

Success factors and barriers for 100% renewable energy-regions

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Abstract: During the last decade so-called energy-regions have been established all across Europe (cf. for instance Lund, 2007 and Krajacic et al., 2011). The over-all goal of such projects is to restructure the energy supply system in order to make a transition to renewable energies and to increase energy efficiency (Müller 2014). The motivation and intentions of the initiators extend beyond the environmental aspects as much as they vary due to geographical location and diverging demographical and ecological preconditions.

The aim of the presented study is on the one hand to verify the expectations held by initiators of these energy-regions, and on the other hand to examine the transferability of success factors. Therefore, interviews with experts were conducted to explore the individual understanding of a “100% renewable” or “self-sufficient” energy-region. Furthermore, an analysis on barriers and drivers which emerge during the implementation process was made.

As it turned out, conceptions and processes of energy-regions differ widely in certain aspects. For instance, the constituents traffic or embodied energy might be neglected, thus not playing a part in the regional definition of the fully renewable concept. Nonetheless, similarities have also been identified such as intense persuading of different players and difficulties with environmental authorities acting as barriers for most energy-region projects.

The study is based on the analysis and the profile of four energy-regions in Switzerland: Toggenburg, Goms, Knonauer Amt and Zimmerberg. Tischler et al. (2006) introduce a suitable guideline to study and compare different energy regions. Within this framework each community or city reaches the four development stages towards an energy region (Preparation – Development – Implementation – Evaluation) at a different pace. In conclusion, it can be said that the success of energy-regions crucially depends on the perseverance, conviction and engagement of its initiators and promoters.

Keywords: renewable energy regions, success factors, barriers.

Introduction

Whether a bio-energy village, an energy-autonomous community or an energy-region (projects and initiatives often differ in their designated nomenclature), they all display similar characteristics.

The dominant themes centre on regenerative regional energy provision and increased energy efficiency. As other studies have shown (Roberts 2014, 7-12), apart from cleaner energy provision, economic and social factors also play a major role. The increase in regional value added, independence from energy sources from the outside world, or job creation are often associated with energy-regions (Roberts 2014, 7-12).

The aims of this paper entitled 'Success Factors and Barriers for 100% Renewable Energy-Regions' are as follows:

- The concepts of '100% renewable' and 'energy self-sufficiency' will be more closely examined.
- The development and implementation processes on-going in energy-regions will be categorised and compared.
- With reference to specific case studies, the barriers that slow down or directly hinder the development of an energy-region will be identified. Particular emphasis will be placed on whether similar or identical barriers are present within the different energy-regions.

With the help of research literature and interviews with experts, we aim to answer and discuss the following three research questions:

1. How should a '100% renewable-energy-region' be defined?
2. What are the biggest barriers/challenges to creating an energy region?
3. What solutions have energy-regions adopted in a bid to overcome barriers?

The paper is structured in the following way: Section 2 deals with the results drawn from reviewing the literature relative to concept definitions as well as to the model of an ideal development and implementation process within energy-regions. Section 3 describes how the interviews were organised and how the energy regions to be analysed were selected. Section 4 describes the results of the expert interviews, which are then discussed in section 5. Section 6 seeks to identify research shortfalls and issues that may need further examination, and section 7 presents the conclusion.

Literature review

Definition of an Energy-Region

In Switzerland, an official definition for an 'Energy-Region' does not yet exist (ARE et al. 2012, 27). However, energy-regions can be identified as those regions that are developing a series of energy projects and have several stakeholders interested in supporting such projects on a regional level (Spät 2007, 11). According to Hoppenbrock & Fischer (2012, 4) an energy-region uses its regional potential to produce environmentally compatible and sustainable energy. ARE et al. (2012, 27) maintain that measures to increase energy efficiency are as important as the production of renewable energy itself.

The size of the region is thus dependent upon two factors: the region as a harbour for both energy production potential, and scope of action (Hoppenbrock & Fischer 2012, 5). There must be enough potential to facilitate the production of enough renewable energy to satisfy the regions annual needs. The scope of action aspect covers the geographical extent of the region with which the various stakeholders are then able to identify. This is relevant in order to ensure 'personal responsibility for energy provision'. Spät (2007, 11) perceives a direct link between the size of the region, the number of available stakeholders, its funding potential and its political decision makers.

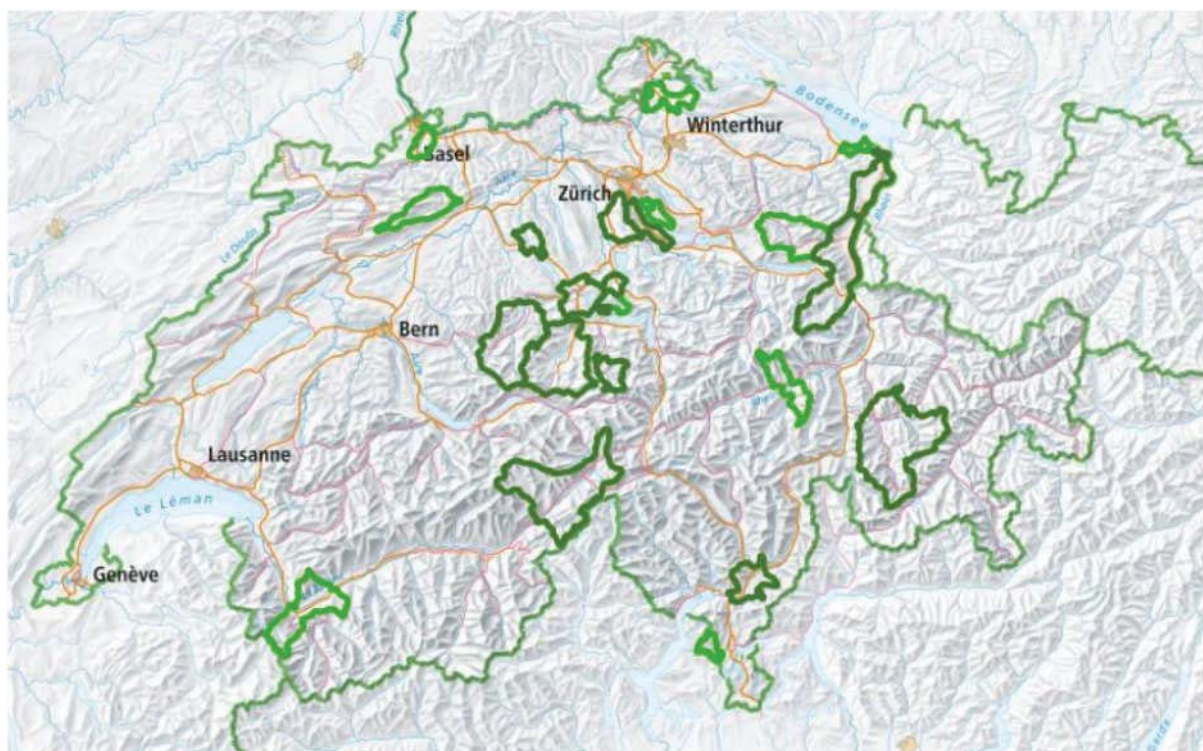


Figure 1 - Energy-regions recognised by the Swiss Federal Office of Energy. Source: <http://map.geo.admin.ch/> (14.11.2015).

Swiss regions that fulfil certain criteria (see Energie-Region 2015) can apply to become part of the Swiss Federal Office of Energy's Support Program (BFE). Once on this program, the region has the right to display an official logo and to use the official title of 'Energy-Region'.

The definition of Energy Self-Sufficiency

For the definition of a '100% renewable-energy-region' we rely on the concepts of self-sufficiency (Luft, 2012) and energy autarky (cf. Müller et al., 2011) as well as on the opinions of the interviewed experts (cf. section 4.2).

The concept of energy self-sufficiency is directly connected to the implementation and development of renewable energy (McKenna et al. 2014, 241). As this is a relatively recent concept, to date no precise definition exists. The following two studies attempt to get to the heart of the term 'energy self-sufficiency'.

In the study by Müller et al. (2014, 5800-5810), a region can be deemed energy self-sufficient when there is no necessity to import large quantities of energy from other regions. Müller (2014, 5802) admits that it is hardly possible to reach total self-sufficiency, since regions are not insular systems, but 'open' systems between which there is an on-going, mutual exchange of information, materials, people and energy. Energy self-sufficiency as a vision is synonymous with the use of sustainable local energy resources and as such depends upon three basic elements:

1. The use of local energy resources to provide energy rather than importing energy;
2. Decentralised energy systems;
3. Increased energy efficiency.

McKenna et al. (2014, 241-247) also define energy self-sufficiency as 'the principle of using either local or regional energy resources as opposed to importing energy'. The goals set by the energy-region and its stakeholders define the desired level of the region's energy self-sufficiency. To achieve this, McKenna et al. differentiate between 3 forms of self-sufficiency (2014, 242-243):

- General self-sufficiency: There is a significant tendency towards regional decentralisation of energy provision. Self-sufficiency is a 'by product' of decentralised energy provision and is not itself defined as a specific goal.
- 'On-grid' or balance sheet self-sufficiency: The region or community is seen as energy self-sufficient on an annual basis. In order to deal with variations in supply and demand, network structures such as energy storage facilities, electricity and gas networks are necessary.
- Off grid self-sufficiency: The region is completely separated from its neighbours on an energy provision level (island management) and covers its own energy demand by 100%. To be able to achieve this, extensive facilities to store the energy are required.
- 'Off-grid' self-sufficiency is not always the ideal solution. Regional storage facilities, network infrastructures and other costs necessary to achieve such 'self-sufficiency' also have to be taken into consideration. It is often the case that such regions or communities make do with existing local energy sources, implementing energy efficient measures which in turn reduce dependence upon fossil fuels. Such measures also lead to a strengthening of regional economic viability and to job creation in the region (ARE et al. 2012, 31-32).

Portrayal of the development processes within Energy-Regions

Establishing an energy-region can be achieved in different ways. In their book, 'Auf dem Weg zur 100% Region', Tischler et al. (2006) describe an ideal implementation process, as shown in figure 2. They sub-divide the developmental process of energy-regions into 4 phases: I. preparation, II. development, III. implementation and IV. evaluation. The four main milestones to achieving this are: 1) initiating 2) format-ting responsible organisation 3) study of potential is completed, and 4) pilot projects are installed (see figure 2).

Method

The contents of this paper are based on both internet research and literature review. However, the essential information is gathered from focussed interviews with initiators from existing energy-regions.

Expert interviews

In view of the distinctly differing situations in which energy-regions find themselves, expert interviews are a suitable method of answering the pre-determined research questions. The main thread of the interview favours a qualitative method of extracting data, which also facilitates spontaneous, additional questions during the interview. Questionnaires relative to expert interviews also take account of internet web pages posted by existing energy-regions.

The four expert interviews were not only fully recorded but also taken down in writing. The recording transcript permitted the faithful rendition of quotes. In an initial phase, the evaluation of the expert interviews enabled us to divide the research questions into themes, providing them with a corresponding nomenclature. In the second phase, the themes were summarised and tabulated.

In the third phase the material was reappraised. The synergy and the differences of opinion expressed by the various experts were then examined. Specific key terms expressed by individual experts were then extracted and compared.

Selection of Energy-Regions

The following criteria were applied for the selection of the energy-regions under investigation:

- Differing geographical locations;
- Both rural and urban locations;
- Differing environmental requirements;

- Differing socio-economic structures (see table 1);
- Differing stages of development within the energy regions.

According to these criteria, the following four Swiss energy-regions were selected:

- Toggenburg, an 'energy valley' in the canton of St. Gallen;
- The Goms energy-region in the canton of Wallis;
- The Knonauer Amt energy-region in the canton of Zurich;
- The Zimmerberg energy-region in the canton of Zurich.

Table 1 - Demographic and economic classification of the energy-regions. Sources: BFS (2012, 2013), EFD (2015).

	Toggenburg	Goms	Knonauer Amt	Zimmerberg
Population (Inhabitants)	45'261	49'965	4'569	120'048
Surface area (km ²)	488,8	113,0	585,8	104,3
Population density (inhabitants per km ²)	92,6	442,2	7,8	1'151,0
Population development (2000-2010) (%)	-4,9 to -2,5	≥ 15,0	≤ -5,0	5,0 to 9,9
Taxable income (Swiss Francs/inhabitant/year)	51'836	77'976	37'145	89'258
Employment development (2001-2008) (%)	-1,9 to -0,1	8,0 to 15,9	< -3,9	4,0 to 7,9

The Toggenburg energy valley and the Goms energy-region were chosen because of their geographical locations and because they are already at an advanced developmental stage in terms of energy-regions. The Knonauer Amt energy-region was selected due to its proximity to the Zurich urban area and its already advanced energy policy. The Zimmerberg energy region was of interest to our study because it is just starting out, and being part of greater Zurich area it has a much higher population density level. Thus, the rural regions of Toggenburg and Goms can be compared with the peri-urban region of Knonauer Amt and the urban Zimmerberg region. The decline of both population and jobs in the Toggenburg and Goms regions, as well as the high population density in the Zimmerberg region are strikingly obvious (see Tab. 1).

Results

The responses derived from the expert interviews helped us to answer the research questions quoted in the introduction to this paper.

The definition of an Energy-Region

To understand what constitutes our vision of an energy-region, the two following questions are relevant:

1. What does the definition of a 100% renewable energy-region include?
2. What degree of energy self-sufficiency (according to McKenna et al., 2014) should be aimed for?

Each of the four experts interviewed came up with a different answer to question 1 (see table 2). All four regions demonstrated the will to provide energy from sustainable, local (renewable) sources. This was particularly relevant with regards to electricity and heating supply. Mobility was only included in

the Toggenburg region. Although the other regions did see mobility as an important factor, they felt that it could not really be influenced.

Table 2 - Interviewees differed as to the definition of renewable energy-regions.

	Toggenburg	Knonaer Amt	Goms	Zimmerberg
Definition of „100% renewable“	Electricity, Thermal energy, Mobility (incl. air travel), Grey energy	Electricity, Thermal energy	Only the general use of local resources is relevant	Electricity Thermal energy

Table 3 shows which of the three forms of self-sufficiency (taken from McKenna et al., 2014, 242-243, see 2.2) surfaced during the expert interviews. The Toggenburg and Knonaer Amt energy-regions both strive for 'on grid/balance sheet' energy self-sufficiency, so that during the year at least as much energy is produced as is needed. For the Zimmerberg region the term 'tendency towards general self-sufficiency' holds true (McKenna et al., 2014). Hallenbarter (Goms region, 2015) and Mueller et al. (2014) agree that regions should not aim for total off-grid-energy self-sufficiency – an island system – that functions completely independently.

Table 3 - Differing interpretations of the term 'self-sufficiency,' according to McKenna et al. (2014).

	Toggenburg	Knonaer Amt	Goms	Zimmerberg
Definition of Self-Sufficiency	On Grid/Balance sheet	On Grid/Balance sheet	no declaration	Tendency towards general self-sufficiency

Barriers and challenges to establishing an Energy-Region

The results from the expert interviews show that in the four regions under examination, collaboration between the various stakeholders involved was, in most cases, highly successful. Stakeholders who failed to get involved (apart from community representatives) were not perceived as a barrier. None of the stakeholders were against creating an energy-region. Egoism, opposition and high administrative costs were thus not mentioned as risk factors.

From the barriers listed in table 4 several common points of agreement clearly emerge. In Toggenburg, Knonaer Amt and Goms the major challenge is to convince people that investment in renewable energy is worthwhile. This is a challenge because people are not really interested in the topic, plus the fact that financial investment is required for which there is little available funding. Another important aspect is that building projects (renewable energy plants such as wind farms or solar installations), which need authorisation, frequently fail because of conditions laid down in landscape, nature or environmental laws. Especially in the sparsely populated Toggenburg and Goms regions, the withdrawal of committed employees could compromise the continuity of energy projects. The Zimmerberg energy-region was the only one to perceive low development potential for renewable energy as a barrier.

Table 4 - Barriers to the creation of energy-regions.

Barriers and Challenges	Toggen-burg	Knonauer Amt	Goms	Zimmer-berg
<ul style="list-style-type: none"> • Economic viability of energy production plants • Lack of demonstration of the additional benefits and savings • Long pay-back period of renewable energy installations 	X	XX		X
<ul style="list-style-type: none"> • Absence of human resources • 'Unsuitable' people for a project • Committed stakeholders cannot be tied down for the long term 	XX		X	X
<ul style="list-style-type: none"> • Energy issues are not uppermost in peoples' minds • Low demand, although supply is present • Short term thinking 	X		XX	
<ul style="list-style-type: none"> • Low level of acceptance among the population • Lack of approval for the energy projects 	XX			
<ul style="list-style-type: none"> • Single projects cannot be implemented • Failed projects 	X		X	
<ul style="list-style-type: none"> • Low energy prices 	X		X	
<ul style="list-style-type: none"> • High costs • Lack of financial resources 			X	X
<ul style="list-style-type: none"> • Landscape and nature protection • Protection laws for home and countryside 		X	X	
<ul style="list-style-type: none"> • Politically conditioned founder groups 		X		
<ul style="list-style-type: none"> • Local authorities show no interest 			X	
<ul style="list-style-type: none"> • Few resources (e.g woodland) and therefore low development potential 				X
<ul style="list-style-type: none"> • Lack of - or inadequate organisational form 				X

What solutions have energy-regions adopted in order to overcome barriers?

An important criterion to creating a successful energy-region is the political will of each community to play an active role within the energy-region. This establishes the basis for successful collaboration beyond community boundaries, and helps to 'boost start' the implementation of projects (see 2.3). Political will gives legitimacy to the creation of renewable energy initiatives, and justifies the provision of both personnel and financial means (Müller 2014, 243). Only people who are very committed and convinced of its necessity can manage an energy-region. Such people are mostly voluntary. They are tireless in their efforts to convince both population and stakeholders alike as to the desirability of energy-regions.

Table 5 - Solutions for successful energy-regions.

	Solutions
Toggenburg	<ul style="list-style-type: none"> • Each community in the region is included • Transparency and raising awareness • Strive for dialogue with critics • Personnel is capital • Persistence, patience • Professional management
Knonaer Amt	<ul style="list-style-type: none"> • Savings due to collaborative action • Readiness to tackle tasks together • Solidarity within the region • Successes experienced • Benefit production • Sponsoring
Goms	<ul style="list-style-type: none"> • Committed personalities • Persistence • Presence • Project transparency • Raising awareness • Persuasion • Value creation compensating weak local economy
Zimmerberg	<ul style="list-style-type: none"> • A healthy financial situation in the communities • Projects that have been successfully implemented

To succeed, an energy-region depends on committed public relations initiatives and raising awareness among all the stakeholders concerned. Absent stakeholders or critics have to be convinced through dialogue about the use of projects. Transparency of communication together with a great deal of patience and persistence have contributed to Toggenburg's progress as an energy-region. Another contributory factor is that Toggenburg has created a special office, and rewarded some employees. Committed people, whether paid or voluntary, provide an important basis for a successful energy-region (Grob, 2015).

To sum up, three main points clearly emerge from the listed solutions (table 5):

1. Wide consensus among all the communities in the region and willingness to cooperate;
2. Committed, motivated and persistent people as promoters;
3. Raising awareness through constructive, transparent communication, and public relations.

Discussion

The energy-regions examined in this paper differ from each other in size, geographical situation and economic capacity (see table 1). In addition, each region is at a different stage of development relative to its installation as an energy-region. The most interesting aspect is revealed by the comparison between rural (Toggenburg, Goms) and peri-urban/urban (Knonaer Amt, Zimmerberg) areas.

Rural regions

Due to their earlier start as energy-regions, rural regions like Toggenburg and Goms have already gathered a lot of experience. However, they have also suffered setbacks with some projects, and their Development Association has already had to cope with employee changes. They are therefore of the opinion that it is important to motivate promoters and other stakeholders. Both rural regions have a low population density and suffer from the decline of both population and jobs (see Table 1). This is

in line with the statement of Roberts (2014, 57), that the main motivation for creating an energy-region lies in its economic situation. Exploiting renewable energy and the value it adds at a local level will ultimately create new jobs in the region (ARE et al. 2012, 3) resulting in the rise of employment levels.

Periurban and urban regions

Urban regions like Knonauer Amt and Zimmerberg have a much higher population density. They started out later as energy-regions and were financially much better off (see table 1). A healthier economic situation opens the door to better opportunities, and potential can be exploited more efficiently. Communities can afford to take part in both individual projects and development associations. However, in urban regions with a high population density it is doubtful that energy needs can be covered 100%, because the potential for renewable energy sources is lacking. It is not possible to judge whether acceptance of energy projects is higher or lower amongst the urban population than it is in rural regions, or whether political processes are faster or slower.

Comparison of the developmental processes within the Energy Regions

When comparing the energy-regions as shown via the road maps in figure 2, various similarities and differences in implementation come to light. Toggenburg and Goms were amongst the first energy-regions in Switzerland to get started. Both regions acted as inspiration to other regions such as Knonauer Amt (Höhn, 2015) and Zimmerberg (Porro, 2015). The developmental processes were, however – taking into account the current differing frameworks – very different (see figure 2):

1. The road from initiation to implementation were of varying speeds
2. Milestones, such as 'potential studies' were achieved in different phases and in a different order.

Linking barriers and solutions

In this part, with the help of some of the important barriers that energy-regions come up against, we aim to show the solutions that have helped the regions under examination to overcome them (see table 6).

As the results show, convincing people within the communities is not always an easy task. Sometimes a community's legislative goals are not always compatible with the 'vision' of energy-regions. In an attempt to meet and solve this challenge, Tischler et al. (2006, 46) state that it is vital to extend the parameters of the core group and supporters via additional key stakeholders. Such people should be well connected and rooted in the region. This increases credibility and the possibility of winning over the more skeptical stakeholders by force of reasoned argument.

The low level of acceptance and the lack of interest displayed by the population towards energy matters is one of the biggest challenges facing energy-regions. This can be resolved by taking specific, suitable measures such as the dissemination of information, installation visits, excursions and inauguration celebrations. The media can also make a useful contribution to promoting acceptance by publishing positive articles on the subject of energy-region development. Raising awareness amongst children and young people via workshops or project weeks in schools are initiatives of a more long term nature. It is nevertheless important to make the younger generation aware of the energy problems we face both today and tomorrow.

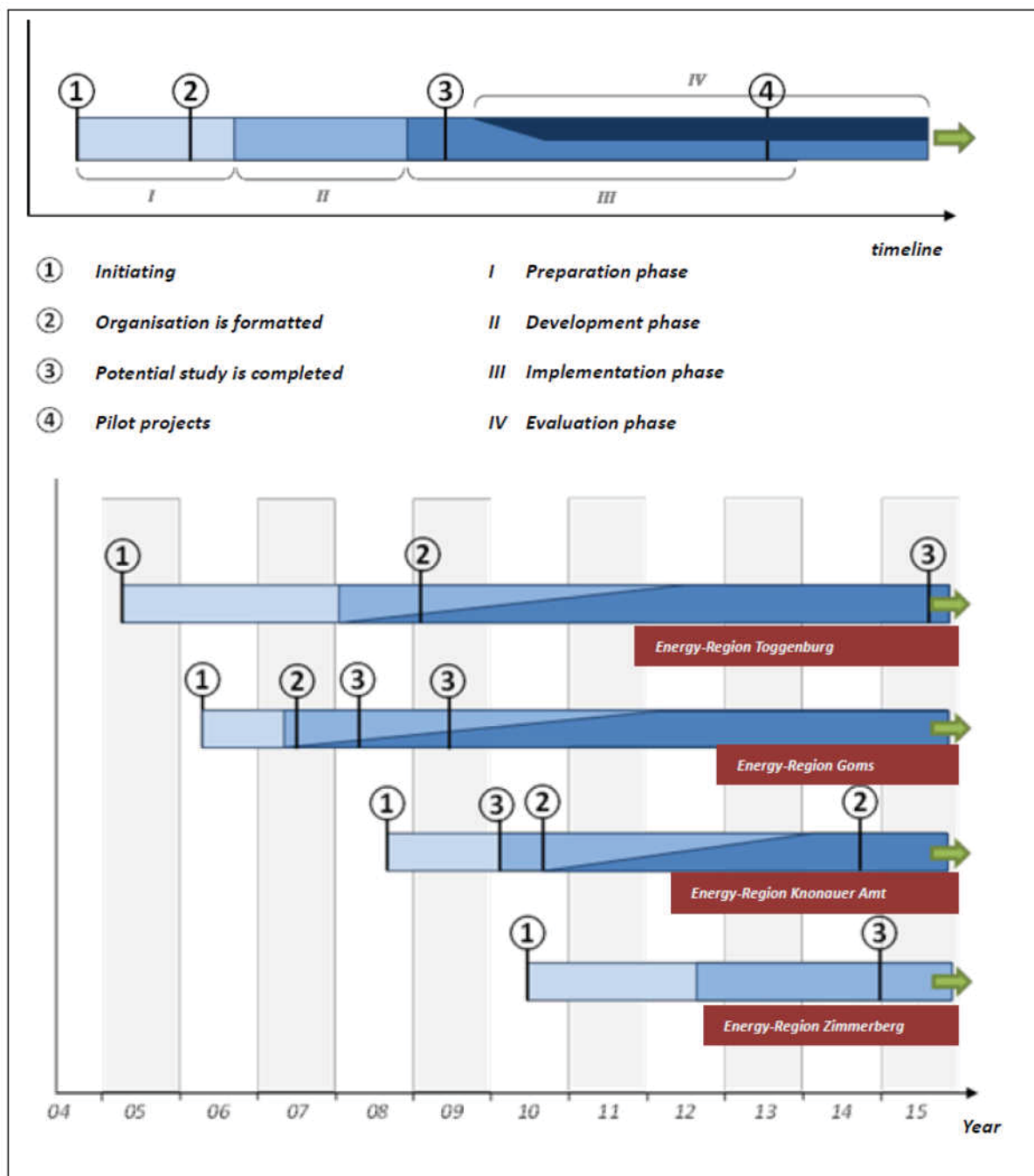


Figure 2 - Ideal Road Map according to Tischler et al. (2006) and comparison of the road maps between the 4 regions.

Table 6 - Barriers with their corresponding solutions.

Barriers	Solutions
The difficulties facing communities and administrations	Promoters who care and key stakeholders to convince the population
Low acceptance among the population	Raising awareness and public relations
Landscape and nature protection laws hinder projects	Making contact in good time and clarifying legal frameworks
Political parties in energy-regions	Establishing development associations
Making appointments with very busy stakeholders	Persistence and patience

Projects such as wind farms or solar installations frequently fail because of landscape, nature or environmental laws. Nature and environmental protection bodies make justified objections to wind, solar or hydro-electric projects. It is therefore necessary to establish a constructive dialogue and collaboration with authorities from the outset of a project. This task can be undertaken by a Development Association, acting as an arbitrator between authorities and project leaders.

The very nature of party political grouping means that their message will not reach the entire population. It is therefore advisable to form neutral development associations able to communicate with all the stakeholders. This will hinder individual parties seeking to gain an advantage by vote catching prior to elections.

Awareness of the fact that the development and implementation of an energy-region is a long term process that requires patience and tenacity is essential. These two virtues are indispensable to promoters. Setting up appointments with stakeholders can be tedious and long drawn out, which in turn can delay the development of an energy-region. As Grob (2015) aptly observes, it is "a constantly back breaking task and in no way a foregone conclusion".

Success factors

By examining three Swiss energy-regions together with one from Austria and one from Germany, ARE et al. (2012, 76-78) have identified the following success factors in the creation and management of energy-regions:

1. Context: energy prices, costs of renewable energy, promotion by the State.
2. Stakeholders: promoters and investors are especially important as is cooperation between all the stakeholders.
3. Input factors: Availability of sufficient natural energy-resources within the region, suitable locations for energy production, capital under favourable conditions, know-how.
4. Development process: Vision and goals, organisational structures, lighthouse projects, communication and raising awareness, knowledge creation and linking.

In point 1, by context we refer to exogenous factors which are established either nationally or internationally and over which regions have little influence. Based on our expert interviews it becomes clear that the success factors 2 and 4 mentioned above, in all the cases we examined with differing start up situations and frameworks, merit particular attention. Likewise, the initiators of the energy-regions, the so called 'promoters' have been the vital backbone for all the successful regions. Their tireless and mainly voluntary involvement has been an invaluable driving force for the energy-regions. Having a firm base in their locality means they are highly motivated and committed to the cause of pushing projects through for the benefit of the region. Such 'promoters' are vital key factors in the

establishment and progress of energy-regions, and without their ceaseless efforts, progress in this direction would scarcely be possible.

Our interviews also reveal that a far reaching consensus of opinion between all the stakeholders is also necessary. This can be achieved by raising awareness and public relation exercises, this is, however, a slow and steady longer term process. Each region tackles these challenges in differing and very individual ways. In some German regions, for example, renewable energy is on the increase with a higher level of acceptance, fuelled by active citizen participation and cooperatives (Ott & Wieg 2014, 829 - 841). Only when every community in the region is convinced by the efforts of promoters and initiators to embrace the creation of an energy-region, can the structure take form. This is important in order to include the goals and strategies expressed by each individual community in the overall picture.

Müller (2014, 243) argues that political will acts as a 'signal' to the communities, providing a legal framework which empowers them to make financial investments and create employment opportunities. However, it would seem that an important element in this process is the presence of a non-party political organisation, e.g. a Development Association. Such an organisation helps to increase acceptance among the stakeholders, especially among potential investors and within the population as a whole. Spät (2007, 47-50) sees success factors as the correct order of the regions based on size, community-wide structures and opportunities to access regional funding programs.

While attention to general principals of innovation can improve policy-making, sensitivity to a broad range of contextual variables is likely to be more important in the domain of renewable energy innovation policy than in conventional innovation policy-making according to IRENA (2013). Therefore, in the attempt to endorse the results of this study to other countries, the Swiss particularities (e.g. high standard of living, increasing comfort in buildings, reliable energy supply security, non-fossil power mix, democracy and participation in decision-making) have to be taken into account.

Critique of methodology

The use of international studies is limited in relation to the Swiss context. In the national literature review as well as in the expert interviews presented in the sections above, responses seemed to be biased resulting in purposive optimism expressed by overeager and engaged authors and experts, as they faded out not only the grey energy but also the energy consumption of transportation in contrary to the international references (e.g. Lund et al., 2011).

Outlook

As a relatively new phenomenon, energy-regions provide an ideal breeding ground for future research. Below we have highlighted some possible issues that may be useful in helping energy-regions to continue to evolve in the future.

- What values can actually be generated within the region? How can they be measured?
- Does energy self-sufficiency make good sense in view of globalisation and networking? If it does, how can energy self-sufficiency be intelligently defined?
- What lessons can be learned from those energy-regions or communities that have failed?
- What role do new or existing labels such as 'energy-city', or 'energy-region' play in the quest to become an energy-region?
- How can the Federal Government, likewise the Swiss Federal Agency of Energy develop energy support programs? How can the next steps/phases be tackled?

Conclusion

In conclusion, we can say that the answers derived from the interviews we carried out mirror the situation relative to the diversity of the different energy-regions. In Switzerland, energy-regions are a new phenomenon. As it turned out, conceptions and processes of energy-regions differ widely in certain aspects. For instance, the constituents' traffic or embodied energy might be neglected, thus playing no part in the regional definition of the fully renewable concept. Nonetheless, similarities have also been identified such as the intense persuasion of different players, and the difficulties with environmental authorities acting as barriers for most energy-region projects.

With committed promoters leading the way, energy-regions can be changed in the long run. It is a long and hard process which can only happen thanks to the support and determination of all the stakeholders involved. It is therefore necessary to ensure that both initiators and development associations are allowed the freedom to structure the processes they consider best suited to the task. We can see that the implementation process takes account of local circumstances, for which reason it is necessary to permit individual solutions. When establishing frameworks, the Federal government has to support the work at a local level and recognise the work done by development associations without exerting too much 'top down' pressure.

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