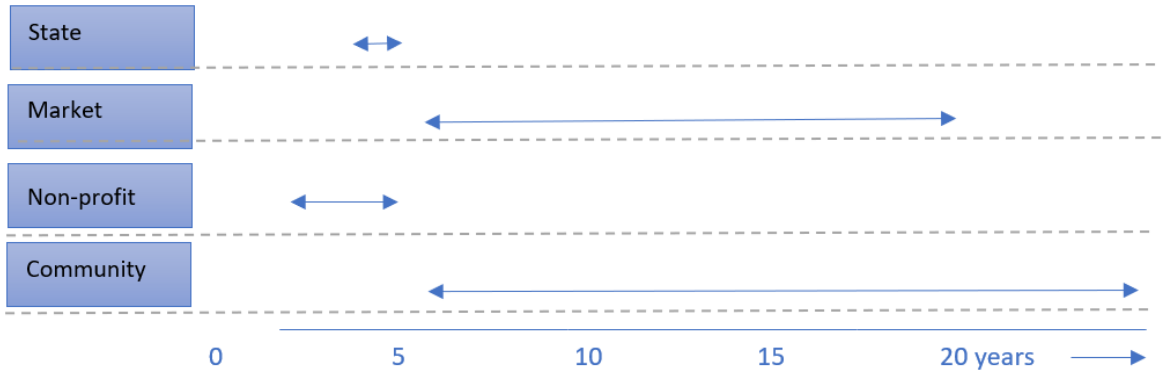


Figure 19: *Comparing the short-term time horizons of the different actor-types*

Short-term

The same sector logic is found with the short-term time horizons. Comparing the findings leads to two remarkable findings.

First, in contrast to the long-term time frame, non-profit actors do refer to a similar short-term time frame. The non-profit actors, both housing corporations and energy focused organisations, mention their ambition to progress within the coming 3 to 5 years. The reason is that both strongly work towards ambitions. The energy focus companies (visionaries) work with the idea of 'as soon as possible'. The housing corporations work towards the agreement of Aedes in 2020. In other words, the state and non-profit actors show consent in terms of progressing.

The second finding is the differences between the state and non-profits actors versus community and market actors. Although for different reasons, the state actors have a similar short-term time frame in mind as the non-profit actors. They refer to a governing period, with more implicit reasoning how they are restricted by the interest of citizens. Both time horizons are shorter than 5 years. Whereas the market and community actors refer to a longer time period. This has to do with them waiting for the right moment to implement technologies. Community actors likewise awaits the 'right' moment to reduce risks as 'wrong' decisions impacts their activities. Comparing this to the market actors reveals their sector logic. From a market point of view, it would make more sense for consumer to wait for technological development. Current offers on the market are not competitive enough to meet consumer demand, especially not with the disappearing of the momentum. Therefore, their time horizon is similar to that of the community actors.

Based on this information, comparing the findings explains how the initial situation aligned the different actor-types. As the infrastructures were thought to be outdated, it would create the right moment to make changes. Drawing on this finding would suggest shorter time frames of both market and community actors.

6.3 Technological changes

When questioning the different standpoints concerning technological capabilities and limitations of existing technologies, it soon revealed discrepancies in the preferred future composition of technologies. On the surface, actors agree about how technologies will improve, but probing for more in-depth information exposed the variation in focus.

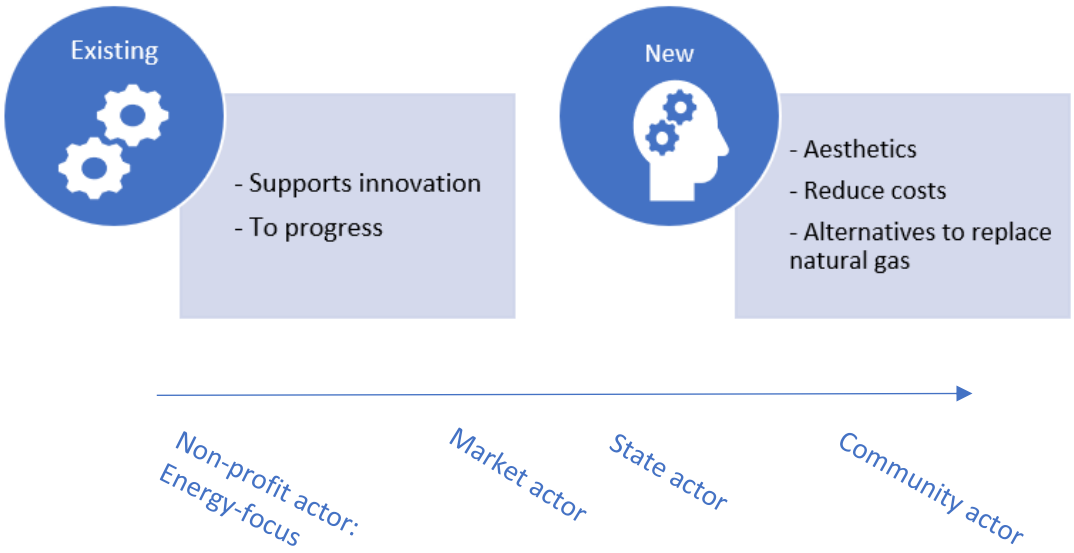


Figure 20: *The reasons to focus on existing or new technologies*

Apart from discovering their preferences in technologies, comparing also revealed corresponding explanations. To what extent an actor relies on using new or existing technology depends on different nuances in their perspectives. For example, visionary non-profit actors prioritise progress as the environmental impact is their main concern. Therefore, non-profit actors are least reluctant to adopt the existing technologies. Second in line are is the market actor. They consider the use of existing technologies as a prerequisite for new technologies to emerge. State actors hope for new technologies as they are circumstanced by the community actors. On the far right are the community actors. Apart from the 'front runners', which are strongly in favour of adopting existing technologies. Most community actors rely on the emerge of new technologies. This standpoint is in line with their focus on natural gas-free, concern of practicalities and being the one accountable for the costs.

Note that the housing corporations are missing. The housing corporations also refer to existing technologies when discussing current activities. However, they seem to rely on new technologies when deliberating natural gas-free. Due to these opposing standpoints, they are missing in the figure to avoid misinterpretation. Nevertheless, the same arguments were discovered with both aims.

6.4 Economic changes

Actors agree that consequences of energy transition affect everyone in society, requiring a 'societal investment'. Correspondingly, the economic concern is evident when reflecting upon statements in the project. '*The project is not supposed to result in higher living costs, instead it strives to reduce costs on the long-term'* (Project team report 2). However, the financial burden on citizens and housing corporations is much more apparent as they are 'homeowners'. Not surprisingly, comparing the findings reveals how standpoints revolving around economic changes differ.

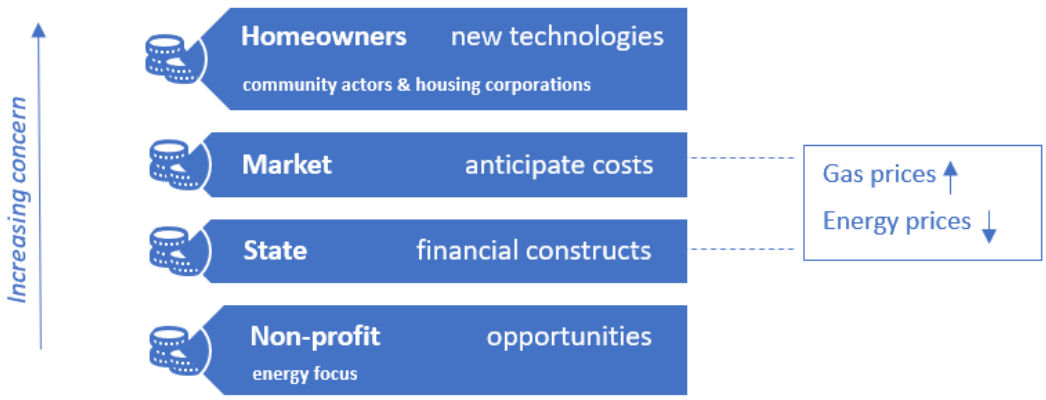


Figure 21: *The dominant perspective about how to cope with financial barriers*

An important finding relates to the different perceptions about how the problem will be dealt with, the weigh of the concern and long-term effect. Comparing the findings reveals that actors who are accountable for the costs, which are the community actors and housing corporations (in the figure referred to as homeowners), weigh this concern the most. Even when individuals or housing corporations are in favour of the energy transition, they still carry the financial burden. Both mention technological development as the main solution, especially with the ambition natural gas-free. This dominant concern places them on top in figure 21. This contrasts with non-homeowners, who are much more confident about future solutions. These actors (state, market and non-profit actors) are more concerned with socio-economic inequalities in which lower incomes are imposed with relatively higher costs.

Evaluating these arguments reveals the sector logic. Starting with the market actors, their sector logic brings the understanding that costs are close to inevitable. As with most technological innovations, transitions come with costs. Technological developments will reduce costs in the future and price developments through market pricing ought to be helpful. The municipality is fairly confident about the government developing alternative financial constructs to lower the burden and ease investments. But then, considering their positioning, it is much more likely that a municipality is more aware of the latest debates at a national level in comparison with, for example, a community actor. Besides, governmental authorities can somehow exert influence on price developments, such as policy interventions. It allows them to be more confident about the outcome. Comparing these standpoints to non-profit actors with an energy focus, they are least concerned with economic viability. Their activities have been able to upscale regardless of the financial burden. In fact, those activities have proven to be economically viable, even profitable at times while boosting local independence and create ownership. This confirms that their economic perspective relates to their positioning as an actor.

6.5 Social changes

To explain the different findings on social changes, they are presented by means of the three indicators: knowledge, values and aesthetics.

Figure 22: *the differences in perceived responsibility (knowledge)*

Knowledge

To avoid misinterpretation of the above figure (22), increasing perceived responsibility does not refer to their willingness to act. In fact, both state and market actors are eager to progress but are rather restricted to act given their position. Instead, it shows to what extent their preferred future is subjected to actions taken by others.

Comparing the perspectives shows a strong sector logic. Starting at the bottom, the market actors are concerned with facilitating infrastructures and boosting innovations. They can facilitate in market supply, but in the end, homeowners are those adopting the technologies. The way in which this forms their preferred future is best explained when looking at the time horizon (figure 19). Their short-time horizon shows a strong overlap with those of the community actors, reflecting how their perspective about the changes is subjected to homeowners. The state actors show a stronger sense of responsibility. With the neighbourhood approach, local authorities are expected to take more responsibility. The municipality indeed recognises their role, but also needs to adhere to the interest of citizens. They consider their role as facilitating and incentivising homeowners. The community actors are aware that they are expected to act. However, the extent to which they feel responsible to act strongly differs as suggested in literature (Steg et al., 2015). Whereas some identify climate change with more distant activities, such as the industry or other countries (sounding board meeting, personal communication, June 26, 2018; R2, personal communication, July 4, 2018), others feel more responsible to act (idem; R1, personal communication, June 28, 2018). Also, their distrust in government seems to play an important role. The non-profit actors are positioned on top as they show a strong commitment to make changes and reduce the environmental impact.

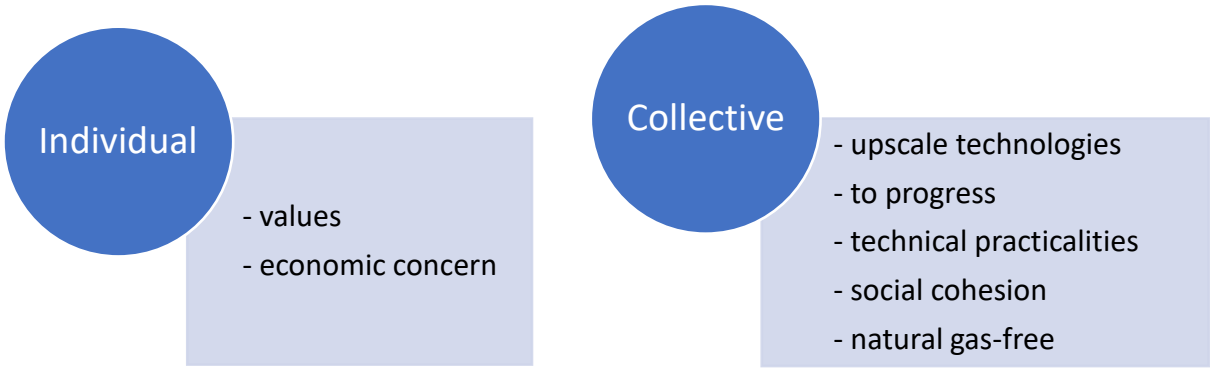


Figure 23: *The reasons to prefer individual or collective activities (values)*

Values

The findings revolving around values led to an interesting insight. Perspectives are strongly formed by an actor's preference to act collectively or individually and those preferences are explained by the same arguments. Relating it to the MaP shows that formal actors prefer collective activities, while informal actors (community) prefer individual choices. Not surprisingly, community actors favour individual choices as activities affect their ways of living. Collective choices might overrule individual interest, risking unwanted consequences. Formal actors prefer collective activities as it leads to various benefits.

Nevertheless, these preferences should be understood as tendencies. If collective activities generate individual benefits, community actors are willing to participate. If collective activities do affect individuals negatively, individual interest should be respected. This interplay was illustrated by the 'front runners' approach. It allows the project to respect the individual interest as current changes are not suitable to meet wishes of all residents.

Comparing the perspectives also reveals the implications of natural gas-free. Offsetting natural gas insinuates that the entire infrastructure will become unserviceable. This means the buildings connected to this infrastructure are forced to find alternatives. Based on this information and relating that to the community's individual interest, it explains how these collide.

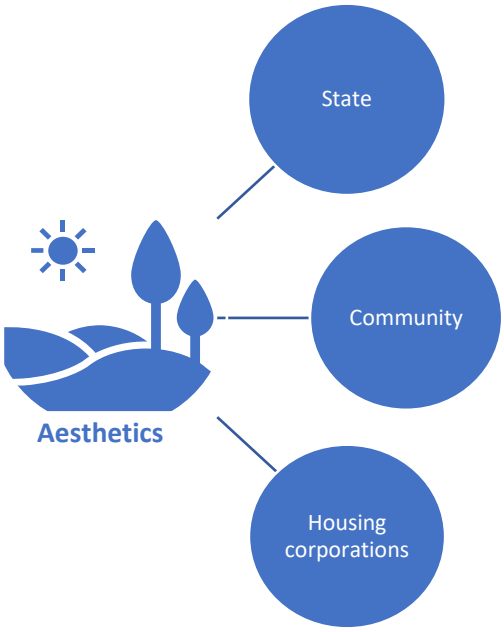


Figure 24: *Actor-types that raise aesthetics in their preferred future*

Aesthetics

A final theme to address is how the preferred futures of actors are formed by aesthetic values. Analysing the different perspectives reveals that the actors prioritising aesthetics are those having a local interest. However, this sector logic is not completely true. It concerns those actors in which a decay in aesthetics affects their activities. They share the concern of improving the surroundings as it would otherwise downgrade their properties or liveability of the city. This means the homeowners (community and housing corporations) and state actors are concerned with aesthetics. Although the non-profit organisations focusing on energy-related activities have local interest in common, their activities are not impacted by aesthetic changes in the neighbourhood.

6.6 Summary: overview of the differences among actor-types

Comparing the different preferred futures provided new insights. As they are important before drawing conclusions, this section briefly summarises the findings for each element.

Sustainable outcome

Comparing the perspectives regarding the preferred sustainable outcome revealed how informal and formal actors relate differently to the formally defined outcome of the project. However, the multi-actor framework only leads to limited understanding of the different perspectives. Reflecting upon the activities reveals how CO2-neutral and natural gas-free are understood in a different way, either as distinct or complementary ambitions.

Time horizon

The findings bring the understanding that short-term and long-term time frames are defined in different ways. The long-term time horizon is best understood when considering homeowners

(community and housing corporations) as a distinct group. Hereafter, it shows that horizons are set according to their sector logic. This differs from the short-term horizon, which shows a direct link to sector logic as the categories presented by the multi-actor perspective, such as technological development, governing period or overarching agreements (Aedes).

Technological changes
To what extent an actor relies on using new or existing technology in the future depends on different nuances in their perspectives. The non-profit actors are eager to make progress, explaining their strong preference to use existing technologies. The community actors consider technological limitations, especially when offsetting natural gas, which is why they prefer new technologies. Note that housing corporations rely on existing technologies when aiming for CO2-ambitions but rely on new technologies when discussing natural gas-free.

Economic changes
Actors whom are accountable for the costs, which are homeowners, weigh the economic concern the most. Another finding is that actors have different ideas about how this problem will be dealt with in the future. These ideas are reasoned through sector logic, such as policy interventions, market pricing, or local energy production creating financial opportunities.

Social changes
The findings relating to social changes revealed the influence of sector logic. Comparing actors' perceived responsibility explained to what extent their preferred future is subjected to others taking action. Questioning values brought the understanding of how formal actors prefer collective activities, while informal actors prefer individual measures as communal actions might overrule personal interests. Aesthetics are valued by those actors which activities are affected by a decay of surroundings.

7. Conclusion and discussion

In this chapter, the findings of this research are brought together into a conclusion to answer the research question. Section 7.1 starts by briefly recapping the research aim, after which it proceeds with answering the research question. Section 7.2 revolves around practical recommendations and makes suggestions for further research. The last section (§7.3) reflects on the research process and discusses its limitations.

7.1 The different preferred futures among actor-types

In response to the local energy transition-built environment, this research revolved around improving long-term collaboration among stakeholders involved in local energy projects. Until now, recommendations to support this fundamental feature focused on developing shared or guiding visions. However, these were often ineffective in practice. The problem is that these are unable to align actors on the long run, because they often remain vague allowing actors to intuitively interpret the vision. As a result, actors with different backgrounds have different understandings of the vision. This leads to actors collaborating with different preferred futures in mind. While this often works in the beginning, the discrepancies are revealed along the way. Even causing conflicts at times. To avoid such conflicts, it requires mutual understanding among stakeholders. Therefore, this research has been concerned with illuminating different standpoints among actors. In doing so, the results contribute as a first step in reaching mutual understanding by studying how preferred futures differ among actors. The following research question was raised:

How do preferred futures differ among the various actor-types in the process of a local energy project in Municipality X with the aim to support long-term collaboration?

By exploring the relation between actor-types and preferred futures, this research worked with the assumption that actors from different backgrounds have different preferred futures. To conceptualise the background of actors, this research studied actor-types that were categorised by means of a heuristic framework, the multi-actor perspective. Conceptualising a preferred future was done by means of an explorative framework consisting out of five elements. These two concepts are discussed throughout the following sections in terms of their usefulness and limitations. Nevertheless, it can already be concluded that studying the relation between these two concepts allowed answering the research question. The following section elaborates on the conclusion by reflecting upon the two events, discusses the main conclusion and elaborates on theoretical conclusions. The latter also discusses how it adds to the existing literature as posed in the section on scientific relevance in the introduction.

7.1.1 Reflecting upon the two events

As the initiation of the case study was due to two events, the conclusion starts with reflecting upon these events to enlarge our understanding of why these conflicts emerged. The first event was the arrival of much more residents at the first meeting than the project team anticipated. The second refers to the disagreement among stakeholders regarding the project's pace once new information revoked the 'right' moment to make changes.

The first event refers to the unexpected interest of residents in the project. Explaining its cause shows a direct link to the framing of terms as presented in chapter 4. These findings were revealed because of the activities prior to the project. Activities of state, non-profit and community actors focused on CO2-reduction. Such activities matched the two different interests of reducing environmental impact and costs. State and non-profit actors were engaged in these activities for mainly environmental reasons. While the community actors were mostly involved for financial reasons. Drawing on the different interpretations of the terms, these tendencies can work in harmony with the ambitions of CO2-reduction and CO2-neutral but collide with natural gas-free. Besides, natural gas-free is associated with many practicalities apart from financial concerns. Having participated in CO2-reduction is therefore no guarantee for residents to take part in natural gas-free. However, as it was the first project, project team members were unaware how the residents would interpret the vision. Mentioning offsetting natural gas as part of CO2-neutral as an initial ambition, led to intuitive interpretations and caused residents to focus on natural gas-free. It brings the understanding why 300 residents showed up for the first meeting. Based on these findings, defining a broad 'shared vision' was counterproductive as it rather provoked intensive discussions regarding the interest of stakeholders.

The second event refers to the conflict revolving around the preferred pace of the project. This event is best explained through sector logic as proposed by the multi-actor perspective. Unlike most actors, the visionary non-profit actors work with the shortest time frame. This actor group is strongly driven for environmental reasons, explaining their desire to make rapid changes. Even though state actors come closest to the preferred pace of the project, they foresee complexities. Postponing the deadline due to new information clearly conflicts with the preferred future of the visionary non-profit actors. More than explaining the difference, this insight brings the understanding that the initial information about the infrastructures being outdated would align the preferred pace of the transition among actors. It would create the right moment for community actors to act, simultaneously moving the time horizons of both community, state and market actors. Once this situation changed, the visionary actors were still eager to progress quickly, but the best moment for community actors to act changed. Consequentially, the state, market and community actors prefer a longer time horizon to

maximize the learning-experience and to await for a better moment to make changes in the energy system.

7.1.2 Main conclusions

Although the reflecting on the events are a starting point to explain the differences, limiting the research to those conclusions would not do right to the findings. This section explains the three most important conclusions about the differences in preferred futures, forming the basis to draw theoretical conclusions.

The starting point to present the main conclusions is discussing the impact of an ill-defined shared vision. If a vision remains vague, the case illustrated that actors will interpret such vision intuitively as suggested in literature. In case of the energy transition, visions often entail terms such as CO2-reduction, CO2-neutral and natural gas-free. This research has been able to give insight how actors interpret these terms differently if a vision remains rather broad. These terms are associated with fundamental differences in terms of practicalities, costs and taking individual or collective measures. Using these terms in a vision without stipulating its definition leads to different interpretations for different actor-types. These interpretations show important differences in the imagined outcome of the project and thus preferred future. With the aim to succeed in establishing long-term collaboration, keeping a vision rather broad does not add to aligning stakeholders.

Another main finding is that homeowners, which are the community actors and housing corporations, show a strong overlap in preferred future. The reason is that homeowners are the actors that have to invest and modify their properties. The impact of the energy transition has a much more direct impact than for state, market or (other) non-profit actors. This impact is not only financially, but also their activities. A vision of natural gas-free triggers more concerns than CO2-neutral due to the practicalities. Although the housing corporations show most consent and understanding for the standpoints of the community actors, their perspective on time horizon and strive to act collectively are in line with the sector logic of non-profit actors. With the aim to understand the preferred futures of actors, it is important to be aware of the positioning housing corporations and their considerations.

The last main conclusion to raise is the distinction between formal and informal actors. The interpretive flexibility of the multi-actor perspective revealed how parts of the preferred futures differed based on their formal or informal interest in the project. It brought the understanding that informal actors do not necessarily show consent with the preferred sustainable outcome set by the project team. Community actors, in particular those that distrust the government, question the underlaying motives to become natural gas-free. This distinction was also helpful in understanding the preferences for collective or individual change. As community actors reason according to their

individual interest, it is conceivable why they are more reluctant to collective actions and thus to natural gas-free. This standpoint deviates from the rest of the project team for whom collective action leads to multiple benefits.

7.1.3 Theoretical conclusions

This section is concerned with drawing theoretical conclusions based on the insights derived from the previous sections. To explain how preferred futures differ among the actor-types, the theoretical conclusion is illustrated in figure 25.

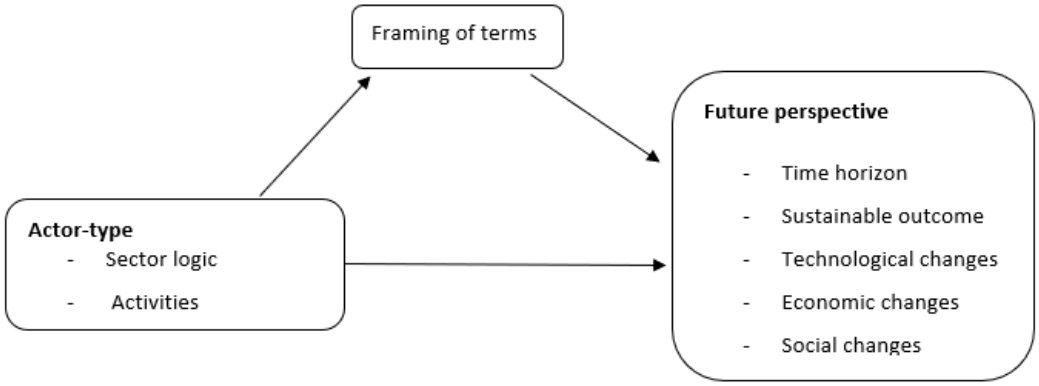


Figure 25: *Conceptual framework to understand the different preferred futures*

The differences in preferred futures are best understood when reflecting on their sector logic and activities. Combining this information with the different interpretations of the terms (CO2-neutral, CO2-reduction, natural gas-free) helps to understand the different preferred futures. It provides a framework to more accurately understand the preferred future of actors in the future. To explain this framework, the following section elaborates about the three elements: framing of terms, actor-type and preferred future.

Framing the different terms

The starting point is to consider the way in which different terms for energy visions are framed. Three terms are commonly used to describe energy visions: CO2-reduction, CO2-neutral and natural gas-free. The terms have different definitions but also associated with different consequences. CO2-reduction is associated with energy-saving measures that can be taken individually and create opportunities to reduce energy costs. CO2-neutral describes a long-term situation in which compensating allows individual choices (freedom of choice), allowing the pursues of preferences. Natural gas-free is associated with multiple issues, insinuates collective actions, practicalities and cost increase. Depending on the actor-type, the preferred future depend on how an actor interprets these terms and its focus, which can be reasoned through sector logic and activities of an actor.

Sector logic

Once being aware of the different framing of the terms, sector logic can be applied to get first understandings of how the actor is likely to interpret the terms, even as it will lead to certain standpoints regarding its preferred future. This research discovered sector logic with the help of the multi-actor framework. This framework has been apt to enlarge our understanding of the actors, in particularly to distinct informal and formal actors and in terms of sector logic. Nevertheless, the multi-actor framework does not provide a complete understanding of the actors, which is why an actor's activities, as discussed later, should be taken into account as well.

Starting with the sector logic, the findings revealed that the preferred future of the state actors is reasoned as a public agent. The perspective of market actors shows a technological focus in which they reason from market logic. The preferred future of community actors is strongly formed by the practicalities that the energy transition insinuates. Non-profit actors with a main focus on energy related activities have a preferred future consistent with their visionary standpoints. This sector logic was particularly evident when comparing the short-time horizons and the perceived responsibility.

Combining sector logic with the different interpretations of terms is suggestive of the different foci among actors. The state actors focus on becoming CO2-neutral. As it allows compensating, it is in line with their interest to make significant progress in their governing period while adhering to the interest of their citizens. A similar logic is discovered with the community actors that focus on natural gas-free. Community actors are most concerned about practicalities, explaining the focus on natural gas-free.

Activities

Despite the interpretive flexibility, the categorisation as proposed by the multi-actor perspective is still limited in understanding the preferred futures of actors. The results point to the importance of activities and how this influences the different preferred futures. Relating actors' preferred futures to their activities sheds light on much more implicit preferences. It helps to understand which local actors focus on aesthetics. It also explains how CO2-neutral and natural gas-free do not always match in terms of activities.

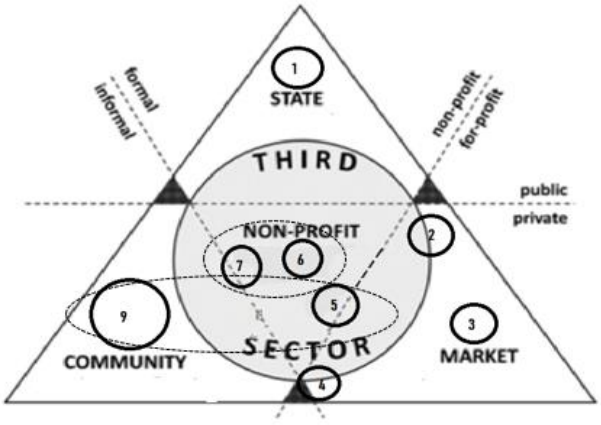


Figure 26: *The preferred future of homeowners versus visionary non-profit actors*

Based on this insight, the research concludes that homeowners should be considered as a separate actor group for a more accurate understanding. The similarities in the perspectives of homeowners are evident when questioning their economic concern, aesthetic values and long-term perspective. This divides the non-profit actors into two groups: visionary organisations and housing corporations. The multi-actor perspective would argue their positioning close to the market actors. However, reflecting upon their activities, homeowners (whether private or corporate) show strong overlap in their preferred futures.

Applying the framework as presented above helps to understand the preferred futures for the different actor-types. Knowing the different preferred future of each actor-type enlarges the theoretical understanding of how these might differ according to their sector logic, activities and interpretations of the different terms. Apart from answering the research question, this information deepens the academic understanding of actors. In addition, the five elements chosen to describe a preferred future (time horizon, sustainable outcome, technological-, social- and economic changes) have proven to be appropriate. The lack of theory on preferred futures regarding the energy transition required the research to develop an explorative framework in a more creative way. Although the five elements proved to be useful, it can be questioned whether this framework should have been developed differently. The elements emerged from common sense but are not exact science. Nevertheless, considering that such information was completely lacking, the research has been able to add in terms of scientific relevance.

7.2 Recommendations

Based on the conclusion, this section discusses both practical recommendations and suggestions for further research.

7.2.1 Practical recommendations

It is not surprising that projects striving to be an example for others to follow are the first to discover different standpoints. Besides, Municipality X strongly valued stakeholder engagement. In doing so, the project worked with conditions in which differences are most likely to be revealed during the process and so it did. Whereas other projects might avoid such conflicts, they are also likely to reveal those differences at an even later point in time. Taking into account how the project has been doing, even though the conflicts did complicate the situation at times, they have been able to increase mutual understanding and to better align stakeholders, as it seems for now. Nevertheless, the question for recommendations remains, how can other local energy projects learn from the findings in this case to support the energy transition concerning the built environment?

First, projects are recommended to consider the different associations actors have with the different terms. Therefore, the utmost important recommendation is that a vision should be specified to ensure the terms leave no space for own interpretations. This means that these terms should not be communicated simultaneously without further explanation to avoid miscommunications. Whereas the project studied came to this conclusion throughout the process, other projects would be able to avoid such conflicts due to miscommunication. In doing so, clear communication is more likely to expose differences at the start of a project, thereby supporting alignment of stakeholders and long-term collaboration.

Furthermore, special attention should be given to the initial premise of costs, definition of 'local' and the motives to engage in natural gas-free. As prior activities most likely focused on CO2-reduction, community actors might engage in natural gas-free projects with the same expectations as they had with earlier projects. As a result, most of the discussions revolving around natural gas are going to be disappointing. To avoid such discontents, projects are advised to be specific about the research aim and leave no space for interpretations. The same applies for the term neutral. Different actor-types will interpret the term according to their interest. If so, 'local' will refer to different areas such as buildings, streets, neighbourhoods or cities. These different interpretations are in reality contradictory. This is similar to the motives associated with the term natural gas-free. Without further explanations, community actors especially might relate the ambition to a different motive than intended by the project. As this is a fundamental driver for actors to engage, such misinterpretations should be avoided.

The last suggestion is to bring up aesthetics and energy independence in the discussions. The reason is that these arguments seem to be hidden in discussions. This is remarkable as the findings are

quite clear about whom values these standpoints. Illuminating these standpoints might help to reach mutual understanding.

7.2.2 Suggestions for further research

As literature has paid little attention to the preferred futures of actors in transition management, it can easily be concluded that maturing the field is needed. In fact, this research is rather an invitation for further studies. Before literature can work towards navigational tools to improve long-term collaboration, it is important that the differences among actors are adequately understood. As this research has been a first step in illuminating the different preferred futures among actors, further research, especially empirical studies, are a must.

Follow-up research should pay attention to the conceptual framework employed in this research. It is an explorative framework developed in a rather creative way. Although the five elements helped the research to draw conclusions, further research should have a critical look at the elements and the indicators. In other words, the outcome of this study has been a starting point for further research, requiring many more studies increase certainty of the answers so far.

In addition to strengthening the findings of this research, more critical issues were discovered to understand the different perspectives of actors in transitions. Maturing this field would require studying the relation between perspectives and power relations (Avelino & Wittmayer, 2016), the influence of multi-level perspective and look into demographic influences (Fenton et al., 2015). Other studies should raise the question to what extent these findings apply to other types of transitions or even if the relations are transition specific in the first place.

Literature strongly advocates formulating a shared vision to align stakeholders but provides little explanation about the actual differences. This is remarkable as it is still unclear to what extent exposing different perspectives is useful in supporting long-term collaboration. This research has been an example of how the different perspectives are revealed along the way, but the question is if emphasising the differences would avoid such conflicts or even benefit the project. Therefore, a second strand of research should focus on the cause-and-effect relationship of this phenomenon, for example through behavioural studies. Such studies will significantly contribute to understanding long-term collaboration, possibly leading to a managerial approach to guide the process.

7.3 Reflecting upon the research process

This section critically reflects upon the research results and limitations. Although the research has been conducted with most effort, circumstances have inevitably influenced the research in both positive and negative terms. The research process can be characterised as creative, but more structured ways

of researching would have been helpful. Looking back at the process, the lack of time while wanting to progress in the beginning of the research has left its footprint.

The research was limited to five elements to describe a preferred future for practical reasons, but definitions given to the elements are rather broad. Consequentially, the framework has been revised several times throughout the process to keep it manageable. Revisions were done after data collection, changing word use and indicators. Even though it is part of an explorative process, I do believe that this also complicated the process. If more attention would have been given to developing a more precise framework, it certainly would have saved some time.

This brings up the next point of discussion which concerns the interviews. Although the interview guides were developed according to a certain strategy, such as comparing, asking implicit questions and allowing storytelling, I wonder if a more structured form of interviewing with more explicit questions regarding the five elements would have made it easier to reveal the findings. If so, this would strengthen the validity of the findings. Additionally, based on the current insights, it is likely that visualizing certain scenario's (for example with certain technologies, economic or social aspects) during an interview would trigger a more dynamic discussion. The respondents replied from their own perspective but were not able to discuss or relate to a different scenario, other than discussing the brief description of the city and national ambition. Based on what I know now, I certainly believe that this could have been improved.

Regarding the analytical generalisation of this study, the main limitation is that the findings are based on a single case. Although the research strategy was chosen for practical reasons, it limits the external validity of the research. Even though multiple stakeholders for each actor-type were studied through multiple sources of evidence, and those findings were corroborate with other studies, the findings are still case-specific. To give an example of this limitation, the residents were of relatively old age. It is likely that this influences the pace of the project, time horizon, but also their values or economic profitability perspective (Löckenhoff & Rutt, 2015). Another example is the municipality. The findings are consistent with data obtained from literature (Fenton et al., 2015), but equally brings the understanding that there are multiple 'types' of municipalities. These different types will most likely have different preferred futures.

Nevertheless, it can be questioned to what extent these limitations could have been avoided. The research was a first step in further research, requiring a more explorative study to gain first insights. Besides, in spite of these limitations, the research has been successful in answering the research question.

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Appendix 1: the preferred future of the Dutch government

Time horizon

Evaluating the climate agreement (Klimaatakkoord, 2018b) and related reports (PBL, 2018a; PBL, 2018b) reveals how to reconstruct the time aspect presented by the Dutch government. The scenario presented is the ambition of becoming a low-carbon society by the year 2050. The long-term time horizon is therefore 2050. The time frame is assumed to be long enough for profound changes, but still imaginable (Höjer, Gullberg, & Pettersson, 2011). In line with the long-term ambition, targets and goals were set earlier in time. The time periods given for the built-environment is reducing 3.4 billion-kilograms of CO2-emmissions by 2030, with a first target of adjusting 50.000 buildings per year before the year of 2021. With the aim of becoming 'natural gas-free', the Dutch government strives to make significant changes before the end of the governing period. This means that three short-term time horizons are presented; 2021, 2030 and the governing period.

Sustainable outcome

The Dutch government refers to the Paris agreement with the aim to limit climate change to less than two degrees. '*The main goal of the climate agreement, reducing emissions*' (Klimaatakkoord, 2018b, p. 7). Common terms to describe the outcome are 'climate neutral', 'low-carbon' and 'energy neutral'. The terms describe a future situation in which climate change remains limited with the aim to mitigate the problem (PBL, 2018a).

Reflecting upon the motive, it is remarkable to see few explicit statements about the underlying reasons. Argumentation of why the energy systems need to change consistently refer to the Paris agreement, and occasionally to climate change. The decision about natural gas is more openly underpinned by stating that '*everybody wants to stop with the production of natural gas in Groningen*' (Klimaatakkoord, 2018b, p. 21), which implicitly refers to an ethical perspective. But other than that, few statements can be found that indicate the motive. Most arguments refer to 'opportunities' for society as the energy transition might lead to new organisational forms, but also technological developments that potentially increase comfort (Klimaatakkoord, 2018a, p. 21). Clean or affordable are equally mentioned, referring an economic or ethical standpoint, yet these are less evident (PBL, 2018a). It seems as if the motive is mostly implicit while focusing on the possible positive contributions.

Technological changes

Reconstructing the perspective of the Dutch government regarding technology, it immediately reveals the hope given to technological improvement (Klimaatakkoord, 2018b; PBL, 2018a). Even when multiple suggestions are made about the ideal technological solutions, similarities among the several standpoints are found. Most evident is how each perspective reasons a mix of energy sources from renewable energy, energy saving and possibly 'clean' fossils where needed. Remarkable is that all

variations in the technological composition refer to more energy efficient technologies while reducing the demand for energy. Energy-saving has therefore been an important pillar in the last couple of years, nevertheless, leading to only 30 percent reduction on estimate.

When evaluating the type of technologies, a wide range of options are presented. A crucial role is given to solar- and wind- energy, but at the same time it emphasisis its current limitation to storage this form of energy. It also shows the concern raised with finding alternatives for heating systems. Examples such as biomass are given despite the limitations, but new upcoming technologies are considered to have strong potential as well (Klimaatakkoord, 2018b).

Whereas the potential of existing technologies is estimated based on current developments and the limitations according to contextual situation, emphasis is similtanously given to the 'uncertainty'. Arguments such as 'if the results are dissappointing' or the possibility of windfalls in completely new technologies are indicators of the nuances. The optimism given to technological innovation is evident, in spite of emphasising that 30 years is relatively short for radical technological development (Rijksoverheid, 2018; PBL, 2018a).

Social changes

When investigating the social impact of the energy transition, the climate agreement (Klimaattakkoord, 2018b) and related evaluation (PBL, 2018a) strongly refer to the 'living environment of people'. Reflecting upon the values, the climate agreement states that '*everybody would like to pay less for energy and have a comfortable living'* (p. 21). As this is a reoccurring statement is about preserving or improving the quality of living, for example in terms of comfort, making hedonic and social-altruistic values important aspects. The financial impact seems to be of equal concern, showing a strong 'egoistic' value in relation to quality of living. No references are made to aesthetic values.

Questioning the perception regarding responsibility shows a focus on societal change. The government is aware that their position is to facilitate the transition, but strongly points out the need for collaboration. '*Especially when we reckon that the biggest challenge of the transition is not technical, financial, or governmental challenge, but a social challenge. It is about people'* (Klimaatakkoord, 2018b, p. 21). The government can facilitate the energy transition, but it requires commitment from the private sector, public agencies and citizens to bundle knowledge and pursue change. In the end, '*the wishes of residents and other challenges in the neighbourhood determine the pace and outcome of the transition'* (p. 22), making societal acceptance key (p. 31).

Economic changes

When evaluating the climate agreement (2018b), it evidently points out the economic concern by explicitly referring to the relation between costs and attaining the ambition (p. 21). Consequentially,

important pillars focus on cost-efficiency or cost-reduction through optimisation, energy-saving measures and upscaling of new technologies. Whereas subsidies can boost technological innovation, future adjustments in tax and energy prices are mentioned. '*About the modifications of energy tax, in which we lower the tax of what we need more (electricity), while increasing taxes on that what we do not want to use (natural gas)'* (p. 22).

Furthermore, as the energy transition is framed as a societal change in which it strongly advocates the necessity for society to cooperate. For that reason, the starting point, as referred to in the agreement, is keeping the costs of living the same as before (p. 21). Calculating the return on investment should make it economically viable for innovations to emerge. Energy-saving or generating energy projects are suggested to contribute to the economic viability. If not, it should be compensated through subsidies, alternative funding methods, or modifying prices.

Appendix 2: Smart Energy Cities program

The Smart Energy Cities program arose from a so-called 'green deal' in which the government supports a sustainable initiative. This deal makes it a public-private partnership between the Ministry of the interior and kingdom relations, the Ministry of economic affairs and climate policy, Netbeheer Nederland, TKI Urban Energy and TKI ClickNL. The program gathered the necessary expertise to develop an approach for municipalities and related actors to create a roadmap of natural gas-free neighbourhoods ('aardgasvrije wijken'). With this approach it aims at facilitating projects at a local scale in their ambition to shift towards a (more) sustainable (and local) energy supply. The green deal 'Smart Energy Cities' was therefore in line with the Dutch ambition set in the built environment to be (almost) carbon neutral in 2050 by supporting local projects (niches).

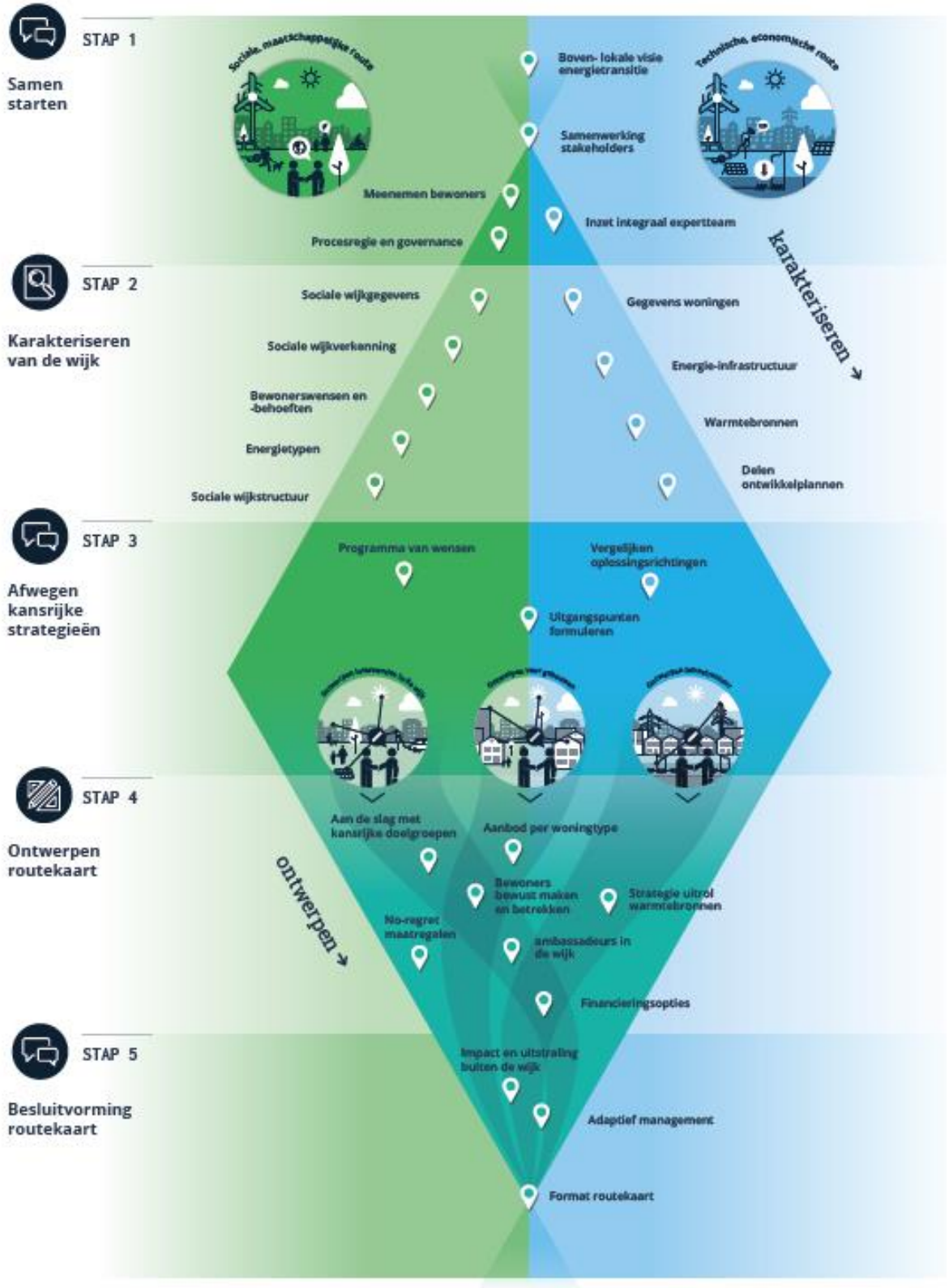
Smart Energy Cities then developed an approach for local energy projects to follow (see next page). In doings so, it helps projects to develop a roadmap on how to create a more sustainable energy supply in a certain area. The model was created based on knowledge gathered throughout 16 different projects. The experience retrieved from those projects led to the model. The model entails 5 steps in which it recognizes the need for both social and technical aspects important in the energy transition. It therefore takes a sociotechnical approach in developing a roadmap to be executed later. By developing this sociotechnical model, it aims to overcome the deficiencies in other approaches in which the focus often lays with technology, therefore being incapable to develop a successful roadmap. The model points out that the transition towards sustainable energies in the built-environment is a socio-technical transition.

The program provides project with a model to facilitate the process. The model advocates using a regional or local vision set by the governmental authorities. Such a vision would help to legitimize the activities and guide the project and forms the basis for a strategy. Although the strategy in line with the ambition can remain open for alternatives as 'many is uncertain, and a transition is a long-term process', it argues the importance of pursuing the shared ambitions. This relates to the second pinpoint, the need to seek for participation of all stakeholders. Therefore, it is important to seek which actors are involved in that project after which they can articulate their expectations (Smart Energy Cities experts, 2018). The program herewith recognizes the importance of the internal process as described in the strategic niche management theory, even as the interaction among the various stakeholders influencing the process.

For more information, please visit www.smartenergycities.nl.

SMART ENERGY CITIES

Een integrale aanpak voor energietransitie op wijkniveau



Appendix 3: Interview guides

Interview guide

Vooraf

1. Voorstellen: Op dit moment doe ik de master milieu en maatschappijwetenschappen aan de Radboud universiteit Nijmegen. Hiervoor loop ik momenteel stage bij het programmamanagement van Smart Energy Cities, waar ik onderzoek doe naar de manier waarop mensen aankijken tegen de energietransitie. Om mijn master te kunnen afronden hoef ik alleen nog het onderzoek af te ronden, daarom wil ik u graag bedanken dat ik vandaag mag langskomen.

2. Achtergrond: De energietransitie; men wil van fossiele brandstoffen naar hernieuwbare energie. In het kader van de energietransitie heeft de overheid zich de ambitie gesteld om in 2050 energieneutraal te zijn. Er is nog een lange weg te gaan en om dit te kunnen realiseren worden er meerdere initiatieven gestimuleerd vanuit de overheid. Smart Energy Cities is één van de initiatieven voortgekomen uit de Green Deals. SmEC heeft een aanpak ontwikkelt voor wijken waarin stappen worden aangegeven die belangrijk zijn voor de overgang naar een meer duurzame energievoorziening.

3. Doel van het interview: In het onderzoek kijk ik naar de manier waarop mensen en organisaties aankijken tegen de energietransitie door te kijken naar één van de projecten van Smart Energy Cities. Het idee hierachter is dat wanneer we expliciet benoemen wat we willen bereiken in de toekomst, we hier naartoe kunnen werken. Door dit te onderzoeken word het duidelijk in welke mate er bijvoorbeeld overlap is om zo samenwerkingen te versterken. Uit de eerste fase van mijn onderzoek is gebleken dat het project in Municipality X voortvarend van start is gegaan met de aanpak en de aanpak hebben gevolgd zoals bedoeld. Dit maakt het voor mij interessant om Municipality X als casus te nemen. Om die reden wil ik graag in gesprek gaan met alle betrokken partijen. Het interview duurt ongeveer een uur.

4. Vraag de respondent om toestemming om het interview op te nemen en vertel waarom. Vertel ook wat ermee gebeurt. De informatie al uitsluitend voor dit onderzoek gebruikt worden. Verder is het mogelijk om het interview geanonimiseerd te verwerken, indien dit achteraf nog gewenst is.

Vragen interview project team

Deel 1: Introductie

Met de eerste serie vragen wil ik graag in kaart brengen wat uw standpunten, ideeën en inzichten zijn over duurzaamheid en de energietransitie.

De vragen zijn breed opgezet om zo het onderwerp te introduceren, zonder hier iets van te vinden. Daarnaast zal een brede opzet helpen de persoon niet te sturen in zijn antwoorden, maar juist het vormen van eigen antwoorden stimuleren.

1. Allereerst, kunt u een korte introductie geven van uzelf, welke opleiding heeft u gevolgd en waarom werkt u in/bent u betrokken bij dit vakgebied?

Wanneer we het hebben over duurzaamheid zijn er verschillende opvattingen en kan het voor ieder een andere betekenis hebben. De nadruk ligt vaak anders. Ik ben daarom allereerst benieuwd naar uw opvatting over duurzaamheid en wat dit voor u betekent.

2. Waar denkt u aan wanneer we het over duurzaamheid hebben?

3. Hoe kijkt u aan tegen de energietransitie? Waarom is het belangrijk en in het belang van wie?

4. Wat zou u als eindresultaat van de energietransitie willen zien? Heeft u een bepaald scenario in gedachte?

5. Wanneer denkt u dat dit resultaat bereikt is? Over welke tijdsperiode hebben we het dan?

6. Hoe zou volgens u de energietransitie georganiseerd moeten worden? Ziet u hier bepaalde fases in? Welk tempo? En wie is er verantwoordelijk voor het aansturen?

7. Voorziet u hier belemmeringen in met betrekking tot het behalen van het resultaat? Wat ziet u als risico's en/of onzekerheden?

8. Wanneer we de energie transitie organiseren zoals net omschreven, zijn er dan negatieve aspecten aan verbonden?

Deel 2: Deelname aan de energietransitie in de wijk

In het tweede deel van het interview ben ik geïnteresseerd de energietransitie in de wijk X. Vanuit de organisatie/gemeente/het bedrijf bent u betrokken bij het aanpakken van de wijk. Hierbij is er gekozen voor de Smart Energy Cities aanpak, een aanpak die de sociale kan als de technische kant van het verhaal benaderd. De aanpak geeft aan in eerste instantie om tafel te gaan met alle betrokken partijen, waar uw organisatie/gemeente/bedrijf onder valt. Ik ben in dit deel benieuwd naar de reden van deelname.

9. Kunt u (in uw eigen woorden) de organisatie/gemeente/het bedrijf omschrijven? Wat is de missie en visie op het gebied van energie?

10. Wat de reden van deelname bij de wijkaanpak van de wijk X?

11. Hoe wil de organisatie bijdragen aan de energietransitie?

12. Hoe ziet u het eindresultaat van de aanpak voor u wanneer de plannen zijn uitgevoerd? Waar hoopt u op?

13. Hoe denkt u dat de verduurzaming van de wijk bijdraagt aan de energietransitie?

14. Er zijn verschillende partijen met verschillende ambities betrokken bij de aanpak van de wijk X. Merkt u tijdens bijeenkomsten en besluitvormingsmoment de verschillen? Zijn die verschillen van invloed op de samenwerking?

Deel 3: Verschillen in ambities

De energie transitie is een lange termijn project waarbij er ambities op lokaal-, regionaal- en nationaal- niveau zijn opgesteld. Echter betekent dit niet dat u het eens hoeft te zijn met de ambities. In dit deel ben ik benieuwd in hoeverre u zich kunt vinden in de ambities. De volgende stukken zijn verkregen uit beleidsdocumenten. Ik zal 1 van de 2 documenten voorlezen, waarna ik zal vragen naar uw mening hierover en of dit overeenkomt met uw ideeën over de energietransitie.

Nationale ambitie

Het kabinet geeft aan in 2050 CO2 neutraal te willen zijn. De Europese energiemarkt bevordert de betaalbaarheid, betrouwbaarheid en duurzaamheid van onze energievoorziening. Het kabinet houdt onverkort vast aan de Europese afspraken voor 2020, 2030 en 2050. Hierbij zijn er 3 uitgangspunten: 1) CO2-reductie, 2) economische kansen verzilveren, 3) Energievoorziening integreren in ruimtelijk beleid.

Municipality X

De centrale doelstellingen van het programma Duurzaam Municipality X 2016-2020 zijn 100kTon CO2-reductie in 2020 (20% ten opzichte van 2015) en een klimaat neutrale bedrijfsvoering in 2020. De stip op de horizon is een klimaatneutraal Municipality X in 2050. Onderdeel hiervan is de energiebesparing bij de bestaande gebouwen, energieopwekking met zonnepanelen en te fungeren als voorbeeldgemeente.

15. Ik heb zojuist kort een stukje van de ambitie voorgelezen. Kunt u zich in deze ambitie, doelstellingen en aanpak vinden?

16. Wat vindt u (on)belangrijke elementen in de ambitie? En waarom?

17. In welke mate denkt u dat Nederland met deze doelstellingen hetgeen bereikt wat u voor ogen had?

18. In hoeverre verschilt uw idee van de uitkomsten van deze voorgelegde situatie?

19. Hoe ziet u de toekomst voor zich wanneer we het hebben over de energie transitie?
    a. Rol van technologie
    b. Tijdsperiode
    c. Schaalgrote
    d. Scenario

Afsluiting

Dit is het einde van het interview. Zijn er naar uw mening onderwerpen die niet aan bod zijn gekomen of wilt u nog iets toe voegen?

Het interview zal ik uitwerken in een samenvatting/transcriberen. Ik zal deze binnen een week opsturen, u kunt hier dan eventueel nog op- en/of aanmerkingen over sturen. Mocht ik na 3 werkdagen niks ontvangen hebben, ga ik ervan uit dat het zo goed is. Kan ik, indien nodig, nog contact met u opnemen wanneer er iets onduidelijk is bij het verwerken van het interview?

Mocht u achteraf nog vragen hebben kunt u altijd contact opnemen. Verder wil ik u nogmaals hartelijk bedanken voor het interview en uw tijd.

*E-mail: ****
*Mobiel: ****

Vragen interview bewoners

Introductie

1. Voordat we beginnen aan het interview ben ik even benieuwd hoe u uzelf zou omschrijven als een bewoner in de wijk X, hoelang bent u woonachtig in de wijk en in wat voor een type woning woont u?

2. Hoe kwam u in aanraking met het project in de wijk X?

3. Wat is uw reden/motivatie van deelname aan dit project?

4. Hoe kijkt u aan tegen het project? Wat vindt u (on)belangrijk?

5. Wat hoopt u als uitkomst van het project? Aardgasvrij of CO2 neutraal? En in welk tijdsbestek?

6. Heeft u een bepaald scenario voor ogen? Hoe ziet de wijk eruit als het eindresultaat behaald is?

7. Zijn er bepaalde ontwikkeling in het project waar u negatief tegenover staan?

8. Welke risico's of onzekerheden ziet u?

9. In welke mate wilt u bijdragen aan het project?

10. Hoe kijkt u aan tegen de energietransitie?

11. Bent u het eens met de manier waarop de gemeente Municipality X/ nationale overheid het aanpakt?

Afsluiting

Dit is het einde van het interview. Zijn er naar uw mening onderwerpen die niet aan bod zijn gekomen of wilt u nog iets toe voegen?

Het interview zal ik uitwerken in een samenvatting/transcriberen. Ik zal deze binnen een week opsturen, u kunt hier dan eventueel nog op- en/of aanmerkingen over sturen. Mocht ik na 3 werkdagen niks ontvangen hebben, ga ik ervan uit dat het zo goed is. Kan ik, indien nodig, nog contact met u opnemen wanneer er iets onduidelijk is bij het verwerken van het interview?

Mocht u achteraf nog vragen hebben kunt u altijd contact opnemen. Verder wil ik u nogmaals hartelijk bedanken voor het interview en uw tijd.

*E-mail: ****
*Mobiel: ****

Appendix 4: References to primary data

The primary data remains confidential as requested by the project team members. To present these sources of evidence, the following section gives an overview of the references together with a brief description. Annual reports have been left out of the listed but are provided in the anonymous list.

Expert interviews

Doornewaard, R. (May, 2018). *Smart Energy Cities programme manager.*

Schipper, L. (May, 2018). *Smart Energy Cities programme manager.*

Vight, M., van der. (May, 2018). *Smart Energy Cities expert.*

Case interviews, observations and internal documents

Brochure LA1 (2015). *A brochure providing information about the ambitions of the local association, their standpoints. Even as it provides information about earlier energy-saving projects.*

Duurzaam Municipality X 2016-2020 (2015). *A report outlining the sustainability ambitions of the city council.* Direct link available in reference list.

EC. Representative of a local energy cooperative (June 21, 2018). *A grassroot initiative focusing on solar panels, consulting households and supporting energy-saving projects.*

HC1. Representative of housing corporation 1 (June 12, 2018). *A local (social) housing corporations that provides people with lower incomes, elderly, handicap or require assisted living 'green' and comfortable housing in the (near) area of Municipality X.*

HC2. Representative of housing corporation 2 (June 21, 2018). *A larger housing corporation, active in different part of the country, that provides safe and comfortable housing for reasonable rents in pleasant living areas.*

Municipality X Gasloos (2017, April 5th). *The way in which Municipality X looks at the ambition of natural gas-free.*

LA1a. Representative of local association 1 in project team (June 12, 2018). *A grassroot initiative with the ambition to create not only a sustainable society and a more independent neighbourhoods, but also focus on the economic feasibility.*

LA1b. Representative of local association 1 (June 26, 2018).

LA2. Representative of local association 2 (September 13, 2018). *Local association with the aim to organise local activities to improve a pleasant living and social welfare. The organisation emphasises*

their aim to raise the voices of their citizens and to speak up for their needs, more than taking standpoints as an organisation.

Media. (July 2018) *News item regarding the withdraw of local association 1 from the project team.*

MO1. Municipal official (May 25, 2018).

MO2. Municipal official (June 1, 2018).

NO1. Representative of the network operator with an organisational focus (June 25, 2018). *A Dutch utility company which operates in the distribution of electricity and natural gas in part of the Netherlands.*

NO2. Representative of the network operator with a technical focus (June 25, 2018). *A Dutch utility company which operates in the distribution of electricity and natural gas in part of the Netherlands.*

Project team report 1. *Summary of the three residents meetings.*

Project team report 2. *Summary residents criteria.*

R1. Resident (June 28, 2018). *A resident relatively new in the area in favour of the project. The house was already provided with solar panels.*

R2. Resident (July 4, 2018). *A resident that has been living in the neighbourhood for many years having a more critical standpoint regarding the project. The resident participated in earlier energy-saving projects and has a solar panel rooftop.*

SCP. Smart Energy Cities expert 'Creative Producer' (June 5, 2018).

SIC. Smart Energy Cities expert 'Innovation Coach' (May 25, 2018).

Sounding board meeting (June 26, 2018).

External documents

Aedes. *The housing sector agreements set by Aedes, which is a national organisation to promote the interest of social housing organisations in the Netherlands. Relevant here is that the union want to improve properties in this sector to an average energy label B (energy-index of 1.25) by 2020. Direct link is presented in the bibliography.*

Convenant energiebesparen huursector (2012). *See Aedes covenant. Direct link is presented in the bibliography.*

Dissertation (2018). *Dissertation about the feasibility of the ambitions set for non-profit (social) housing corporations in the Netherlands.*

Energy congress (2019, April 4th). *Review about the energy congress, providing information on the residents of the neighbourhood.*

Green deal. *Provided background information elucidation the initial standpoint and aims of the energy cooperative.*

Kadernotitie (sd). *Report about the way the municipality considers it role in the energy transition.*

Kok, Vries, & Lugt (2018). *Information about the role of SEC experts revealed motives and interest, which helped to deepen the information from the interviews. Direct link is presented in the bibliography.*

LA2 studies (2017-2018). *The local association aims to raise the interest of the citizens living in the neighbourhood. Information regarding these interests was gathered through meetings.*

Monitor (2017). *The municipality conducted a survey in the neighbourhood the year prior to this research. The information was relevant as it provided insight into the features of the neighbourhood, type of residents and standpoints about the quality of living. Even as it provided essential information about the projects context.*

News items (2017, 2018). *Both local associations and municipality reached out to the media to inform residents about the projects' progress.*

Project team reports 1 & 2. *The project team gathered information similar to what was needed in this research. The creative producer, responsible for gathering input from the residents, developed two reports concerning their standpoints based on multiple interviews and meetings.*

Research neighbourhood incentives (2016). *The energy cooperative and two local association requested a research regarding the interest of residents to participate in energy-saving projects and solar energy initiatives.*