



# Exploring Strategic Diversity; How Gelderland's RES Regions Navigate the Energy Transition

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# Abstract

The transition from non-renewable to renewable energy is one of the main pillars of the Dutch Climate Agreement. To make this transition possible, the National Program Regional Energy Strategy has been formulated in which 30 regions in the Netherlands can formulate their own energy transition strategy. Limited research has been conducted on how these strategies differ in practice, this could contribute to knowledge on the ways in which EU policy can get implemented at the sub-national level and therefore help inform future policy decision about decentralized energy governance. This thesis has analysed how Regional Energy Strategy (RES) regions in the Dutch province of Gelderland have utilized the freedom of action granted by the NPRES in shaping their RES 1.0. Specifically, it examines regional differences in ambition levels, renewable energy source mixes, and participatory approaches, and explores the underlying reasons for these variations. A qualitative, comparative case study design has been used to compare the RES 1.0 documents of the six selected regions, complimented by interviews conducted with representative from each region. The findings reveal that the regions reflect differences in each of the three variables. However, the types of stakeholders involved in the energy transition remain largely consistent across regions, reflecting a shared commitment to broad stakeholder inclusion. The differences between the regions in the ambition level are due to spatial limitations, such as nature protection laws, inter-municipal dynamics and prior experience with energy transition projects. Variation in renewable energy source mixes are primarily driven by levels of resistance of residents and politics to wind energy projects. The revealed differences in public participation are due to a lack of knowledge and a feeling of abstractness in the energy production plans by residents and them becoming tired of participating. Next to this, the national goal of reaching 50% local ownership has been taken over in the regions' strategies. Overall, the diverse ways in which regions exercise their freedom of action result in strategies that are tailored to region-specific contexts. However, the success of these tailored strategies depends on the regions themselves, which may lead to regions legging behind because of limited capacity. Therefore, some regions can be classified as pioneers and others as laggards. The overall satisfaction from the regions with the freedom of action in the NPRES suggest that the chosen type II governance structure is an effective approach to the energy transition.

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#### List of Abbreviations

European Green Deal = EGD

European Union = EU

National Program Regional Energy Strategy = NPRES

Nationally determined contributions (NDCs)

Regional Energy Strategies = RESs

Regional Energy Strategy = RES

Sustainable Development Goals = SDG

Terrawatt hours = TWh

United Nations Framework Convention on Climate Change = UNFCC

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# 1. Introduction

## 1.1 Background

‘The last ten years have been the warmest ten years on record’ (Copernicus, 2025). The global warming has multiple causes, an important one being the burning of coal, oil and gas. (European Commission, n.d.-a). The global warming is not the only effect of climate change, more severe storms, drought, a rising ocean, loss of species, health risks and poverty are other results (United Nations, n.d.-a). To tackle these pressing problems, the Paris Agreement was signed by 195 Parties in 2015. This is a legally binding international treaty on climate change. Its goal entails to keep the increase in the global average temperature well below 2°C above pre-industrial levels, with the ambition of keeping it below 1,5°C (United Nations, n.d.-b).

In line with this global commitment, the former European Council President set an ambitious goal for 2050 to make Europe the first climate-neutral continent (Council of the European Union, n.d.-a). The Member States of the European Union (*EU*) all signed the Paris Agreement, which makes them legally bound to undertake action to keep the increasing temperature within established limits. To reach this goal, the European Green Deal (*EGD*) has been set out by the European Union in 2019 to tackle the current challenges of climate and environment (European Council & Council of the European Union, n.d.). It’s main goal is to make the EU greenhouse gas emission free in 2050. All the while, it also focusses on themes such as economic growth, a fair and prosperous society, and the well-being of its citizens related to environmental threat (European Commission, 2019). One of the main sources of greenhouse gas emissions is the production and use of energy across economic sectors. So, renewable sources, such as wind, sun, and water, need to replace the non-renewable ones, such as oil, coal and natural gas, a process called clean energy transition (European Commission, 2019).

These efforts of the EU reflect a broader international vision. In 2015 the Sustainable Development Goals (*SDG*) were launched by the United Nations (*UN*) to universally build a set of goals which encounter the pressing challenges of environment, politics and economy (UNDP, n.d.). SDG 13 focusses on urgent climate action, to fight against climate change and its effects. It stresses the importance of undertaking action fast, which includes changes and commitments which also produces work opportunities (United Nations, n.d.-c). Another important SDG is number 7, this one dives into ensuring ‘access to affordable, reliable, sustainable and modern energy for all’ (United Nations, n.d.-d). According to Koundouri et al. (2024) SDG 7 is a prominent one when it comes to alignment with policies within the EGD. This shows that clean energy is an urgent priority of the EU and its strategic goals. However, in the years of 2022-2023, SDG7 received less attention in EGD policy which can indicate a shift in policy focus.

To achieve the commitments of the Paris Agreement regarding the greenhouse gas emission reduction the Renewable Energy Directive was taken into effect in 2018. This is part of the Clean energy for all Europeans package, which focusses on the EU being a frontrunner worldwide in renewable energy. Renewable energy is thus one of the pillars of the clean energy transition in the EGD. To keep up with the ambitions of the EU, the Renewable Energy Directive of 2018 has been revised in 2023 (European Commission, n.d.-b). It's target is increased from 32% to 42,5% renewable energy sources in gross energy consumption, with the endeavour of reaching 45% by 2030 (European Parliament, n.d.). Member States thus need to further develop their renewable energy production measures to reach this increased target.

When looking at taking on renewable energy sources, the Netherlands has been seen as one of the frontrunners in Europe. According to Heleen de Coninck, co-author of multiple IPCC reports, various reasons contribute to the Netherlands being compatible with being a leader in climate action within the EU. Not only is the Netherlands wealthy, it is also an educated and knowledgeable country. Moreover, with part of the country lying below sea-level, it also has a self-interest in resolving their vulnerability to climate change (Eindhoven University of Technology, 2021). Nevertheless, the Netherlands is among the countries in the EU with the lowest share on renewables (Eurostat, 2024). In 2019 the Netherlands signed a 'Klimaataakkoord' [*climate agreement*], which is an important part of the nation's contribution to the Paris Agreement. This Klimaataakkoord includes all kinds of rules on the mission of greenhouse gasses. The aim within renewable energy sources in this national agreement is to produce 35 Terrawatt hours (*TWh*) renewable energy on land within the year of 2030 (Ministerie van Economische Zaken en Klimaat, 2019, chapter 5). To be able to achieve this goal, the 'Nationaal Programma Regionale Energie Strategie' [*National Program Regional Energy Strategy*] (*NPRES*) has been set up, in which 30 regions, made up by provinces, municipalities and water boards, make their own Regional Energy Strategy (*RES*). Together, these 30 regions have the, even higher, target of reaching 55TWh renewable energy on land. The RES each of this region makes is a document in which they explain their choices in producing renewable energy and warmth (Regionale Energiestrategie, n.d.-a). Thus, the Netherlands has the national energy transition organised through these 30 RES regions which each get to decide on their own strategy for producing renewable solar- and wind energy for 2030.

## 1.2 Research framework

### 1.2.1 Problem identification

The transition from non-renewable to renewable energy is one of the main pillars of the Dutch Climate Agreement, which sets ambitious goals for 2030. Because every region in the NPRES can create its own strategy based on their regional context, there is a possibility of differences on the approach taken between the regions.

However, limited research has been conducted on how these RESs differ in practice. These variations could potentially influence the effectiveness of the energy transition, and a clear understanding of these potential differences can contribute to making more efficient policy in the future of the energy transition. Moreover, it also contributes to the knowledge on regional approaches and how the policies made are put into practice. Therefore, this thesis explores the potential different approaches taken in the RESs in the Dutch province of Gelderland, and on what basis the choices taken for the corresponding approaches are being made.

### 1.2.2 Aim and research question

The main goal of this thesis is to contribute to a better understanding of how policy decisions in the energy transition differ between RES regions, and why certain regions make specific policy choices when given the freedom of action within the NPRES, as reflected in their levels of ambition, the mix of renewable energy sources and their approaches to participation. These three aspects of the RESs in the region can be decided upon by the regions themselves and are key aspects to put the regional policies in practice. To achieve this better understanding, six RES regions within the province of Gelderland are being compared.

The central question of this thesis is the following;

*‘To what extent and why do Regional Energy Strategy regions in the province of Gelderland differ in how they utilize the freedom of action granted by the National Program Regional Energy Strategy, as reflected in their levels of ambition, renewable energy source mix, and participatory approaches?’*

To be able to properly formulate an answer to this main research question, sub-questions have been formulated:

1. Can differences be observed between the Regional Energy Strategies 1.0 within the province of Gelderland, in terms of their ambition level, renewable energy source mix, and the participatory approach?
2. In what ways do the RES regions in the province of Gelderland differ in their levels of ambition, and what factors explain these differences?
3. In what ways do the RES regions in the province of Gelderland differ in their renewable energy source mix distribution, and what factors explain these differences?
4. In what ways do the RES regions in the province of Gelderland differ in their participatory approach, and what factors explain these differences?

## 1.3 Relevance

### 1.3.1 Scientific relevance

As we have seen, sustainability and energy transition policy are being produced at multiple governance levels. Scaling down policy from the EU level to the RES level in the Netherlands is a complex process. It requires a substantial amount of policymaking, communication between different governance levels and alignment of frameworks to adequately translate policy into the regional context. Research has been done on the national implementation of EU renewable energy policy (Knodt & Ringel, 2019; Jorge-Vazquez et al., 2024; Hoicka et al., 2021) however, according to Thomann & Sager (2017), it is necessary to research the implementation process of EU policy below the national level, because it can add to the whole picture of EU implementation. By comparing six RES regions within the province of Gelderland in the Netherlands, this study contributes to the knowledge of the way in which EU policy can get implemented at the sub-national level and the way in which different regions implement and perform differently.

Secondly, Treib (2006) mentions that there is a gap in the literature when it comes to the exploration of the processes of implementation in different EU policy areas. By doing research on the implementation of measures to achieve the goals within the energy transition area, this study can add to the knowledge about the process of implementation of EU energy policy.

Lastly, this research contributes to the literature of multi-level governance within the energy transition. Teisman et al. (2018) describes that the success, within issues as the energy transition, of the national government, is determined at the regional and local level. Actions taken on these two levels can either have boosting consequences or slow down processes. Thus, scaling action can be a difficulty which is of importance for achieving or failing the energy transition goals that were set on national and EU level. In this research, regional differences and their contribution to national goals are being assessed, which makes a contribution to the knowledge about the effects of regional successes on a national success.

### 1.3.2 Societal relevance

At the start of 2025, a majority of the Dutch national government voted on a motion for abolishing the NPRES after 2030 (NOS, 2025). This motion indicates that the NPRES leads to an inconsistent energy policy and advocates that this level of governance is unnecessary (Regional Energiestrategie, n.d.-h). Experts and the regions themselves are sceptical about the motion because of its success and the progress it brought the country in the energy transition (NOS, 2025).

This political debate reflects a tension between the national and regional level. According to the World Economic Forum (2024), a successful energy transition not only includes sustainability and security,

but also key aspects as equity and inclusivity. Disregarding these social dimensions, such as fair access to energy and public involvement can create resistance, which in its turn can cause delays or failures of energy transition projects. This would in its turn slow down the energy transition as a whole and the progress in achieving its matching goals (World Economic Forum, 2024). Moreover, it would not align with SDG 7, which ensures access to affordable energy for all (United Nations, n.d.-d). This research will give an insight into if and how RES differ in their approach within the energy transition. With this in mind, abolishing the NPRES may risk losing the localized insights and participatory structures which help the energy transition to be socially accepted.

This thesis investigates whether the RES regions in Gelderland differ in their approach to the energy transition and what the reason for these possible differences is. By analysing these possible differences, this thesis aims to better understand the role of regional variation in shaping an effective energy transition. The findings can help inform future policy decisions by identifying which policy decisions contribute to an effective energy transition strategy. Moreover, it contributes to knowledge about decentralized energy governance in the Netherlands. This creates possibilities for policies to become more effective and in line with contextual factors. In doing so, it also addresses a social question; in what way can energy policy be designed that is effective, but also inclusive and responsive to regional needs?

## 1.4 Outline of the thesis

Following chapter 1, which introduces the research topic, chapter 2 will provide the theoretical background of the thesis. It discusses the energy transition within the broader context of the EU and the Netherlands. Moreover, the governance system of the Dutch energy transition will also be discussed. This chapter also presents the analytical framework and the operationalisation of the key variables. Chapter 3 outlines the research design, which includes a combination of document analysis and semi-structured interviews. Chapter 4 will report on the empirical analysis of these documents and interviews, while chapter 5 will place these results into theoretical context. The limitations and recommendations for future research will also be given in this chapter. Finally, chapter 6 provides the conclusion, summarising the main insights and answering both the sub-questions and the central research question of the thesis.

## 2. Theoretical Framework

### 2.1 Overview

#### 2.1.1 Energy transition within the international and European Union context

The Paris Agreement, adopted in 2015 by 195 parties, represents a landmark in international climate governance. It is an international legally binding treaty under the United Nations Framework Convention on Climate Change (*UNFCCC*). The goal is to limit the rise of the global average temperature to 1.5°C above pre-industrial levels and to keep it well below 2°C. This agreement is a milestone in climate action because of the many parties involved and the binding nature of the agreement. Each country communicates their actions through nationally determined contributions (*NDCs*). These *NDCs* include plans to reduce greenhouse gas emissions, and their actions to build resilience against the impact of climate change. To make sure that vulnerable countries are also able to make plans and take action, financial assistance is provided by developed countries (United Nations, n.d.).

In response to this international binding agreement, the EU implemented several policies and strategies on climate action. As mentioned above, the EGD, adopted in 2019, is one of these. With this growth strategy, the EU and its Member States want to be the first continent which is climate-neutral by 2050, based on a clean, circular economy (European Commission, 2019). The EU has been long interested in limiting climate change effects. Furthermore, the EU leads in cutting greenhouse gas emissions. (Council of the European Union, n.d.). This makes the EU a frontrunner in climate action. For a clean energy transition three main principles were formulated. The first one; is ‘ensuring a secure and affordable EU energy supply’. The second principle is about ‘developing a fully integrated, interconnected and digitalised EU energy market’. Lastly, it mentions ‘prioritising energy efficiency, improving the energy performance of our buildings and developing a power sector based largely on renewable sources’ (European Commission, n.d.-c).

To make the goals of becoming climate-neutral a legal obligation, the European Climate Law was set out in 2021. Net zero greenhouse gas emissions should be achieved by 2050 and in 2030 the target is to have reduced the emission already with 55% compared to the levels in 1990. The 2030 Climate Target Plan, adopted this reduction of greenhouse gas emissions of 55% in 2021, where it was first the goal to reach a 40% reduction (European Commission, 2020) . To reduce the greenhouse gas emissions while still providing enough energy for the consumption level, the transition to sustainable, secure and affordable energy has become a priority (European Union, 2021). The ‘Fit for 55 package’ is a set of laws which has the goal to decrease greenhouse gas emissions in the EU by 55% in 2030 (Council of the European Union, n.d.-b). Thus, it ensures that a set of proposals is adopted into law, to

make sure EU legislation is in line with the EU climate goals for 2030 and the transformational change that comes with it (European Commission, 2021). The REPowerEU plan builds upon the Fit for 55 package. This plan has been adopted to reduce EU's dependency on Russia for energy. The invasion of Russia in Ukraine from 2022 onward has put pressure on the world's energy system because of the dependency of Europe on the gas, oil and coal from Russia. The European Council decided to gradually eliminate Europe's dependency on Russia for energy because they refuse to support its war against Ukraine (European Commission, 2022). To be able to do this, Europe needs to produce more (renewable) energy by itself and the Fit for 55 package helps by providing proposals for a bigger share of renewable energy. Altogether, these international and EU ambitions set a broad framework in which Member States, including the Netherlands, are expected to develop and implement their own energy transition strategies.

### 2.1.2 Energy transition within the Dutch context

To contribute to the goals and vision set in the Paris Agreement and the EGD, the Netherlands adopted the National Climate Agreement of the Netherlands in 2019. This agreement has the national goal of reducing the emission of greenhouse gases with 49% in 2030 compared to levels in 1990. It also argues for a reduction of 55% in Europe in 2030. This was all based on the international context of 40% reduction of greenhouse gas emissions in Europe, before the 2030 Climate Target Plan.

(Rijksoverheid, 2019-a). In 2023 an extra package of measures was formulated by the Ministry of Economics and Climate, focused on a national CO<sub>2</sub> reduction of 55% to 60% in 2030 (Ministerie van Economische Zaken en Klimaat, 2024). To make all these goals a legally binding obligation, the national Climate Law was established in 2019. The Netherlands must achieve the goals set for 2030 and the zero net emission aim in 2050 (Rijksoverheid, 2019-b). A CO<sub>2</sub>-free electricity system means that non-renewable energy sources should be replaced by renewables. In the Climate Agreement, a goal of producing 84 TWh renewable energy is set with concrete targets on 35 TWh renewables on land and 49 TWh of wind at sea (Rijksoverheid, 2019-a). To be able to keep track of all measures taken and plans made on all different levels of governance within the Dutch climate policy, the Klimaatnota, a document formulated by the Dutch cabinet, provides a yearly report on the progress of that year and it compares goals set at national and European level (Ministerie voor Klimaat en Groene Groei, 2024).

The national Climate Agreement builds on the previously established 2013 Energy Agreement of the Netherlands which formulated goals for the year 2023. Agreements on phasing out natural gas in residential heating, expanding wind energy at sea, and increasing renewable solar- and windenergy production on land in the Energy Agreement for 2023 ran in parallel to the ones established in the Climate Agreement of 2019 (Rijksoverheid, 2019-a). However, the 2013 Energy Agreement was not the first step in climate action within the Netherlands. The country has had, for example, the SDE++

(Stimuleren Duurzame Energieproductie en Klimaattransitie), a subsidy opportunity for non-profit organisations and companies since 2008 for those who produce renewable energy (Rijksdienst voor Ondernemend Nederland, 2023). The 2013 Energy Agreement could be seen as a forerunner of the 2019 Climate Agreement. For the future of the energy system as a whole, the Netherlands adopted a National Energy System Plan for 2050 in 2023 which is embedded in the European context and its regulatory frameworks and goals. Where the Climate Agreement formulates specific measures on how, where and when to produce renewable energy, the National Energy System Plan goes into depth about energy saving, the infrastructure plans, international cooperation and joined management and participation of inhabitants. This national coordination of the energy transition is based on European goals and guidelines (Ministerie van Economische Zaken en Klimaat, 2023). The energy transition can take shape in a lot of national and subnational plans and strategies, but businesses and non-profit organisations can also contribute to the Dutch energy transition. For them to be able to afford and achieve this transition, the SDE++ subsidy regulation stimulates investments in renewable energy production and the reduction of CO<sub>2</sub> emissions (Rijksdienst voor Ondernemend Nederland, 2020).

This thesis will go into depth about the governance of renewable energy production on land, because the Netherlands has come up with an interesting national program to regulate the production of renewable solar and wind energy on a regional scale. However, sustainable wind energy is also produced at sea. With the goal of the Climate Agreement to reach 49 TWh, the Roadmap Wind energy at Sea provides us with specific targets and locations for this production (Ministerie van Economische Zaken en Klimaat, 2018). All while The North Sea Agreement ensures that the production of offshore wind energy is balanced with ecological priorities and fisheries (Ministerie van Infrastructuur en Waterstaat, 2020).

To coordinate the energy transition on land, the NPRES has been established, as part of the Dutch Climate Agreement. 30 regions have been drawn up to each work on the production of sustainable energy on land and are in search for sustainable heat sources within their own strategy. The regions are made up out of municipalities, provinces and water boards. Inhabitants, energy and social companies, the national government and network operators work together with them on the strategies and the realisation of these plans (Vereniging van Nederlandse Gemeenten [VNG], 2018). The initial goal of NPRES was to produce 35 TWh renewable energy on land, but the set goals of the regions sum up to produce 55 TWh in 2030 (Regionale Energiestrategie, n.d.-a). The NPRES helps these regions with formulating their strategies where necessary, but leaves the content up to the regions themselves. The national program thus does not only provide knowledge, but it also connects different parties and matches them for cooperations, moreover, it addresses bottlenecks (Regionale Energiestrategie, n.d.-b).

## 2.1.3 Governance system of the Dutch energy transition

### *Multi-level governance*

Multi-level governance offers a comprehensive framework to analyse the way in which energy transition policy is governed and the interaction between different governance levels; such as the EU, the national government and regional and local authorities. According to Hooghe & Marks (2001, p. 3) multi-level governance is ‘the extent to which authority for a particular territory is dispersed across multiple jurisdictions’. The concept of multi-level governance has emerged as a framework for analysing processes that involve multiple levels of government, such as decision-making and implementation of policies. In the current context of the RESs in the Netherlands, multi-level governance provides us with a lens to understand how authority, decision-making and implementation responsibilities are distributed among different governance levels and multiple actors.

However, to better capture the complexity of multilevel, multi-actor decision-making and implementation, particularly evident in the EU context, Hooghe & Marks (2001) distinguish between two different types of multi-level governance. Type I multi-level governance is characterized by jurisdictions which are multi-task, mutually exclusive at any particular level, a limited number of them, organized in a limited number of levels and jurisdictions which are intended to be permanent. Thus, attention is being called to authorities without denying the possibility of other parties playing a role. Type II multi-level governance is characterized by task-specific jurisdictions, overlapping jurisdictions at all levels, an unlimited number of jurisdictions, no limit to the number of jurisdictional levels and jurisdictions which are intended to be flexible. This means that this type is focussed on flexible jurisdictions where governance is fragmented and networks are issue-specific.

European policy is based on Type I multi-level governance, it works with a vertical coordination. This means that the EU makes policy, which is being implemented in a lower governance level, the Member States. National targets set by the Member States then in its turn shape provincial, regional and local measures. However, it also partly works with Type 2 multi-level governance. Some EU legislations call for task-specific jurisdictions, for example the Regulation on the Governance of the Energy Union and Climate Action which takes care of the EU being aligned with international commitments of the Paris Agreement by setting out rules for planning, reporting and the monitoring mechanisms (European Commission, n.d.-d). The governance of the energy transition within the Netherlands, coordinated through RESs, is a complex system. It involves not only governmental actors at various levels, but also energy companies, investors, and technology firms which all work together. This system is mostly shaped through vertical coordination, but the 30 regions are made up out of more actors than just governmental ones. The RES system aligns more closely with Type II multi-level governance. It works across overlapping boundaries of municipalities and provinces, thus it is a created collaborative network which does not follow strict hierarchical structures. Responsibilities are

allocated based on the nature of the task rather than strictly following administrative or political boundaries. However, this system is constructed through a national program at the central state level with six commissioners; the Ministry of Climate and Green Growth, the Ministry of Internal Affairs and Kingdom Relations, the Interprovincial Consultation, the Association of Dutch Municipalities, the Union of Water Boards and network operators. The NPRES supports the cross-boundary RES regions with drafting their Region's Energy Strategy, the program for example provides knowledge which can help the RES regions in making decisions.

Each of the regions in the NPRES has a degree of freedom in their energy transition pathway (Martínez-Reyes et al, 2025). This freedom means that the RES regions can each decide on their own energy transition strategy towards 2030 within the national guidelines from the national program. The RES 1.0 documents were released in 2021, when necessary a Recalibration RES 2.0 [*Herrijking RES 2.0*] can be made, in which new insights, innovations and ambitions can be established (Nationaal Programma Regionale Energiestrategie, n.d.-b). In the pilot edition of the RESs, variation was found in the way the regions organised, governed and implemented their strategies (Schuurs & Schwencke, 2017). In their explorative research Van Dijk et al. (2022) found, among other things, that this freedom within regions leads to regional differences in the role of provinces as a result of differences in ambitions of politicians and civil servants. The freedom can also be remarked by the differences in quantity and type of stakeholders who are involved in decision-making processes. In their comparison research between two regions, a financial difference was found; one region used financial pooling in which multiple participants' resources were used, the other mostly relied on the nationally provided sources. Lastly, another distinction between the two regions was the scale at which renewable electricity planning took place, it was either the regional or the local scale. Overall, these findings thus highlight how decentralization and discretion in designing the RESs enables differentiated approaches, which result in significant regional variation in stakeholder involvement, finance, and operating governance levels.

## 2.2 Conceptual framework and operationalisation

### 2.2.1 Analytical framework and operationalisation

#### *Regional freedom of action*

As we have seen in the previous chapter, regions within the NPRES have some degree of freedom in the development and implementation of measures within the joint goal of creating 35 TWh renewable energy on land in 2030. This regional freedom of action allows each of the 30 RES regions to develop their own strategic approach. This way, regions can align their view and strategy with the specific regional context and priorities. This decentralization of environmental action comes with advantages and disadvantages. On the positive side, decentralization leads to an expected efficiency gain and

opportunities for tailor-made policies (Vries, 2000). Moreover, it also results in improved policy outcomes as long as the administrative qualities are high (Kim & Yoon, 2017). Disadvantages include small communities not being able to handle complex problems at their governance level (Vries, 2000). Furthermore, Yang et al. (2021) suggest that with a decentralized system, the total input from the local governments is lower than the input from the central government in a centralized system, this is due to risk-taking attitudes. For the RES regions, this could mean that the strategy taken aligns with their context, but there are risks of lower input and not being able to handle complex problems.

It is important to distinguish this regional freedom from regional autonomy, as RES regions do not possess the legal right to take independent decisions (Regionale Energiestrategie, n.d.-g). Rather, the regions are embedded into decentralized governance. This means that the NPRES does not possess decision-making authority, instead it provides the regions with knowledge and communication support (Regionale Energiestrategie, n.d.-b). Within these regions, municipalities, provinces and water boards collaborate to produce a strategy. However, final decisions are being made by democratically chosen bodies such as municipal and provincial councils, and the general boards of water authorities (Regionale Energiestrategie, n.d.-e). Thus, the energy regions within the NPRES do not possess the authority to take decisions, rather, they possess the freedom to produce their own energy transition strategy. Dahl (2007) describes ‘national freedom of action’ on the EU level as ‘the possibility for EU members to have ambitious environmental policies according to their own interest, either through national or EU legislation’ (p.69-70). Drawing on this concept at the regional scale, this thesis defines ‘regional freedom of action’ as the possibility for RES regions to develop an energy transition strategy that aligns with their specific context, ambitions and priorities.

To be able to put a finger on the ways in which RES regions possibly differ in their manner of filling in the freedom of action they receive within their strategy, three main dimensions will be elaborated below; ambition, choice of renewable energy source mix, and the participatory approach chosen.

### *Ambition*

Ambition reflects a desire to achieve something (Cambridge Dictionary, n.d.). A possible difference between different regions in the NPRES is their level of ambition, as identified in the research of Van Dijk et al. (2022). Ambition in energy policy can be assessed in two ways; directly, through concrete and measurable outcomes, and indirectly, through plans, strategies and policy frameworks, or a combination of both. In the article by Strunz et al. (2021), ambition in renewable energy policy is introduced as being built upon three pillars; meaningful targets, target achievement and an enforcement procedure. According to Strunz et al (2021), a target is considered ambitious if it goes beyond the Business as Usual scenario. This means that an ambitious target is one that sets higher goals which require effort to achieve, instead of letting the situation remain as it is. The Business as

Usual scenario serves as a useful reference point for evaluating environmental policy, as it is not based on a fixed point, allowing an improved relative comparison between environmental policy measures.

Thus to develop a comprehensive understanding of ambition within RES regions, this thesis will analyse the targets set by each region in relation to meeting the overall goal in the NPRES. Moreover, the reasoning as to how the regions came up with the target described in their RES 1.0 documents will be assessed. By doing so, this research aims to reveal the differences between regions in their level of ambition in the energy transition, and how this results in variation between RESs from different energy regions. Differences in the level of ambition are expected between the regions. Van Dijk et al. (2022) found some variations in ambitions of politicians and civil servants, there is expected that these variations will be visible in the targets set by the regions. The target achievement and enforcement procedure, as considered two pillars of ambition by Strunz et al. (2021), are not being analysed because not all plans and projects are in realisation yet, which makes these two pillars difficult to evaluate.

#### *Renewable energy source mix*

Each RES region has assessed where renewable energy in the form of solar and wind on land can be produced, how energy can be saved and whether a connection to the power grid is possible (Regionale Energiestrategie, n.d.-c). Producing a balanced mixture of wind and solar energy is of importance for a stable energy supply, as these sources generate power at different times. Wind energy is generally more productive at night (Cai & Bréon, 2021), while solar energy peaks during daylight hours and in summer (Solar energy UK, 2023) Additionally, a combination of both these energy sources optimizes the capacity of the power grid, thereby improving efficiency (Nationaal Programma Regionale Energiestrategie, n.d.-a). While the NPRES advises the RES regions to balance their mixture of wind- and solar energy 1:1, there is no national goal as to the distribution of energy produced from either solar or wind. This absence of a specific goal grants the RES regions the freedom of action to shape their energy strategy based on regional preferences, spatial planning possibilities, and public support. This freedom allows the regions to produce a renewable energy development in ways that align with local conditions and ambitions.

The NPRES prioritizes solar energy on rooftops, sun energy on land and wind energy on land. Each region determines its focus between these categories. To systematically create a clear overview of the renewable energy priorities of each RES region, this thesis categorizes the selected energy sources per region. This classification provides a structured way to compare regional strategies and understand the factors influencing the preferred choice of renewable energy source. By examining these variations, this thesis will offer insights into how regional freedom of action contributes to different priorities in renewable energy sources, observable in their strategies. A slight difference is expected in the choice

of renewable energy source per region, because each region faces different contextual factors, for example geographical and ecological factors, political preferences and economic factors.

### *Participatory approach*

Each RES region organizes its own energy transition strategy, allowing for regional differentiation in stakeholder involvement and governance structures. Municipalities, provinces, and water boards serve as the formal owners of the RES 1.0 and they hold responsibility. Each region has the freedom of action to determine which additional parties, such as citizens, grid operators, local businesses and social organizations, are involved and how they contribute (Regionale Energiestrategie, n.d.-e). This freedom of action, the possibility for RES regions to develop an energy transition strategy that aligns with their specific context and ambitions, logically results in a choice of number and type of stakeholders involved in decision making. This means that not having a strict set of stakeholders to involve in the strategy making leaves the stakeholder involvement up to the region and their context. Involving various stakeholders improves long-term and multi-scale thinking (van Dijk et al., 2022). Understanding how and why different RES regions structure their freedom in stakeholder involvement differently provides an insight into the broad dynamics of regional energy governance. By analysing these variations this thesis assesses how freedom of action is used to structure regional governance and who gets to influence the energy transition process.

The involvement of varying types of stakeholders is different to public participation. Burdett (2023) describes the main difference as that stakeholder engagement is focused on different types of organisations and individuals, while public participation centralizes the broad public. Public participation provides innovation options in governance (MacArthur, 2015). The NPRES mentions that an important part of participation is local ownership, the goal is to reach 50% local ownership in each RES. This is not only focussed on financial ownership, but also on codetermination (Regionale Energiestrategie, n.d.-f). When analysing the strategies, Lelieveldt & Schram (2023) found that citizens were absent in the formulation of the strategy drafted in RES region Zeeland. This is in line with the approach of other regions in the Netherlands. Planbureau voor de Leefomgeving (2020) also mentions that a third of the regions did not involve citizens. Thus, variation is found again between regions. Moreover, Lelieveldt & Schram (2023) found that a relatively large share of the actors involved in creating a strategy represent state and market while civil society is weakly represented. These findings highlight an imbalance in the involvement of citizens or representatives thereof, which raises questions of inclusivity in regional energy transition planning.

Participatory approaches in this thesis will be defined as the involvement of stakeholders and residents in policymaking through various forms of participation, based on the definition of participatory governance used by Baasch & Maschke (2025), which is ‘the non-regulatory involvement of civil society stakeholders in policymaking through various forms of participation’. The key indicators are

the diversity of stakeholders, based on the corresponding sectors, the success of public participation, and the way in which local ownership is adopted in the RESs of the regions. To create a clear overview of the diversity of stakeholders, a table is created in which the corresponding sectors will be listed per RES region. The sectors that will be included are the following; agriculture, care, economy, energy, housing, mobility, national authorities, nature and environment, residents, and subnational authorities. Variation of sectors involved and levels of public participation and local ownership are expected, as the freedom of action allows the regions to tailor their RES to their own interests and needs.

### 2.2.2 Conceptual model

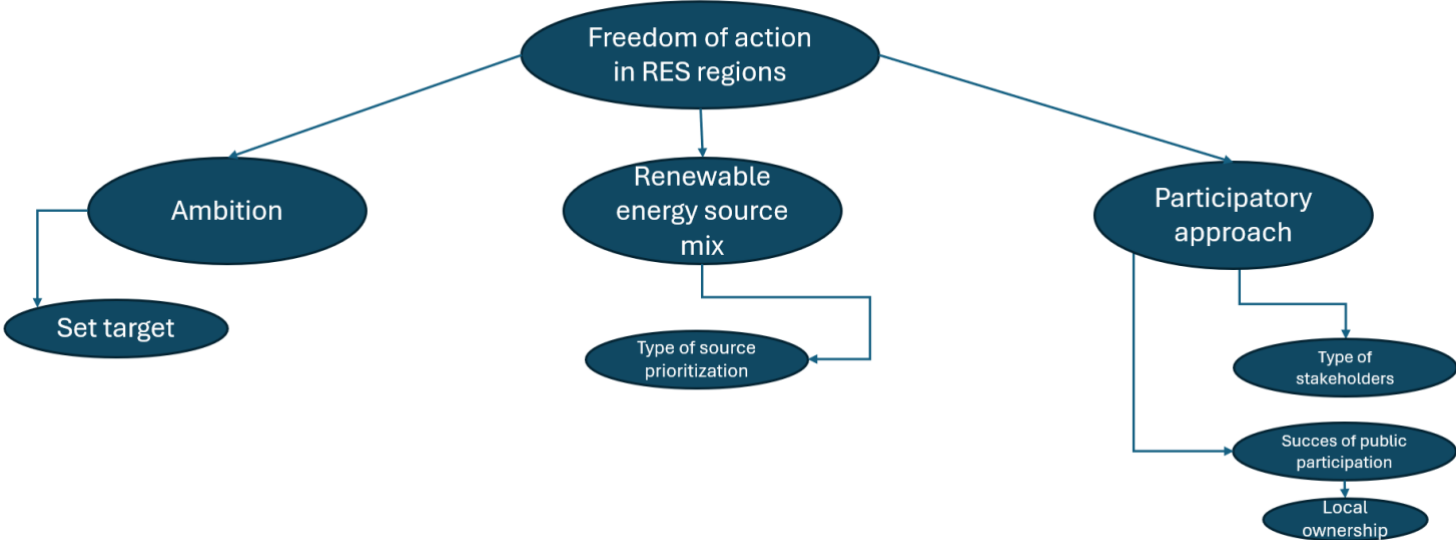


Figure 1: Conceptual Model

Figure 1 visualises a conceptual understanding of the freedom of action RES regions possess, and three dimensions in which the regions may differ in their usage of this freedom, and their key indicators.

## 3. Research design

This thesis makes use of a qualitative, comparative case study design to analyse how six RES regions in the province of Gelderland use their freedom of action in formulating their RES. The qualitative approach was adopted for its capacity to establish patterns or themes via both an inductive and deductive data analysis (Creswell, 2013). This dual approach is valuable in this thesis, because it enables themes and patterns to be explored through targeted questions and through spontaneous emergence from the regions themselves. A comparative approach was taken for its capability of heightening awareness on systems and patterns of thinking and acting, therefore sometimes creating new insights for other cases to adapt (Esser & Vliegthart, 2017). This is applicable to this thesis, because it enables RES regions to possibly learn from each other. Case studies were chosen for its ability to work with different types of information, such as documents, interviews and observations (Yin, 1984). The cases analysed in this thesis are six RES regions which each have received the assignment by the national government to determine its approach to the energy transition within a national framework. This thesis aims to contribute to a better understanding of the freedom of action RES regions receive from the NPRES, and if this leads to differences RESs from various regions. Furthermore, it tries to create knowledge on these potential differences and why certain regions make specific policy choices when given the freedom of action within energy transition governance.

The combination of a qualitative approach and a comparative approach thus provides a possibility for the identification of both similarities and differences as well as patterns in the approach to energy transition policy, across the six cases chosen. The RES regions in Gelderland are thus embedded cases within the same institutional context of the NPRES and the province of Gelderland. This contributes to keeping the embedded case study design in focus (Yin, 2018). Moreover, the comparative case study design enables an analysis of the reasoning and contextual factors behind different regional approaches to policy. Furthermore, it provides insight into the context which shape the decisions being made. The regions chosen for the comparative case study all represent a RES which offers a comparable case selection, because they all operate under the influence of both the NPRES and the provincial government of Gelderland. This shared framework ensures that any potential differences between the strategies from the RES regions can be more confidently assigned to the regional level and their context, choice and priorities.

### 3.1 Case study selection and description

A multiple case study design studying six energy regions was chosen to be able to create a broad understanding of the similarities, differences and patterns in usage of the freedom of action in RES regions in the Netherlands. This thesis focusses on six RES regions (partly) located in the Dutch province of Gelderland. This province is of interest, because it contains bigger challenges than many

other provinces in the Netherlands. However, the chairman of the Dutch Sustainable Energy Association (*Nederlandse Vereniging Duurzame Energie, NVDE*) expresses his confidence in the possibility of further speeding up the energy transition in this region (Elk, 2025). The Assembly of European Regions even hosted a study visit on the energy transition to this province, to observe how the bottom-up approach and its unique multi-stakeholder collaboration is contributing to the energy transition (Assembly of European Regions, 2018). Furthermore does this province contain the city of Nijmegen, which has been named as the European Green Capital in 2018 (European Commission, n.d.-e). The six selected RES regions are thus of interest for investigating if the strategies set up are ambitious and on what aspects the regions based their decisions regarding the energy transition. Moreover, the same provincial oversight is of interest because it ensures contextual comparability, the regions each work in the same provincial and national frameworks. This allows for identification of similarities and the exploration of region-specific policy choices There was chosen for all six regions within this province, because this could offer a broad understanding of the potential differences, by isolating the impact of the province over the regional choices.

The six RES regions in Gelderland under consideration, namely- Achterhoek, Arnhem-Nijmegen, Cleantech, Foodvalley, Noord Veluwe and Rivierenland, – are thus all subject to the same provincial oversight an all of them established their RES 1.0 in 2021. Achterhoek is an energy region in the east part of Gelderland, next to the border of Germany. The region consists of 8 municipalities. The focus of this region is aimed at creating support for the energy transition (Achterhoek, n.d.). Arnhem-Nijmegen lies in the middle of south Gelderland and it is a partnership of 17 municipalities. Its location is beneficial against the border of Germany, because it makes it an important transport hub (Groene Metropoolregio Arnhem-Nijmegen, n.d.). Energy region Cleantech is also known as region Stedendriehoek. It is located in the northeast of the province of Gelderland, but it also partly lies within the province of Overijssel. This region is a collaboration of 8 municipalities. With big Natura2000 areas in this region, these are European protected natura areas, landscape is a high priority (RES Stedendriehoek, 2021). Foodvalley lies on the west side of Gelderland and is a collaboration between 8 municipalities. Next to the RES, this region also has a regional Energyprogram 2024-2026. This goes, among other things, into depth about decreasing net congestion, the development of an energy system for the future and making business parks more sustainable (RES Foodvalley, n.d.). RES region Noord-Veluwe is at the complete north of the province of Gelderland. The region includes 7 municipalities. This region does not only focus on the regional goals, but municipalities have their own goals too. For example, the municipality of Ermelo wants to be energy neutral in 2030, whereas the region itself wants to be energy neutral in 2050 (RES Noord-Veluwe, 2021). Finally, RES region Rivierenland is located at the southwest corner of Gelderland and works together with 8 municipalities. This region has a lot of local initiatives by inhabitants, which contribute to sustainable

energy in 2050 (RES Fruitdelta, n.d.). For a schematic representation of the RES regions included in the thesis, see figure 2.

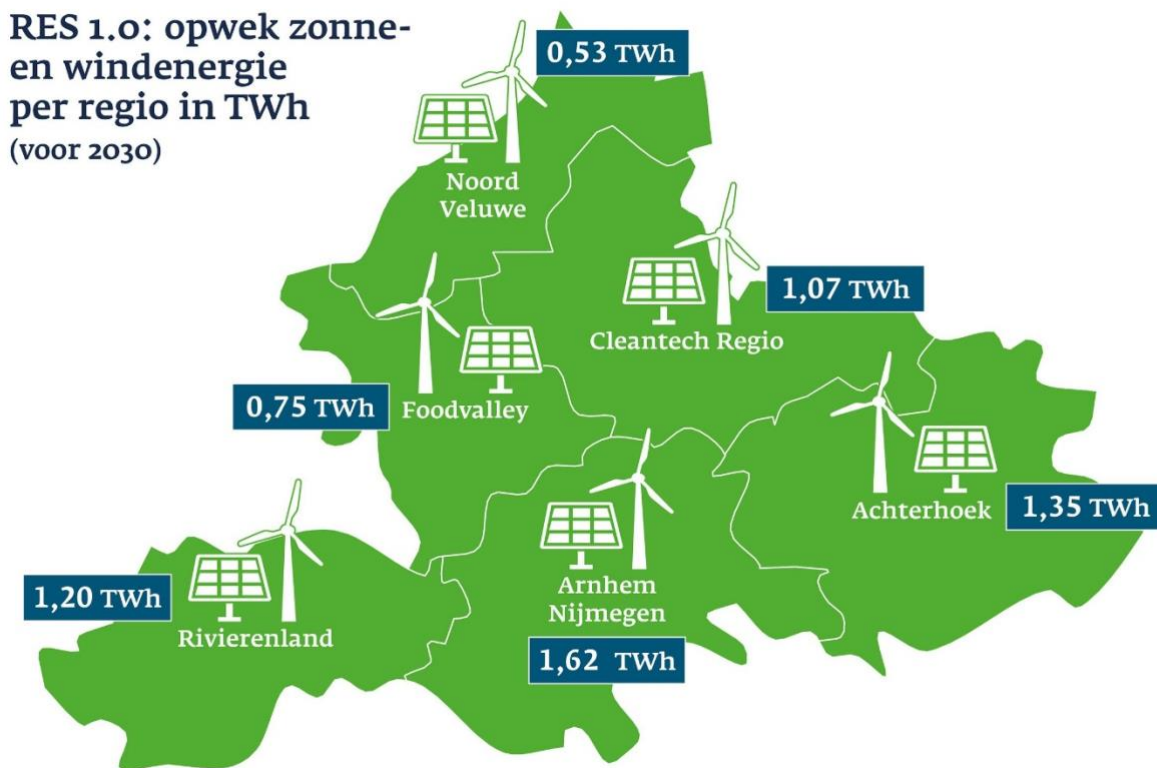


Figure 2: RES 1.0 production of solar and windenergy per region in TWh. Retrieved from Provincie Gelderland (n.d.).

## 3.2 Data collection

To be able to provide an answer to the research question and sub-questions, data has been collected from multiple sources; the RES of the six selected regions, and semi-structured expert interviews.

### 3.2.1 Regional Energy Strategies 1.0

A grey literature data collection includes the RESs 1.0 of the selected regions; Achterhoek, Arnhem-Nijmegen, Cleantech Regio, Foodvalley, Noord-Veluwe & Rivierenland. These documents are part of the NPRES, and include the region-specific goals, plans, and strategies for their contribution to the national energy transition goal in 2030. There is currently being worked on the RES 2.0 versions, but these are not yet available. Therefore, there has been chosen to use the 1.0 version. The RES documents are considered to be grey literature, which is 'information produced outside of traditional publishing and distribution channels, and can include reports, policy literature, working papers, newsletters, government documents, speeches, white papers, urban plans, and so on' (Simon Fraser University Library, 2024). The RES documents are publicly available, and thus collected from the

website of each RES region (See appendix A). The strategies provide a clear overview of the policy approaches taken within the six regions and they serve as a main source of information for locating the similarities and differences between the strategies in the selected regions.

### 3.2.2 Semi-structured expert interviews

To gain in-depth information regarding the motivation and contextual factors behind the variations seen in the document analysis, semi-structured expert interviews were conducted. A semi-structured interview was chosen because it allows the ability to go into depth about themes that come up during the interview itself. However, it also includes structured questions which allows the interview to stay on topic. Expert interviews provide in-depth case study insights, while including comparison aspects. Furthermore, the interviews can be focused on specific aspects of interest for the comparative analysis (Dorussen, Lenz, & Blavoukos, 2005). The RES regions were approached with a purposive sampling method, mediated by gatekeepers within the RES regions. After contacting the general RES email addresses, the organizations determined internally which representative would participate in the interview. This does limit the control over participant selection, but it increases the chance that knowledgeable employees were included. With five out of the six regions an interview was conducted, the non-present interview is from RES region Foodvalley. The interviews were done with one representative per region (See appendix B). The absence of insights from the sixth region cause the comparison between the six regions in the province of Gelderland to be incomplete and this thus limits the comprehensiveness of the analysis. There has been contact with RES region Foodvalley but after a misinterpretation of an email, no further contact with another representative could be found. The representatives of the RES regions which could be reached, included process managers, process directors, program managers and energy advisors. For these interviews, an interview guide has been created with relevant, in-depth questions about explanatory factors that provide insights on the differences found regarding ambition, choice of the renewable energy source mix, and participatory approaches (See appendix C for the Dutch interview guide and appendix D for an English translation). The collected data from the interviews will only be accessible by the researcher and their supervisor. Furthermore, confidentiality is secured as no names have been used and a consent form has been signed by the interviewees to confirm they agree to the interview being recorded.

## 3.3 Methods of data analysis

A structured analysis has been conducted to evaluate the differences between the six energy regions and the reasons for the approaches taken by each region. First, the RESs 1.0 have been used to sketch the current situation in each region. The chosen themes, ambition, renewable energy source mix and participatory approaches, were compared in these six strategies. To give a complete overview of the situation within and between these regions, a table was created. This serves as the basis for the interviews.

The interviews were recorded, transcribed and anonymised before the analysis started. To get consent from the interviewees to record the interview, consent forms were created and signed. The transcript versions of the interviews have gone through a thematic analysis in Atlas.ti, based on the analytical framework and the aligning operationalisation. The usage of thematic analysis provides flexibility through theoretical freedom, which can lead to a detailed analysis of the data (Braun & Clarke, 2006). This type of analysis fits the current research design, because it enables the identification of patterns across qualitative data, while staying flexible enough to reflect similarities and differences between RES regions. Important themes in the interviews have been identified and coded. A theme is ‘something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set’ (Braun & Clarke, 2006). The steps made during the thematic analysis are based on the ones described in the article of Braun & Clarke (2006). First, familiarisation with the data has been done through transcribing the interviews done. Secondly, important words were coded, to create a first overview of the findings. Thirdly, thematic categorizations have been made, in which important themes have come forward. Next, the themes have been reviewed to look for mistakes or themes that can be merged together. Lastly, relationships between themes have been analysed, which creates a clear overview on the collected information of the interviews. The approach taken in this thematic analysis is theoretical. According to Braun & Clarke (2006), this means that the analysis is based on the existing research question, and it is more analyst-driven. It gives a less accurate description of the complete data set, and a more details analysis of certain aspects of the data. In this case, it means that it goes into depth about how the freedom of action is visible within ambition, the renewable energy mix and participatory approaches, and why that is the approach taken by the regions.

After the interviews were coded, an analysis was done to gain insight into the reasoning behind the differences and similarities established from the document analysis of the policies in the energy regions. With this comparison, conclusions have been drawn about the themes in which the differences in policies lie, and the reasons for different approaches taken within these themes. The document analysis of policies has been used as the basis for the interviews.

### 3.4 Validity and reliability

Ensuring validity and reliability is essential for producing credible findings. Reliability is the consistency of procedures used in the analysis of the collected data (Noble & Smith, 2015). To ensure reliability, a standardized data collection method has been used in the form of a semi-structured interview guide for the conducted interviews. Secondly, the coding process has been done systematically to minimize interpretative bias. Lastly, methodological triangulation was applied by combining data from both policy documents and interviews, thereby increasing reliability and the validity of the results.

Validity concerns the accuracy of the findings reflecting the data (Noble & Smith, 2015). Regarding the external validity, the findings are specific to the Dutch context, especially in the implementation of in selected regions in the province of Gelderland. Because of this case- and context specific design, the results are not easily generalisable. However, through a detailed description of the decision-making processes, the findings may be transferable to other RES regions within the NPRES that operate under similar institutional and spatial context. To strengthen internal validity, multiple data sources were used; the RESs 1.0 as policy documents, and interview data, allowing cross-verification of findings and strengthen conclusions.

## 4. Empirical analysis

### 4.1 Ambition

#### 4.1.1 Descriptive analysis

The analysis of the RES 1.0 documents of the six regions located within the province of Gelderland reveals variation in target level. Table 1 provides an overview of the set targets for the production of renewable energy in 2030 per region.

Region	Target (in TWh)
Achterhoek	1,35
Arnhem-Nijmegen	1,62
Cleantech	1,07
Foodvalley	0,75
Noord-Veluwe	0,53
Rivierenland	1,2

Table 1: Renewable energy production target by each RES region in Gelderland in TWh for 2030

On a first glance, when looking at the similarities and differences between the various targets, they range from a low of 0,53 TWh in Noord-Veluwe to a high of 1,62 TWh in Arnhem-Nijmegen. Most regions have set their target above 1,0 TWh, with Foodvalley and Noord-Veluwe as exceptions on the lower half and Achterhoek and Arnhem-Nijmegen on the higher half. The differences in set targets reflect how regions make use of the freedom of action granted by the NPRES. While all regions work under the same national target of 35 TWh in total, their self-determined contributions reveal their varying levels of commitment before the national program came up, and their will to undertake action in this moment. All regions have come up with a higher renewable energy production target than they would have without the NPRES. This means that all regions go above the Business as Usual scenario, and are thus all considered ambitious. Nevertheless, some regions are more ambitious than others. From table 1 we can conclude that for example Achterhoek and Arnhem-Nijmegen are more ambitious than Noord-Veluwe.

Although all regions are considered ambitious, differences were observed when expressing their targets. Regions acknowledge that achieving their goals will require significant effort. The RES documents frequently pair their quantitative targets with their dependency on innovation or collaboration. For example, Cleantech underscores the technical challenge of its target;

*‘The contribution of our region is 1,07 TWh. Realization of this is possible, but requires innovative techniques, including for energy storage’ (RES Cleantech 1.0, 2021, own translation).*

Rivierenland links its target explicitly to the necessary cooperation between actors;

*'Our ambition is to make maximum use of large roofs. We are aiming for a fivefold increase in the surface area of solar energy on large roofs compared to the first of January 2020. This is very ambitious, but possible if governments, companies and owners work together with Liander to remove hindrances'* (RES Rivierenland 1.0, 2020, own translation).

And Noord-Veluwe mentions their target to be a nice contribution to the national climate goals, while searching for areas in which wind and solar energy production can take place will be a difficulty because of nature protection regulations. Moreover, a small electricity grid causes hindrances.

*'With the target of 0,53 TWh, the region believes it can make a nice contribution to achieving the national climate goals. The search for promising search areas for wind energy and areas where solar energy can be generated is difficult. As a result of nature conservation legislation, there is little technical space for wind and solar energy. The region is also challenging from a system efficiency perspective. The electricity grid is thin and reinforcement or expansion leads to high social costs'* (RES Noord Veluwe 1.0, 2021, own translation).

Foodvalley has its target set at 0,75 TWh, but what catches attention in their RES 1.0 is their ambition to reach 1,0 TWh. This shows that this region keeps their vision focussed on the future and reaching a higher renewable energy production than expected in first instance.

*'Together we will make every effort to achieve the target of 0,75 TWh of sustainable electricity production in our region by 2030. Our ambition goes one step further; namely 1,0 TWh in 2030. In the coming years we will continue to work on additional opportunities and work on solving obstacles and stimulating innovations to achieve this ambition'* (RES Foodvalley 1.0, 2021, own translation).

Achterhoek emphasizes their actions in energy transition that have been on the agenda since 2009. According to their RES 1.0, this leads to policy already being in place, designated areas for the production of renewable energy, and residents already being informed by municipalities.

*'Since 2009, climate and sustainability have been on the agenda in the Achterhoek and the municipalities are taking steps to shape the energy transition. The ambition in the Achterhoek has resulted in municipalities having spatial policy to facilitate the production of sustainable energy by solar panels and wind turbines. Within a system of designated areas and assessment criteria, the market is developing initiatives for solar or wind farms. Municipalities have discussed their spatial plans with residents and other stakeholders to gain understanding and acceptance for the generation of sustainable energy on their territory'* (RES Achterhoek 1.0, 2021, own translation).

And Arnhem-Nijmegen frames its target as something to be proud of, but not yet sufficient. This reflects a very high ambition, as it recognizes their target as something big, but this region still sees that the target should be even higher to achieve the goals set for the future.

*'From the Arnhem-Nijmegen region, we contribute 1,62 TWh to the national ambition of 35 TWh generation via solar fields, large-scale solar on roofs and wind turbines. It is a bid we can be proud of, although it is not yet enough for the regional ambition of 55% CO<sub>2</sub> reduction in 2030.'* (RES Arnhem-Nijmegen 1.0, 2021, own translation)

Thus, the ambition levels in the six RES regions differ, despite all regions operating within the same national framework. While regions such as Arnhem-Nijmegen and Achterhoek have set high targets in TWh, which indicates high ambition, regions as Noord-Veluwe and Foodvalley take a modest approach to their target. Cleantech and Rivierenland directly mention their dependencies for being able to reach their target, while Noord-Veluwe mentions nature protection regulation that stands in the way of finding areas where renewable energy can be produced. Foodvalley brings up a higher ambition than their set target, Achterhoek emphasizes their previous efforts to produce renewable energy which sets them at a nice starting point for the implementation of RES 1.0, and Arnhem-Nijmegen introduces their target while already mentioning that it is not yet sufficient although it is the highest bid within the province of Gelderland. This found variation between RES regions reflects the flexibility in the NPRES. However, the regions acknowledging the hurdles ahead in implementing measures for meeting their target, presents a shared recognition of doubts on feasibility of the targets set. In sum, the regions with lower targets cite more limitations, for example the physical hindrance of nature protection and conservation laws, while the higher targets of the more ambitious regions can be attributed to their previous experience and future oriented vision.

#### 4.1.2 Explanatory analysis

Interviews were conducted to gain a more in-depth understanding of the choices made in the set targets, and thus the ambition levels, of the selected RES regions in the province of Gelderland. A few influencing factors emerged from these interviews, which are discussed below.

Firstly, spatial limitations played a significant role in shaping a target for the RESs. Noord-Veluwe, the RES region with the lowest target in Gelderland, 0,53 TWh, stated physical limitations as one of the restricting factors. As their region consist approximately 60% of protected Natura2000 area, 20% of agricultural land and the other 20% has been build on. Moreover, peatland soil conditions hinder the possibility to build on certain areas within the region (Interview 2). These constraints likely contributed to Noord-Veluwe being the RES region with the lowest set target in the province. Noord-Veluwe consisting of 60% Natura2000 area also is a huge challenge for them to find areas in which renewable energy can be produced, as these are protected nature and habitat areas. Arnhem-Nijmegen, with the highest target in the province also mentions spatial constraints, although these are more based on the urban density and the cities in this region, reaching their full capacity for wind and solar installations (Interview 1). Other regions did report spatial limitations as a major factor in setting targets in their region.

Secondly, inter-municipal dynamics seem to be of influence of ambition level. In Noord-Veluwe, a reluctance to stand out as a municipality emerged, either by producing the least renewable energy or by taking on a disproportionately large share of the region's production (Interview 2). In contrast, Rivierenlands' municipalities expressed a clear willingness to contribute to the overall production of renewable energy (Interview 3), and in Achterhoek a strong regional identity and community feeling fostered a sense of shared responsibility for the energy transition (Interview 5). These different collaboration structures within a region thus seem to contribute to the height of the target set in the RES regions.

Thirdly, prior experience with energy transition projects influenced the target setting. Achterhoek, Cleantech, Arnhem-Nijmegen and some municipalities in Rivierenland had already been working on or executing energy transition projects before RES 1.0. This existing organizational capacity and renewable energy production enabled these region in setting a higher target (Interview 1, 3, 4). Noord-Veluwe, however, lacked a history of such projects and had to develop new projects from the start, this likely constrained their ability to set higher targets (Interview 2).

## 4.2 Renewable energy source mix

### 4.2.1 Descriptive analysis

In addition to differences in ambition levels, the RES 1.0 documents reveal differences in the distribution of renewable energy sources of choice. Table 2 outlines the distribution of each renewable energy source per region. The NPRES encourages a 1:1 distribution between wind and solar energy, because they complement each other in terms of producing times, this means that the capacity of the electricity network is being used more efficiently, while providing a stabilized electricity delivery (Nationaal Programma Regionale Energiestrategie, n.d.-a). When looking into the distribution shown in the RES 1.0 documents, variation is found.

What catches attention is that the summed up targets per renewable energy source in RES region Foodvalley is not the same as the total target of 0,75 TWh as described in chapter 4.1.1. This is due to their higher ambition of aiming for 1,0 TWh. The same goes for RES region Rivierenland, although here there has been calculated a risk marge of 0,1 TWh.

Region	Wind energy (in TWh)	Solar fields (in TWh)	Large-scale solar on roofs (in TWh)	Solar other (in TWh)	Other, not allocated (in TWh)
Achterhoek	0,55	0,21	0,35	0	0,24
Arnhem- Nijmegen	0,47	0,65	0,49	0	0
Cleantech	0,11	0,45	0,51	0	0
Foodvalley	0,25	0,26	0,41	0,04	0
Noord-Veluwe	0,22	0,12	0,19	0	0
Rivierenland	0,75	0,28	0,30	0	0

Table 2: Renewable energy source distribution per region in TWh

Achterhoek seem to have a balanced mix between wind and solar energy, aligning with the national guideline. Rivierenland comes close to this balanced mix, however, it has a remarkable dominance in wind energy. All other five regions lean more or clearly towards solar energy. For example, Cleantech and Foodvalley rely for a big part on solar energy and very little on wind. The same goes for Arnhem-Nijmegen and Noord-Veluwe. The presence of the unallocated energy potential in Achterhoek, 0,244 TWh, could indicate decision uncertainty, or for example leaving possibilities open for future technological or political decisions. These variations in the mix of renewable energy sources seem to underline how regions differently use the freedom of action granted by NPRES. While this NPRES encourages a balanced mix between solar and wind energy, RESs often reflect a disbalance. A reason for this could be that solar energy is faster realizable than wind energy (RES 1.0 Achterhoek, 2021).

#### 4.2.2 Explanatory analysis

Several regions reflected a clear dominance towards solar energy, particularly Cleantech, Foodvalley, Arnhem-Nijmegen and Noord-Veluwe in their RES 1.0. This imbalance is partly driven by the resistance from both residents and politics, which make the realisation of wind energy projects difficult. Across all regions, this resistance against wind energy is a main factor limiting the possibility of setting up wind energy projects (Interview 1, 2, 3, 4, 5).

In Noord-Veluwe, spatial constraints played a key role in shaping the energy mix. A spatial analysis revealed very limited potential for wind energy in the region. In one of the wind projects that was initially planned, two windmills were removed from the plans by the province due to concerns over landscape aesthetics. This was decided upon, despite the fact that from an economic and energy standpoint, their inclusion would have made reaching the target of the region more feasible (Interview 2). Arnhem-Nijmegen also mentioned the visual aspect as a reason for resistance against windmills (Interview 1). When analysing the ambition level of Noord-Veluwe, spatial constraints were also a

limiting factor. These spatial limitations are caused by laws around ecological themes, such as the protected Natura2000 areas.

By contrast, Rivierenland, which showed a relatively balanced mix between solar and wind energy, places a strong emphasis on wind energy, considering it both to be the most important and the most challenging form of renewable energy. As a result, the region has prioritized wind in its planning efforts. This region also avoids solar in nature areas and preferably also not on agricultural land, in reality however, agricultural land is sometimes used for solar projects. However, from the interview with Rivierenland emerged that this balanced mix from their RES 1.0 is largely coincidental, instead of deliberately attempt to follow the recommended 1:1 distribution (Interview 3).

## 4.3 Participatory approach

### 4.3.1 Types of stakeholders

#### *Descriptive analysis*

Across all regions, a core set of stakeholder types is consistently involved. These include firstly, the owners of the RES; municipalities, water boards and provinces. Secondly, this includes in all six regions Liander, the company that works as the grid operator. Furthermore, energy companies are often involved, just like environmental organizations, housing associations and residents. Youth engagement emerges as an important stakeholder theme, primarily because of long-term climate effects and their future impact. Alongside this, the youth themselves seem to attain a positive attitude about the energy transition. However, a positive attitude does not directly mean participation, a more extensive description on this will be described in the sub-section ‘public participation’.

‘Young people are involved in thinking about and implementing plans at local and regional level’ (RES Arnhem-Nijmegen 1.0, 2021, own translation).

‘A recent survey among young people shows that the youth in the Noord-Veluwe region are positive about the energy transition’ (RES Noord-Veluwe 1.0, 2021, own translation).

Across the six RES regions in the province of Gelderland a wide range of stakeholders has been involved in the development of the RES 1.0. While the precise composition of stakeholders differs between regions and is sometimes a little unclear, some patterns occur frequently. All regions involve a broad and diverse range of stakeholders. Next to this, most regions mention each other as collaborative partners, sometimes even collaborating on research for certain renewable energy production areas. Furthermore, the regions have a few common national stakeholders, such as the NPRES, ProRail, Rijkswaterstaat and the Ministry of Defence. ProRail is the railway manager in the Netherlands and Rijkswaterstaat is the executive agency of the Ministry of Infrastructure and Water Management. A unique collaboration is Arnhem-Nijmegen meeting with the German Nordrhein-Westfalen region on the topic of energy transition and whether sharing electricity across borders is a

possibility, however this is not being seen as a stakeholder as this did not end up in a collaboration for the future. In table 3, all stakeholders from each region have been divided into sectors, this provides an extensive overview of involved stakeholders and their corresponding sectors within the formulation of RES 1.0 and the energy transition per region.

Sector	Achterhoek	Arnhem-Nijmegen	Cleantech	Foodvalley	Noord-Veluwe	Rivierenland
Agriculture	X	X	X	X	X	X
Housing	X	X	X	X	X	X
Energy	X	X	X	X	X	X
Subnational Authorities	X	X	X	X	X	X
Nature and Environment	X	X	X	X	X	X
Mobility	-	X	~	~	X	X
Residents	X	X	X	X	X	X
Economy	X	X	X	X	X	X
National Authorities	X	X	X	X	X	X
Care	~	~	~	~	X	-

Table 3: Represented sectors in RES 1.0 per region. X = present, ~ = mentioned, but no specific stakeholder; - = not present

What stands out in this overview is the ‘care’ sector, Noord-Veluwe is the only region that mentions GGZ Centraal, an association focussed on mental health care, in their list of stakeholders. Other regions, except for Rivierenland, do mention the importance of health of residents in general, mostly related to the sound made by windmills, but do not mention a health-related stakeholder being actively involved in the planning. However, this has been somewhat difficult to trace, because not all regions provide a full list of all involved stakeholders. For these regions, the stakeholders have been searched for through the RES 1.0 documents. Rivierenland only briefly mentions residents’ response to a questionnaire in which personal health has come forward as a small theme of worry, but does not go further into depth about this. Another sector that comes forward with differences between RES regions is ‘mobility’, Arnhem-Nijmegen, Noord-Veluwe and Rivierenland all mention a stakeholder related to mobility, such as ProRail. Cleantech mentions mobility as a theme for RES 2.0, and Foodvalley shortly mentions sustainable mobility as part of becoming energy neutral. Achterhoek is the only region that does not mention anything about mobility in their RES 1.0. Nevertheless, ProRail is considered a national stakeholder like Rijkswaterstaat so it probably is involved in the regions that do not mention it in their strategies themselves.

Concludingly, all RES regions show a commitment to a broad stakeholder involvement and mostly the same type of stakeholders are involved in the regions, such as housing associations, energy companies, the agriculture sector and residents. Two sectors came forward as reflecting a difference between the six RES regions in the province of Gelderland, namely mobility and care. The involvement of these sectors as stakeholders could depend on regional specific problems or possibilities. Next to this, apart from mostly the same sectors involved, the specific companies, businesses or organisations working in the regions on projects differ, it is mainly just the sector in which certain stakeholder work, which aligns between regions. Thus, the RES regions in Gelderland mostly involve the same stakeholder sectors in their RES.

#### *Explanatory analysis*

In table 3 is visible that the RES regions in Gelderland mostly involved the same sectors in the formulation of their RES 1.0. During the conducted interviews, the regions mentioned that they do not expect their stakeholders to be different than the ones involved in the other regions. This is thus mainly in line with what came up from the RES 1.0 analysis. Rivierenland mentioned their uniqueness to be in the broad representation of stakeholders at the local level, and not just on the regional level. According to them this adds to act on a complete overview (Interview 3). And Achterhoek brought up that their history with projects in the energy transition gave them a headstart in the organization and communication of their RES 1.0 (Interview 5).

Rivierenland emphasizes the broad stakeholder involvement on the regional level, while Noord-Veluwe brought up the importance of bringing all types of knowledge into consideration (Interview 2), this shared emphasis helps explain the similarities between the regions in the sectors they involved in their RES 1.0. Cleantech further underscores this by attempting to link the energy transition to other major transitions, such as the agriculture transition, resulting in a more inclusive stakeholder involvement than if the focus had solely been on replacing the non-renewable energy sources by renewable ones (Interview 3). Across the regions a broad stakeholder involvement is thus considered important across the RES regions, not only for ensuring a comprehensive understanding of the regional context but also for possibility of combining interconnected transitions. The mobility and care sector were involved in a few of the regions, this illustrates an effort to address cross-sectoral challenges and reflect an even broader interpretation of the energy transition.

### **4.3.2 Public participation**

#### *Descriptive analysis*

The regions all recognise the importance of public participation in the development of their RESs. Noord-Veluwe also mentions the added value of local participation as being unexpected in outcomes of energy projects. This shared value is presented in each region's RES 1.0 document, as stated in the following quotes;

*'As a Cleantech Region, we emphasise the importance of participation from the start of the planning process'* (RES Cleantech 1.0, 2021, own translation).

*'Everyone must have had the opportunity to participate at the right time. That is the starting point of the RES FruitDelta Rivierenland. The RES 1.0 is the result of a process in which both residents and stakeholders have been at the table from the start'* (RES Rivierenland 1.0, 2021, own translation).

*'Local participation and local ownership (aim for at least 50%) are of paramount importance'* (RES Noord-Veluwe 1.0, 2021, own translation).

While all regions emphasize the importance of public participation in the planning of the RES, a distinction has been found in successfully involving residents in the RES 1.0 documents. Residents in region Cleantech want to be involved better in the regional energy strategy plans while residents in Arnhem-Nijmegen do not seem to be motivated to involve in interaction with the organisation of the energy transition. Residents in Foodvalley advice the region to improve the communication on both regional and local level, moreover, they emphasise the importance of discussing hindrances and involving residents from an early point on in the process. Noord-Veluwe brings up their goal to not only involve residents that live directly around an energy project, but also the group of residents which may be interested in giving their opinion or ideas, but did not yet do this. Meanwhile, Rivierenland is already thinking about plans to keep the residents and interested parties involved in the future. Achterhoek also says to have a good base for the realisation phase of energy projects regarding the involvement of residents. Thus, the extent to which residents have been successfully involved, varies across RES regions in Gelderland, but each region mentions different aspects of public participation ready for improvement.

Within public participation, the youth gets special attention in each region. Foodvalley and Achterhoek even mentioned specific measures taken for facilitating youth participation. This included for example reserving seats in stakeholder meetings. However, the extent of youth engagement varied across regions and all regions except Arnhem-Nijmegen and Achterhoek brought up challenges in fostering participation action from this group. For instance, Noord-Veluwe reported limited involvement despite an open invitation. And Rivierenland struggled to fill the youth representatives position. Cleantech also mentions difficulties in engaging youth in sustainability discussions, noting that their views often go unheard unless approached in the right way.

Residents can get involved at either the regional or the local level. When examining their involvement in energy transition plans, a clear similarity emerges across regions. In all cases, municipalities are responsible for engaging local actors. Not surprising this is likely to be the case due to their proximity with their local residents.

*'Municipalities are closest to their residents and are therefore responsible for participation with residents'* (RES Arnhem-Nijmegen 1.0, 2021, own translation).

*'Municipalities remain responsible for involving local stakeholders and individual stakeholders in their environmental policy'* (RES Cleantech 1.0, 2021, own translation).

*'On a local level, residents were involved when municipalities developed policies for their ambitions in the field of sustainable energy'* (RES Foodvalley 1.0, 2021, own translation).

*'This was chosen on the one hand because local (resident) participation has already taken place in the municipalities for drawing up their policy frameworks for sustainable energy in relation to spatial planning'* (RES Achterhoek 1.0, 2021, own translation).

*'Each municipality has given its own interpretation to local participation. This has been facilitated regionally'* (RES Noord-Veluwe 1.0, 2021, own translation)

*'Initiating participation is therefore also slowly shifting from the region to municipalities and developers/initiators'* (RES Rivierenland 1.0, 2021, own translation).

A commonly used method for regional engagement was the organisation of ateliers [*ateliers*], which provided a platform for organizations, interest groups, professional stakeholders, businesses and residents for a collaborative development of the RES. All regions worked with this method of workshops, except for Achterhoek, who called them dialogue sessions. Despite these structured engagements of interested parties, some regions observed limitations. For example, Rivierenland reported concerns about lack of inclusiveness and looking ahead this region has indicated the need for more structural approaches to public participation in RES 2.0.

Local ownership is another form of involving residents or local businesses in the RES. In the Dutch National Climate Agreement, the agreement has been made that big scale renewable wind- and solar energy projects should strive to be locally owned for 50% (Rijksoverheid, 2019-a). All six selected RES regions acknowledge this target in their RES 1.0 documents. However, different levels of policy integration and commitment are reflected between the regions. The Noord-Veluwe region expresses the importance of local participation and ownership, stating that;

*'Local participation and local ownership (aim for at least 50%) are of importance'* (RES Noord-Veluwe 1.0, own translation).

Cleantech adopts an ambitious position, by suggesting the possibility for even higher targets at the local level. It also emphasizes the need to come up with specific measures and clear policy frameworks to guarantee this ambition;

*'By aiming for at least 50% local ownership, which can be set higher locally, we give local communities a say in the energy transition and keep the yields local. And for that reason it is important that the Cleantech Region also includes this ambition in the RES 1.0, including agreements on the embedding of this ambition in policy and implementation'* (RES Cleantech 1.0, 2021, own translation).

This highlights a proactive approach towards implementing specific measures and a structured plan. Similarly, Achterhoek region also mentions the importance of concrete steps. This RES notes that some municipalities have already taken their first steps to stimulate local financial participation and ownership;

*'In various municipal policy frameworks of municipalities in Achterhoek, provisions have already been included that stimulate the pursuit of local financial participation and ownership of energy production resources. It is also already common practice for project developers to allow a certain percentage of the proceeds from energy production to benefit the environment. The arrangement in the Climate Agreement goes considerably further than that. This great ambition means that opportunities must be actively sought to increase local ownership or financial participation in other ways. A systematic approach to achieve this is essential'* (RES Achterhoek 1.0, 2021, own translation).

Rivierenland emphasizes the role of the initiators of wind and solar energy projects to have clear set principles about the 50% local ownership and the process to achieve this target;

*'From the start of the development of solar and wind farms, developers must have clear principles regarding 50% local ownership and the method by which solar and wind farms will be realised through citizen participation'* (RES Rivierenland 1.0, 2021, own translation).

On the other hand, Arnhem-Nijmegen formulates the hurdle of still needing to work on the local ownership ambition in their policies. This suggests that within the region, some municipalities are more progressed than others;

*'More than a third of municipalities have already included this ambition in their policy. A number of municipalities are still working on this'* (RES Arnhem-Nijmegen 1.0, 2021, own translation).

Lastly, Foodvalley reveals a less proactive approach, recognizing that the 50% goal may not be feasible. It mentions the possible need for alternative measures. This could either reflect flexibility or a lower level of commitment than visible in the strategy of the Achterhoek region;

*'If it is not possible to achieve 50% local ownership, other solution will be sought'* (RES Foodvalley 1.0, 2021, own translation).

In conclusion, while all six regions in Gelderland underscore the importance of public participation in the energy transition, their level of implementation and success varied slightly. The same goes for the specific involvement of the youth. Workshops were widely used across regions to involve stakeholders, though not always reaching a broad and new audience. Moreover, several regions acknowledged that there is still progress to be made, particularly in reaching residents and youth, and keeping them interested. All six regions in the province of Gelderland commit to the 50% local ownership goal. Cleantech and Achterhoek stand out for their proactive approach with the ambition of concrete plans, while Foodvalley illustrates that the 50% local ownership goal can still be a challenge to achieve. These differences illustrate the diverse interpretations and operationalization by the RES

regions of the goals set at the national level. Overall, the RES 1.0 documents show an active approach towards involving the public in participation, moreover, the same constructs in organizing this participation are visible.

### *Explanatory analysis*

The success of public participation varied across the RES regions in Gelderland. This view was shared by the regional representatives interviewed, although, they did come up with different reasons for this varying success. Out of their RES 1.0, Arnhem-Nijmegen' residents showed limited motivation to participate in interactions with the organisation of the energy transition. According to the interview, this is attributed to the participators becoming tired of participating (Interview 1). Rivierenland was already thinking about the future of public participation in RES 1.0, keeping the residents involved. However, the interview revealed that involving the public has been challenging. They accounted this to the fact that many of the plans are still too abstract, too far away from reality, for people which makes them not yet interested in being involved (Interview 3). Achterhoek claimed to have a good base for the realisation phase of involving residents in energy projects, however, they also had varying results because of the abstract planning. However, there was emphasized that the community feeling in this region contributes to the municipalities wanting to tackle the energy transition together, which positively influences participation (Interview 5). In RES 1.0 of Cleantech is mentioned that the residents want to be involved better in the RES plan-making process. In the conducted interview, Cleantech goes into depth about that the strategies in which the public is being involved, information evenings, and that these have been proven ineffective. Moreover, there is being mentioned that residents of each municipality are different, which makes finding a way to get all types of residents involved difficult. They also noted that residents tend to have a lack of knowledge which results in not being able to truly contribute to discussions which makes it difficult to get a good representation of the opinions of residents (Interview 4). Noord-Veluwe stated in their RES 1.0 that it is their goal to not only involve residents that live directly around an energy project, but also the group of residents which may be interested in giving their opinion or ideas, but did not yet do this. The conducted interview revealed that the region is still not occupied by getting the public involved, because other matters are more pressing at the moment (Interview 2).

As was visible in the RES 1.0 documents, youth engagement also varied across the RES regions. Arnhem-Nijmegen brought up no challenges in their RES 1.0 in involving youth, and the interview confirmed this with JongRES still being involved and their opinion being considered important (Interview 1). Achterhoek did not bring up any challenges either, and their interview confirmed the involvement of JongRES, however, the representative also mentioned that they are not visible in this stage of the strategy (Interview 5). Rivierenland argued the youth to be difficult to reach (Interview 3) and Cleantech confirms the youth to be severely underrepresented (Interview 4).

Local ownership is a form of public participation. Cleantech seemed to stand out because of their proactive stance towards local ownership, however, in the interview emerged that reality is unruly and reaching the target of 50% is difficult (Interview 4). Achterhoek also took this positive stance, but hindered upon the limitation it brings on the earning potential for professional parties (Interview 5). Arnhem-Nijmegen emphasizes that the outcome of this target differs largely per project and municipality (Interview 1).

Concludingly, the variations found in public participation can be attributed to the energy projects still being too abstract for residents to feel keen to be involved, moreover, they are experiencing participation fatigue. The strategies used to involve residents are sometimes ineffective and the variety of residents per municipality makes this even more difficult. Nevertheless, there has been found that a strong community feeling can contribute to participation levels.

## 5. Discussion

The main goal of this thesis was to contribute to a better understanding of how policy decisions in the energy transition differ between RES regions, and why certain regions make specific policy choices when given the freedom of action within the NPRES, as reflected in their levels of ambition, the mix of renewable energy sources and their approaches to participation. To achieve this, six RES regions within the province of Gelderland have been compared by analysing their RES 1.0 and by conducting interviews. As reflected in chapter 4 ‘Empirical Analysis’, both similarities and differences have been found between the RES regions. These findings thus suggest that the regional freedom, which the RES regions receive from the NPRES, results in different ambition levels, distribution of renewable energy sources, and participatory approaches. The results of ambition and the renewable energy source mix are in line with the expectations, however, the sectors of stakeholders involved are mostly similar, which is against expectation.

The findings of this thesis are in line with Van Dijk et al. (2022), who state that the freedom in the approach of the RES logically leads to differences. Specifically, the case of Noord-Veluwe, with its spatial and policy limitations due to protected nature areas, supports Van Dijk et al.’s observation that municipalities situated in restricted areas face significant limitation in implementing renewable energy projects. This reflects how physical geography and legal protections can create structural differences in regional energy potentials, which results in the need to search for alternative options. The used definition of freedom of action, derived from Dahl (2007), is; the possibility for RES regions to develop an energy transition strategy that aligns with their specific context, ambitions and priorities. This freedom of action means that regional preferences, such as a lean towards solar energy production, can result in a deviation from the advised 1:1 distribution. This advised distribution is based on the timing of peak production of the respective energy source, thus meaning that when wind production is low, often the solar energy production tends to be higher, and the other way around. This causes the two energy sources to complement each other on the local level (Miglietta et al., 2017). An uneven distribution thus decreases predictability of the electrical grid (Weschenfelder et al., 2020). RES regions that do take notice of this advice thus benefit from an even distribution, but due to resistance against wind energy production some regions do not have an electricity power grid that is as predictable. The freedom of action the RES regions receive thus result in uneven approaches and strategies. The variation in success of public participation is in line with the findings of Lelieveldt & Schram (2023), who found that the involvement of civil society was sometimes limited in the drafting process of the strategy. Moreover, there is suggested that if participation is considered important, that formal process requirements are needed to achieve this goal. In quite a few regions public participation, including the youth, did not go as smoothly as anticipated in RES 1.0.

With the observed differences between the RES regions, they can be classified into local pioneers and laggards. The definition by Liefferink & Wurzel (2017, p. 952) of pioneers is that they are ‘ahead of the troops or the pack’. This suggests that pioneers are exploring new areas where others may not yet have been. In the context of the RES regions in Gelderland, Achterhoek and Arnhem-Nijmegen are best embodying this role of pioneership. Both regions set a relatively high target, 1,35 TWh and 1,62 TWh, which contributes to them being frontrunners compared to the other regions in this province. In the case of Achterhoek their pioneership is a result of their prior experience with energy transition projects and governance, which contributed to their set target and their readiness for the energy transition. Arnhem-Nijmegen showed a forward looking mindset with their statement of being proud of their target but considering it to not be sufficient yet. It is not considered as leadership, because none of the regions have the goal of leading other regions. According to Liefferink & Wurzel (2017, p. 960), a laggard ‘has neither internal nor external ambitions and therefore does not exhibit leadership’, moreover, they can be potential followers. The collected data reveals that strictly speaking none of the regions can be considered as laggards in the sense that they do set meaningful targets. However, the variety in target levels points to a distinction that is in line with the pioneer-laggard typology. The region that mostly seems to lag behind when comparing them to the pioneers, is Noord-Veluwe. They express a relatively low target and are facing difficulties in the realisation of their RES 1.0. Foodvalley could also be considered as a laggard based on their set target, however, there has not been conducted an interview with this region which makes it difficult to truly interpret this target.

Most regions expressed their satisfaction with the freedom of action they receive from the NPRES, this aligns well with the principles of type II governance structures, as discussed by Hooghe & Marks (2003), characterized by flexible and task-specific jurisdictions operating at multiple levels. This suggests that the decentralized structure of the RES regions is effective. However, Noord-Veluwe has expressed desire for clearer national guidance within this governance structure, this is a concern about responsibility which they would rather see shifted upwards. This reflects a contradiction with the type II governance structure. By examining the implementation of the decentralized energy transition governance in the Netherlands, this thesis contributes to the literature on how type II governance structures function in reality.

This thesis did come with its limitations. The most important limitation is the absence of an interview with RES region Foodvalley. As a result, although differences based on their RES 1.0 were identified, there is no in-depth understanding of the underlying decision-making processes. This creates a gap in the findings, particularly within the context of a complete analysis of the province of Gelderland. The absence of this interview has been the result of a miscommunication, however, there have been attempts to find another representative of this region to conduct the interview with but this has led to no results. Secondly, the interviews with representatives from RES region Achterhoek and Cleantech were conducted with individuals who both have only recently started working within their current RES

region. This led to minor difficulties in answering certain questions. However, with most questions, the representatives provided detailed and informative explanations. Thirdly, the interviews reflected not only perspectives from the time of the RES 1.0 in 2021 but also current reflections and experiences. While this may have introduced a slightly different insight into the decision-making, this also offered valuable and interesting insights into the realisation and adjustments of the original plans. The interviews were led back to the making process of the RES 1.0 again. Another limitation is that, due to time constraints, the researcher managed to interview only one representative per region. As a result, the perspective presented for each region in this thesis reflects the views of a single individual. Interviewing more representatives from each region would have contributed to a more objective view from each region. Fifthly, the analysis of the stakeholder variation from the RES 1.0 documents has been somewhat difficult because not all regions provided a list of involved stakeholders. This could potentially have led to overlooking stakeholders, however, the analysis has been done with preciseness. Lastly, all used quotes were translated from Dutch to English. This may have caused a degree of interpretative bias in the translation. Nevertheless, effort was made to ensure as objectively translations as possible.

## 6. Conclusion

With the help of the formulated sub-question, the main question has been answered in this chapter. The central question of this thesis was the following; *‘To what extent and why do Regional Energy Strategy regions in the province of Gelderland differ in how they utilize the freedom of action granted by the National Program Regional Energy Strategy, as reflected in their levels of ambition, renewable energy source mix, and participatory approaches?’*

The first sub-question that has been discussed, is the following; *‘Can differences be observed between the Regional Energy Strategies 1.0 within the province of Gelderland, in terms of their ambition level, renewable energy source mix, and the participatory approach?’* When comparing the RES regions in Gelderland based on their ambition level, the renewable energy source mix and the participatory approach in their RES 1.0 documents, differences were observed. Mostly ambition level and the mix of wind- and solar energy showed differences, while participatory approaches seemed to show mostly similarities with some small differences.

Secondly; *‘In what ways do the RES regions in the province of Gelderland differ in their levels of ambition, and what factors explain these differences?’*. The ambition levels, determined by the renewable energy production target set per region, differed between the six RES regions despite all regions operating within the same national framework. Among the RES regions within the province of Gelderland, Arnhem-Nijmegen and Achterhoek reflected the highest level of ambition, as a result of setting a higher target, while Cleantech and Rivierenland showed more moderate ambition. Foodvalley fell on the lower end, with Noord-Veluwe reflecting the lowest ambition level overall, due to setting the lowest renewable energy target. During interviews a more in-depth understanding of these differences was gained. Spatial limitations, inter-municipal dynamics and prior experience with energy transition plans and projects seem to have influenced the height of the set target.

As a third sub-question; *‘In what ways do the RES regions in the province of Gelderland differ in their renewable energy source mix distribution, and what factors explain these differences?’*. Regarding the renewable energy mix, Achterhoek and Rivierenland were the only regions who reflected a balanced mix. Rivierenland caught attention as it is the only RES region that performs a slight dominance in wind energy, all other regions lean heavily on solar energy. This preference for solar energy is mostly induced due to resistance against wind energy by residents and politics. The lean towards wind energy in Rivierenland is the result of treating it as a priority because of the difficulties it comes with.

Lastly; *‘In what ways do the RES regions in the province of Gelderland differ in their participatory approach, and what factors explain these differences?’* Participatory approaches were analysed according to the sectors involved in the RES making, and the public participation, including local ownership. From the RES 1.0 documents emerged that mainly the same sectors are involved in each region. However, the sectors care and mobility showed some differences. The perspectives of the

interviewees of the selected regions were in line with this finding of mostly involving the same sectors. In the RES 1.0 documents from the six regions the importance of public participation is emphasized, with extra attention for involving the youth. From these documents already emerged differences in the success of involving residents and the youth, and the interviews confirmed these findings. The reasons that came forward were residents getting tired of participation, or the feeling that these plans seem to still be far away from realisation which makes it not attention worthy. Moreover, a lack of knowledge for truly contributing to a discussion from the residents also emerged. Local ownership is another form of public participation, and all regions adopted 50% local ownership per project as a strive, adopted from the Dutch Climate Agreement. In reality, reaching this strive comes with its hindrances.

Thus to answer the main question of this thesis, the regions do differ in the way they utilize the freedom they receive from the NPRES. This translates into different ambition levels, different distributions as to which renewable energy source has the preference, and some small differences in participatory approaches, but the RES regions mostly take the same approach. The differences are mostly the consequence of spatial limitations, sometimes partly due to nature protection policy, inter-municipal dynamics, prior experience and resistance from residents and policy.

Limited research had been done on the differences between the RESs in practice. A clear understanding of the variations contributes to more efficient policy in the future of the energy transition. Regional energy transition governance in the Netherlands thus contains quite some freedom of action, which results in RES regions tailoring the energy transition to their own needs and context. This freedom has led to diverse approaches, with some regions pursuing more ambitious strategies than others, and diverse approaches to the renewable energy source mix chosen and participation. While this decentralized approach enables regional adaptability of which most regions are appreciative, it also exposes regions, in this case mainly Noord-Veluwe, to not see options for new energy projects caused by protection policies of areas. Guidance from a higher governance level could perhaps help because by providing clarification on balancing spatial protection with energy transition goals and offering support to navigate conflicts. Thus, for some regions it could be helpful to balance the freedom of action more with targeted guidance. Next to this have spatial limitations been an issue, including nature protection laws which make certain areas unusable for energy projects, in both ambition and the energy mix. An implication for policy could be to better integrate spatial constraints in the regional boundaries in the future, because some regions are bound to become laggards if they spatially do not have options for renewable energy projects. Another implication for future policy could be to better integrate the resistance against wind energy production into plan-making processes. The resistance has caused, in most regions, a deviation between the advised 1:1 distribution between solar and wind energy and reality. By taking this resistance into account, a more well-considered approach to wind energy production projects can be developed.

The found variation between the RES regions in the province of Gelderland in ambition, the distribution of solar- and wind energy, and the involvement of public participation offers valuable insights into the broad context of the energy transition. The decentralized approach that was used in the Netherlands for the energy transition reflects an international trend towards decentralization. Strategies can be tailored towards region-specific and more inclusive contexts, however, this used regional freedom's success depends on the region. Regions with limited capacity may lag behind which makes the achievement of the set goals complex and thus possibly results in not being able to take enough urgent climate action, which is of importance for SDG 13, the fight against climate change and its effects with urgency. The overall limited success of public participation in the making of the RES 1.0 reflects concerns about inclusiveness in the energy transition. Ensuring that all voices are heard is essential for ensuring SDG 7, which focusses on access to sustainable energy for all.

For future research it would be interesting to do a comparative case study with RES regions which are located in different provinces, to identify what role the province plays in the formulation of the RESs. This is of interest because it could single out the influence this actor has. It would also be interesting to do this research again when RES 2.0 has been written. This way there would be visible what changes have been made since RES 1.0 and what energy projects came to realisation and what still needs to be done. Future research could also assess the effectiveness of the NPRES and their regional approach to the energy transition. Mixed signals were given in the conducted interviews when asked about the opinion on regional freedom of action the regions receive.

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## 7. Appendices

### A. List of documents

Document	Date of publication	Type of document	Language	Date of last access	Weblink
RES 1.0 Achterhoek	07 / 2021	Strategic policy document	Dutch	05 / 2025	<a href="https://besluitvorming.doetinchem.nl/Vergaderingen/gemeenteraad/2021/30-september/19:30/Bijlage-Regionale-Energiestrategie-1-0-Achterhoek-1.pdf">https://besluitvorming.doetinchem.nl/Vergaderingen/gemeenteraad/2021/30-september/19:30/Bijlage-Regionale-Energiestrategie-1-0-Achterhoek-1.pdf</a>
RES 1.0 Arnhem-Nijmegen	06 / 2021	Strategic policy document	Dutch	05 / 2025	<a href="https://prvgelderland.maps.arcgis.com/apps/MapSeries/index.html?appid=e0b3c4dc3dac443db3a300e0094c5447">https://prvgelderland.maps.arcgis.com/apps/MapSeries/index.html?appid=e0b3c4dc3dac443db3a300e0094c5447</a>
RES 1.0 Cleantech	11 / 2021	Strategic policy document	Dutch	05 / 2025	<a href="https://regiostedendriehoek.nl/wp-content/uploads/2023/06/Definitieve-1.0.pdf">https://regiostedendriehoek.nl/wp-content/uploads/2023/06/Definitieve-1.0.pdf</a>
RES 1.0 Foodvalley	07 / 2021	Strategic policy document	Dutch	05 / 2025	<a href="https://www.regiofoodvalley.nl/fileadmin/energietransitie/April_RES_1.0/Formele_versie_rapport_RES_1.0_2021-print.pdf">https://www.regiofoodvalley.nl/fileadmin/energietransitie/April_RES_1.0/Formele_versie_rapport_RES_1.0_2021-print.pdf</a>
RES 1.0 Noord-Veluwe	07 / 2021	Strategic policy document	Dutch	05 / 2025	<a href="https://energiestrategieenv.nl/uploads/637546799608339084_RES-01%20Noord%20Veluwe%20-%20Bestuurlijk%20document.klein.pdf">https://energiestrategieenv.nl/uploads/637546799608339084_RES-01%20Noord%20Veluwe%20-%20Bestuurlijk%20document.klein.pdf</a>
RES 1.0 Rivierenland	07 / 2021	Strategic policy document	Dutch	05 / 2025	<a href="https://www.resrivierenland.nl/wp-content/uploads/RES-1.0-Rivierenland-6-april-2021.pdf">https://www.resrivierenland.nl/wp-content/uploads/RES-1.0-Rivierenland-6-april-2021.pdf</a>

## B. List of respondents

Number of Interview	Respondents	Date	Language	In-person or online
1	Arnhem-Nijmegen	27 / 05 / 2025	Dutch	Online
2	Noord-Veluwe	27 / 05 / 2025	Dutch	Online
3	Rivierenland	02 / 06 / 2025	Dutch	Online
4	Cleantech	02 / 06 / 2025	Dutch	Online
5	Achterhoek	05 / 06 / 2025	Dutch	Online

## C. Dutch interview guide

### *Introductie*

Allereerst wil ik u bedanken dat u mee wil doen aan dit interview.

Het doel van dit interview is om inzicht te krijgen in de wijze waarop beleidsbeslissingen op het gebied van de energietransitie verschillen tussen regio's en waarom bepaalde regio's bepaalde beleidskeuzes maken binnen het Nationaal Programma Regionale Energie Strategieën. Hierbij zullen we vooral ingaan op ambitie, de verdeling tussen zonne- en windenergie, en de participatie.

Het interview zal ongeveer 30 à 45 minuten duren. Met uw toestemming zou ik graag het interview opnemen, zodat ik dit later nauwkeurig kan transcriberen en analyseren. De data zal vertrouwelijk behandeld en geanonimiseerd worden en alleen mijn scriptiebegeleider en ik zullen toegang hebben tot deze gegevens. Als u wil, mag u op elk moment stoppen met het interview, en u bent vrij vragen te stellen.

Heeft u nog vragen?

### *Semigestructureerde Interview Guide*

#### *Vrijheid in beleidsbeslissingen*

- Hoe wordt de regionale vrijheid die vanuit het Nationale Programma Regionale Energie Strategieën wordt gegeven ervaren in uw regio?
- Werkt u samen met buurregio's? Merkt u verschillen in de aanpak tussen uw regio en de andere regio?

#### *Ambitie*

- Hoe is in uw regio het bod voor de opwek van hernieuwbare energie in RES 1.0 tot stand gekomen?
- Welke factoren waren het meest bepalend bij het vaststellen van deze doelstelling?
- Wanneer beschouwt u een energie bod als ambitieus?
- In hoeverre beschouwt u de huidige doelstelling als ambitieus voor uw regio? Waarom wel of niet?
- Speelden eerdere energieplannen of regionale initiatieven een rol in de totstandkoming van de doelstelling?
- Was er intern binnen de regio discussie of onenigheid over het ambitieniveau?

#### *Hernieuwbare energiebron mix*

- Hoe is in uw regio de mix tussen windenergie en zonne-energie tot stand gekomen?
- Wat waren de belangrijkste overwegingen en factoren bij de keuze voor meer wind of juist meer zon?
- Hoe kijkt u aan tegen de landelijke aanbeveling voor een 1:1-verhouding tussen wind- en zonne-energie?

## Participatie benadering

### *Type stakeholders*

- Waren er unieke samenwerkingen binnen uw regio? Wat waren hierbij de voordelen of uitdagingen?
  - o Hiermee wordt bedoeld, sectoren die uniek zijn om te betrekken in de energietransitie, of bijvoorbeeld type stakeholders.

### *Publieke participatie*

- Welke methoden werken volgens u om het publiek te betrekken bij de regionale energie strategieën? En welke niet? Waarom?
- Welke strategieën zijn er gebruikt om jongeren te betrekken? Welke uitdagingen kwam u tegen?

### *Lokaal eigenaarschap*

- Hoe is het doel van 50% lokaal eigenaarschap vanuit het Klimaatakkoord geïnterpreteerd en verwerkt in uw regio?
- Welke specifieke beleidsmaatregelen of aanpak werkt om lokaal eigenaarschap te stimuleren? Welke niet? Waarom?
- Welke uitdagingen ondervindt u bij het realiseren van lokaal eigenaarschap?

## D. English interview guide

### *Introduction*

First of all, I would like to thank you for participating in this interview.

The purpose of this interview is to gain insight into how policy decisions in the field of energy transition differ between RES regions and why certain regions make certain policy choices within the National Program Regional Energy Strategies. We will mainly discuss ambition, the distribution between solar and wind energy, and participation.

The interview will take approximately 30 to 45 minutes. With your permission, I would like to record the interview so that I can transcribe and analyze it accurately later. The data will be treated confidentially and anonymized and only my thesis supervisor and I will have access to this data. If you want, you can stop the interview at any time, and you are free to ask questions.

Do you have any questions?

### *Semi-structured interview guide*

#### Freedom of action

- How is the regional freedom given by the National Program Regional Energy Strategies experienced in your region?
- Do you work together with neighbouring regions? Do you notice differences in the approach between your region and the other region?

#### Ambition

- How was the target for the generation of renewable energy in RES 1.0 established in your region?
- Which factors were most decisive in determining this objective?
  - o Spatial limitations, local support, political preference, etc.
- When do you consider an energy target ambitious?
- To what extent do you consider the current target ambitious for your region? Why or why not?
- Did previous energy plans or regional initiatives play a role in the establishment of the target?
- Was there internal discussion or disagreement within the region about the level of ambition?

#### Renewable energy source mix

- How did the mix between wind and solar energy come about in your region?
- What were the most important considerations and factors in choosing more wind or more solar?
- What is your view on the national recommendation for a 1:1 ratio between wind and solar energy?

## Participatory approach

### *Type of stakeholders*

- Were there unique collaboration within your region? What were the advantages or challenges?
  - o This could mean sectors that are unique to involve in the energy transition, or for example types of stakeholder.

### *Public participation*

- Which methods do you think work to involve the public in regional energy strategies? And which don't? Why?
- Which strategies have been used to involve young people? What challenges did you encounter?

### *Local ownership*

- How has the goal of 50% local ownership from the Climate Agreement been interpreted and processed in your region?
- Which specific policy measures or approaches work to stimulate local ownership? Which don't? Why?
- What challenges do you experience in realizing local ownership?