

**Transition Towards Renewable Energy:
A Regional Challenge for Local Governments?**

A Comparative Study in Four Dutch Municipalities

by

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Introduction

1.1 The Impact of Climate Change

Over the Earth's history, the climate has been changing over time due to natural processes. In the last 100 years, however, following the Industrial Age, these changes have been more radical and occurred faster than in any other recorded history. Modern climate change is now dominated by human influences (Karl et al., 2003). Moreover, climate change is a threat to human societies and natural ecosystems and people have begun to feel its impact on their daily lives all over the world. Climate change is now a common concern of humankind.

Therefore, 197 countries signed the United Nations (UN) Paris Agreement on December 12, 2015. The agreement entails efforts to combat climate change and keep the global temperature rise well below 2 degrees Celsius (above pre-industrial level) (UNFCCC, 2019). The agreement itself was highly praised by the European Union, India, and the US. China called the Paris Agreement "fair and just, comprehensive and balanced, highly ambitious, enduring and effective" (Dimitrov, 2016).

But the Paris Agreement is only the beginning of the collective effort to fight climate change, reduce carbon dioxide emissions (CO₂) and keep the temperature rise in check (Roberts, 2016). In doing so, one of the focal points is electricity and power production. We have to produce large amounts of renewable energy to reduce CO₂-emissions, i.e. we need a power production that is sustainable and no longer causes a threat to our ecosystem and societies as it does now with fossil fueled power production.

However, one can set such a goal at the international or European Union (EU) level, it can only work in practice when it is implemented by and within member states (Bondarouk et al. 2020). Most of its possible impact will eventually be experienced at the regional and local level ¹. To increase renewable energy production, the Paris Agreement therefore stresses the importance of engaging all levels of governments (Hofbauer et al. 2022). Hence, a transition of fossil fueled energy systems implies a transition away from a system based on central power production towards tailor-made and local energy systems. Consequently, there is an increasing need to include local stakeholders and authorities in renewable energy planning. Municipalities in particular can be considered key actors in relation to the design and implementation of our future energy systems (Sperling et al., 2012; Yazdanie and Orehounig, 2021). Yet, they do so in many different ways (Bondarouk et al. 2020). Na-

¹ A regional level can be defined as an intermediate level of government between the lowest level (local / municipality) and the provincial or national government level, with at least 150.000 inhabitants per region on average.

tional governments will have to translate the global goals on climate change to national policies leading to regional and local implementation. Only more recently there is an interest towards a solid understanding of the practical and local implementation of environmental policies (Bondarouk & Mastenbroek, 2018).

In the Netherlands, however, local and regional governments have already been making a head start with policies and implementation processes on the topic of reducing emissions by producing renewable energy. Several municipalities have – as pilot regions, appointed by the national government - been cooperating in making a Regional Energy Strategy (RES) in 2017. The goal of these regional strategies is to stimulate cooperation in a region between governmental actors and other stakeholders, to learn of best practices and eventually speed up the local contribution to climate goals (VNG, n.d.). Eventually the Dutch National Climate Agreement, that translates the Paris Agreement into national goals, requires all Dutch local governments to participate in such a RES to contribute a minimum of 35TWh² to renewable power production on land (Klimaataakkoord, 2019). In this way, national governments encourage their decentralized administrations to contribute to the Paris Agreement (Hoppe and Miedema, 2020).

It is becoming a broader trend in Dutch national politics that major challenges, such as agricultural reforms, solving the housing crisis and reaching climate goals are being handed over to local or regional governmental actors. According to scientific literature on intermunicipal cooperation³, this encouragement of regional cooperation - whether it is in new partnerships between government, industry and society, or in more traditional regional governmental cooperation – seems to be a logical way of dealing with challenges such as reducing CO₂-emissions by renewable power production. Scholars such as Boogers (2013) state that when local governments succeed in addressing their challenges on a regional level, companies, organizations and especially inhabitants of the region will profit of that. Intermunicipal cooperation generally speeds up implementation of policies. Moreover, it is expected that regional partnerships produce even more innovative policies than those that purely come from the national and global level (Bauer & Steurer, 2014).

Yet, little research shows us results on the effectiveness of intermunicipal cooperation, especially on a new policy-domain such as the transition to renewable energy and achieving global climate goals. As mentioned before, Bondarouk et al. (2018) even conclude that municipalities implement EU-environmental policies in a ‘remarkably different way’. That notion brings forth the notion that municipal cooperation in this domain could also be ‘remarkably different’. As far as local governments

² Terawatt hour, a unit of energy that is being used to express the amount of renewable energy produced.

³ Intermunicipal cooperation occurs in many forms: from legally established cooperations to network-type of cooperations. It is a way of municipalities to deal with their challenges in a communal way.

are responsible for the implementation of (EU) policies, they codetermine the compliance and outcome of policy. Regional Energy Transition therefore, is a topic that is receiving increasing attention from policymakers across Europe (Hoppe & Miedema, 2020), but we actually barely know in practice if regional cooperation matters and if it makes the difference (Peters et al, 2023). This leaves us with a knowledge-gap on the effectiveness of regional cooperation, and thus, a gap if regional cooperation contributes significantly to reaching the climate goals that are set. Moreover, it can determine the fate of international agreements and EU legislation on the topic of renewable power production. Consequently, this research is on the edges of the domains of Public Administration and European Studies. This is an interesting combination because it goes beyond the assumption that when nation states sign certain treaties, implement international, European Union law or directives, this automatically means that the nation state abides these set of agreements. It is key to know how policy is domestically brought forward to know whether – in this research – European and global climate goals will be reached.

1:2 The Regional Energy Transition

We are living in a time in which climate change is showing its effects and costs. Societies and ecosystems around the globe are experiencing long periods of heat and drought, disappearing species and less biodiversity (Malhi et al, 2020). In the meantime, local and regional governments are the level of government that need to (spatially) approve projects to enable less CO₂-emissions by renewable energy production. The municipal work with energy supply is of great importance to fulfilling objectives to the fossil fuel free society and an increased security of renewable energy supply (Sperling et al, 2012; Yazdanie and Orehounig, 2021). The pace in which they are able and willing to admit such projects in their jurisdiction is going to determine whether we reach the goal of producing enough renewable energy, and thus, reduce our CO₂-emissions.

The influence of local context and national factors on the outcome of specific energy projects is well known, but the aspect of regional cooperation on the outcome of renewable energy planning has merely been subject of research (Day et al, 2009; Hoppe and Miedema, 2020). In this thesis, I will therefore try to test the assumption that regional cooperation, c.q. intermunicipal cooperation in a region, can speed up the pace of renewable energy production.

The research question of this thesis will therefore be: *To what extent is there an association between (the degree of) intermunicipal cooperation and the pace of production of renewable energy?* Hereby, we will focus on the period of 2018-2022 (last term of office that ended in march 2022) and in which the association between intermunicipal cooperation and the pace of production of renewable energy changed during that period of analysis. Traditional studies often tend to research a

phenomenon in a timeframe of 10 years. In this research we will deviate from this because it is key to know and test the effectiveness of local or regional governmental actors that are largely responsible for reaching climate goals. This policy choice could potentially influence the ability to reach carbon dioxide emission reduction targets set for the short- and long term (2030 and 2050) in a great extent.

This will at first hand be a comparative and in-depth study into the field of regional municipal cooperation on the topic of local renewable energy production in the Netherlands. In exploring our main research question, we will face the challenge of how to measure and compare 1) the (degree of) cooperation of a municipality in a region, and 2) the amount of renewable energy that is being produced in a certain municipality. These sub-questions are vital for answering our research:

- *How can we measure a) the degree of cooperation and b) the production of renewable energy of a municipality in a region?*
- *How can we compare a) the degree of cooperation and b) the production of renewable energy of a municipality in a region?;*

These questions will be addressed thoroughly in our research design (chapter 3) and eventually answered in the conclusion.

Next to this, it is interesting to see how this mechanism works in other European countries. Therefore, we will take a look into the regional energy transition in Denmark and Sweden. Given the perspective of European Studies in this thesis, the experiences in other (comparable) countries, are used as a starting point to analyse the Dutch case.

1:2 Scientific and Societal Relevance

With this research, I will try to contribute to the scientific debate on the effectiveness of municipal cooperation, particularly on the topic of climate goals and the transition towards renewable energy. This is valuable and important because of the weight that is put on the Regional Energy Strategies (RES) to achieve the Dutch climate goals. That means that the (in)capability of municipalities to cooperate together and execute the goals of such a strategy can, in the end, strongly affect renewable energy production in the Netherlands and thus the ability of government to fight climate change. And eventually, as Bondarouk (2018) states, it will codetermine the compliance to EU legislation and international agreements. Therefore, next to the contribution that is mentioned above in the effectiveness of municipal cooperation, this thesis also contributes to bridge the perspectives from European Studies and Public Administration.

In doing this research I hope to explore by what means regional municipal cooperation does or doesn't help in achieving the goals of the Dutch climate agreement. That climate goals are to an extent dependent on municipal cooperation is a new phenomenon. I hope to gain new insights that help us explore the mechanism of municipal cooperation and its effectiveness.

After this introduction, chapter 2 discusses the theoretical perspectives on energy policy and intermunicipal cooperation. Chapter 3 presents the methods to collect data for this research. The empirical analysis is presented in the fourth chapter. The final chapter presents the answer to the research question and proposes further directions for scientific investigation and policy.

Theoretical Framework

In creating a theoretical framework for our research, it is necessary to take a further look into the general literature that exists on the incentives, costs and benefits of intermunicipal and regional cooperation. Afterwards, focus can be put on literature that mentions intermunicipal cooperation in the context of renewable energy production on the municipal level. Next to this, we will also elaborate on a section on cases in Denmark and Sweden. These cases will be used as a starting point to build a framework and to analyse the Dutch case.

2.1 Energy Policy and Local Governments

The transition from fossil fuels towards renewable energy is a major challenge for governments, industry, and institutions. This transition is central to the core of global challenges from mitigating climate change to reducing local pollution (Hofbauer et al. 2022). The involvement of many actors – governmental and non-governmental makes the transition towards more renewable energy a unique governance challenge.

Global environmental issues have led to initiatives that enhance the capacity of cities and municipalities as more active players (Betsill & Bulkeley, 2007; Yazdanie and Oreounig, 2021). The increased importance of climategoals in the recent years, such as with the Paris Agreement, have only reinforced this notion of cities and municipalities as important players. The Paris Agreement also stresses the importance of engaging all levels of government (Hofbauer et al. 2022). As a consequence of global and national agreements, many cities and towns have been putting together visions and implementationplans about how to achieve 100% sustainable energy production, energy neutrality, zero carbon emissions or zero-impact of their com-

munity (Van der Schoor & Scholtens, 2015). Achieving this goal will require an effective cooperation of multiple levels of government where energy strategies and actions of actors are coordinated and mutually reinforcing across scales (Hofbauer et al., 2022). Regional and local governments will have to cooperate and translate the (global) policy agenda on climate change to local implementation on producing renewable energy.

2.1 Cooperating Local Governments

Intermunicipal cooperation is a widespread phenomenon throughout Europe. It has been in place since the 19th century (Boogers et al., 2016). Boogers (2013) writes that municipalities will be able to address their common problems in a communal way with the use of regional cooperation. Regional cooperation - whether it is in new partnerships between government, industry and society, or in more traditional regional governmental cooperation - generally speeds up policy learning and or implementation. Hulst and Van Montfort (2012) emphasize that cooperation of local governments creates an economy of scale and scope and that this is a way to meet the rising expectations of citizens. If local governments succeed in addressing their challenges on a regional level, companies, organizations and especially inhabitants of the region will profit of that because of potential strategic, tactical and operational advantages (Boogers et al., 2016). Moreover, Bauer and Streurer stress that through regional partnerships, including societal actors, even more innovative policies and outcomes will be produced (2014).

Municipalities themselves are convinced that intermunicipal cooperation is a positive phenomenon with positive effects. Research of Boogers et al. (2016) shows that 75 percent of the Dutch municipalities' representatives state that municipal cooperation is necessary to create effective policy and to attain local policy goals. This is backed by the scholarly work by Daniell and Kay (2017). They mention that individual local governments nowadays rarely have all the resources and structures that are required to adequately respond to policy challenges, such as the production of more renewable energy. Intermunicipal planning and cooperation makes it possible to incorporate mutual independencies and to increase the capacity for solving policy problems that escape the boundaries of a single municipality (Hulst and Montfort, 2012). This points to capacities and capabilities of single municipalities that is strongly increased with intermunicipal cooperation: a economies of scale and scope (idem.).

Some scholars even argue that mandatory centralization of government units – and

thus mandatory intermunicipal and regional cooperation - can better address environmental issues because spillover problems⁴ in one municipality can impose negative consequences (costs or benefits) on the other municipality (Downs, 1994, Katz, 2000 and Warner & Hefetz, 2002 in Feiock, 2007). In the field of producing renewable energy this can be observed in cases in which municipalities choose their spatial-locations for wind farms or solar fields near other municipalities without cooperation and coordination (Hoppe and Miedema, 2020). Hoppe and Miedema (2020) often see renewable energy projects that have cross-municipal implications with local communities being affected in a positive or negative way (business development or property values). Congestion issues are, for example, can arise on the power grid when renewable energy projects in a certain municipality are not coordinated with the neighboring municipalities, while both using the same limited capacity on that power grid. Large sized wind and solar parks therefore have implications that go beyond the jurisdiction of a single municipality. This raises the question if a single municipality can be effective without its neighbors, and thus, without municipal cooperation.

Effectiveness of regional cooperation is not only dependent on the administrative establishment of the cooperation, it is also affected by the number of municipalities that work together (Boogers, 2013). When there are more municipalities collaborating, it is harder to create strong policies. Moreover, Hoppe and Miedema (2020) argue that when regions lack systemic structures and governance arrangements the likelihood is low that transformative change can be expected. Opposite to this is the theory on economies of scale: scholars have studied intermunicipal cooperation as a governance solution with the potential to generate economies of scale and reduce financial costs (Hulst and Montfoort, 2012; Ferreira et al., 2022). But, as Boogers (2013) points out, the effectiveness of regional cooperating local governments is not only dependent on institutional factors. In other words, there is more that explains the effectiveness and gains of regional and intermunicipal cooperation. This possibly is a prelude to later research of Boogers et al. (2018) that mentions cooperative climates and trust (as a cultural variable) as prerequisites for effective cooperation⁵ in an intermunicipal context.

However, a consensus seems to exist regarding the difficulties of measuring and explaining the effectiveness when local governments cooperate on a certain topic. Even though intermunicipal cooperation is a widespread phenomenon (Hulst and Van Montfort, 2012), it has not yet been subject to systematic comparative research. Clear and objective ways to measure gains from intermunicipal cooperation

⁴ Spillover problems refer to the unintended impact of an event or decision by one actor on the perceptions and decision of other actors and their stakeholders (Shi et al, 2021).

⁵ Effective cooperation: reaching the strategic, operational and/or tactic advantages that can be expected from intermunicipal or regional cooperation.

has been a challenge for scholars. Moreover, there is no good overview of the variety in municipal cooperation in certain policy sectors (idem.). When research on effectiveness of municipal cooperation scholars deepens, it is mostly about economic policies, producing services and its performance, not about climate policies or renewable energy production. Recent literature on the topic of municipal cooperation in Regional Energy Transition exists, but is mainly focused on the possible lack of democratic values when cooperating on a regional scale (Boogers, 2019), on smart energy grids and polycentric local decision-making (Lammers and Arentsen, 2016) or it elaborates on the research question what regional cooperation exactly is in the policy domain of renewables, but it does not address the effectiveness of it. Attention to regional intermunicipal cooperation in the energy transition in academic literature is scarce (Hoppe and Miedema, 2020).

2.2 The cases of Denmark and Sweden

As we just concluded, the scholarly work on the effectiveness of intermunicipal cooperation in the domain of renewable energy production is scarce. When research deepens in the field of effective cooperation between municipalities, it is mostly about services and performance of cooperation. To broaden our theoretical perspective for formulating proper hypotheses and eventually answering our research question, we could take into account the research that has been done by scholars on local and regional cases in Denmark and Sweden on energy planning and implementation of renewable energy goals because in those two countries, local and regional implementation of renewable energy goals has already been going on for a long time.

Years before the Climate Agreement of Paris is signed by many nations around the globe, the Danish national government for example started the transition from a centralized, fossil energy system to a renewable energy system (Mendonça et al, 2009). As a consequence, Danish municipalities have been voluntarily drawing up renewable energy plans. Out of 93 Danish municipalities, 63 municipalities made their own local and strategical renewable energy planning policy documents (Sperling et al, 2012). The motivations for these municipalities were mutually different. On the one hand municipalities made plans to be fully carbon neutral, on the other hand municipalities made planning documents or visions that only focused on a single jurisdiction such as stimulating sustainable local businesses development and job creation. A common goal that defined what a necessary contribution of municipalities would be to the Danish climate goals was missing.

Sperling et al. (2012) concluded that making strategic agenda's on climate change and sustainability solely on the local level appeared not be sufficient to make real progress on the topic of renewable energy production. This notion is emphasized by the fact that Danish municipalities held a different view on their roles in relation to

producing renewable energy. Moreover, only 2 municipal energy strategies showed congruity with the national strategy of Denmark and the national renewable energy targets. I would conclude, therefore, that in Denmark the role of municipalities as strategic planning authorities at a local level has not been defined properly. Moreover, most municipal energy plans appeared to address the issue of a 100% renewable energy system insufficiently. Sperling et al. (2012) conclude that it is not likely that the other Danish municipalities that were not part of the 63 that were examined, had made concrete and integrated plans.

The Danish case study conclusions emphasize the question that I have for my research: to what extent are more or less solely operating municipalities capable of significantly increasing the pace of renewable energy production in that municipality? In the research of Sperling et al. (2012) an underlying conclusion can be deducted: when there is no regional or national framework were municipalities rely on (or were they must build upon with their climate- and energy plans), it will result in well-intentioned, but uncoordinated actions of policy. In short: actions of municipalities that work solely on the implementation of national-, EU- and Paris Agreement goals without regional or national framework, could very well lead to local action on renewable energy production that will be uncoordinated and not sufficient. Intermunicipal and regional cooperation in line with national goals, therefore, seems necessary to successfully fulfil the municipal tasks in renewable energy planning.

The question which governmental cooperation or governmental level fits best (municipal, regional or national) for boosting renewable energy production, however, is still debated up to today. In line with the results of the Danish case study of Sperling et al., Baker and Eckerberg (2007) conclude in their research of Swedish municipalities that a more centralized governmental involvement with clear guidelines and possibilities, in contrast to a solely local level focus in terms of making energy planning strategies for the long and semi-long term, is necessary for coordinated renewable energy action at the local level.

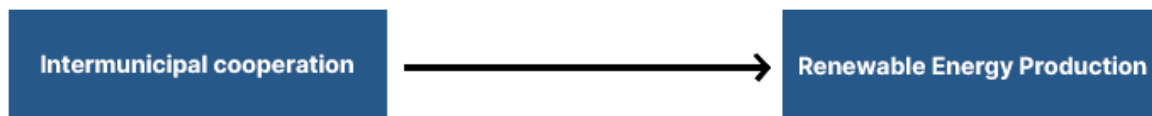
To summarize: the Danish and Swedish case studies on municipal energy planning teach us that a certain degree of centralization with a regional and national framework seems necessary to produce decent, concrete and coordinated renewable energy action at the local level.

2.3 Hypothesis

When combining the theoretical perspectives on intermunicipal cooperation from the available literature with the Danish and Swedish case study research, we can draw up two hypotheses for our research. The first one is based on scholarly work on the topic of intermunicipal cooperation in general. The second hypothesis is based on the research in Denmark and Sweden. The work of Hulst and Montfoort

(2012) and Ferreira et al. (2022) also support the second hypothesis: intermunicipal cooperation as a governance solution with the potential to generate economies of scale and reduce financial costs.

H1a: *If there is municipal cooperation, then production of renewable energy increases.*



H2b: *The higher the level of municipal cooperation, the higher the level of renewable energy production.*

Methodological Approach

The main research question presumes the existence of an association between intermunicipal cooperation on the one hand, and the pace of production of renewable energy on the other hand. Moreover: a presumption that there is an association between reaching the renewable energy goals that are set in the Dutch National-, EU- and Paris Climate Agreements and the way municipalities cooperate. A case study is a valid and useful method when the goal of the research is to conduct an in-depth study of a certain phenomenon (Vennix 2011; Gerring, 2007). In this chapter we will elaborate on the research design that is chosen for the research.

3.1 Case Study: Municipalities in Energy Transition

The research design that is used for this thesis is a comparative multiple case study. Case study research focuses on a small number of cases that are expected to provide an insight into a relationship across a larger population of cases (Gerring, 2007). The difference between a single case study and a multiple case study is that the researcher is studying multiple cases to understand the difference and the similarities between the cases (Baxter & Jack, 2008 in Gustafsson, 2017). Another reason to choose a multiple case study is that it enables us to analyze data both within each situation and across each situation (Yin, 2003). Moreover, it can be used to augur contrasting or similar results in the studies (idem.). The comparative approach allows us to examine our cases in sufficient depth to understand the mechanism of intermunicipal cooperation on the results on renewable energy production.

To get an answer on the main research question - *To what extent is there an association between (the degree of) intermunicipal cooperation and the pace of production of renewable energy?* - we select the *diverse-case method* for hypothesis testing. With this method, the full range of values characterizing X or Y should be represented in the case studies (Gerring, 2007). For this research, X is the extent of municipal cooperation. The variation on X is a low or a high score on municipal cooperation. The *diverse-case method* requires the selecting of a set of cases. We will select two cases of municipalities in which I assume there is a lot of intermunicipal cooperation (X = high) and two cases in which the opposite is assumed to be the case (X = low).

The data of the case study that will be conducted exists of multiple sets. Several datasets contain quantitative data (climate monitor), and de interviews and policy documents can give a qualitative overview:

- (1) In-depth interviews with local aldermen (or their policy-advisor) that are responsible for the topic of renewable energy in their municipalities;
- (2) Analysis of the climate monitor of the Dutch National Government;
- (3) Analysis of local (and regional) policy documents that are available on the topic renewable energy production.
- (4) Analysis of resolution of the local city councils on the topic of intermunicipal cooperation on energy policy ⁶.

Interviews

In order to (qualitatively) explain the results of cooperation on the topic of renewable energy production, it is key to elaborate on the incentives and results of municipal cooperation in a region. Therefore 4 interviews will be conducted with key-figures that are or were closely involved in the policy domain of sustainability in the municipality. Retrieving information about municipal cooperation and the way this affects (policy) results on renewable energy production is key.

The interview as a method to collect data for the case studies of this research is an appropriate method to obtain specific information such as the story behind a participant's experiences. The interviewer can pursue in-depth information around the topic and it can provide participants' experiences and viewpoints of a particular topic (Turner, 2010). We can get a grasp at views, incentives and ideas of the way intermunicipal cooperation works in practice and how well-organized it is on a specific policy field such as renewable energy. Every municipality cooperates on a set of topics with neighboring municipalities, but it cannot be observed properly from an outside perspective whether the cooperation on the topic of renewable energy is

⁶ A resolution is a proposal that entails a political statement and gives direction to the policy of a municipality.

there, only because a municipality is obliged to cooperate, or whether they intrinsically cooperate and the cooperation brings about renewable energy results. The interview design will be a standardized open-ended interview because this allows participants to express their viewpoints and experiences. Questions are predetermined and respondents are asked identical questions, but the interviewer is free to ask for clarification (Gall et al., 2003 in Turner, 2010).

In selecting the respondents to interview, we specifically ask local officials or their policy advisors on the topic of renewable energy production that were involved in the matter in the 2018-2022 term of office. A local official or his/her advisor, after all, are responsible for and have a broad overview on the topic of sustainability and renewable energy production. When it is necessary to go in-depth on a topic, local officials will mostly be supported by policy officers that can elaborate on a specific question. It will be persons that have knowledge of the content.

The data will be collected by listening and taking notes on the spot.

During the interview it is key to respect the privacy of the respondents in the interviews and in this research. Therefore, we will make sure that it is impossible to link certain transcripts, statement or quotes to a specific person. There will not be a relationship of authority with the interviewee. In respecting the privacy of the interviewee's procedures will be followed. The interviewee will be assured that their interview will be treated confidentially and that quoting will only happen on an anonymous basis. Interviewees will be informed that they can stop and retreat from the interview at any time they want.

Climate monitor

The Dutch department of Economic Affairs and Climate (Department of EZK) yearly produces a *Klimaatmonitor* (climate monitor) in which the efforts of the municipalities to increase their amount of renewable generated energy and the achievement of climate goals are reported and monitored. The *Klimaatmonitor* reports over multiple years and therefore reveals a broader trend in sustainability on the local level that can be observed. This is useful information to see whether the results from our more qualitative data on the way of municipal cooperation and the effectiveness of that holds true (on the short term). Long-term gains of municipal cooperation (e.g., policy learning) probably cannot be retrieved from the climate monitor. The climate monitor can be found on the website of the Dutch department of Economic Affairs and Climate.

Policy Documents

Policy documents will help to answer the research question because they contain policy goals as well as the effort that municipalities have to make in order to implement and eventually achieve these renewable energy goals. Policy documents are

the official documents in which the ambitions, goals and tasks will can be found, as well as the importance that is being given to intermunicipal cooperation. We select these documents because they contain ambitions, goals and tasks and, most important, they are officially approved by the local municipal council.

The policy documents that are approved by a municipal council can generally be found on the public administrative systems of city councils that are accessible via official government websites. Per case the local sustainability policy document, that narrow down further specifically on renewable energy production, will be coded. (see 'Appendix: Coding' for results).

Resolutions of the city council

Resolutions of the city council will tell us, next to the aldermen or policy advisors that are being interviewed, how the elected councilmembers look at intermunicipal cooperation on the policy domain of renewable energy. We take an in-depth look into the online accessible systems of the city councils in which these resolutions are being published. The period we will examine is 2018-2022 (last term of office that ended in march 2022).

Scoring the data (Score on Cooperation)

To make a more objective claim about the degree in which a municipality is cooperating with other municipalities in the domain of renewable energy production, a model is developed in which our data is scored. The method for data analysis is text analysis which uses coding to extract data for analysis.

The data will be scored upon the question: is the municipality in favor of intermunicipal cooperation in the policy domain of renewable energy production? It is necessary to code the data that is collected. Coding means attaining keywords to the data. (Vennix, 2011). The keywords that will be used in our research are derived from our theoretical framework. The codes, in short, are a link between the theoretical framework and the empirical data. The policy documents of municipalities on the topic of sustainability and renewable energy production will be checked for how many times the word 'regio', 'regionale' or 'regionaal' is mentioned. The scoring of these words gives us a good overview on how the local renewable goals are set in a wider framework of regional cooperation.

The retrieved data of our research (the interviews conducted, policy-document that are retrieved and - when available - city council resolutions) will be scored according to a Likert-scale. A Likert-scale is widely used in research. Most of the times, this scale refers to a form in which answers vary on a one to five-points scale (ibid., 2011).

The other data source for our research, the climate monitor, has quantitative data that cannot be scored without its context, and even when it could be scored, it does not tell us anything about the degree of intermunicipal cooperation.

In determining the score on cooperation, the information of a municipality will get a different weight. This is the case because in conducted interviews one can assume that a more pronounced or distinct opinion can be observed on intermunicipal cooperation. In city council resolution this is also the assumption, but mainly because of the public character of city council meetings, the pronounced or distinct opinions can be more or less diplomatically articulated. The weight of this source will therefore be slightly less: x2. Eventually, the policy documents will receive a score of x1. This is the case because distinct opinions on municipal cooperation in official policy document are not to be expected, or at least will not be so distinct as in an interview.

Table 1. Possible scores and weights in measuring willingness of municipal cooperation

Data	Possible score	Weight
Interview	1 - 5	x3
City council resolutions	1 - 5	x2
Policy documents	1 - 5	x1

To make the scores as objective as possible, the following guidelines will be followed per source. These guidelines are non-exhaustive, but give us an indication:

- 1) Policy documents: Is there a policy document that is approved by the municipality? How many times are the words 'regio', 'regionale' or 'regionaal' mentioned? The scoring of these words gives us a good overview of how the local renewable goals are set in a wider framework of regional cooperation. Next to these words, they will also be analyzed in their context to check whether it entails an ambition to cooperate to reach goals, or if it is merely a description of – for example - a geographical situation.
- 2) City council resolutions: is regional cooperation mentioned positively or negatively? It will give us an overview how the elected councilmembers look at intermunicipal cooperation on the policy domain of renewable energy.
- 3) Interview: score must refer directly to a textual quote in which an opinion on intermunicipal cooperation is given. The interview as a method to collect data for the case studies of this research is an appropriate method to obtain specific information such as the story behind a participant's experiences (Turner, 2010).

Eventually a score will be deducted for each municipality that gives us an indication on willingness to cooperate. The maximum score that points to willingness to cooperate with other municipalities is the score of 30. The minimum score is 6.

Limitations of the design and collection method

The research design of this thesis has its limitations. The number of four diverse cases in one election term for hypothesis testing is limited. Next to interviews, resolutions and climate policy documents, there can be geographically limited possibilities to produce renewable energy that cannot be observed by our data. In interpreting our data, there is also a limitation when e.g., counting words as regional or region. The ambition of the municipalities can also be observed in other words or other side-documents that are not included. Nevertheless, the 3 types of data that we are going to collect, combined with the Climate Monitor give a decent overview of the renewable energy ambitions and results of a municipality in a intermunicipal context.

3.2 Case Selection: Four Dutch Municipalities

The case-selection will consist of four different municipalities. The units of analysis in this research will be a set of municipalities that on the one hand work together in their region in the Regional Energy Strategy or in other forms of municipal cooperation on the topic of renewable energy production. On the other hand, the units of analysis are municipalities that to a great extent work solely in achieving climate- and renewable energy goals.

For a proper comparison, we strived at first to select these diverse cases on the variable intermunicipal cooperation. In selecting these municipalities, public news articles with statements of i.e., city councils on the topic of cooperation in the domain of renewable energy production will be a selection criteria. This is important at forehand, because it is necessary to have 4 diverse cases in our case study. At second, we selected the municipalities as much as possible on identical characteristics, such as on the number of inhabitants. In selecting the cases, there was an extend of dependency on the responsiveness of municipalities (in finding alderman and/or their policy advisors having time and willingness to contribute to this research).

The context in which these municipalities operate is that they can be chosen out of 12 Dutch provinces and belong to 1 of the 30 RES-regions that are there in the Netherlands.

Eventually we selected two municipalities in the province and RES-region of Friesland and two municipalities in the province of Overijssel and RES-region of Twente. In the diverse case selection of solely working municipalities, we will focus on the municipality of Rijssen-Holten (Twente) and the municipality of Sudwest-Fryslan (Friesland). In the diverse case selection of cooperating municipalities, we will focus on Heerenveen (Friesland) and Dinkelland (Twente). These cases are distinct when

compared to the all the cases in their provinces.

Table 2. Overview of interviews conducted.

Name of Organization	Date of Interview
Gemeente Rijssen-Holten	06-07-2021
Gemeente Heerenveen	08-07-2021
Gemeente Dinkelland	09-08-2022
Gemeente Súdwest-Fryslân	24-08-2022

3.3 Conceptualization and Operationalization

In developing the conceptualization, we draw upon our theoretical framework in chapter 2. The concepts that are mentioned there will be explained in this section.

Renewable energy

The field of climate change is broad: in the Paris agreement, EU-legislation or in the Dutch national climate agreement, a lot of climate goals are mentioned. Biodiversity, climate-adaptive public spaces, and so forth. In this research, there is a main focus on renewable energy production. Focusing on renewable energy means that we focus on (policies for) production of solar- or wind energy on the local level. These two sustainable energy sources are also the energy sources which are primarily focused on in the RES-approach.

Intermunicipal/regional cooperation

With regional and intermunicipal cooperation, municipalities can address their common challenges in a communal way. When municipalities do so, organizations, inhabitants and businesses generally profit from that (Boogers, 2013). Intermunicipal cooperation (X-variable in this research) occurs in many forms: from legally established cooperation (known as ‘Gemeenschappelijke Regeling’) to more or less informally established network types of cooperation (idem.).

Effectiveness of municipal cooperation

In this research, the variable ‘effectiveness of municipal cooperation’ on the policy domain of renewable energy goals is of great importance. This concept elaborates on the relation between cooperating on a municipal level and the achievements of a policy goal that in the end can be described as effective cooperation. Effective cooperation is the following: reaching the strategic, operational and/or tactic goals that can be expected from intermunicipal or regional cooperation.

Regional Energy Strategy (RES)

Following the Paris Climate Agreement, member states and the European Union made a deal to reduce the CO₂ levels in 2050 by 80 to 95 percent. The Dutch National Government made a Climate Agreement in which local governments are

obliged to make a Regional Energy Strategy (RES). A lot of municipalities, provinces and waterboards already had the ambition to get to 100% CO₂ reduction in 2050. A Energy strategy can therefore be a policy instrument to achieve this goal. Regional and national choices can be integrated in such a strategy (VNG, n.d.). In a RES, one can observe the ambitions of cooperating local governments expressed in TWh or GWh. These goals are quantified in each RES and set by the National Program RES. For the region of Twente, the goal is set at 1.5TWh. The goal for Friesland is 3TWh.

Region

A region can be defined as an intermediate level of government between the lowest level (municipality) and the provincial or national government level, with at least 150.000 inhabitants per region on average.

TWh and GWh

Terawatt hour (TWh) and Gigawatt hour (GWh) are units of energy that are mainly being used for expressing the amount of produced renewable energy and heat. The amount of 1 TWh is 1.000 GWh.

Megajoule

As with TWh and GWh, megajoule (MJ) is also a unit of energy. It is a rather small unit compared to TWh and GWh. In our research, it is used to express the amount of renewable energy per inhabitant of a municipality or region in a useable unit of energy.

Spillover problems

Spillover problems refer to the unintended impact of an event or decision by one actor on the perceptions and decision of other actors and their stakeholders (Shi et al, 2021).

Empirical Analysis

In this chapter the empirical analysis will be done. Before we discuss our four cases, this chapter will start with describing the research context in which the units of analysis (municipalities) operate.

4.1 The Regional Energy Strategy-approach

In making the first steps after the Paris Agreement of 2015, the Dutch national government drew up the Dutch Climate Agreement in 2019. This agreement puts a great emphasis on regional plans and strategies for producing renewable energy. There is a national program RES at the level of the national government, which supports thirty regions. Appointing these thirty so called 'energy-regions' to cope with the challenges on producing renewable energy, implies that the bulk of the tasks

are put at the local and regional level (Boogers, 2019). The appointed energy-regions are set with the task of creating a strategic agenda in boosting the production of renewable energy from now until 2030 to 35TWh (Climate Agreement, 2019).

Image 1. Map of the thirty Dutch energy-regions (Nationaal Programma RES, 2019)



The regions are either chosen geographically (in terms of a region based upon a larger municipality, or a certain part of a province) or historically, but they can also be chosen on a functional basis, e.g. a region in which municipalities already work together on safety issues, youth care or regional economic agenda's (Hoppe & Miedema, 2020).

In reaching the goal of producing 35TWh renewable energy, the regions will ideally have to cooperate with a great variety of actors, such as other governments, societal partners, grid operators, businesses and inhabitants. This multiple cooperation in a RES-region has advantages. It gives the cooperating partners flexibility and strength. But it can also create coordination-problems⁷ that nullify these advantages (Boogers, 2019).

⁷ The core of this problem, as identified by Boogers is that, in a regional cooperation such as the RES, in the end the legal responsibilities, accountabilities and powers are still on a local municipal scale. This can cause coordination problems.

According to the Dutch Climate Agreement of 2019, a RES-approach provides the local actors with a regional and national framework to coordinate the production of renewable energies and the investments in necessary energy-infrastructure. Despite the supportive character of the RES-approach, some municipalities are turning back to a more local focus since July 2022, as observed by the National Program RES in their monthly newsfeed (NP RES, n.d.). The municipalities they describe chose to fulfill the tasks of producing more renewable energy with merely a municipal focus. This move of a number of municipalities makes our research even more relevant.

In the Dutch Climate Agreement, the following timeline has been set for the RES-regions: the draft versions of the RES policy documents that had to be created by each energy region had to be ready in June 2020. In March of 2021, the final versions of the RES-documents needed to be adopted by the councils of the cooperating governmental bodies (municipalities, provinces and waterboards). Eventually, the documents will be updated every few years. The first updated version, called RES 2.0, has to be ready by 2023 (NP RES, n.d.).

4.2 RES Twente and Friesland

Two of our cases are part of the Regional Energy Strategy Twente, the municipalities Rijssen-Holten and Dinkelland. These cases are diverse cases in the sense that Rijssen-Holten and Dinkelland both have a quite opposite opinion on the degree of intermunicipal cooperation that is necessary to boost production of renewable energy.

The RES Region of Twente has 16 members. 14 of them are municipalities, added up with the waterboard Vechtstromen and the province of Overijssel. The RES Twente has no (formal) partnership with societal actors. Consultations of inhabitants is partly done by the municipalities themselves (RES Twente, 2022).

Two of the other cases that are selected are part of the Regional Energy Strategy Friesland, the municipalities Heerenveen and Sudwest-Fryslan. These two cases can also be typed as diverse cases: Heerenveen and Sudwest-Fryslan have different opinions on the value of intermunicipal cooperation in reaching renewable energy goals.

The RES Region of Friesland has 20 members. Out of these 20 members, 18 of them are municipalities, added up with the waterboard Wetterskip Fryslan and the province of Friesland. In this region they have formalized the partnership with societal actors, business and so forth in the Friesche Energie Alliantie (FEA) (Interview, 2021).

4.3 The Case of Rijssen-Holten

Rijssen-Holten is a municipality that started to exist when the cities of Rijssen and Holten merged in 2001. It has about 38.000 inhabitants and is partly situated in the west of the region of Twente and partly in the east of the region of Salland. Formally it is part of many - by national government obliged - intermunicipal cooperations in the region of Twente, such as on the policy field of safety and youth care (Overheid.nl, n.d.).

On the topic of sustainability and renewable energy, Rijssen-Holten is part of the RES Twente. It is one of the 16 members of the RES-region. The city-council of Rijssen-Holten adopted a policy document on the topic of sustainability called 'Duurzaamheidsvisie 2020-2023' in which they set themselves climate goals in line with the Paris Climate Agreement. The goal for 2050 is 100% renewable energy production. For the mid-term (2030) their goal is set on 41%. Next to this, the local policy document further entails a vision on energy reduction goals, citizen participation, sustainable transport and sustainable businesses. It is 41 times that Rijssen-Holten refers to words that refer to the region in their policy document of which 4 times renewable energy cooperation in Twente is mentioned.

Just as the other 15 municipal members of the RES-region of Twente, the municipality of Rijssen-Holten had to adopt a draft version of the RES policy document before the end of March 2020. On January 29th that year, when the draft version was on the political agenda during a meeting of the city council, the council issued a resolution that the municipality sees energy-policies purely as a local issue. A majority of the council did not want to admit to regional goals and schemes, or only for the part they are obliged to. They set themselves a high goal in terms of production of renewables (179GWh), but see this as a local affair. Eventually, when all the Dutch municipalities had to adopt the 1.0 version of the RES, the municipality of Rijssen-Holten decided not to adopt it. Instead, as their city council already stated when the draft version was there, they see renewable energy production as a local task. Therefore, the region of Twente was not able to hand over an unanimously supported regional energy strategy to the National Program RES.

In the interview with the content expert of Rijssen-Holten, one of his first opinions on the RES-region of Twente reflected this notion of the city council. He stated that the way the RES-region works – in his view - is too top-down. Although he admitted that the scale of working on renewable energies would favorably be the scale of a region, he added that "we [Rijssen-Holten] want to make our own choices in the field of renewable energies" and "in the instance that I do talk about regional cooperation in debates with the city council, I am a *'voice crying in the wilderness'*".

In assessing the economies of scale theory, and the argument of Daniell and Kay (2017) of the amount of resources that a municipality has to adequately respond to policy challenges such as the topic of the energy transition, the interviewee admitted that the number of civil servants that they have to work on this topic is low. They have a (by inhabitants) supported policy-document on sustainability, they want to make their own choices, but they are mostly reliant on external staffing bureaus to fulfill their needs in the policy domain of sustainability. The municipal of Rijssen-Holten itself has only 1,5 fulltime-equivalent employees on the topic of wind- and solar parks. It makes them, according to the interviewee, too dependent on other parties (Interview, 2021).

Whether this dependency really hinders achieving their results has to be seen. Despite their hesitations on regional cooperation, the municipal claims that they do have relatively high goals and that they did make progress the last few years with producing renewable energy. An example given by the alderman is the solar park next to the motorway A1 of 15 hectares. Another 28 hectares are currently observed as new development. The political leadership of the municipality is also researching whether revenues of these new developments can be used to fast forward other sustainability projects in the city. The city council is convinced – as stated in their local policy document – that they have to contribute to producing more renewable energy, but is also convinced that they can do it on a local scale.

In reviewing the results of renewable energy production in the national climate monitor of Rijssen-Holten, one can conclude that Rijssen-Holten as a municipality underperforms when compared to the RES-region of Twente (image 1.). In the region on average a 3.728 megajoule (MJ) per inhabitant renewable energy is produced in 2020. In the municipality of Rijssen-Holten this amount is significantly lower with 2.872 MJ per inhabitant.

Image 2. Amount renewables per inhabitant of Rijssen-Holten, compared to the RET region of Twente (Klimaatmonitor 2022).

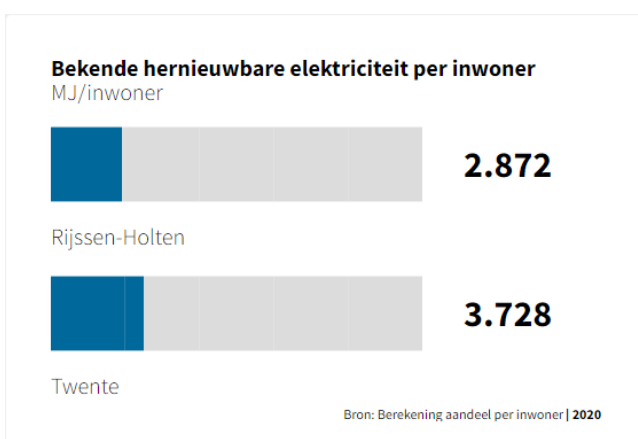
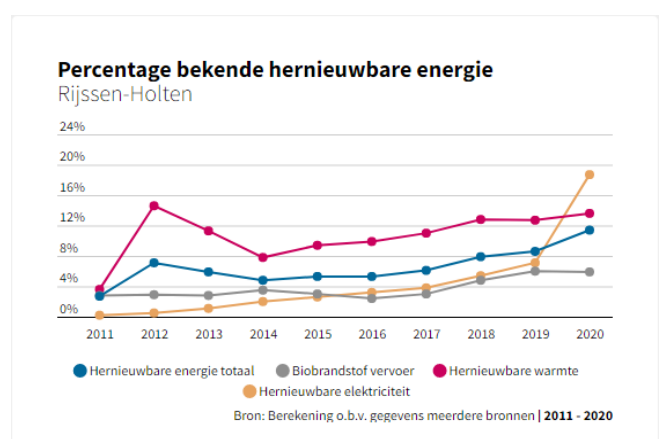
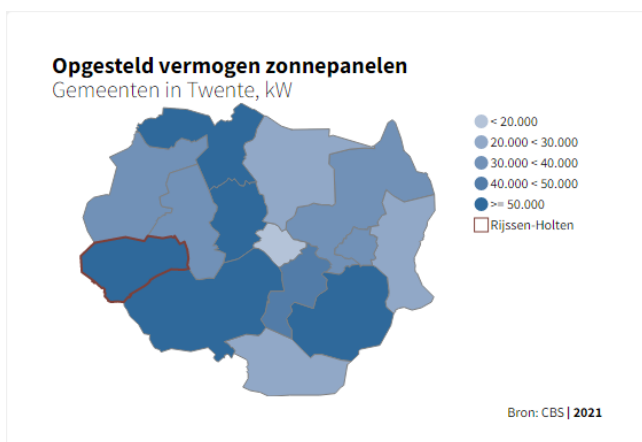


Image 3. Amount of renewable energy production in Rijssen-Holten in % of total energy use during the last 10 years (Klimaatmonitor, 2022).



In the interview with the context expert of the municipality it was stated that Rijssen-Holten – despite their view of taking up matters on their selves - nevertheless has admitted a number of solar parks next to motorways and that they still have larger solar projects that are being reviewed. In Image 3. one can observe that the amount of renewable energy has significantly grown over the past few years to nearly 20 percent of all power production.

Image 4. Renewable energy production via solar panels in the RET region of Twente in kilowatts (kW). Rijssen-Holten is highlighted. (Klimaatmonitor, 2022).



When compared to the regional production of renewable energy via solar parks, one can conclude that Rijssen-Holten contributes significantly to the regional production of solar energy with 4 other municipalities in Twente (image 4.). In the region of Twente, there currently is no renewable energy via wind parks.

In the conducted interview, it is clear that Rijssen-Holten is a municipality that rather works alone, even though the interviewee sometimes tries to appeal to the broader regional cooperation (Interview, 2021). In the policy document, regional cooperation has a place in all the paragraphs. But more specifically, in the chapter on renewable energy production, it is mentioned only 4 times in a non-ambitious context. The resolution from the city council on regional cooperation was clear: the council of Rijssen-Holten wants to see renewable energy production as a local affair. It leads to a score on cooperation of 7 on a maximum of 30.

Table 3. Score on Cooperation Rijssen-Holten

Data	Possible score	Score	Weight	Total score
Interview	1 - 5	2	x3	6
Policy documents	1 - 5	2	x1	2
City council resolution	1 - 5	1	x2	2
Total score on cooperation				10/30

4.4 The Case of Heerenveen

Heerenveen is a municipality in the province of Friesland. It has about 51.000 inhabitants and is situated in the southern part of Friesland. Formally it is part of many - by national government obliged - intermunicipal cooperations on the scale of de province of Friesland, such as on the policy field of safety and youth care (Overheid.nl, n.d.).

The municipality of Heerenveen is part of the RES Friesland. It is one of the 18 municipal members of the regional cooperation on the energy transition, next to the Waterboard and the Province. In Friesland, not only these actors are involved in the RET, also the Friesche Energie Alliantie (FEA) is more or less a member next to the governmental actors. It is a broad alliance of societal partners, such as businesses, farmers and youth boards. They have an important saying in the translation of goals in their region towards concrete renewable energy projects. This is also mentioned in the interview that is conducted (2021).

The city of Heerenveen has a sustainability policy called 'Samen Duurzaam in Heerenveen 2019-2022'. The words 'regio', 'regionale' and 'regionaal' are mentioned 44 times. The document, however, focusses on the policy domain in a broad manner. Not only renewables are addressed, biodiversity and climate-adaptive public spaces are also included. In their policy document, Heerenveen mentions funds for regional cooperation and incorporates the (inter)national goals that are set on 95 percent CO₂ reduction in 2050 and 49 percent in the year of 2030. In reducing CO₂ with 49 percent in the year of 2030, they want 40 percent renewable energy production. In the short term (2022) Heerenveen wants 75 hectares of solar parks in their municipality to boost renewable production. Results are already there, according to the municipality (Interview, 2021). Heerenveen-Zuid is an example of a solar park in which the revenues roll back to the local community (and to the municipality itself) to reinvest in new projects.

According to their content expert, the city of Heerenveen is an active player in the RES Friesland (idem.). This holds true, according to the municipality, for the production of renewable energy in their region as well for producing renewable heat for warming up residential area's and houses. Heerenveen thinks they need to fulfill this role because they are one of the bigger municipalities in the region of Friesland. They hired 10 employees to fulfil these tasks and they are convinced a regional (and national) framework is necessary for the municipalities to reach their goals. They see the RES as a starting point for a long-term cooperation in their region between them and other actors. They also broadly incorporated societal actors in their de-

signing of the RES and found new partnerships between governmental actors, industry and societal actors called the Friesche Energie Alliantia (FEA). Not only policy-making actors are included, also players with the knowledge of technology, nature and owners of large pieces of land are included. With this amount of actors, they make ‘few and sometimes little steps on the field of producing renewable energies’, but Heerenveen is convinced that ‘the broad alliance is necessary to pursuit the goals and it needs patience to grow’ (Interview, 2021).

“Local governments are responsible of setting goals and targets, but we are not a construction company [that builds energy projects].” (ibid., 2021).

In that sense, Heerenveen is convinced they need others to be able to realize sustainable goals and they are convinced that Friesland also has the bottom-up power from local communities to boost renewable energy production.

In reviewing the results in the national climate monitor of Heerenveen, one can conclude that - on average per inhabitant - Heerenveen is not a frontrunner in producing renewable energy in the RET-region of Friesland (image 5). Only 3.542 MJ per inhabitant is produced in the city of Heerenveen, compared to a 6.170 MJ per inhabitant in the whole of Friesland.

Since the year of 2017, however, we can see a growing amount of renewable energy production. In 2020 they reached nearly 16 percent of renewable production when compared to the total power production. This is, however, not a huge amount yet when compared to the ambitions the municipality has.

The first concrete results of the ambitions they formulated in their sustainable policies – boosting production with a total of 75ha solar parks – can clearly be seen in image 7. Together with 3 other municipalities in the region of Friesland they are the frontrunners on producing renewables with solar power. In terms of renewable energy production via wind parks in the RES region of Friesland, de city of Heerenveen is not one of the major producers (image 8).

Image 5. Amount renewables per inhabitant of Heerenveen, compared to the RET region of Friesland (Klimaatmonitor 2022).

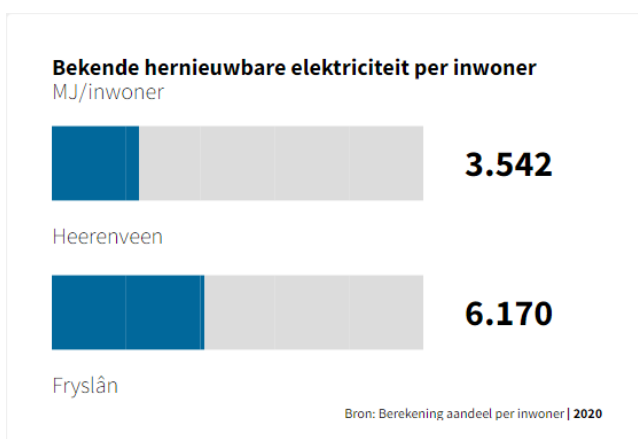


Image 6. Amount of renewable energy production in Heerenveen in % of total energy use during the last 10 years (Klimaatmonitor, 2022).

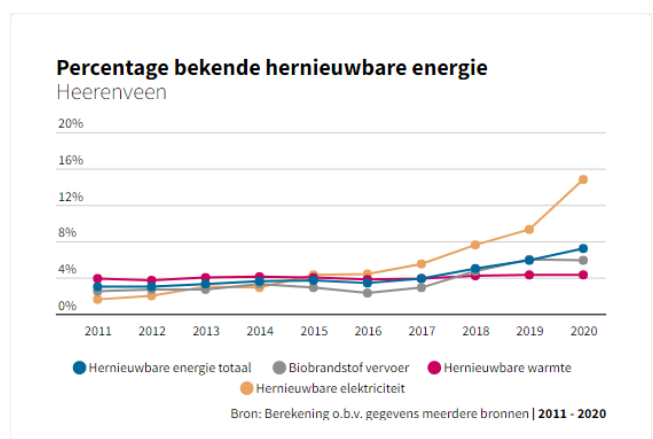


Image 7. Renewable energy production via solar panels in the RES region of Friesland in kilowatts (kW). Heerenveen is highlighted. (CBS in Klimaatmonitor, 2022).

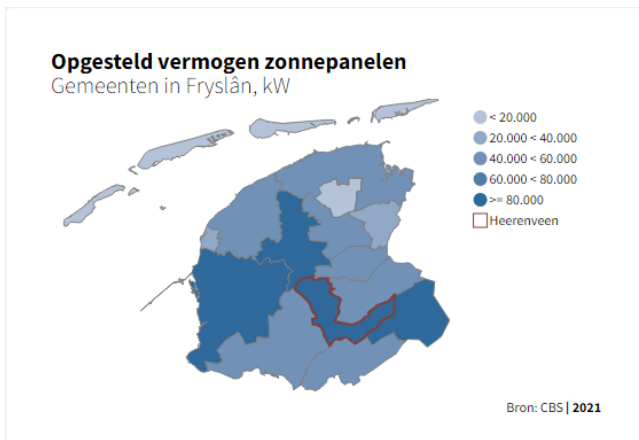
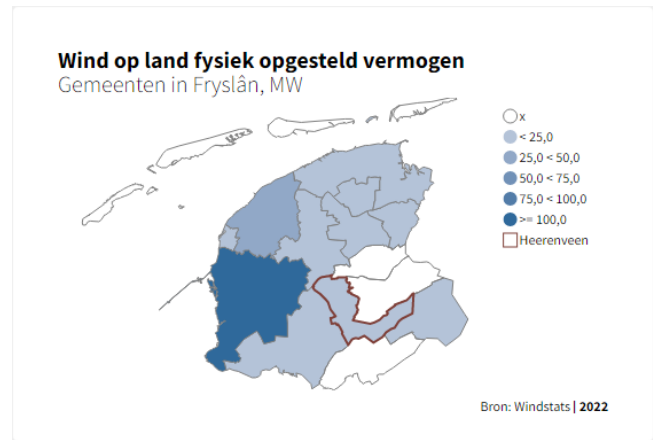


Image 8. Renewable energy production via wind parks in the RES region of Friesland in megawatts (mW). Heerenveen is highlighted. (Windstats in Klimaatmonitor, 2022).



In the conducted interview, it is clear that Heerenveen is a municipality that feels responsible for regional cooperation and invests in that. They think building a regional alliance – that is broader than just governmental actors – is important.

In the policy document, regional cooperation has a place in all the paragraphs. In the chapter on renewable energy production, it is mentioned 28 times. The city council did not adopt any resolution that directly affects regional cooperation in the field of the energy transition. In the interview (2021) however, a notion of how the city council thinks is given: “The city council did not pronounce a clear opinion on regional cooperation. ... The members of the city council have different opinions on this topic.” We will therefore take this notion into account when filling in the Score on Cooperation.

Table 4. Score on Cooperation Heerenveen.

Data	Possible score	Score	Weight	Total score
Interview	1 - 5	5	x3	15
Policy documents	1 - 5	5	x1	5
City council resolution	1 - 5	2	x2	4
Total score on cooperation				24/30

4.5 The Case of Dinkelland

Dinkelland is a municipality in the province of Overijssel. It has about 26.600 inhabitants and is situated in eastern part of the province. Formally it is part of many - by national government obliged - intermunicipal cooperations on the scale of de province of Overijssel, such as on the policy field of safety and youth care (Overheid.nl, n.d.). Dinkelland consists out of 11 villages and is a municipality that merged from several smaller municipalities at the start of the 21th century.

Next to Dinkelland being a member of the RES Twente with other governmental actors, the municipality is also part of Energie van Noordoost-Twente. This is a cooperation between the 4 municipalities in a subregion of the RES Twente. Energie van Noordoost-Twente exists since 2018 and carries out the task of making policies and promoting renewable energy and heat production in the four municipalities (Interview, 2022). In doing so, the municipalities coordinated and bundled resources (staff and other means) in one office in the region. The organization Energie van Noordoost-Twente works together with societal actors such as volunteers that visit households as energy coaches and inhabitants' energy cooperatives that want to produce their own renewable energy.

The municipality Dinkelland has set sustainable targets in the medium and long term: in 2030 they want to have 50 percent renewable energy production and in 2050 the municipality wants to be energy-neutral (i.e. no use of fossil fuels). Their policy document is called 'Ambitie Duurzaam Dinkelland' and mentions the regional perspective 6 times. However, Dinkelland does not participate as a single municipality in the RES Twente, but does this together with 3 neighboring municipalities as if it was one municipality with one set of goals. The other 3 municipalities, therefore, have the same sustainable goals. The policy documents on solar-energy, wind energy (draft) and sustainable heating of houses are the same in the four municipalities (Interview, 2022). In the RES Twente, the municipality actively works together with other stakeholders because they see advantages of cooperating in this policy field. It is mentioned in the interview (2022), that the RES-cooperation offers a regional and national framework to coordinate actions, get expert opinions on topics and offers cooperation with organizations such as grid operators. It is also mentioned that this latter is, in specific, an important cooperation: "you can run renewable energy projects, but the regional coordination and consultation with the grid operator is of utmost importance to connect your projects and produce renewable energy."

Dinkelland, just as the 3 other municipalities, is reliant on the cooperation in Energie van Noordoost-Twente. With this cooperation, they have been able to fulfil more goals than when they would have done it without cooperation (Interview, 2022). This is the fact because of the scarce availability of resources, such as civil servants in the policy field of sustainability. This clearly links to the economies of scale and Daniel and Kay (2007) that mention the scarce resources for municipalities as an incentive to cooperate.

With pooling of resources, Energie van Noordoost-Twente has been able to run more projects. Examples of these projects are that they recently founded a regional energy company with societal partners (that focuses on developing renewable energy projects by inhabitants), they developed 23ha solar parks and reached out to households for energy saving.

In the interview (2022) it is mentioned that – next to this - a lot of projects are in the development stage in the 4 municipalities. 63ha of solar parks are mentioned, just as two wind turbine-projects, combined with a strong focus on using roofs of companies and houses for solar energy production.

In reviewing the results in the national climate monitor of Dinkelland, one can conclude that - on average per inhabitant - Dinkelland is not the best performing municipality in producing MJ's of renewable energy in the RES-region of Twente (image 9). In their cooperation, they did not mention in what municipality the projects will be located. Whether it is their own or a neighboring municipality that is part of their cooperation Energie van Noordoost-Twente.

In image 10, we can see that in 2020 there was, nevertheless, a spike in renewable energy production that almost reached out to 20 percent of all production. Since the year of 2017, we can see a trend with a growing amount of renewable energy production. Boosting production with solar panels on roofs and solar parks can probably be seen. In image 11, one can see that Dinkelland is not a frontrunner nor lagging behind in solar power production. They score on average when compared to the other municipalities in the RES Twente.

Image 9. Amount renewable energy per inhabitant of Dinkelland, compared to the RES region of Twente (Klimaatmonitor 2022).

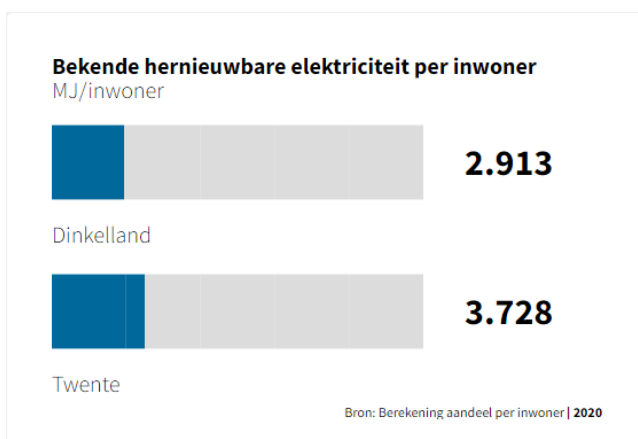


Image 10. Amount of renewable energy production in Dinkelland in % of total energy use during the last 10 years (Klimaatmonitor, 2022).

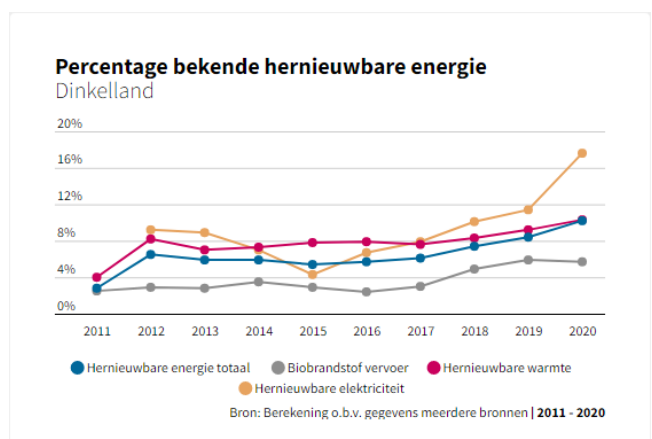
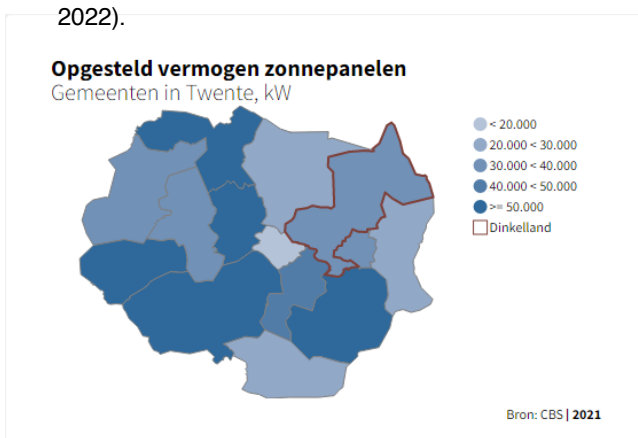


Image 11. Renewable energy production via solar-panels in the RET region of Twente in kilowatts (kW). Dinkelland is highlighted. (CBS in Klimaatmonitor, 2022).



In the conducted interview, it is clear that Dinkelland is a municipality is using regional cooperation as a way to achieve more results. This holds true for the cooperation with their 3 neighboring municipalities (Energie van Noordoost-Twente), as with the RES Twente. Pooling and coordinating resources with other actors, whether it is municipal, grid operators or society is important for them to reach their goals.

Even though their policy document on renewables is relatively short, regional cooperation is mentioned 5 times. The city council did not adopt any resolution that directly affects regional cooperation in the field of the energy transition, but in the interview (2022) a sense of how the municipal council of Dinkelland thinks about the topic can be derived. The interviewee mentioned that: “the municipal council is in itself more inclined to think in terms of local affairs than of regional affairs, but, when we brought the council of Dinkelland together with 3 other councils of our cooperating partners, they [the councilmembers] clearly expressed support for regional cooperation.”.

Table 5. Score on Cooperation Dinkelland.

Data	Possible score	Score	Weight	Total score
Interview	1 - 5	5	x3	15
Policy documents	1 - 5	5	x1	5
City council resolution	1 - 5	4	x2	8
Total score on cooperation				28/30

4.6 The Case of Súdwest-Fryslân

The municipality of Súdwest-Fryslân is a municipality in the western part of the province of Friesland. The municipality has about 89.710 inhabitants and they live in one of the 89 villages that together form Súdwest-Fryslân. De municipality is a result of multiple rearrangements of local governments in the region. Formally it is part of many - by national government obliged - intermunicipal cooperations on the scale of de province of Friesland, such as on the policy field of safety and youth care (Overheid.nl, n.d.).

Súdwest-Fryslân is a member of the RES Fryslan with other governmental actors, the waterboard and the province. The municipality agreed to the RES of Fryslan under the conditions that a) every [other] municipality must do their own share on their own municipal territory before Súdwest-Fryslân wants to think of generating electricity for another municipalities. This is the case because they already generate a lot of renewable energy from wind parks themselves. Next to this, b) the municipal council has stated in a resolution (proposal) on June 6th of 2019 that the municipality of Súdwest-Fryslân will no longer cooperate to admitting permits for wind parks or for solar parks that is fit for agriculture or for wind parks. In our interview this is

backed up by the interviewee: “We already did our share. Let others take it now” (2022).

Next to the regional cooperation including societal actors and businesses in the Friesche Energie Alliantie (FEA), the municipality of Súdwest-Fryslân has held an own inhabitants-panel with 16 randomly selected inhabitants of their municipality. The goal of this panel was to get an advice what the important building blocks were for civil society in reaching the energy transition goals. The municipal council fully adopted the advice of the 16 inhabitants in their ‘Klimaatagenda SWF’ in which they mention the regional context 19 times, mainly in RES-procedures that should be followed. In their policy document on sustainability, they mention that they are strongly in favor of local ownership and want to actively stimulate that a minimum of 50% of the ownership of renewable projects (i.e., not only financial revenues) will benefit the local society and businesses. In reaching this, they are doing research to see whether an own municipal energy-company can reach these targets for them.

The municipality Súdwest-Fryslân has set sustainable targets in the medium and long term: in 2030 they want to have 70 percent renewable energy production and in 2050 the municipality wants to be energy-neutral (i.e., no use of fossil fuels). The power they will need at that time use must be generated in their own municipality: they strive for self-sufficiency.

Image 12. Amount renewable energy per inhabitant of Sudwest-Fryslan, compared to the RES region of Friesland (Klimaatmonitor 2022).

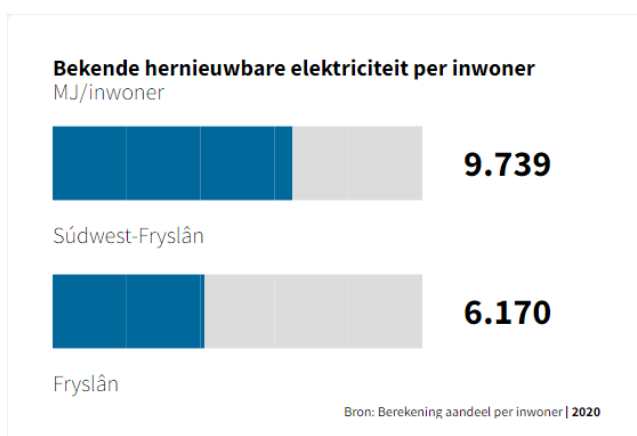


Image 13. Amount of renewable energy production in Sudwest-Fryslan in % of total energy use during the last 10 years (Klimaatmonitor, 2022).

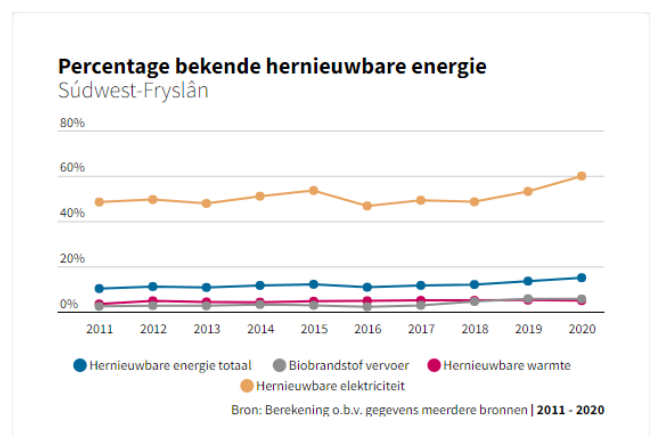


Image 14. Renewable energy production via solar-panels in the RES region of Fryslan in kilowatts (kW). Sudwest-Fryslan is highlighted. (CBS in Klimaatmonitor, 2022).

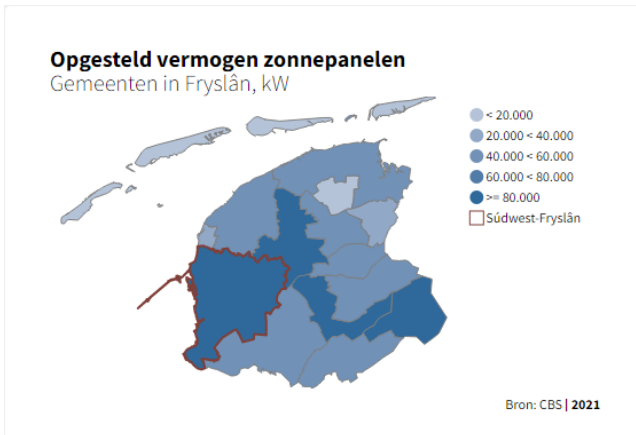
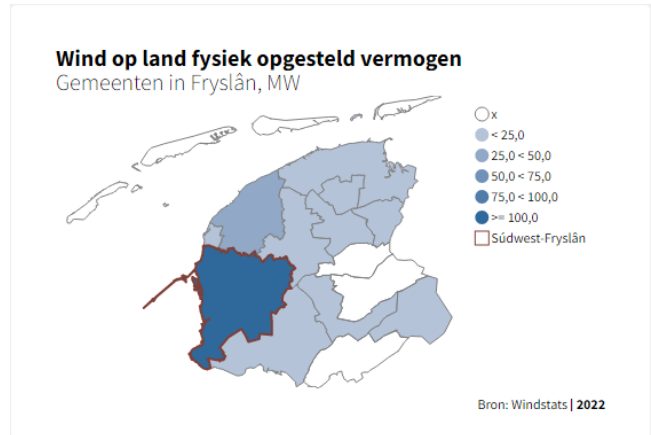


Image 15. Renewable energy production via wind-parks in the RES region of Fryslan in megawatts (mW). Sudwest-Fryslan is highlighted. (Windstats in Klimaatmonitor, 2022).



In reviewing the results in the national climate monitor of Súdwest-Fryslân, one can conclude that - on average per inhabitant – the municipal is performing quite well in producing MJs of renewable energy in the RES-region of Friesland (image 12). Súdwest-Fryslân is a municipality that had wind parks producing renewable energy since many years before climate agreements were signed. In 2020 they boosted wind production again with the opening of a national wind project on the Ijsselmeer with 89 wind turbines, although this does not account for municipal renewable energy production in the images above.⁸ The municipal council did not agree with the project, but the national government overruled the municipality (Interview, 2022).

Since the year of 2018, we can see a trend with a growing amount of renewable energy production that almost reached out to an additional 10 percent in renewable energy production (from 50 percent to 60 percent). Boosting production with solar panels on roofs and solar parks can probably be seen, and this is also backed up by the interview: “the last few years we have seen inhabitants and businesses that built a few small but also large solar parks in our municipality.” In image 14 and 15, one can see that Súdwest-Fryslân is quite a frontrunner in renewable power production. They score above average when compared to the other municipalities in the RES Friesland.

In the conducted interview, it is quite clear that Súdwest-Fryslân is a municipality that thinks they do not need regional cooperation as a mean to achieve renewable energy results. Regional cooperation is, according to the municipality, ‘too complex and the municipalities in their region are too diverse’ to cooperate on renewable energy production (Interview, 2022). They deliberately choose for civil-society initiatives to boost renewable power production instead: the bottom-up approach (idem.). And, according to the interviewee, they are successful in their approach.

⁸ In the renewable energy goals for (cooperating) municipalities wind on sea does not account for their goals. The goals attain to solarpowerproduction and windpowerproduction on land.

Súdwest-Fryslân does have concerns about the capacity and strength of their organization in terms of enough civil servants. They have a lot of job vacancies on the policy domain of sustainability and see this as a major problem, but they do not turn to regional cooperation as a mean to solve this issue.

Even though the word ‘regio’ can be found 21 times in their policy document Klimaatagenda SWF on renewables, it is often mentioned in a contextual sense: as a description of what the European Union does for regions, what a RES is, what the region of Friesland does on sustainable heat issues. Next to this and as mentioned above, the city council of Súdwest-Fryslân adopted a resolution that directly affects regional cooperation in the field of the energy transition: no large sustainable projects on land because it is the turn of other stakeholders in the region of Friesland now. It gives us a sense of how the municipal council thinks about the topic of regional cooperation. The municipal council is in itself more inclined to think in terms of local affairs than of regional affairs.

Table 6. Score on Cooperation Súdwest-Fryslân.

Data	Possible score	Score	Weight	Total score
Interview	1 - 5	1	x3	3
Policy documents	1 - 5	2	x1	2
City council resolution	1 - 5	1	x2	2
Total score on cooperation				7/30

Conclusion

We are living in a time in which climate change is showing its effects and costs to the world. Societies and ecosystems around the globe are experiencing long periods of heat and drought, we see disappearing species and experience a loss of biodiversity (Malhi et al, 2020). To increase renewable energy production, and to lower CO2-emissions, the Paris Agreement stresses the importance of engaging all levels of governments. The municipal work with energy supply is of great importance to fulfilling objectives to the fossil fuel free society and an increased security of renewable energy supply (Sperling et al, 2012; Yazdanie and Orehounig, 2021).

In 2019, the Netherlands has followed this pledge by appointing 30 energy regions in which municipalities have to cooperate to make and execute a Regional Energy Strategy (RES) to produce 35TWh of renewable energy on land. These RES-regions include local government actors, provinces and waterboards. Some RES-regions also have included societal actors or businesses in their energy planning.

Many scholars wrote about the advantages of intermunicipal and regional cooperation. It creates an economy of scale and scope that can bring strategic and tactical advantages. When societal actors are included in such a cooperation, even more innovative policies and outcomes can be expected. Yet, little research shows us the effectiveness of these types of intermunicipal cooperation, especially on a new policy domain such as the transition to renewable energy (Day et al, 2009; Hoppe and Miedema, 2020).

Because of the importance that is being attached to local and regional governmental actors in producing renewable energy, my research is focused on the following question: *to what extent is there an association between (the degree of) intermunicipal cooperation and the pace of production of renewable energy?* In my research, I focused on the last term of office that started in March 2018 and ended in March 2022. I assume that *if* there is municipal cooperation, then production of renewable energy increases (H1a) and the *higher the level* of municipal cooperation, the higher the level of production of renewable energy (H2b).

The following two sub questions are vital: *1) how can we compare a) the degree of cooperation and b) the production of renewable energy of a municipality in a region?; and 2) how can we measure a) the degree of cooperation and b) the production of renewable energy of a municipality in a region?* In my research I found answers on these sub questions in a SoC-model (Score on Cooperation). Municipalities were able to score a maximum of 30 cooperation points. These points were assigned to a municipality with analyzing policy documents on production of renewable energy, analyzing city council resolutions and with an interview with policymakers.

In examining four Dutch municipalities in the RES regions of Friesland and Twente, we eventually discovered that distinct results of intermunicipal cooperation on the production of renewable energy are not (yet) there. The percentage of the total power production that was to be marked as renewable did not significantly differ in the four municipalities that did not cooperate when compared with the municipalities that were (strongly) in favor of cooperating with other municipalities. Moreover, although all four municipalities experienced a growth of renewable energy between 7 and 13,5 percent the last 4 years, the municipalities that rather worked on the topic without regional cooperation, had a bigger growth of renewable energy production.

Table 7. Cooperation vs. renewable electricity production 2018-2022

Municipality	Score on Cooperation	% Renewable electricity 2018 - 2022	Growth %
Sudwest-Fryslan	7	48 - 60	+ 12
Rijssen-Holten	10	5,5 - 19	+ 13,5
Heerenveen	24	8 - 15	+ 7
Dinkelland	28	10 - 17,5	+ 7,5

In exploring this mechanism of intermunicipal cooperation on renewable energy production, we did examine a lot more ‘pipeline-projects’ (i.e., solar- and wind park plans) in the municipalities that were cooperating actively than in the other two municipalities (Interviews, 2021-2022). This reinforces the idea that results of intermunicipal cooperation on the policy field of renewable energy could very well require a longer time-horizon than one election term that has passed since the appointed RES-regions started. Strategic and scope advantages do manifest themselves in the two cooperating municipalities in terms of more civil servants (scope) to work on strategic planning and ways how to realize renewable energy projects that benefit the local society (strategy). Next to this, a suggestion for new research on effectiveness of intermunicipal cooperation would also be to include pre-existing conditions in municipalities, such as civil society actors that have been involved in energy project planning.

Nevertheless, as far as local governments are responsible for the implementation of (EU) policies, they codetermine the compliance and outcome of policy. Although vast more research has to be done, one should question whether the broader trend in Dutch national politics - that major challenges such as agricultural reforms, solving the housing crisis and reaching climate goals are being handed over to local or regional governmental actors - is a solid choice in complying to EU and international policies and reaching the targets set on that level. Answering this question in a broader way can also form a necessary bridge between focus in European Studies and Public Administration research.

With my research I hope to add urgency to the scientific debate on the outcome of regional cooperation, because little is known on the effectiveness of this cooperation. Research on a bigger scale could deepen the discussion on effectiveness of cooperation and, in the end, bring forth more answers to the question when, how and eventually whether intermunicipal cooperation is the most effective government-arrangement to put in use when one wants to achieve results on great challenges of our century, such as fighting climate change.

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Appendix

Interview 1

Interview 2

Interview 3

Interview 4

The interview transcripts are to be found in a separate document that is available on request.

Interviewguide

1. What is the overall policy of the municipality of [name] on the topic of climate change and the transition towards renewable energy?
2. How does your municipality look at the role of local governments in the broader topic of renewable energy production?
3. Does your municipality have enough capacity (strategic, scale) to manage all the issues and legal duties that are connected to renewable energy production?
4. How effective is your municipality in reaching concrete goals in renewable energy production?
 - What goals did you reach the last few years?
 - Because of what did you reach that goals? What are crucial factors?
5. What is your opinion on the role of municipal cooperation in the field of renewables?
6. How effective is the cooperation of municipalities in your region (RES) in promoting or achieving these goals?

7. What is the view of the municipal council upon the topic of renewable energy production in general?
8. What is the view of the council on (the progress of) reaching goals in renewable energy production?

Coding policydocuments

The policy documents of municipalities on the topic of sustainability and renewable energy production were checked for how many times the word 'regio', 'regionale' or 'regionaal' is mentioned. The scoring of these words gives us a good overview of how the local renewable goals are set in a wider framework of regional cooperation.

Rijssen-Holten

The policy document of Rijssen-Holten is called "Duurzaamheidsvisie 2020-2023". For coding we used the version of June 2020.

Coding	Amount	Context of words
How many times is the word 'regio' found?	22	Mainly focussed on 'Regio Deal', i.e. another policy field.
How many times is the word 'regionale' found?	10	Mainly describing regional context
How many times is the word 'regionaal' found?	9	Focussing on heat-transition and table of contents
Total	41	

Heerenveen

The policy document of Heerenveen is called "Samen Duurzaam in Heerenveen 2019-2022". For coding we used the version of May 2019.

Coding	Amount	Context of words
How many times is the word 'regio' found?	24	Mainly describing the RES-process and the ambition
How many times is the word 'regionale' found?	18	Describing funds for regional cooperation and heat-transition
How many times is the word 'regionaal' found?	2	Focussing funds for cooperation

Total	44	
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Dinkelland

The policy document of Dinkelland is called ‘‘Ambitie Duurzaam Dinkelland’’. For coding we used the version of November 2020.

Coding	Amount	Context of words
How many times is the word ‘regio’ found?	0	
How many times is the word ‘regionale’ found?	5	Describing regional cooperation as a goal
How many times is the word ‘regionaal’ found?	1	Mainly describing a geographical situation
Total	6	

In coding the document of Dinkelland, we found that ‘Energie van Noordoost Twente’, their subregional cooperation with 3 other municipalities, is described twice as important cooperation for reaching the renewable energy goals.

Sudwest-Fryslan

The policy document of Sudwest-Fryslan is called ‘Klimaatagenda SWF’’. For coding we used the version of 2021.

Coding	Amount	Context of words
How many times is the word ‘regio’ found?	12	Describing RES-procedures and possible funds
How many times is the word ‘regionale’ found?	5	Mainly headings in the document
How many times is the word ‘regionaal’ found?	2	Mainly describing structure within the policy document
Total	19	