Research Paper

Regional Territorial Energy Strategies

A roadmap to transform abstract climate goals into concrete spatial actions

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Abstract

The energy transition will have an enormous impact on our living environment. Besides the fact that new types of energy sources, energy storage and energy distribution need to be integrated into our (built up) landscapes, energy reduction will lead to a spatial transformation of our built up area. The Regional Territorial Energy Strategies (RTES) discussed in this paper will provide a framework in which the energy transition can take shape in a substantiated, balanced and controlled manner, supported by sufficient local embeddedness. Afterall, the energy transition will require an approach on several scale levels. The current Flemish energy and climate targets are a result of international engagements. At the moment however we see that there is a substantial gap between these ambitious long term goals and current actions in the field. Regions, which are voluntary cooperations between several municipalities, could fill this gap by transforming abstract goals in a concrete framework and actions. It allows taking local potentials regarding energy production, energy reduction and energy efficiency into account and linking these to the specific spatial context.

The focus of this paper is the regional level and the role this level can play in the climate and energy transition. It argues that setting goals is not enough and concrete actions guided by a roadmap are needed. Moreover, the climate and energy transition is foremost a spatial transition, because using a spatial perspective allows you to integrate several transition challenges, like climate mitigation, climate adaptation, circular economy, health, mobility and so on in concrete projects. This paper sets the scene of the current state of play of research on energy regions in the literature and continues with the situation in Flanders. It will introduce a roadmap on how regions can start to develop their own Regional Territorial Energy Strategy. Eight steps are presented that could guide regions in developing their own strategy. To conclude, several lessons learned are discussed and recommendations are made towards the Flemish level to support, facilitate and guide regions in the elaboration of their RTES.

Keywords

Spatial Development, Energy Transition, Climate Change, Mitigation

1. Introduction

The energy transition will have an enormous impact on our living environment (van Noordt, 2018, Sijmons, 2014, Wauters et al., 2017, Posad et al., 2016). Besides the fact that new types of energy sources, energy storage and energy distribution need to be integrated into our (built up) landscapes, energy reduction will lead to a spatial transformation of our built up area. Climate and energy targets keep evolving to more ambitious numbers (European Commission, 2019, European Commission, 2022).

These numbers however, need to be translated to the terrain. To concrete projects in cities, municipalities, countryside, industrial sites, harbours, and so on. When we do not succeed in this translation, the mathematic numbers of reduction, efficiency and production will stay meaningless. Potentials for this reduction and production is very much dependent on the specific spatial organisation of a certain territory. Rural areas with scattered small villages and valuable landscape characteristics need other approaches compared to areas with large industrial complexes and a high population density. Energy and climate targets should therefor not be spread out homogenic, but instead a place-based approach, tapping into the potentials, but also taking the barriers of a certain region into account, should be applied (Boeijenga et al., 2018).

Moreover, research within Flanders, but also abroad shows that spatial policy in function of the climate- and energy transition is needed on all scale levels (Declerck et al., 2019, Wauters et al., 2017, van Noordt, 2018). Also, standalone measures are not enough. A strategy, supported by all stakeholders, with an ambitious vision and roadmap which is also implemented over the years could give the desired result in the end. This approach requires a more active spatial policy where an evolution from facilitating and regulating needs to evolve to stronger coordination and leadership (van Noordt, 2018, Wauters et al., 2017). A more spatial approach to the energy challenges also has the benefit that other challenges, like climate adaptation, circular economy, health, mobility and so on can be integrated (Van Den Driessche et al., 2019). Regional territorial energy strategies (RTES) could provide a framework within which the energy transition could evolve on a substantiated, balanced and controlled manner supported by sufficient local support (Custers et al., 2021).

This paper wants to contribute to the already existing research and knowledge on regional energy strategies (RES) and starts with giving a brief overview of the literature. It aims to further argue the important role the regional level can play in the climate and energy transition. In addition to the importance of the regional level, it adds the explicit mentioning of a 'territorial' approach. This paper therefor adds the 'T' of Territorial to RES, so it becomes RTES, in order to emphasise this territorial aspect. This paper is based on two concrete cases in Flanders where a RTES is already elaborated, complemented by the results of a more generic research in which a roadmap has been developed to assist regions in developing their own RTES (Custers et al., 2021). The literature overview, together with the cases in Flanders leads to some conclusions on RTES in general and for the region of Flanders specifically.

2. Energy regions: linking multi-level governance with a territorial perspective

The importance of a multi-level governance approach in environment issues in general, but also for climate more specifically, has been more and more accepted. Moreover, multi-level climate governance is usually also conceived as multi-sectoral or multi-stakeholder governance, making it a model that can address not only all scales but also all relevant interest groups in global climate governance (Jänicke, 2017). The debate on which level is most important in climate policy put forward that each level, from global to local, has its role to play. It has its own responsibilities, challenges and opportunities. The importance of the regional level lays in the fact that the actors (political, social and economic) are able to recognize local specificities because of their closeness to the local context. There seems to be however a remarkable low attention for energy governance at the regional level (Hoppe and Miedema, 2020). Although the number of scholarly studies available on regional energy transitions are increasing, few see the region as the spatial scale where inter-municipal issues manifest themselves and are addressed. The region, defined as the level in between the local and the provincial, is often overlooked. Applying a regional perspective could however help small and medium scale cities that are in need of inter-

municipal collaboration, particularly in relation to the development and proper implementation of energy strategies (Boogers et al., 2016). Smaller municipalities often lack the capacities, investment room and interests (Hoppe and Miedema, 2020) to develop a proper strategy, despite their political commitments to for instance the Covenant of Mayors.

Although the regional level has been acknowledged by dominant theories like the multi-level perspective, these theories are also criticized for not sufficiently addressing spatial issues (Mattes et al., 2015, Juwet, 2022), especially at the regional and local level. Cities and regions are places where interactions between different transition processes take place and thus synergies and hindrances between different technological transformations may become apparent. Using territorial energy planning could play an important role in the discussion and imagination of the spatial and socio-political transformative potential of the these transitions (Juwet, 2020). Additionally, cities and regions are major nodes in wider networks of actors that may simultaneously develop their local resources and access and influence resources at different spatial scales. Transition analysis have often neglected where transitions take place and the spatial configurations and dynamics of the networks within which transitions evolve (Coenen et al., 2012). This lack of attention is surprising given the significant differences that characterize local energy transitions. Lessons learned however reveal that the context-specific character of a regional transition process is of key importance (Stremke, 2017). A better understanding of place-specific impacts on sustainability transitions seems necessary and even urgent to explain the geographical unevenness of transition processes.

When we go a step further and look at the actual implementation of renewable energy actions in a region, we see that there is a strong link between having a regional plan and successful implementation. Although developing a strategy through a comprehensive approach may require longer planning phases, regions using these approaches seem to be more aware of and, more importantly, to be better prepared to deal with the energy transition and climate change (Lutz et al., 2017).

Engaging in the development of a regional territorial energy strategy is new for many actors. A RTES is a new form of governance at a new level. It still remains to be seen whether or not this level will be successful in providing legitimate and effective policies that contribute to both carbon reductions as well as to welfare and wellbeing of regional residents and stakeholders. It seems to be crucial that after the development of a vision and strategy, the actor-network is maintained and implementation of actions part of the strategy is done, monitored and evaluated (Hoppe and Miedema, 2020). There is however at the moment a lack of comparative studies investigated the links between having a RTES and renewable energy implementation (Lutz et al., 2017).

3. Methodology

This paper is based on a research commissioned by the Department of Environment and Spatial Development Flanders performed in 2020 and 2021 in which the goal was to design a roadmap for RTES (Custers et al., 2021). First of all an exploration on the concept of 'Energy regions' was executed. This exploration was mainly based on existing initiatives in Flanders. At the moment several initiatives, spread out over Flanders, where regional energy strategies are developed are ongoing. By analyzing existing documents and performing six semi-structured interviews with key stakeholders more insights on the content of these initiatives, the process of developing a RTES and the spatial scale was developed.

Based on these results and complemented by input from the Dutch process of energy regions, a roadmap is presented on how regions can start to develop their own RTES. This roadmap has been fine-tuned during several workshops with key stakeholders and finally presented in an end report published by the Flemish government.

4. Cases

The first part of the research consisted of an exploration of the concept of an energy region. In this part ongoing initiatives were explored and compared. Data was collected using semi-structured interviews based on a written survey send to the participants up-front of the interview. In the end six interviews were performed. In this paper we will discuss two of the cases that represent regions which are furthest in the process of a RTES.

4.1 Case Pajottenland

The region of Pajottenland is located west of Brussels and is composed by the municipalities of Bever, Galmaarden, Gooik, Halle, Herne, Lennik, Liedekerke, Pepingen, Roosdaal and Sint-Pieters-Leeuw. In 2015 a study was commissioned by the province of Vlaams-Brabant in which the potential for renewable energy production in the province was investigated. The Pajottenland was indicated as a very promising region. In 2016 a coalition was formed by the province of Vlaams-Brabant, 10 municipalities and the two regional stakeholders of 'Klimaatpunt' and 'regionaal landschap Pajottenland & Zennevallei' to further investigate this potential. They applied for a subsidy by the Flemish region and once awarded, this region could work on a supported vision on the role of renewable energy from 2018 to 2021.

The ambition of the energy region of Pajottenland was to become energy neutral and climate robust by 2040. With this ambition both climate mitigation as well as climate adaptation goals were formulated. The strategy tried to find solutions for the increasing energy demand, the droughts, but also floods as well as to the challenge of keeping this rural area authentic. By commissioning a landscape study, several scenarios for reaching these goals were investigated. Moreover, a great emphasis was placed on a participative approach combined with a research by design exercise.

The research by design landscape study contained an energy system analysis, support base analysis, landscape and system analysis. Parallel with the elaboration of the vision and strategy, concrete actions were set up. Based on the first results of the landscape study an ambition framework was agreed upon with the province and the municipalities in 2019. This ambition framework formed the guideline for implementation of the first concrete, small scale actions and also served as the starting point for the vision and strategy. Continuing on the ambition framework and aided the landscape study, each municipality was putting the puzzle together to determine the ideal energy mix. This search was facilitated by the regional team and supported by the landscape-study. All these exercises put together determined the overall ambition of the region. Besides the overall ambitions a roadmap, specifying how to reach these ambitions, was elaborated. In this stage the study was complemented by a broad participation trajectory in order to gather input on the proposed energy scenarios and further fine-tune the strategy. In 2021 all the key-stakeholders signed the landscape vision 2040. The region is however very well aware of the fact this is not an endpoint: the journey is only beginning and further implementation is needed in order to reach the ambitions in the vision.

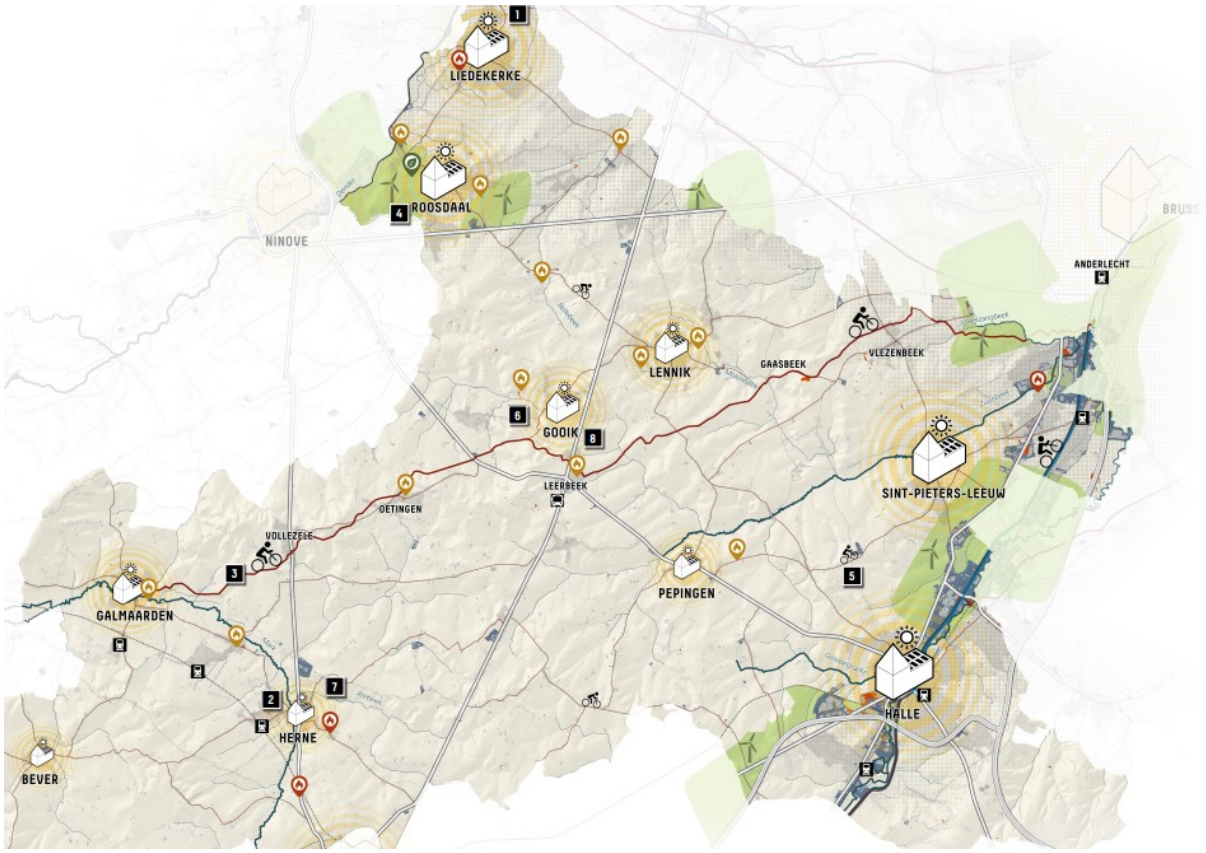

Figure 1: Impression of the landscape vision Pajottenland. Source: Provincie Vlaams Brabant (2022)

4.2 Case Denderland

This initiative started when more and more municipalities in the region were confronted with ad hoc applications to build wind turbines within their borders. They sensed a need to start a regional initiative to be able to properly judge ad hoc applications in order to effectively contribute to an optimal development. Moreover, several municipalities felt resistance towards the existing ad hoc developments and wanted more instruments to force wind developers to start a participatory trajectory with local inhabitants. In 2015 the development of a spatial vision for the energy landscape Denderland started. This project was part of a larger initiative, financed as a strategic project by the Flemish government (Depraetere et al., 2017). It focused on an area specific development plan for the zone surrounding the river Dender. The coalition consisted of the province of Oost-Vlaanderen and the municipalities of Aalst, Affligem, Denderleeuw, Haaltert, Liederkerke, Lierde, Roosdaal, Ninove and Geraardsbergen. This initiative had three main goals: (1) Stimulating the transition towards renewable energy, (2) improving the resilience in the area in function of climate change and (3) to develop the touristic potential. The energy transition goal was supported by two research projects commissioned by the province of Oost-Vlaanderen: (1) Development of a spatial vision for energy landscape Denderland (Custers et al., 2018) and (2) Drafting and implementation of a communication and participation strategy for the Denderland energy landscape. These two projects were complemented by two concrete pilots.

The initial ambition put forward by the partners in this project was to become climate neutral by 2050. But it was very much unclear if this abstract ambition was possible in this region. In order to investigate the possibilities of local, renewable energy production that took the carrying capacity of the region into

account a research by design project was started. This focused on the spatial translation of the abstract ambitions.

The intention that was set from the beginning was to couple the energy transition with spatial policy principles like reinforcement of villages and cities, liveable villages and cities, preservation of open space and transition to sustainable mobility. This integrated approach also resulted in a broad number of involved actors. In order to tap into their expertise and incorporate points of attention and concern, a broad participation trajectory was started parallel to the development of the territorial strategy. Several workshops and bilateral conversations provided input and contributed to the support base. The exercise resulted in a vision in which up to 50% of the current energy needs could be produced within the region. To become an energy neutral region by 2050 efforts to reduce energy use are as a consequence crucial. The results of this project are therefor only the starting point.

Figure 2: Impression of the spatial vision Energy landscape Denderland. Source: Custers et al. (2018)

5. Roadmap towards Regional Territorial Energy Strategies

Based on the research done and partly discussed above on already existing initiatives of RTES both in Flanders and The Netherlands and adjusted to the Flemish and international policy goals regarding climate, a roadmap has been made towards a RTES (Custers et al., 2021). A RTES should give substance to climate and energy targets on higher levels. It should create the spatial conditions in order to be able to reduce the energy demand and increase the energy efficiency and production of renewable energy. A

RTES takes up concrete commitments. The challenge is however not easy. The energy transition will involve a spatial, landscape, economic and social transition. A RTES should therefor not only take climate and energy into account, but use an integrated approach to be able to reach a resilient and sustainable society. It should create a narrative in which all actors are encouraged to take up initiatives within their specific domain in order to contribute to the effective realization of the strategy.

A RTES has the following goals: (1) formulating regional ambitions, (2) searching for space for the production, distribution, transmission, and storage of energy, (3) looking for synergies with other spatial transitions, (4) building a narrative which supports cooperation and involvement of actors and (5) guide the implementation of the energy transition. The roadmap elaborated below is the further detailing of the general principles of a RTES in a process flow. It describes the different stages and the tasks associated with it.

5.1 Initiative and preparation

This phase lays the crucial base for the whole RTES trajectory. At the moment, in Flanders, making a RTES is voluntary. Taking the first steps requires a political initiative in which budget and capacity needs to be found. Preferably all the different government levels are aligned, from the local to the Flemish, to commit in preparing a RTES. A leading partner should be assigned that takes the lead in the necessary further steps. In this first phase, all the key stakeholders and actors are mapped and contacted. Agreements should be made on the process, who should be involved and the division of work. A roadmap should describe al the steps that should be taken to come to an agreed RTES.

5.2 Research and analysis

This phase typically starts with mapping the energy demand and the energy production (current and potential) in the region together with the infrastructure. It is also the moment to start with a 'working' ambition: could this region become energy neutral or even energy positive? This ambition is adjusted in an iterative manner, until it is definitely decided in phase 5. The analysis on the potential energy production helps to define the ambition. Other sectors, like industry, buildings, mobility, agriculture and land use are also taken into account. This enables to detect opportunities and possible synergies. Finally a screening on possible energy building block is performed with an inventory on possibilities for energy production, energy storage and buffering. This inventory on possibilities are like different pieces of a puzzle and is used later on for scenario development and the actual development of the RTES.

5.3 Scenario development

During this phase the results of the research and analysis phase is integrated into spatial scenarios. Possible energy building blocks and design principles are identified and for each type of renewable energy a research by design exercise is done to develop different landscape concepts and visions. In the next step these concepts are integrated in one or several overarching scenarios.

5.4 Screening and consideration

Once the scenarios are elaborated, more details can be studied and the positive and negative consequences can be weighted. The goal of this stage is to get more insight into the impact of the scenarios on different areas like consumption and production, infrastructure, society and governance and the spatial context. In this stage, scenarios can also be adjusted, combined or excluded. In the end this iterative process should end in a final RTES which is supported by as many stakeholders as possible. Participation is therefor very important, both to incorporate the knowledge of (local) stakeholders and to create as much support for the RTES as possible.

5.5 Developing a Regional Territorial Energy Strategy

In this phase the RTES needs to be developed based on the considerations of the previous phases. Within this vision, the targets for the local production of renewable energy and renewable heat are also determined. The zones where renewable energy production and infrastructure for distribution, transmission, buffering, storage and conversion should be sited need to be decided and detailed in a spatial plan. These spatial choices should be well argued in order to facilitate spatial policy and permits. Now is also the time that a political consensus needs to be reached, both at a local, regional and higher (Flemish region) level, in order to ensure the political commitment and engagements needed for the next phases.

5.6 Implementation

Within this phase steps are taken to actually implement the vision and ambition of a RTES. This will have an impact on how local governments work, but also on companies and citizens in the region. In order to successfully implement this transition, existing policies need to be adjusted, and the right policy instruments chosen and applied. Moreover, strategic partnership with the key stakeholders identified in the previous phases, need to be formed. Also, in order to enlarge the support base for the strategy a broad communication campaign targeted towards local citizens explaining the importance of the strategy needs to start. All this, but also all the actions taken up by governments, grid operators, industry, citizens cooperatives, … should be summarized in action plans. These action plans give a concrete interpretation of the next steps to be able to execute the RTES.

5.7 Execution

After all these planning steps action on the terrain can be executed. Within this phase the initiative also changes from the region to local governments, grid operators, different sectors and individual citizens. Each of them is responsible for the execution of the actions in the action plan. The regional level stays in charge of the central coordination of the RTES and facilitates the cooperation and communication.

5.8 Monitoring and evaluation

Because the execution of the RTES is done by many different actors, each responsible for its own actions, it is important that the region keeps its role as coordinator. The region should therefor check if the implemented actions are in line with the RTES and if ambitions are reached in time. The region is also responsible for the contacts with the different sectors and should monitor the developments within spatial development, mobility, landscape and so on in order to guarantee the coherence between the actions and make sure the targets are reached. Based on the monitoring an evaluation can be made if certain actions should be adjusted or added.

6. Discussion and conclusion

At the moment we are at the starting point of the transition towards renewable energy. Renewable energy will take up a prominent place in space. If we want to use this transition to also take steps in a more sustainable use of space and repair some spatial evolutions of the past, like urban sprawl and the high degree of soil sealing, we need to act now. The energy transition can be seized for a spatial development with an added value for landscape and society.

This research was done in cooperation with several regional key actors, both with and without experience in developing a RTES. During the research process it became clear that cooperation between different actors like governments, companies and network operators, but also creating support from local

inhabitants and providing a well-organized process is crucial in the RTES process. It quickly became clear that a RTES should not only look for space for energy production, but should instead incorporate a system approach which integrates spatial, industrial and social developments with energy. The importance of a balance on the network and infrastructure for distribution, buffering and storage should not be overlooked. Lessons learned from both the Pajottenland and Denderland showed that there is great added value within the interaction between a vision on a regional level and individual projects at the local level. The Pajottenland showed that working on a regional level also provides more opportunities to actually become energy neutral within an area where the fringes are more built-up and industrialized and the core more rural. The Denderland region on the other hand showed that coordination between the regions is also needed in order to balance the potentials between the regions.

Challenges from the cases are the support base within the region for the vision to go towards energy neutrality. Despite the extensive participatory trajectory and the many initiatives set up by the project teams, most of the inhabitants were not reached, and workshops only attracted a few dedicated citizens. It is also very difficult to talk about complicated details of climate, renewable energy, different targets, visions towards 2040,… this information proved to be difficult and abstract to digest for an inhabitant. It seems therefor key to involve citizens more into concrete projects, when it becomes more clear what is actually meant. Challenges around using the right instruments to implement the energy strategy is also put forward. Also, new instruments to facilitate using the profits of for instance a large wind turbine to improve local conditions need to be investigated. At the moment these profits disappear to large companies, while the negative side-effects of these large scale turbines are for the local community. A roadmap combining all these issues and giving a clear step to step approach on how to continue from vision to implementation is missing.

Moreover, although local governments endorse the climate ambitions by signing the Covenant of Mayors, capacity was lacking to actually go towards implementation. The support of a dedicated team at the regional level was crucial. So, regions should not be left unsupported with this challenge, each level of government, but also the network organizations, different sector policies and companies should cooperate. This research project also showed, like others (Stremke, 2017, Hoppe and Miedema, 2020, Lutz et al., 2017, Juwet, 2020), that spatial multi-actor processes are complicated and take time. As such, there is a need for sound process management and guidance by professional, experienced teams.

This roadmap is the first step in providing a framework for regions to cooperate with the different key stakeholders in their region in making a RTES. The bigger challenge however still lays ahead: the implementation of the strategy. A fast and effective implementation still proves to be difficult. Monitoring and evaluation is there for key (Wauters et al., 2017, Hoppe and Miedema, 2020). The roadmap provides several suggestions to incorporate the RTES in spatial policy to be able to quickly start with concrete projects. But, the proof of the pudding is in the eating, and a learning process for all actors is needed. This also means a RTES should not be a static document, but should constantly evolve and be adjusted when new developments and opportunities occur or when barriers are encountered.

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