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REGIONAL ENERGY TRANSITION: EXPLORING THE SIGNIFICANCE FOR THE DUTCH SITUATION

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WORKING PAPER

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Introduction, approach and questions

Although aims and options for measures regarding energy transition are - and have been - formulated at the national and international level, the focus seems to shift to subnational, regional and local levels. This goes along with the rise of the concept "regional energy transition" (RET), both in scientific and policy papers. Despite this shift, it is far from clear what regional energy transition means; how it can be analyzed and described; and maybe most importantly, how "it is", "can be" and "should be" orchestrated.

The aim of this working paper is to shed light on the issue of regional energy transition in the Netherlands and explore the significance of this concept for the Dutch situation. This should be seen in the light of the so-called RES-regions (RES: Regional Energy Strategy). These "energy regions" are a relatively new addition to already existing (formal and informal) regional demarcations in the Netherlands such as provinces or COROP areas. RES-regions came into existence in 2019 when the Dutch government selected 30 RES-regions to develop plans for renewable energy, mainly electricity, for their region (See Figure 1). Partly the demarcation of these RES-regions follows the lines of provinces (such as is the case for Groningen, Fryslân and Drenthe); other RES-regions are parts of provinces (the province of Utrecht for example has 3 RES regions). Each of the RES regions has the responsibility for implementation of the national energy policy (mainly in relation to electricity) with the relative freedom to make their own choices. In this, the Netherlands links up to comparable developments in other part of Europe as other European countries like for instance Austria[1] and Germany[2] also had or have distinguished energy regions to develop regional energy strategies.

This explorative study includes three sub studies. Firstly, we made a quick scan of the literature on regional transition, to characterize RET's. In addition to the literature, we were already familiar with, we conducted a literature search in the *Scopus* database. For the search we used the key words 'energy', 'transition' and 'region' or 'regional' and focused on published papers in the years 2020 and 2021. We used keywords, title and abstract for the selection and took only European cases into consideration. After our first search we made a second selection manually, by eliminating irrelevant papers, for instance papers which focus on food as a source of energy or on supra-national regions. We used the following leading questions for the analysis of the papers:

- What is the meaning of regional energy transition?
- What are main factors influencing regional transition?
- Can regional transition be steered and if so, how?

Our literature scan identified participation as one of the components of RET's, which is the component this report focuses on. In order to understand how participation is linked to energy transitions, and specifically RET's, we provide an overview of how 'participation' is approached at the national and regional levels. For that we reviewed the Dutch Climate Agreement and Environmental Act to understand the national setting, and the way the Regional Energy Strategy of two Dutch provinces, Groningen and Friesland has approached governance and participation. Leading questions here are:

- How is participation and governance operationalized at the regional level in RES?
- How is this regional energy transition linked to national and local transition?
- How is governance and participation at regional level linked to local levels?

Based on our journey from the national to regional level, we move our analysis to the practice of participation on the local level. In order to understand participation at the local level, its relation to the RES and the implementation of regional and national targets at the local level, we have studied four cases:

Groningen, Loppersum, Buren/Ameland and Middag-Humsterland. The leading questions for our case study application was:

- How have participation processes unfolded in different local contexts?
- How does the local level context impact participation processes?
- How does the participation processes at the local level link to the regional level?

Figure 1: The RES regions in the Netherlands

Literature quick scan: what is regional transition and what are main factors?

This section/chapter presents the findings and analysis of a literature quick scan on regional transition. Three research questions will be addressed: 1) What is the meaning of regional energy transition? 2) What are main factors influencing regional transition? 3) Can regional transition be steered and if so, how?

Regional energy transition: meaning and introduction

Our first research question concerns the meaning of "regional energy transition", which include "regional" and "energy transition". With energy transition we mean the transformation of the current centralized fossil energy-based energy system to a more decentralized system based on renewables. The term "region" has many different interpretations, both in science and everyday discourse. In geography, where region is one of the key concepts, it is defined as "a more or less bounded area possessing some sort of unity or organizing principle(s) that distinguish it from other regions".[3] This organizing principle may be manifold: a region may be considered as a unit for administrative, cultural, functional, geographical, functional or social reasons. Usually, regions are units within a nation, between the scale of the local and the national.[4] In this paper, our working definition of region is:

"the more or less bounded area between the municipal and national level, an area that (most of the time) is demarcated for a shared set of biophysical and societal characteristics, including culture, economy and human-biophysical interactions such as land use."

Both in science and in professional practice, we find that "energy regions" are often defined based on existing regional boundaries (e.g. existing administrative boundaries such as provinces) or as specifically and purposely created "energy regions" when demarcation is based on energy related characteristics.

According to various scholars and policy makers the energy transition increasingly takes place at the regional level. Indeed, regions may have an important role to play in energy transition processes, and many governments feel an urgent need to stimulate energy transition at this regional level. However, before this can be done successfully, it should be known what factors may stimulate or hinder the energy transition on the regional level. In literature, we found various approaches to classify and operationalize these factors, often referred to as constraints, drivers or conditions. Because we are interested in governance and participation, and options to steer and participate, we should know what - given these factors - options for steering and participation are. In the following paragraphs we will discuss these questions.

Relevant factors

Our second research question is about relevant factors for regional energy transition. This issue has been described in papers by scholars from various disciplines in different ways. Some focus on one or several factors relevant for transition, or use a specific perspective such as physical or cultural geography, economy, governance or technology, while others try to present a more integrative perspective. Geographers mention for instance local cultural traditions or physical conditions, while economists focus on investments or regional economic developments. Governance studies focus on legislation, funding systems, networks and citizens' engagement, while technologists or technology studies scholars emphasize the role of technological innovation, technological infrastructure, grid connections or knowledge diffusion and technology transfer.

But obviously, regional energy transition does not take place in a vacuum and is influenced by and may influence developments at the local, municipal, national or international levels. Structures and processes at the regional scale or level are tied to other scales or levels, for instance concerning governance, science and

technology, value chains, social movements or biophysical linkages. For that reason, various scholars look at the integral picture, also taking into account relationships between energy transition at various levels. In particular spatial scientists and researchers from the field of energy transition proposed integrated schemes.[5]

Overview of relevant factors

Roughly speaking, papers on regional energy transitions can be divided into 4 groups: one focusing on economy and markets, one on typical socio-cultural or biophysical regional characteristics, one on infrastructure, technology and innovation, and one focusing on governance and participation.

Economy

Economy is in two different ways related to energy: energy as stimulating factor for regional economic development and economic factors that influence regional energy transitions. In Scotland it was found that energy efficiency improvements at the household level not only reduced energy use, but also stimulated regional economic developments.[6] A case study from Wales reveals that energy innovation in regions is hindered if key firms have their home location far from these regions.[7] In a Romanian region, SME's turned out to play a crucial role in energy production.[8] According to simulation studies, regional markets may have a significant impact on energy systems, because local trading results in a better share of benefits for all participants, energy balancing is easier and it reliefs transmission grids.[9] In a German study, two main economic categories are distinguished to explain the differences in energy transition potential in various regions: economic structure (such as numbers of earners in various sectors, i.e. forestry, agriculture, industry, commerce and services) and economic strength (tax income and unemployment rate)[10], while in another German study the number of energy initiatives for instance by energy cooperatives is mentioned as stimulating factor.[11]

Socio-cultural, demographic and biophysical characteristics

Some regions have specific characteristics which may support or hinder energy transitions. In volcanic areas for instance, is easier to apply geothermal energy.[12] In general islands, and sometimes other remote areas, are, despite their isolation and sometimes their vulnerability, considered excellent places for regional energy transition because of the abundance of space, wind or water.[13][14] Also solar radiation and waste biomass potential could explain differences between German regions.[15] Because energy activities may compete with other activities, infrastructure and existing land use may be relevant constraining factors.[16][17]

Several authors stress the importance of demographic or social-cultural factors, which may differ from country to country or from more urban to more rural areas.[18][19] In a German study, population density, population growth and property rate could explain different energy potentials of regions.[20] In another study, including regions inside and outside Europe, demographic factors appears to be important, but the impact of urbanization on energy consumption appeared to vary greatly, dependent on the migration rate and the economic development.[21]

Infrastructure, technology and innovation

Lack of infrastructure is seen as a main factor which may influence type and pace of energy transition, in particular on islands.[22] Also, in some countries on the European mainland grid congestion is one of the main factors hindering the energy transition.[23] At the same time technological innovation may play a key role in accelerating this transition in general as has been pointed out by numerous papers on niche innovation in various areas, such as for example wind energy and biofuels.[24][25] Currently acceleration is expected from, for instance, introducing new integrated, low- cost wind and solar energy systems including hydrogen or battery storage.[26][27][28]

Several authors show that it is not technology or knowledge as such, but the way it is integrated and related to other factors that makes it influential[2930], for instance the way a knowledge structure functions, as a study on Scotland shows.[31]

Governance, visions and participation

Various studies on governance explicitly list crucial factors affecting regional energy transition.[32] A German study mentions: the quality of the planning process, the strength of the related governance network, inclusion of various actors, exchange of knowledge, and funding capacity.[33] A Dutch study comes to comparable hindering factors for RET: unclear balance between top-down and bottom-up governance, lack of transparency concerning costs and benefits, insufficient governing capacity, bad fit with institutional frameworks, no means to regulate efficiency and optimization of energy system, no fair participation and too little focus on community energy.[34] In addition the way several visions and cultures are aligned is seen as a major factor [3536], for instance in a study on Swiss regions.[37] Several authors mention bad coordination of policy as an important factor, or as one of them put it "…a blurry mix of technical and socioeconomic agendas".[38]For that reason many studies, for instance in Sweden and Spain, suggest to give a key role to intermediaries. [39]

Connections and frames

Various scholars try to connect different factors in a framework. A German study for instance shows that regional developments and energy transition pathways depend on the interaction of what the authors call "sub systems", in particular 'science', 'governance', 'industry',' finances' and 'civil society', while intermediaries play a crucial role to integrate.[40] Sometimes, outsiders may play an important role, while in all the German regions, substantial national and international influences can be found. Similarly, Dutch authors bring together various systems, which are integrated under the umbrella of what they label the "energy landscape".[41] Here the systems are defined as 'physical infrastructure', the 'bio-physical system', the 'community' (including identity, culture, acceptance), the 'economic system' and the 'governance'.

In three other traditions it is tried to combine factors in overarching schemes.

First, in so-called Regional Innovation Studies, governance is linked to innovation. Here governance arrangements are considered crucial for innovation and transition at the regional level. So-called proto-innovation systems should be supported by governmental policy through coordination and a specific regional policy to stimulate innovation.[42]

Secondly, in spatial sciences, spatial entities are seen as integrating factors. Space and place bring activities, actors and factors together and form a coordinating agent. In fact, the 'energy landscape', as mentioned before, is an example.

Finally, a family of approaches from transition and innovation studies integrate various factors, levels and time frames. Most influential is the tradition of the multi-level perspective on transition (MLP). These transition studies investigate how radical innovations at the so-called niche level can result in regime changes, facilitated by changes at 'landscape level', the larger socio-cultural context. Although no clear spatial components are distinguished within transition studies, it is not uncommon to associate the niche level with the local and regional level, the regime level with the nation-state level and the landscape level with events of a supranational scale, although not everyone agrees with this. Key elements of the regime are 'science', 'technology', 'governance', 'markets', 'industry' and 'socio-cultural aspects'. In line with the analysis of innovation and transition processes according to the MLP are Strategic Niche Management (SNM) and Transition Management (TM). SNM is a framework for managing socio-technical niches for sustainable system change, focusing on experimentation and development at the niche level, as well as the

breakdown of existing socio-technical regimes. Also, TM wants to change several social-technological subsystems through a process of co-evolution in which technological and social elements mutually reinforce each other. TM looks also at congruency in time and space, and dynamics between the niche, regime and landscape levels.

Most of these frames suppose equal importance of all factors of the energy system or regime, which are distinguished. Few studies explicitly state which of these factors are most relevant, although the importance of these factors might be region dependent. In a model study on regional transition in Europe, regional characteristics, technology and economic factors are found to be more important than climate policy.[43]

In a study on German regions, it was found that socio-economic factors explain variation of success among regions better then biophysical ones.[44] According to a study on Italian and British regions, visions, land use, infrastructure and governance together determine RET in these regions [45], while another study on Italian regions concludes institutional and regional-specific factors to play a pivotal role in regional energy transition.[46]

One study emphasizes the reciprocal relationship of these factors: energy transitions are not only determined by material and social factors, but they also influence for instance social configuration and spatial configurations, such as new social networks and new types of infrastructure and land use [47]

All in all, no clear answer can be given to our second research question what the main factors are for regional energy transition. A long list of factors appears to play a role in regional energy transitions, ranging from different types of biophysical to socio-cultural, economic, technological and governmental factors. Some of them are connected or can be connected to each other in integrating frames. Based on these studies it is difficult to identify a number of dominant or main factors that always, consistently play a role in regional energy transitions. Factors such as technology, economy, governance, coordination and competing land use seem to be most important, but this may vary from region to region. Interesting is the strong connection between some factors in certain regions, such as reciprocal relationship between regional economy, investments, energy initiatives and social networks.

Intervention, implementation and participation

If indeed so many (different) factors do influence RET, it is hard to identify what appropriate interventions can be. Moreover, many authors stress the importance of region-specific factors. In fact, we found a kind of paradox: some emphasize the importance of some structural and key elements or conditions, while others stress the context dependency. As two German scholars put it: “transitions are foremost locally and regionally organized, and important technical and institutional innovations for energy transitions are developed, tested, and brought to application at the regional and local levels” and “energy transitions do not follow a master plan, nor are they coordinated at the national level. It is rather a variety of regional actors with different aims and interests who are involved in these processes, culminating in the development of space-specific technological mixes and situational governance structures”.[48]As we have seen, in Germany the implementation of the Energiewende varies significantly from region to region.[49] Also, a recent review stresses the context dependency of regional energy transitions.[50] They can occur in different value chains, are determined by various factors, can be implemented through different forms of agency and can lead to different types of results.

At the same time, these studies admit that regulatory and market frameworks play a role and that regions in Western European countries are quite dependent on higher governmental levels. In many cases, national governments formulate the agenda of sustainable energy transition and regional and local governments follow. And there are good reasons to do so: regional solutions for energy transition are not always the best

if comes to energy efficiency and costs; and close connection between different scales and regions is preferable.[51] According to MLP, structural elements at higher levels stabilize the current energy regime or system. In case of transition these key elements, for instance market structure, infrastructure or governance, should be changed.

For governments at the regional level, literature delivers some suggestions. From implementation studies in German regions, we know that policy should address at least the following problems – and focus on corresponding solutions:[52] political will, legislation, social resistance, funding schemes, coordination, planning, rising costs and technology. Dutch researchers suggest to found special professional and flexible organizations to align informal and formal parts of decision-making, to coordinate and manage, to develop capacity, trust, a common language and a shared vision and to build a high-quality network with all stakeholders.[53]

Concrete applications and options for participation

Although certainly not the only factor, good and inclusive governance is one of the key elements to make RET successful. Many studies found the quality of participation important or even decisive for the successful implementation of renewable energy technologies.[54] A combination of an instrumental rationale, broad inclusiveness, and a participation level of consulting or informing is commonly perceived as an innovative participatory practice in most regional contexts.[55]

Various scholars work on instruments to make RET related frameworks for well informed and inclusive decision-making. Based on an inventory of biophysical, social and economic factors some authors were able to make an overview of German regions, in which RET would be more and less successful.[56] Others did the same for Greek regions, making use of GIS and Multi criteria analysis.[57]

Examples of more inclusive approaches, which also include several stages come from some Dutch and German regions.

One of them is the so-called Three Phase Model for the transition process, developed in Germany and tested in a region in California. Three phases are identified: pioneer, pivotal and extended network, and these phases are distinguished by actors, activities and artifacts. Despite the different contextual differences, there were many similarities found in the transition processes. [58]

Another one is the so-called Spatial Transition Analysis (STA) which defines spatially explicit and evidence-based targets for energy transition. This STA aims to combine quantitative modelling of local and regional energy potentials, qualitative spatial considerations for the siting of energy technologies and scenario development. This approach was applied to the Dutch province of Limburg. During the scenario-development stage, actors of various kinds are asked to participate.[59]

A last example is Transition Management, which is also applied to the Dutch province of Limburg. By using this model, the researchers looked at the different stages of regional transition and the way actors and factors have been linked to each other, and to what extent stakeholders were able to participate and influence the process. Instead of just studying the process, researchers were involved in interventions.[60]

The third question of this part of this quick literature scan was whether regional transition can be steered and if so, how? Obviously, governance turned out to play a significant role in regional energy transitions, at national and regional levels. We identified some crucial factors for good governance related to goal setting, policy instruments, coordination and implementation. In each of the stages of the policy for alignment of aims, knowledge exchange, network building and developing capacity. formal parts of

decision-making, to coordinate and manage, to develop capacity, trust, a common language and a shared vision and to build a high-quality network with all stakeholders.

Concluding

Based on our quick literature scan we can answer our three questions as follows. First the meaning of regional energy transition: this can be seen as the transformation to a more sustainable energy system at the regional level. In the Dutch situation, energy regions are defined in a very practical way, but in most cases related to provincial boundaries. In other cases, demarcation is based on energy related characteristics which may include cultural, economic and biophysical dimensions. The question regarding main factors influencing regional transition is not easy to answer. Technology, economy, governance, coordination and competing land use seem to be most important factors, often related to each other, but this varies from region to region. In addition, , regional energy transition is often strongly related to external factors at a higher level, such as markets and national government. Our third question was whether regional transition can be steered. Yes, governance plays a substantial role but can be hindered by a long list of factors concerning coordination and implementation. One of the factors is stakeholders' involvement or public participation. Conditions for successful engagement are:

- Options for involvement of actors in all stages, form vision development to implementation
- Options for all actors to be informed on all relevant aspects, technological, economic etc.
- Options for all actors to be involved in different domains: economy, formal decision-making, technology assessment or cocreation
- A network in which all actors can participate

In the following chapter/section we will further investigate how participation has worked out/was included in the regional energy transition policy in the Netherlands and discuss if and how governments and participants deal with these conditions.

Participation in RES: framing participation from the national to the regional and local level

In the previous chapter/section we discussed the main (recent) scientific literature on regional energy transitions. We found that overall, many factors play a role in whether or not regional energy transitions are successful, indeed it was difficult "distillate" one or two dominant factors. We also saw that regional context matters, however, at the same time some aspects, such as regulatory frames or the energy markets are best dealt with at national (government) level. One of the factors that can impact regional energy transitions was 'participation'. According to various authors it may even be decisive for energy transition. [6162] This is particularly relevant when analyzing regional energy transitions in EU-countries, including the Netherlands, given the importance placed on 'participation' and 'local ownership' in climate, environmental and energy plans in these countries. The crucial elements of participation identified in the literature includes: involvement at all stages; "full informedness", different types of involvement; network. To this end, we pay specific focus to the participation component of regional energy transitions in the context of the Netherlands the key questions we asked for this section are:

- How is participation and governance operationalized at the regional level in RES?
- How is this regional energy transition linked to national and local transition?
- How is governance and participation at regional level linked to local levels?

In order to answer these questions, we have conducted an empirical study on 'participation' and 'governance' at the national, regional and local level. Our analysis started with how these concepts are framed at the national level through the National Climate Agreement and the Environmental Act and the connection between these national goals and the Regional Energy Strategies (RES). We explored how national goals of participation has been operationalized in two RES cases: RES Groningen and RES Fryslân how the RES's operationalize and frame 'participation' and 'governance' sets the stage – or not - for the context in which participation occurs in our analysis.

National Level Framing

The National Climate Agreement of the Netherlands was presented in June 2019 with the key aim of reducing greenhouse gas emissions by 49 percent by 2030 compared to 1990 levels.[63] In order to achieve the key target and the sector specific targets in the Climate Agreement, local ownership and citizen participation is considered an important component of the Dutch energy transition. In relation to the transition from natural gas the Agreement takes a district orientated approach, with a focus on community involvement in the process given that residents and building owners are crucial stakeholders. In addition, the Climate Agreement states that "participation and acceptance are crucial to the spatial integration of the energy transition and to its feasibility".[64] Since the Climate Agreement targets need to be translated into citizen action perspectives for broad based and active participation, a comprehensive public participation approach has been developed. This includes a public campaign and networking approach; the former is focused on targeted communication to citizens and the latter involves co-developing opportunities for citizens to contribute to the transition. To this end, the Agreement outlines ambition to achieve 50 percent ownership of the production in the local community which includes both citizens and businesses locally.[65] While participation and local ownership is enshrined in the Agreement, there is no overarching definition of "citizen/public participation" and "local ownership" in it, instead it refers to the Environment and Planning Act which outlines the participation process, and the Regional Energy Strategies will define and outline its tailored participation approach.

Several acts make up the Environment and Planning Act which is the basis for environmental legislation in the Netherlands. The Act is referenced in the Climate Agreement for further details on participation processes, it stresses early participation, transparent decision making and the means for participation.[66] A key aspect of this Act is the importance of entering into discussions and consultations with the public at an early stage to achieve greater support, acceptance and decision making in planning processes.[67] However, it does not detail 'how' participation should take place or what defines participation, instead it takes an area-specific approach, allowing more freedom to shape the participation process. The Act is intentionally flexible in its approach to participation given that different stakeholders, local context and types of decision making may be suitable in different projects and phases of projects.

At a provincial level, the Regional Energy Strategy (RES) through process participation develops a regional approach to participation processes. The Environmental Act applies to the RES in that it needs to outline how citizens, civil society, the private sector and public authorities will be involved achieving the municipal in terms of environmental planning and programs. In addition, any stakeholder can submit an opinion about the plans and decisions can be overturned based on the court's decision. The national government has made €22.5 million per year available for the National RES Program and €2.5 million has been reserved for the participation coalition.[68]

Regional Level Framing

The area-specific and participatory approach is detailed in the municipal vision for the transition which is outlined in the Regional Energy Strategies (RES). The 30 energy regions in the Netherlands have been tasked with identifying where and how sustainable energy and heat can be generated to increase the renewable energy production in the energy mix and transition away from natural gas.[69] These regional targets all contribute to the overarching goals and targets set out in the Climate Agreement. The overall national target was to produce 35 TWh of solar and wind energy, in the concept RES in 2020 the collective bid of the regions was 52.5 TWh and it has increased to 55.1 TWh in 2021 RES 1.0.[7071] The RES however is not only a strategy on how to achieve the energy targets of the Agreement but also a strategy on how to work with non-governmental stakeholders. To this end the Climate Agreement states that "…a welcoming process must be set up around the RES in which the participation of interest groups, businesses and residents is embedded".[72] Citizen participation in the RES is meant to be a means for greater support of policies and energy projects. The provincial council, municipal council and waterboard executives are the highest political decision-making bodies, collectively they decide on how to structure the RES and their own policies. In most instances the waterboards and municipalities have agreed to the RES but there are a few municipalities who have not. Given the emphasis of process participation in the Climate Agreement, interest groups, companies and residents are expected to have avenues to participate in the development of the RES itself.[73] Generally, the municipalities and waterboards have discussions locally with citizen representatives and other stakeholders and either accept or reject the RES proposal of the provincial government. In regions without specific organization of participation in the RES, citizens are included indirectly by voting in elections to have their interest considered. Many regions have informed citizens through the regional RES website, social media, newsletters and newspapers and almost all regions have consulted citizens through surveys.[74] At the municipal level in regions, dialogues have been organized through workshops, dialogue sessions and roundtables to give citizens an opportunity to advise on the RES. However, while it was expected that these diverse local stakeholders would be included in the development of the RES, an evaluation of the concept RES noted that this was not the case in all regions.[75] How citizen participation is framed in the RES and how citizens have participated in the development of the RES has differed in different regions.

RES-Groningen

The RES Groningen decided that it wants to generate 5.7 TWh of wind and solar power of the total goal of 35 TWh set out in the Climate Agreement.[76] In addition, 20 percent of buildings in Groningen need to be heated without the use of natural gas. In terms of process participation in the RES Groningen, a study conducted showed that there was little or no participation opportunities for residents.[77] In addition, not all municipal councils agreed to the RES in the region. The municipality of Pekela has not agreed to the RES and the municipalities of Eemsdelta and Veendam have agreed to some aspects of the RES but has rejected the rest of it.[78]

In terms of translating the 50 % local ownership goal to the Groningen specific context, the Groningen RES has an accompanying workbook on participation which outlines its specific participation approach. Since there is no national definition of participation and ownership, the RES Groningen defines local ownership as "Local ownership in sustainable energy projects is the risk-bearing (co-) development and -exploitation of those energy projects by local parties, with a view to their revenues can also be used locally again for CO 2 reduction, tax relief and quality of life".[7980] The definition given is intentionally broad so that it is adaptable to different context. However, it broadly states that participation may be expressed during the process or in the financial sense. The RES Groningen defines process participation as the involvement of the local environment (stakeholders) in the development of new policies or energy project, the initiator along with local stakeholders undergo a process in which agreements are made in relation to the spatial planning integration, extra-statutory consumption, financial participation and the design of the project among other things (see figure 2). Financial participation entails investing and/or benefiting from the revenue of an energy project in the form of co-ownership, financial participation, environmental funds and local resident schemes . Co-ownership is defined as local residents jointly owning a project through an association or energy cooperative; financial participation includes local residents in risk-bearing through shares, bonds or certificates; environmental funds means that part of the proceeds of the energy project benefits social goals in a neighborhood; and local residents schemes is defined as providing immediate advantage to local residents in the form of sustainability of their home or green discounts. In line with the 50 % local ownership goal, the RES notes that energy cooperatives or community energy initiatives who work at the local scale can contribute to the ownership goals of the region.[81] In the Groningen region there are about 46 of these initiatives. However, to date there have been very few projects set up with a focus on citizen participation linked to the RES Groningen framework which further indicates the lack of involvement of residents in the actual implementation of the RES.

Figure 2: Participation in Groningen RES[82]

RES- Fryslân

In line with the national target to achieve 35 TWh sustainable electricity on land, the province of Fryslân aims to contribute at least 3 TWh by 2030 to the goal.[83] All municipalities in the region have accepted the RES 1.0 proposal. In terms of citizen participation in the development of the RES, Súdwest-Fryslân is applauded in recent RES evaluations for its inclusion of citizens in the RES. In its process citizens were included in a citizen's forum in which a survey was circulated to residents to provide advice and opinions to the city council which was then discussed in the local council.[8485] While the citizens forum adopted in Súdwest-Fryslân does not offer direct decision-making power, it did offer citizens the opportunity to advise on what residents find important which could then be used in the decision to accept or reject the RES. In order to facilitate participation a recurring citizen summit has also been organized for citizens to contribute to energy policy such as the RES 2.0 and 3.0 in Fryslân. In addition, an Energy Council has been set up to give citizens an opportunity to participate in the implementation of the energy policy and programs in Fryslân. The RES of Friesland aims for a higher participation rate than 50%, it considers 100 % local ownership of collective projects to be attainable and an ambition.[86] While the document notes that a clear definition of local ownership is needed to avoid different interpretations, it also notes that what local ownership is defined as it should be controlled by the local environment in which the project occurs. Consequently, the RES focuses on agreement between project planners and the local environment; these need to be in agreement about the aspects of the project such as the size before a permit will be granted by the authorized supervisor. Financial participation is also seen as an important aspect of ownership, by this the RES defines financial participation as financing the operation of a project. It further distinguishes between a participation area and an acceptance area; the former is the area in which citizens can control the project not only through financial participation although it may also include it; and the latter is an area in which the local community may accept or reject a project. Local energy cooperatives and initiatives are also considered an important stakeholder in achieving the local ownership goals. There are 64 initiatives currently in Fryslân. However, it is unclear how many local projects have been set up within the RES framework.

Concluding

At the start of this paragraph, we formulated three questions, concerning the operationalization of participation and governance at the regional level in RES, the way regional energy transition is linked to national and local transition, and the way governance and participation at regional level are linked to local levels. We will discuss these together.

In summary, the Climate Agreement outlines the national targets for the Netherlands energy transition, the RES is a regional document which outlines each of the 30 energy regions contribution to the national targets and the provincial energy transition approach. Municipalities and waterboards are included in the development of the RES, and most but not all municipalities have accepted the proposed RES. Municipalities are also able to develop municipal energy and heat transition visions to further define the municipal approach to the RES.

In addition, municipalities are often charged with the task of including citizens in the energy transition. At the national level the Climate Agreement stresses the importance of involving local businesses, citizens and other stakeholders in the energy transition through its 50 percent local ownership target. In addition, process participation in the development of the RES documents is envisioned in the Climate Agreement. Citizen participation is viewed as a means for greater support and acceptance of policies and energy projects. It also viewed as important given the decentralized nature of some of the energy targets. However, participation and local ownership is intentionally broad in the Climate Agreement because participation may look different in different regional or local contexts, dependent on the chosen decision-making structure and the stakeholders in each local environment. Consequently, the depth and definition of participation is also flexible and approached differently in the energy regions. The provinces and municipalities have adopted a tailor-made approach to participation, but citizens have not always been included in the process of defining regional participatory goals. Citizen participation in the development of the RES has not been uniformly approached in all regions. While a goal of the RES was to include citizens in its development to increase support for policies and projects, many citizens are included through the usual processes of representative democracy but in general, citizens have not been actively included in the development of the RES.

In most instances, citizens have been included mostly through information sharing, consultation and advising in the development of the RES, and have rarely been given any decision-making power. In addition, the proposed RES in some regions were not accepted by the municipalities. Another problem with citizen participation in the realization of the RES has been the opposition to wind. In instances where citizens are involved in setting the targets of the RES, they have opted for a higher bid on solar than wind which is problematic for the national energy mix.

In addition, there are several problems with the approach to participation at the national and regional level. While it is true that participation differs in different context, there are some challenges with this flexi approach. There may be very different sometimes conflicting approaches and definitions of participation across the Netherlands which can lead to inefficiencies with achieving the 50 % local ownership goal. Given that the project initiator is usually responsible for the participation process in their respective projects, this assumes that all project initiators are equally and well informed about participation processes and can effectively execute such plans. Moreover, given that what is considered local ownership entails a broad spectrum of stakeholders including businesses and municipalities, it is a possibility that actual citizens are excluded in the process.

Local participatory approaches in practice

In the Dutch context, RES may be seen as one of the first deliberate attempts for regional energy planning and, in its trail, local energy planning. Indeed, the local (municipality) level plays a crucial role in this, in particular in terms of participation. As we have seen in the preceding section/chapter, both national climate policy and RES leave citizen participation and ownership mostly at the local level. A few issues for discussion emerge from this. As there is no uniform approach to process participation, the way citizens were part of the RES process itself differs for the different regions. As mentioned, this is intentionally left broad, to fit local context and allow tailor-made approaches. At the same time, most RESs recognize the role and importance of local initiatives. For instance, 64 of these local initiatives were identified in Fryslân and 46 in Groningen. However, it is unclear at present how they link to the RES framework. This is not uncommon as we know from international scientific literature that often these bottom-up grass root local energy initiatives and formal local energy planning not always meet.[87] Finally, at present it is unclear how participation of citizens in the actual planning, design and implementation of concrete energy project will take place. Overall, we can see that there are many uncertainties on how citizen participation and ownership in relation to RES will be organized, both in terms of local initiatives to RES as well as concrete planning and implementation of energy transition projects "on the ground". In order to get a better understanding of how participation at the local level can work out, its relation to the RES and the implementation of regional and national targets at the local level, we have further investigated the practice of participatory approaches in energy transition on the local and regional level in a number of case studies. It should be mentioned here that these case studies have no direct relation to the RES process – in fact they were developed and implemented independent of RES. This is partly due to the fact that RES was being developed at the time of these case studies, in a process that – as mentioned – largely took place parallel to many existing local transition initiatives. However, we assume that the local case studies presented here may shed some light in how local transition practices potentially may be linked to the RES. In this paragraph, we will look at participation processes, how these are related to the local level context and explore if and how these are linked to the regional level?

Our analysis was conducted both in rural and urban areas in the province of Groningen and Fryslân. We analysed how participation processes unfolded in different local contexts, how the local level context impacts participation processes, and how participation processes at the local level are linked to the regional level. In the first section we analyse the participatory practices in the context of the heat transition, illustrated by local case studies in Paddepoel, a neighbourhood in the city of Groningen, and in Loppersum, a village in the province of Groningen. In the second part of this chapter/section we will address concrete interventions in the self-planning of the transition process of local (regional) communities in the Middag-Humsterland region (province of Groningen) and the village of Buren (Ameland, province of Fryslân).

Participatory environment and levels of participation in the heat transition

In addition to the RES, municipalities have been tasked to develop heat transition plans. The Climate Agreement aims to end natural gas extraction in Groningen by 2035 and to move 20 % of houses in the Netherlands away from natural gas use by 2030.[88] The key target in the Climate Agreement for the built environment is to reduce carbon dioxide emissions in the built environment by 3.4 Mt by 2030.[89] Since the heat transition is reliant on residents and building owners to commit to sustainability improvements, a neighbourhood and participatory approach has been adopted at the national level. While at the regional level, the RES outlines the current and future heating demand, the spatial distribution of that demand and potential bottlenecks, the actual approach to the heating transition lies with the municipalities who have drawn up Heat Vision documents for their respective municipalities.[90] To date 3,000 newly built homes in the province has shifted to from natural gas in 2020, 2000 homes natural gas connections have been removed and the municipal plans collectively have plans to make 18,000-20,000 additional homes natural

gas free.[91] Of these homes 4,700 homes are included in the 'living labs' under the Programma Aardgasvrije Wijken (PAW-Natural gas free neighbourhoods programme) and are expected to be natural gas free by 2030.

In terms of local participation, the municipalities in the province of Groningen and the province of Groningen have established the Energieloket, which is an entry for residents to raise questions about energy savings and generation. Generally, it serves as an information sharing platform. More active participation in the heat transition is organized at the municipal level, this is reflected by the fact that every municipality in Groningen has one or more local energy initiatives in which citizens can organize themselves or partner with municipalities in joint projects. Local residents are also included in the heating transition through the PAW. Currently, there are 6 of these PAW-living labs that have started in 2018 and 5 that have started in 2020 in the province.[92] While the Climate Agreement and RES has specified a neighbourhood approach to the heating transition, it is unclear how participation is operationalized in different local context. Consequently, the PAW pilots are expected to support municipalities in understanding the best way forward in implementing a neighbourhood – or village - approach to the heat transition.

To support the understanding of participation in these neighbourhood pilots, a study was conducted reviewing the two cases of Loppersum and Groningen throughout the project cycle and measured the participatory environment and levels of participation in the projects. The participatory environment may be viewed as the local context which comprises of the perceptions, location, demographics, socio-economic characteristics and history which can impact the participation processes as noted in the RES and Climate Agreement. Participation levels look at how the participation process has unfolded in the given participatory environment. Collectively, these two factors and case studies outline how participation unfolds in different context and project scales. This is further outlined below in the summaries of the case study findings.

Paddepoel/Groningen

The Buurtwarmte project was initiated by local residents of Paddepoel in 2012. In 2016 residents formed Paddepoel Energiek, a foundation. The project has two phases, the first targeted 450 connections in Paddepoel and the second that started in 2018 targets about 3000 connections in Paddepoel, Selwerd and Vinkhuizen. The findings concluded that the participatory environment changed over the course of the project, which was largely due to the scaling up process. This may be attributed to the socio-economic attributes of the targeted districts, Paddepoel was low income but had higher education levels whereas the other two neighbourhoods were low income and had lower education levels. This is attributed to the link in the literature between lower incomes and education with less willingness to participate. Awareness of sustainability, the project and willingness to participate remained average in both phases although there was greater awareness and willingness in Paddepoel than the other 2 districts. The socio-economic characteristics and mental models in the 3 neighbourhoods related to the willingness to move away from natural gas; in Paddepoel, moving away from natural gas was important due to climate considerations whereas in the other two districts there was some scepticism and conditions with moving away from natural gas. The latest developments in the phase 2 of the project are positively addressing these challenges through increased engagement and awareness raising. The levels of participation also differed greatly between phase 1, interim phase 2 and phase 2 of the project. In phase 1 while higher levels of participation were recorded, it did not relate that much to higher levels of self-organizing activities. Phase 1 was a bottom-up initiative, and the sense of ownership was higher due to the perception of it being a local led initiative but Paddepoel Energiek was a foundation and key decisions involved only a handful of residents. Consequently, local residents were largely involved in information sharing activities. In the interim phase trust and confidence in the project diminished as the Municipality and Grunneger Power (a broader operating energy cooperative) decided to scale up without informing residents, and no local residents were involved in

planning or decision making during the interim. However, the current stage of the project is promising with a high degree of citizen power and self-organization. This is largely due to the fact that energy cooperatives have been formed to allow local residents to be equal stakeholders with a form of genuine ownership in the project. Currently, the project is considered one of the largest scale heating projects with active participation of local residents in the Netherlands, and can be used a lessons learned for a locally owned heat transition in Groningen.

Loppersum

The Warmtenet Loppersum-Noord project was initiated by the Municipality of Eemsdelta in 2018 and the local energy cooperative LOPEC officially joined the project in 2019. The project started with 10 residential connections and 4 non-residential connections, this was changed to 60 residential connection and most recently to 210 residential connections and 4 non-residential connections. The participatory environment of the project scored very high in the framework in both phases of the project, meaning that participation in this context would be easier to achieve. While there were few low-income residents and while the education levels were low, residents were still willing to participate in the project. This may be attributed to the fact that most of the residents were home-owners which studies suggest are more likely to partake in energy efficiency upgrades than those who rent. In addition, it is a smaller village setting with stronger social networks and sense of community. Consequently, there were high degrees of awareness of both the project and sustainability issues and more preference to move away from natural gas which positively correlated with the willingness to participate in the project. The fact that an established energy cooperative, LOPEC, was engaged early on in the project the participation routes were clear, governance was transparent, and residents had trust in the project due to previous successes of LOPEC. In addition, given the smaller village setting and strong social networks, local residents received very individualized attention. The Municipality official engaged and informed residents door to door, and residents had the personal number of the official, who is well known, if they had any concerns or wanted more information. Given that the project engaged an energy cooperative all residents could easily participate and have equal say to other project planners such as the Municipality or Enpuls. In addition, financial participation which includes the distribution of benefits was high in the project due to the cooperative receive equal profit to other project planners (2%) and residents receiving a 5% reduction in their energy bill. The Loppersum Warmtenet is a good example of shared ownership between local residents, governmental agencies and private sector. It further outlines how smaller initiatives can take a more personalized approach to ownership and participation.

Key findings

In conclusion, the national target to reduce carbon dioxide emissions in the built environment by 3.4 Mt by 2030 is translated to regional goals in the RES. In terms of heating, a neighbourhood approach has been adopted. Consequently, the RES leaves the decision and vision of the heating transitions to municipalities in the region. Municipalities are tasked with drawing up heating visions to outline their goals and approach to the heat transition. In line with this, the Programma Aardgasvrije Wijken has 11 pilot projects to understand how the neighbourhood approach to heating can be organized in different municipal settings. Collectively, the Loppersum and Groningen projects contribute to transforming 3210 residential buildings and 4 non-residential buildings to natural gas free heating, which is aligned with the national target of shifting 20 percent of homes away from natural gas.

In Loppersum and Groningen, the participatory environment (context) was different both within the projects itself and between the two cases. In the Groningen context, Paddepoel is a low-income neighbourhood with higher education levels. On the contrary, Selwerd and Vinkhuizen are both low-income neighbourhoods with lower education levels. The social network in Paddepoel was also stronger than in the other two

neighbourhoods. Consequently, the mental models in the three neighbourhoods are different which proved problematic in the scaling up process. Project planners had difficulty in stimulating participation in Selwerd and Vinkhuizen. In addition, due to the scale of the project local residents had less feelings of ownership in the interim phase than the first phase which was initiated at the neighbourhood level. While the feeling of ownership was more in the first phase versus the interim second phase, the broader local residents were not actively involved in decision making given the structure of the local residents group (a foundation) in phase 1. The sense of ownership may be attributed to the smaller setting in which residents felt more included than in the larger setting of phase 2 of the project. Based on the different neighbourhood context in phase 2 of the project, additional efforts needed to be made to develop a sense of community and involvement despite neighbourhoods not feeling connected to each other. The project planners opted for a targeted approach of awareness raising and consultation to get the two additional neighbourhoods on board. In addition, neighbourhood cooperatives are set up in each neighbourhood, so residents better identify with the project and all have a sense of ownership and are able to be equal participants in the project.

Loppersum's local context was vastly different to Groningen, while the residents were also low-income groups with lower education levels, most residents were building owners unlike in Paddepoel, Vinkhuizen and Selwerd. Studies suggest building owners are more likely to adopt sustainability improvements than renters. In addition, the social networks were stronger and close knit which created an environment of greater awareness of the project and issues. This was further complimented by the scale of the project which was relatively small: this allowed residents to get one on one attention which strengthened the sense of ownership.

Based on these two cases it is evident that the context of projects influences the participation processes in that a more enabling context allows for easier and more effective participation processes. In instances where the context is not ideal for participation, more has to be done to create a more enabling environment through awareness raising and targeted communication for example. It is also evident that a local organization with clear governance and participation routes such as an energy cooperative are better situated to increase local participation in district heating projects.

Participatory interventions

In the previous section two cases studies were discussed in the context of the heat transition. These were clearly linked to policy implementation, in this case the heat transition, in particular the Programma Aardgasvrije Wijken. In that process, there is an important role for local government, linking up with cooperatives. In this section we will discuss two case studies that were conducted independent of formal planning processes and policies.

There are many local energy initiatives of communities that have the ambition to for actively engaging in the energy transition of their communities, stipulating ambitions such as finding a pathway towards a CO_2 neutral community; energy self-sufficiency and autarky; or simply increasing the use of renewable energy technologies. In order to facilitate and support such communities a number of methods are available. In many of these methods, the interaction with community members, experts, and other stakeholders play an important role. These interventions may help a community to develop plans for the route towards becoming a renewable or sustainable community. One example of such an intervention is the Charrette or community energy workshops. In general, these charrettes are design-based workshops that can be used to design and plan communities to tackle challenges or problems in a community, such as for example the energy transition. Typically, they are multiday session in which experts and designers in a collaborative effort make a plan for the community. Based on the principles of the Charrette, two case studies were conducted,

one in the rural area in Middag-Humsterland, province of Groningen, and one in the village of Buren, on Ameland. We will discuss how the participation process unfolded in these case studies.

Middag-Humsterland (Groningen)

Middag-Humsterland is a region in the Province of Groningen – its demarcation defined not for administrative reasons but defined by its landscape: the area was designated one of the national landscapes of the Netherlands for its uniqueness as a former tidal landscape with high level cultural and historical characteristics. This highly valued landscape was part of the reason that a group of citizens and an associated regional cooperative initiated a project to explore the possibilities for the uptake of renewable energy technologies in the region, without destroying the landscape. For this a charrette project was designed: a multiday collaborative workshop that allows experts and stakeholders to engage in co-production. The charrette project was not part of a formal planning process – but rather it was framed as an opportunity to make a grassroot or bottom-up plan, that – in the end – was to feed into the planning process of the municipality and the province. For this, 3 charrette meetings were organised over a period of 4 months in which different options and scenarios were explored. In particular, two landscape-based scenarios were discussed: one that concentrated large scale technology options with high visual impact in one place and another one dispersing smaller scale technologies with less visual impact in over the entire area. The end product was not so much a fully developed energy transition plan (as was the original idea) but rather an informative publication explaining the results of the project.

In reflection, a few issues come to the fore in relation to the participation process. No decision was taken on the preferred option – rather the main principle was emphasized: any development should respect the landscape. Although a group of local citizens and the regional cooperative were part of the project, the participants (themselves) and experts questioned the representativeness and legitimacy of the project. Issues related to that refer to the (assumed) complexity of the subject, the lack of good data, etc. In addition, the fact that in the end no plan was produced but rather a rough sketch was delivered ('houtskoolschets') was considered problematic by some of the participants and experts. Although it had never been the plan to develop an official plan that was ready for implementation, allowing for free and out of the box thinking, the informality of the end result led to some disappointment among the participants. Based on this, the take home messages (leasons learned) were that in order for such trajectories to be successful or meaningful, it is important to be clear about the status of project (and if possible, link it to an official planning process); to be clear about the outcomes and results; to make time and resources available for data collection; and to ensure relevant participation of stakeholders. In a more general conclusion, the shared concern of the people for the place they live in can be used to mobilize people. As we know from literature, strong bonds of people with places may work constructively to overcome the risk of NIMBY reflexes. This may mean that it is worthwhile to involve people as early as possible in energy transition processes: in a preplanning phase or even when there is no planning at all. However, as mentioned, also then it is important to be clear what the status of a project is, and if possible, link it to (formal) planning processes to ensure people are not demotivated for future participation.

In relation to the RES-Groningen a number of observations can also be made. At the time of the charrette project Middag-Humsterland, the RES was under construction. Except for some participation of officials who were involved in the future RES, there was no direct link of the charrette project and the participants to the RES process. In the RES- Groningen 1.0., the Middag-Humsterland region, included in the greater area of the municipality Westerkwartier, does not appear to have been assigned a task. Part of the RES Groningen is a "Spatial Workbook" that considers the spatial consequences of renewable energy.[93] In that, the value of the Middag-Humsterland region in terms of landscape seems undisputed. However, the principle at stake is how this works in regions with less clear generally accepted landscape values but with

people that are equally attached to the area. Meaningful engagement of people in these processes requires a planned and coordinated approach of local and regional governments, including an alignment with other spatial claims. In that respect, the construction of a new high voltage power line in the area is illustrative of how also externally induced developments may cut right through any carefully constructed local plan.

In sum, based on this case study, we can say that the participation process was potentially very promising, and indeed some interesting ideas emerged from the project, in particular in terms of how to deal with the energy transition in a valuable landscape. However, some critical reflections must also be made due to the fact that only a small group actually was involved, no final plan was produced and there was no follow-up.

Ameland – Buren (Fryslân)

Another intervention/case study was conducted on Ameland, in the village of Buren. Ameland aims to be frontrunner in energy transition in the Netherlands the ambition is formulated to be CO2 neutral in 2035, 15 years ahead of the rest of the Netherlands, and as self-sufficient as possible. The island of Ameland has a long history of being involved in energy transition processes. Since 2006, by means of a Covenant, the municipality of Ameland, together with a number of energy corporates such as NAM and Gasterra, have started a long-term cooperation towards the reduction of CO2 emissions and energy self-sufficiency. While this started with a number of mostly technical innovations, the involvement and participation of local citizens, the Amelanders, has always been considered important. This is especially marked by the foundation of the Ameland Energy Cooperative in 2009, that successfully co-developed and implemented the construction of a solar park. At the time of its opening in 2015, it was the largest in the Netherlands. The AEC organisation has 300 members and 1,000 customers, and the linked company has 80 bondholders. The AEC is also involved in developing new (innovative) projects aimed at the production of renewable energy. As such, AEC illustrates how this works on the local level. But there is more in the Ameland case that is worthwhile considering. Although, as mentioned, the citizens of Ameland have been involved in various ways (kitchen table talks, customers, charrettes etc)[94] in the sustainable Ameland initiative, an Evaluation study that was commissioned by the partnership, indicated that participation could be further developed. The municipality and the Covenant partners have taken this message onboard, and are intensifying citizen engagement both for new, future projects meant for production of energy and for the built environment. In particular for the built environment, the Municipality of Ameland's leading principle is that citizens are by definition "the owners of the problem" and therefore they envisage a tailor-made approach. In practice this means that they will start conversations for all households to support their decision-making process to implement renewable energy interventions at house level, and at the same time make plans for the village community and island in terms of options for renewable energy production. In one of the villages, Buren, a concrete research project and intervention was developed to further explore and support this process, initiated by the village association in cooperation with the municipality of Ameland, Hanze University and Gasterra, one of the Covenant partners. In this project, several consecutive steps were taken. First, a heat scan was made of all the houses, and a survey on current energy use was distributed. Second, a full zero-scan of the total current energy situation in the village was done. Third, using an energy model designed for the house level was developed and tested. Fourth, an energy model for the regional level was developed and tested, all of this resulting in a plan or roadmap for energy transition for individual houses and for the village. Partially, steps (e.g. the house-model) developed in this project are included in the future planning and policy of the municipality (e.g. in the Heat Vision) and in the general approach of Ameland in relation to citizen engagement.

Fase	Activiteit	Omschrijving
Stap 1: Bewustwording	Enquêtes, warmtescans, led-lampen	Van alle (270) huizen in Buren zijn warmtescans gemaakt en onder bewoners zijn enquêtes afgenomen om inzicht te krijgen in elektriciteits- en gasverbruik, staat van isolatie, manier van verwarming etc. Via een subsidieregeling zijn ook led-lampen uitgedeeld.
Stap 2: Inzicht krijgen	Opstellen Nulmeting	Om beter inzicht te krijgen in de huidige situatie van het gehele dorp Buren zijn de gegevens van stap 1 gebruikt, en gecombineerd/aangevuld met andere data, volgens de methodiek van de Nulmeting.
Stap 3: Verkennen van opties	Toepassen Huismodel (We-Energy In-house)	Met behulp van de tool "Huismodel" hebben een aantal bewoners van Buren opties verkend voor hun mogelijke ingrepen/maatregelen in hun eigen huis.
Stap 4: Scenario's	Toepassen Gebiedsmodel (We-Energy Region)	Met het gebiedsmodel, met name gericht op de opwekking van duurzame energie, zijn mogelijke scenario's voor het dorp verkend, en in het grotere verband van het eiland Ameland.
Stap 5: Plan maken	Opstellen Plan/routekaart	Aan de hand van de bovenstaande stappen kunnen plannen of een routekaart gemaakt worden, zowel op het niveau van individuele huizen als dorp.

Figure 2: The general format of the Buren project (in Dutch)

Overall, in terms of the participation process, the Buren Energy project is a mixed case. On the one hand, almost all citizens (households) of Buren were included in the first stage of the project (e.g. all the houses received a heat scan and many people completed the survey); the village association initiated and participated in the project as well as a group of volunteers; and indeed, some local house-owners actively participated in testing the tools. In this, much of what happened was based on using existing networks on the island. On the other hand, due to Covid19 restrictions the original idea of organizing collaborative design-workshops (charrettes) with the broad participation of the citizens of Buren to make an energy transition plan for the village had to be abandoned. Strictly speaking then, the participation levels were much lower than anticipated. However, making a virtue out of necessity, it was possible to develop a set of interactive tools that can be broadly used to engage citizens in making plans for their houses and community. In fact, the approach that was developed for Buren directly feeds into the overall island-wide approach now developed by the municipality of Ameland for the energy transition process in general and for citizen engagement in particular. As mentioned, in this approach the active engagement of citizens is the guiding principle. Two tracks are distinguished in this. One track focusses on the built environment where the "tailor-made, talking to everyone approach" is leading. The clear message here is a three-step action plan for house owners: first, reduce energy use e.g. by insulation; second, make your house ready for low temperature heating; and third, link up to a sustainable energy source. This last part is taken up in the context of the entire island in the second track: in the context of the Covenant Sustainable Ameland, a number of innovative technical projects have been and are being developed for the production of energy (solar park, tidal kite, hydrogen etc.) for the entire island. Citizens of Ameland participate in these projects as consumers, co-designers and co-owners. Both tracks merge in current policies such as the Heat Transition Vision. Ameland has also submitted a plan for the PAW. In all of this, the relation with RES-Fryslân is maintained via the municipality of Ameland. In the RES, the Ameland initiative is briefly mentioned in the

context of local initiatives. On a speculative note, this seems – given the many developments on Ameland – an illustration that at present there is no straightforward and satisfying link between local (Ameland) development and the regional level.

Concluding

For this paragraph our leading questions concern local participation processes and their relation to the local context and to the regional level.

Overall, in all case studies it becomes clear that local context matters, in particular in social terms. In addition, we also see that other place related issues, such as concern for the landscape, may mobilize people. It was hard to identify relationships between local participation and the regional level. Although we know from literature that potentially local and regional energy planning and local initiatives not always align, we have seen in many if not all examples discussed here that there are strong and important links between local initiatives, cooperatives, and local government. In many cases a collaboration of cooperatives with local government exists. In some cases, local governments are indeed responsible for initiating local initiatives, e.g. in the case of Loppersum. Also, in Buren - although formally the project was initiated by the village association - the municipality played a strong role in facilitating the process leading up to the project, its implementation, and in linking it up to the broader island-Ameland context.

In any case, cooperatives are almost always present although their role in the successfulness of participation may vary. For the Paddepoel case it was concluded that a cooperative works better than a foundation. In this case too, however, the intervention of a broad cooperative (Grunneger Power) was not immediately successful as it interfered with the original plans. The Middag-Humsterland case shows that a cooperative does not necessarily have to be energy related: here a more general regional cooperative was the initiator for organizing the charrettes. In Buren, although Ameland has a strong energy cooperative, there was no direct involvement of a cooperative; however, here the strong village association played a crucial role.

Overall, from the case studies we see that connecting local initiatives to formal policies is possible, although in some cases not without struggle, potentially leading to loss of commitment (e.g. see Paddepoel).

Most cases indicate that it is worthwhile starting with a small group of dedicated people and start scaling up from there. Clear examples in Paddepoel en Loppersum. In Buren on Ameland the intervention was unintentionally small scale, but here scaling up is envisaged for the near future. Also, in Middag-Humsterland charrette project only a small group of people were involved however, in this case it was not successfully scaled up as far as we know.

Based on assumption from literature, there is strong indication that indeed local context in terms of e.g. socio-economic characteristics such as level of income, level of education, house-ownership etc. play a role in the way people are willing and able to participate. This also has implications for how people are approached for participation.

In terms of participation, it also seems ‘easier’ to have meaningful participation in rural areas and villages. Sense of community and stronger social networks explain part of this as well as that more tailor-made approaches and individual, direct contact are ‘easier’ to organize with lower population numbers. The cases of Loppersum and Buren for example show how important the combination of strong social village network and individual approach may be in people participating in energy projects. However, this should not lead to the conclusion that this is not possible on the scale of urban areas and neighborhoods – it may take more effort

Final remarks

All I all it can be concluded that multiple factors are relevant to realize RET. Governance is complex and asks for respecting the multiple character and several additional requirements. Key element of RET is not only quality of governance, however, but also right economic and technological conditions and including stakeholders and the general public are crucial. Sometimes biophysical and socio-cultural conditions are relevant, too. These elements are not always really aligned but should be connected. In addition, right procedures should be implemented to be able to involve citizens/stakeholders. According to literature, interaction of regional transition with higher and lower levels is required. Although transition takes place at regional or local levels, it is steered, determined or facilitated by higher level constraints or interventions.

From RES experiences can be learned that if it comes to regional transition in the Netherlands, the process and structure are in its infancy. This is also true for governance and participation. As a result, they are not sufficient. RES distinguishes various type of participation, such as be involved in political decision-making processes and co-ownership, but implementation is poor. So far, participation is often 'participation by municipalities', but that was not easy to realize, while involvement of all stakeholders has been even more difficult. RES focusses on governance and do not or hardly include other relevant domains, i.e. economy and technology. Further research into the relationships of these factors and domains may lead to better understanding and options for new widened policy approaches. We also advise to look at experiences in other countries with regional energy transition.

Literature suggests to involve actors in all stages, from vision development to implementation and in different domains: economy, formal decision-making, technology assessment or cocreation. Apparently, in the RES the focus was on formal top-down decision-making. In our case studies, however we found many options for other types of participation, such as exploring scenario's, co-creation of technology and co-ownership of energy systems. Literature also suggests to found long-lasting social networks around complex issues such as energy transition. Although some networks have been formed around Regional Energy Strategies, this asks for further development. New approaches should be implemented, looking for new alignments and new procedures, such as regional institutions, new intermediaries and new roles of relevant parties. RES is, we think, a good experience but it should be better connected to local initiatives, and to other domains, to be able to influence crucial economic and technological factors.

Notes and literature

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