'Energy Regions' in Austria – Conceptual building blocks for the analysis of regional actor networks which aim to realise sustainable energy systems

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Introduction

Since the 1990s, the phenomenon of 'Energy regions' can be observed in some German speaking countries. The label 'Energy Region' or derivates like 'Solar Region' or 'Bio-Energy Region' are used to denote regional1, energy policy related initiatives aiming to implement innovative forms of energy supply and/or to change consumption patterns which often involves participatory processes of target setting (in German called 'Leitbild-Prozess').

In Austria, for example, in some regions individuals or groups aiming at more sustainable energy supply and consumption systems perceived both the market mechanisms in place as well as the given political system to be inadequate to mobilise the regional potentials for alternative energy supply. They wondered why the regional resources such as biomass from forests and agriculture or wind- and waterpower potentials should not be used to a higher extent - to relief the environment from the externalities of fossil energy consumption and to support the regional economies. As they had observed market failures and what they perceived to be inadequate political response on different policy levels, they elaborated on actor networks to overcome the barriers to more sustainable energy systems. They focused their activities on the regional level (speaking of regions at sub-provincial level up to NUTS3-regions, comprising a couple of 10.000 people) which allows for frequent face-to-face interactions.

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[1] The term is usually attributed to (more or less clearly delineated) geographical areas much smaller than nation states in which a diverse set of actors aim to contribute to a general change towards more sustainable energy systems by local action.

In the context of these initiatives, regional activities are undertaken in order to facilitate a regions contribution to a broader trend towards more sustainable energy supply and consumption patterns. Usually groups of stakeholders (sometimes also rather large groups of interested people from the region) define a set of shared long- or medium term objectives related to energy and institutionalise it in some kind of manifesto that shall provide an orientation for diverse regional actors (be it policy makers, companies and/or households) and hence allow for a co-ordination of their respective actions. By applying this strategy, these Regions expect to achieve a forerunner position with regard to sustainable energy patterns. As benefits, besides advantages for their individual regional economy, usually also contributions to societal sustainability in general are expected, at least in the long run.

The relatively new phenomenon of Energy Regions is not yet thoroughly conceptualised[2]. It attracts more and more interest among regional activists, policy makers and scientists though, as some larger research and dissemination projects demonstrate (see e.g. the German network www.bioregio.info and CEnCE[3] at EU-level).

For a preliminary definition, we could state that 'Energy Regions' are such regional initiatives, which try to build up an outstanding profile of a (sub-national) region by special efforts to overcome unsustainable energy systems, and which follow some kind of a manifest commitment or specified targets with regard to the sustainability (in various senses) of the energy supply and consumption system, aiming e.g. at regional 'energy autonomy', or a certain share of energy provision from renewable sources.

A current research project on 'Energy Regions' in Austria

In order to assess whether such initiatives actually can (in theory or already empirically) contribute to a transition of the socio-technical system of energy supply, the idea of 'Energy Regions' needs first to be empirically scrutinised in empirical case studies and should be juxtaposed with some pieces of theory about regional governance.

In an empirical research project[4], lasting from 2006 to 2007, the Inter-university Research Centre for Technology, Work and Culture (IFZ) in Graz[5] is currently examining HOW exactly such regional processes of building up a profile as 'Energy Region' and participatory target setting are aiming to produce WHAT effects. We analyse the set up and history of four

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[2] Although there are some commonalities of the empirically found cases of 'Energy Regions', there has not much been done in terms of the conceptualisation of the new phenomenon: There are for example no explicit definitions of the term. Assumptions about how 'Leitbilder' can actually co-ordinate (different kinds) of action remain implicit in most cases. The strategies underlying activities of network building have also usually not been spelled out yet.

[3] Connecting Energy Clusters across Europe, http://cordis.europa.eu/innovation/en/policy/cluster-net-text.htm

[4] We gratefully acknowledge the funding of this project by the Austrian Ministry of Transport, Innovation and Technology (BMVIT) within the Programme 'Energy Systems of Tomorrow' (www.edz.at).

[5] Besides the IFZ in Graz, being project leader, further scientific partners of the consortium are 'Ökologie-Institut', Salzburg, 'ARC Systems Research', Vienna and 'Florian Faber Communications Consulting', Vienna.

specific 'Energy Regions' in Austria, initiate and accompany an exemplary learning process among them and aim to conclude on the potential of such initiatives as an instrument of co-ordination and governance on the way to more sustainable energy systems.

The project is entitled "'Leitbilder' in 'Energy Regions' or how to co-ordinate technical change towards sustainable energy systems in regions (LeitER)". It has been granted funding (within the programme 'energy systems of tomorrow', an initiative of the Austrian Ministry for Transport, Innovation and Technology (BMVIT) and will last from February 2006 to July 2007.

Approach and methodology of the project

The basic approach of the project is to create a platform for main actors of Energy Regions to jointly learn by exchanging about the history of the individual 'leitbild' processes and their impact on technical change. They will be supported by experts on regional development and on communication and network strategies.

Main methodological steps are:
- developing a joint framework for analysis (done)
- self-documentation of initiatives along those guiding questions (ongoing)
- focus groups with further key persons (following)
- interviews with further persons, incl. 'relevant outsider perspectives'
- sharing perceptions on single case studies with colleagues and experts
- comparing case studies concerning differences and similarities
- identifying major elements of context conditions & successful combinations with process design
- concluding on transferabilities and possible multiplicators
- concluding on general feasibility of 'governance by Leitbildprozess in Energy Regions'

The trans-disciplinary character of the project – bringing together activist from the Energy Regions with social scientists and experts on energy policy, regional development, network development and communication, as well as scenario methodology – is reflected in the joint development of a glossary, comprising practical and adopted definitions of scientific terms and theoretical concepts which might be of help to understand the processes under examination.

The aim of this contribution is to describe the idea of 'Energy Regions', to explain the aims, approach and methodology of the project that the IFZ has set up to examine the new phenomenon, and to briefly introduce some conceptual building blocks, that we think might be useful for our endeavour.

1. The diversity of 'Energy Regions' in Austria

We selected four Austrian 'Energy Region' initiatives to be examined as case studies[6]. Major representatives of the respective official carrier organisations of these initiatives have been co-opted to participate in the project. These are

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[6] Three of these four Regions have been awarded a price in 2004. They have been selected together with nine other Austrian 'Energy Regions of tomorrow' within the framework of an Austrian R&D programme called

A) „Energie-Vision Murau"
    (an initiative in parts o. Upper Styria, represented by energy agency Obersteiermark),

B) „Energie-Region Weiz-Gleisdorf"
    (an initiative in parts of East Styria, represented by WEIZ Innovation Centre)

C) „Energie-Region Oststeiermark"
    (a project in East Styria, - including Weiz-Gleisdorf subregion- , represented by
    Regional Management Oststeiermark)

D) „Wärmeschiene Salzburg-Hallein"
    (part of Salzburg Province, represented by Ökologie-Institut and members of the
    provincial government)

In each of these four regions different processes and actor constellations can be observed[7].
Te Energieregion Weiz-Gleisdorf (B) for example consists of a myriad of private and
commercial initiatives around the use of solar energy. These initiatives were linked under a
regional perspective only partially and very slowly. In the broader Region of Oststeiermark
(C) to the contrary, the Energy Region Initiative developed out of an official planning
exercise. It soon was adopted by an official regional agency with strong ties to the provincial
government. The chances that this 'Energy Region' and its objectives are visible in different
processes of agenda setting of the region might therefore be much higher than in the first
case. Such a 'top level engagement' is not necessary to make a difference though, as the
Energievision Murau (A) demonstrates. This latter initiative has been developed jointly by a
local energy agency and a consulter on participation processes. It involved a high number of
local people interested in energy issues and has shown great impact e.g. on the business
strategy of two local enterprises deciding to withdraw from the installing of fossil fuel based
heating systems. The project Wärmeschiene Salzburg-Hallein (D) finally originated in a
provincial plan on energy which was taken up by a regional heat supplyer. In this case, 'hard

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'energy systems of tomorrow'. This programme focuses on energy efficiency, the use of renewable energy
sources and systems innovations and strategies (see http://edz.at/english.htm). The call asked for "already
realised and exemplary activities, measures and projects with regard to energy on a regional/local level in four
thematic fields: Successful implementation of sustainable energy systems / highly innovative energy related
single measures with local or municipal relevance / Implemention of Leitbilder (joint guiding visions), visions
and plans / Lokal and regional initiatives (e.g. civics, projects at schools,…)". For the assessment of regional
initiatives by a jury, the following criteria have been used: "Contribution to sustainable development as defined
by the programme ,energy systems of tomorrow' / Support for the use of renewable energy /
Integration/participation of the local population in the implementation of the measures / Attention paid to basic
needs and services / Attention paid to efficiency (energy, resource and cost efficiency) / Contribution to
employment, income generation and quality of living / Innovativeness and effectiveness of the measures /
Exemplary character and potential for diffusion and multiplication" (own translation, source:
http://edz.at/wettbewerbe/index.htm downloaded 29.5.06).

[7] Out of the great diversity of initiatives that were awarded prices as 'Energy Regions of tomorrow' in 2004 (see
the last footnote above) we decided to conduct case studies on those initiatives that are most different but still
meet our above mentioned definition. They are different with regard to their 'decentrality' from a very 'bottom
up' type to rather 'top down' approaches. We still have to bear in mind that we start our modelling or theory
building on the new phenomenon with a very limited and highly heterogeneous data base.

facts' have been created in form of a link between two dispersed district heating systems, providing the opportunity for more areas to connect to the greater system. This infrastructural development is hence creating a different situation for many municipal decisions in a certain area and is triggering an exchange of views and joint action (maybe even some form of regional identity?) among those affected. This last case obviously differs significantly from all other cases, to an extent, that it probably hardly fits to adequate definitions of 'Energy Regions' but still yields a big potential to improve our understanding of regional infrastructure development and its governance.[8]

As noted above, there has not been done much in terms of defining the phenomenon of 'Energy Regions' and of categorizing different forms of it.

In order to learn from an exchange of (comparable) experiences and to (prudently) generalize findings, different context conditions and respective strategies need to be categorised in - to some extent - comparable classes. Although the number of our case studies therefore is very small, we still have to start and develop a kind of inter-subjective language and to more generally conceptualise the different processes observed.

But how to conceptualise the phenomenon of 'Energy Regions' then? And how does it fit in the current discourse on regional governance?

The following sections address these questions by firstly distinguishing three levels of analysis:

On the first level, the cognitive and communicative processes involved in 'Energy Regions' shall be analysed: How is orientation generated by specific ways of communication? This (micro-)level of analysis focuses on individual actors and the dynamics of their interaction e.g. the communication of 'expectations', 'visions' and 'Leitbilder'.

A second level of analysis shall focus on recurring patterns and the structure of Energy Regions. Here different notions of networks like actor networks (networks of translation),

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[8] For this case theoretical work on large technical systems (LTS) might be particularly helpful. There was no bottom up process leading to a shared understanding of being an 'Energy Region' in the Salzburg-Hallein region in the fist place. The initiative originated from a provincial energy plan, which has been followed up by some managers in the regional utilities (which became a private company in heat supply later). They decided to link two urban areas with a heat network, a decision likely to improve the sustainability of the regions energy system. From this starting point, municipal decision makers in the region began to realise that they are part of a cutting edge development. The actual connection of their municipal areas to the network creates new framework conditions for private and public decisions concerning energy supply and industrial development - specific opportunities as well as constraints – or infrastructural and institutional lock-in, to use the terms of the large technical systems (LTS) approach. Since they have these conditions in common now, they start trying to jointly optimise their decisions on this mutual ground and might even develop joint policies in the future. Infrastructure and following institutions is hence effecting, one could even say co-ordinating the behaviour of actors, and in our case created a special kind of 'Energy Region'. At least in such cases involving physical infrastructure as a backbone of an 'Energy Region', the concepts of large technical systems (role of system builders, technical and institutional lock-in, economies of scale, scope and networks etc.) might be of high value.

policy networks and clusters will to a varying extent turn out to be helpful for analysing our empirical observations.

Finally, we want to reflect on the way Energy Regions are embedded into broader systems of regional governance, for example with regard to innovation.

2. How to understand cognitive processes *in 'Energy Regions'*

The role of 'expectations' and 'Leitbilder'

The objective to contribute to 'sustainable energy systems' is very demanding: Since each local context differs in terms of available resources[9], economic activities and resulting energy needs, to determine what a 'sustainable energy system' of a region would look like and how communities could get there has to be figured out for each regional context separately. And since sustainability is such a normative concept, such conceptualisations have to relate to the values and perceptions of all the people which are relevant for a change in these specific regional energy consumption and supply patterns. 'Energy Regions' therefore imply very intense processes of communication about preferences and about expectations with regard to the future.

As far as theory and integrated models of such processes of visioning and co-ordination are concerned, 'social learning theory' seems best suited to become a point of departure. The approach of 'communities of practice' (CoP), for example, could provide an analytic framework differentiating several modes of belonging to social learning systems, of activities that are crucial for the existence and success of such systems and the processes of identity building they are important for (Wenger 2000, Fox 2000, Hislop 2003 and - more critical - Swan et al. 2002).

But the CoP approach, having been developed with regard to the sharing of professional knowledge, does not offer concepts useful for describing the *subject matters* of the processes of learning, agenda setting and co-ordination in Energy Regions: The individual or shared expectations, visions and the guiding principles with regard to future energy systems that people and other actors can commit themselves to or not.

With regard to such elements, specific concepts have been developed in science and development studies (STS), especially within the discourses on 'Technikgenese' and 'the social shaping of technology' as well as in certain branches of innovation studies. Among these, the notions of 'expectations', 'Leitbilder' and 'visions' are of particular importance and should be integrated into a better conceptualisation or 'model' of social learning in Energy Regions.

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[9] This can be primary energy potentials as well as human and other resources

The important role that the communication of 'expectations' plays in the shaping of technologies and in the shaping of conditions for their diffusion has attracted scientific attention only in the last few years. Today, however, it receives attention from scientists of different disciplinary backgrounds (see Brown et al. 2003, Van Lente and Rip 1998, Konrad 2004, Borup et al. 2006). Some of these works touch on "significant issues of importance to practitioners, be they scientists and technologists, managers making tactical and strategic decisions, or policy makers and societal actors […] Strategy development (including scenarios and portfolio analysis) and science & technology foresight are activities where understanding of expectations is of key importance (and the exigencies of doing these exercises often take precedence over understanding what is being done") (Brown et al. 2003).

"Leitbilder" are often used for co-ordination: for a strategic orientation of companies, for urban and regional planning and in the regional realisation of goals for sustainability. In the early 1990s, 'Leitbild' has become a major term of the discourse on technology development (Technikgenese), after Dierkes and colleagues differentiated the co-ordinating and mobilising functions of 'Leitbilder' especially in R&D (Dierkes et al. 1992, Dierkes et al. 1995, Gleich et al. 2004). While it is impossible to translate the German term 'Leitbild' into English, it can be said that the much used term denotes special kinds of guiding principles or rather visions shared by a set of actors. The term 'Leitbild-Prozesse' is hence used to describe systematic (and often participatory) processes of collective target setting. As such it has been conceptualised as a new form of 'soft' governance instrument, e.g. in the German discourse on 'Leitbild-Steuerung' (Brand 2002). In the context of Energy Regions, the quest e.g. to become energy autonomous or to 'rely solely on renewable sources of energy from the year xy onwards' can be conceptualised as Leitbilder. These elements obviously play a very important role in clustering individual projects, in mobilising resources and guiding diverse decisions. The concept of 'Leitbild' might have to be concretised with reference to the concept of technical generalisations (Kuusi and Meyer 2002). It seems anyway to be suitable in the explanation of resource mobilisation, the co-ordination of private and governmental agendas and the establishment of economic networks.

In the English discourse, especially in the context of 'innovation studies', we find either references to the German term 'Leitbild' too, or a distinction of 'guiding visions' into individual ones and collective ones (with the latter being conceptualised similar to the German 'Leitbilder' (Berkhout 2006). The term 'vision' - applied to something between 'Leitbild' and Science Fiction - features also centre stage in the approach of 'vision assessment' (Grunwald 2004) which could inform our analysis too, if it proves applicable.

Of importance might also be the reflection of different dynamics induced by communication in the mode of 'bargaining' as contrasted to 'arguing' (Saretzki 1996).

3. *How to understand* the structure *of 'Energy Regions'*

An in-depth case-by-case analysis of individual communications and events in a quasi biographical mode is certainly advisable to better our understanding of Energy Regions. In order to derive some (to some extent) generalised recommendations for activists and policy makers though, we need especially to identify recurrent *patterns* of such individual communications and institutional processes. This means a shift of perspective from individuals or at least single collective actors and unique processes to classes of (aggregated) actors and prototype processes – a heuristic shift, which is discussed at length in sociology as the micro-macro problem. But how can we get to robust categories and prototypes? We will probably have to search through all available case studies for recurrent patterns and for concepts and categories that have proven to be in some way 'useful'. And we need to be very careful, reflexive and transparent about this 'selection of prejudices'.

An adequate model of networks

Sets of interactions that are not (fully) characterised by hierarchical control or market mechanisms are nowadays usually described as social networks (Weyer 2000). Energy Regions are often called and perceived to be networks, and that often right from the beginning when they were invented – as networks. Although there has been some resistance on both sides: among the majority of researchers doing network analysis and among most sociological theorists, there are ideas on how notions of social networks could actually help bridging the micro - macro divide (i.e. individuals vs. society) in sociological theory and methodology (Weyer 2000).

A methodology, which might reduce the influence of pre-scientific categorisations, which might hence be able to provide some rather 'objective' insight into useful categories and processes is the formal quantitative network analysis (Jansen 1995, 1999). I am convinced it would be very fruitful to perform such an analysis on our four case studies. This is unfortunately not possible within the budget of our project though. What is absolutely necessary and also achievable is a rough analysis of intentional network building processes, using some shared categories across the single case studies, which have been developed jointly by the main actors in those Energy Regions. On the basis of an analysis of these networks which contrasts the intentions of actors with the observed outcomes and which compares the processes in the different Energy Regions, we will come to some hypotheses about how differences and similarities can be explained, to what feature of the specific contexts this or that difference could be attributed etc.

If we conceptualise Energy Regions as inter-organisational networks (Weyer 2000, p.20) we can highlight some commonalities: All origin in an initiative of a few people, search support in defined communities and aim to support regional economic activities by connecting diverse

regional actors and resources with both some weak and some strong ties, and try to provide access to arenas of regional governance in order to influence political agenda setting and support schemes.

Policy networks

Constellations of actors and their networks are at the heart of interest for the 'Energy Regions' in their attempt to make a difference. Policy networks are hence an important metaphor of social relations and soft mechanisms of co-ordination. But also as an analytical approach, the policy network approach[10] has been very influential in the political sciences from the early 90s (Benz and Furst 2002) – mainly by focussing attention to the interaction of actors of diverse kinds also beyond the sphere of government agencies. The analysis of policy networks seems to be of crucial importance for the understanding of Energy Regions, since the success of such endeavours intrinsically depends - as all empirical evidence shows - on the establishment of relationships of certain kinds with certain actors from within the realm of regional policy making and the fulfilment of different kinds of intermediating functions. In order to analyse the power of such initiatives, the newly established 'arenas' of negotiation and communication of objectives for regional energy policy among private and governmental actors will best be described in terms of policy networks.

The seductive language of actor network theory

It will sure be of interest to consider also other entities than persons and organisations to be elements of these regional networks related to 'Energy Regions'. Certain objectives and 'leitbilder', provincial energy plans but also physical infrastructure like the tubes of district heating systems are certainly interfering with persons and organisations in ways that are important to analyse. Hence the request for a symmetrical conceptualisation of relationships of those non-human entities with human actors which became a core principle of the actor network theory (ANT) (see e.g. Callon 1986, Latour 1996, Schulz-Schaeffer 2000, Brand 2004), might be very attractive. And the results of an analysis using this radically innovative language would surely enable to produce some entertaining documents.

But the ANT-approach advises us to start analysis without any assumptions on how such networks usually are made, what types of actors we will most probably discover, what institutional constellations are relevant etc. For our endeavour of developing an inter-

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[10] As early as in 1998 some scholars complained about the Babylonian confusion with myriads of different uses of the term 'policy network'. The concept is still quite influential, as a metaphor but also as an 'analytical toolbox'. Until today, there has not been much convergence about an appropriate theoretical foundation of the concept, although of course there are tight relationships to the concept of 'social systems' and different kinds of network theory, more actor related ones as well as more system related ones. Some adaptations grounded in recent institutionalism are particularly referring to cognitive concepts, like the advocacy coalition concept (Sabatier). The latter is especially interesting since it might be a fruitful context for the study of 'leitbild'-processes, which are highly relevant for 'Energy Region' initiatives.

subjective language for the comparative analysis of Energy Regions (especially if we think of highly constrained resources for such analyses) this radical approach will probably not be able to provide us with any methodological orientation that would be practically applicable for a real-world analysis of Energy Regions.[11] To conceptualise a principle equality and bi-directionality of all relationships among 'actants' might rather disguise important differences and specialities in certain relationships within the network, including hierarchical dependence, one-sided power over resources, one-way communications etc.

Having to forget before starting an analysis for example that 'there is' the institution of mayors (with certain role models connected to it etc.) would be a severe setback for a scientific[12] and comparative analysis of Energy Regions.

To state that 'power is always the result of a battle or negotiations' might be completely true - but the radical focus, that the 'sociology of translations' puts on the processes between individual actants, and the fact, that these processes are all treated equal – being analysed as acts of translation - pulls our attention away from patterns, structures and categories, tools that – as I argue – are helpful and necessary for an efficient analysis of Energy Regions, maybe even for any comparative analysis of social processes.

In order to generalize findings and transcend them from the level of anecdotes and single case narratives we rather have to *focus* on those returning patterns and structures. To guide this search, in my view - we have therefore to resort to rather classical theories or, if these are not 'fit' for our subjects, we have to tailor-make our own frameworks from diverse theories and models.

Once we have adopted such an eclectic approach, we may find that certain elements of ANT can be integrated fruitfully. Especially the set of four consecutive stages used by Callon to describe the 'domestication of scallops and fishermen of St. Brieuc Bay' (namely the phases of problematisation, interessement, enrolment and mobilisation of allies), may be turned into a heuristic tool that is helpful in describing the processes involved in building up networks of Energy Regions.

As stated earlier on, theory of social learning, and especially the 'Communities of Practice' (CoP) approach might be a good starting point for such an endeavour, since it could help to categorise actors by their level of belonging to distinct communities, to categorise activities either as related to the core of certain communities or as some kind of 'border work' etc. (Wenger 2000, Hislop 2003, and for a connection to ANT: Fox 2000).

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[11] I am not the first one to remark, that ANT is not a theory in the sense that is commonplace in the studies of sciences but rather a completely new approach to research.

[12] In terms of 'inter-subjectivity' achieved by a common 'vocabulary'

Energy Clusters

There is an EU-Project called CEnCE, which just started to analyse what it calls 'energy clusters', giving us an actual occasion to reflect upon the relationship in which we can put the phenomenon of 'Energy regions' with the concept of clusters in economics and innovation theory. This project has not yet thoroughly defined what an 'energy cluster' is. But if a broader definition of 'cluster' is applied, extending the term to any network of companies with some sort of institutionalised exchange among them - which provides a framework for co-operation e.g. along value chains as well as links to regional government and to knowledge based services and which is functional in the facilitation of knowledge transfer, - than some of the Austrian ‚Energy Regions' can certainly be called an energy cluster. Since the organisations in charge of the 'Energy Region' initiatives describe their functions often as facilitating knowledge transfer, intermediating e.g. between science and regional enterprises, or as facilitating market developments, e.g. by setting up biomass logistics etc., they are - or at least could become - core to the establishment of specific 'clusters'.

4. 'Energy Regions' and their role in Regional Systems of Innovation

The 'Energy Region' initiatives share a lot of aims and features with other regional activities which try to foster innovation at a regional scale.
'Energy Regions' - or rather the persons and organisations engaged in such processes - usually define it as their objective to intermediate between diverse actors. Most often communication is sought between energy activists on one hand and political decision makers on the other hand. In other cases it is the intention to co-ordinate between decision makers in companies, policy makers and energy activists, and at least in some cases it is intended to organise systematic communication with larger parts of the regions population.
Some 'Energy Region' initiatives fulfil the function of providing orientation and influencing the direction of research and entrepreneurial activities by initialising and moderating regional processes of participatory target setting or the creation of guiding visions of regional development with regard to energy. Such 'Leitbild-Prozesse', are often institutionalised under the label of 'Energy Regions' and correspond with creating a specific profile of a region which aims to become for example 'energy autonomous'. Such processes usually involve many different actors from local government, companies, NGOs, energy initiatives etc. and hence result in the integration or at least convergence of different knowledge cultures.
The organisations in charge of the processes (The regional energy agency of upper Styria, to give just one example) define connecting actors and facilitate knowledge flows (e.g. by meetings, newsletters etc.) participate in knowledge production (e.g. applied scientific projects), building up trust, aligning producers and consumers (e.g. the hands-on facilitation

of market development by establishing a regional system of logistics for biomass) as their primary tasks. Although they often do not call this 'intermediation', these organisations are clearly functioning as intermediating institutions contributing substantially to what we described as regional systems of innovation.

Following a differentiation of different loci of intermediation by Rohracher (2005), with regard to 'Energy Regions' it seems most promising to have a closer look on the hypothesis of the so called 'systemic intermediaries' (van Lente et al. 2003). The question, whether the organisations in charge of the 'Energy Region' processes really fulfil (if only at the regional level) the functions of systemic intermediaries? has - to our understanding - not been answered yet. Are 'systemic intermediaries' possible at all on regional level?

'Energy Regions' as regional parts of broader transition strategies

Main driver for many 'Energy Region' processes are rather broad environmental and social concerns, hence they mostly refer to the objective of sustainability – e.g. by aiming for 'sustainable' energy systems. An interesting question for theoretical considerations and empirical verification is whether these processes and the organisations in charge can consequently (under certain conditions) play an integrative and actually co-ordinating role across policy fields – or whether they have to remain rather single issue initiatives.

'Energy Regions' as regional initiatives use proximity of regional actors to build up tight networks of innovation but with a broader societal objective in mind: the general shift (also at higher scales) towards more sustainable energy supply systems, in German often referred to as 'Energiewende'.

Evidence for this 'acting local – thinking global' approach and broad perspectives on socio-technical change feature prominently in declarations of objectives of several carrier organisations of 'Energy Region' initiatives such as regional energy agencies or inter-municipal planning and development organisations.

Most of these regional processes aim at some forerunner position. This is however seen as instrumental for a broader change that should spread globally. Consequently, the initiatives usually welcome to be imitated. This distinguishes them from many other more competitive endeavours such as clusters etc. and shows that they rank societal benefits of multiplication higher than the specific economic benefits related to keeping a regional forerunner position. Although the activities related to 'Energy Regions' are focused on the regional level, and resemble those of other intermediary agents in the context of 'Regional Systems of Innovation', there obviously are some significant differences with regard to the scope of their objectives.

'Energy Regions' adopting an integrating perspective incl. the demand side

The 'Energy Region' activities under study are pursued for being functional with regard to the overall aim of creating a sustainable energy system in the region and beyond.

Due to their generally systemic perspective – which is partly induced by the aspiration of 'sustainability' – activists of 'Energy Regions' tend to look at complete production-consumption chains, which sheds light on the demand side – an area often overlooked in R&D and policy circles. The activities around 'Energy Regions' hence again support a widening of perspectives and a more holistic view on the socio-technical system of energy supply and consumption.

This tendency can be amplified by an often observed effect of system dynamics: Once an organisation, like, e.g., an energy agency, has been established to accomplish one specific task with regard to regional development and energy policy - it naturally develops an organisational self-interest: Individuals professionally involved with these organisations will aim to – besides advocating for desired changes - enlarge and diversify the scope and portfolio of their activities in order to stabilise the organisation and create conditions for its growth.

Many 'Energy Regions' also attempt – more or less successfully – to reach out to larger groups of the regional population by means of systematic communication processes like scenario building exercises etc. They might thereby use the dynamics of regional identity building for their initial purposes. This possibility might again be an incentive to open-up the definition of the issue they were initially created to deal with, e.g. by integrating aspects of regional employment opportunities and value creation etc.

'Energy Regions' as test bed for new forms of governance

Most 'Energy Regions' are meant to be testing grounds for cutting edge technologies and new technical configurations e.g. in the fields of renewable energy, combined heat and power generation or energy efficiency. Many experiments concern the innovative embedding of technology in specific social contexts, such as the combination of new pumping technology for wood pellets with new forms of delivery contracts merging to new services in fuel retailing. Besides on technical innovation, 'Energy Regions' in most cases are explicitly working on organisational innovations too and also experiment with new forms of governance. The latter is often induced by the attempt to integrate and *co-ordinate policies* of different fields in the spirit of sustainability. Besides technical developments, they consequently often address (explicitly or implicitly) a further key aspect of socio-technical change –the institutional arrangements and modes of governance. They can in fact be understood themselves as attempts of creating alternative or additional arenas for the

definition of regional energy policy, which are open to interested individuals and organisations.

'Energy regions' thereby reflect - on a regional scale - to a high extend the general trend towards network oriented forms of governance[13], and could function as testing fields for new institutional configurations. The term 'regional governance' since the 1990s marks a turn from top-down 'regional planning' and more reflexive forms such as 'integrative planning' to the recognition and promotion of more co-operative and network oriented processes, which involve co-operation and negotiation of governmental and private actors and some degree of regional autonomy (BENZ 2004).

Since 'Energy Region' initiatives aim to intermediate not only between different market actors but also between local energy activists and policy makers, they attempt from the beginning to establish interfaces with mayors and other institutions of regional governance. This is one of the most tricky parts of their endeavours, since no blueprints for the integration of such corporatist elements into political processes are available, and their legitimacy can easily be put into question.

In this context, the above mentioned establishing of regional processes of participatory target setting or the creation of guiding visions of regional development with regard to energy ('Leitbild-Prozess' as this is called in German) can be interpreted as attempts to draw on participation as a resource of legitimacy and allow regional activists to interact with policy makers and the wider public at the same time, hence facilitating regional policy making.

The importance of such regional arenas as test-beds for concrete policies and maybe also for new configurations of governance can be seen in innovative support schemes for electricity generation from renewable sources or for solar heating, which have often first been developed on local or regional level before diffusing and being adapted on the national level.

5. Conclusions

As mentioned above, we have only started to deal with this new subject of 'Energy Regions' a few months ago. It is therefore not yet possible to present any sophisticated results or conclusions.

The example of 'Energy Regions' shows, however, that regional innovation networks do not necessarily restrict themselves to specific functions of regional innovation support, but can well endorse to support broader and large scale transition processes, which is in many cases

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[13] The term ‚governance' – besides other things - marks a widening of perspective in political sciences, which happened mainly in the 80s and 90s. Due to this widening of perspective, - inspired by the observation, that in modern, highly differentiated and complex societies, there are many limitations to hierarchical steering, brought to light, that besides the hierarchical government/ rule by centralised power and the coordinating function of market forces, there are other, more network oriented or corporatist instruments of policy making and implementation. It meant furthermore that non-governmental actors and the prominent role they actually play in policy making in modern societies were better recognised.

induced by the integrative and holistic claim of 'sustainability' as an objective, the related methodology of participatory target setting and consequently by attempts of policy integration14. As we have shown, the conceptual framework of regional systems of innovation (RSI) in its classical form tends to fall short of capturing this dimension. To deal satisfactorily with such phenomena, it seems to be very fruitful to enrich the RSI framework with concepts from the studies of socio-technical transitions.

With regard to our motivation for this contribution, (to ask for comments on our perception of the phenomenon of Energy Regions and the assumptions about the usefulness of some conceptual building blocks), two hypotheses shall be exposed to your critical examination:
- Firstly, there is our conviction that this new subject of 'Energy Regions' is at all worth the effort of further investigation. Despite al heterogeneity, our cases do have some important features in common, and the most striking of them is the strong dynamic and engagement of regional actors. Under the flag of 'Energy Regions' quite some resources are mobilised, and the subject is increasingly gaining political and scientific attention. We hence think the time is ripe to critically assess the potential contribution that this new phenomenon can make for the governance of socio-technical change.
- Furthermore, the origins of some of our 'conceptual building blocks' suggest, that there might actually be some justification to present our considerations to you in this STS-related publication. We are convinced that STS-concepts, - besides more general concepts of networks and learning theory - will prove most valuable for dealing with the issue of 'Energy Regions'.

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14 To take up the term of socio-technical regime, an interesting conceptual question seems to be: Can 'Energy Regions' develop from regional policy networks and niches for regime relevant experiments into sub-regimes obtaining the quality of rule sets or shared grammars themselves?

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