INTERACT

Integration of Innovative Technologies of Positive Energy Districts into a Holistic Architecture

D 2.2 Stakeholder Needs

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Authors:

Andrea Werner, FH Technikum Wien

Markus Olofsgård, Afry

Helmut Bruckner, Sonnenplatz Großschönau

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Executive Summary

With the Clean Energy for All Europeans Package (CEP), the European Commission enables different stakeholders to jointly generate and consume energy. Energy Communities should facilitate the decentralization of the energy system by motivating and incentivizing citizens to take care of their own energy supply.

Within the INTERACT project, the goal was to identify relevant stakeholders within the involved focus regions, and assess their motivations towards energy communities based on both study of existing documents/studies as well as empirical assessments. Consequently, suggestions towards integration of stakeholder groups into the EC, the implementation in the respective focus region addressed to different subgroups should be derived.

This goal was approached by application of a Stakeholder Mapping Methodology and the analysis of perspectives of stakeholder representatives via interview in the two focus regions. From a methodological perspective, the assessment methods were based on adaption of social network analysis in regard to depiction of interrelatedness and interconnections of various stakeholder perspectives. The two focus regions, Großschönau (Austria) and Fyllinge (Sweden) start from two very different dispositions, therefore the methods of the Stakeholder Mapping have been adapted to the respective focus regions.

The results contribute to the overall understanding of local stakeholder representatives' motives, expectations, challenges and visions for future implementations of Energy Communities. The results for Case 1 in Großschönau, Austria can be taken as a starting point for building communication strategies and involvement management, so that the transition and introduction of energy communities can be facilitated and addressed to target groups. ECs need to fulfil clear benefits if participation and long-term functioning is expected – among respondents these are clearly both financial as well as ecological benefits, that should be showcased.

The first year of pilot EC with public building is decisive in forming out roles, identifying costs and thereafter forming clear communication towards future potential members in the EC. The results of the stakeholder mapping in Großschönau give a broad spectrum of Stakeholder groups motives, expectations, challenges and visions for future implementations of EC. This serves as a basis for the creation of communicative narratives that support the community building and deployment of the vision of the EC in the region.

The general stakeholder perspective as well as the dialogue with the local stakeholder for the Case 2 in Fyllinge, Sweden shows that an energy community needs to develop other benefits than economical since there will likely be rather little individual economic incentives from an EC. On the other hand grid stability, efficient usage of the grid and increased use of renewable power are all questions all stakeholders regard as important.

Communication strategies in future will need to address the increased potential of locally produced energy and the energy efficiency. Potential starting point from organizational perspective could be the formation of EC in the same way as housing cooperatives, thereby replicating a successful and community led organizational structure.

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List of Abbreviations and Acronyms

CEP	Clean Energy for All Europeans Package
DSO	Distribution System Operator
EAG	Erneuerbaren Ausbau Gesetz
EC	Energy community
EMB	Electricity Market Directive
ENU	Energy Agency of Lower Austria
EVN	DSO of Lower Austria
EZN	Newly founded facilitator of ECs in Lower Austria
PED	Positive energy district
REC	Renewable Energy Communities
RED	Renewable Energy Directive
WP	Work package

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1 Introduction

With the Clean Energy for All Europeans Package (CEP), the European Commission enables different stakeholders to jointly generate and consume energy. The Renewable Energy Directive (RED) and the Electricity Market Directive (EMB) set the framework for citizen and renewable energy communities. Energy Communities should facilitate the decentralization of the energy system by motivating and incentivizing citizens to take care of their own energy supply.

The RED explicitly names individuals, SMEs and local authorities (including municipalities) as members of renewable energy communities (REC) and restricts its shareholders from generating profit out of the REC. In order to set up and manage an energy community, of course several other stakeholders have to be involved. As ECs fundamentally change the role of citizens within the energy market, this is undoubtedly the most significant stakeholder group for the success of ECs, and their concerns and motives must be considered. However, energy communities bring together various stakeholders and new roles and responsibilities arise. Therefore, it is crucial to gain deeper understanding on the roles of all involved stakeholders and on the motives and challenges they face when it comes to running an energy community.

In Austria, the "Erneuerbaren Ausbau Gesetz" (EAG) and the novelized ElWOG set the legal framework for establishing citizen and renewable energy communities. This enables ECs to produce, consume and store energy as well to sell to community members. Further, ECs are allowed to act as aggregator and to offer other energy services (these services are not further specified). The EC operator may operate the production units itself or commission a service provider. ECs are not allowed to operate their own electricity grid. These legal requirements show the close relationship – and dependency – of actors within an EC and underlines the necessity to consider needs and requirements of all stakeholders involved.

Within the last years, many research projects investigating energy communities and setting up pilot sites for real world testing of the new concept. Regarding stakeholders and their roles, motives and challenges, most research focuses on citizens' role within energy communities and their willingness to join renewable or citizen energy communities (e.g. Azarova et al. 2019, Conradie et al. 2021, Savelli and Morstyn 2021, Soeiro and Ferreira Dias 2020).

Actor-related barriers for the rise of ECs are identified by Palm (2020): at present state, few actors (mainly large energy companies and state owned companies) dominate the energy sector. Whether they are willing to share their market power depends on the benefits e.g. network operators and utilities may achieve through energy communities, such as grid stability. However, Roberts (2020) questions, whether Energy Communities bring advantages to network operators.

Some Pilot-Projects setting up (renewable) energy communities take into account their stakeholders and actors, but these are pilot-specific analyses, with limited generality (e.g.

CLUE[1], COMPILE[2]). There is lack on research on motives and barriers of stakeholders such as DSO/TSO, utilities, local authorities and (new) energy service providers.

1.1 Purpose of the document

Within the INTERACT project, the goal was to identify relevant stakeholders within the involved focus regions, and assess their motivations towards energy communities based on both study of existing documents/ studies as well as empirical assessments. Consequently, suggestions towards integration of stakeholder groups into the EC, the implementation in the respective focus region addressed to different subgroups should be derived. This goal was approached by application of a Stakeholder Mapping Methodology and the analysis of perspectives of stakeholder representatives via interview/ survey in the two focus regions.

1.2 Relation to other project activities

This Deliverable summarizes the results of Stakeholder Mapping approach in the two INTERACT focus regions. It serves the purpose to form a basis for organizational structure introduced to WP3 within the research project, and contributes to the overall understanding of local stakeholder representatives' motives, expectations, challenges and visions for future implementations of Energy Communities. The output from this deliverable will be used for the recommended organizational form of the specific INTERACT Energy Communities in WP4. Furthermore information from this deliverable will be used to generate the success factors of Energy Communities in WP2. The whole information will be brought together into the roadmap as final output of the INTERACT project within WP6.

1.3 Methodology

A Stakeholder Mapping approach was chosen to identify stakeholder groups, assess their perspectives towards energy communities and their roles within them.

From a methodological perspective, the assessment methods were based on adaption of social network analysis in regard to depiction of interrelatedness and interconnections of various stakeholder perspectives. The mapping process itself was structured in two stages, the (1) first one focusing on **identification of relevant actors and stakeholder groups** in the two regions, in addition to collection of relevant information and data on those stakeholder groups from previous studies, the (2) second stage was **the assessment of stakeholders' perspectives on energy communities' roles and other stakeholders** via an empirical survey with representatives of stakeholder.

The two focus regions, Großschönau (Austria) and Fyllinge (Sweden) start from two very different dispositions; at the time of conducting this Stakeholder Mapping, a first version of the Austrian governments legislation to establish energy communities (as before mentioned, EAG) has already been published and various pilot studies, initiatives and research projects had already made efforts to prepare for first implementation steps, among them various

[1] https://project-clue.eu/
[2] https://www.compile-project.eu/

actors in the municipality of Großschönau. In Sweden, however, neither legislative basis for EC is adopted (see chapter 3) and there are few pilot studies available that specifically focus on REC. Additionally, Fyllinge is a green field project in the status of planning in which therefore the vision of an energy community should be integrated at an early stage, yet regarding the availability of already involved and informed stakeholder groups and representatives is limited. Therefore, two variations of the methodological approach have been conducted in the two regions:

1.3.1 Methods applied for Case Großschönau, Austria

The Mapping of Stakeholders in Großschönau was conducted in two main stages:

1) **Identification of relevant actors and stakeholder groups**

The first stage is dedicated to understanding pre-conditions and starting position for the analysis in the respective region in open, explorative discussion setting with representatives of the focus region. Representatives should provide an overview on local actors and good network within the community, in order to identify most relevant stakeholder groups, potential interview partners.

Additionally, previous studies and existing data – about the region and its stakeholders, similar projects in same regulative context (e.g. actors and motivational backgrounds, roles in communities, customer segmentations, survey results) were identified as a knowledge basis. Another goal was the adoption of a fitting methods approach adapted in regard to local circumstances, including the selection of relevant questions, type of survey (personal, online, other, …) and goals for the analysis were chosen.

2) **The assessment of stakeholders' perspectives on energy communities' roles and other stakeholders**

Interviews with 15 representatives of identified stakeholder groups were conducted in order to assess perspectives on energy communities, their potential roles within them and assessment of other stakeholder groups. The interview guideline consisted of a pre-formatted interview guide with a mixture of open-ended, single/multiple choice and rating questions, which were to be filled out and discussed in presence of an interviewer.

The interview guideline was structured in two parts, where one part was specifically addressed to representatives already involved in the planning or organization of the energy community, while the other part was also addressed towards people not part of the planning.

Questions addressed to representatives involved in the planning were asking about the stage of planning and current plans regarding members, goals, business cases, ownership structures, organizational planning, roles in the EC; pre-arrangements as well as expected benefits and current challenges. Questions addressed towards all stakeholder group representatives were covering knowledge background on EC, benefits and burdens in participation, as well as the assessment of expertise, roles, conflicts of interest as well as

interest in an influence on the success of an EC. Analysis and derivation of recommendations is partially based on the stakeholder analysis approach based and adapted from Mendelow (1981) and its popularized approach[3].

Following **limitations** need to be taken into account: Results from the stakeholder mapping process represent perspectives from selected individuals representing stakeholder, therefore diverse opinions within the stakeholder groups could not be represented. The limited number of participants requires a mainly qualitative approach, yet for the sake of visualization, analyses were summarized numerically. Numerical figures should be taken within the context of the overall sample, and not be confounded as statistical results. Also, the stakeholder mapping was conducted during summer 2021, during that time the legislative framework was already available as a draft version, however various administrative, procedural and detailed legislative aspects for roles and functions, distribution of tasks was still unclear.

1.3.2 Methods applied for Case Fyllinge, Sweden

For the mapping of Fyllinge stakeholder needs, a combination of literature review and interviews has been applied. This methodology is applied since Fyllinge is a greenfield project to be implemented several years into the future. Identification of, and dialogue with the stakeholders therefore differs some from that in the case of Großschönau. The stakeholders' roles are to some extent defined, however individuals that represents the different stakeholder groups might not be able to find in relation to Fyllinge. In the case where they can be identified (municipality, DSO) there is still a challenge of providing input in the same way as the stakeholder in Großschönau where the energy community project is much more tangible.

Since the Swedish legislation on energy communities has been out for consultation in 2020/2021, many of the major stakeholders groups have been engaged to give their feedback on the legislation, these answers can be found publicly at (Remiss av Energimarknadsinspektionens rapport med förslag för genomförande av EU-lagstiftning på elmarknadsområdet samt för genomförande av vissa delar av det omarbetade förnybartdirektivet, u.d.)

Furthermore, a master thesis was recently conducted at the university of Lund trying to map the major stakeholders' views on opportunities and challenges with energy communities. (Mattson, 2021).

The literature review will take its origin in these two sources to give an overall stakeholder perspective, this will then be completed with the information from the local real estate developer in Fyllinge, the municipality in Halmstad, and the local DSO HEM achieved through questionnaires and interviews.

[3] https://www.mindtools.com/pages/article/newPPM_07.htm [01.08.21]

An attempt to include the future citizens need is done by studying the literature regarding earlier community owned energy resources in Sweden, mainly wind and solar cooperatives. this is based on the “come together – The development of Swedish energy communities” (Magnusson & Palm, 2019)

2 Case 1 – Großschönau, Austria

Großschönau, a rather small but very well-known rural municipality in Waldviertel, Lower Austria, has been pushing since decades towards sustainable and environmentally friendly ways of living. Großschönau is rated an e5-municipality, was winning the European Energy Award in Gold for its achievements in energy efficiency, and has with the fair BIOEM and the permanent exhibition SONNENWELT two nationwide known showcase projects of sustainable thinking and acting.

In the municipality, about 1 kWp of photovoltaic is already installed per capita, bringing the municipality into the Top10 in this measure in the state of Lower Austria. Within the region, Großschönau aims to be energy-neutral by the year 2030, and is proactively working towards this aim, in line with its slogan “Spür die Energie”, in English “Feel the Energy”.

Within Großschönau, an energy data measuring network is in place for all public buildings, and step-by-step also private houses are being connected. There are several public charging stations for electrical cars, privately and commercially used battery storages in addition to the before mentioned PV-installations, and also heat pumps are available and accessible in order to increase the flexibility of a potential energy community.

With national and international research projects like cFlex, Flex+, Urban Energy Cells, BEYOND or InBetween, the municipality has already achieved notable fundaments, which will now be extended by the knowledge created within INTERACT.

2.1 Stakeholder Map

2.1.1 Stakeholder Groups in Großschönau

In Großschönau, initiative has already been taken towards establishing an energy community and various actors are committed to this cause and involved in this process. Additionally, there is a vivid network of community members that have been engaged in energy- related projects. This is due to the long tradition of the Municipality engaging in various sustainability activities. Großschönau has different already established organizations to inform about new ideas and initiatives, and to invite the local citizens to join such initiatives. The municipality is a rather small, rural municipality, where the personal contact to the different citizens is given. Therefore, personal discussion and word of mouth is very important and a critical factor for a successful project implementation.

Within the Stakeholder Mapping for Großschönau, seven relevant stakeholder groups were identified and surveyed through representatives of each stakeholder groups: First of all, the Municipality represented by its Mayor. Municipal organisations represent both members of the public council, to the stakeholder group also belong other organisations that are in public domain. Opinion leaders encompass associations and organisations that work in the field of energy/ sustainability and regional development, therefore already serve as opinion

leaders through their informational activities. All stakeholder categories and a description is given in Table 1.

Table 1 Stakeholder Groups in Großschönau

Stakeholder Category	Stakeholder ID	Stakeholder Representatives	
		Number of representatives	Description
Municipality	1	1	Mayor
Municipal organisations	2	2	Representative of municipal council and public administration
Opinion leader organisations	3	2	Regional organisations with focus on climate strategies for municipalities, involved in strategic alliances and information campaigns.
Private Businesses	4	3	Representatives from Local businesses: tourism, guest house, farming and information centre/ local permanent exhibition on energy for the public.
Infrastructure	5	1	Energy and grid provider
Local associations	6	4	Representatives from associations: Tourism & local economic development, rural youth club, volunteer firefighter.
Citizens	7	2	Representatives from the community, consumer and prosumer.

2.1.2 Background of Stakeholder representatives

Regarding their background and knowledge on energy related topics, the groups of participants were diverse with about half of them having no or very few knowledge and the other half stated to have some to very specific knowledge and experience.

The majority of stakeholder representatives had already heard about the concept of energy communities, two were introduced to the concept before the interview yet stated to have no prior knowledge about the concept.

In the interview guidelines, respondents are asked frequently to assess not only their own perspectives (in representation of the stakeholder group) but also assess other stakeholder groups. Table 2 shows the assessment of stakeholder groups regarding their own and other stakeholders' formal and informal expertise in respect to EC. The table gives translated and shortened answers from the open questions. These perspectives give discrepancy between own assessment and potential expectations from other stakeholders, e.g. citizens neither consider themselves to have expertise nor other stakeholder groups expect them to have expertise, and even one statement says that they would not need any expertise. Yet, Municipal organizations assess that there is no or low expertise available, but other stakeholder representatives agree but state this to be highly relevant, therefore capacity building seems to be of relevance, too.

Table 2 Assessment of Stakeholders knowledge

Formal and informal expertise		
Stakeholder category	**Perspective on own stakeholder group**	**Perspectives from other stakeholder group representatives**
Municipality	n/a	Very high Currently building up Important, highly necessary, has to be there Should be pioneer No
Municipal Organisation	No	Has to be there, highly necessary No, low, none Teachers could have an impact [on pupils] Expected precondition
Infrastructure	n/a	High Necessary
Associations	Mutual education and information sharing necessary Not necessary	None Low
Private businesses	Yes Could bring in their point of view	Medium Low, depending on background
Opinion leaders organisations	Yes	Necessary High
Citizens (Prosumer and Consumer)	No Everyone contributes “as good as they can”	No, none, low Not necessary

2.2 Planning an Energy Community – Current Status

Among the respondents, six stakeholder representatives claim to be involved in the planning of an energy community and therefore received further questions on the organization of the energy community. Those come from municipality and representatives of municipal organizations (3), from specialized associations (1) and businesses (1), as well as one representatives from an association (1). Their responses give insight to the current state of planning, as well as ideas and expectations on the organizational setup, such as possible business cases, structure and expected ownership.

Among stakeholder representatives, this perspective on organizational aspects was mostly unanimous, with only few deviations in responses. Most respondents were referring their responses to planning of the “REC Lainsitztal”, only one mentioned an “REC Sonnenplatz”, yet did not give further information on organisational set-up, therefore the next sections will mainly focus on responses towards REC Lainsitztal.

Currently, all municipalities within the region Lainsitztal, especially the mayor of Großschönau, and the specialized business Sonnenplatz Großschönau are involved in the process. Additionally, an external organisation is involved in the organisation: representatives of EZN (a newly formed business that aims to help municipalities in Lower

Austria to establish energy communities, founded by ENU and EVN). A pre-agreement between the Municipalities and EZN was in negotiation at the time of the survey, in which organisational and administrative support for the energy community will be provided by EZN.

The implementation of the energy community is planned incrementally, starting with 6 organisations of public buildings in municipal ownership (Town halls, schools, kindergarden, sewage cleaning plant, water supply building, fire department) and later expanding it to local businesses, private households with potentially 2.000 members.

2.2.1 Goals for the Energy Community

Respondent involved in the organization of the Energy Community were asked to select which goals they aim to achieve for the energy community. The results are listed below in table 3 including the frequency of chosen answers (maximum = 6).

Table 3 Goals of the Energy Community –Numerical ranking by no. of selections, multiple choice (n=6)

Goals for EC	(n=6)
Local energy production and consumption (preference of direct usage, over feeding-in)	6
Increase Renewable Energy in the region	6
Alleviate/ easing of local grid loads	5
Peer-2- peer Energy trading (active trading of electricity among consumer and prosumers)	4
Flexibility Trade	4
Fostering investment in decentral renewable energy (crowdsourcing, community owned power plants etc.)	3
Energy autonomy (independence from grid)	1
Community Storage	1
Other goals	1

Only once, an additional goal was selected and added in an open text field: “Operation and integration of private storages”.

2.2.2 Business Case and Economic Goals

Few responses were given in the regard to the business cases that are expected or planned. In the open ended question, no clear indication of the planned business case is given. Following themes were given:

- Planned to bring in motivational elements to bring in other members, so that production and consumption is brought “closer together”.
- Ensure 100% of energy by regional supply and become energy neutral by 2030 within the municipal strategy plans.
- Development of flexible pricing model.
- Ideally reduce electricity costs, and open opportunities for new business fields of (local) enterprises

2.2.3 Ownership structure and form of organisation

Regarding the preferred ownership structure, only few responses were given in the question that gave a single choice of various ownership types - with selection of citizens, public or private ownership or mixed combinations of the three ownership types. Results are shown below in table 4.

Table 4 Preferred ownership structure, multiple choice (n=5)

Ownership structure	Single ownership (100%) by			Mixed ownership		
	Citizens	Public	Private Enterprise	Citizens/ Public	Private / Citizens	Public/ Private
	1	1	4	1	1	1

Regarding the planned organisational form, respondents expect or plan the energy community to be formed as an enterprise (Personen- oder Kapitalgesellschaft) (4), association and cooperative were both selected once. In both questions the enterprise tops the list with 4 nominations each, and therefore planned and preferred organizational form seem to fit. Results of the planned organisation type are listed below in table 5.

Table 5 Planned organisation type, responses from stakeholder representatives (single choice, n=6)

Organisation type	Association (Verein)	Cooperative (Genossenschaft)	Enterprise (Personen- oder Kakitalgesellschaft)	Owners association (Eigentümergemeinschaft, nach WEG oder ähnliche Vereinigung mit Rechtspersönlichkeit)
	1	1	4	0

2.2.4 Organisational and administrative challenges

At the stage of planning the energy community, various detailed questions for the organisational set-up are yet unclear and therefore stakeholders state various concerns:

- Grid level – Energy Community organisations depend on the information of at which grid level, prosumer and consumer are connected, resulting in different costs (e.g. due to different grid-fee reductions).
- Costs – For Investment and Operation are yet unclear, especially the costs during operation depend on various, unprecedented situations.
- Contracts – Setting up of contracts and finding good sample contracts.
- Uncertainty – Further burdens and obstacles are being expected by stakeholders, due to the novelty of the approach and the lack of practical experience.

In spite of those challenges, some respondents seem to take on a positive expectation towards the process of establishing an energy community. It is mentioned, that challenges will be taken on step-by-step and it is expected to learn from mistakes in those early phases of setting it up.

2.3 Roles and responsibilities

2.3.1 Roles and tasks in EC

Respondents were asked which future role they would take on within the EC, and given a multiple choice options of pre-selected answers. Those "roles" represent tasks that need to be undertaken within an energy community, based on feedback with representatives of the case region before the survey.

Table 6 Roles in energy community, overall and sorted by stakeholder groups (multiple choice, n=15)

	Sum		Roles stakeholder groups would consider for themselves in an energy community *(responses in absolute numbers)*						
	number	mean	Municipality	Municipal organisations	Multiplier organisations	Private Businesses	Infrastructure	Associations	Citizens (Prosumer / Consumer)
	15	(0=no; 1=yes)	n=1	n=2	n=2	n=3	n=1	n=4	n=2
			8	13	10	13	6	13	3
Consumer	8	0,5	0	1	1	1	1	3	1
Prosumer	9	0,6	1	2	0	3	0	1	1
Investor	2	0,1	0	0	0	0	0	1	1
Operator	4	0,3	1	1	0	0	1	1	0
Administrational Help – Member Acquisition	9	0,6	1	2	2	2	1	1	0
Conceptual Help	8	0,5	1	2	2	1	1	1	0
Administrational Help – Accounting	5	0,3	1	1	0	1	0	1	0
Administrational Help – Membership Administration	10	0,7	1	2	1	2	1	2	0
Marketing	7	0,5	1	0	2	1	1	2	0
Community Building	7	0,5	1	2	1	2	0	0	0
Flexibility Trade	0	0,0	0	0	0	0	0	0	0

Table 6 gives the results of the multiple choice options of roles that survey respondents would consider to take on for themselves in an energy community. Most selected options were the roles as consumers (8) and prosumer (9) as well as function of administrational help in member acquisition (9) and member administration (10). Only few respondents would consider to take on the role of operator (4, representatives from municipality, Municipal organizations, infrastructure and from an association) and even less as investor (2, representative from association and citizens). Flexibility trading was not selected by any respondent.

Overall, citizens have the lowest count of selected roles, and considered consumer, prosumer and investor as potential role/function. On the other hand, representatives from

associations, private businesses and from Municipal organisations chose various of the mentioned roles/functions.

2.3.2 Roles and tasks for stakeholder groups

Additionally to the selection of roles for themselves from a given choice (see above), respondents were asked to assign for each stakeholder group potential roles in an EC – results are summarized in Table 7.

Table 7 Perspective on stakeholder groups roles in EC (own and other groups) – qualitative summary

Formal and informal role in Energy Community		
Stakeholder category	**Perspective on own stakeholder group**	**Perspectives from other stakeholder group representatives**
Municipality	n/a	Initiator Operator Pioneer / Role Model Offer Info, Consultation Organisation Member (Prosumer) Building up EC Leader
Municipal Organisation	Prosumer Consumer	Operator Member (Prosumer) Pioneer Opinion leader Information Consumer Role Model
Infrastructure	n/a	Billing, Accounting (3) Grid services Grid availability Provide infrastructure Role should be well developed DSO Operator Passive role Provide data
Associations	Member Information Motivation consumer Prosumer Profit	Member (Prosumer) Multiplier Role Model
Private businesses	Producer Consumer Pioneer, Multiply idea Investor Operator	Organiser Member (Prosumer) Pioneer Operator Role Model Leadership
Opinion leaders organisations	Motivator Caretaker Counsellor Opinion leader Help with organisation Initiation marketing	Initiator User Marketing Care-Taker Awareness raising Information Motivation Professional support of all stakeholders Organisation Operator Support Marketing Pioneer Mediator
Citizens (Prosumer and Consumer)	Producer Consumer	Member Pioneer Operator Investor Prosumer Consumer Pioneer

Important is to mention, that this table summarizes expectations towards groups responsibilities and role in an EC, yet no information was given on the legally assigned roles. The summary also shows some discrepancy between expectations of roles for stakeholders posed by other respondents towards some groups, and how interviewed respondents expect to fill this role themselves: citizens as well as Municipal organisations gave a relative narrow role definition towards their own group, as consumer and prosumers, yet received various additional roles from other respondents. Unfortunately, no reply was given from respondent from infrastructure and the Municipality – bother roles received various assigned roles. In regard to infrastructure, respondents were assigning this group both a very active role (for grid services, billing and accounting, even as operator) and in contrast a "passive role".

2.3.3 Organisational Leader

Another perspective on the potential roles in an EC are given in regard to leading role in the EC; respondents rated which stakeholder they would trust and prefer to take on the leading role. In addition to the before mentioned seven stakeholder groups, additionally existing and

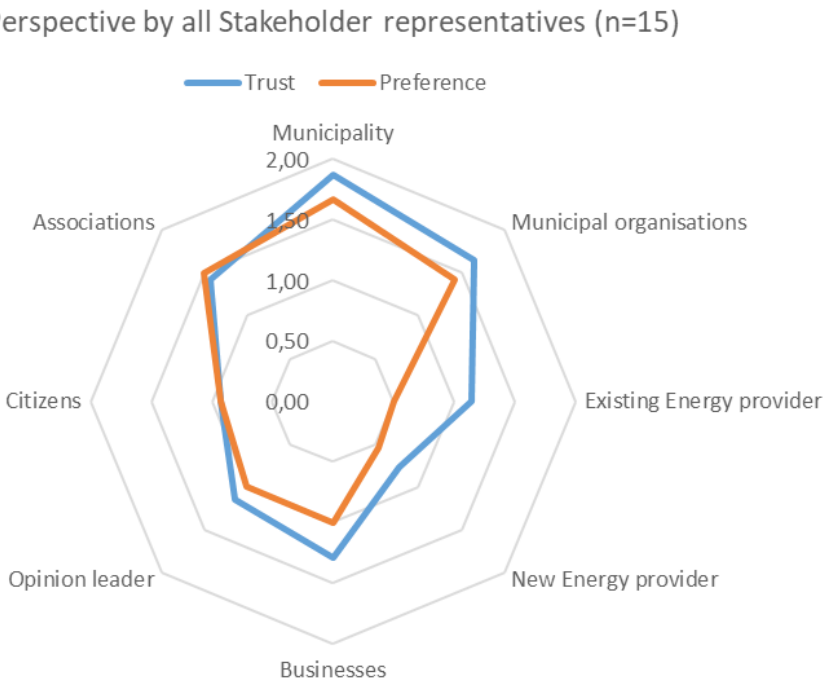

Figure 1 Trust and preference for leading role in EC – overall (0=no, 1=maybe, 2= yes)

new energy provider/ organisation was added to the selection. Infrastructure provider were retracted from the selection. As Figure 1 shows, the overall assessment shows that the Municipality and municipality organisations are both trusted and preferred in the role of leading the organisation of an EC, while both existing and new energy provider are not preferred to fill this role. Also citizens, opinion leader organisations and private businesses are overall not preferred for this leading role.

In a more detailed view, the stakeholder group representatives' different opinion on the leading roles are given in the following Figure 2:

Figure 2 Trust and preference for leading role in EC by stakeholder group (0=no, 1=maybe, 2= yes)

Each of the above given graphs represents the rating of representatives of a stakeholder group summarized towards their trust and preference of who should take on a leading role in an EC. Regarding the leading role of Municipality and municipal organisations, perspective of stakeholder groups supports the overall view and only representatives from local associations response is less clear. Yet, they give generally a lower rating towards trust and preference of all given options. Citizens themselves trust most other stakeholder groups, yet

not their own stakeholder group to take on the role. Municipality and municipal organisations rate energy provider and a potentially new energy service provider the lowest in a leading role.

Generally, here especially the limitations of the study regarding sample size should be considered in interpretation of results.

2.4 Motivators and Needs

2.4.1 Goals and motivation for participation

Stakeholders perspective on goals for their participation as well as motivating factors to contribute or participate in an EC were assessed via open questions in order to not pre-empt answers and leave space for a broader exploration of potential motivators. Figure 3 gives a graphical representation of the answers that were categorized and summarized. They show a broad variety of motivators for participate, also they vary from meta-level (secure our future) to very specific motivators (business expansion).

Figure 3 Motivation to participate in an EC, categorized from open statements

Stakeholders participation is connected to the fulfilment of the above summarized motivators; when asked about the conditions under which they would be willing to participate, various of the motivators were repeated or specifically mentioned that they

need to be clarified and ensured to be fulfilled. Fair prices, clear defined framing conditions and a good balance of benefits and efforts it need to be invested were stressed again.

As before, stakeholder representatives were asked additionally about their perspective on other stakeholder groups, results regarding benefits and motivators per stakeholder group are shown in Table 8 below.

Table 8 Analysis of stakeholder motivators and needs

Motivation and benefits		
Stakeholder category	**Perspective on own stakeholder group**	**Perspectives from other stakeholder group representatives**
Municipality	n/a	Financial benefits Security of supply Increase Renewables Climate protection Energy autonomy
Municipal Organisation	Cost saving Financial benefits Pioneer	Increase Renewables Climate protection Financial benefits, savings Pioneer, Role model Security of supply
Infrastructure	n/a	Grid stability and relieve
Associations	Savings Financial benefits Motivate internally Getting in touch with members Further increase group dynamics, Winning of competitions, awards	Pioneer Climate protection Electricity from renewables Financial benefits
Private businesses	Financial benefits, revenues Non-financial benefits Fulfilling of the own purpose Gaining cross-regional experience Strengthen business model Service Security Electricity from renewable resources	Pioneer Financial benefits Security of supply
Opinion leaders organisations	Strengthening regional added value, usage of renewable energy high motivation work Further projects, work	Pioneer Regionalism and added value Financial benefit Continuation of work, projects Security of supply
Citizens (Prosumer and Consumer)	Profit Climate protection	Pioneer, Role model “Green” thinking Community Spirit Financial benefits Security of supply

In the interview guideline, separate questions were asked about the potential benefits of an EC and the motivators of stakeholders participating in an EC. However, the responses were for both questions similar and not clearly to differentiate, therefore results are summarized in the table.

Results show generally similar topics as beforehand in Figure 3, yet some additional benefits were mentioned to specific stakeholder groups, for example private businesses that additionally could benefit from cross- regional experiences, a strengthened or expanded business model and have secure supply from renewable sources. Also associations add further potential benefits that come from a strengthened relationship within members of the association and benefit the group dynamic. Only for infrastructure provider, few benefits were mentioned.

2.4.2 Burdens and interferences

Questions of potential burdens was approached in three ways, challenges in regard to participating in the energy community, challenges for specific stakeholder groups and thirdly, in how far certain stakeholder groups themselves could hinder the progress or interfere in the success of an EC.

Expectations regarding challenges for setting up an energy community and uncertainties have been assessed in an open question form and topics were, again, categorized and displayed in graphical representation in Figure 4.

Figure 4 Challenges for participation in an EC, categorized from open statements

As before, stakeholder representatives were asked additionally about their perspective on other stakeholder groups, results regarding burdens per stakeholder group are shown below in Table 9. The table gives few additional insights regarding the burdens for each stakeholder

group, unfortunately various fields were not answered. For stakeholder groups the main concerns mentioned here are the effect of high fees and the lack of benefits. For the category infrastructure, the challenge of having a new role to fulfil, added duties and the potential loss of influence due to the changing market dynamics are mentioned.

Table 9 Potential burdens for stakeholder groups

Burden for Stakeholder Groups		
Stakeholder category	**Perspective on own stake-holder group**	**Perspectives from other stakeholder group representatives**
Municipality	n/a	Unclear
Municipal Organisation	n/a	n/a
Infrastructure	n/a	High fees/ tariffs New role, new duties Losing political influence Maybe high investment costs
Associations	No personal benefits	High fees
Private businesses	n/a	Tariffs too high No personal benefits
Opinion leaders organisations	n/a	Tariffs too high No personal benefits Not enough info
Citizens (Prosumer and Consumer)	Tariffs too high	None

Stakeholder groups could not only benefit to the success of EC, but interfere with its progress – respondents stated various causes, that even though considered to be unlikely to happen (as has been stated various times in the responses), in which way interference could accrue.

Summarized in Table 10, these interferences are connected with inactivity or no participation and thereby hindering the progression of an EC, as well as bad publicity and gossip that could overall bring a bad reputation for the concept. Also, personal differences were mentioned as potential threat to the success of the process. Since personal recommendations are of high importance in the community, the good publicity and a reliable chain of information seems to be crucial to the success.

The potential interference in regard to Municipality gives various entries of interferences, yet if taken reverse it can also be interpreted as high expectation on the role Municipality has to play – taking on a role as a leader, giving information, integrating other municipal facilities, supporting marketing and helping in the organisation.

Table 10 Potential interferences from stakeholder groups

Potential interferences from Stakeholder Groups		
Stakeholder category	**Perspective on own stakeholder group**	**Perspectives from other stakeholder group representatives**
Municipality	n/a	In our community not to be expected Deny role as leader Does not include municipal facilities Not giving information Omits participation, Not supporting marketing, Not helping with organisation Different political goals, Different personal and ideological approaches Working against it
Municipal Organisation	n/a	No participation Employees are not convinced and protest it
Infrastructure	n/a	High fees/ tariffs for EC Cumbersome accounting, hinder billing Bad communication No grid improvements or expansion Working against it
Associations	Inactivity Leadership is sceptical No participation, then members wont either No reason to interfere with EC	No participation Protesting against it Setting a negative mood Bad word of mouth
Private businesses	n/a	No interest Inactivity Leadership is sceptical Will not interfere Personal reasons maybe
Opinion leaders organisations	n/a	Only in case of personal differences Inactivity Will not interfere Leadership is sceptical
Citizens (Prosumer and Consumer)	No participation	No participation Bad word of mouth “The loudest are against it” “Fake news can spread around”

2.5 Network of Stakeholder

The overall assessment of relations of stakeholder groups towards each other was assessed with rating of groups in regard to their shared interests or opposing interests in EC by a rating of all groups, from all stakeholder representatives.

2.5.1 Shared interests or conflicts within stakeholder network

Beyond the various roles and responsibilities, that need to be defined and might include unwanted responsibilities, stakeholders might have varying interests (from their organizational or personal background) that could result in different interest towards the creation of energy communities. On the other hand, shared interests could be taken for alignment and coalition in the formation of an EC. Stakeholder respondents rating of each connection between stakeholder groups (each connection of stakeholder groups was rated giving a + for shared interest, - for opposing interests) identified a picture of predominately assessment of shared interests (of overall 274 ratings, 231 were + ratings indicating shared interests). Only 43 entries indicated opposing interests among stakeholder groups.

The following Figure 5 gives an overview on the network of interests, in which the ratings were transferred to colour coded lines – the thicker the line, the more often this connection was stated in this sense. As we can see, most stakeholder groups share interests in regard energy communities, only few conflicting lines remained in the overall perspective – between local association groups and infrastructure, as well as citizens and infrastructure.

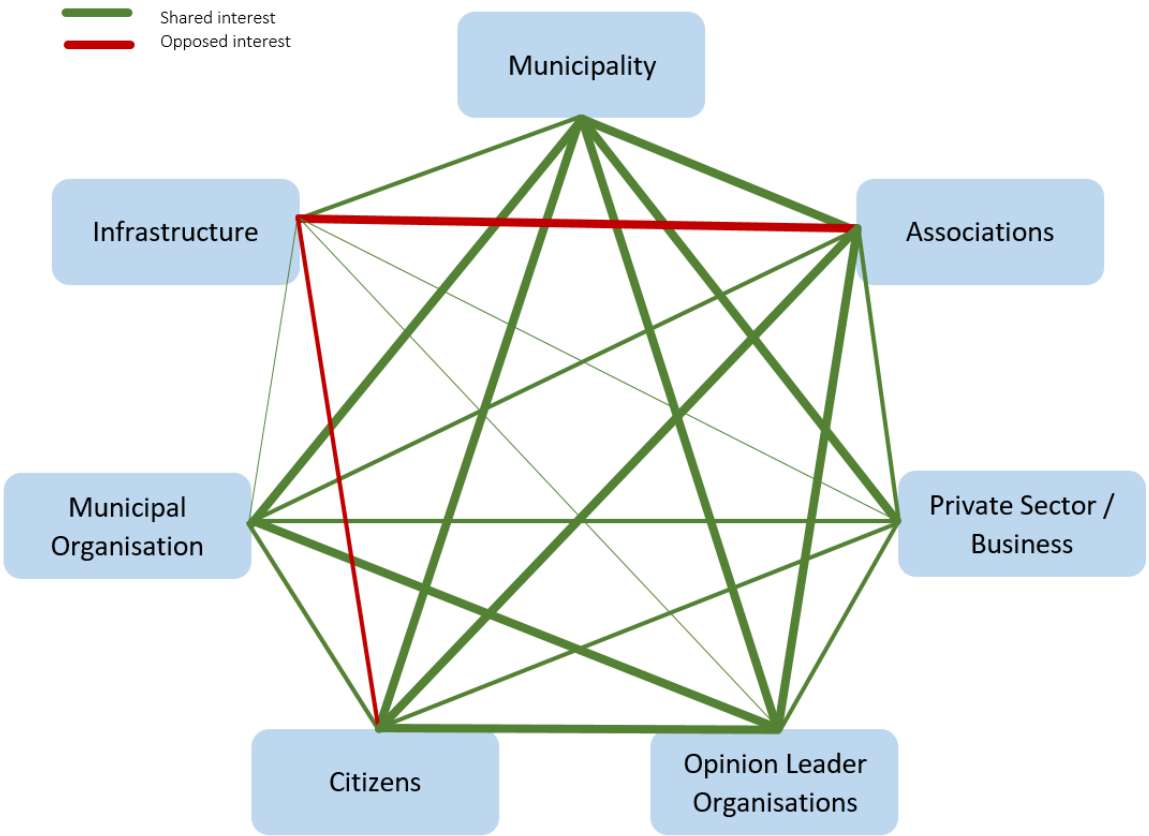

Figure 5 Stakeholder perspectives on shared and opposing interests (Overall)

In a more detailed view on the mentioning of potentially opposing interest (Table 11), the overall impression of few potential conflicts of interest at the current state is supported. In addition to the above mentioned two lines of opposing interests (which are labelled red in the table), there are other less frequently mentioned opposing interest. Various times the

conflict connections are towards infrastructure - e.g. between municipal organizations and infrastructure (3), private sector businesses (4), municipality (3), and opinion leader.

Other conflicts mentioned municipal organizations with associations and private sector (2), and citizens (1). Various but few mentioned arise in connection with private businesses, towards other organizations.

Table 11 Shared and opposing interests - summary results of stakeholder groups rating (numerical)

Connection		shared interest	Opposing interest	no entry
		+	-	0
Municipality	Municipal organisations	15	0	0
	Infrastructure	9	3	3
	Associations	14	0	1
	Private Sector/ Business	14	0	1
	Opinion Leader	15	0	0
	Citizens	12	0	2
Municipal organisations	Infrastructure	9	3	3
	Associations	13	2	0
	Private Sector/ Business	12	2	1
	Opinion Leader	14	0	1
	Citizens	13	1	1
Infrastructure	Associations	1	11	3
	Private Sector/ Business	8	4	3
	Opinion Leader	9	3	2
	Citizens	1	10	3
Associations	Private Sector/ Business	11	1	2
	Opinion Leader	13	0	2
	Citizens	14	0	1
Private Sector/ Business	Opinion Leader	11	1	3
	Citizens	10	3	1
Opinion Leader	Citizens	12	0	2
	SUM	**231**	**43**	**274**

Even though potential conflict lines are given, yet there is no qualitative description on the nature of potential conflicts, and whether the mention of conflicts is based on already existent or historic conflicts, or whether they are mentioned as a hypothetical interpretation.

2.5.2 Interest and Impact on EC success

The assessment of knowledge, interest and impact on the EC is used as a basis to identify which stakeholder groups should be tendered to with more attention in the process of organisation and setting up the EC.

Stakeholder interview partner were asked to rate all stakeholder groups regarding knowledge on EC, interest in EC and their impact on the success of an EC through a three-scaled single choice selection of low, medium or high. Results of this rating is given in Figure

6, where the average value of assessments, as well as the minimum and maximum value is given.

			Knowledge	Interest	Impact on Success
1.	Municipality	Min	1	1	1
		Average	**1,86**	**1,86**	**1,71**
		Max	2	2	2
2.	Municipal organisations	Min	0	0	0
		Average	**0,82**	**1,18**	**0,98**
		Max	2	2	2
3.	Infrastructure	Min	1	0	1
		Average	**1,57**	**1,25**	**1,75**
		Max	2	2	2
4.	Associations	Min	0	0	0
		Average	**0,14**	**0,64**	**0,75**
		Max	1	2	2
5.	Private Sector / Business	Min	0	1	1
		Average	**1,68**	**1,79**	**1,36**
		Max	2	2	2
6.	Opinion leader organisations	Min	1	1	1
		Average	**1,46**	**1,86**	**1,86**
		Max	2	2	2
7.	Citizens (Prosumer / Consumer)	Min	0	0	0
		Average	**0,00**	**1,07**	**1,18**
		Max	0	2	2

Figure 6 Interest, knowledge and impact on success of EC (mean between 0=low, 1=medium, 2=high; n=15)

The methodological approach assigns suggestions according to influence and interest in a project (adapted from Mendelow, 1981). Currently, Municipality received highest ranking in all three categories (knowledge, interest and impact), followed by private sector organisations and opinion leader organisations. According to literature (ibid.), organisations with such ranking should be managed closely in the process or be involved in the management – as is already the case in this EC process. Here, these are the ones that are already involved in the organisational process, consequently the rating is reasonable. Organisations with high influence, yet low interest are said to be kept satisfied in the organisation – this is the case here for infrastructure. Municipal organisations and citizens both have medium rankings in interest and impact, which is recommended to at least keep informed and manage closely. Since the level of knowledge of citizens is assessed to be very low, it seems relevant to fill this informational gap.

Responses towards the rating of knowledge, interest and impact are depicted disaggregated in Figure 7, where the internal perspective on these three aspects are compared to the external rating. Interestingly, most assessments are comparably close. Yet, the assessment of infrastructure shows discrepancies in the assessments – while other stakeholder representatives assess the impact to be very high, yet the interest comparably low,

infrastructure representative themselves assesses the other way round, with high interest yet low impact. Rating for businesses impact on EC success shows also that they assess relatively high impact, yet others assess it to be a bit lower overall.

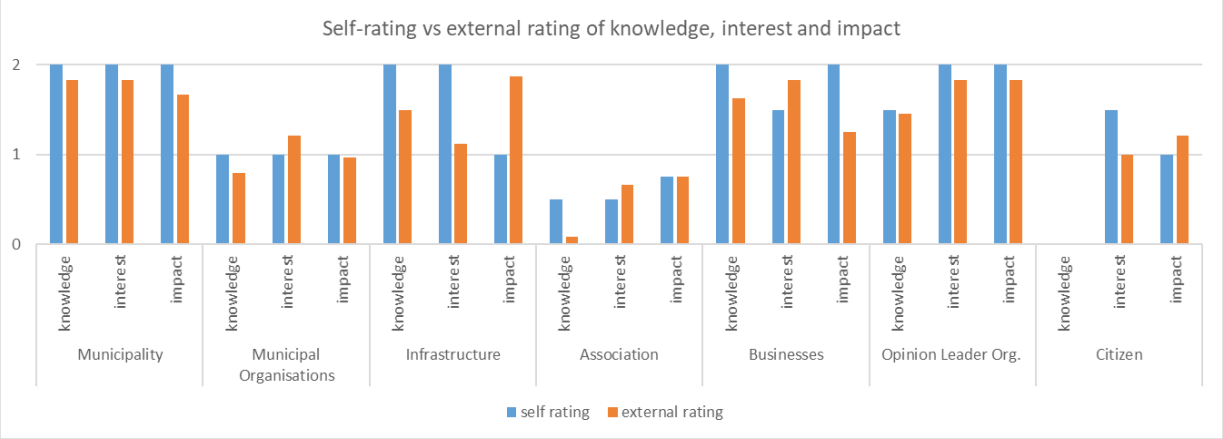

Figure 7 Internal and external rating of knowledge, interest and impact on EC mean between (0=low, 1=medium, 2=high; n=15)

2.6 Conclusions for Case 1- Großschönau

The results can be taken as a starting point for building communication strategies and involvement management, so that the transition and introduction of energy communities can be facilitated and addressed to target groups. Overall, results show highly interested and motivated respondents among the seven stakeholder groups, yet various open questions, potential gaps of roles and differing interpretations regarding the influences on the EC.

EC need to fulfil clear benefits if participation and long-term functioning is expected – among respondents, these are clearly both financial as well as ecological benefits, that should be showcased. With the unclear cost structure on administration costs for billing and cost reductions before starting the EC, monitoring results in a pilot stage will help in clarifying expectations and framing conditions for future participation.

Various stakeholders are already involved and therefore highly informed about the energy community process. They are trusted and preferred for leading the organisations and should be prepared to function as communication hub, and building pilot cases that can be showcased to clarify future roles for replication and enlargement of the energy community. With the approach of incrementally starting the EC and monitoring the first stage closely, before offering it to the community, a good strategy to increase members trust in the functioning is instated. In the definition of roles and functions, various mentioned tasks were not particularly organisational or technical roles to fulfil, but focus on a community building function, such as the motivation of members, taking care of needs in the process.

Additionally, integrating leaders from local organisations into EC process, supporting them through successful pilot case and thereby defining role of members in EC with concrete examples of citizens' engagement could help in the positive communication strategy.

Through their good practice and role in a community towards its members should ensure positive communication. Since social trust and word of mouth is highly relevant for the communication in the region, positive examples should help to avoid bad reputation as has been suspected to interfere in the process.

There may be potential for conflict in the redefinition of roles in the energy community with representatives of infrastructure and energy provider. The fact that infrastructure providers interest in and impact on EC was assessed differently from themselves and other stakeholder groups, pinpoints to relationship that needs close attention and careful communication.

The results of the stakeholder Mapping in Großschönau gives a broad spectrum of Stakeholder groups motives, expectations, challenges and visions for future implementations of Energy Communities. This serves as a basis for the creation of communicative narratives that support the community building and deployment of the vision of the EC in the region.

3 Case 2 – Fyllinge, Sweden

Tornet Fastighetsutveckling AB (eng. Tornet Property Development AB) in Sweden has a number of developing areas, whereof Fyllinge (part of the city of Halmstad, south-west in Sweden) is one with special interest since the municipality has invited for innovative solutions and new and somewhat „daring“ and „challenging“ concepts to really address and initiate a change of use for the limited resources at hand.

The plans for Fyllinge include around 2000 apartments in combination with recreation areas and areas for urban farming. Tornets plans for Fyllinge already include local production of heat and electricity in form of hybrid solar panels and geothermal heating. In addition to that, the area is in proximity to the shopping centre „hallarna“ which contains several commercial actors with cooling, heating, and electricity needs such as grocery stores and pharmaceutical stores. An Energy Community in this area would have the potential of connecting all these actors and enable more efficient use of the locally produced energy. The area also plans to develop special lanes for electrical busses which also could serve as an interesting actor in the system. In Fyllinge INTERACT will be designed for new developer districts.

3.1 Stakeholder Map

The main stakeholders in Fyllinge is the Municipality, the DSO, and the real estate developer. these will be the once that initially plan and set up the EC. For it to be long term sustainable, the future citizens are also relevant stakeholders even if their needs are harder to assess.

3.2 Motivators and Needs

3.2.1 General stakeholder perspective

The most extensive stakeholder dialogue can be found in “The potential role of energy communities in Sweden” (Mattson, 2021). The author of the thesis has conducted interviews with representatives for the main stakeholder groups. listed below

- Producing/Trading/DSO companies
  - Göteborg energy,
  - Kraftringen
  - E.ON
  - Energiföretagen
- Businesses
  - Confederation of Swedish enterprise
- Municipalities
  - Malmö
  - Örebro
- Governmental authorities
  - The Swedish Energy Markets Inspectorate
  - The Swedish energy Agency

    - The Swedish EPA
- Solar energy advocacy groups
    - Swedish solar energy
    - Solisten

In the interviews with these stakeholders several opportunities and challenges with regard to energy communities where identified. Some issues can be found both as an opportunity and a challenge depending on the stakeholder e.g energy security/energy insecurity. The opportunities and challenges where divided into four main areas; social, technical, organizational and system. They are briefly described in text below and the different stakeholders view on them is summarized in Table 12. In addition to the opportunities and challenges described below all participants where asked on their opinion of the potential impact of energy communities in the future. All participant except for the municipalities and the solar power advocated found the potential to be low or modest.

3.2.1.1 Social

3.2.1.1.1 opportunity - Added values

By added values other values than economical or environmental are the focus, such as purpose or the feeling of ownership

3.2.1.1.2 opportunity - Citizen engagement

The energy community can increase the engagement and interest of the energy consumers

3.2.1.1.3 opportunity - Justice

The element of justice is due to the fact that energy communities can enable more people to produce energy without owning a fitting property.

3.2.1.1.4 Challenge - Injustice

If the EC creates additional costs for the DSO for instance for balancing. and that cost is distributed among all customers there will be customers with additional cost without the benefits.

3.2.1.1.5 Challenge - Individuality

Sweden generally combines a high level of individuality with high trust in authorities. there is therefore a challenge for the EC in that the swede rather produces energy individually than in a community.

3.2.1.2 Technical

3.2.1.2.1 opportunity – Energy security

Since decentralized energy system means less reliance on a few large producers there might be an increased energy security with EC. if the EC where to be self-sufficient at times this would add even more to the security

3.2.1.2.2 Opportunity – increased and more efficient use of energy storage.

since storage is more efficient in close proximity to production and consumption the EC might have the opportunity to optimize the storages design and the storage can aid in optimizing the EC performance.

3.2.1.2.3 Opportunity – increased use of renewable energy

One inherent advantage of the EC is that it allows for more renewable energy use.

3.2.1.2.4 Opportunity - Innovation

Energy communities creates an opportunity for new services, and products therefore Energy communities have the potential to incentivize innovation.

3.2.1.2.5 Opportunity – larger projects

A community might have the ability to handle larger energy project than a single individual.

3.2.1.2.6 Opportunity – optimization

A potential for optimization of the energy system coupled to an implementation of energy communities.

3.2.1.2.7 Challenge – Energy insecurity

An increased number of EC can lead to a more vulnerable system over all due to poorer regulation.

3.2.1.2.8 Challenge – Sub optimization

There is a risk that energy communities sub-optimizes the energy system. E.g, by utilizing a high degree of self-consumption of electricity, there might be a shift from district heating to electrical heating in the communities.

3.2.1.3 Economical

3.2.1.3.1 Challenge – lack of incentives

Because of the low prices for electricity Sweden is experiencing[4], there might not be a particularly strong incentive for the regular citizen to engage in an energy community. In addition, the current tax laws will impose a challenge for energy communities, since the

[4] This was written before the autumn of 2021 with rising electricity prices

existing laws are based on a centralized system and means that there will be taxation on electricity sold and bought within the community.

3.2.1.4 Organizational

3.2.1.4.1 Challenge - Difficult to operate

It has been proven difficult to cooperate with others and the cooperation adds a layer of bureaucracy compared to individual micro production.

3.2.1.4.2 Challenge – Resources

The lack of resources is possible challenge for the communities. To mitigate for this, external actors can provide a supporting role.

3.2.1.5 System

3.2.1.5.1 Opportunity – New perspective

The communities entail an alternative to the centralized system. By constituting an alternative, they can facilitate for a new way of thinking

3.2.1.5.2 Challenge – Inexperience

Most actors are not used to cooperating over matters such as energy and since energy communities is a new concept, the inexperience of the energy system means that there is a lack of support structure for the communities.

3.2.1.5.3 Challenge - Regulatory framework

There are fundamental legislative hindrances, such as the communities not being allowed to both produce energy and distribute it on an internal grid. Another limiting factors in the regulatory framework of today is its focus on property limits regarding production and consumption of electricity.

Table 12 Summary on stakeholder perspective on opportunities and challanges (Mattson, 2021)

		DSO/prod	DSO/prod	DSO/Prod	DSO/prod	Business ass.	Gov. Aut [EPA]	Gov. Aut[EMI]	Gov. Aut[SEA]	Municipality	Municipality	advocacy group solar	advocacy group solar
Social opportunity	Added values			x		x	x			x			
	Consumption patterns											x	
	Engaging the consumer				x	x		x				x	
	Justice		x		x	x	x			x	x	x	
Social Challenges	Injustice		x		x					x			
	Individuality	x		x		x	x			x			
Technological opp.	Energy security			x					x		x	x	
	Excelled use of CES	x							x		x	x	
	Expansion of renewable	x	x	x			x	x		x	x	x	x
	Innovation					x							x
	Larger projects						x						
	Optimization	x		x	x				x		x	x	x
Technological Challenges	Energy insecurity		x			x							
	Sub optimization		x		x	x							
Economic Challenges	lack of incentive		x	x	x	x	x	x	x	x	x		x
Org. Challenges	Difficult to operate	x	x	x	x	x	x			x	x	x	x
	Resources	x	x	x	x					x			
System Opportunity	New perspective	x							x		x		
System Challenge	Inexperience	x									x		x
	Regulatory framework	x		x			x			x	x		x

3.2.2 Stakeholders views with regards to legislation

As part of the implementation of the renewable energy directive in Swedish legislation there is a suggestion for new legislation that has been out for consultation 2020/2021. (EiR2020:02).

Consultation answers that relates to energy communities have been submitted by 26 different stakeholders, including TSO, DSO, municipalities, energy producers, universities and governmental agencies.

In the answers there are two main questions that are recognized by several stakeholders:

- Tax reduction, Economic incentives
- Grid ownership

In the proposed legislation there are no tax reductions and the taxation of electricity bought and sold within the community will be sold at market price with full taxation. This concern is mainly from organizations that organize consumer or producers and different municipalities. It is generally seen as a major barrier in introducing energy communities.

In the proposed legislation energy communities are not allowed to own the grid. This fact is well received by the DSOs since they see that it allows them to keep the grid stability. Other stakeholders, such as municipalities and citizen NGOs see this as a potential barrier to introducing energy communities, since it means that grid fees and taxes still need to be payed and further reducing the economic incentives.

The organizational form suggested in legislation is an economical association. This is seen as a positive thing by most consultation answers since there is a large experience of these kind of association from the Swedish housing cooperative which is a very common form of organization in Sweden. Around 40% of all apartments are owned by housing cooperatives and 2% of all residential houses.

3.2.3 Future citizens

Although prerequisites for setting up Municipal energy is less beneficial than in other parts of Europe (Magnusson & Palm, 2019) (Palm, 2021) Sweden has been able to show some community energy initiatives. In 2018, 225 such initiatives where identified mainly solar and wind cooperatives (Magnusson & Palm, 2019). In a study from 2019 interviews with 36 of the initiatives where carried out to, among other things, identify drivers and inspirations. Several key words where identified that could be interpreted as driver for setting up Municipal energy. These keywords and the frequency of them is presented in figure 8 below:

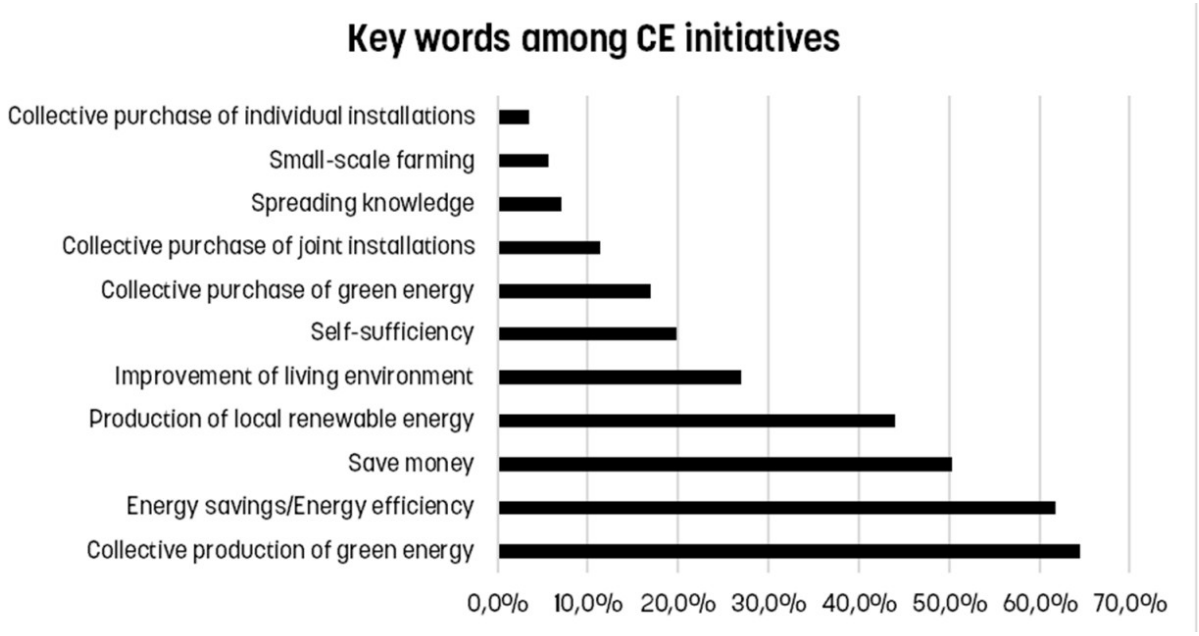

Figure 8 Key words among CE initiatives, an indicator of citizen needs (Magnusson & Palm, 2019)

3.2.4 Stakeholders in Fyllinge

For the greenfield area of Fyllinge three main stakeholders have been identified and addressed through interviews and questionnaires. The municipality of Halmstad, Halmstad Energy and environment (DSO) and Tornet (Real estate developer). With regards to the result from the literature review, there are three main questions in the questionnaire that are highly relevant the answers to these are given below

Why are you interested in participating in and supporting an Energy Community (EC)? What benefits do you expect for yourself / your organization?

Tornet: Because it is necessary and a natural step for our company to take. It is a huge possibility for the company to reduce the energy in our buildings and make a lesser CO2-footprint.

DSO: increasing the exploitation rate with a reduced need in grid capacity, increasing local production. A possible supplier of auxiliary services

What obstacles and challenges do you see for your participation in the energy community?

Tornets: The challenge is probably that it will be a new thing to learn and manage.

DSO: potentially an increased administrative burden.

Who would you trust to lead the central organization of the EC? And who would you prefer for the central organization?

Both Tornet and the DSO showed higher trust in the public organisation such as municipalities or the commercial actors such as established or new energy supplier. The trust was however lower for NPOs, Local associations and citizens. No one could name a preferred actor to organize the EC.

3.3 Conclusions for Case 2- Fyllinge, Sweden

The general stakeholder perspective as well as the dialogue with the local stakeholder shows that an energy community in Fyllinge needs to develop other benefits than economical since there will likely be very little economic incentives from an EC. On the other hand grid stability, efficient usage of the grid and increased use of renewable power are topics all stakeholders regard as important.

With regards to key stakeholders they change over the course of the implementation. In an early phase they are the three major stakeholders: The DSO, The Municipality and the real estate developer that needs to be addressed, since it is their joint effort that will enable the EC formation. Below the main questions for each initial stakeholder are summarized.

Municipality

- how does an EC support the development of the municipality? both with regards to overcoming technical issues and in form of communicational value

DSO

- How does an EC support our work with grid stability and increasing Renewable energy production?

Real estate developer

- How can an EC become commercially feasible and provide communicational advantages both with regards to municipalities and future tenants/buyers?

In the later part of the implementation future inhabitants will become a more important stakeholder to address. Based on the results in Figure 8 the main issues to communicate is the increased potential of locally produced energy and the energy efficiency. The economical part is also rated high but since there are great uncertainties on how economical beneficial an EC will be in a Swedish context this might not be the main issue to address.

Another identified issue is that the legislation proposal states that an EC must be organized as an economical association. While the trust that citizens that would form these organisations is considered low from both the real estate developer and the DSO. One possible solution to this would be to organize the EC in the same way as housing cooperatives. There are advantages of using the same format as the housing cooperatives:

- They are a widely used and accepted form for cooperation and Municipal ownership.
- to some extent they have shown to be a way of trusting organized citizens without specific competence to handle specific tasks that might require specific competence. e.g. Facility management. this might serve to overcome the lack of trust in citizens expressed by the DSO.
- It is possible to set up the organisation in a relatively early phase of the area development. and then hand it over to local citizens when in place.

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