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Engaging inhabitants into energy transition in climate and energy model (CEM) regions: case studies of Freistadt, Ebreichsdorf and Baden

Riegler, M., Vogler, C., Neumueller, S. & Komendantova, N.

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Monika Riegler, Christina Vogler, Sonata Neumueller, Nadejda Komendantova

Approved by

Joanne Linnerooth-Bayer
Acting Program Director, Risk and Resilience
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Abstract

Austria has settled a target to reach 34% of renewable energy sources in final energy consumption by 2020. The Climate and Energy Model (CEM) regions are the major vehicles for implementation of this target. Until now little research was done on existing participatory governance measures in the Austrian CEM regions, which involve not only stakeholders but also inhabitants into decision-making processes on energy transition. The aim of this paper is to collect information about existing participatory governance measures in three CEMs, such as Freistadt, Baden and Ebreichsdorf, and to analyze these measures by using methodologies developed by Arnstein in his ladder of participation. Our results show that the majority of existing measures are at the level of providing information and awareness building. However, there are also some measures, such as energy groups, which allow all interested inhabitants for providing feedback about proposed in their CEM projects. Other measures, such as Helios or Badener Sonnerkraft, allow for financial participation of inhabitants in deployment of renewable energy projects in their region.

Acknowledgments

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About the Authors

Monika Riegler is a research assistant at the Risk and Resilience working group at IIASA. Her main focus is on participatory processes and methods for stakeholder engagement in decision making processes concerning risk mitigation and renewable energy systems. She holds a Master's degree in Social Ecology from the University of Klagenfurt.

Email: riegler.monika@gmail.com

Christina Vogler studied International Development Studies and Human Geography (Department of Geography and Regional Research) at the University of Vienna. Her research focuses on Central Europe and Southeast Asia, migration studies and environmental issues. She works as a social researcher, video journalist and online editor in Austria. Email: christina_vogler@gmx.at

Sonata Neumüller graduated from Lithuanian University of Educational Sciences (German language) and from University of Vienna (Sociology), where her diploma work was "Das Selbstbild Litauens und Abgrenzungen gegenüber Nachbarn". She was always interested in science and also has experience of work in diplomatic services.

Email: sonata.n@chello.at

Dr. Nadejda Komendantova is a coordinator of the research theme "Governance in transition" within the Risk and Resilience Program at IIASA, Austria, and a senior research scholar at ETH Zurich, Switzerland. Her research interests include participatory and multi-risk governance of climate change mitigation and adaptation, based on the understanding of views and risk perceptions of involved stakeholders, of governance structures, market and civil society as well as social institutions and political processes towards more adaptive and inclusive governance approach, which is central to the science-policy interface.

Engaging inhabitants into energy transition in climate and energy model (CEM) regions: case studies of Freistadt, Ebreichsdorf and Baden

Monika Riegler, Christina Vogler, Sonata Neumueller, Nadejda Komendantova

1. Introduction

Austria has a target to reach 34% of renewable energy sources in final energy consumption by 2020 and 78% by 2050, according to the National Renewable Energy Action Plan for Austria, developed in the year 2010. At the regional level, this goal is implemented at the climate and energy model regions, which also see investment into renewable energies as a driver for regional energy security and socio-economic development.

Human factors such as public support and willingness to participate or to pay are crucial factors for implementation of these goals. In 2013 the Climate and Energy Fund developed additional programs to understand public support or opposition to regional energy transition. However, little evidence, to our knowledge, exists currently on available participatory governance mechanisms at the regional level, which would facilitate involvement into energy transition discussion of organized stakeholders as well as of inhabitants. In this work, we follow the assumption that the public is more likely to accept technologies and technological strategies if they are involved into energy policy process. Also previous projects, such as the ACRP supported project “Transition Dynamics in Energy Regions: An Integrated Model for Sustainable Policies (TERIM)” on the examples of such regions as Güssing and Weiz-Gleisdorf showed that it is necessary to stimulate deployment of participatory governance measures (TERIM, 2012).

The first aim of this paper is through the method of stakeholders method to understand, which stakeholders, from which groups and at which levels of governance are involved into discussion about energy transition in a number of selected climate and energy model regions. The second aim is to understand at which level of participatory governance the existing in the regions measures allow for involvement of inhabitants into the discussion about energy transition.

2. Theoretical approach

The theoretical approach of this work is in participatory governance research on decision-making processes regarding energy transition. In energy policy, especially regarding deployment of energy generation and transmission infrastructure, the flow of knowledge is often going one way, from experts to policy-makers. Afterwards decisions are communicated to public in the form of decide-announce-defend model. However, such expert-driven process often does not take into account complex relationship between experts and public and can even lead to the loss of trust in the public institutions. The shortcoming of this process call for greater public participation in decision-making processes which affect communities and the way of life of people (Thompson, 2013; Renn, 2010).

According to available definitions discourse analysis relates to understanding of existing in society ideas and values and the interactive process of how these ideas are conveyed. Discourses are shared, structured ways of speaking, thinking and interpreting (Dryzek, 1997). The theory of plural rationalities or cultural theory is one of possible frameworks to interpret these discourses (Linnerooth-Bayer, 2005). According to this theory there are plural stakeholders discourses or voices and each of them is legitimate and has to be understood. According to the cultural theory all discourses could be grouped to four: hierarchy, individualism, egalitarianism and fatalism.

- The hierarchical voice calls for control, providing of guidance and expertly planned solutions. It speaks for the top-down planning by governmental authorities with support of a number of experts.
- The individualistic voice argues for the market, deregulation, freedom of innovation, personal responsibility for risk and recognition of trade-offs for competing use of resources as well as evaluation of costs and benefits.
- The egalitarian voice speaks for holistic, moralistic and natural approach, for sacred values, which cannot be traded and tends to see structural measures as problems and not solutions.
- The fatalistic voice does not believe that there is a chance to change anything and that mitigation of existing risks is out of control

Sherry Arnsteins “ladder of participation” distinguishes between different levels of participation: the bottom rungs of the ladder manipulation and therapy are considered as “non-participation” because they aim to cure citizens’ doubts and fears and to educate them but do not give them a chance to influence the decision making process. The next

rungs information, consultation and placation are called “tokenism”. Those strategies allow citizens to hear and be heard but it is not guaranteed that their views will be heeded by the powerful ones who decide. True participation starts with the two rungs called delegated power and citizen control in which citizens obtain the majority of decision making panels or have the managerial power (Arnstein 1969).



Figure 1: Arnstein Ladder (1969)

This classification is used to cluster CEMs activities and governance structures and compare the study regions’ participatory governance. Due to the divergent characteristics of the selected CEM regions, different processes and levels of participation can be compared and their influence on social acceptance of energy transition can be identified. For the comparison of participatory governance in the different case study regions, the analytical framework of Arnstein (1969) is used.

3. Case study regions

Based on results of the cluster analysis and further factors described in previous documents “Modellregion Badener Energiekur”, “Region Ebreichsdorf”, and “Region Freistadt” were identified as our case studies for further consideration in the LINKS project (see Figure 2). Table 1 summarizes socio-demographic and economic data for the case study regions.

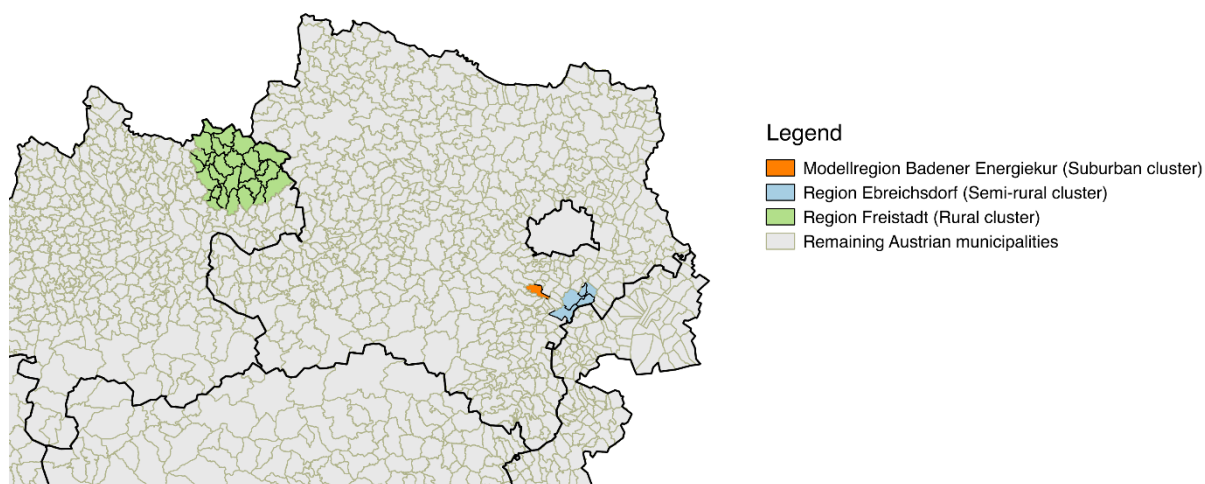


Figure 2: Mapping of the three case study regions

As indicated in Table 1, the CEM Freistadt is a rural CEM in the North of Upper Austria. The CEMs Badener Energiekur and Ebreichsdorf, on the other hand, are suburban and semi-rural CEMs respectively, located in Lower Austria, South of Vienna. They are both part of the same political district, Baden. The suburban CEM Energiekur Baden consists of only one densely populated municipality and the CEM management is located within the municipal administration. CEM Ebreichsdorf, the case study representing the semi-rural cluster consists of five municipalities and became a CEM in 2009. The rural case study CEM Freistadt is one of the biggest CEMs regarding population and participating municipalities and builds on a long history of energy projects and bottom-up processes. None of the three case studies gives a definition of the term energy autarky in the implementation concept, although Baden aims a total energy self-sufficiency above 100%. Freistadt has specific energy targets as well, which do not account for full energy self-sufficiency.

Table 1: Economic and socio-demographic data of case study regions

	Modellregion Badener Energiekur	Region Ebreichsdorf	Region Freistadt
CLUSTER	Suburban	Semi-rural	Rural
START YEAR OF KEM	2011	2010	2010
TOTAL POPULATION	25,093	21,491	65,113
AREA	2,688	13,174	99,410
TOTAL GROSS VALUE ADDED [MIO €]	900.25	387.67	1,132.12
POPULATION DENSITY [CAP/KM ²]	933	163	66
GROSS VALUE ADDED PER PERSON [€]	35,876.47	18,038.73	17,386.94
EMPLOYEES IN FIRST SECTOR [%]	3.2	3.2	15.9
EMPLOYEES IN SECOND SECTOR [%]	26.4	26.4	22.9
EMPLOYEES IN THIRD SECTOR [%]	70.4	70.4	61.2
ENERGY CONSUMPTION [MWH]	34.52	27.68	19.14
POTENTIAL FOR SELF SUFFICENCY (ELECTRICITY) [%]	25.50	25.50	74.50
POTENTIAL FOR SELF SUFFICENCY (HEAT) [%]	37.00	37.00	87.00
DEFINITION OF ENERGY AUTARKY	No definition	No definition	No definition
GOALS FOR ENERGY AUTARKY	More than 100%	No goal	Less than 100%

For further information on the history and background of the selected case study region please see our scoping study and working paper 1 (Truger et al., 2016) on the cluster analysis.

4. Methods

Various methods are deployed to explore the development of the selected CEMs, to identify relevant stakeholder groups and to elicit existing governance tools and decision-making processes within the CEMs. The following methods were used for all case study regions. Detailed information on CEM specific application and data sources is listed below.

4.1.1. Literature review and media analysis

The research process started with an extensive literature survey to generate background information on different CEM regions, their history, activities and governance schemes. We used the following sources of information: scientific literature, press releases and newspaper articles, web pages of CEMs and Climate and Energy Fund and PR-material. We also analysed the news archives of local and national newspapers by using specific keywords for every CEM. Based on the conducted background data review, we identified the most representatives for three clusters (semi-urban, semi-rural and rural) CEMs, conducted stakeholders mapping to identify the stakeholders involved and the level of governance where they are involved and to develop interview protocols for further stakeholders dialogue.

In ***Freistadt*** the main sources of information were webpages by the EBF, Climate and Energy Fund, Helios GmbH. Furthermore, archives of local newspapers (OÖ Nachrichten, Tips) and national newspapers (derStandard.at, diePresse.at) were used to gain a deeper understanding of the CEMs activities, main topics and its communication strategy. Keywords for this media analysis were “EBF”, “Energiebezirk Freistadt” and “Helios” for which more than 100 newspaper articles in total could be found from 2008-2016. Further information came from the “Energieblicke”, a leaflet published by the CEM Freistadt regularly to inform the residents of on-going activities and events.

In ***Baden*** the main sources of information were webpages by the Municipality of Baden, Climate and Energy Fund. Furthermore, archives of regional newspapers (NÖN, Bezirksblatt) were used to gather further information. Keywords for this media analysis were “KEM Baden”, “Klima und Energiemodellregion” and the name of the current CEM manager. In the NÖN there were in total 25 hits for these keywords.

In ***Ebreichsdorf*** the main sources of information were webpages by the Energiepark Bruck an der Leitha, Climate and Energy Fund. Furthermore, archives of regional newspapers (NÖN, Bezirksblatt) was searched according the keywords “Ebreichsdorf”, “KEM”, “Klima

und Energiemodellregion” and the name of the current CEM manager. In the NÖN there were no relevant hits for this keywords and in the Bezirksblatt four articles could be found.

4.1.2. Stakeholder mapping

The goal of stakeholder mapping is to define relevant stakeholders groups on different regional levels based on the literature review. In addition to description of involved groups, the stakeholders mapping also acts as a basis for identification of relevant interview partners. During the interviews the stakeholder mapping is evaluated and revised in an iterative process.

4.1.3. Interviews

Interviews with stakeholders help to gain a comprehensive understanding of activities and the process of decision-making in the CEM regions. Based on the results of the literature review, we developed the interview protocol, which we divided into two main parts (see Appendix). One part covers general questions on the implementation of the CEM process in the region, the decision making process, former and on-going projects and communication strategies with stakeholders and residents. The second part comprises CEM specific questions on individual projects or specific topics. The interview protocol included mainly open-ended questions in order to encourage the interviewee to express their opinion, ideas and thoughts in an open and honest way and to reduce the interviewer impact.

Prior to start the research, our assumption was that conducting several in-depth interviews with different stakeholders would help us to better understand local processes, activities and problems regarding energy transition and the deployment of renewable energy sources in CEM regions in Austria. All interviews were recorded with the help of audio-recorder and then fully transcribed in German language.

Altogether we contacted 42 stakeholders and 20 stakeholders finally agreed to give in-depth interviews. Each interview lasted for around two hours. The biggest part of interviews (around 80%) was conducted on face-to-face basis, the remaining interviews were conducted by phone. We selected our interview partners according to following criteria:

- Location in one of three case study regions (we identified equal number of interviewees and their social group in each region to allow comparisons).
- Belonging to one of four major groups: policy-makers, civil society, inhabitants and NGOs, project developers and financing as well as academia. The reason for identification of these four groups was our interest in discourses and their differences across these groups. In each region the equal number of stakeholders from these four groups was interviewed.

We applied Chatham House rules granting anonymity to interview partners, therefore we are not including names of people or of organisations here.

In Freistadt, Ebreisdorf and Baden in-depth interviews were conducted with the current CEM manager and other stakeholders according to the interview protocol (see Annex). These were face-to-face interviews and lasted for around two hours each. All interviews were fully transcribed. In addition to this formal interview further information was collected in a few informal discussions with members of EBF, energy groups and residents.

4.1.4. Observations

The method of observation helps to gain a more comprehensive picture of the study regions by opening a chance to determine characteristics of different stakeholder groups for example their composition (regarding age, gender, educational background), to elicit their most relevant concerns and interests and to ascertain how they organize negotiation and communication. Furthermore, observations provide information on the flow of information, interactions between different stakeholders, and power relations. This is of great importance especially in governance research, as politics is not only constituted in text and talk, but also in practice and observation of processes help to explore the performative aspects of governance. Details on observations of the meetings are included in the methodology description below, which is relevant to each case study.

In *Freistadt* we observed four stakeholder events and meetings in the CEM region on March 31, 2016. In the first meeting the CEM management informed local head officials about the planned future initiative on e-mobility, e-car sharing and funding options and elicited their interest in an e-mobility focus. The second meeting was a networking event for energy group speakers and members of local environmental panels, in which the EBF manager presented the future focus on e-mobility to them. In addition to this two events, we observed a general assembly of one local energy group (Neumarkt/Mühlkreis) and a

public lecture of the Upper Austrian climate protection agent. The observations followed several key questions e.g. on topics, time management, participants, mode of discussion, conflicts and the participants' possibility to contribute.

5. Participatory governance in CEM Freistadt

The CEM is operated by the CEM manager, whose duties are the communication with different actors (Climate and Energy Funds, local and regional authorities, residents, etc.), project development, coordination and organization of CEM's activities. The management in Freistadt consists of 2-3 people who prepare proposals for future projects and focus themes based on current funding options of the Climate and Energy Fund and other funding programs (e.g. EGEM, State of Upper Austria). These proposals are presented to the board in regular meeting, which decides on its implementation. The board consists of eight political representatives, who are sent by the district office according to the election outcome.

In the beginning of the CEM process, two energy group speakers and representatives of partnership firms were members of the board in addition to political representatives. After changes in CEM guidelines, private involvement in CEMs is not possible anymore. The CEM management itself has no vote in the board meetings but makes suggestions for future initiatives. The CEM office also develops project ideas for local energy groups to offer guidelines for potential future initiatives to them. This strategy supports the persistence of the existing energy groups, reduces their effort to keep the energy group running and assists them in planning.

Speakers of the energy groups meet with the CEM management three times a year to discuss future projects and focus themes of the CEM and have the chance to propose project ideas to the CEM management.

For Helios, Freistadt's solar power plant financed mainly through citizens' participation, the decision making process is constituted in a similar way. The EBF board makes decisions on businesses processes, the shareholders, which are mostly residents, and the management do not have a formal vote. Due to an inherent inefficiency in this decision making process, the management makes an effort to change this legal constitution to be in a better position to adapt to changing conditions.

Different stakeholders on various regional levels are involved in the CEM's activity (figure 3). On the national level the most important stakeholder is the Climate and Energy Fund which administrates the CEM process and provides further funding options. The Climate and Energy Fund is mainly financed by two Austrian ministries.

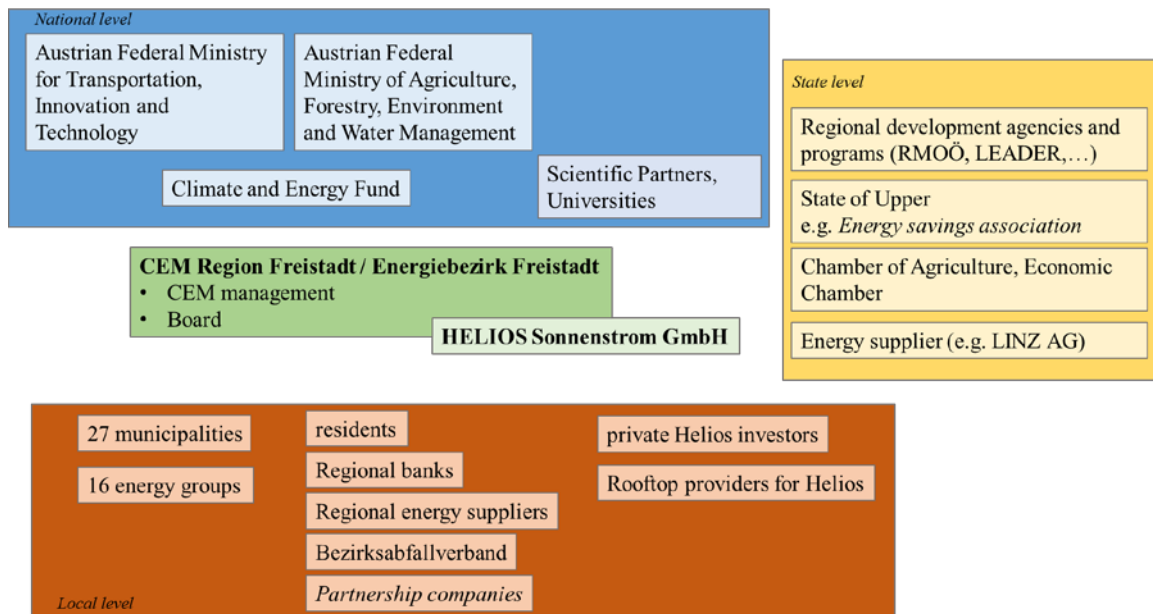


Figure 3: Stakeholders in CEM Freistadt

Further important stakeholders are scientific partners and universities, which cooperate with the CEM in various research activities, mainly focussing on solar energy and storage technology. On state level there is a close interaction with public regional development agencies and LEADER regions. The CEM has cooperation with energy providers and implements project together with those private partners e.g. on e-mobility and e-car sharing. There is also a close interaction with the state government to work towards new laws and regulations concerning regional energy issues. On the local level important stakeholders are representatives of 27 member municipalities (mayors, environmental committee officers, head officials), which partly finance the CEM's activities. Furthermore, energy groups are influential stakeholders, which constitute of local residents who are willing to participate in a regional energy transition (find more information on energy groups below). There is also a very close interaction to the district waste association, due to a shared history.

The CEM applies various activities to interact with stakeholders, different groups of residents and the general public and to provide target-group specific information and

events. This chapter focuses on activities to interact with different stakeholder groups and examines participatory in those processes (table 2).

Table 2: Participation tools of CEM Freistadt according to Arnstein's ladder of participation

LEVEL OF PARTICIPATION (ARNSTEIN 1969)	TOOLS/INSTITUTIONS
THERAPY	Media campaigns
INFORMING	Climate schools, media campaigns, public information events
CONSULTATION	Exhibitions and excursions
PARTNERSHIP	Helios Sonnenstrom, scientific cooperation, energy groups

We are describing further existing measures to engage and to inform inhabitants of Freistadt about energy transition process in their region. The measures are divided to awareness raising and to participation.

5.1. Awareness building

Climate schools are a key initiative of the CEM process to support cooperation between the CEMs and schools. The aims are to promote awareness for climate and energy related issues and to involve students of all ages, teachers and directors. Until now there has been three project calls by the Climate and Energy Fund starting in 2013. Aims of climate schools are to assess the current energy demand of the participation schools together with

students and to jointly develop energy saving measures. Students should act as “energy detectives” and reveal energy consumption and its cost not only in schools but also at home. Besides these goals the acting CEM and participating schools can decide on thematic priorities to be discussed in the climate schools. At the end of the period, public information events take place to inform the wider public about the process and outcomes¹. The CEM region Freistadt participated twice in the climate school program, cooperating with eight schools in total. After implementing the basic concept of climate schools in 2013 with a focus on energy demand and energy savings in schools and private houses, the climate schools in the next year was designed more comprehensively including lifestyle related topics like sustainable nutrition and waste prevention. The overall topic of the climate school was “The power of the sun”. The main goal was to elicit the role of solar energy for biological and chemical processes and to raise acceptance for solar energy². The next phase will start in September 2016 in which four schools will be accompanied by the CEM management to implement energy projects throughout the school year. All four schools to take part in the next phase have already participated in the climate school project.

Public Relations for information purposes the EBF hosts a webpage but is not active in social media. There is a frequent coverage in local newspaper. Around 100 newspaper articles, op-ed articles and announcements have been published since 2005 on the EBF and Helios. Helios’ discrepancies with the FMA were covered and discussed nationwide. As a form of cooperation with a local newspaper, the CEM biweekly publishes inserts on various issues that are connected to the central themes of the CEM for the following three years. In the next months, information on climate change and RES provided by the Climate and Energy are published to dispel common myths about climate change³, followed by a focus on e-mobility and energy efficient house renovations. Besides reports in local newspapers, the CEM in cooperation with local energy groups publishes leaflets in the participating municipalities to inform the public about on-going activities and projects and

¹ <http://www.klimaschulen.at/klimaschulen/ziele-und-hintergrund/>

² <http://www.klimaschulen.at/klimaschulen/klimaschulen-2-ausschreibung-2014-2015/klimaschulenprojekt-freistadt/>

³ This information is mainly based on *Faktencheck Energiewende* <http://www.faktencheck-energiewende.at/>, for examples of this cooperation: <http://www.tips.at/zeitung2015/?ausgabe=tips-freistadt&id=24411#/12> or <http://www.tips.at/zeitung2015/?ausgabe=tips-freistadt&id=25795#/20>

upcoming events. Around 200 of those “Energieblicke” have been published since 2005⁴. Furthermore, a monthly radio show and TV reports on a local TV broadcast are released.

Public information events: since 2005, five energy festivals in have taken place in different communities of the EBF to raise awareness for renewable energy, energy efficiency and energy saving measures and to communicate the activities of CEM Freistadt to a broader audience

Exhibition: a travelling exhibition on energy self-sufficiency was design that can be booked by schools, public facilities or businesses⁵.

Excursions: furthermore, around 15 excursions has been organized for the interested public and representatives of the local communities e.g. to visit hydropower stations or solar plants, car-sharing facilities and energy efficient model houses. Furthermore, excursions are organized for the interested public e.g. to visit hydropower stations or solar plants, car-sharing facilities and energy efficient model houses. Moreover, five energy festivals took place to communicate the activities of CEM Freistadt to a broader audience. A travelling exhibition on energy self-sufficiency was design that can be booked by schools, public facilities or businesses⁶.

5.2. Participation

Financial participation: as a form of cooperation with CEM Freistadt regional banks provide coupons valid for firm-independent energy consulting for residents and businesses that plan to develop energy related projects like house construction, renovation, e-mobility etc. In the past years more than 300 consultations were accomplished. The CEM focuses strongly on awareness raising campaigns to promote energy savings, energy efficiency and an energy transition in the region. These measures aim at informing the general public, business leaders, communes and opinion leaders. Tools that are commonly used are workshops, lectures and information events concerning topics like e-mobility, energy-saving construction methods and lifestyle related issues like nutrition or waste reduction⁷. Whereas most information events target the residents and the general public some awareness raising campaigns aim at business owners to promote

⁴ http://www.energiebezirk.at/uplfiles/EBF_Energieblick_10Jahre_web-21_12_2015-10_12_34.pdf

⁵ http://www.energiebezirk.at/uplfiles/EBF_Energieblick_10Jahre_web-21_12_2015-10_12_34.pdf

⁶ http://www.energiebezirk.at/uplfiles/EBF_Energieblick_10Jahre_web-21_12_2015-10_12_34.pdf

⁷ http://www.energiebezirk.at/uplfiles/Bewusstseinsbildung-29_11_2011-11_11_08.pdf

changes. “E-mobility Days” were established to provide information on e-cars for regional car dealers to trigger diversification of the product range.

HELIOS Sonnenstrom GmbH: the CEM Freistadt hosts Austria’s biggest regional solar power plant that is financed mainly through citizen participation. Helios Sonnenstrom GmbH, the implementing association of the solar plant was founded in 2012 and is a subsidiary company of CEM Freistadt and therefore in public ownership. Interested citizens can buy PV-panels for 500 Euros each and residents with available and suitable rooftops can provide it to Helios for the installation of panels. In 2016 around 700 citizens invested in PV with a mean investment of 7000 Euros. The investors are paid back within 13 years with a 2.2% interest rate. Currently around 6 MWp on 600 rooftops are produced. The establishment of a solar plant with citizen participation led to further private investment in photovoltaic technology in the region. In four years the share of solar energy rose from 1% to 10% and more than 17 MWp are produced, leading to a total investment of around 30 Million Euro in PV within the district of Freistadt⁸. The produced electricity is fed into the energy grid, the OeMag guarantees fixed prices for 13 years. Around 1,500 households can be supplied with energy⁹.

In 2013 the financial market authorities (FMA) accused Helios and other institutions of illegal banking business. For this reason, all investment contracts had to be converted into subordinate loans (Darlehen mit Nachrangsklausel) to meet the legal requirements. Currently around 75% is financed through citizens’ participation and 25% through bank credits. For the next expansion phase, which starts in the year 2016, all money will be raised through citizen participation. Around 90% of all investors live within the district of Freistadt, the residual 10% come from the rest of Austria. Helios does not heavily advertise new expansion phases but can generate enough capital through word-of mouth marketing and existing investors. As Helios is a subsidiary company of the EBF, the EBF board also has the formal decision making power, whereas the investors and Helios management have no decisive power.

Experiences with the FMA led to a new project (KEM-PRO-FIN), which aims to improve the bankability of energy projects by using different financing models (crowd-funding, banks and grants) and to develop methods for the standardized assessment and financing

⁸ http://www.energiebezirk.at/uplfiles/EBF_Energieblick_10Jahre_web-21_12_2015-10_12_34.pdf

⁹ <http://www.helios-sonnenstrom.at/pages/index.php?mid=12&name=NUTZEN>

of energy projects¹⁰. Results of this project can be useful for other regions that plan to start large-scale energy projects.

Energy groups: within the CEM Freistadt local energy groups were founded to act as connecting link between the CEM management, local residents and local authorities and to initiate the discussion on energy issues. The energy groups should act as “local trouble-shooter”, interact with the public and implement site-specific projects with the support of the CEM management on a communal level. A further task of local energy groups is to assist in energy usage surveys on household basis, which was of major importance especially during the initial period of the CEM process.

The first energy group was founded in Neumarkt/Mühlkreis by a newly elected mayor who wanted to enforce involvement of citizens in decision-making and project implementation. The authorities contacted local residents who had shown to be interested in sustainable development in the past (e.g. organic farmers, residents applying for subsidies for PV, thermal energy and other RES etc.) and invited them to join the process. During this process the authorities discharged moderation and coordination duties, the thematic focus was negotiated by the participants. In this meetings working groups on various topics were deployed, one of which was a group dealing mainly with energy issues. Out of this procedure the EBF arose as a bottom up initiative mainly led by the current CEM manager. After becoming a CEM in 2010, the CEM management installed a network of energy groups, following the same procedure. This process was accompanied by the CEM management for two years to establish an organizational structure and promote regular meetings. In May 2011, there were 21 energy groups in existence or in installation, in 2016 16 of those energy groups are still active. According to diverging local circumstances and dynamics and furthermore varying motivation of individual members, the intensity and range of activities varies substantially between the different energy groups.

As an example the energy group Neumarkt/Mühlkreis, which can be considered a rather active and well established energy group provides a wide range of services and information to different user groups. It follows a broad understanding of sustainability including lifestyle, nutrition, and social interaction rather than focusing solely on energy topics. The local energy group installed a platform for private e-bike and car sharing and

¹⁰ <http://www.klimaundenergiemodellregionen.at/start.asp?ID=257360>

provides a van for car sharing purposes¹¹. Furthermore excursions and open houses at energy efficient buildings were organized for the general public, whereas special field trips for children took place during school holidays. Besides organizing particular events on energy issues, the energy group also participates in existing local social events like Christmas markets or town fairs to raise awareness for energy related topics. Other activities which are only vaguely connected to the energy theme but are related to the overall idea of sustainability are the establishment of an open meeting space and event location (Otelo) for various purposes, for example bike repair workshops, give-away shops or traditional handicraft workshops. The concept of Otelo is to establish an open room for development equipped with free basic technical infrastructure to support cultural exchange, interaction and communication between actors of various ages, professions, gender and interests. There exists a network of Otelos within the CEM region.

Scientific cooperation: experiences from Helios with the FMA led to a new project (KEM-PRO-FIN), which aims to improve the bankability of energy projects by using different financing models (crowd-funding, banks and grants) and to develop methods for the standardized assessment and financing of energy projects.¹² Results of this project can be useful for other regions that plan to start large scale energy projects. Furthermore, a joint research project on storage technology for solar plant are planned, together with the Technical University of Vienna, Linz AG and Ökostrom AG.

6. Participatory governance in CEM Ebreichsdorf

The CEM Ebreichsdorf is the most densely populated region of the Lower Austria and has also a very high number of daily commuters, who commute to Vienna. The community of Seibersdorf attracts commuters from Vienna to its scientific research centre. The region sees its way to energy sustainability and climate protection in the interlocking of several measures: reduction of energy consumption as well as an increase of energy efficiency (focus on buildings), promotion of independent energy supplies (strengthening of regional RES) and of sustainable mobility solutions with more public and less private transport.

¹¹ <http://www.carsharing-neumarkt.at/>

¹² <http://www.klimaundenergiemodellregionen.at/start.asp?ID=257360>

The goal of the CEM process is to pave the way into the future with sustainable energy. The region sees as a first step measures to promote awareness about renewable energy and energy efficiency. Another goal is to implement energy accounting to help municipalities to raise awareness about their energy consumption for heat, electricity and fuels. Energy accounting shows the type of fuels consumed as well as the volumes. The following 10 communities are participating in the CEM process: Blumau-Neurifshof, Ebreichsdorf, Mitterndorf an der Fischa, Oberwaltersdorf, Pottendorf, Reisenberg, Seibersdorf, Tattendorf, Teesdorf and Trumau. All of them have different goals and not every municipality provides subsidies for implementation of renewable energy sources.

Until February 2016 the Regionalverband Industrieviertel was the hosting organization of the CEM Ebreichsdorf, when the new implementation phase started the newly founded association “Kleinregion Ebreichsdorf” took over the operational activities.

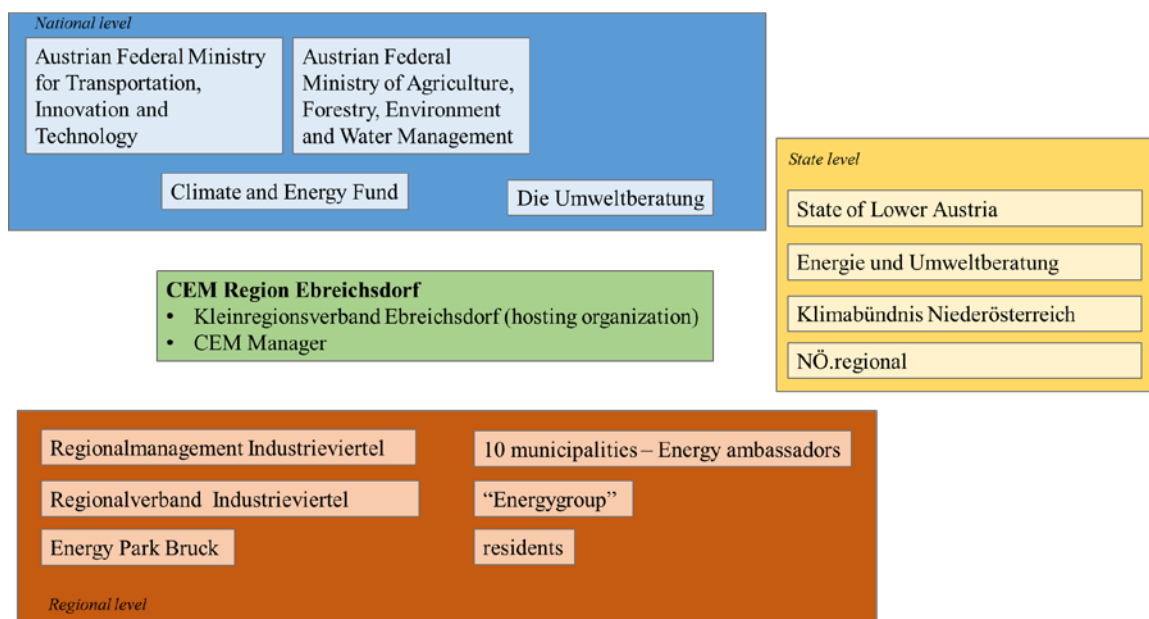


Figure 4: Stakeholders in CEM Ebreichsdorf

Activities of these municipalities are coordinated by the CEM manager who also give consultations to inhabitants on energy transition questions. In addition, each municipality appoints one representative and one deputy representative to be responsible for its energy and climate change mitigation measures. Ebreichsdorf also provides to inhabitants an opportunity to contribute to the discourse about energy transition via energy groups. Every energy group can decide on on-going and future renewable energy projects in every community. The energy group consists of the representative, the model region manager,

mayors and regional players, e.g. representatives of agriculture, industry, and service providers. The energy group has regular meetings, as a minimum once in a quarter in an energy jour fixe. The mayors of municipalities receive reports from energy group meetings and use them further in their meetings on energy policy issues where they incorporate recommendations from the energy groups into the decision-making process.

Other important players in the decision-making process on energy transition are regional development organisation, ENU and the Climate Alliance. The regional development organisation (Entwicklungsverband) is a promoter and an important player in the interaction of municipalities and beyond the region, and also organises regular meetings of all CEM Industrieviertel and supports the communication between the regions. The ENU with its experts represents an important cooperation partner. The ENU experts give comprehensive and independent consultations in the field of energy, construction and refurbishment. The Climate Alliance (Klimabündnis) has a comprehensive set of tools on renewable energies and rich experience in cooperation with municipalities.

Energy Efficiency Measures: the municipality of Neunkirchen constructed a new administration office building following the string energy efficiency standards and refurbished the old building to increase its energy efficiency. Another measure was to converse to use the LED lighting for street lighting. In Oberwaltersdorf, the heating systems of the school, one kindergarten and the administration office was converted towards the use of wood chips.

In January 2017, a campaign was started to check the improvement potential of existing heating systems in companies and agricultural holdings. Companies are invited to register for the energy check. Experience shows that similar checks may lead to improvements with savings of 5% to 30% in heating, and with 90 % energy savings in electricity use.

More than 50 buildings of municipality were analysed by using energy accountancy data and then suggestions for improvement of energy efficiency were agreed on. 4 municipalities also provided reports about results of energy accountancy measures conducted in their municipalities.

Several awareness-raising campaigns are ongoing with information about energy efficiency in construction and housing, thermal refurbishment, passive houses, electricity saving technologies. Additional information was also provided to all interested inhabitants about

replacement of heating boilers, heat pumps, lending out of ammeters to inhabitants, replacement of energy wasting devices.

Mobility and transportation is a big issue for Ebreichsdorf. The split between motorized private transport (MIV) and transport modes of environmental alliances (pedestrian, bicycles, public transport, car sharing) is currently not optimum. In frames of the CEM process a feasibility study for regional municipality buses was conducted. The CEM region is also currently constructing the e-loading stations and implements car-sharing models.

Energy generation: new power generation installations are being constructed. In total 178 kWp of PV systems was implemented and 55 wind power systems with 170 MW, according to the data for 2016. Also 4 municipalities are considering to develop their own maps of solar potentials.

In January 2017 the region started a campaign to check private solar systems as experience of previous years shows that without appropriate maintenance the private solar systems do not run optimally. The service check can be then followed by suggested maintenance measures to improve its efficiency. The municipalities are actively promoting organizing of such checks with the help of national experts institutions.

Table 4: Participation tools of CEM Ebreichsdorf according to Arnstein's ladder of participation

LEVEL OF PARTICIPATION (ARNSTEIN 1969)	TOOLS/INSTITUTIONS
THERAPY	Media campaigns
INFORMING	Betting on ice blocks, climate cabaret, energy rap
CONSULTATION	Power to the kids - a day full of energy for our pupils, climate agents

PARTNERSHIP

Energy groups, financial participation, crowd financing, partnership with some stakeholders groups such as farmers

6.1. Awareness raising

There is significant work on awareness raising about renewable energy sources which is going on in Ebreichsdorf. This includes several excursions to wind operation farm and other renewable energy projects. All interested inhabitants can visit biogas power plants, district heating plants, wind power stations and small hydropower plants.

Betting on ice blocks (Eisblockwette) demonstrated the effects of proper insulation. During a public event, a block of ice was wrapped with insulation material and left out in a public place. The participants could watch the effects of the insulation material over the summer. The inhabitants were invited to bet on the amount of ice that would be left when the insulation was unwrapped. This raised awareness on the importance of insulation.

Climate cabaret „Wurscht und Wichtig“ (kind of „So Irrelevant, so Important“) brought the issue of energy out in a humorous way.

Energy rap at school was an awareness raising measure for children when pupils from the Ebreichsdorf primary school sang rap about energy, which was composed by the City council and the energy ambassador Otto Strauss. This awareness raising measure demonstrated the children's excitement regarding energy issues and led to greater awareness and willingness of parents to participate in discussions about energy matters.

Power to the kids - a day full of energy for our pupils was a day when energy experts accompanied a class on one of their school days and raised awareness about energy related issues through such events as a) impromptu speech on the topic of „24h renewable energy in my every day life“; b) followed by experimental workshops featuring sterling motors, PV panels, solar cookers, wind wheels etc.; c) visions for my community: groups designed posters as to how their communities could be supplied with renewable energies. The posters were given to city councilors and were displaced in the local municipality buildings; d) as a reward, everybody received the book „Climate and Energy“ to take home to their families. This project was intended to support the integration of schools into the CEM issues and influence future behavior regarding energy issues.

Climate agents (Klima-AgentInnen) project is unique as it strives to visualize the energy demands at schools and - if possible - in households in the school community (children, teachers, school employees). In this project, students calculate the land usage needed for different energy generation technologies. Based on their results they develop recommendations for the policy making process. In order to have practical relevance, students work with professional simulation software for PV plants, perform economic efficiency calculations and develop ideas for demonstration objects. Students also conduct mobile diaries to identify how the available in the region wind electricity potential could be used for electro-mobility in the region.

6.2. Participation

There are some projects in the region *involving local farmers*. For instance, farmers could provide straw or other materials needed for biomass power stations and district heating power plants. This initiative is called “energy farmers” and currently brings together 15 farmers who deliver their straw to the district heating plant in Seibersdorf. However, this is more a normal business model as farmers are getting reimbursed for the delivered materials.

An example of *financial participation* from citizen is the municipality of Trumau. The municipality is currently constructing two photovoltaic parks with 1200 PV modules. The financing model is “sale – and- lease back”. The costs of one module are 950 Euro. One person can purchase maximum 10 modules. The park has an agreement with Wien Energies, which leases the panels and pays yearly remuneration to private owners. After approximately 25 years, which is the life time of the system, Wien Energies buys the panels back from private owners.

Another example of financial participation and *crowd financing* is wind park in Pottendorf, where the similar model of “sale – and – lease back” is applied. After participants purchased shares of windmill, they lease it to Wien Energies for annual remuneration. Wien Energies is buying the windmills back after approximately 20 years.

7. Participatory governance in CEM Baden

Communities in Baden are playing an increasingly important role in the decision-making processes regarding climate change mitigation and adaptation. The aim of the CEM Baden is to be regarded as a front-runner in implementation of climate change mitigation measures, deployment of renewable energy sources and energy efficiency measures. The goals of the CEM Baden include: reduction of energy demand in the sectors heat, electricity and mobility, especially the reduction of fossil energy consumption, development of energy self-sufficiency with RES, change of behavior in mobility, informing and raising energy consciousness, the highest possible implementation of energy autarchy by 2030. The main topics of decision-making processes are: energy management, energy-efficient restructuring and new buildings, public lighting system, customized production of renewable energies, mobility schemes (incl. e-mobility and car-sharing), municipal support of energy-efficient measures, involvement of companies and enterprises, awareness building, information and consulting. Raising energy efficiency in existing buildings is the essential challenge in the area of energy-saving measures. The main focus regarding RES is the use of solar energy systems for heat and electricity.

The CEM is managed by Baden's climate and energy departments (Energierreferat). Financial service providers and energy suppliers are integrated into decision-making processes as partners of the CEM in awareness building, public participation and financing of projects. Small and medium-sized enterprises, service providers and municipal companies are important partners. CEM cooperates also with educational institutions, managers and teachers as well as young people and their parents regarding implementation of awareness raising measures.

There are also different committees at the local level of governance, which conduct workshops and discussion panels such as project oriented meetings, stakeholders workshops, working groups meetings etc. where stakeholders also have a opportunity to participants in discussion about energy transition at least in frames of concrete projects. There is also a working group on planning and evaluation, which works together with the CEM management. This group includes representatives of companies and experts who discuss energy transition issues. This group contributes to the following CEM management issues:

- CEM management reports to the municipality committee on environment protection, including six regular meetings per year,

- CEM management guidelines also including the e5-team Baden, 2-3 meetings per year
- Weekly jour fixe meetings with mayors of communities

In the area of energy transition there are following projects, including both renewable energy sources deployment and energy efficiency measures. Some examples are below.

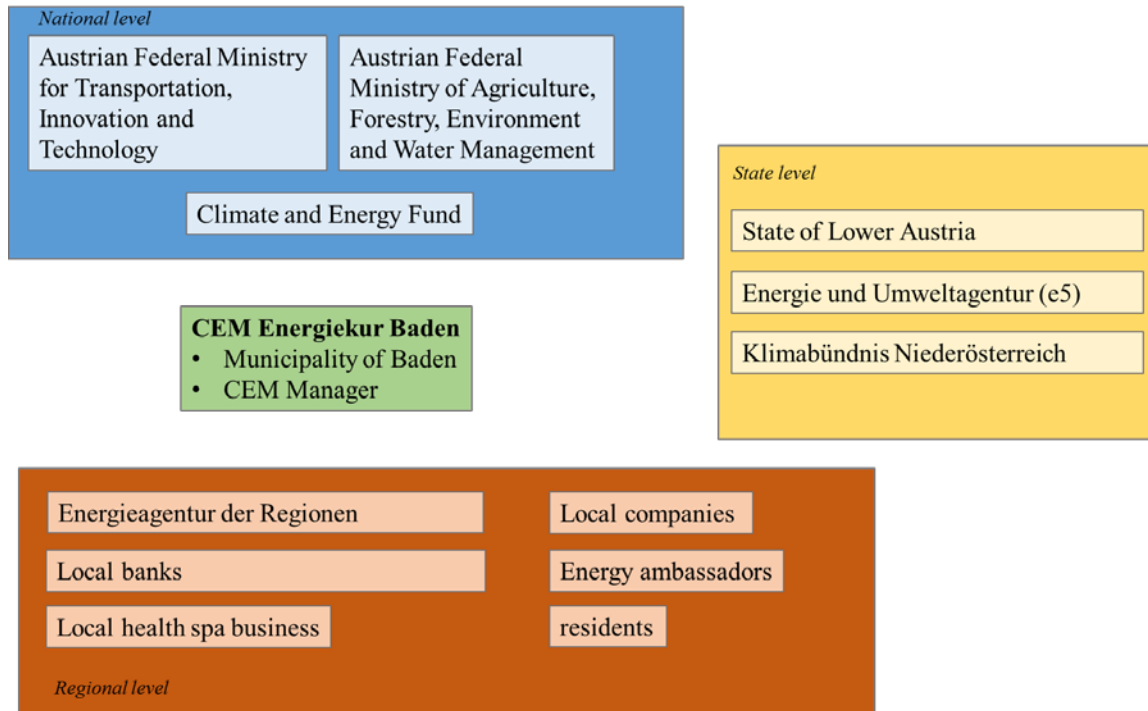


Figure 5: Stakeholders in CEM Baden

Other stakeholders include local companies such as the recycling center, the sewage treatment plant, the Bäderbetriebs-GmbH (pool management), banks such as Sparkasse Baden, Raiffeisenbank Baden, Volksbank Wien-Baden, cultural institutions such as Cinema Paradiso, educational institutions such as primary and secondary schools, higher schools, kindergartens, universities (TU, WU, BOKU, Uni Wien), industry such as NÖM, energy suppliers such as EVN, Wien Energie, Wiener Netze, AEE, Ökostrom AG, organisations such as eNu, AEA, Klimabündnis, BBG, WIFI, service providers such as external energy consulting companies, media such as regional media, journals, ORF, companies such as Autohaus (car dealer involved in e-car sharing), Weltladen and other organizations such as Federal monuments office, ÖGUT, city marketing Baden, museums in Baden, AMS.

Renewable energy sources: due to urban constitution of this region there are only limited possibilities for energy production. The construction of wind power plants is prohibited in Baden. The main focus is on solar power on buildings for which an inventory of potential

roof areas was established. Until 2016 18 photovoltaic installations were co-funded. Furthermore, citizen could invest in solar power as a form of cooperation with a local bank. Interested people could deposit money in a “solar bank book” with an interest rate of 3%, which is paid back within ten years. Around 300 people invested in this system. This money is used by the CEM region to invest in solar power installations on public buildings.

A small-scale hydropower plant is planned but has not been realized yet. Geothermal energy is considered a potential future energy source for the region. Due to uncertainties e.g. the influence on thermal water reservoirs, financial aspects and the need for regional cooperation, usage of geothermal energy has not been started yet.

Renewable energy sources for households and municipalities: in 2015 additional PV capacity was added (34kW) on the roof of AMS Baden. This project was realized with the financial support from the CEM process. In 2016 there was implementation of PV system (76 PV modules with 20 kWp) for the new parking deck next to the railway station in Baden. CEM process financed analysis of solar potentials in Baden, namely, 6070 roofs were analyzed regarding their suitability for solar systems. This information was integrated into the city GIS and helped to increase the level of awareness and interest of Baden inhabitants in PV deployment.

Energy efficiency: the CEM region focuses on retrofitting of public buildings e.g. insulation, energy efficient heating systems etc. in cooperation with a local real estate management company. The municipality also offers a program for private buildings to co-fund to provide financial support for insulation of rooftops, installation of PV or solar panels, connection to district heating. This funding is financed by the municipality but not by the Climate and Energy Region. Besides energy savings in buildings the community focuses on e-mobility and car sharing. An e-car sharing platform using three cars was established in and is currently used by around 50 people.

Energy efficiency measures included expansion of infrastructure for e-cars loading including public loading stations with 2 x 22 kW implemented in Baden-Leesdorf in cooperation with the Autohaus car dealer and the company Weltladen Baden. In 2016 the second e-loading station was in planning next to the Strandbad Baden.

Many projects were on energy efficient lighting such as public street lighting in Baden, which included conversion of 307 lamps to LED in 2015 with the overall performance of 7.500 W. This conversion brings yearly energy savings of 32.500 kWh/a. In 2016

additional 277 lighting points were in planning. Another example is interior lighting of the sports hall, which includes conversion of 54 lamps to LED with an output of 1.900 W in 2015. This brings energy savings of 6.800 kWh/a. All lighting objects of the municipality were checked with regards to possible conversion to LED in places like sports halls, three parking decks, streets and pedestrian zones, sewage plants and administration buildings such as primary schools, city halls etc.

Table 5: Participation tools of CEM Baden according to Arnstein's ladder of participation

LEVEL OF PARTICIPATION (ARNSTEIN 1969)	TOOLS/INSTITUTIONS
THERAPY	Media campaigns
INFORMING	Media campaigns, public information events, information campaigns targeting specific groups, climate schools
CONSULTATION	Consultations on topics like funding, e-mobility, energy efficient refurbishment provided by local government. Consultations on realised projects such as passive house kindergarten
PARTNERSHIP	Badener Sonnenkraft, bea – das Badener eCar Sharing, cooperation with scientific organisations

1. Awareness raising

Media campaign: every year approximately 20 press releases and 100 media reports are issued on renewable energy projects and energy efficiency measures in Baden. The CEM is highly active in communication and outreach. In 2015: 16 press releases and 96 relevant press articles in local and regional newspapers, more than 40 entries on the Baden website. There were also several TV reports about the e5-exemplary municipality of

Baden¹³. Information with 35 reports about energy transition in the region is also available at the municipality homepage¹⁴. The municipality of Baden provides tips for energy saving and user behavior on its homepage. For instance, only in 2015 more than 40 articles were published on this issue. All news about any change regarding CEM subsidies are regularly published in the town newspaper and on the municipality's homepage. There are also regular weekly to quarterly communications about all planned and implemented measures of the CEM region from the mayor, municipality councils, department managers, schools and companies. Additional media sources about energy transition are Lebensart Baden Stadtportrait – Nachhaltige Lebensqualität für die Stadt“, Factsheet CEM Baden to Change Magazine, Folder for e-carsharing bea, Klimabündnis - KlimaCheck: How is your municipality's "climate fitness"?, brochure "Kostenlose Energie-Spar-Tipps", which is distributed to all tenants of the municipality Baden

There are also several *public information events*, exhibitions and presentations on the subject of energy in the CEM Baden. These events include climate film days in Baden, which attract over 1000 visitors every year, and the Day of the Sun with approximately 30 exhibitors and cooperation partners, which attract over 2000 visitors each year. "Climate Cinema" was established three years ago, movie screening, key lectures and discussion with filmmakers, scientists, political representatives on energy and climate related topics, around 1.350 people visited in 2015. There were also several information campaigns on lighting in households and in business spaces. Information was put into the articles in the city newspapers and during private or business consultations. CEM specialists and the partners were offering consultations regarding conversion of lighting and illumination systems.

There are *information campaign targeting specific groups* of stakeholders such as workshops on bicycle driving for elderly people or a photo campaign on the topic of energy transition at 4 kindergartens and 2 schools, which was followed by a public exhibition in the Baden's central square. Training programs were developed for teachers regarding energy savings in public buildings.

The CEM *climate schools project* of 2013 awoke interest and awareness for necessary refurbishment of the Weikersdorf primary school, which is one of the oldest schools in CEM Baden. The refurbishment of the school was financially supported by the government

¹³ <http://www.p3tv.at/webtv/7448-baden-setzt-voll-auf-klimaschutz>

¹⁴ www.baden.at/de/unsere-stadt/energie-klima/

of Lower Austria and the federal government of Austria as well as with some EU funds. The thermal refurbishment brought energy savings of 610.000 kWh and the heating demand was lowered from 172 kWh/m²a to 22 kWh/m²a¹⁵. In cooperation with the Immobilien Baden GmbH, the primary school Am Pfarrplatz, the Weikersdorf primary school and the FRG Biondekgasse school, teachers and students worked together on various energy projects. The main issue was to get to know and to understand energy usage by means of measurements, such as: how much energy is used with different means of transport? How does insulation influence buildings? How much energy is used in households and how much at school?

The “*passive house kindergarten*” project is regarded as one of the best practices of awareness raising on energy transition. Since 2007 four new kindergartens were built following to the passive house standards. One kindergarten was honored with the Wood Prize of Lower Austria. According to Dr. Gerfried Koch “Kindergartens are places for the development of our children and they should be places of well-being. With the climate campaign at kindergartens, we started an exemplary track in public buildings. Contemporary architecture and energy conception created buildings which children and teachers enjoy - and this is absolutely without the use of fossil energy”¹⁶. The project was financed by the municipality and government of Lower Austria from school and kindergarten funds. Investments total € 7,026 million, subsidies in the amount of € 2,527 mio. Payback calculated in 15 years.

In the year 2015, around 160 *consultations* with residents and companies took place covering various topics like funding options, e-mobility. These consultations are conducted by different department of the city administration. There are also events and consultations like “Sanieren in der alten Bausubstanz” with presentations, discussion and workshops with representatives from construction sector, architecture, monument protection, energy consultants and building authorities. Further awareness building measures are available through the Info point network for politics, administration, media, institutions, schools, companies and households. This information includes technical issues and examples of successful renewable or energy efficiency projects. There are also consultative services and information from the CEM management, which consults private persons, companies and organizations on the possibilities of subsidies and technical measures. These

¹⁵ <http://www.umweltgemeinde.at/nutzen-von-e5-fuer-gemeinde-und-buergerinnen>

¹⁶ <http://www.klimaundenergiemodellregionen.at/start.asp?ID=244484>

consultations include advisory conversations with companies and organizations, consultations of housing providers in regards to heating supply, consultations for condominium owners about refurbishment and deployment of PV.

2. Participation

Badener Sonnenkraft project is one of the example of financial participation of inhabitants, which includes three PV systems with 60 kWp. The project was initiated by Immobilien Baden GmbH, the bank Sparkasse Baden and the municipality of Baden. It was financed by inhabitants of Baden in the form of saving books.

According to Dr. Gerfried Koch: „The model Baden“ with participation of inhabitants at power generation systems is simple, secure and attractive. Even grandmothers have signed saving books for their grandchildren supporting climate protection in Baden.“¹⁷

The municipality of Baden did strategic planning, negotiations of finance model, information for inhabitants. The operative implementation was done by the subsidiary company Immobilien Baden GmbH. Starting from April 2012 inhabitants were invited to do binding reservations of „Sonnenbausteine“. 300 „Sonnenbausteine“ were signed within the first nine days. Municipality assigned subsequently the PV modules with the certificates. The participants paid their part into the solar saving book at the Sparkasse Baden. The project was very successful and the demand on the „Sonnenbausteine“ was much higher and lasted long time after the finishing.

Estimated costs of the project:

- Total costs approx. 150.000,- Euro.
- Electricity revenue until 2024 approx. 17.000,- Euro/a
- Verifiable CO2 savings: 19 Tonns per year

“bea – das Badener eCar Sharing” is another example of financial participation of inhabitants. The project provided a special form of cooperation between companies, associations and municipalities. Inhabitants had a chance to participate as consumers and as users of e-cars and to contribute financially to the project. The major aim of the project was to show that e-mobility works and that driving e-car is comfortable. The e-cars were

¹⁷ <http://www.klimabuendnis.at/badener-sonnenkraft-buergerinnenbeteiligung>

available in two locations in Baden. Originally 63 persons participated but in 2015 the number of bookings increased to 970. The project was managed by the Energiereferat Baden and Weltladen. The project was co-financed by membership fees of the users, booking revenues and donations. The infrastructure of loading stations was established by municipality of Baden with the help of subsidies from the CEM program. The cars were sponsored by the project "e-commuters in Lower Austria". bea is cooperation project with several local partners. Energiereferat Baden and Weltladen developed the project and implemented it. They may use the bea for their business trips free of charge. Five companies are "friends of bea".

The costs calculations of the project were based on the costs covering model without any profit orientation. The current annual costs are the following:

- Yearly membership fee for 1 person 135,- €; 2 persons: 215,- €, 3 persons: 300,- €; 4 persons: 400,- €.
- Rate per km (Kilometergeld): 22 Cent
- Hourly rate: from the 3rd hour bea using 1 €/hour

Verifiable CO₂ saving: at the end of 2015, after 40.000 km e-drives approx. 6.400 kg CO₂-equivalents saved.

- bea experience: 2.5 years
- bea-members: 53
- plus 20 users = business partners
- km driven: 73.000
- average distance: 26 km
- bookings: > 2.800
- result: 17 users refused to have private car in their own

The project bea was evaluated by the UNI project „Sustainability Challenge 2014“ and often cited in scientific works as best practice sample. 2014 bea was rewarded with the prize Climate Star. The „Climate Star“ award honours municipalities, cities or regions from Europe-wide that go new paths and do pioneering activities. This event is highlight of international climate conference that dedicates four days attention to the culture of local climate protection.

Scientific cooperation: CEM Baden together with TU Vienna and AIT (Austrian Institute for Technology) have enabled the project ECOCITIES.at . ECOCITIES.at is the first integrated

online platform for comprehensive analysis and optimization of impacts of different measures for energy efficiency and is a tool for municipalities. The project supports operators of building portfolios (building groups) in deciding how present budget can be used most effectively to align the energy efficiency of their real estate to required political, economic and environmental objectives. It considers the thermal envelope, heating, cooling, alternative energy networks, PV, solar thermal and lighting. It identifies optimized refurbishment and energy net building scenarios in relation to the ecological and financial effects. It also enables efficient administration and maintenance of real estate portfolios and proposes measures the minimum investment and energy costs and cause maximum CO2 reduction. The tools developed by the project can be used by municipalities to develop strategies on energy efficiency. It may be also used to control single initiatives on their direction in relation to the total energy political strategy. Municipality of Baden and their 100% subsidiary Immobilien Baden GmbH have processed the relevant data of more than 90 buildings and provided them as basis for the program developing. The results and recommendations of ECOCITIES.at build appropriate base for structured planning and processing of measures within e5 and CEM. The tool enables simulation of various strategies and shows long-term consequences of decisions. The system ensures the taking into account of all dependencies. The tool reduces the administrative, optimizing and energy efficiency monitoring efforts by up to 60%, it identifies new energy saving potentials and herewith it is significant contribution to the national and european climate goals¹⁸.

Other cooperation forms include research projects such as PACINAS on private and public adaption to climate change, UBA (Federal Office for Environment), Smart City Microquartiere, UBA, Interreg-Project Mobi-Plan, Klimabündnis (Climate Alliance) and the project "MUSTERSANIERUNG KONKRET" developed by the workgroup Renewable Energies Lower Austria.

8. Conclusion

Results of evaluation of stakeholders involved into energy transition in three case study regions, Freistadt, Ebreichsdorf and Baden as well as the participatory governance

¹⁸ <http://ecocities.at/>

measures involving stakeholders into shaping energy transition allowed us developing the following conclusions.

First, in each region stakeholders from all governance levels: local, regional and national, are involved however to a different extent and at the different phases of decision-making process.

Second, there are several measures to shape energy transition together with inhabitants of the regions, however, the majority of these measures are focused at the level of information and awareness building exercises like raps at school, climate cinemas and cabaret as well as media work.

Third, one measure where inhabitants could provide feedback about energy transition was identified. These are energy groups, where everybody interested in energy transition could participate. In Freistadt, participants also have a chance to discuss funds, which are provided by the national authorities for energy transition and to decide where they would like to apply these funds.

Fourth, inhabitants have an opportunity to participate financially and can be involved through different forms of crowd financing. In each of the regions such models were identified such as Helios in Freistadt for participation in solar PV electricity generation, wind parks in Pottendorf and Trumau as well as Badener Sonnerkraft.

Fifth, we did not identify any significant differences in measures of participatory governance between three regions, each representing different clusters – semi-urban, semi-rural and rural. In each of these regions the majority of measures are concentrated at four levels (according to the ladder of Arnstein), at the level of therapy, information, consultation and partnership.

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10. ANNEX: Interview Protocol

Relevant stakeholders (public, public authorities at all scales, experts, NGOs, and enterprises) on the local, regional and national level (see Fig. 1) will be queried on their vision of the climate and energy model regions as a way of fulfilling Austria's climate, energy, and regional development goals. The interviewer will explore the interviewees' narratives in order to ascertain their awareness of Austria's goals, their opinions on the desirability of the goals, and particularly on the RES model-region strategy as a way of meeting the goals. The questions will also include:

- a. willingness to pay higher prices to support RES generated electricity in their region (excluding policy maker interviews);
- b. willingness to prioritize taxpayer-funded investments in RES infrastructure in the regions (including policy maker interviews); and
- c. other indicators of support, for example, if NGOs invest resources in supporting the projects (NGO interviewees).

1. CEM Model to reach Austria's climate, energy and regional development goals

- Do you know what Climate and Energy Model regions are?
- In your opinion, what are the goals of the CEM? Is this model suitable to reach these goals?
- What is the role of the regional scale for a transition of the current energy system?
- Where do you think the major change should take place towards low-carbon transition of the currently energy system? At the level of individual behavior? At the level of municipalities and communities where deployment of infrastructure takes place? At the level of the region and country which settles targets? At the level of international and supra-national policy and frameworks which drive climate change mitigation?

2. Social and Public Acceptance

- Are you familiar with the Paris Agreement? If yes, what is it?
- When should fossil fuels be not used anymore globally?

- What is your opinion on energy autarky / energy self-sufficiency / energy independence? Do you think it is a suitable solution to tackle climate change? Why or why not?
- Do you think an energy transition is necessary?
- What are the most important issues for an energy transition? (What should be tackled? Mobility, change to RES, Buildings (Households, Businesses, Public buildings), new technology?)
- Is energy independency necessary to reach...
 - goals of climate change mitigation?
 - goals of energy security?
 - goals of regional socio-economic development?
- In your opinion, is it possible to reach energy independence in general, and taken into consideration available resources, in particular?
- What is necessary to promote a regional energy transition? (E.g. Should there be a focus on technology or on individual behavioral change? Change the underlying circumstances e.g. tax system, funding? Is more cooperation between regions the key? Involvement of residents or companies?)
- How do you assess public interest in renewable energy sources?

3. Costs and benefits of regional energy transition

- What benefits do you perceive of the implementation of a regional energy transition for your region (economic, social, ecological)?
- Are there any co-benefits, if yes who/which sectors benefit from processes in your region?
- Do you perceive an equal distribution of benefits? (e.g. between local and national level, Between population groups?)
- What are the costs and risks of a regional energy transition? Who carries those? Are the costs justified?

- How should cost be distributed between energy consumers and taxpayers?

4. Governance

- Who, do you think, should be involved into decision-making on energy transition, in general? (e.g. in the identification of the need for the project, identification of the location)
- Are they involved?
- Do you think, should inhabitants and lay people be involved into decision-making on energy transition and to which extent? (only ask question if needed)
- To which extent can these stakeholders be involved?
- At what time should stakeholders be involved?
- Which forms of involvement would you recommend?
- Concerning information on energy policy and energy issues: What kind of information do you trust? Information by whom? (ministries, climate fund, regional authorities, local authorities, environmental groups, science)

5. Willingness to pay (excl. policy maker)

- Would you (or your company) be willing to pay higher prices for RES in general?
- Would you (or your company) be willing to pay higher prices for RES if the energy is produced in your region?
- How much more would you be willing to pay?
- If yes, what is your motivation and the reasons to pay higher prices? If no, why not?
- Under what conditions? (How much more would they pay, what level of transparency is necessary, do people trust in it? What information is necessary to be trustworthy? How can transparency be established?
- Are you willing to invest in RE infrastructure (e.g. solar power, wind power through citizen participation)? Under what conditions?

- Who do you think should carry the main costs for an energy transition? (taxpayers or energy consumers)

Questions for political representatives:

- Are inhabitants in the region supporting energy transition? What are the major concerns of inhabitants about energy transition?
- What is the level of awareness of stakeholders and inhabitants in the region about energy transitions and their region being a CEM?
- Are they supporting the idea of their region becoming a CEM? Are there any protests?
- Do you know who are the major supporters and protesters?
- What is the image of the project manager who realizes energy transition?
- Are you willing to invest public money to make use of renewable energy sources? Are there any obstacles? Which? How do you deal with those?