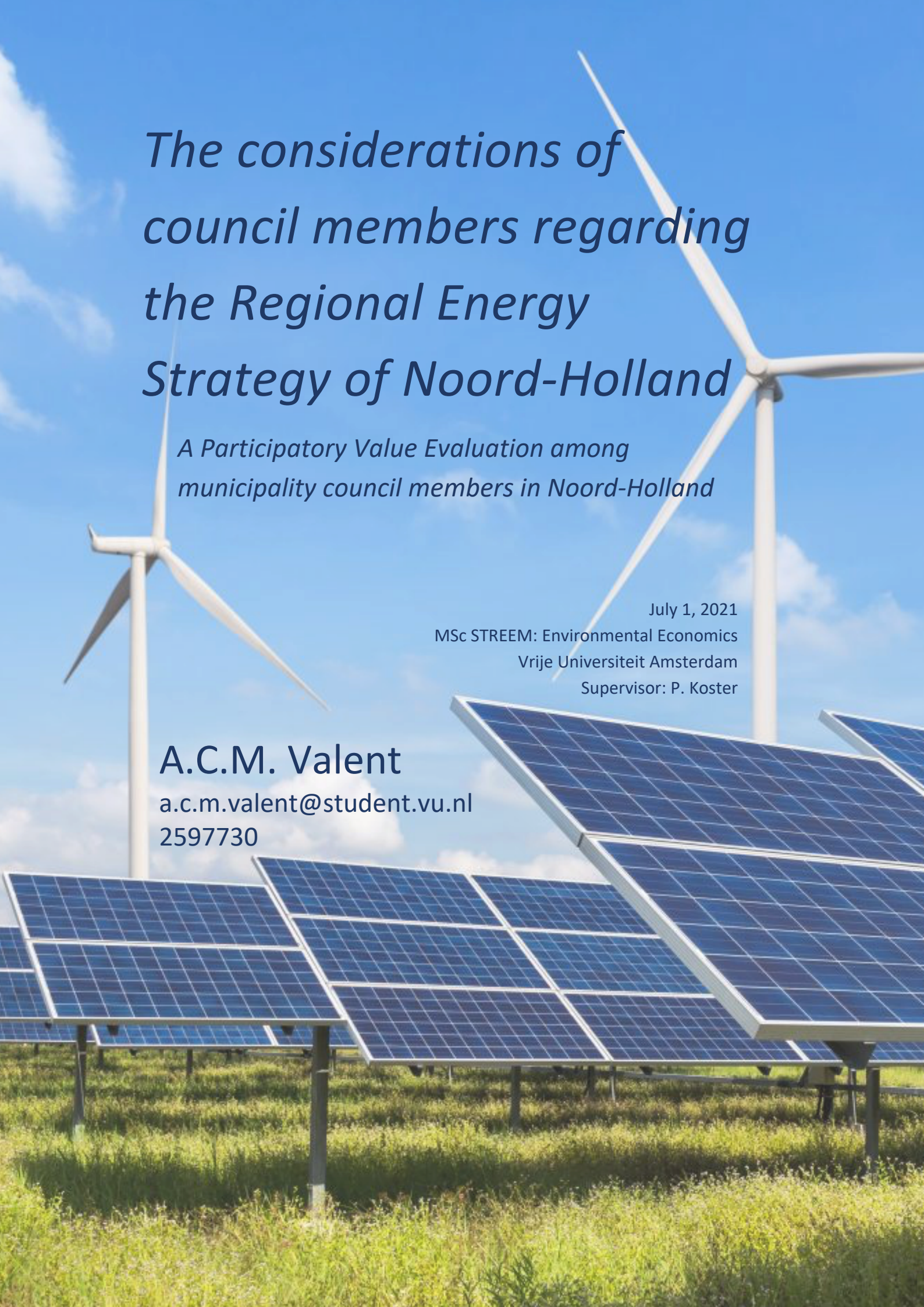

The considerations of council members regarding the Regional Energy Strategy of Noord-Holland

A Participatory Value Evaluation among municipality council members in Noord-Holland

July 1, 2021
MSc STREEM: Environmental Economics
Vrije Universiteit Amsterdam
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Preface

In front of you is my master thesis 'The considerations of council members regarding the Regional Energy Strategy of Noord-Holland'. This thesis is written for the fulfilment of my master's programme: Spatial, Transport, and Environmental economics in the specialization 'Environmental Economics' at the Vrije Universiteit in Amsterdam.

Last winter, I participated in the youth table for the regional energy strategy of North-Holland, and I got inspired to contribute my view on the energy transition as well as to think about how to organise our surroundings in the next ten and thirty years. These sessions raised more questions than were resolved, and at that moment the realization came that I wanted to know more about the energy transition and get more involved in the process of the regional energy strategy in the Netherlands.

Once the time came around to choose a thesis topic, I knew that I wanted to dive into the regional energy strategy and the considerations that must be made to reach the target of 35 TWh renewable energy on land by 2030. During the meeting with the programme managers of the regional energy strategy in Noord-Holland, I found out that there is a knowledge gap regarding the preferences and line of thought amongst municipality council members. This gave me an excellent opportunity to study this in this thesis.

At this point, I would like to acknowledge the guidance of my supervisor Paul Koster who has given me useful feedback during the process. I would like to thank the programme managers of Noord-Holland Zuid for directing me to this topic. Of course, this research would not have been successful without the municipality council members in Noord-Holland filling in the survey and therefore I would like to thank all respondents and even more the council members whom I could interview. Finally, my friends and family for their support during the writing process.

Abstract

Municipality council members in Noord-Holland think that nuisance is the most important factor to be considered regarding the regional energy strategy. This is followed by spatial coherence, the impact on the landscape, and how well a project can be implemented into the landscape. These factors are established to be the most important based on a Participatory Value Evaluation study among the council members of Noord-Holland. This study asked the council members to allocate 100 points over the principles, as put forward by the regional energy strategy 1.0 of Noord-Holland Noord and Zuid, and to allocate 100 points over six renewable energy projects. Both are used to test the importance of the principles and attributions. This study can conclude that there is a preference for solar energy among the council members which has been linked to the fact that nuisance and spatial coherence are seen as the most important factors.

The participatory value evaluation method has been used for a non-budgetary question and is targeted at political decision-makers, this has been an expansion of the previous uses of this method. By not using money as point allocation, no value could be established separately from the other principles. The goal of this study was to find the main considerations within the set framework which has been established by a relative value of each principle of the Regional Energy Strategy of Noord-Holland.

Table of contents

1. Introduction

Last April, after a long process of consultation of different stakeholder groups, the first version of the regional energy strategy was announced in Noord-Holland Noord and Noord-Holland Zuid[1]. This strategy was developed because of the goals set in the climate agreement, back in 2019. In the climate agreement, the national government of the Netherlands decided to divide the country into 30 energy regions, all of which had to develop a strategy to be able to generate 35 TWh renewable energy in total, on land in 2030 (Ministerie van Economische Zaken en Klimaat, 2019). This task has been carried out with a bottom-up approach over the last few years. In Noord-Holland, this has now resulted in a strategy document for Noord-Holland Noord and one for Noord-Holland Zuid. Even though the participation process was open for everyone, the level of participation differed severely among various stakeholder groups. Municipality council members are a group whose general opinion was rather unknown as the level of participation, aside from a fanatic group, had been low.

The focus of this thesis is on the considerations of municipality council members in Noord-Holland regarding several principles which have an impact on the renewable energy projects that will be executed. To measure this, the Participatory Value Evaluation (PVE) method will be used which lent itself useful to put a relative value on the different principles that the council members decided upon in the survey. This research method and the set-up of the questionnaire are explained in detail in the methods in chapter 4 and the research design in chapter 5.

The energy transition and the regional energy strategies are a topic that will have a large impact on how the Netherlands will look like and the landscape will form in the next year. The societal relevance is that this research contributes to the portrayal of the wide range of opinions of stakeholders. This research can be used by the programme managers of the regional energy strategy in Noord-Holland Noord and Noord-Holland Zuid to better respond to the council members' needs and considerations. Furthermore, municipalities can use it in their decision-making process as a benchmark for the main considerations.

This thesis took another approach for the PVE method as previously done, and thereby explores the possibilities this rather new method offers. This thesis analyses the opinion of council members and not citizens as per usual, which makes this a political PVE. The municipality council members are, in general, aware of what is going on among the inhabitants of their municipality and make their decisions to a large extent based on the preferences of

[1] In the text, Noord-Holland Noord and Noord-Holland Zuid will be used as those are the official names of the regions. Noord-Holland Noord is the Northern region of the province of Noord-Holland and Noord-Holland Zuid means the south part of the province. See appendix A in chapter 13.1 for all municipalities in these regions.

the inhabitants of their municipality, however, they also take other factors into account. The contribution of this thesis is that it does a PVE study among a political sample rather than citizens and accordingly has academic relevance. In addition to the fact that this a political PVE, it also uses a non-budgetary point allocation to measure the relative value of principles within the set framework.

The programme managers of the RES in Noord-Holland did not have a good overview of the opinion of council members in the process leading up to the Regional Energy Strategy (RES) 1.0. This raised the issue that they did not know what the support for the RES 1.0 would be in all municipalities in the period thereafter and what the issues are that council members face. This could potentially harm the implementation of the RES since the municipalities oversee spatial planning and landscape design, especially important is the licensing of permits to build new solar fields and wind turbines. This has been tried to resolve with an online session on May 19, 2021, to inform elected representatives in the region.

The goal of this thesis is to find out what the main considerations regarding the principles of the RES 1.0 are for municipality council members in Noord-Holland. This thesis gains insight into the thought process of council members as well as gives insight into the current stance of the Dutch energy transition. This research is based upon a Participatory Value Evaluation (PVE) survey and six interviews. In addition to the goal of the research, this thesis also investigates how the PVE method can be further developed as participatory and evaluation method among elected representatives whereas in this case municipality council members are being researched.

The main research question of this thesis is: *What are the key considerations of municipality council members when implementing the regional energy strategy?*

To be able to answer the main research questions, several sub-questions are answered to come to a complete overview of the issue. Those questions are:

- *How does the Regional Energy Strategy fit into the energy transition?*
- *What is the Regional Energy Strategy in general, in Noord Holland Noord and Noord-Holland Zuid?*
- *What relative value can be given to the principles of the Regional Energy Strategy of Noord-Holland as stated in the RES 1.0 based on the opinion of municipality council members?*
- *What are the key considerations regarding the principles of the RES and how are those influenced by the background and participation level of a municipality council member?*
- *How can a Participatory Value Evaluation study measure considerations of municipality council members?*

This thesis will put a relative value on the several principles such that they can be better weighted off against each other which is helpful in the next stage of the energy transition where the strategy will be implemented. The methods that are used to answer these questions are a survey, interviews, and a literature review. To answer the descriptive questions about the energy transition and the position of the RES, a literature review is done. The questionnaire is used to answer the research questions regarding the value of the principles, the main trends, and whether higher participation leads to more acceptance of the offer. The interviews and the comments in the survey are used to show the considerations that were made regarding the principles.

This thesis will start in chapter 2 with a literature review that discusses the multi-level framework and places the energy transition in the Netherlands in this framework. In chapter 3 the regional energy strategy in general and the one of Noord-Holland specifically. Chapter 4 discusses the Participatory Value Evaluation method. The fifth chapter discussed the research design of this thesis and in this part, the set-up of the questionnaire and the interviews is explained in depth. Once this is established, the results will be examined in chapters 6, 7, and 8. Firstly, the descriptive results are shown to get a proper overview of the answers in the survey. Secondly, the main trends and the division of points are being examined. Finally, the interview outcomes will show the underlying considerations of municipality council members.

2. Literature review on energy transition

This chapter discusses the literature on the energy transition, the Multi-Level Perspective framework, and how the Dutch energy transition fits into this framework. This literature review will define what an energy transition is and place the energy transition in the wider trend of sustainability transitions happening all around the globe (Markard, 2018).

2.1 Energy transition

There are plenty of definitions of the energy transition. The energy transition can be defined very broadly as a systematic change in production and consumption patterns to very narrow as, a mere change in fuels and their related technologies (Hirsh & Jones, 2014; Laird, 2013). For this literature review where the focus will be on the governance and policy side of the energy transition, a broad definition is better suited and therefore it will be defined as long-term structural changes in energy systems leading to a shift in production and consumption patterns towards low-carbon energy sources (Edomah et al., 2020; World Energy Council, 2021).

2.2 Socio-technical transition and the Multi-Level Perspective

The goal of this thesis is to better understand the considerations policymakers must make in the energy transition therefore, the energy transition will be analysed from the broader socio-technical system literature and transition studies. The energy sector can be seen as a socio-technical system, which is a configuration of actors, rules, and technologies for the fulfilment of a particular societal function (Kanger, 2021, p. 2). Various aspects are included in a socio-technical system, for example, the economy, engineering, policy, and culture (Kanger, 2021; Markard, 2018).

The Multi-Level Perspective (MLP) framework is used to describe changes in systems, such as the transition in the energy system (Geels, 2019). The MLP puts a transition into four phases. Even though this method is not undebated, it is selected for this literature review as framework for analysing the energy transition. It is the most-suited framework since it also shows the stages of a transition and the new becomes mainstream. Those later stages of a transition are described by MLP as the third and fourth phases (Geels, 2011; Roberts & Geels, 2019).

The Multi-Level Perspective is built up of niches, regimes, and landscapes (Geels, 2014; Kanger, 2021; Roberts & Geels, 2019). Niches are the secluded area where radical innovations emerge. The regime covers established practices such as the set of rules and institutions but also includes the business-as-usual way of life. The landscape represents exogenous factors

and broader developments in society (Geels, 2018; Kanger, 2021). Figure 1 shows the interaction between the niche innovations the regime and the landscape.

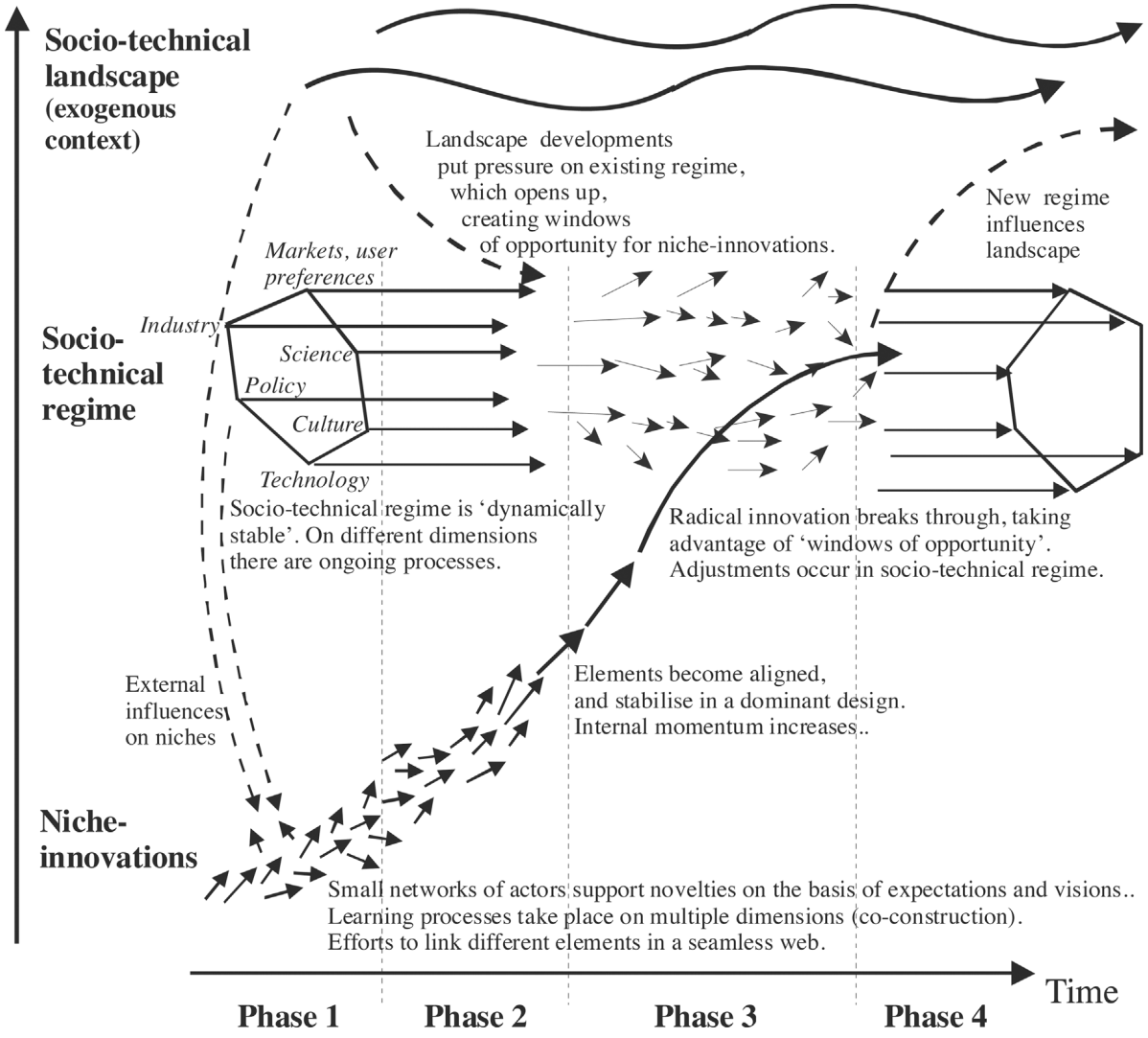

Figure 1: The Multi-Level Perspectives framework (Geels, 2018, p. 226)

The first phase is mainly experimentation, and this is where new radical innovations are made. In the second phase, the successful inventions are developed into more mature technologies, however, they can also track controversy in this stage, which happened with onshore wind turbines (Geels, 2019). The third phase is characterized by diffusion through the existing regime while also still begin in competition with older techniques or conventions. The fourth phase is the substitution of the old with the new.

2.3 Dutch energy transition in the MLP framework

The energy transition of the Netherlands can be placed in this framework within the third phase. There is a window of opportunity for renewable energy to compete with older sources of energy. This has been created by the landscape putting pressure on the regime, for example

by a shift in the public opinion expressed by climate protests, scientists' letters, but it has also been pushed by internal drivers of the innovations such as price/performance improvements of wind turbines and solar panels (Geels, 2019; International Renewable Energy Agency, 2017). The development of the Regional Energy Strategies comes from the policy angle within the socio-technical regime, this shows that the energy transition has reached the third phase of the framework. With the climate agreement and the regional energy strategies, the Netherlands is preparing for phase 4 where renewable energy has substituted non-renewable energy sources and the regime has fully transformed. In that stage, the landscape will be affected as well, think of wind turbines but also a systematic change in the lifestyle and the view on what is normal (Geels, 2018).

3. Regional Energy Strategy

The current green energy transition will not occur in one day, this has been a process of many years and many more to come. In 2015 all global leaders got together and signed the Paris agreement, which has been a huge accelerator of the energy transition. The Paris agreement, however, was not the first step the Netherlands took to enhance the energy transition, in 2013 the government presented the energy agreement [energieakkoord] (Sociaal-Economische Raad, 2013). One of the main goals of the energy agreement, 14% renewable energy in 2020 has not been reached, however, the percentage of green energy of the total energy consumption is rising (Planbureau voor de Leefomgeving, 2021; Volkskrant Redactie, 2021). In 2019 this was 8,8% and in 2020 it increased to 11.1%, this is still below the goal for 2020 (Volkskrant Redactie, 2021).

This chapter will give an overview of the history of the energy transition in the Netherland and how the regional energy strategies came about. It will also include a short overview of the approach of other west-European countries to compare the approach of the Netherlands with similar countries. Finally, it will also show what the situation in Noord-Holland is regarding renewable energy and give a summary of what the RES in Noord-Holland Noord and Noord-Holland Zuid contains.

3.1 Paris agreement and climate agreement

The regional energy strategies are a direct result of the targets set in Paris back in 2015, therefore it is important to see where the need for a strategy for the energy transition is coming from (Ministerie van Economische Zaken en Klimaat, 2019). The main goal of the Paris agreement is: “Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change” (United Nations, 2015, p. 3).

The Netherlands signed and adopted the Paris agreement which resulted in the climate agreement [klimaatakkoord]. In the climate agreement, the plan to divide the Netherlands into 30 energy regions to reach 35 TWh of renewable energy by 2030 was presented (Ministerie van Economische Zaken en Klimaat, 2019).

3.2 RES process

As agreed upon in the climate agreement of the Netherlands, carbon emissions had to decline severely. One of the measures to do so was the creation of 30 energy regions which would all have to come up with an energy strategy about where and how renewable energy coming

from solar, and wind could be generated on land.[2] Other goals of those regions were to define which heat sources could be used for sustainable heating of houses in that region so that neighbourhood can be disconnected from the natural gas network (Nationaal Programma Regionale Energiestrategie, 2021).

This thesis focuses on the renewable energy goal of wind and solar power on land of the regional energy and therefore the heat transition will not be discussed as it is beyond the scope of this research. The target for renewable energy on land is 35 TWh in2030 as set in the climate agreement, it is up to the 30 regions to come with an offer to reach this goal, preferably above as there will be some areas which later turn out as unacceptable or not possible. This target is based on the 49% reduction of CO2 emissions compared to 1990 set in the climate agreement (Nationaal Programma Regionale Energiestrategie, 2019b).

3.2.1 Timeline of the RES process

The regions Noord-Holland Noord and Noord-Holland Zuid followed a very similar approach for the creation of their regional strategy, therefore this will be discussed at once for both regions, if there are any striking differences those will be highlighted.
The process of the RES started with the making of a 'picture' of the current situation, this is a map that shows how much renewable energy there is now and what the demand will be in the future. In this analysis, data about energy use, energy production, and infrastructure are used to serve as a basis for the development of the energy strategy (Nationaal Programma Regionale Energiestrategie, 2020). This step already started before the climate agreement was finalized in June 2019 as both regions already anticipated the agreement and wanted to optimize the available time for the whole RES process which they knew would be long.

The second step in the process was to develop three scenarios for each subregion together with diverse partners from municipalities, civil organisations, and other stakeholders[3] (Programma RES Noord-Holland Noord & Provincie Noord-Holland, 2021; Programma RES Noord-Holland Zuid & Provincie Noord-Holland, 2021). The second step led to the starting note [startnotitie] at the end of 2019. This served as a baseline to work from in the third step, where this was discussed with many different stakeholders such as citizens, municipality council members, representatives of the water authority. In Noord-Holland Noord this consisted of 37 local sessions, in Noord-Holland Zuid, there have been 44 meetings in total (Programma RES Noord-Holland Noord & Provincie Noord-Holland, 2021; Programma RES Noord-Holland Zuid & Provincie Noord-Holland, 2021). All those meetings have been conducted offline in January and February and were finished before the covid-19 pandemic hit the Netherlands.

[2] See appendix A in chapter 13.1 for an overview of all the regions and the municipalities within those regions.
[3] See appendix B in chapter 13.2 for an overview of the subregions in Noord-Holland Noord and Noord-Holland Zuid.

The fourth step in the process was to merge all the input into one concept version of the RES resulting in a map with the first roughly defined search areas. Search areas are locations on the map that might be suitable for renewable energy, such as solar fields, solar panels above parking lots, or wind turbine locations.[4] This map is based on the scenarios of step 2 and the consultations in step 3, for example, all areas with offices are linked to solar panels on business parks. After all the wind and solar energy options were included in the map, the safety and environmental restrictions were included resulting in some areas being removed. Finally, a feasibility test was made to define what was possible to do before 2030, after this the search areas were finalized for the concept-RES, both in Noord-Holland Noord and Noord-Holland Zuid. These search areas defined the offer of the energy regions of 2,7 TWh in Noord-Holland Zuid and 3,6 TWh in Noord-Holland Noord (Programma RES Noord-Holland Noord & Provincie Noord-Holland, 2021; Programma RES Noord-Holland Zuid & Provincie Noord-Holland, 2021).

The concept-RES was used to gather more reactions and then further specify the search areas, between April and September 2020, people got to send in responses on the offer that was in the concept-RES. Moreover, the concept versions were sent to the national programme of the energy strategy so that they could calculate the definite effect of the proposed plans and if the plans of all regions would add up to the goal of 35 TWh. A wide range of comments was given at this time, for example from Staatsbosbeheer [national forest management], farmers, and the net operator (Programma RES Noord-Holland Noord & Provincie Noord-Holland, 2021; Programma RES Noord-Holland Zuid & Provincie Noord-Holland, 2021).

At this point, the covid-19 pandemic was severe, especially around the spring of 2020, there was a delay because of the regulations therefore the deadline of the concept-RES changed from July 2020 to October 2020 (Programma RES Noord-Holland Zuid & Provincie Noord-Holland, 2021).

All replies were collected into a response note [reactienota] together with the comments of council members, representatives of the province of Noord-Holland, and the water authorities. This document was used as an intermediate step towards the RES 1.0 which had to be finished in April 2021. Moreover, seven thematic sessions in NHN and eight sessions in NHZ were organised to gain more input that was still lacking, those sessions took place between October 2020 and February 2021 so that the input could be implemented before the RES 1.0 had to be published in April. The themes of those sessions were: Principles of solar and wind energy, opportunities for farmers, spatial cohesion, local ownership, youth, heat from water, energy infrastructure and NHZ also had an eight session about innovation (Programma RES Noord-Holland Noord & Provincie Noord-Holland, 2021; Programma RES Noord-Holland Zuid & Provincie Noord-Holland, 2021).

[4] See section 3.2.4 and 3.2.5 for the maps of Noord-Holland Noord and Noord-Holland Zuid with all the search areas drawn in.

At last, the search areas became narrower and more specified, either because of critique or that the area was not suitable after all, this step is not finalized yet as this can still change even now after the RES 1.0 is published because the situation in areas can change. This process finally led to the RES 1.0 of Noord-Holland Zuid and Noord-Holland Noord on April 21, 2021.

3.2.2 RES Noord-Holland

In April 2021, the first version of the RES was presented for both regions that are being discussed, this section will be a summary of what is in it and what the next steps will be in general whereas the next section will discuss some highlights per energy region in Noord-Holland.

In May and June municipalities and the water authorities must decide on the RES, afterwards in July the province will make its decision. The goal of the deciding vote is to incorporate the strategy into the policy of all those governmental organs (Provincie Noord-Holland, 2021). The municipalities have to incorporate the search areas of the RES and the final destination for solar and wind energy into their landscape and surrounding policy, this implementation in policy will give the RES the necessary legal status (Stuurgroep Regionale Energiestrategie Noord-Holland Noord, 2021). This will require customization for each municipality and subregion in case of cross-border plans.

In the upcoming two years, the RES 1.0 will be further developed into a RES 2.0, during this time the support by project management for both regions will continue since the collaboration between all different parties has been perceived as successful and much appreciated. The intensity however will be dependent on the contribution of the national government which will be decided by a new administration (Stuurgroep Regionale Energiestrategie Noord-Holland Noord, 2021).

3.2.3 Principles of RES

In all the sessions that were held with a wide range of interest groups, representatives and citizens, there were some overlapping ideas and interest, those came together in the principles of the RES. These principles are the same in Noord-Holland Noord and Noord-Holland Zuid, therefore they will be discussed together. In the questionnaire, those principles form the basis of the decision-making process for municipality council members since it will be difficult to honour each principle as much for each project. The eight principles that must be taken into consideration for each project principles are listed below.

1. **Careful participation:** Residents and other stakeholders can contribute ideas during implementation and the municipality facilitates residents' initiatives.
2. **Fair distribution of benefits and burdens:** the aim is to achieve a minimum of 50 percent local ownership per project.

3. The **legal frameworks for distance and (noise) nuisance** remain the starting point. Local authorities can decide on stricter standards.
4. Rapidly realizable projects such as **sun on large roofs, parking spaces, and noise barriers** are actively encouraged.
5. There is and remains room for new initiatives and search areas.
6. Every project strives for **added value for the landscape and nature** and measures are taken to prevent or reduce negative effects.
7. **Spatial coherence** is important. The province is taking the lead in monitoring these.
8. For each project, it is explored how **opportunities can be linked**, or where generation can be combined with other functions.

(Stuurgroep Regionale Energiestrategie Noord-Holland Noord, 2021; Stuurgroep Regionale Energiestrategie Noord-Holland Zuid, 2021).

3.2.4 Noord-Holland Noord

Noord-Holland Noord has committed to an offer of 3,6 TWh of renewable energy in 2030 including the existing 2,1 TWh. This should be realised with fourteen new windmills and roughly 2485 hectares of solar panels (Stuurgroep Regionale Energiestrategie Noord-Holland Noord, 2021).

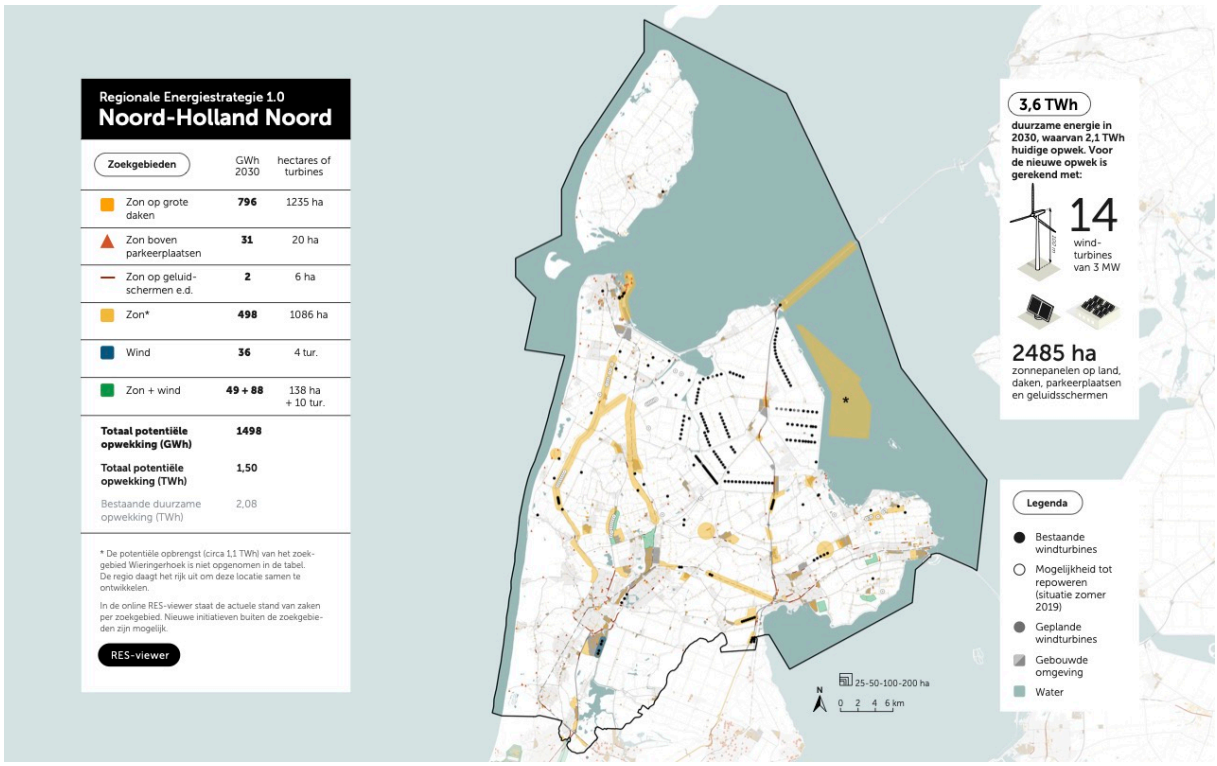

Figure 2: Map of search areas in Noord-Holland Noord

(Stuurgroep Regionale Energiestrategie Noord-Holland Noord, 2021)

This map shows the search areas as proposed in the RES of Noord-Holland Noord. The main generation will have to come from sun on large roofs and solar panel fields. In total there are 45 areas where renewable energy can be considered and are defined in the RES.

Unique about the plan in Noord-Holland Noord is the out-of-dike plan in the IJsselmeer, this is not yet included in the offer of 3,6 TWh as it is very uncertain if it can be realised, but the potential is huge, with 1.1 TWh it could make a large contribution (Energieregio Noord-Holland Noord, 2021). The plan is an exceptional mix of nature conservation, recreation, and renewable energy generation and consists of placing solar atolls on the water to create shallow water which is beneficial for bird wildlife. There will be five islands created, one with only nature and four with solar panels, the vegetation underneath will be beneficial for the biodiversity in this area. This concept is unique as worldwide there does not exist such an area yet (Energieregio Noord-Holland Noord, 2021). This plan came to be because there is a lack of public support for large areas of solar panels on land as well as low support for large wind parks on land. It also fits with the national plans to create more shallow water in the IJsselmeer and does not conflict with the agricultural sector that uses the water of the IJsselmeer for irrigation. The search area of Wieringerhoek is unique and shows the innovative way of thinking the RES process has encouraged.

3.2.5 Noord-Holland Zuid

Noord-Holland Zuid committed to generating 2,7 TWh in 2030 from which currently 0,7 exists. This is divided over 32 search areas, even though the potential of all those areas combined is more, the offer is set at 2,7 TWh because it is expected that some areas will not make it (Stuurgroep Regionale Energiestrategie Noord-Holland Zuid, 2021).

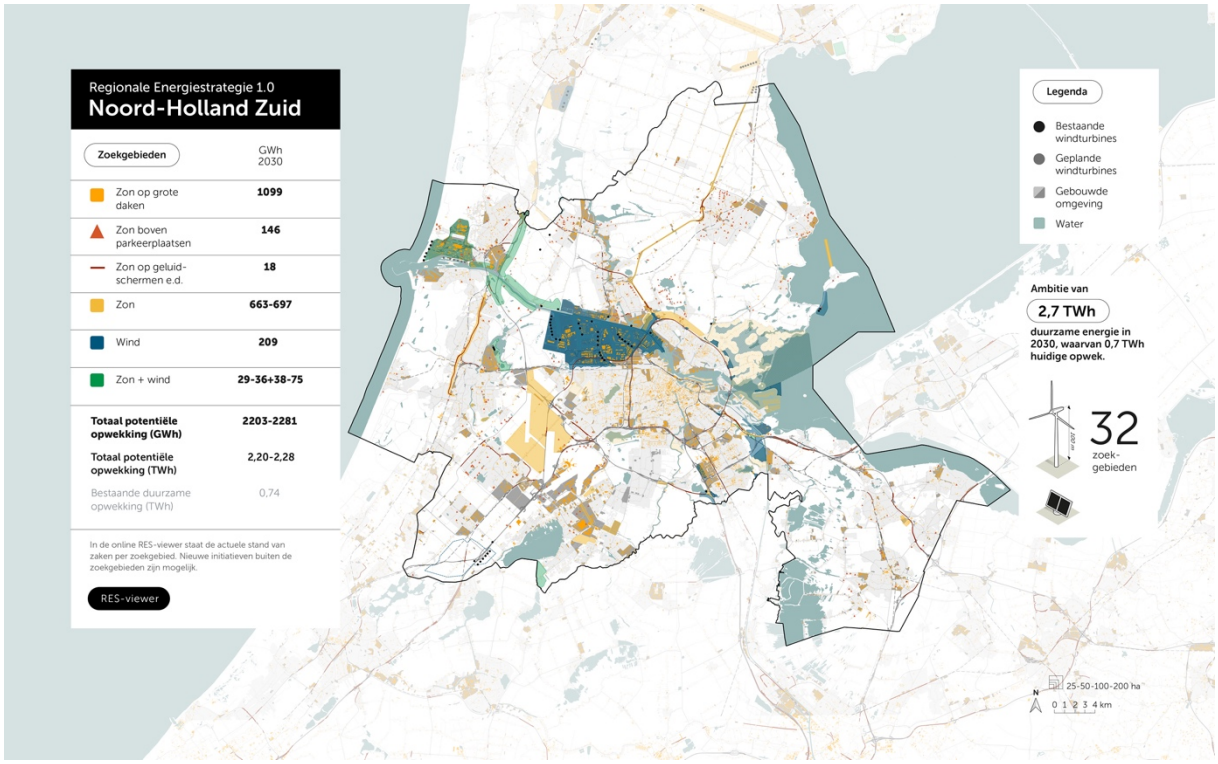

Figure 3: Map of search areas in Noord-Holland Zuid

(Stuurgroep Regionale Energiestrategie Noord-Holland Zuid, 2021)

The map of Noord-Holland Zuid shows all the areas where there might be potential for renewable energy. A remarkable area is at Schiphol airport, since the landing strip region cannot be used for any type of buildings as the view has to remain clear, it makes a good location for solar panel fields. The airport however also creates a challenge for this energy region because of the height restrictions due to overflying planes. Other challenges are that this region is densely populated which makes it more prone to as well as that there is high energy demand. Furthermore, there are some large energy users such as Tata steel and the harbour of Amsterdam. Both locations of these large energy users are appointed as search areas such that the renewable energy can be generated as close to the end-user as possible.

4. Methods

This section will discuss the relatively new method of Participatory Value Evaluation (PVE) developed by Dekker, Mouter, and Koster who first published about it in 2018. Firstly, PVE will be explained and placing it in contract to the wider applied cost-benefit analysis. Secondly, the application of PVE for this research study will be elaborated on and why this method is chosen to look into the trade-offs that policymakers must make.

4.1 Cost-Benefit Analysis and Willingness-to-pay

Before going into depth about the participatory value evaluation method, it is important to briefly discuss the current most-used method for valuation studies. Every economist or policymaker is familiar with cost-benefit analysis, as this is the most used method to decide which policy options are the best to pursue (Mackie et al., 2014). A cost-benefit analysis adds up most benefits, both monetary and other effects expressed in monetary terms, as well as costs expressed in monetary units. Those results for each policy can be compared to each other, and the project with the highest net result can be executed (Robinson, 1993). The monetized results often rely on willingness-to-pay estimates (Robinson, 1993).

Willingness to pay for environmental goods is often based on contingent valuation studies (Sen, 1995). In a contingent valuation study, people are asked what they would be willing to pay for goods that are not sold on the market from their own budget, or in other words how much they value a certain good just for it being there without themselves benefitting. This could be, for example, biodiversity in the Amazon rainforest, clean air in China, or coral reefs in Australia while not living there or benefitting in any way (Sen, 1995). A downside of this approach is that people might report higher values than they would actually pay as they know it is only a hypothetical question, and people tend to answer strategically to these questions.

The main limitation of this approach is that it cannot cope with the fact that private choices might not reflect what people want the government to spend the public money on (Mouter et al., 2019; Sen, 1995). This is shown in research by Howley et al. (2010), people give different responses whether they are asked as a citizen or as a consumer, as citizen they consider the government having responsibility for road safety and environmental protection, however, they would not contribute as consumer because they do not see it as their responsibility (Mouter et al., 2017). To overcome this limitation people can be asked for their willingness to allocate public budget (WTAPB), this method lets people make trade-offs within the governmental budget, and thereby the problem of public investments being incommensurable with consumer choices disappears.

4.1 Participatory Value Evaluation

In a Participatory Value Evaluation (PVE) study, people are asked to divide the government budget over a selected number of projects, other choices are to delegate the decision to an expert, to save budget for upcoming years, or diverge to other projects that are not included. PVE is an extension of the WTABP method because it allows people to not spend all the budget on the offered choices, but they can also decide to keep a part of the budget for other projects or for following years (Mouter et al., 2019). There is a distinction between a fixed PVE and a flexible PVE, the latter also gives the possibility to reduce and increase the budget, whereas the former only has the option to postpone expenses to a later time (Mouter et al., 2019). The reduction and increase of the budget translate to higher or lower taxes for the citizens filling in the survey. The advantage of this approach is that it takes considerations about the public budget as well as the private budget into account, thus the social welfare effects of both budgets are taken into account, whereas with the fixed budget PVE this is not the case. The flexible PVE method can capture the most preferences (Mouter et al., 2019).

The PVE method is used on online platforms resulting in that it can be used to involve citizens who are usually less included in the consulting of citizens for policymaking, such as younger people and people who do not have a strong opinion on the topic (Mouter et al., 2021). This increases the level of participation, especially of underrepresented groups who generally do not show up in physical citizen consultation sessions. Moreover, people gain awareness about the considerations policymakers have to make, and by filling out the survey they learn about the topic as well.

4.2 PVE for this study

Participatory Value Evaluation has been chosen for the use of this study as it offers a wide range of possibilities for survey-takers to express their preferences. In the regional energy strategy, many choices regarding specific cases will have to be made, especially in the next stage of implementation. It is necessary to have a clear and specific overview of what is deemed important, PVE can be very specific in the point allocations but also clear as the system of point allocation is easy to understand. It also pushes people to deliberately make a trade-off, as they cannot exceed the limit of points, but they are given the option to spare points and allocate those to 'other' projects or attributes.

Usually, a PVE study is aimed at citizens and places them on the seat of the decision-maker, however, I have chosen to consult municipality council members instead. The PVE method offers the possibility to let the council members have very distinct preferences because of the point division. Their advice by filling in this study can help the program manager to better steer the direction of the RES 2.0 which will be made in the next two years. It is thus, still used as a consultation of a large group of people but rather a political PVE instead of a citizen consultation. It also serves to increase the participation of council members with the RES,

which was one of the first issues that led to the start of this study. The PVE method is very useful to analyse the results of the questionnaire since it can look in-depth into the preferences regarding the different principles, for example, it provides more information than a choice experiment or ranking of preferences.

5. Survey design

Within this thesis, data is collected from municipality council members about the considerations they make in the execution of the regional energy strategy of Noord Holland Noord and Noord-Holland Zuid with a questionnaire and interviews. The research questions that will be answered with this data are the following: *What are the key considerations regarding the principles of the RES and how are those influenced by the background and participation level of a municipality council member?* and *What relative value can be given to the principles of the Regional Energy Strategy of Noord-Holland as stated in the RES 1.0 based on the opinion of municipality council members?*

The principles used in the survey are based on the principles in the RES of Noord-Holland Noord and Zuid. Those have come about through two and a half years of collaboration between municipalities, the water councils, the province of Noord-Holland, energy network operation as well consultation of citizens, energy co-operations, experts, and civil organisations (Stuurgroep Regionale Energiestrategie Noord-Holland Zuid, 2021; Stuurgroep Regionale Energiestrategie Noord-Holland Zuid, 2021).

In the set-up of the questionnaire, several choices had to be made, such as where to focus on, which options to present, and principles to include.[5] There are two questions in the questionnaire which use the PVE method by point allocation. I have made some adjustments to how the method is usually used. First, the questionnaire is aimed at municipality council members instead of citizens. Second, the points represent preference towards a principle, and they are a proxy for time and effort that council members can put into the projects whereas usually, the points stand for a budget that can be allocated for the principles question. Finally, I have chosen to not include the consult an expert option in the project question because as local representatives, they should be expertized in what they prefer, and what the citizens of their municipality want. Furthermore, they will have to make the vote on the RES themselves as well, and they are the ones who will have to put time and effort into the creation of the framework for the specification of search areas. Besides the two PVE questions, the principles question, and the project selection question, there are some more questions about their general stance on the RES, solar, and wind energy, and their involvement in the creation of the RES.

The remainder of this chapter will be organised as follows. Firstly, the principles are further explained as they form the core of the study. Secondly, the set-up of the projects questions is discussed and the choices that were made for that. Thirdly, the distribution of the survey and

[5] See appendix C in chapter 13.3 for the full questionnaire that was presented to the municipality council members.

the process of data collection are presented. Thereafter, the interview plan is discussed, and this chapter ends with a description of how the collected data will be analysed.

5.1 Explanation of principles

I have decided to select six out of the eight principles for the question about project selection and seven while deciding between the importance of all principles. This means that the first and fifth principle of careful participation and room for new initiatives is dropped. These principles are about taking new ideas and initiatives which is out of the scope of municipality council members deciding how to give substance to the RES search areas. Table 1 below shows how the original principles were transformed into the principles asked about in the questionnaire.

Table 1: Conversion of principles for the questions in the survey

	Principles in the RES	**Question principles**	**Question project**
1	Careful participation		
2	Fair distribution of benefits and burdens	→ Fair distribution →	Local ownership
		Efficiency	
3	Legal frameworks for distance and (noise) nuisance	→ Nuisance →	Nuisance
4	Rapidly realizable projects	→ Timeline →	Completion date
5	Room for new initiatives and search areas		
6	Added value for the landscape and nature	→ Biodiversity →	Biodiversity
7	Spatial coherence	→ Spatial coherence →	Net infrastructure
8	Opportunities can be linked	→ Combined use of space →	Combined use of space

As mentioned before, the first and fifth were dropped completely as this does not impact the decision of municipality council members directly in their choice regarding the further development of the search areas. The second principle is barely adjusted for the questions about the principles and project since this covers the aim to achieve a minimum of 50 percent local ownership per project and in the project selection question the options are 30%, 50%, and 70% local ownership of a project, as local ownership will lead to a fairer distribution of

benefits and burdens is the assumption (Stuurgroep Regionale Energiestrategie Noord-Holland Zuid, 2021; Stuurgroep Regionale Energiestrategie Noord-Holland Zuid, 2021).

Efficiency is added as a principle in the question about the principles, however, it is excluded from the project selection, the reason for this is that I have assumed that for many the choice will fall on the most efficient project regarding energy generated and costs, and the purpose of this study is to find the secondary preferences besides efficiency. It is included in the principles question to test the hypothesis of people having a high preference for efficiency.

In the questionnaire, the explanation for nuisance is that the more points given to this statement mean stricter norms set by the municipality. In the project there are several forms that nuisance can take, those are noise nuisance of windmills, shadow flicker effect of windmills, or nuisance of solar panel fields. All of those are within the national norms but some are directly on it while others are below. This makes it possible to test what type of nuisance is considered less disturbing as well as whether council members prefer stricter norms. In the project selection question, plus and minus signs are shown for people to easily spot the level of nuisance.

In the RES, the principle of rapidly realizable projects covers sun on roofs, parking lots, and on highway noise barriers, however since those projects are not included in the questionnaire, this has become the time of completion of the project. Already in the question on the principles, the addition of the type of project is dropped resulting in a more similar interpretation in both questions.

The sixth principle: Every project strives to create added value for the landscape and nature and to mitigate negative effects became the extent to which a project has an impact on biodiversity. I have made this choice since this is more easily measurable by different signs ranging from negative to positive impact on biodiversity.

The principle about spatial coherence has changed the most in the project selection question since it can cover many aspects and has a wide range of possible applications, I have chosen to only focus on net infrastructure, meaning the level of changes to be made for a project to be connected to the electricity network. In the question on the principles, it does cover the whole range of spatial coherence including landscape, nature, agriculture, recreation, and net infrastructure.

The final principle about the possibility of linking opportunities is similar to spatial coherence, however, the main difference is that spatial coherence is about existing structures while linking opportunities and combined use of space is about implementing multiple options into the new to be build plans of wind and solar power. This principle does not change from the

RES to the question on the principles. In the projects, it can take shape as a combination of renewable energy and water storage, biodiversity, or nature.

5.2 Projects question

This question is made up of six different projects, all with six different attributes, each question contains three wind energy projects and three solar energy projects. Each council member is presented with the projects and has to divide 100 points over all projects. Below an example of how the configuration of one project looked like. There are in total six different versions of six projects to test the influence of the level of one attribute on the total score, see also table 2 on all possible levels of the attributes. The attributes levels are randomized over the projects.

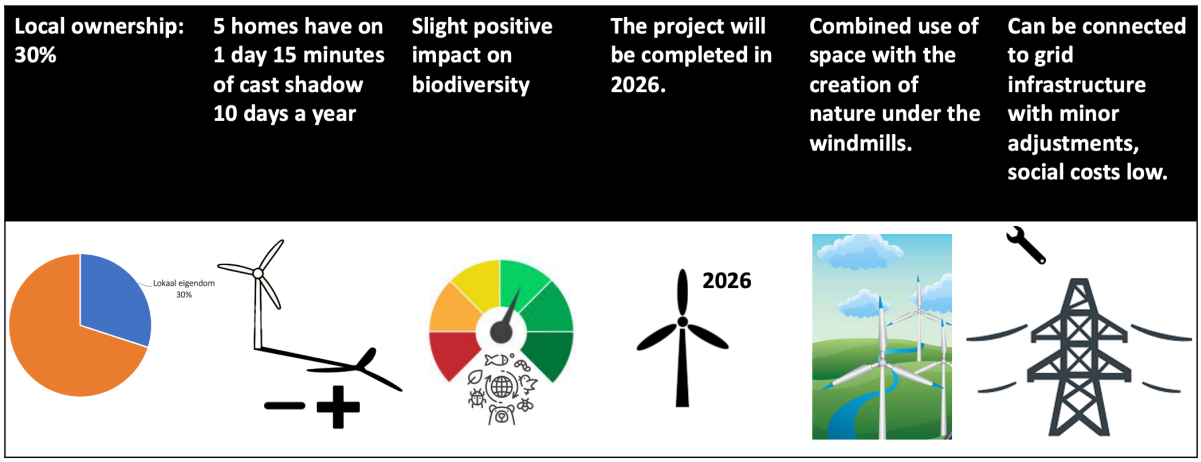

Figure 4: Example of a wind energy project in survey

The attributes are based on the principles as those are assumed to be of main impact on a choice of a council member. For local ownership is chosen to have three levels since the goal is 50%, it is chosen to randomize around this. Nuisance can consist of cast shadow, noise, or general nuisance, this is shown by the plus and minus signs in the pictogram. Biodiversity has six levels. The RES has 2030 as a goal, therefore this is the last year a project could be completed. For realistic purposes, the first option for a project to be completed is 2024. There are two options in combined use of space if there is which are a combination with water storage and combination with nature, however, those have not been categorized in the analysis. The final attribute is net infrastructure, this shows how easily a project can be connected to the electricity grid and the social costs that will come with the implementation of the project on the grid.

Table 2: All possible levels of the attributes for project question

Local ownership	Nuisance	Biodiversity	Completion date	Combined use of space	Net infrastructure
1 =30% 2=50% 3=70%	1 = very bad 2 = bad 3 = average 4 = good 5 = very good	1 = very bad 2 = bad 3 = just below average 4 = just above average 5 = good 6 = very good	1 = 2030 2 = 2028 3= 2026 4= 2024	1 = no 2 = yes	1= very high cost 2 = high cost 3 = low cost 4 = no cost

5.3 Data collection and sampling

The questionnaire is distributed through email to all the municipality council members in Noord-Holland. At first, this was done through the program managers of the RES in Noord-Holland on May 26, 2021, they forwarded it to the working group members of the RES in both regions who were then asked to forward it to all the municipality clerks, who could send it to the council members.

After a couple of days, I was under the impression that not all of these steps were taken in all municipalities since the results were only coming from a few municipalities. On June 3rd, a reminder was sent out to the working group members to forward the questionnaire another time, however also this message did not lead to more than 25 respondents in total. My goal for a minimum number of respondents was 115 which is 10% of the total number of council members in Noord-Holland and preferably at least 1 reply from each municipality. To reach this goal, I have sent personal messages to all municipality council members on June 9 and June 10, this step was very successful because quickly the number of respondents jumped to 90. The first deadline for council members was set on June 12, however since a few people replied that they did want to fill out the survey, but could not do so before the 12th, I postponed the deadline to Wednesday, June 16, 2021. To make people aware of this change, I send out a reminder to all council members on June 12. After this reminder, I reached the goal of 115 respondents. At this point however there was not at least 1 respondent from each municipality, a final reminder was sent on June 15 to the municipalities from where there were no respondents yet. The survey closed on June 16 with in total 289 respondents of which 122 completely filled in the survey. For the analysis of the results, the 55 respondents who filled in the questionnaire partly and stopped after the principles are included in the evaluation of the value of the principles, as this increases the number of respondents drastically, however for further comparison they are not used since they did not fill in any other questions.

5.4 Interviews

This thesis is based on data from the questionnaire and also on several online interviews. In the questionnaire, people were asked to do an interview of about 30 minutes, this had led to 43 people willing to do an interview. From those, I selected 12 people, who came from different subregions, different political parties, and a wide range of opinions. Six people replied to the invitation and interviews were scheduled. One person of this selection did not show up in the zoom call at the scheduled time. The goal of the interviews is to get a broad view of perspectives, to achieve this, four more people were invited to have at least one person from each subregion. They all answered, and the interviews were planned for Wednesday, June 23, however, three people cancelled on the day itself or did not show up in the zoom call. As of a limited time, no more interviews were planned and in total thus six interviews were held. There were three interviewees from the region IJmond & Zuid-Kennermerland, two from the Zaanstreek region and one from the Kop of Noord-Holland.[6] They do cover a wide range of characteristics, see table 3 below.

Table 3: Overview of characteristics of interviewees

Interviewee	Level of involvement leading up to the RES 1.0	Preference for wind or solar power	Offer of energy region	Sub-region	Political party
1	Very much involved (5)	Strong preference for wind (5)	Too low (1)	Zaanstreek	GroenLinks
2	Somewhat involved (2)	Strong preference for solar (1)	Much too high (5)	IJZK	Local party
3	Somewhat involved (2)	Slight preference for solar (2)	Too high (4)	Zaanstreek	Local party
4	Averagely involved (3)	Slight preference for solar (2)	Good (3)	IJZK	Local party
5	Very involved (4)	Slight preference for solar (2)	Good (3)	IJZK	CDA
6	Very involved (4)	No preference (3)	Good (3)	Kop	ChristenUnie

From three regions, no people were willing to do an interview at all which are Amsterdam, Haarlemmermeer, and Gooi- en Vechtstreek. From the other regions, people were invited but did not reply or did not show up, and therefore are not represented.

The interviews are semi-structured, and people received the questions beforehand, however, there was room for divergence from those questions if something came up in the interview.[7] The interviews were conducted in Dutch since this was more convenient for the municipality council members.

[6] See chapter 13.2 for appendix B with the sub-regions division of Noord-Holland.

[7] See chapter 13.3 for appendix C with the interview guide in Dutch and English

5.5 Analysis of data

The quantitative data that was collected for this research in the survey are analysed with several statistical tests in SPSS and regressions. The principles question will be analysed with a t-test to see if the means differ from a random distribution. For the principles questions, the means given to each project will be calculated and then it will be tested with a regression, what the impact of the values of the attributes will be on the outcomes. This will show whether or not an attribute has a significant impact on the choice made by the council members. The remaining questions will be analysed with correlation tests to see whether there is a relation between the background of a council member and their choices.

The interviews are transcribed by Word in the online version of the Office 365 software, they were edited as the software was not fully correct yet in transcribing. Once the transcriptions were done, the interviews were coded with Atlas.ti. A thematic analysis of the interview transcripts is carried out to understand the general ideas and considerations made by the council members. A deductive approach for the coding strategy is used as it is based on the principles of the RES and related to the outcomes of the survey. A total of 50 codes in 9 code groups were created.[8] The codes are created by two rounds of coding, at first, open coding was used, thereafter the codes were placed into general themes by organising them into code groups.

[8] See appendix D in chapter 13.4 for the codebook

6. Descriptive results

6.1 Representation of sample

This section will present the descriptive results of the survey to better understand the data that is being analysed such that there is a better understanding of the respondents compared to the target population. In total there are 122 completely filled in surveys. 55 respondents stopped after the question of the division of points for the principles which is at 17% of the full survey. There are 103 entries where people stopped before filling in any questions and only agreeing with the terms and the explanation. There are 9 entries where the respondent did not agree or comply with the terms and conditions and therefore left the survey immediately.

Table 4: Progress in survey

Progress in survey	No. of respondents
Finished	122
Question about principles answered, then stopped	55
Stopped before the question about principles	103
Not agree or not comply with terms	9

There are 1153 municipality council members in total in Noord-Holland, this can be split into 729 in Noord-Holland Zuid and 424 in Noord-Holland Noord, thus roughly 11% finished the questionnaire completely and roughly 25% started the survey, however, there is a chance that there are some duplicates in there as people can start the survey on one device, not finish, and start again on another device. Interestingly, 50,8% of the respondents come from Noord-Holland Noord and 49,2% from Noord-Holland Zuid, whereas the division of council members is 36,8% and 63,2% respectively. There are two municipalities in Noord-Holland Zuid from where there are no respondents, Laren and Weesp. In Noord-Holland Noord, the only municipality with zero respondents is Enkhuizen.

In Noord-Holland, there are 33% women in the municipality councils elected in 2018/2019 (VNG, 2020). In the sample, this is 23% women. In table 5 below, an overview can be seen between party membership in the sample and in the Netherlands (VNG, 2020).

Table 5: Political party representativeness

Political party	Sample	Noord-Holland
CDA	11%	9,64%
CU	3%	2,22%
D66	12%	12,29%
GL	15%	13,60%
PVDA	4%	9,06%
VVD	18%	14,89%
Local party	29%	23,63%
SGP	0%	0,11%
SP	0%	4,22%
PVDD	0%	2,65%
DENK	0%	2,42%
FvD	0%	1,78%
PVV	0%	0,82%
50plus	0%	0,58%
I rather not say	6%	
Other	2%	2,09%
Total	100%	100%

As can be seen in table 5, the party representation in the sample is rather similar to the distribution in Noord-Holland for the whole population. PvdA and SP are slightly underrepresented and local parties and the VVD are somewhat overrepresented.

The average age of the sample is around 55 years, this is by taking the middle age of each group and then taking the mean of all groups. The average age of municipality council members was 52,8 years old during the municipal election in 2018, as those people, in general, will have aged three years by now, the average age will also be around 55 years old (VNG, 2020).

Based on these descriptive statistics of the sample compared to characteristics of the entire population of municipality council members, it can be concluded that the sample is representative regarding party affiliation and age, and less regarding gender and Noord/Zuid region within Noord-Holland. This is important to keep in mind when interpreting the results.

6.2 Descriptive statistics

The previous section discussed the representation of the sample compared to the test population, this part will show the results of the questions that were asked in the survey.

The first question after the terms and explanation of the survey, that municipality council members had to fill in was the question about the principles of the RES. In this question, they were asked to divide 100 points over the principles or select other with a minimum of 1 for each principle. Table 6 below shows the minimum, maximum, mean, standard deviation, and variance for each of the principles. A random division would imply 12,5 points for each principle.

Table 6: Descriptive statistics of principles

Field	Minimum	Maximum	Mean	Standard deviation	Variance
Fair distribution	1.00	55.00	13.99	11.68	136.38
Efficiency	1.00	40.00	12.79	9.73	94.76
Nuisance	1.00	93.00	19.14	17.74	314.87
Biodiversity	1.00	93.00	11.57	11.10	123.15
Timeline	1.00	74.00	7.89	9.17	84.11
Combined use of space	1.00	44.00	11.65	8.49	72.16
Spatial coherence	1.00	80.00	16.80	12.52	156.83
Other	1.00	93.00	6.18	14.80	219.05

Nuisance has the highest mean and could therefore be seen as valued the most, however, the variance is also the largest which means that the council members had rather broad opinions about it. As can be seen from figure 5 on the next page, is that 11 people have put in a value above 50, and even 3 council members have put the highest possible value of 93. Even if the three outliers of 93 are removed from the sample, the mean of nuisance remains the highest at 17.86.[9] Efficiency has the lowest maximum score although the mean is average, as can be seen in the histogram of efficiency below, there is quite some divergence in the lower spectrum. This is unexpected as one could expect to always pick the most efficient option and thus have the highest value in this question. The timeline is valued the lowest, also with a lower variance, which can also be seen in the graph below, that it looks like that it matters the least for council members when the project is finished. Spatial coherence is also valued more than average and it has two higher outliers with values of 70 and 80, however also without those outliers, it has a high mean. There were only a few comments with other principles that people considered important which three comments mentioned support among residents.

[9] See appendix D in chapter 13.4.4 for the results and means of all principles.

Table 7: T-test of means of principles

One-Sample Test

Test Value = 12.50

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Fair distribution	1.691	176	.093	1.48870	-.2486	3.2260
Efficiency	.389	176	.698	.28531	-1.1628	1.7334
Nuisance	4.961	176	.000	6.63559	3.9959	9.2753
Biodiversity	-1.111	176	.268	-.92938	-2.5802	.7215
Timeline	-6.673	176	.000	-4.61299	-5.9773	-3.2487
Combined use of space	-1.328	176	.186	-.85028	-2.1140	.4134
Spatial coherence	4.558	176	.000	4.30226	2.4393	6.1652
Other	-5.664	176	.000	-6.31921	-8.5209	-4.1175

In table 7 above, the result of a t-test is shown to test whether the values differ from 12.5, as this would be the value if all were equally important. Nuisance, timeline, spatial coherence, and other are all significantly different from 12.5 with a significance of 95% confidence interval, and fair distribution is significant at the 10% level.

Table 8: T-test of means of principles

One-Sample Test

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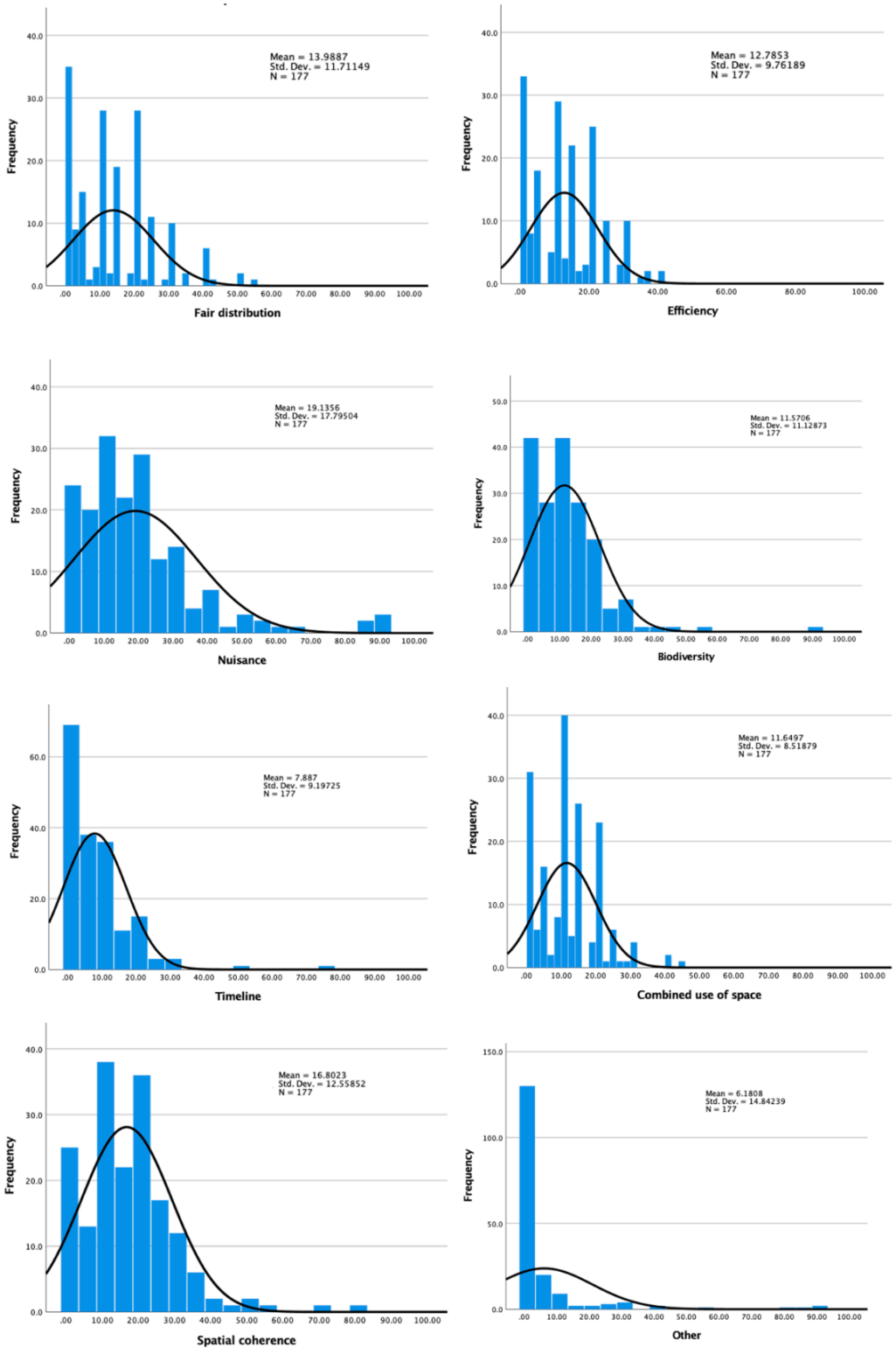

Figure 5: Histograms of each principle

In table 9, a comparison is made of Noord-Holland Noord and Noord-Holland Zuid. A t-test shows that only the means of fair distribution for Noord-Holland Noord (*M* = 11.13; *SD* = 9.15) and Noord-Holland Zuid (*M* = 16.30; *SD* = 11.13) are significantly different (t (122) = -2,805; p

< 0.01). As this is the only one that significantly differs, it shows that there are no other major differences between the two regions.

Table 9: Comparison of means by energy region

Noord-Holland Noord	Minimum	Maximum	Mean	Standard deviation	Variance
Fair distribution	1.00	40.00	11.13	9.15	83.79
Efficiency	1.00	37.00	12.43	9.85	96.98
Nuisance	1.00	93.00	20.90	18.30	334.75
Timeline	1.00	45.00	10.87	9.28	86.05
Biodiversity	1.00	50.00	8.06	8.43	71.01
Combined use of space	1.00	44.00	12.08	9.61	92.33
Spatial coherence	1.00	50.00	17.35	10.65	113.50
Other	1.00	93.00	7.17	17.98	323.41
Noord-Holland Zuid	**Minimum**	**Maximum**	**Mean**	**Standard deviation**	**Variance**
Fair distribution	1.00	42.00	16.30	11.13	123.81
Efficiency	1.00	40.00	14.30	9.79	95.78
Nuisance	1.00	93.00	17.52	16.09	258.77
Timeline	1.00	55.00	12.46	10.13	102.64
Biodiversity	1.00	30.00	7.43	7.74	59.85
Combined use of space	1.00	30.00	12.21	6.90	47.68
Spatial coherence	1.00	45.00	14.75	10.22	104.35
Other	1.00	39.00	5.03	8.45	71.44

As expected, the council members who filled in the survey were involved in the participatory process leading up to the RES 1.0. There is no significant difference between participation between the two main regions.

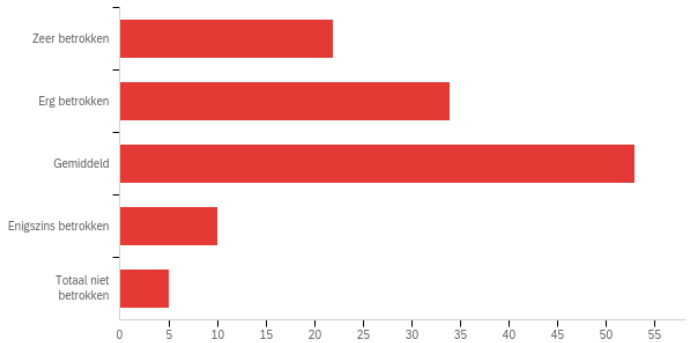

Figure 6: Level of participation

In Noord-Holland Zuid, the respondents tend to agree with the offer of 2,7 TWh of renewable energy as the mean is 2,95 and *SD* = 0.72 where way too low is 1, good is 3 and much too high is 5.

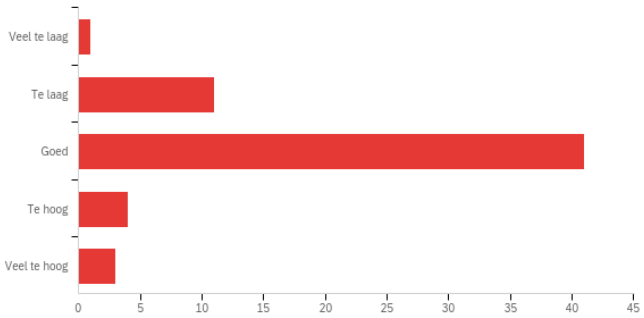

Figure 7: Offer of Noord-Holland Zuid

In Noord-Holland Noord, the municipality council members consider the offer of 3,6 TWh a bit too high as the mean is 3,19 with *SD* = 1.01.

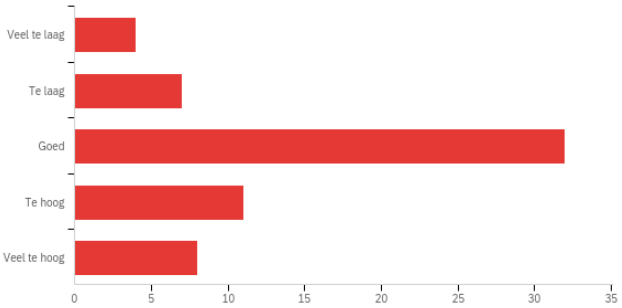

Figure 8: Offer of Noord-Holland Noord

There is a strong preference for solar energy among the municipality council members as can be seen below, from 1 to 5 where 1 is a strong preference for solar and 5 a strong preference for wind energy, the mean is 2,29 with a standard deviation of 1,18. 60% of respondents prefer solar while only 14,5% prefer wind energy, the others did not have a preference.

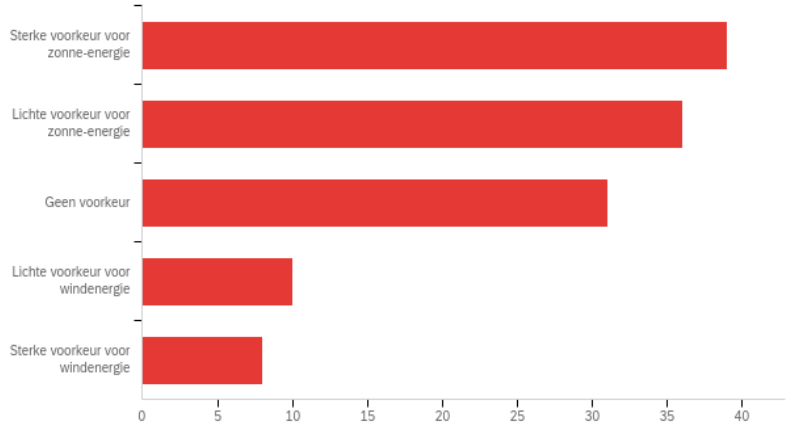

Figure 9: Preference for solar energy or wind energy

7. Quantitative results

This chapter discusses the outcomes of the questionnaire and shows several interesting statistical tests that were performed to get these results. Firstly, the regression on the principles and projects is studied and in the second half of this chapter, several correlations between the answers are presented.

7.1 Projects

Figure 10 shows one version of the project question of the questionnaire, in total there were six different versions with all randomized attributes. The council members were shown one version of the question which all contained 6 projects, three wind energy and three solar energy projects, with six attributes. I have given the 6 attributes of each project a value on an ordinal scale. This is used to run a regression to see which factors have a significant impact on the mean score a project receives. Those attributes are based on the principles, which was the first question in the survey.

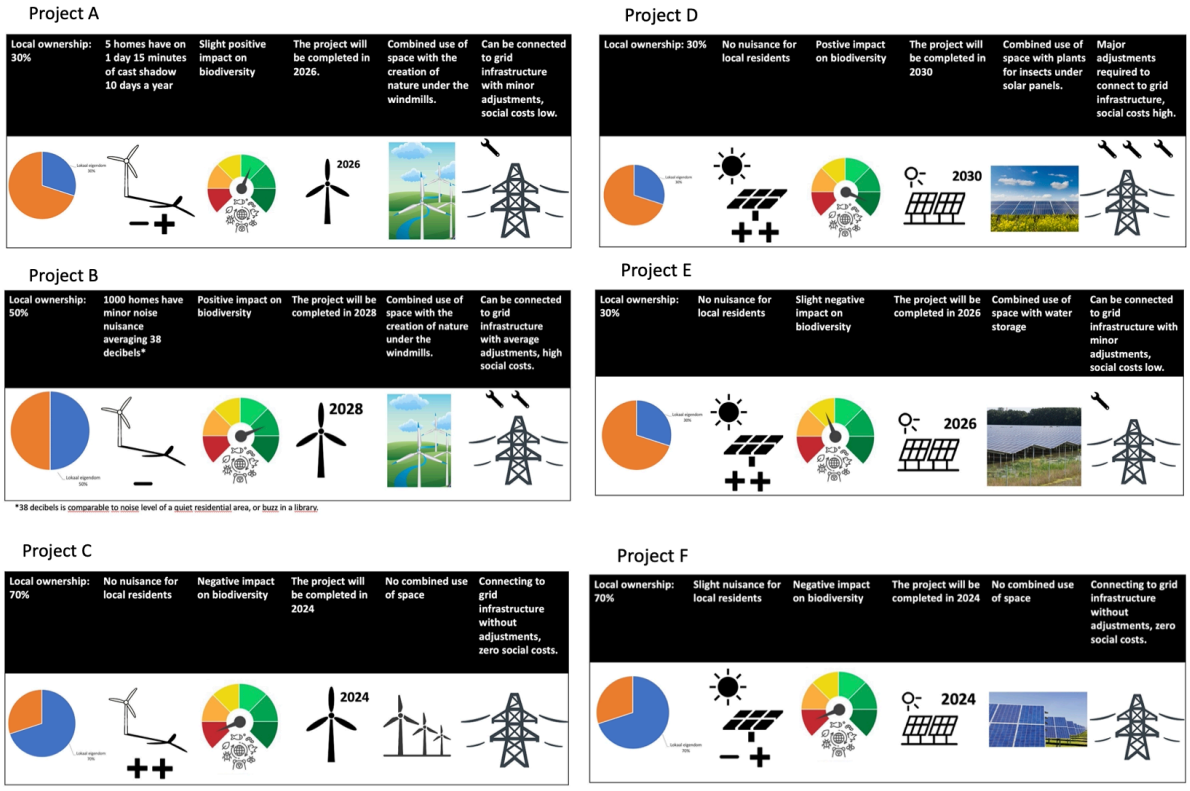

Figure 10: Example of presentation of the six projects in the questionnaire

Table 10: All possible levels of the attributes of the principles

Local ownership	Nuisance	Biodiversity	Completion date	Combined use of space	Net infrastructure
1 =30% 2=50% 3=70%	1 = very bad 2 = bad 3 = average 4 = good 5 = very good	1 = very bad 2 = bad 3 = just below average 4 = just above average 5 = good 6 = very good	1 = 2030 2 = 2028 3= 2026 4= 2024	1 = no 2 = yes	1= very high cost 2 = high cost 3 = low cost 4 = no cost

As explained in chapter 5 on survey design, the attributes are derived from the principles of the RES. To test whether any attribute had an impact on the end result, all attributes were given ordinal values which are described in table 10. A regression is run on the mean score of all projects with as predictors the level of attributes in the model.[10] This led to the following results.

[10] The means for all projects can be found in the appendix in chapter 16.4.4

Table 11: Statistical result of regression of the project question

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.626[a]	.392	.288	6.17230716

a. Predictors: (Constant), Net infrastructure , Combined use of space, Nuisance, Local ownership, Biodiversity, Completion date

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	860.018	6	143.336	3.762	.005[b]
	Residual	1333.408	35	38.097		
	Total	2193.427	41			

a. Dependent Variable: V8

b. Predictors: (Constant), Net infrastructure , Combined use of space, Nuisance, Local ownership, Biodiversity, Completion date

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	8.023	4.370		1.836	.075
	Local ownership	-1.431	1.294	-.171	-1.106	.276
	Nuisance	2.320	.772	.472	3.004	.005
	Biodiversity	.780	.622	.209	1.253	.218
	Completion date	-1.539	1.042	-.251	-1.477	.149
	Combined use of space	1.494	2.317	.103	.645	.523
	Net infrastructure	.151	.984	.025	.153	.879

a. Dependent Variable: V8

The R square is 0.392, thus the model does have some explanatory power, however since the people should only base their choice on the attributes, this is rather low. In the table on coefficients of the regression, it can be seen that only nuisance leads to a significant difference in the outcome of the mean score. A higher point value for nuisance in a project, meaning less nuisance, leads to more points given to that project.

Whether the project was wind or solar energy was put into the regression to test if people looked solely at the attributes, or also considered their own opinion on wind and solar energy. This indeed led to a significant impact of the WindSolar variable and thus this did impact the choice of people. See the result in table 12 below, the impact of wind and solar is significant, moreover the R square, the explanatory power of the model, has also increased to 0.489.

Table 12: Statistical result of regression of the project question including WindSolar

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.699[a]	.489	.384	5.74115464

a. Predictors: (Constant), WindSolar, Combined use of space, Completion date, Local ownership, Biodiversity, Net infrastructure , Nuisance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1072.758	7	153.251	4.649	.001[b]
	Residual	1120.669	34	32.961		
	Total	2193.427	41			

a. Dependent Variable: Mean

b. Predictors: (Constant), WindSolar, Combined use of space, Completion date, Local ownership, Biodiversity, Net infrastructure , Nuisance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.489	3.007		1.493	.145
	Local ownership	-.043	.041	-.150	-1.042	.305
	Nuisance	.096	.054	.292	1.795	.082
	Biodiversity	.075	.049	.236	1.516	.139
	Completion date	-.052	.050	-.168	-1.045	.303
	Combined use of space	.030	.036	.121	.816	.420
	Net infrastructure	.028	.047	.090	.587	.561
	WindSolar	2.737	1.082	.351	2.529	.016

a. Dependent Variable: Mean

This result shows a significant value at the 5% level for the type of project, wind or solar, and a 10% significance for nuisance. The nuisance attribute influence is still in line with the previous result. Since the impact was of the two types of projects was significant, another two regressions were done for the wind and the solar energy projects separately to test the impact of the attributed without the choice of wind and solar influences the results. This led to a higher R square in both cases than it was in the first regression[11], for solar energy, this is 0.790 and for wind energy projects it is 0.536.

Nuisance remains, also in those two regressions, significant at the 10% level with a value of 2.144 in the wind projects regressions and 2.157 for the solar energy projects. Biodiversity is in both regressions significant at the 5% level with 2.922 for wind and 2.978 in case of solar energy. This positive value means that a better impact of biodiversity led to more points given to projects with this higher value. Furthermore, combined use of space is significant at the 5%

[11] See Appendix D in chapter 13.4.3 for the separate results for the wind energy projects and the solar energy projects.

level in case of solar energy with a value of 2.281, meaning that in case of combined use of space, those projects were given higher points.

The mean of the points given to wind energy projects and solar energy projects are shown below.[12] These are the means of the projects for wind energy and the projects for solar energy. Table 13 shows that in general solar energy projects were given more a higher score. An important note with this table is that there were always three solar options and three wind energy options. Therefore, wind energy is still around three times more preferred than other projects. If the protest votes are removed of those who did not give any points to a project but only to other, the mean of other drops to 7,53. This shows that there is a willingness to implement renewable energy projects in a municipality and that those will increase public welfare according to the council members.

Table 13: Means of projects separated by wind energy and solar energy projects

	Mean	***N***
Wind energy	10,446	121
Solar energy	18,683	121
Other	11,466	121

Besides the projects and the principles question discussed in the previous chapter, there were some more questions on the background of the council members and their general stance on wind and solar energy. Those will be shown next.

7.2 Correlations

An interesting result is that in Noord-Holland Zuid there is a significant difference (t (58) = -3.139; p <0.01) regarding whether the offer is too high or too low between preference for solar energy (*M* = 3.16; *SD* = 0.718) and wind energy (*M* = 2,59; *SD* = 0,590). This is also seen by the two-tailed Pearson correlation (-0.482; p <0.01).[13] A preference for solar energy correlates with considering the offer of 2.7 TWh in Noord-Holland Zuid too high. The Pearson correlation is -0.482 and significant at the 1% level. [14]

The level of participation of municipality council members is also related to which principles they think are of value. A value >= 3 means average to low involvement whereas < 3 consists of the answer option very involved and involved. Municipality council members who were more involved think fair distribution is of higher value and combined use of space is of less

[12] See for the full summary of means per project in appendix D in chapter 13.4.4.

[13] See appendix D in chapter 13.4.1 for test results.

[14] See Appendix D in chapter 13.1.1 for the result.

importance. For other principles, there is no significant difference based on the participation level.[15]

There are several correlations between what council members think of the current offer of the RES in their region and how they valued the different principles. In table 14, all correlations between the principles and the offer can be seen. A negative relation means that the more weight is given to a principle, the council member thought the offer was too low. In case of fair distribution, council members of Noord-Holland Zuid tend to give more points to fair distribution if they think the offer of 2.7 TWh is too low. Nuisance is given in both regions more points if council members think the offer is too high. Especially nuisance has a high correlation of above 0.5. In Noord-Holland Noord, timeline has a strong negative relation.

[15] See appendix D in chapter 13.4.2 for test results.

Table 14: Correlation between principles and the offer of the RES in each energy region

		Offer of 2.7 TWh in Noord-Holland Zuid	Offer of 3.6 TWh in Noord-Holland Noord
Fair distribution	*Pearson Correlation*	-.423**	-.243
	Sig. (2-tailed)	.001	.057
	N	60	62
Efficiency	*Pearson Correlation*	-.253	-.065
	Sig. (2-tailed)	.051	.616
	N	60	62
Nuisance	*Pearson Correlation*	.605**	.506**
	Sig. (2-tailed)	.000	.000
	N	60	62
Biodiversity	*Pearson Correlation*	-.190	-.224
	Sig. (2-tailed)	.147	.080
	N	60	62
Timeline	*Pearson Correlation*	-.232	-.573**
	Sig. (2-tailed)	.075	.000
	N	60	62
Combined use of space	*Pearson Correlation*	-.305*	-.462**
	Sig. (2-tailed)	.018	.000
	N	60	62
Spatial coherence	*Pearson Correlation*	.128	-.020
	Sig. (2-tailed)	.330	.876
	N	60	62
Other	*Pearson Correlation*	.249	.286*
	Sig. (2-tailed)	.055	.024
	N	60	62
** Correlation is significant at the 0.01 level (2-tailed).			
* Correlation is significant at the 0.05 level (2-tailed).			

Party membership, age and gender did not have any particular correlations on the principles or the projects, therefore those will not be further discussed.

8. Qualitative results

This chapter will present the main considerations regarding the principles of the RES and how are those influenced by the background and participation of a municipality council member based on the interviews that were held.[16] In this chapter, the results will be presented in the same order as questions were asked in the interview. First the participation of a council member in the process leading up to the RES and the accompanying remarks that were said about the process of the RES, the participation, and governance in general. Thereafter the principles and projects are covered, along with other concerns that come up. Hereafter a question about PVE as a method was asked. The last section of the interviews discussed the offer of the RES in their energy region and this part will also cover some stances on wind and solar energy. At last, the general comments and the comments left in the questionnaire are discussed in this chapter.

8.1 Participation and process

- *How familiar are you with the RES and the search areas in your municipality and sub-region?*
- *How familiar are you with the role you have in the RES as a council member?*
- *In what way have you been involved and what did you think of this?*

The first section of questions in the interview was about familiarity, awareness, and participation regarding their knowledge about the energy strategy and role as a council member.

All interviewees were aware of the search areas in their own municipality, several mentioned that for the provision of information they were dependent on the region or the province and not so much their own municipality. For all interviewees, the RES was part of their portfolio of topics and thus familiarity with the RES, in general, was high.

The following quote summarizes the sentiment regarding the role of council members in the RES very well for all interviewees. The remarks regarding their role also covered that they could make amendments and submit a motion to influence the final decision.

> *We deal with the frameworks, so we make the choices of what is possible or not and what we find acceptable for the population. Ultimately, we make the choices, the officials prepare everything and try to give us a good foundation about why it is important. And the councillors may or may not agree with what they've come up with for us, in the end, you're in charge you might say. (Interviewee 1)*

[16] See Appendix C in chapter 13.3 for the interview guide

As for the level of participation, all interviewees had been at one or more participation events leading up to the RES 1.0. In general, the interviewees have a higher participation level than most council members, this has been shown already by their willingness to fill in the survey, do an interview, and show up at the set time and date of the interview. They do have quite a strong opinion on the process of the development of the RES and what role participation had in this. This will be discussed in the next governance and process section.

8.1.1 Governance

This section describes the reflection on the process and notes the point of view of council members on their role in the broader process of the RES. The appreciation of the process differed among the interviewees, and this seemed to correspond with their general sentiment towards the energy strategy. Interviewee 6 said that the sector tables and the way the process was built with the bottom-up approach to gain support were very good. Interviewee 2, on the other hand, felt that meaningful participation happened only in the online sessions where in smaller groups the conversation was started and felt overlooked in the sessions where flags could be set out on a map for search areas. This interviewee thought that the participation of council members was too late and not taken seriously enough in the first stage. The other interviewees had less strong opinions about the process and were in general content however a bit unclear about what was discussed in which sessions.

Council members tend to focus on their municipality and sometimes their sub-region as they only have authority in their municipality as well as knowledge about the region. Often comments were made such as I do not decide about their municipality but also that in the region-wide sessions it was very easy to say that something should be placed in another municipality. This also corresponds with the point that to some extent council members compare their municipality to others, both positively and negatively. Interviewees 2 and 6, both from municipalities with a search area for wind energy, told that maybe it could be moved elsewhere because they were already responsible for so much. Interviewee 1 said that his municipality should do more because it was way less compared to others. The other three interviewees did look to some extent at others but mainly concluded that their municipality was not suitable for wind energy, for various reasons, but they were happy to contribute with solar panels and felt no obligation to the other municipalities to do more and that each should focus on what they were capable of doing.

8.1.2 Process of RES: possible improvements

There were quite some remarks on how the process could have been improved for council members, but also for their citizens. The main overarching theme of the comments regarding the process was that it was unclear, what the purpose was of all the different types of meetings, the final goal, and the corresponding implementation plan of the RES on a municipal level. The idea of the interviewees to improve this, is better information provision for council members especially from their own municipality, this should contain a clear plan of action on

the different decision-maker levels in the RES. Another improvement that was mentioned especially regarding the search areas was to know the impact and effect of the search area, the positive and negative effects remained unclear, such as the generated energy, the nuisance for citizens, the impact on nature and biodiversity of a plan. Those effects were now not known which made it difficult to make a deliberated choice. It was also mentioned that it is a difficult topic to get acquainted with at a later stage. This is especially important regarding the municipal election coming up next year, which will lead to many new council members who will have to get familiar with the RES.

8.2 Principles and projects

- *Do you agree with all the principles?*
- *You were able to indicate which principles were important to you, can you explain this choice?*
    - *What else is important in your decision?*
- *On which attributes did you make your choice?*
- *Were the principles that you previously gave a higher number of points also weighed more heavily in the final choice?*

All interviewees agreed with the principles as they were stated during the interview. The main addition was public support for the initiatives, however, this could be categorized under local ownership and/or nuisance. During this part of the interview, often many other concerns came up that were not directly related to the principles itself.

The principles were coded in the interview to test for their importance among the council members. These results are shown in table 16. To test whether the coding of principles was accurate also a word count on words related to the principles was also counted by Atlas.ti.[17]

In both cases, nuisance is the principle that is most referred to, followed by biodiversity. Regarding local ownership, as both local and ownership is counted, this has possibly led to a double count in the word count as they can have been mentioned together. For net infrastructure, the word net can be used in a different meaning also leading to a higher count than strictly about net infrastructure. It can be concluded based on the code count and the word count, that nuisance and biodiversity are the principles that are the highest concern for the council members.

[17] See appendix E in chapter 13.5.2 for the result of the word count by word and the principles.

Table 15: Ranking by word count in the interviews

Rank	Principle	Word count
1	Nuisance	56
2	Biodiversity	47
3	Local ownership	39
4	Net infrastructure	37
5	Spatial coherence	35
6	Efficiency	30
7	Fair distribution	28
8	Combined use of space	26
9	Completion date	20

Table 16: Ranking by code count in the interviews

Rank	Code	Count
1	Nuisance	25
2	Biodiversity	14
3	Fair distribution	12
4	Spatial coherence	12
5	Efficiency	7
5	Net infrastructure	7
5	Combined use of space	7
6	Completion date	6
6	Local ownership	6

A concern that was also brought up was the energy use of firms and households. It was perceived by council members that in the RES there was no attention for the energy use and according to them, a reduction of the use of energy also has a role in the energy transition.

Council members made their choice between the projects often on one or a few attributes, also including whether it was a wind energy or solar energy project as also stated in the next quote.

> *I mainly went for the projects that dealt with solar on land, because it generally causes less nuisance to the environment than wind turbines on land. (Interviewee 2)*

In this case, it did not matter what the attribute level of nuisance was in the project, based on the assumption of the interviewee that wind energy causes more nuisance, those were not chosen. Attributes that were named that could imply an immediate drop-out were nuisance and high social cost for connecting to the energy grid.

In general, the interviewees mentioned that they looked at the attributes of the projects more for which they also had given a higher value for that principle in the question before as well as named during the interview.

8.3 Method

- *What did you think of this way of asking questions?*

A question about the methodology of the survey was asked to be aware of any remarks or if something had been unclear. Overall, the questionnaire was well understood in the way it was intended. Some remarks were that it might not be suitable to use for the real search areas because there are fewer of them in one municipality and the effects would then be too simplistic. Others named that it forced you to choose by limiting the number of points, as well as that the system was clear when too much or too few points were given.

Interviewee 4 also mentioned that because in her municipality wind energy was not a search area or space for it, she only chooses between the solar energy projects. This might have been the case for more survey-takers and thus affect the results.

8.4 Offer of RES

- *You have indicated that you think the offer is too high/just right/too low, why?*
- *Does the selection of search areas in your municipality play a role in this?*

The interviewees differed in their opinion whether the offer was too low or too high as they stated in the questionnaire. Interviewee 2 states it is too high because it is more than the national target divided by the number of energy regions.[18] In this densely built region, therefore there should not be more than average, and if so the 'hazardous' projects did not have to be included. As well as that if other municipalities cannot deliver what is asked from them, that her municipality will be hit extra. Interviewee 1 stated the offer was too low because he expects that many projects will drop and therefore you can better start high such that in the end a reasonable amount is generated. Interviewees 4 and 5 based their view on what there are as search areas in their municipality, since they consider that part to be reasonable, they assumed it would be for the whole region. Their agreement with the offer comes from their agreement with the search areas in their own region. Interviewee 6 thinks the offer is good however does worry whether it is possible, especially if the energy infrastructure can keep up with the offer. Interviewee 3 had heard from others, who he considers to be more specialized that the offer was on the high end, and he copied that view.

In the interviews, it became clear that often a preference for solar or wind energy comes from an aversion to the other source of energy. In the case of wind turbines, the aversion is mainly because of the nuisance and difficulty to place in the landscape. Solar energy is less debated however interviewee 1 mentioned the spatial element in combination with efficiency that solar fields take up a lot of space and that wind turbines are spatially more efficient.

8.5 Comments in survey

In the questionnaire, people had the option to leave comments at three moments. Firstly, was to name any other factors in addition to the principles in the first question. Secondly was to elucidate their preference for wind and solar energy, the last opportunity was at the end to leave any final remarks.

8.5.2 Comments principles

The comments left to describe the category ‘other’ in the principles can be categorized into the existing principles or are related to increased participation of citizens and public support for the plans.

[18] (35 TWh /30 energy regions =1,16 TWh per region)

8.5.1 Comments about preference for wind or solar energy

The comments in the survey about the preference for wind and solar are coded, from which the result can be seen in table 17. Noteworthy is that mainly the preference for solar energy stems from a sentiment of anti-wind energy. It is often noted that someone prefers solar because it causes less nuisance and is better to implement in the landscape. Spatial coherence is sometimes also used as a benefit of wind turbines as they take up less space. It can be noted that there is quite some resistance to wind energy while there is close to no opposition to solar energy, especially not on the roofs of buildings.

Table 17: Code count of the comments regarding preference for wind or solar energy

Code	Count
Anti-wind energy	24
Pro wind energy	11
Anti-solar energy	2
Pro solar energy	12
Spatial coherence	24
Nuisance	20
Biodiversity	7
Nuclear energy	4
Efficiency	3
Outside factor	3
Citizen support	2
Combined use of space	1
Net infrastructure	1
Completion date	1
Densely built region	1

8.5.2 Miscellaneous comments

The comments left at the end of the survey were as expected difficult to organise. There are 32 comments in total of which seven are 'no' or 'good luck'. Some comments about the method are made, ranging from too simplistic to the point division is too difficult. Four council members used this space to highlight their preference for nuclear energy, whereas three others also use this room to ask for other innovative methods such as geothermal energy or hydrogen. Some also mention their general resentment toward the RES and their unhappiness with the process.

9. Conclusion

The regional energy strategy of Noord-Holland Noord and Zuid has many aspects, whereas the focus has been on the generation of renewable energy and to increase participation of council members as well as find out how council members value different aspects of the regional energy strategy. The main research question of this thesis is: *What are the key considerations of municipality council members when implementing the regional energy strategy?* Quantitative and qualitative research has been conducted through a questionnaire and interviews to the views of council members on the principles of the Regional Energy Strategy of Noord-Holland.

9.1 Place in the energy transition

The energy transition in the Netherlands has been placed in the third phase of the Multi-Level Perspectives framework. The Regional Energy Strategy prepares the energy transition for the final phase of transition where the socio-technical landscape will be influenced. The regional energy strategy is a development of the socio-technical regime and therefore the energy transition is well-established in the third phase, also shown by other indicators such as the public opinion and pushed by internal drivers like the price/performance improvements of renewable energy. In the final stage, the new replaces the old, renewable replaces the fossils.

Solar energy projects are preferred over wind energy projects, as well as a higher preference for solar energy, both show that the energy transition has not reached the final stage. The innovation of wind turbines still has some resistance of parts of the socio-technical regime and is not mainstream in the landscape yet, which is necessary for the final phase.

9.2 Relative value of principles

The relative value of the principles to each other as stated by the municipal council members in Noord-Holland is summarized in table 18.

Table 18: Relative value of principles

Principles	**Value**
Fair distribution	13.99
Efficiency	12.79
Nuisance	19.14
Biodiversity	11.57
Timeline	7.89
Combined use of space	11.65
Spatial coherence	16.80
Other	6.18

Nuisance has the highest value and is therefore considered the most important by municipality council members, followed by spatial coherence. Timeline is considered the least important principle. Furthermore, in addition to the previously mentioned principles also spatial coherence and fair distribution are significantly different from 12.5, this implies a non-random distribution of points for those principles. The value of 'other' is the lowest which corresponds with what people also reported in the interviews. The main other concern is the public support and participation of citizens in the process.

The results from the survey and the interviews are similar except for biodiversity, see table 18.

Table 19: Ranking based on interview and survey data

	Ranking based on interview data		***Ranking based on survey data***
1	Nuisance	***1***	Nuisance
2	Biodiversity	***2***	Spatial coherence
3	Fair distribution	***3***	Fair distribution
4	Spatial coherence	***4***	Efficiency
5	Efficiency	***5***	Combined use of space
6	Combined use of space	***6***	Biodiversity
7	Timeline	***7***	Timeline

Nuisance is considered to be the most important principle based on the principles question and project question in the survey as well as on the interviews. In the question on the projects, nuisance was the only significant attribute with a positive correlation of t=3.004.

9.3 Key consideration based on background and participation level

The council members have a preference for solar energy over wind energy. This can be related to the fact that nuisance is the main factor of influence in council members their thought processes. In general, wind turbines are perceived to give more nuisance to citizens, the skyline, and nature. The considerations that council members make are similar throughout the different regions, political parties, age, and gender, no significant differences were found. Some background characteristics that did influence the result were the level of participation of a council member, and whether they thought the offer was too high or low. A higher level of participation correlates with a higher value given to fair distribution whereas combined use of space is of less importance. The level of participation does not impact what people think of the offer of the RES.

There is a strong correlation between the importance of nuisance and the opinion on the offer of the RES. If council members consider nuisance to be of higher importance correlates with considering the offer of the RES being too high, this is the case in both regions.

9.4 Key considerations of council members

Nuisance is the key consideration of municipal council members of the Regional Energy Strategy of Noord-Holland Noord and Zuid. Council members are locally focussed where the impact of renewable energy generation can outweigh the benefit of reduced climate change. They are fond of their municipality and want to leave it behind with the best conditions which can be seen in that they value low nuisance, a neat landscape, and sufficient biodiversity. The council members care about the negative effects as the overall benefits, reducing climate change, have a very small impact compared to the impact that renewable energy generation can have on their municipality. Council members prefer solar energy over wind energy since this has a smaller impact on the landscape and comes with less nuisance for citizens.

Other factors that council members considered are the level of participation and understanding among the citizens in their municipality. The council members are well-informed about the concerns of their constituency, and as a representative, they stand for their inhabitants from which they are concerned that the inhabitants are not heard enough in the bottom-up approach of the RES. They noted that citizens have minimum to no knowledge about the RES and the search areas and that in the process only a small group has been heard.

A group of council members experiences the RES as a top-down policy instrument and that they have to implement in it without being able to voice their concerns and own initiatives, which they have a negative sentiment about. The knowledge about the process and the goal of the RES among a group of council members is low, they have a minimum understanding of the goal of the RES and of the meetings they can participate in, plus they do not know where to look for more information.

Council members consider the regional energy strategy to be important and recognize the fact that it will have an impact on their region in the next ten years. They consider the target of generated renewable energy in their energy region as appropriate and have a general will to cooperate as long as their voices can be heard. Taking in mind the key considerations of council members will increase the social welfare in the province of Noord-Holland.

10. Discussion

This chapter will discuss the validity of the research and establish whether the Participatory Value Evaluation is suitable to study considerations of municipality council members. Furthermore, the results are interpreted, and the lessons learned from the survey regarding participation of council members are examined. This chapter finishes with the limitations of this study and recommendations for further research.

10.1 Validity and reliability

This study aimed to measure a value for the different concerns that council members could have regarding the regional energy strategy of Noord-Holland. The validity of this study is based on the method and how well this was able to cover all parts of the considerations as well that is clear and precise. As in the survey as well as in the interviews, it was mentioned that the principles covered the factors that contributed to their decision-making, it can be concluded that the study covered all main considerations.

The representativeness of the sample is good regarding party affiliation and age, and less regarding gender and Noord/Zuid region within Noord-Holland. The sample is on the low side for the population group and the aim of this study. This does show the participation level and general interest among council members for the RES. After several reminders and two weeks, the sample contained 11% of all council members.

Furthermore, the validity is based on that there are no other factors that influence the results. The survey was carried out in the time frame that council members had to vote in their municipality about the RES. It will have differed among council members whether this had taken place already in their municipality. This is a factor that could have influenced the result to some extent. The interviews were all conducted via zoom to keep the circumstances as similar as possible. An effect on the validity of the questionnaire could be that people filled it in without paying much attention to all the different attributes and not thinking about the future complications of the principles. This could lead that people went with their gut feeling and previous assumptions, especially with the projects. This was seen in the results by the fact that in general solar energy projects were preferred compared to wind energy projects despite the attribute levels.

The reliability is based on the homogeneity of results between the survey and the interviews. Moreover, the reliability is based on that the results of the principles and the choices between projects were similar.

The results of this study can be generalized to all council members in Noord-Holland, since the sample was representative of the whole population, and the principles were already based on consultations with stakeholders in this province including council members. It cannot be concluded whether those considerations are similar for all council members in the Netherlands since the circumstances might differ in other regions, this can be interesting for further research.

10.1.1 Participatory Value Evaluation and a non-budget study

This thesis has developed a PVE study with a non-budget question. Council members do not decide on how much money should be spent on a project as usually is the case in a PVE study, however, with the point allocation they state their preferences. As the government will not be the one paying for those projects, it is deemed not suitable to use a monetary value in the decision-making. The projects that could be chosen were made up of different levels of attributes and not based on real search areas. This has changed the methodology to some extent as the choice of a project was indirectly a choice for the attributes and thus not a project that could be directly executed. This has put some limitations on the use of PVE for measuring the considerations, however, this has still been done by use of a regression on the attributes and mean value given to each project. The benefit of the point allocation has been that preferences could be made much clearer than just by a ranking since the scale is ordinal instead of nominal. In addition, a relative value could be given to the principles based on the point allocation, however, no non-dependent value could be given to each principle. For the purpose of this study to find out which are the main considerations, this has been sufficient. As the principles were established by consultation of several stakeholder groups, there was a sufficient base to assume that the principles would cover all main attributes going into the decision-making. In case, the considerations are less clear and have to be established, a PVE study would not be recommended. It is a recommended method to measure considerations of a group if there is a clear framework from which can be chosen and what can influence the choice. Regarding municipality council members, this is a group that is familiar with the policy-making procedure and the choices that have to be made in this process, to which a participatory value evaluation is similar, therefore this method can be successfully applied to this target group.

10.1 Interpretation of results

The fact that nuisance is perceived as most important by the council members is comprehensible when the council members are viewed as local representatives. They are the ones to safeguard the interests of their citizens. From the principles, nuisance has the most direct effect on the inhabitants of a municipality.

The level of participation in the process among the survey-takers has been quite high, this is as expected since more involved council members are more likely to fill in a survey about the topic.

In the design of the survey, it had been decided to leave out careful participation as a principle, however by leaving comments regarding participation and citizen support, it does show that it is of value for the council members. It can be understood that for each project, there has to be sufficient public support before carrying out the plan.

10.3 Contribution to literature

The addition of this study to the existing academic literature is the expansion of the participatory value evaluation method to a non-budget question and using political decision-makers as the target population. This has been done by adjusting the PVE to non-realistic projects such that the focus came to be on the attributes of those projects more than the project itself, it finds itself in between a choice experiment and a PVE study in that sense.

10.4 Limitations

The main limitation of this study is the small sample size regarding the target population, as this means that the margin of error is larger, especially since this might also mean that those who did fill in the survey do have a strong opinion on the topic, therefore the results might be biased toward stronger opinions and more involved council members. For participation, it was found that there might have been a bias, however, in other categories, there has been no indication of this. For repetition of this research, there could be put more effort in reaching the target population however for this study they have gotten three to four email invitations already.

The projects question in the survey used connection to the net infrastructure to serve for spatial coherence. Spatial coherence is a very broad term and has now been applied in a limited sense in this question. Other results have shown that the impact on the landscape is an important factor that now was not captured in this question. This limits the research because this value could not be measured well.

10.5 Further research

There are several approaches that future research could take. First of all, future research can expand and elaborate on the use of PVE with a non-budgetary research question. This study has shown that this is possible however some pitfalls in it can be further smoothened to take this approach to a more advanced level.

Furthermore, this study could be expanded to different target groups and test whether the considerations are similar. This could be done for all council members in the Netherlands for example, or different stakeholder groups could be studied, such as farmers, the younger generation, or local shop owners. As such, the participatory part of this method can come into use by specific groups who are harder to reach with the usual consultation options. This can

contribute to the public debate on the energy transition and the RES, which is taking on now all the regional energy strategies are finalized.

Lastly, another option is to use a game-theoretic approach such as a sequential game where the actions of a municipality have an impact on the choice that another municipality must make regarding their contribution to the generation of renewable energy. In the choice there is a personal disadvantage and a public advantage, this makes it interesting to look into the choices are made once this is modelled in such a way.

11. Recommendations

This chapter gives recommendations based on the conclusions of this study to improve the next phase of the Regional Energy Strategy leading up to the RES 2.0.

There should be increased attention for nuisance on citizens of the projects in the search areas. A negative impact on citizens will lead to resistance of council members which should be avoided. This can be circumvented by setting clear boundaries of how much nuisance is allowed and be open about those levels and find ways to make the projects more insightful. Visualization of a project including sounds can be helpful, this can be done by photoshop online but also for example with virtual reality glasses. With VR, people can see around how the landscape would look like. For wind turbines, options to reduce nuisance are turning them off in case of cast shadow or during the bird migration period. This can reduce the level of nuisance drastically and lowers the impact on citizens.

Most council members reported that the participation process was not as they wished. The needs for council members differ, some prefer digital meetings while others will only attend physical meetings. Therefore, it is good to offer both. Participation of citizens is another concern of council members and should be increased as well. For citizens, be early to approach them and create an open space where all concerns can be heard, and their input is taken seriously. Higher participation does not immediately have to lead to higher citizen support and increasing support should not be the goal of increased participation, the citizens' input should be taken seriously and be able to change the strategy.

There is a lack of knowledge among council members and not all the information about the RES reaches them. There is plenty of information online, however, this is not always easy to find. Next year, there will be municipal elections, after which many new council members have to get acquainted with the RES. To get the new council members soon up to date, and onboard with the RES, offer an introduction method to the RES. This should be readily available on the website and offered to the responsible council members through the municipality clerks. This can contain a short overview of the search areas in their subregion including the effects of those projects. Furthermore, brief documents and videos can be included such that information can be easily conveyed.

An important issue to address is that municipality members start to feel a sense of coherence and common goal. There is a lingering sentiment that if another municipality does not do as much, their municipality can also do a bit less. To overcome this, there needs to be a form of ownership for the common goal otherwise there might be a severe lack of possible generation in the implementation phase based on unwillingness. This sense of ownership can be created by increased collaboration in the subregions.

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13. Appendix

13.1 Appendix A: Energy regions

(Nationaal Programma Regionale Energiestrategie, 2019)

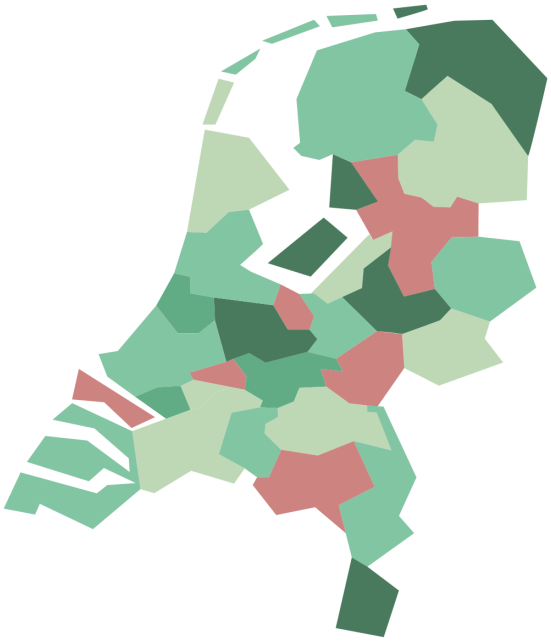

Figure 11: Map of the Netherlands with the energy regions

Regio Achterhoek

Aalten, Berkelland, Bronckhorst, Doetinchem, Montferland, Oost-Gelre, Oude IJsselstreek, Winterswijk

Regio Alblasserwaard

Gorinchem, Molenlanden

Regio Arnhem Nijmegen

Arnhem, Berg en Dal, Beuningen, Doesburg, Druten, Duiven, Heumen, Lingewaard, Nijmegen, Overbetuwe, Renkum, Rheden, Rozendaal, Westervoort, Wijchen, Zevenaar

Regio Amersfoort

Amersfoort, Baarn, Bunschoten, Eemnes, Leusden, Soest, Woudenberg

Regio Drechtsteden

Alblasserdam, Dordrecht, Hardinxveld-Giessendam, Hendrik-Ido-Ambacht, Papendrecht, Sliedrecht, Zwijndrecht

Regio Drenthe

Aa en Hunze, Assen, Borger-Odoorn, Coevorden, De Wolden, Emmen, Hoogeveen, Meppel, Midden-Drenthe, Noordenveld, Tynaarlo, Westerveld

Regio Flevoland

Almere, Dronten, Lelystad, Noordoostpolder, Urk, Zeewolde

Regio Foodvalley

Barneveld, Ede, Nijkerk, Renswoude, Rhenen, Scherpenzeel, Veenendaal, Wageningen

Regio Friesland

Achtkarspelen, Ameland, Dantumadiel, De Fryske Marren, Harlingen, Heerenveen, Leeuwarden, Noordeast-Fryslân, Ooststellingwerf, Opsterland, Schiermonnikoog, Smallingerland, Súdwest Fryslân, Terschelling, Tytsjerksteradiel, Vlieland, Waadhoeke, Weststellingwerf

Regio Goeree-Overflakkee

Goeree-Overflakkee

Regio Groningen

Groningen, Het Hogeland, Eemsdelta, Het Hogeland, Midden-Groningen, Oldambt, Pekela, Stadskanaal, Veendam, Westerkwartier, Westerwolde

Regio Hart van Brabant

Dongen, Gilze en Rijen, Goirle, Heusden, Hilvarenbeek, Loon op Zand, Oisterwijk, Tilburg, Waalwijk

Regio Holland Rijnland

Alphen aan den Rijn, Hillegom, Kaag en Braassem, Katwijk, Leiden, Leiderdorp, Lisse, Nieuwkoop, Noordwijk, Oegstgeest, Teylingen, Voorschoten, Zoeterwoude

Regio Hoeksche Waard

Hoeksche Waard

Regio Midden-Holland

Bodegraven-Reeuwijk, Gouda, Krimpenerwaard, Waddinxveen, Zuidplas

Regio Noord-Holland Zuid

Aalsmeer, Amstelveen, Amsterdam, Beemster, Beverwijk, Blaricum, Bloemendaal, Diemen, Edam-Volendam, Gooise Meren, Haarlem, Haarlemmermeer, Heemskerk, Heemstede, Hilversum, Huizen, Landsmeer, Laren, Oostzaan, Ouder-Amstel, Purmerend, Uithoorn, Velsen, Waterland, Weesp, Wijdemeren, Wormerland, Zaanstad, Zandvoort

Metropoolregio Eindhoven

Asten, Bergeijk, Best, Bladel, Cranendonck, Deurne, Eersel, Eindhoven, Geldrop-Mierlo, Gemert-Bakel, Heeze-Leende, Helmond, Laarbeek, Nuenen; Gerwen en Nederwetten, Oirschot, Reusel-De Mierden, Someren, Son en Breugel, Valkenswaard, Veldhoven, Waalre

Regio Noord-Holland Noord

Alkmaar, Bergen (NH.), Castricum, Den Helder, Drechterland, Enkhuizen, Heerhugowaard, Heiloo, Hollands Kroon, Hoorn, Koggenland, Langedijk, Medemblik, Opmeer, Schagen, Stede Broec, Texel, Uitgeest

Regio Noord- en Midden-Limburg

Beesel, Bergen (L.), Echt-Susteren, Gennep, Horst aan de Maas, Leudal, Maasgouw, Mook en Middelaar, Nederweert, Peel en Maas, Roerdalen, Roermond, Venlo, Venray, Weert

Regio Noordoost Brabant

Bernheze, Boekel, Boxmeer, Boxtel, Cuijk, Grave, Haaren, Landerd, Meijerijstad, Mill en Sint Hubert, Oss, ‘s-Hertogenbosch, Sint Anthonis, Sint-Michielsgestel, Uden, Vught

Regio Noord-Veluwe

Elburg, Ermelo, Harderwijk, Hattem, Nunspeet, Oldebroek, Putten

Regio Fruitdelta Rivierenland

Buren, Culemborg, Maasdriel, Neder-Betuwe, Tiel, West Betuwe, West Maas en Waal, Zaltbommel

Regio Rotterdam-Den Haag

Albrandswaard, Barendrecht, Brielle, Capelle aan den IJssel, Delft, Den Haag, Hellevoetsluis, Krimpen aan den IJssel, Lansingerland, Leidschendam-Voorburg, Maassluis, Midden-Delfland, Nissewaard, Pijnacker-Nootdorp, Ridderkerk, Rijswijk, Rotterdam, Schiedam, Vlaardingen, Wassenaar, Westland, Westvoorne, Zoetermeer

Cleantech Regio

Apeldoorn, Brummen, Epe, Heerde, Lochem, Voorst, Zutphen

Regio Twente

Almelo, Borne, Dinkelland, Enschede, Haaksbergen, Hellendoorn, Hengelo, Hof van Twente, Losser, Oldenzaal, Rijssen-Holten, Tubbergen, Twenterand, Wierden

Regio U16

Bunnik, De Bilt, De Ronde Venen, Houten, IJsselstein, Lopik, Montfoort, Nieuwegein, Oudewater, Stichtse Vecht, Utrecht, Utrechtse Heuvelrug, Vijfheerenlanden, Wijk bij Duurstede, Woerden, Zeist

Regio West-Brabant

Alphen-Chaam, Altena, Baarle-Nassau, Bergen op Zoom, Breda, Drimmelen, Etten-Leur, Geertruidenberg, Halderberge, Moerdijk, Oosterhout, Roosendaal, Rucphen, Steenbergen, Woensdrecht, Zundert

Regio West-Overijssel

Dalfsen, Deventer, Hardenberg, Kampen, Olst-Wijhe, Ommen, Raalte, Staphorst, Steenwijkerland, Zwarte waterland, Zwolle

Regio Zeeland

Borsele, Goes, Hulst, Kapelle, Middelburg, Noord-Beveland, Reimerswaal, Schouwen-Duiveland, Sluis, Terneuzen, Tholen, Veere, Vlissingen

Regio Zuid-Limburg

Beek, Beekdaelen, Brunssum, Eijsden-Margraten, Gulpen-Wittem, Heerlen, Kerkrade, Landgraaf, Maastricht, Meerssen, Simpelveld, Sittard-Geleen, Stein, Vaals, Valkenburg aan de Geul, Voerendaal

IJsselmeergebied

Het IJsselmeergebied is toebedeeld aan omliggende gemeenten dus regio’s.

13.2 Appendix B: sub-regions Noord-Holland

Figure 12: Map of Noord-Holland with all sub-regions

13.2.1 Noord-Holland Noord

Westfriesland	**Regio Alkmaar**	**Kop van Noord-Holland**
Hoorn	Alkmaar	Schagen
Medemblik	Bergen	Hollands Kroon
Stede Broec	Uitgeest	Den Helder
Enkhuizen	Castricum	Texel
Drechterland	Heiloo	
Koggenland	Heerhugowaard	
Opmeer	Langedijk	

13.2.2 Noord-Holland Zuid

Zaanstreek/Waterland	**Gooi en Vechtstreek**	**IJmond & Zuid-Kennemerland**	**Amstelland**
Beemster	Weesp	Beverwijk	Amstelveen
Edam-Volendam	Wijdemeren	Bloemendaal	Aalsmeer
Landsmeer	Gooise meren	Haarlem	Ouder-amstel
Oostzaan	Huizen	Heemskerk	Uithoorn
Purmerend	Blaricum	Heemstede	Diemen
Waterland	Laren	Velsen	
Wormerland	Hilversum	Zandvoort	
Zaanstad			

Amsterdam	**Haarlemmermeer**
Amsterdam	Haarlemmermeer

13.3 Appendix C: interview guide

13.3.1 Dutch

RES-proces

- Hoe bekend bent u met de RES en de zoekgebieden in uw gemeente en regio?
- Hoe bekend bent u met de rol die u speelt in de RES als gemeenteraadslid?
- Op wat voor manier bent u betrokken geweest en wat vond u daarvan?

Principes

De principes in de vragenlijst zijn gebaseerd op wat nu in de RES 1.0 staat. Deze zijn tot stand gekomen op basis van overleggen met inwoners, waterschappen, gemeenten, netbeheerders, en andere betrokken partijen zoals milieubewegingen.

- Kunt u zich in al deze principes vinden?
- U heeft kunnen aangeven welke principes u belangrijk vond, kunt u deze keuze toelichten?
    - Wat weegt verder nog voor u mee in uw keuze?

Projecten

Bij de keuze tussen de 6 projecten, moest u tegelijkertijd afwegingen over de diverse principes maken.

- Op welke punten heeft u uw keuze gemaakt?
- Hadden de principes die u eerder een hoger puntenaantal gaven ook een zwaardere weging bij de uiteindelijke keuze?
- Wat vond u van deze manier van vraagstelling?

Het bod in de RES

- U heeft aangegeven het bod te hoog/precies goed/te laag te vinden, hoezo?
- Speelt hierbij mee wat in uw gemeente aan zoekgebieden zijn aangewezen?

Heeft u voor mij nog vragen? Of nog opmerkingen naar aanleiding van de vragenlijst of dit interview?

13.3.2 Translation: interview questions

RES process

- How familiar are you with the RES and the search areas in your municipality and sub-region?
- How familiar are you with the role you have in the RES as a council member?
- In what way have you been involved and what did you think of this?

Principles

The principles in the questionnaire are based on what is stated in the RES 1.0. These have been established based on consultations with residents, water councils, municipalities, network operators, and other parties such as environmental movements.

- Do you agree with all these principles?
- You were able to indicate which principles were important to you, can you explain this choice?
    - What else is of importance in your decision?

Projects

When choosing between the 6 projects, you had to consider the various principles at the same time.

- On which principles did you make your choice?
- Were the principles that you previously gave a higher number of points also weighed more heavily in the final choice?
- What did you think of this way of asking questions?

The offer of the RES

- You have indicated that you think the offer is too high/just right/too low, why?
- Does the selection of search areas in your municipality play a role in this?

Do you have any questions for me? Or do you have any comments regarding the questionnaire or this interview?

13.4 Appendix D: Statistical test results

13.4.1 Offer NHZ and preference wind and solar energy

Table 20: Statistical result of correlation of offer and wind/solar preference

T-Test

Group Statistics

	Heeft u een voorkeur voor zonne- of windenergie?	N	Mean	Std. Deviation	Std. Error Mean
Wat vindt u van het bod van 2,7 TWh in Noord-Holland Zuid?	>= 3	22	2.59	.590	.126
	< 3	38	3.16	.718	.116

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper
Wat vindt u van het bod van 2,7 TWh in Noord-Holland Zuid?	Equal variances assumed	.185	.669	-3.139	58	.003	-.567	.181	-.929	-.205
	Equal variances not assumed			-3.307	51.081	.002	-.567	.171	-.911	-.223

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
Wat vindt u van het bod van 2,7 TWh in Noord-Holland Zuid?	Cohen's d	.674	-.841	-1.384	-.291
	Hedges' correction	.683	-.830	-1.366	-.287
	Glass's delta	.718	-.790	-1.340	-.230

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Correlations

		Wat vindt u van het bod van 2,7 TWh in Noord-Holland Zuid?	Wat vindt u van het bod van 3,6 TWh in Noord-Holland Noord?	Heeft u een voorkeur voor zonne- of windenergie?
Wat vindt u van het bod van 2,7 TWh in Noord-Holland Zuid?	Pearson Correlation	1	.[a]	-.482**
	Sig. (2-tailed)		.	.000
	N	60	0	60
Wat vindt u van het bod van 3,6 TWh in Noord-Holland Noord?	Pearson Correlation	.[a]	1	-.204
	Sig. (2-tailed)	.		.111
	N	0	62	62
Heeft u een voorkeur voor zonne- of windenergie?	Pearson Correlation	-.482**	-.204	1
	Sig. (2-tailed)	.000	.111	
	N	60	62	122

**. Correlation is significant at the 0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

13.4.2 Participation and principles

Table 21: Statistical result of means of the principles by level of participation

Group Statistics

	Bent u betrokken geweest in het proces om te komen tot de RES 1.0?	N	Mean	Std. Deviation	Std. Error Mean
Fair distribution	>= 3	68	11.7941	9.74229	1.18143
	< 3	56	15.9464	11.09532	1.48267
Efficiency	>= 3	68	13.5588	10.35833	1.25613
	< 3	56	13.0893	9.40460	1.25674
Nuisance	>= 3	68	19.6471	13.92814	1.68903
	< 3	56	18.7500	20.97899	2.80344
Biodiversity	>= 3	68	12.0588	9.40607	1.14065
	< 3	56	11.1607	10.27579	1.37316
Timeline	>= 3	68	7.7500	7.99883	.97000
	< 3	56	7.7500	8.36714	1.11811
Combined use of space	>= 3	68	14.0147	9.48289	1.14997
	< 3	56	9.8750	6.28725	.84017
Spatial coherence	>= 3	68	17.5882	11.07537	1.34309
	< 3	56	14.2321	9.68596	1.29434
Other	>= 3	68	3.5882	6.64726	.80610
	< 3	56	9.1964	19.51635	2.60798

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Fair distribution	Equal variances assumed	1.179	.280	-2.218	122	.028	-4.15231	1.87204	-7.85819	-.44643
	Equal variances not assumed			-2.190	110.460	.031	-4.15231	1.89581	-7.90919	-.39544
Efficiency	Equal variances assumed	.566	.453	.262	122	.794	.46954	1.79364	-3.08116	4.02023
	Equal variances not assumed			.264	120.808	.792	.46954	1.77687	-3.04830	3.98738
Nuisance	Equal variances assumed	2.295	.132	.285	122	.776	.89706	3.15121	-5.34108	7.13520
	Equal variances not assumed			.274	92.203	.785	.89706	3.27293	-5.60308	7.39720
Biodiversity	Equal variances assumed	.001	.979	.507	122	.613	.89811	1.76982	-2.60543	4.40165
	Equal variances not assumed			.503	112.945	.616	.89811	1.78512	-2.63856	4.43478
Timeline	Equal variances assumed	1.230	.270	.000	122	1.000	.00000	1.47374	-2.91742	2.91742
	Equal variances not assumed			.000	115.320	1.000	.00000	1.48022	-2.93195	2.93195
Combined use of space	Equal variances assumed	6.811	.010	2.798	122	.006	4.13971	1.47933	1.21122	7.06819
	Equal variances not assumed			2.907	117.005	.004	4.13971	1.42419	1.31918	6.96024
Spatial coherence	Equal variances assumed	.290	.591	1.776	122	.078	3.35609	1.88967	-.38469	7.09688
	Equal variances not assumed			1.799	121.537	.074	3.35609	1.86526	-.33652	7.04870
Other	Equal variances assumed	15.536	.000	-2.220	122	.028	-5.60819	2.52619	-10.60904	-.60735
	Equal variances not assumed			-2.054	65.520	.044	-5.60819	2.72972	-11.05900	-.15739

13.4.3 Regression results projects separated for wind and solar projects

Table 22: Statistical result of regression of the project question with only solar energy projects

Model Summary

Model	R WindSolar = 1.00 (Selected)	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889[a]	.790	.676	4.03652531

a. Predictors: (Constant), Net infrastructure , Combined use of space, Nuisance, Completion date, Local ownership, Biodiversity

ANOVA[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	675.398	6	112.566	6.909	.003[c]
	Residual	179.229	11	16.294		
	Total	854.627	17			

a. Dependent Variable: Mean

b. Selecting only cases for which WindSolar = 1.00

c. Predictors: (Constant), Net infrastructure , Combined use of space, Nuisance, Completion date, Local ownership, Biodiversity

Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4.973	5.494		-.905	.385
	Local ownership	.020	.044	.082	.466	.651
	Nuisance	.170	.079	.362	2.157	.054
	Biodiversity	.200	.067	.705	2.978	.013
	Completion date	.076	.061	.269	1.233	.243
	Combined use of space	.099	.044	.402	2.281	.043
	Net infrastructure	.078	.045	.278	1.742	.109

a. Dependent Variable: Mean

b. Selecting only cases for which WindSolar = 1.00

Table 23: Statistical result of regression of the project question with only wind energy projects

Model Summary

Model	R WindSolar = 2.00 (Selected)	R Square	Adjusted R Square	Std. Error of the Estimate
1	.732[a]	.536	.283	3.84158395

a. Predictors: (Constant), Net infrastructure , Completion date, Local ownership, Combined use of space, Biodiversity, Nuisance

ANOVA[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	187.394	6	31.232	2.116	.133[c]
	Residual	162.335	11	14.758		
	Total	349.729	17			

a. Dependent Variable: Mean

b. Selecting only cases for which WindSolar = 2.00

c. Predictors: (Constant), Net infrastructure , Completion date, Local ownership, Combined use of space, Biodiversity, Nuisance

Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-6.137	5.482		-1.120	.287
	Local ownership	.014	.045	.077	.309	.763
	Nuisance	.185	.086	.766	2.144	.055
	Biodiversity	.199	.068	.942	2.922	.014
	Completion date	.002	.065	.009	.035	.973
	Combined use of space	.068	.039	.447	1.763	.106
	Net infrastructure	.081	.058	.343	1.412	.186

a. Dependent Variable: Mean

b. Selecting only cases for which WindSolar = 2,00

13.4.4 Principles means without outliers of nuisance

Table 24: Means without outliers for nuisance

One-Sample Test

	Test Value = 12.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
Fair distribution	1.933	173	.055	1.71264	-.0359	3.4612
Efficiency	.663	173	.508	.48851	-.9661	1.9431
Nuisance	4.706	173	.000	5.36207	3.1131	7.6111
Biodiversity	-.885	173	.377	-.74713	-2.4135	.9193
Timeline	-6.422	173	.000	-4.49425	-5.8756	-3.1129
Combined use of space	-1.038	173	.301	-.66667	-1.9348	.6015
Spatial coherence	4.831	173	.000	4.57471	2.7055	6.4439
Other	-5.495	173	.000	-6.22989	-8.4676	-3.9922

13.4.5 Means per project

Table 25: Means per project

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
1A	13	1.00	40.00	18.6923	13.10461
1B	13	1.00	50.00	8.0769	13.09237
1C	13	1.00	30.00	13.3077	10.77331
1D	13	1.00	94.00	25.7692	22.76750
1E	13	1.00	67.00	22.5385	17.57657
1F	13	1.00	28.00	9.9231	8.66469
1G	13	1.00	10.00	1.6923	2.49615
2A	16	1.00	35.00	6.1875	9.10838
2B	16	1.00	29.00	4.0625	7.13180
2C	16	1.00	50.00	11.6875	15.02318
2D	16	1.00	50.00	18.6875	18.77132
2E	16	1.00	94.00	21.5625	25.38495
2F	16	1.00	29.00	9.1250	9.40833
2G	16	1.00	94.00	28.6875	38.77236
3A	22	1.00	20.00	10.8636	7.15339
3B	22	1.00	60.00	19.4091	19.24197
3C	22	1.00	37.00	7.7273	8.53665
3D	22	1.00	50.00	14.4091	13.43293
3E	22	1.00	87.00	27.0909	20.43319
3F	22	1.00	26.00	10.0000	7.38080
3G	22	1.00	94.00	10.5000	27.10430
4A	16	1.00	20.00	6.8750	6.51025
4B	16	1.00	36.00	11.8750	12.34976
4C	16	1.00	40.00	13.1875	12.51249
4D	16	1.00	56.00	25.8750	17.00147
4E	16	1.00	35.00	22.7500	9.88264
4F	16	1.00	32.00	12.0000	9.60555
4G	16	1.00	56.00	7.4375	14.75113
5A	25	1.00	94.00	17.6800	24.75163
5B	25	1.00	36.00	9.6800	11.56042
5C	25	1.00	40.00	7.4000	8.89757
5D	25	1.00	34.00	9.1600	8.71149
5E	25	1.00	80.00	31.8000	22.42395
5F	25	1.00	35.00	13.4800	11.60144
5G	25	1.00	76.00	10.8000	19.41434
6A	32	1.00	57.00	12.2812	14.40483
6B	32	1.00	45.00	7.7500	11.18467
6C	32	1.00	20.00	5.4063	5.80800
6D	32	1.00	79.00	24.0313	19.29146
6E	32	1.00	56.00	16.9062	16.99214
6F	32	1.00	51.00	14.5938	14.08238
6G	32	1.00	94.00	19.0312	29.34718
Valid N (listwise)	0				

13.5 Appendix E: Interview results

16.5.1 Code book Atlas.ti

Code groups

Comments survey

Members:
- Comment method
- Geothermal energy
- Lack of information council
- Nuclear energy
- Participation process

Concerns

Members:
- Citizen support
- Densely built region
- Energy use
- Local generation
- Misunderstanding among citizens
- Narrow look of RES
- No attention for worries
- Other problems

Governance

Members:
- Authority
- Background municipality
- Focus on own municipality

- Lack of information of effects
- Looking at what other municipalities do
- Low capacity of municipality
- Low influence of council
- Role for council members
- Small municipality sentiment

Participation

Members:

- Improvement process: earlier participation
- Level of participation
- Participation process

Principles

Members:

- Biodiversity
- Combined use of space
- Completion date
- Efficiency
- Fair distribution
- Local ownership
- Net infrastructure
- Nuisance
- Spatial coherence

Process RES

Members:

- Improvement process: broader outlook
- Improvement process: better information council

- Improvement process: earlier participation
- Improvement process: larger meeting
- Improvement process: more information for citizens
- Lack of information process
- Level of participation
- Unclear goal

PVE

Members:
- Comment method
- Projects: broad focus
- Projects: focus on negative effects

RES

Members:
- Local generation
- Offer of RES
- Role search areas in municipality regarding offer
- Unclear goal

Wind/Solar

Members:
- Anti solar
- anti-wind sentiment
- Pro solar energy
- Pro wind

13.5.2 Results word count principles

Table 26: Results word count for principles

Word	Translation	Count
overlast	nuisance	56
net	net	24
biodiversiteit	biodiversity	20
ruimtelijke	spatial	16
lokaal	local	16
ruimtegebruik	use of space	14
kosten	cost	13
tijd	time	13
eigendom	ownership	12
verdeling	distribution	12
ruimte	space	10
samenhang	coherence	9
eerlijke	fair	9
gecombineerd	combined	9
lokale	local	8
infrastructuur	infrastructure	8
efficiëntie	efficiency	7
tijdspad	timeline	7
eerlijk	fair	5
netbeheerders	network operators	5
efficiency	efficiency	4
efficiënt	efficient	4
ruimtebeslag	take up space	3
efficiënter	more efficient	2
eigenaarschap	ownership	2
eerlijker	fairer	2
lokaler	more local	1
natura2000	natura2000	1
natuur	nature	18
natuurbehoud	nature conservation	1
natuurgebied	nature reserve	5
natuurgebieden	nature reserves	2

Table 27: Result word count per principle

Rank	Principle	Word count
1	Nuisance	56
2	Biodiversity	47
3	Local ownership	39
4	Net infrastructure	37
5	Spatial coherence	35
6	Efficiency	30
7	Fair distribution	28
8	Combined use of space	26
9	Completion date	20

Table 28: Result code count per principle

Rank	Code	Count
1	Nuisance	25
2	Biodiversity	14
3	Fair distribution	12
4	Spatial coherence	12
5	Efficiency	7
5	Net infrastructure	7
5	Combined use of space	7
6	Completion date	6
6	Local ownership	6