COME RES

Advancing Renewable Energy Communities

Deliverable 5.2

Good Practice Portfolio of Renewable Energy Communities

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SUMMARY

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ABOUT COME RES

COME RES - Community Energy for the uptake of renewables in the electricity sector. Connecting long-term visions with short-term actions aims at facilitating the market uptake of renewable energy sources (RES) in the electricity sector. Specifically, the project focuses on advancing renewable energy communities (RECs) as per the EU's recast Renewable Energy Directive (REDII). COME RES takes a multi and transdisciplinary approach to support the development of RECs in nine European countries; Belgium, Germany, Italy, Latvia, the Netherlands, Norway, Poland, Portugal, and Spain.

ISSUES ADDRESSED AND MAJOR STEPS

COME RES covers diverse socio-technical systems including community PV, wind (onshore), storage and integrated community solutions, investigated in nine European countries. The project has a specific focus on a number of target regions in these countries, where community energy has the potential to be further developed and model regions where community energy is in a more advanced stage of development. COME RES analyses political, administrative, legal, socioeconomic, spatial and environmental characteristics, and the reasons for the slow deployment of RECs in selected target regions. COME RES synchronises project activities with the transposition and implementation of the Clean Energy Package and its provisions for RECs in policy labs. Policy lessons with validity across Europe will be drawn and recommendations proposed.

ABSTRACT

Work package 5 (WP5) of the COME RES project identifies good practices of renewable energy communities (RECs) as defined by the Renewable Energy Directive (2018/2001/EU) (RED II) and provides a best practices inventory. The inventory is part of a synthesis report of the best practice cases regarding novel and promising REC initiatives or REC approaches in the COME RES partner countries. Work package 5 includes in-depth assessments of innovative, adoptable and transferable cases. It examines the extent to which the good/best practices provide environmental, economic and/or social community benefits (as defined in cf. RED II, Art. 2). Based on the good/best practices a sustainability scorecard for renewable energy communities is developed. The scorecard provides principles and criteria for sustainable community energy which serve both as a self-assessment tool for RECs and a potential guidance tool for policy development to promote the further development and improvement of RECs. Methods applied include primary and secondary literature and document analysis, desk research and semi-structured, qualitative interviews with relevant stakeholders and discussion within the country desks in WP3.

This Deliverable 5.2 includes the categorisation and characterisation of all 21 good practice cases and the selection and justification of the best practice cases. The case studies are analysed according to the methodology and template elaborated in Deliverable 5.1 and describe and examine the activities, purposes and benefits of each good practice; between 1-3 for each COME RES participating country. A rigorous and transparent selection procedure is then followed to select the best practice cases, including suggestions of the stakeholder desks (Work package 3) and potential cases to be included in the "best practice" portfolio. Deliverable 5.2 is designed as follows: firstly, we will provide introductory remarks on the identification and analysis of good practices, as well as the selection of best practices. The following section develops the methodology and process of good practice portrait development. Subsequently, the categorisation and characterisation of good practice cases is provided, as well as the selection and justification of best practices. Lastly, a proposal for the next steps is elaborated.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 Introduction

To achieve a low-carbon economy, system-wide transformations are key. In some regions of the COME RES partner countries, a transition to local and renewable energy systems (RES) is already taking place at the local level. The energy transition poses not only a technological and ecological challenge, but also a political and social one. However, the lack of local acceptance plays a role as a potentially inhibiting factor in the implementation of the energy transition. Indeed, this a core understanding of the COME RES project, as outlined in the preceding deliverable of this COME RES Work Package (Deliverable 5.1 Methodological Framework).

Furthermore, the social dimension has become just as important for a successful sustainable energy transition as the technological aspects. Citizen energy in general and energy communities in particular are becoming important instruments not only for decentralisation, but also for the democratisation of the energy systems in the COME RES countries and elsewhere. Community energy, citizen energy and renewable energy communities have become increasingly important in recent years. These initiatives are more diverse today than ever before and will probably continue to act as incubators for significant activities dealing with virtually all aspects of energy. RECs organise collective energy action and are characterised by open and democratic participation and governance structures, and generate significant added value for the local community.

Overall, based on the findings of the model regions, the analytical focus of COME RES is to examine the legal, socio-economic, spatial and environmental realities as well as the reasons for the slow uptake of RECs in selected target regions. Learning from other experiences and a comprehensive analysis of good/best practices that can be transferred to other local, regional and national contexts, can provide useful indications on how to face implementation barriers and enhance a market uptake of RES in target regions.

This deliverable aims to provide a categorisation and characterisation of good practices. It develops an analysis and assessment of the selected good practice cases. Moreover, a rigorous and transparent procedure is elaborated to identify and justify a number of best practices amongst the set of good practices.

In terms of the structure of Deliverable 5.2, after the description of the methodological framework (Section 2), a summary of the good practice cases selection is provided for each of the COME RES countries (Section 3). Then, Section 4 develops the characterisation and categorisation of all 21 good practice cases including activities, purposes and benefits. Section 5 then elaborates on the selection of best practice cases, which is based on a stringent and coherent criteria, based on what set out in Deliverable 5.1 methodological framework). Section 6 then briefly develops a methodological proposal to conduct the next steps.

2 Methodology and process for good practice portrait development

The foundation for the characterisation, analysis and assessment of the cases was laid within a previous Deliverable 5.1 produced by FUB-FFU. This was the document titled “Methodological framework for good/best practices selection (Deliverable 5.1)”. This deliverable clearly stressed that successful examples from other contexts or similar enabling conditions are both important foundations on which to build an effective strategy for further promoting RECs. In this regard, the methodological framework identified a number of studies[1] that show how potential and real barriers to the market uptake of RECs in general could be overcome and what framework conditions can enhance the uptake of RECs in regions with low REC development.

More specifically, as spelled out in Deliverable 5.1, a good practice encompasses the process of carrying out a task using recommended methods. Indeed, the documentation of procedural manuals, guidelines and codes of practice are often required when implementing good practices. Similarly, according to the Food and Agriculture Organisation (FAO) of the United Nations, a good practice is “not only a practice that is good, but a practice that has been proven to work well and produce good results, and is therefore recommended as a model. It is a successful experience, which has been tested and validated, in the broad sense, which has been repeated and deserves to be shared so that a greater number of people can adopt it.” [2]

Practically speaking, on the basis of this common methodological framework and good practice portrait template, the project partners identified a total of 21 good practice cases across nine COME RES partner countries. For each identified case, descriptions and preliminary evaluations were provided by the respective country desk partners. An evaluation (in the form a self-evaluation matrix) of all the collected good practice measures was performed based on common criteria elaborated by FUB-FFU within the Methodological Framework mentioned above. The partners carried out self-evaluations of their good practice cases according to the following criteria:

- Innovativeness
- compliance with RED II
- provision of environmental, social and economic benefits,
- inclusiveness,
- transferability as well as relevance/model character for other COME RES partner countries

The descriptions of each of the good practice cases, combined with the preliminary assessment by the partners based on a self-evaluation matrix, together served to facilitate the selection process for the best practice cases (as elaborated in Section 5). This process also ensured that there was an accurate

[1] C.f. Baker, L. (2021). Procurement, finance and the energy transition: Between global processes and territorial realities. In: Environment and Planning E: Nature and Space. DOI: https://doi.org/10.1177/2514848621991121

Bauwens, T., Gotchev, B., & Holstenkamp, L. (2016). What drives the development of community energy in Europe? The case of wind power cooperatives. Energy Research and Social Science, 13, 136-147.
Brummer, V. (2018). Community energy – benefits and barriers: A comparative literature review of Community Energy in the UK, Germany and the USA, the benefits it provides for society and the barriers it faces. In: Renewable and Sustainable Energy Reviews, 94,187-196.
Coy, D., Malekpour, Sh., Saeri, A. K. & Dargaville, R (2021). Rethinking community empowerment in the energy transformation: A critical review of the definitions, drivers and outcomes. In: Energy Research & Social Science 72: 101871.

[2] Cf. - www.fao.org/capacitydevelopment/goodpractices/gphome/en/

and consistent understanding of all identified measures. Figure 1 below provides a more detailed overview of the process for good practice development:

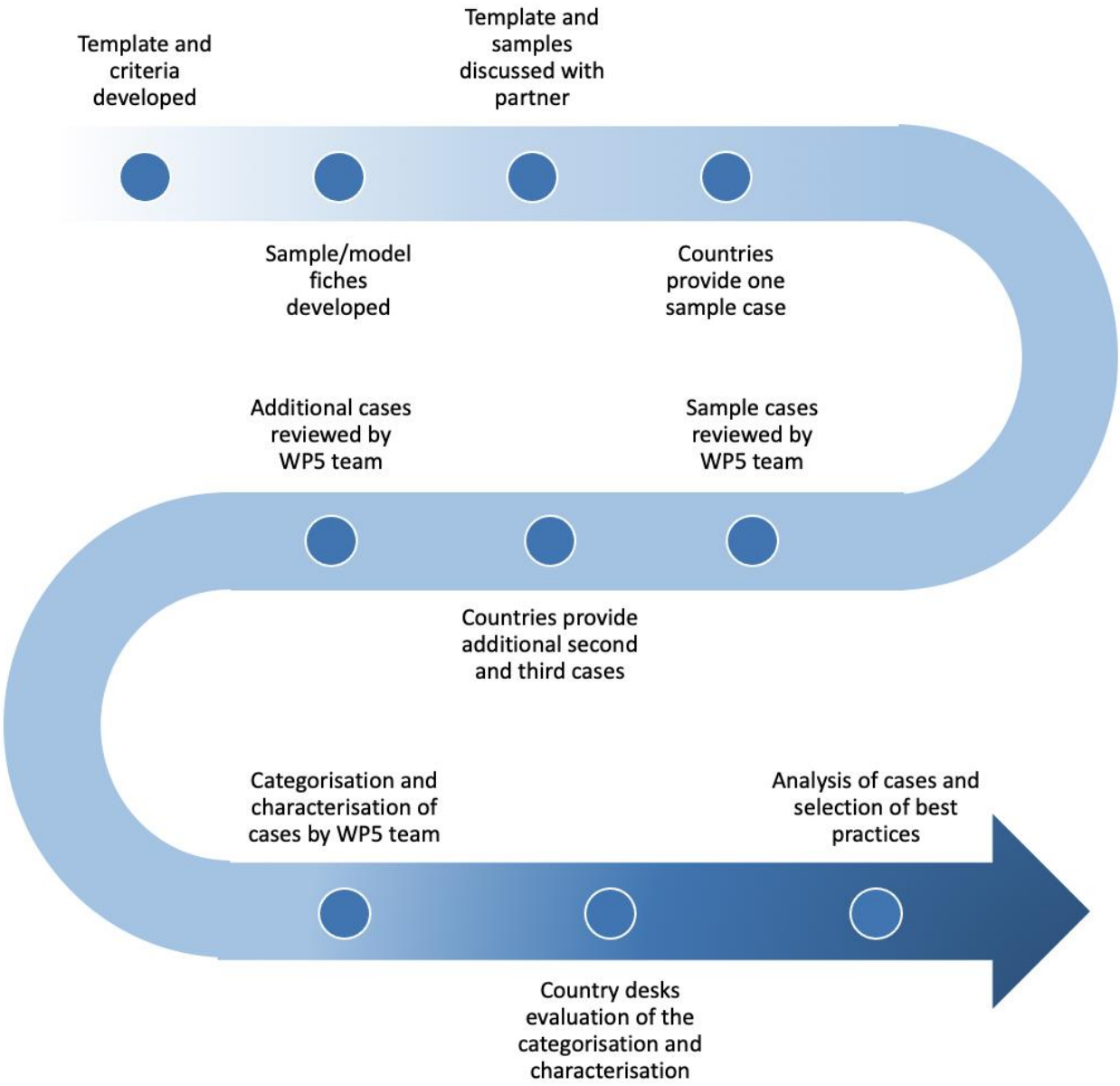

Figure 1. Overview of the process for good practice development

3 Overview and summaries of good practice cases

In the sections below, for each of the COME RES partner countries, we provide an overview of the 1-3 good practice cases selection, with some reflections on key characteristics and levels of development/maturity of the projects. It is important to point out that many of the good practice cases have been established already before the RED II was adopted. These fulfil all or most criteria of a REC as defined by RED II. Only a few of our cases can be formally considered as RECs in the sense 10ft he RED II, after RED II was launched and a corresponding legal framework was established. It is further important to note that, in several COME RES countries, the transposition of RED II provisions regarding the REC is still on-going.

Belgium

The three selected good practice cases from Belgium represent mature and large energy renewable communities operating at both regional and local levels. These co-operatives fulfil the criteria of a REC as defined by RED II and as transposed into the Flemish law. The cases include the success factors for the growth of these energy communities. They cover a wide spectrum of activities, including electromobility, flexibility services and production of hydrogen, active R&D in these fields. The RECs invest in a variety of RES technologies.

Germany

Two of the three cases from Germany represent grassroots community wind farms, the third one a cooperation of project developer, municipal utility company and energy cooperatives. The capacities installed in a single project vary from a few MW to a few tens of MW. The legal forms used in the presented cases are hybrids of a limited partnership and a limited liability company. One of the main drivers for establishment of the energy communities was to generate economic profits for residents and municipalities. Citizens wind farms, particularly in Schleswig-Holstein, provide a high contribution to sustainable development of the local area.

Portugal

The Portuguese cases comprise R&D initiatives, which are pilot projects where innovative solutions are planned to be tested. The start of the operations are planned for 2022, thus the case studies identified have not determined and established their legal form as of yet. The communities show energy sharing solutions based on PV systems integrated with storage in multifamily buildings. Importantly, the energy communities are focused on the social housing sector as well, thus contributing to mitigation of energy poverty.

Italy

The cases selected by the Italian desk demonstrate a group of energy communities which have been recently created or are being created, thus having relatively low level of maturity. They use associations as the legal form. They all operate at the local level and utilise PV and biogas installations. The cases present different scales of total capacity installed, ranging from 20 kW to 16 MW.

Latvia

The example from Latvia gives a picture of a pilot project of a roof-top solar PV and solar domestic hot water system on multifamily buildings. The idea was to utilise RES electricity and heat to partially cover

energy demand of the building. The energy generated is being used only for common premises. At the same time, these pilots present roadmap and step-by-step measures how to spread the concept of energy communities and establish cooperation among the residents.

Norway

Norway presents two different projects. The first concerns utilisation of water resources through hydropower plant within community, where local citizens benefit as investors and landowners receive benefits from land lease. The second case shows development of PV systems, storage and EV charging points in a housing cooperative in order to address the current issue of rapid increase of EVs of residents. The project has a pilot character but with high degree of innovativeness and moreover address the upcoming problem of our societies.

Poland

The Polish energy communities (energy clusters) are not legal entities but civil law agreements between a large number of partners including local governments, enterprises, municipal companies and individuals. Energy clusters are to serve as a tool aiding the development of the distributed energy generation concept which in turn is designed to safeguard the energy security of small areas and hence, ultimately, contribute to the growth of local economies. The communities started their operation in 2017.

Spain

The cases from Spain, both established recently, operate at local level and utilise PV and storage. In the first example, based on a cooperative model, the municipality enabled public buildings and areas for development (by providing the land to be used for the installations) and the projects were financed by mix of loans from regional banks and H2020 funding. The second case, based on an association model, showcases a pilot project of collective self-consumption from energy generated in RES installations placed on public buildings.

The Netherlands

In the Netherlands, the RECs are well developed, and the selected cases are based on a cooperative model. Therefore, the cases consist of community projects of significant capacity varying from 2 to 40 MW. The presented communities are successful examples of using revolving fund and crowd funding for investing in solar PV, insulation, heat pumps etc. One of the projects works to involve local citizens directly from the start in the design phase to capture the main local nature, landscape, cultural-historical values in the project area and to create and maintain RES projects.

4 Categorisation and characterisation

As mentioned in the chapter above, in the process of developing the present deliverable (Deliverable 5.2), all the partners have contributed by identifying and elaborating between 1-3 of good practice cases (in the form of good practice portraits) from their own countries. These good practice cases serve as potential best practice cases of renewable energy communities. In total, 21 portraits have been provided by the partners in consultations with the country desks. **Table 1** below shows the number of good practice portraits from each country.

Table 1. Number of good practice portraits provided by each country

No.	Country	Number of good practice portraits
1	Belgium	3
2	Germany	3
3	Portugal	2
4	Italy	3
5	Latvia	1
6	Norway	2
7	Poland	2
8	Spain	2
9	The Netherlands	3
Total		**21**

The individual elaboration and collective consolidation of these 21 cases is a positive starting point for selecting a smaller group of cases for in-depth analysis. The collection of a broad selection of cases from nine different countries provides insight into a wide diversity of renewable energy communities, enabling the COME RES consortium to select a rich and representative mix of cases for the purpose of in-depth investigation and analysis.

4.1. Overview of cases and description

Given the specifics and complexity of energy communities, a systematic overview of the selected cases has been elaborated with the objective to demonstrate the main features of each case in a structured and harmonised way. In this regard, an overview presented in the **Table 2** below comprises of the following information for each energy community:

- **Legal form:** In the revised Renewable Energy Directive (REDII), participation in renewable energy community projects should be open to all potential local members based on non-discriminatory criteria. Furthermore, the Directive emphasizes effective control by local citizens, local authorities and smaller (SME) businesses. The REDII provides that for private undertakings their participation in the REC does not constitute their primary commercial or

professional activity. Member States are free to define the eligible legal forms of RECs. In turn, legal and organisation forms provided by the good practices give insight into the above-mentioned aspect of possible choices.

- **Geographical scope:** The RED II keeps the tie to having local energy communities. Namely, the REC should be effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that REC.
- **Number of members:** Gives a view on the scale of energy community and provides information on type of members: natural persons, households and others. In the table below we pay attention to a number of participating citizens, treating them as the 'heart' of energy communities.
- **Total capacity controlled:** This feature gives an insight on total electrical capacity controlled by a given energy community (total capacity is a sum of different energy installations).
- **Energy technologies:** Gives a picture on RES technologies utilised within energy community.
- **Year of establishment:** This information is essential to determine the maturity level for each of energy community.

Based on the overview presented in the Table 2 below, the analysis has been performed and the results are presented in the following parts.

Table 2. Overview of the selected good practice cases

Country	Energy community	Legal form	Geographical scope	Number of members	Total capacity controlled	Energy technologies	Year of establishment
Belgium	**Ecopower**	Cooperative	Regional/ National	60000	50 MW, over 100 GWh/year	Wind, PV, hydropower, CHP, bioenergy	1991
	Beauvent	Cooperative company with limited liability	Regional/ National	6192	33 MWe + DH (12 GWh/year)	Wind, PV, CHP	2000
	Zuidtrant	Cooperative company with limited liability and a social purpose	Local level	626	376 kWp	PV, storage, hydrogen	2016
Germany	**Community wind farm Neuenkirchen**	Limited partnership with a private limited liability company as general partner	Local level	145 limited partners	26 MW	Wind energy	2013
	Wind farm Uthleben	Limited partnership with a municipal limited company as general partner	Regional level	450 residents	6 MW	Wind energy	2016
	Grenzland pool of community wind and ground-mounted PV farms	Limited partnerships with a private limited liability company as the general partner	Local level	1069 residents	100 MW of wind	Wind energy, ground-mounted PV, hydrogen	1995-2020
Portugal	**Energy community "Agra do Amial"**	Not yet defined	Micro-area	181 dwellings	114 kWp + 154 kWh (storage)	PV, storage	2022
	Energy community "Condomínio da Torre"	Ruled by the internal regulation document (no formal legal format required in this particular case).	Micro-area	150 dwellings	no data	PV	2022
Italy	**Pinerolese Energy Community**	"Temporary Association of Purpose" to be transformed into a cooperative	Regional level	not estimated	0.5 MW	PV, Biogas	2020
	Energy City Hall REC-1	ARN association	Local level	<10	20 kWp	PV	2021

	GECO – Green Energy Community	Not yet defined	Local level	not estimated	16 MWp	PV, storage, biogas	2019
Latvia	**Energy communities in apartment buildings**	The association of apartment owners	Micro-area	24 apartments	9.24 kWp,	PV, SDHW	2020
Norway	**Reinli small-scale hydropower plant**	Stockbased limited company	Local level	28 local households + 35 local landowners	3.2 MW	Hydropower	2002
	Røverkollen housing cooperative	Housing cooperative	Micro-area	246 apartments/shareholders	70 kWp, 50 kWh battery // 64 EV charging points	PV, storage.	2018
Poland	**energyRegion Michałowo**	Civil law agreement	Regional level	8 entities	0.66 MWe + 0.6 MWp	Biogas, PV	2017
	Słupski Klaster Bioenergetyczny	Civil law agreement	Regional level	24 entities	> 40 GWh/year	PV, biogas, CHP	2017
Spain	**COMPTEM- Enercoop**	Cooperative	Local level	65 households (250 people)	120kWp, 240kWh storage	PV, storage	2020
	Hacendera solar	Neighbours association	Local level	not estimated	13 kWp + 200 kW	PV, wind energy	2020
The Netherlands	**Energy Cooperative Loenen**	Cooperative in partnership and collaboration with a series of foundations.	Local level	275 households	2.2 MWp	PV, heat pumps	2019
	Energy Gardens	Various forms. The management will be allocated to a management foundation	Local level	4 pilot locations	40 MW	Ground-mounted PV	2019
	Citizen wind farm "de Spinder"	Alliance of 11 energy cooperatives and public investment fund Energiefonds Brabant	Regional level	619 households	14.4 MW	Wind energy	2015

Starting from the common legal form, this aspect is presented in the Figure 2 below. It is important to note that COME RES Deliverable 4.1 (organisational and legal forms and businesses models) forms the basis and develops the conceptualisations for this analysis.

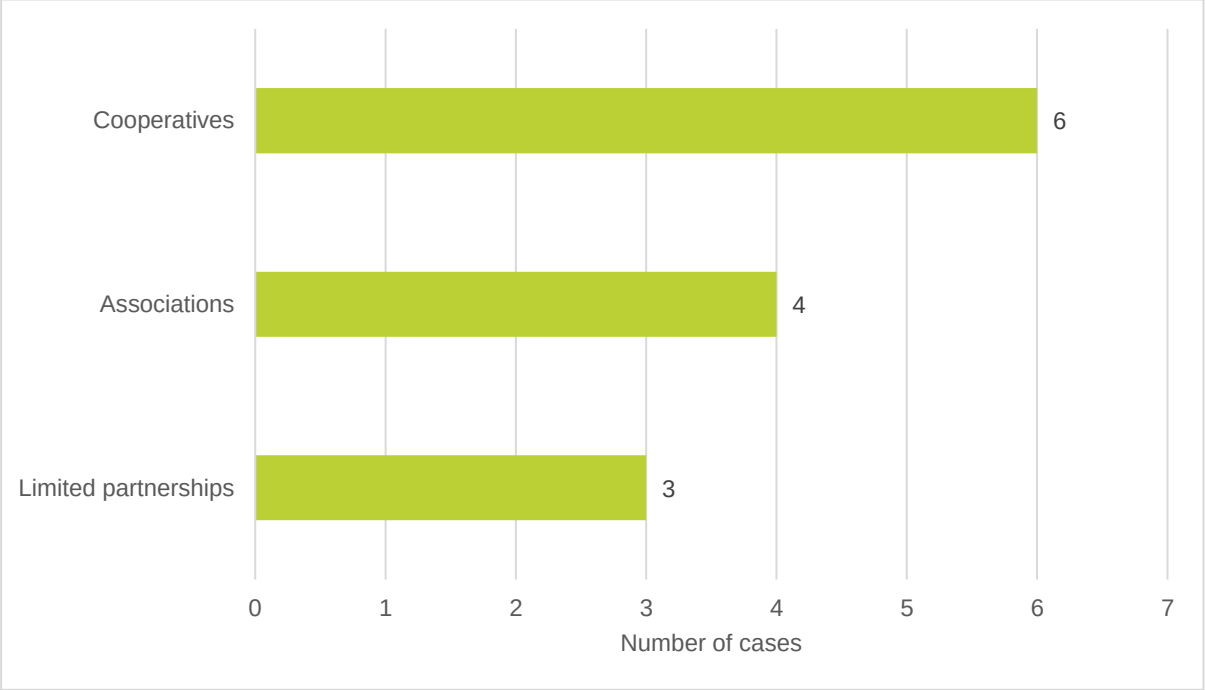

Figure 2. The most common legal forms within the selected cases studies

The group of 21 cases comprises various legal forms, of which the most popular are cooperatives, associations and limited partnerships. Given a very early stage of development of several projects, some of them have not established their legal form yet.

The most commonly used are different variations of cooperatives. This legal form is used in many partner countries e.g. Belgium, Spain, The Netherlands. The form of association is representative for relatively young energy communities (established not earlier than 2020). Limited partnership with a private limited liability company as general partner are represented by German cases of citizen wind parks. The other forms in the group of 21 cases are alliance, stockbased limited company.

The Polish energy communities (energy clusters) are not legal entities but civil law agreements between a large number of partners including local governments, enterprises, municipal companies and individuals. Moreover, they are multi-technologies initiatives.

The selected 21 energy communities have been also categorised by their geographical scope (Figure 3). Three subcategories have been identified:

- **Micro-area:** refers to the projects operating in building/s and gather households being in the proximity
- **Local level:** addresses energy communities operating within the area of a city or municipality.
- **Regional level:** refers to the energy communities, which operational area goes beyond the area of one municipality.

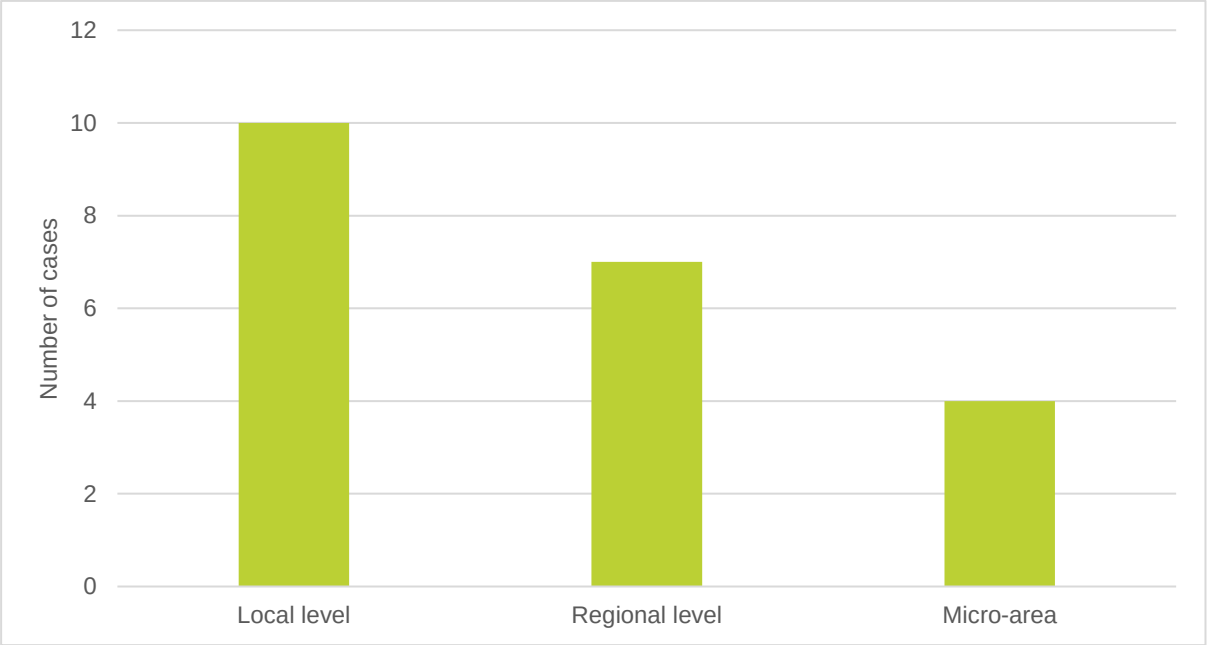

Figure 3. Geographical scope of the selected case studies

Most of the RECs act at the local level. There is a linkage between geographical scope and year of establishment. The more mature the REC is, the wider geographical spread it has. A number of examples acting at local level and all the cases operating on micro-area are pilot projects which has recently started its operation or are preparing to do so. The examples from Belgium: Ecopower and Beauvent could be also considered as energy communities operating at national level.

In the Figure 4, the selected RECs have been categorised by the total capacity controlled by the community.

Figure 4. The energy communities grouped by total capacity controlled [MW]

The aggregation of the cases is high in the range below 1 MW (9 energy communities). These are mainly pilot projects where innovative solutions are being tested. Such concentration of the energy communities with total capacity below 10 MW is linked to their aims of increasing self-sufficiency and utilisation of local resources. Larger capacity RECs mostly concern those projects with a history of rather long and successful development. On the other hand, it has to be underlined that the size is also dependent on the respective technology. Community wind projects typically have larger capacities than community PV projects. In this regard, is particularly important to note tthe Grenzland pool. This pool covers five community wind farms with a total installed capacity of approximately 100 MW. But if we consider each wind park community separately, the largest project has an installed capacity of up to 40 MW

The 21 case studies considered in this report show that there is a wide diversity of RES technologies utilised within energy communities (Figure 5).

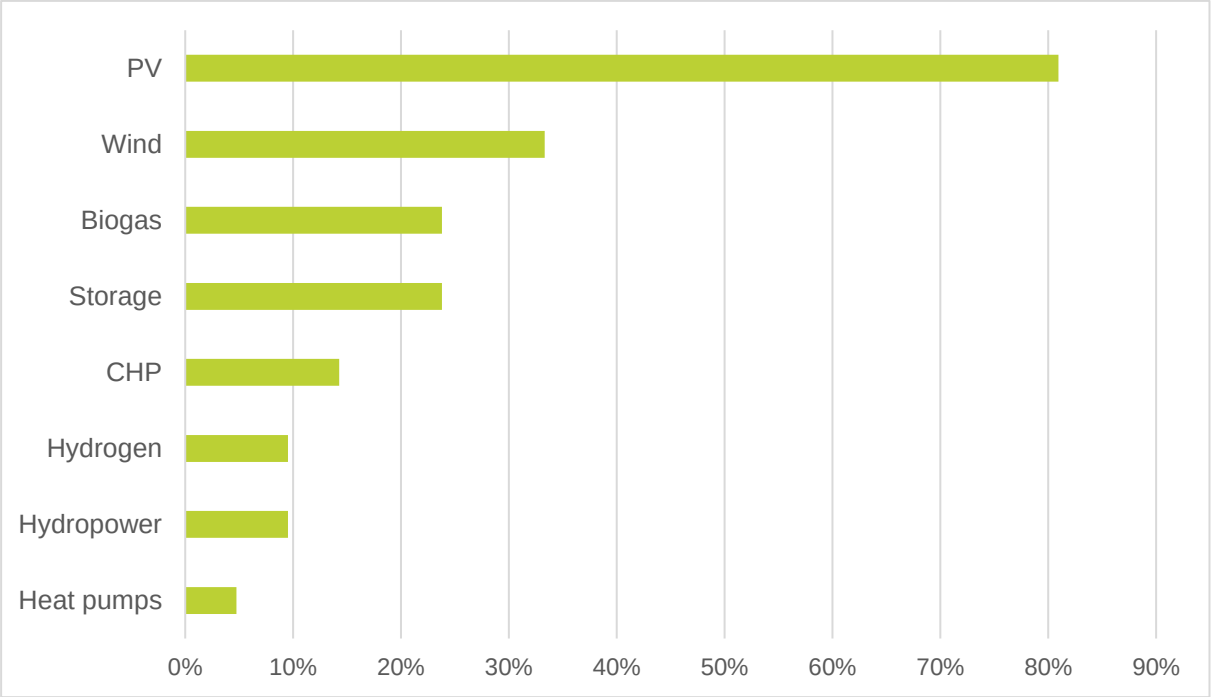

Figure 5. Energy technologies utilised within the 21 cases

The reason for the differences in utilisation of RES technologies lies in different factors such as local energy resources, legal framework, support schemes and aims of energy community and its members.

PV technology is a part of almost all 21 cases. This fact is linked to the attractive prices of PV components, wide range of capacities available (from several kW_p to MW_p) and relatively high level of social acceptance. PV technologies are also the most simple and suitable solution for the urban micro-area energy communities Total investment costs are typically lower for a PV rooftop project than for a wind project, and it is easier to raise capital from citizens for smaller projects. PV systems are often combined with storage in order to increase self-consumption of electricity produced and ultimately increase self-sufficiency of energy community.

Other technologies (wind, biogas, hydropower) are strongly dependent on local resources and have much more complex development process. Furthermore, wind and biogas often encounter social resistance. Biogas plants besides electricity generated also have to find customer (end-use consumer) for heat in order to maintain economic profitability of the investment. That was the case of Energy Cluster Michałowo in Poland. A direct idea for the Michałowo Cluster was the need to improve the economic efficiency of an agricultural biogas plant. Through an agreement with local authorities, the producer of biogas receives additional revenues from the sale of heat, and the commune has half the cost of heat for heating the swimming pool and the school complex.

In order to assess the maturity of the energy communities, the year of establishment has been utilised. The selected cases have been assigned into three categories as presented in the Figure 6 below.

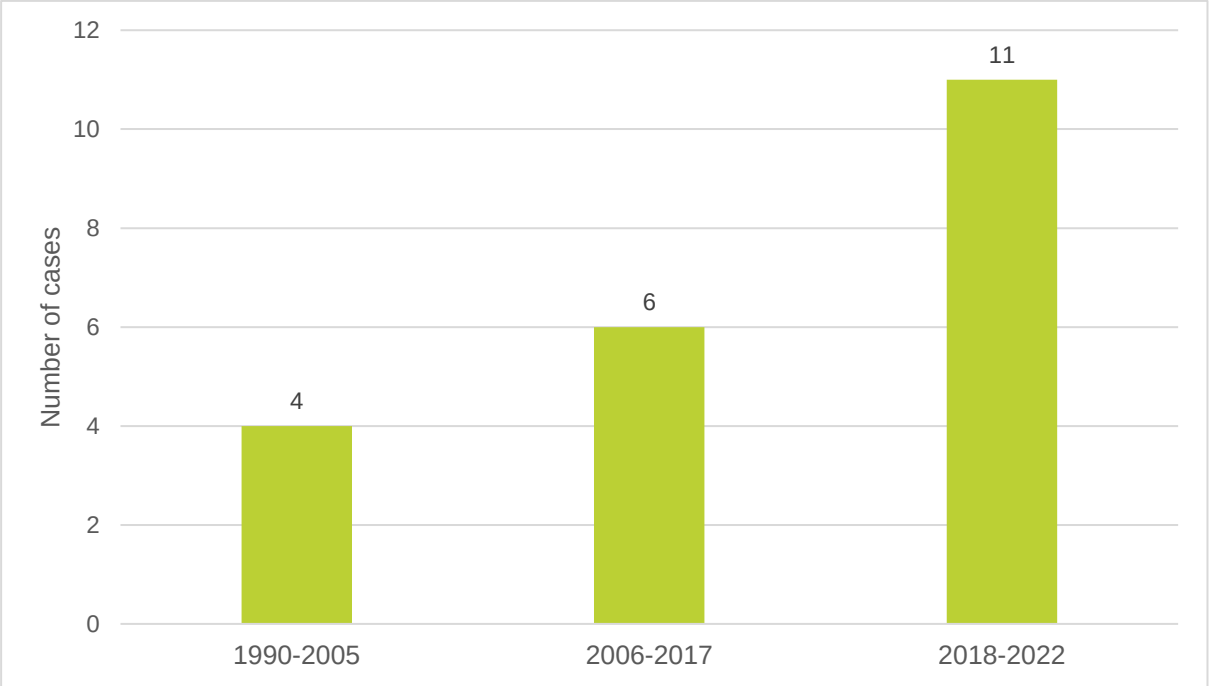

Figure 6. Year of establishment of analysed case studies

Most of the examples were established after 2017 and some are planning to start operation in 2022. The reason for this is linked to the actual transposition of the RED II into national regulatory framework of the respective countries. Number of energy communities assigned to the three time periods, shows that the topic of energy communities has been gaining an importance over the last years.

4.2 Overview of activities

Renewable energy communities cover a broad range of activities referring to all forms of renewable energy in the electricity and heating sectors. RECs can undertake variety of activities, including generation, distribution, supply, aggregation, consumption, energy sharing, storage and flexibility services (Table 3). Depending on the activity performed, they must comply with the obligations and restrictions applicable to the other market participants (generators, suppliers, distributors, aggregators and other market actors). Energy generation is not presented in the Table 3, because all the energy communities perform such activity. For the remaining activities additional explanations have been elaborated:

- **Supply:** sale and resale of electricity and/or other energy carriers to customers;
- **Consumption:** self-consumption of electricity produced by members of the community;
- **Distribution:** community (co-)ownership and/or management of distribution networks, such as local electricity grids or small-scale district heating and biogas networks;
- **Energy sharing:** the energy produced by the energy community is shared inside the community. In this regard, it is useful to differentiate between collective self-consumption which refers to jointly acting self-consumers located in the same building; or multi-apartment block and other types of energy sharing beyond these narrow boundaries which also may use the public grid. The indicated in Table 3 below electricity sharing relates to this broader case.
- **Energy efficiency:** indicates whether the energy community advances energy efficiency measures e.g., renovation of buildings, heat pumps deployment; performs active energy efficiency consulting for its members;
- **Flexibility and storage:** this indicates whether the energy community also applies energy storage systems and provide flexibility services e.g. working on balancing energy demand and production.

Table 3. Overview of activities within the selected case studies

Energy community	Supply	Consumption	Energy sharing	Distribution	Energy efficiency	Electromobility	Hydrogen	Flexibility & storage
Ecopower	Yes	Yes			Yes			
Beauvent	Yes, for heat	Yes			Yes	Yes		
Zuidtrant	Yes, for heat	Yes			Yes	Yes	Yes	Yes
Community wind farm Neuenkirchen								
Wind farm Uthleben								
Grenzland pool	Partly	Partly			Partly	Partly	Partly	Partly
Energy Community "Agra do Amial"		Yes	Yes		Yes	Yes		Yes
Energy Community "Condomínio da Torre"		Yes	Yes			Yes		
Pinerolese Energy Community		Yes	Yes					
Energy City Hall REC-1		Yes	Yes			Yes		
GECO – Green Energy Community		Yes						Yes
Energy communities in apartment buildings		Yes						
Reinli small-scale hydropower plant	Yes							
Røverkollen housing cooperative		Yes				Yes		Yes
EnergyRegion Michałowo	Yes	Yes						
Słupski Klaster Bioenergetyczny	Yes	Yes		Yes	Yes	Yes		Yes
COMPTEM- Enercoop		Yes	Yes	Yes	Yes	Yes		Yes
Hacendera solar		Yes	Yes			Yes		
Energy Cooperative Loenen		Yes	Yes		Yes	Yes		Yes
Energy Gardens	Yes							
Citizen wind farm "de Spinder"	Yes	Yes			Yes			

The following spider graph (Figure 7) shows which activities are being undertaken within the group of the selected 21 case studies.

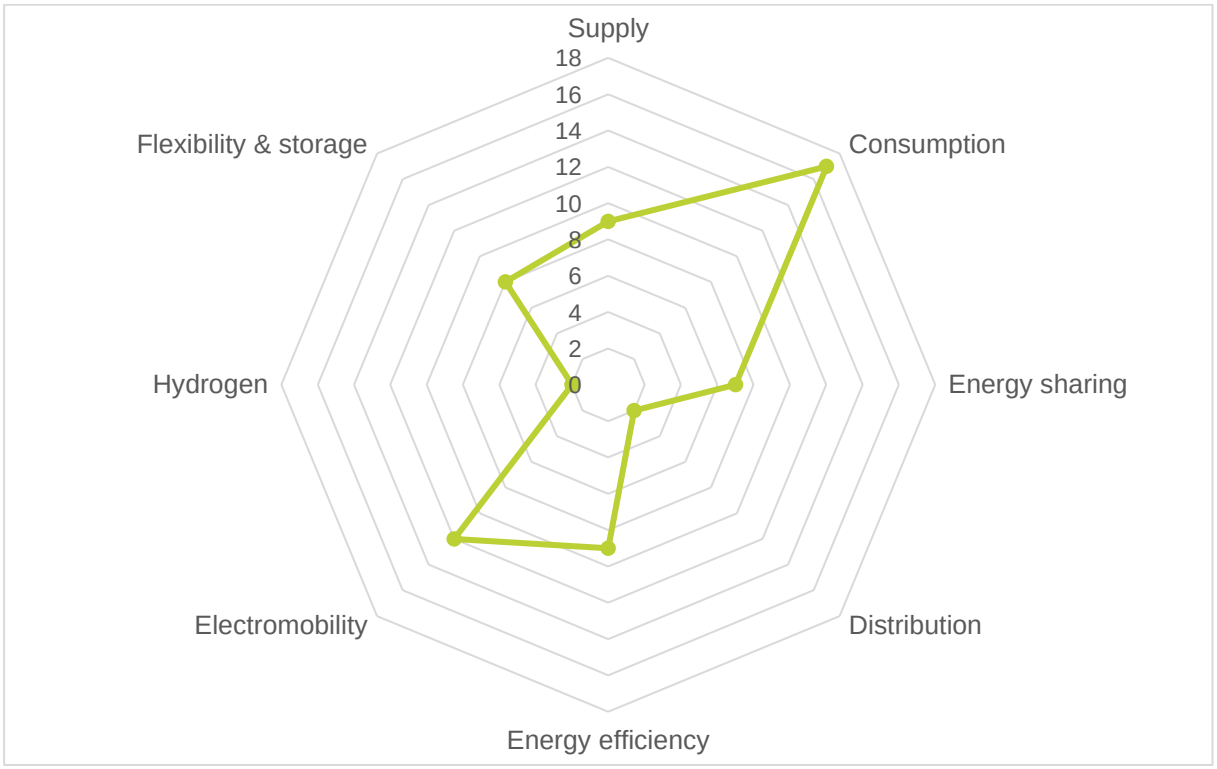

Figure 7. Activities within the selected case studies

Apart from generation, which concerns each case, consumption of energy is a core activity among most of the cases. Additional services in the field of electro-mobility are becoming increasingly popular. 12 out of 21 energy communities use produced electricity for electromobility purposes though EV charging stations. Electric cars can also serve as flexible demand making use of the excess electricity from the local production assets. A prominent example is Røverkollen housing cooperative, where PV systems, storage and EV charging points were developed in order to address the current issue of rapid increase of EVs of residents. The project has a pilot character but with high innovativeness and moreover addresses the current or/and upcoming of our societies.

Flexibility services and storage are also considered or tested in some initiatives. Half of the represented communities provides supply services, energy efficiency measures, energy sharing. Although electricity sharing is one of the important features of REC, as stated in the RED II, it is still provided in the minority of the cases, indicating the importance of enabling framework for this issue. The minority of selected case studies provides distribution services. In addition, there are two communities which are involved in production of green hydrogen (Zuidtrant and Grenzland pool). Additionally, the case of Grenzland pool illustrates showed how a community wind farm successfully switched to a Power Purchase Agreement (PPA) after remuneration via feed in tariff expired.

4.3 Purpose and motivation

Main drivers for creation of the energy communities have been analysed in the three dimensions, underlined in the RED II:

- Environmental;
- Economic;
- Social.

An overview of purpose and motivation for the selected cases has been presented in Table 4.

Table 4. Overview of purpose and motivation for the selected cases

Energy community	Environmental	Economic	Social
Ecopower	✓	✓	✓
Beauvent	✓	✓	✓
Zuidtrant	✓		✓
Community wind farm Neuenkirchen		✓	✓
Wind farm Uthleben		✓	
Grenzland pool	✓	✓	✓
Energy Community "Agra do Amial"	✓	✓	✓
Energy Community "Condomínio da Torre"	✓	✓	✓
Pinerolese Energy Community	✓		
Energy City Hall REC-1	✓	✓	✓
GECO – Green Energy Community	✓	✓	✓
Energy communities in apartment buildings	✓	✓	
Reinli small-scale hydropower plant		✓	
Røverkollen housing cooperative	✓	✓	✓
energyRegion Michałowo	✓	✓	
Słupski Klaster Bioenergetyczny	✓		✓
COMPTEM- Enercoop	✓		✓
Hacendera solar	✓	✓	
Energy Cooperative Loenen	✓	✓	✓
Energy Gardens	✓		✓
Citizen wind farm "de Spinder"	✓	✓	✓

For most of the RECs, the main driver was a mixture of environmental, economic and social aspects. Only a few (Wind Farm Uthleben from Germany and Reinli small-scale hydropower plant from Norway) treat economic benefits as the main push towards REC establishment.

It is worth noting that some selected energy communities clearly indicated their main motivations:

- **Ecopower (Belgium)** the main reason for creation of the community was finding an alternative for nuclear energy and to unite people in a cooperative to invest in the production, and supply of renewable energy and to promote energy efficiency;
- **Community wind farm Neuenkirchen (Germany)**, a key driver for founding the wind farm was to avoid the involvement of and dependency on external investors for energy production and to

keep added value in the local area. Another driver was the prospect of income diversification and additional profit generation from agricultural areas;

- **Pinerolese Energy Community (Italy)** had pure environmental motivations, namely to decrease the utilisation of fossil fuels and create a 100% self-sustain energy community.
- There are examples where social benefits play a key role in creation of the energy community. For **GECO – Green Energy Community (Italy)**, reduction of the cost of electricity for social housing affecting energy poverty[3] and improving local business are the most important topics. Furthermore, in the case of Energy community "Agra do Amial" (Portugal), social housing is at the core of the focus – this community is to be developed in a local neighbourhood, comprising a social housing condominium of 8 building blocks and a public school.

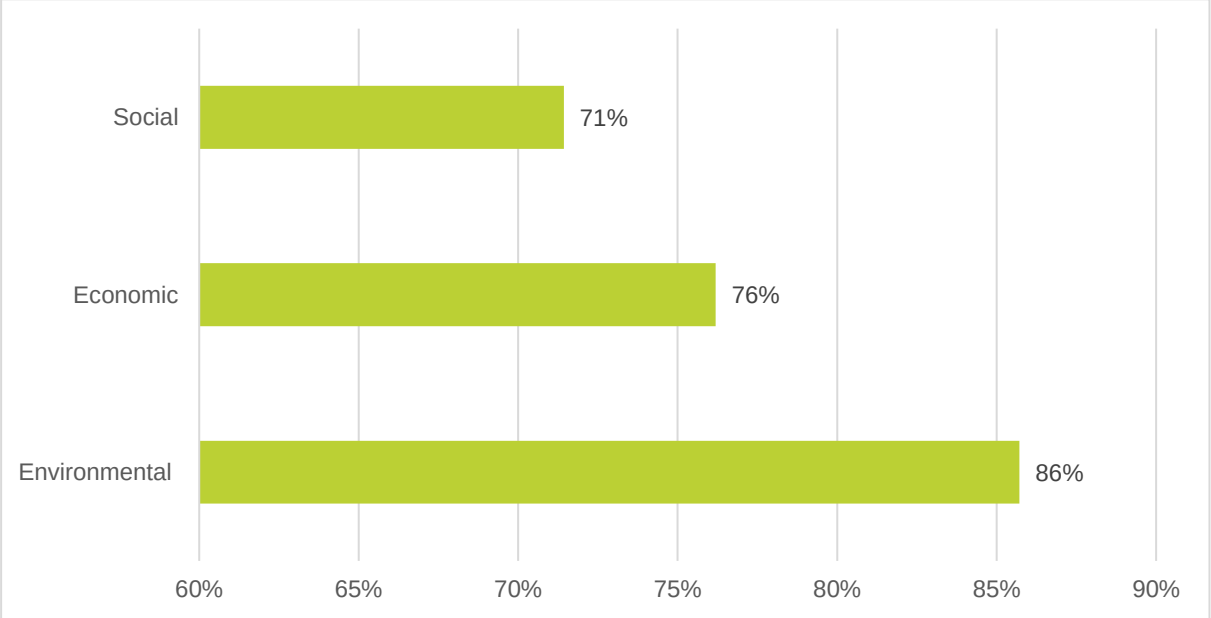

Figure 8. Drivers for creation of RECs.

Based on the Figure 8 the most common drive is the motivation to protect the environment by mitigating climate change. Most of the communities underline the importance of phasing out fossil fuels, RES development, increasing energy security and availability.

For instance, for the case of COMPTEM-Enercoop (Spain), the main objectives of this pilot project and its expansion was collaboration towards the green transition by achieving a 100% renewable origin in the electricity mix of Crevillent by 2050.

However, the economic and social dimensions are also important drivers for establishing energy communities. It shows that usually at least two aspects play a key role when creating such initiative.

[3] Energy poverty—involving a combination of factors, such as low household incomes, high energy prices, and low levels of residential energy efficiency—is identified as a complex and increasing issue affecting people's physical health, well-being, and social inclusion.

4.4 Socio-Economic Benefits

Socio-economic benefits comprised of the following positive aspects:

- **Participation/ownership:** indicates whether the community is open for citizens and other entities and/or gives opportunity to become shareholder;
- **Lifestyle**: this includes a desire to be self-sufficient and promote a sense of community as citizens want to become more independent from fossil fuels and from centralised energy supply. Lifestyle choices are also associated with anti-nuclear sentiments and pro-environmental attitudes;
- **Tackling energy poverty**: indicates whether the energy community helps to alleviate vulnerable households to some extent by special electricity tariffs, discounts etc.;
- **Social cohesion:** indicates whether the energy community is socially inclusive, contributes to creating a community feeling, trust e.g. benefit-sharing, providing some resources to charity or giving a chance for disabled people to work for the cooperative on repetitive administrative tasks;
- **Local job creation and skills**: this includes mobilisation of local economy , local added value generation (including local jobs, local income/profits, local purchase power, local tax revenues);
- **Direct financial profits:** refers mainly to dividends that are given on annual basis to the members of energy community.

An overview of socio-economic benefits is presented in the Table 5 below.

Table 5. Overview of socio-economic benefits in the analysed case studies

Energy community	Participation/ ownership	Lifestyle	Low-cost energy bills	Tackling energy poverty	Social cohesion	Local job creation and skills	Direct financial profits
Ecopower	✓	✓	✓	✓	✓	✓	✓
Beauvent	✓	✓	✓		✓	✓	✓
Zuidtrant	✓	✓	✓	✓	✓		✓
Community wind farm Neuenkirchen	✓				✓	✓	✓
Wind farm Uthleben	✓					✓	✓
Grenzland pool	✓	✓		✓	✓	✓	✓
Energy Community “Agra do Amial”	✓		✓	✓	✓		
Energy Community “Condomínio da Torre”	✓	✓	✓	✓	✓		
Pinerolese Energy Community	✓	✓	✓				
Energy City Hall REC-1	✓	✓	✓		✓		
GECO – Green Energy Community		✓	✓				
Energy communities in apartment buildings	✓	✓	✓				
Reinli small-scale hydropower plant	✓				✓		✓
Røverkollen housing cooperative	✓	✓	✓		✓		
energyRegion Michałowo		✓	✓		✓	✓	
Słupski Klaster Bioenergetyczny		✓	✓	✓	✓	✓	
COMPTEM- Enercoop	✓	✓	✓				
Hacendera solar	✓	✓	✓				
Energy Cooperative Loenen	✓	✓	✓	✓	✓		
Energy Gardens	✓	✓			✓	✓	✓
Citizen wind farm “de Spinder”	✓		✓				✓

The following spider graph (Figure 9) shows which benefits occur in the group of the selected 21 case studies.

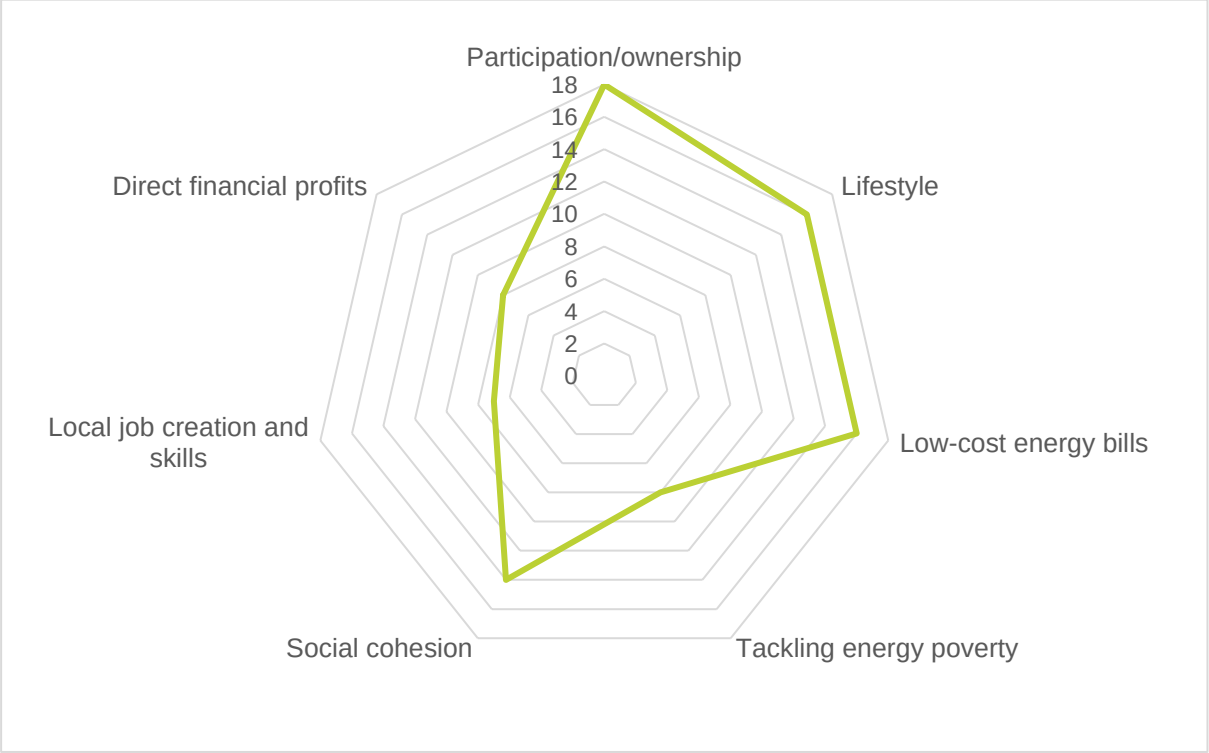

Figure 9. Overview of socio-economic benefits occurring/achieved in the selected cases

Almost all the energy communities have open membership and give option to purchase shares in the community and becoming co-owner. The most common benefits include progression in lifestyle, improve social cohesion and contribute to reducing electricity bills.

The Energy Gardens (The Netherlands) is a prominent example of lifestyle improvement. The community works to involve local citizens and stakeholders directly from the start in the design project to capture the main local nature, landscape, cultural-historical values in the project area and to create and maintain RES projects.

A good example enhancing social cohesion is Zuidtrant (Belgium) which is a local energy cooperative engaged in a broad range of social activities, such as workshops for schools on energy and climate. Zuidtrant works together with social welfare offices and social housing companies, and they participate in projects which have a social aspect or focus. Examples include: the organisation of repair cafés, the model renovation of a house together with the social welfare office, a renovation coaching process for vulnerable house owners with the social welfare office, making a financial contribution to a citizens initiative that aims at enhancing energy efficiency in rented dwellings, and others, the legal form of Zuidtrant implies that at least 15% of the profits will be used for a social purpose.

It is important to underline that, although there are direct financial profits (mostly dividends) in case of energy cooperatives, they are not in a core of the whole spectrum of benefits.

4.5 Environmental benefits

Additional environmental benefits apart from reduction of GHG emissions being a result of RES development have been presented in the Table 6.

Table 6. Additional environmental benefits

Ecopower	Ecopower also removes waste out of the river Dijle at its watermill in Rotselaar
Beauvent	Beauvent only owns cars on alternative fuels (CNG, plug-in hybrid and electric). Beauvent implements climate-friendly office policy. Their office is equipped with a solar installation and connected to a heat network. They have an office on a low-energy boat.
Zuidtrant	The REC provides the electricity from its PV-installations in certain locations directly to the smart charging infrastructure, electric vehicles (car sharing) and e-cargo bikes (bike sharing).
Grenzland pool	A non-profit nature conservation association was founded by the managers of the wind farm Grenzstrom Vindtved as a compensation measure enabling the implementation of a comprehensive nature protection project.
	Production of green hydrogen as well as power-to-gas fuels (new project). Option for e-cars charging.
Energy gardens	Enhancing ecological value and biodiversity is one of the pillars of Energy Gardens. For each Energy Garden specific ecological design sessions lead to special attention to local species, such as birds, reptiles, insects and flowers.
	Energy gardens are built e.g. on unused industrial terrain, or in one case on a remediated landfill.
	Local nature and environmental volunteers are consulted and involved in the design and practical maintenance and monitoring of biodiversity.

The examples as above concern a wide spectrum of environmental issues. Some energy communities are realising environmentally friendly policies, e.g. by using cars on alternative fuels and producing green hydrogen. The energy communities also initiate various nature protection projects.

However, the analysis also shows that apart from the reduction of GHG emissions, only minor part of cases identifies additional environmental benefits, definitely this is an issue important in the context of future RECs development.

5 Best practice selection and justification

The main conceptual and practical characteristics to be fulfilled and satisfied for a case to be selected as a best practice case (and thereby subject to further in-depth analysis), have been elaborated in Deliverable 5.1 “Methodological Framework for good/best practices selection”. This deliverable underlined the importance of having a clear definition of a ‘best practice’ a crucial means to evaluate cases in a systematic and concise manner. Thus, in the context of the COME RES project, it is reminded that a “best practice” is defined as a proven or innovative REC, preferably implemented in a COME RES model region, target region or any other region of the COME RES partner countries, or third countries.

In order to determine the final 10 best practice cases, a transparent selection procedure, in consultation with project partners, has been conducted in order to ensure their effective participation. In this regard, parallel to drafting and submitting the good practice portraits, the COME RES partners also completed a self-evaluation matrix for the cases, for which a common framework was also developed as part of COME RES Deliverable 5.1. On top of this, the partners of each country desk were also to rank their respective national cases and provide a justification for their ranking. On top of the the general principles for the selection of best practice cases that were layed out in the self-evaluation matrixes, some additional principles and considerations have been applied as part of this selection process, which include:

1. Ensuring **broad geographical representation of COME RES countries**
2. Ensuring a **variety** of legal forms, driving motives, objectives, stakeholder involvement & technologies
3. Ensure that the best practices are **representative of different levels of REC implementation and development**, thereby including:
    a. Pre-existing cases launched before REDII
    b. New energy community cases.
    c. Pilot projects (although a clear division between the new RECs and the pilots could be considered subjective, as the new RECs also fulfil to a great extent the functions of demonstration projects).

Figure 10 below provides a representation of the factors involved in determining the 10 best practices:

Figure 10. Factors having impact on best practice selection.

Table 7. Selection of Top 10 cases catarogised by their stage of implementation/development

Stage of development	Number	Best Cases
Mature RECs (established 2017 and earlier)	4	• Ecopower • Zuidtrant • Grenzland Pool • Region Michałowo
New RECs	4	• Energy City Hall REC-1 • Røverkollen housing cooperative • COMPTEM-Enercoop • Energy Gardens
Pilot and R&D initiatives	2	• Pilot projects in Latvia • Energy community “Agra do Amial”

As a final overall consideration, in the top 10 cases, we have also ensured to include good/high adaptability and transferability. Table 8 below presents the model character of each of the Top 10 practices.

As a results of this selection process, Table 9 below outlines our descriptions and justificatitons for the 10 selected best practice cases.

Table 8. Short summary and model character of top 10 practices

Country	Title	Short summary	Best practice and model characteristics for adaptation & transfer
Belgium	Ecopower: energy cooperative	A large-scale energy cooperative bringing together people investing in a variety of renewable energy technologies. It performs a broad range of activities: energy production & supply, energy efficiency, advise on new technologies for members, amongst other activities.	The step-by-step 30-year growth process, from the initiators group to the Flanders-wide energy cooperative, which currently includes activities at the national scale to raise awareness with regards to climate change and promote citizen participation in the energy transition. The practice shows how the experienced cooperative develops and plans activities as well as how it collaborates with other energy cooperatives. The producer/supplier model could be interesting for other regions, especially if it succeeds in becoming a cheap energy supplier. Moreover, the legal form of a cooperative is well known and recognised. Relevant lessons can be

			drawn, particularly for already existing energy cooperatives.
Belgium	Zuidtrant: energy cooperative with social purpose	A local-level energy cooperative with environmental and community-level social objectives. The cooperative aims to enable its members to play an active role in the transition towards a low-carbon economy by means of a highl broad a broad range of activities.	An example of a local-level energy cooperative (5 years old) entailing a broad range of activities including: energy production, near-zero energy building renovation advise, school workshops on energy and climate, shared electric mobility and other climate awareness raising activities. Being a cooperative with a strong social purpise, Zuidtrant is a particularly interesting case of social innovative in the context of the REDII. Indeed, the case shows the importance of municipalities providing an enabling framework (in this particular case enabling the possibility of RECs to participate in public tenders). Moreover, it also demonstrates the importance, for the of growth a REC, of cooperating and partnering with local authorities and neighbouring renewable energy cooperatives. Thus, many lessons exist for energy communities working at the local level.
Germany	Grenzland-Pool of community wind and ground-mounted PV parks	Pool of community wind and PV farms in Northern Friesland (“Grenzland-Pool”). The provisionof profitable, clean energy investment options for local citizens is realized, together with promoting the sustainable development of the local area. There are high levels of innovativeness and visionary thinking, based on the widespread involvement of local citizens and local	Good example for grassroots initiatives and a corresponding enabling framework. The managers can be regarded as pioneers in Germany in the field of citizen/community wind energy (the first projects started more than 20 years ago). The projects have advanced from traditional single wind energy production facilities to conducting new innovative activities (incl. hydrogen production, EV charging, flexibility and storage, etc.). The practice shows how RECs can significantly contribute to the sustainable development of local economies (incl. income diversification in traditional agriculture areas, stable business tax revenues for local municipalities, added value to the region, social investments, etc.). The model character and relevance for other regions is relatively high. Even though full replicability itself is limited due to the specific framework conditions, certain important elements of the model could be largely replicated. Providing

		stakeholders, collaborative partnership and good public leadership.	funding for civic associations or non-profit foundations, as well as establishing local partnerships as the basis of the energy community, are important lessons in the REDII context.
Italy	Energy City Hall REC-1	A municipality as the initiator of the REC. This case shows how a municipality can offer public buildings for an energy community. It is also an example of municipality-households-small businesses cooperation for collective self-consumption of electricity.	The first example of a REC in Italy. The practice shows how a municipality can be the initiator of a REC by both providing public buildings rooftops and catalysing collaborations with other stakeholders. The model has already been replicated in the region. Energy City Hall is already recognised as a best practice case and a model in Italy for several energy communities that are in the process of being set up. The model is well accepted by the residents due to the effectivness in terms of the communication and training activities carried out by local administrations and research institutes. For regions currently without energy communities experience, this is key model to follow since it is a rather small in terms of the RES technological capacity (and not so complex to replicate).
Latvia	Energy communities pilot projects	This case is a novelty at the national level. Latvia is now starting to develop energy communities. The practice presents the roadmap and set of activities of two pilot projects in apartment buildings.	In regions having no experience with energy communities, the challenge is to generate trust in the energy community concept and communicate its benefits. Implementation of demonstration projects is therefore very necessary. The presented pilot projects can be considered as a relevant model for other apartment buildings, as they portray a possible pathway and a set of measures for the establishment of other REC pilot projects. However, the experience of the pilot projects shows that a feasibility study should be conducted on a case-by-case basis. Currently feasibility studies for the implementation of further pilot projects are ongoing in Latvia. The lessons can be of importance for other regions which are currently beginning to develop energy communities.

Norway	Røverkollen housing cooperative	A novel case at the national level. Røverkollen is a pilot living lab within the H2020 project Green Charge. The objective is to provide environmentally friendly electricity for charging residents EVs at reduced costs, and to provide predictability and security concerning residents charging needs (as the increase in EVs is anticipated).	An example of how a housing cooperative can contribute to the development of electromobility. Norway being pioneer in the penetration of EV, the model is important because the uptake of electric vehicle will require establishing an appropriate charging infrastructure in urban areas, particularly apartment building. In this sense, housing cooperatives/associations have a high technical potential for rooftop PV, which might be combined with EV charging points. The practice is a good case of collaboration to develop and implement smart energy systems (rooftop PV electricity generation, battery storage, predictive planning). Regarding the overall power grid, the system provides flexibility to the system by reducing peak loads.
Poland	Energy Region Michałowo	The energyREGION Michałowo is a dynamically developing local energy market. It balances energy demand and production, and thereby establishes cooperation between local energy producers and consumer entities. The energy cluster elaborated its own development strategy and push on realizing the projects and initiatives in a consistent manner with high engagement of key	The energy cluster is an example how to achieve desired economic profitability of a biogas plant while providing a wide spectrum of benefits to the society and local entities. A key driver for the Michałówo cluster was the need to improve the economic efficiency of an agricultural biogas plant. Through an agreement with local authorities, the producer of biogas receives additional revenues from the sale of heat, and the municipality has half the cost of heat for heating the swimming pool and the school complex. The case demonstrates efficient production of electricity and heat from agricultural resources and extensive supply of heat and electricity – then directed towards many recipients (almost all public buildings, enterprises, households in the vicinity). Thanks to the enlargement, the network is prepared for the connection of other entities. The energyREGION Michałowo encourages new investors actively, creating an industrial zone in Michałowo, equipped with energy carriers from RES increasing the attractiveness for future investments.

		stakeholders from the local market.	
Portugal	Energy community “Agra do Amial”	The energy community aims to create more sustainable local neighbourhoods by mitigating energy poverty. A mix of innovative solutions, particularly in their application to social housing blocks, will be tested and implemented. The expected result is rebates on the energy bills of local social housing residents.	This is an example of an energy community in a micro-area (eight apartment building blocks and a public school) to tackle energy poverty. This appears to demonstrate an effective approach to involve local authorities in the implementation of RECs, as they own and manage a large number of buildings (administrative and social housing). Being a pilot case, and as its development is still ongoing, it is not possible to fully assess the barriers to the implementation of this initiative. At the same time, the case is particularly important in the REDII context, as it directly focuses on social benefits. There is large potential for transferability within the city of Porto and to other municipalities in Portugal, due to the relevance of energy poverty overall in the country and the fact that all municipalities own and manage social housing buildings. The same might relate to other areas having social housing infrastructure.
Spain	COMPTEM - Enercoop	A H2020 supported pilot project, this is a non-for-profit energy cooperative with the objective of generating rebates on members’ energy bills and eventually supplying 100% renewable energy to the whole village of Crevillent. This case is that of good collaboration between the local administration and the energy cooperative. Moreover, the financing model	The pilot project consists of establishing a PV generation facility on ceded public land that supplies electricity to houses in the vicinity. Other activities carried out include a medium capacity storage facility and an e-mobility charging facility, among others. The strong involvement of the municipal government has been significantly important (cession of public land) and shows the critical role that public administrations can play in determining the success of RECs. Moreover, members of the cooperative did not have to make any initial investments, as the installation will be repaid through the rebates on the energy bills of members. This allows the general public to be involved easily, partially eliminates reluctances related to cost, and allows low-income households to participate. This model could be easily replicated elsewhere as both the cession of public land and the financing model are transferable. Nonetheless, cession

		chosen has probably convinced people reluctant to participate.	of public land might be more difficult in densely populated areas where this may be scarcer.
The Netherlands	Energy Gardens	An innovative concept to produce an additional socio-ecological value through an energy community project. Several renewable energy generation projects with multiple functionalities are implemented. Local citizens and stakeholders are directly involved from the start in the project's design, its exploitation and its maintenance.	The case is an innovative concept to achieve ecological surplus value through an energy community project. The project consists of establishing multifunctional and biodiverse energy parks for and with the local community, which offer both recreational and educational services. The parks are administered by a managing foundation in which RES technologies developer, the Dutch Nature and Environmental Federation and the local community - are represented. Local citizens and stakeholders are directly involved from the start in the project's design to take into account local characteristics (landscape, cultural-historical values) and to create and maintain the projects, which are co-owned by the local communities. These pilots show that high social acceptance can be generated. These are relevant lessons for communities developing similar activities in other regions.

Table 9. Top 10 practices evaluation against the criteria elaborated in Deliverable 5.1

	Innovativeness	Compliance	Additional environmental benefits (see note)	Economic benefits	Social community/ societal benefits	Inclusiveness	Model character/ relevance	Adaptation & transferability
Ecopower	Medium	High	High	High	Medium	Medium	High	High
Zuidtrant	Medium	High	Medium	Medium	High	Medium	Medium to High	High
Grenzland-Pool of community wind and ground-mounted PV farms	High	Medium	Medium to High	High	Medium to High	Medium	Medium to High	Medium
Energy City Hall REC-1	High	High	Low	High	Medium	Medium	High	High
Latvia: pilot projects in apartment buildings	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium
Røverkollen housing cooperative	Medium to High	Medium	High	Medium	Medium	Medium	Medium to High	Medium
EnergyRegion Michałowo	Medium	Low	High	High	Medium	Medium	High	Medium
Energy community "Agra do Amial"	High	High	Medium	High	High	High	Medium	High
Energy cooperative Enercoop	Medium	High	Medium	High	Low	Low	High	High
Energy Gardens	High	High	High	Medium	High	High	High	High
Note: all cases include fossil fuel reductions and thus contribute to GHG emissions reduction. Evaluation of additional environmental benefits relates to benefits other than GHG emissions reduction.								

6 Next steps

In order to further develop the outcomes and analysis of this deliverable as well as to delve in deeper into analysis and comparison of the best practices identified, we will carry out in-depth assessments and a comparative analysis of the best practices. The output of this exercise will flow into the deliverable titled 'Synthesis Report based on in-depth assessment of ≥ 10 transferable best practices'.

Our methodological approach is conscious of the fact that, in order to be able to compare across diverse cases, similar data need to be collected. These will be gathered through desktop research and consulting stakeholders and market actors as well as through complementary quantitative data.

Our analyses will entail stakeholder mappings, innovative business and cooperation models, local value creation and co-benefits, including social, and environmental benefits, quantitative and qualitative employment effects and gender issues.

On the basis of the outcome and findings of the in-depth assessments, Deliverable 5.3 will carry out a comparative analysis of the best practice cases extracting lessons that can have an overall validity.

This Deliverable will be the following according to the following chapters:

1. Introduction & objectives of the Deliverable
2. Key concept
3. Methodological tools for in-depth data collection and strategy for synthesis & comparative analysis
4. Executive summaries of best practice cases
5. Synthesis of best practice cases
6. Comparative analysis of characterstics
7. Key lessons learnt for successful development and operation of RECs
8. Transferability
9. Conclusions
10. Annex – full description of all best practice cases

The findings of this analysis will be consolidated in a synthesis report and will serve as the basis for the development of the Sustainability Scorecard (Task 5.4). Deliverable 5.3 will be discussed within the country desks during specific stakeholder dialogues (WP3) and will feed into the capacity development and transfer activities under WP6, and policy learning processes in WP7.

Annex 1: Good practice portraits

a. Ecopower (Belgium)

Authors	*Dirk Vansintjan – board member of Ecopower and President of REScoop.eu* *Stavroula Pappa – REScoop.eu*
Date	*12/10/2021*
Name of REC	*Ecopower cv*
Country	*Belgium (Flanders)*
Type of region	*The Provinces of Antwerp and East-Flanders are described as model regions for Belgium in the COME RES GA. Ecopower's legal address is Posthoflei 3/3, 2600 Berchem (Antwerp), Belgium.*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The transposition of the EU REC provisions into Belgian law is still in progress. In Flanders and Brussels the transposition of the definitions has progressed more compared to Wallonie and the Federal level. The Flemish Energy Decree frames "energy communities" as a single concept, with CECs and RECs representing slightly different notions of this concept. Criteria of the EU definition are reflected in the national definition, nothing more, nothing less. Most principles contained in the EU criteria are not elaborated in detail. Furthermore, participation is limited to members that do not participate in energy communities as a primary professional activity. The legal entity allowed is not defined. All renewable energy cooperatives, members of REScoop Vlaanderen, are considered to comply with the RED II provisions on RECs. In more detail, in Ecopower there is open and voluntary membership and every member has one vote in the Annual General Meeting (AGM), regardless of the number of shares the member has. Ecopower's activities fall into the range of activities described in article 22(2) of the RED II, while it also provides economic, social and environmental benefits to the local community where it operates. Moreover, when there is profit (all years since 2002, except for 2 years) a dividend goes to the members (legal maximum is 6%).*
Foundation	*Ecopower started in 1991 as an initiative of a handful of citizens to finance the renovation of the hydropower installation of the watermill of Rotselaar. First milestone was winning the tender issued by the city of Eeklo that allowed Ecopower to build 3 wind turbines in 2001-2002 and increase its member basis to 1200 members. A year later, Ecopower became a green electricity supplier, since the energy market was liberalised. Being one of the less expensive suppliers of green electricity has led to a constant growth in number of members and equity.*
Driving forces	*Main drivers for the citizens who set up the community was twofold. Firstly, their will to set up concrete alternative production for nuclear power after the nuclear disaster in Chernobyl (1986). Secondly, the opportunity to invest in this alternative offered by the restauration of the old (1902) hydropower installation of the watermill of Rotselaar. Overall, the objective of Ecopower was to unite people in a cooperative to invest in the production, and supply of renewable energy and to promote energy efficiency. Later, also the cooperative identity became more emphasised, as reflected in the statutes and internal rules (as revised in 2021). The reasons why the cooperative identity served as a driving force for success are as follows: The aim of Ecopower as a cooperative is to invest in the energy transition in return for a fair dividend for its members. The green electricity is sold at cost to the members which results in an interesting price for most households in Flanders. This combination of a fair dividend and low electricity price has proven quite successful in convincing people to join the cooperative. Ecopower never needed publicity since its members did it for the cooperative.*
Organisational structure/ ownership model	*Ecopower is a 'Coöperatieve Vennootschap', abbreviated: a 'cv'. A cooperative society, according to Book 6 of the Belgian law on legal entities (see the reference). Some of the main characteristics highlighted there are the open and voluntary membership, minimum of 3 founders required for the establishment of the cooperative, the need to have a minimum initial equity to be established and so on. There is only one category of members. Every member has one vote in the AGM regardless of the number of shares*

	they may have (Maximum of 20 shares/member). Shares are worth 250€. The average member has about 4 shares, but about 75% of the members only have 1 share. There is no information on the gender balance aspect of the membership, though a lot of shares are owned by couples. On 31.08.2021 a total of 224.453 shares of 250 euro exist.
Attributions of roles and functions in decision making	• *The **General Assembly** of all members is the highest decision making entity. It assembles at least once a year (AGM) and takes strategic decisions, e.g. to become an electricity supplier, not to sell fossil gas, start production of pellets from locally sourced wood. The AGM also elects the board members and approves the accounts and the destination of profits.* • *In the **Board of Directors** about half of the directors are volunteers that work for the coop, the others are volunteers that do not work for the coop.* • *The AGM also elects among its members a **group of controllers** that meet regularly with the coordinator and some board members to follow up on the activities of the coop. They report about their activities to the AGM and give their advice to the AGM about the approval of the accounts and the dividend proposal.* • *Ecopower has a **coordinator**, who constitutes the daily **managing committee**, together with the heads of the different teams (supply, engineering, accountancy). The different teams meet regularly and their members each have their say about how things are run.* • *Ecopower currently (autumn 2021) has **54 employees**. Each autumn, Ecopower organises 5 energy cafés spread around the Flemish Region to interact more closely and locally with its members.*
Geographical scope	*Ecopower is active at national level. It supplies green electricity to the Flemish region and has renewable energy production installations across the whole of Belgium. At the moment it has more than 60.000 members.*
Activities in the energy system	• *Invest in renewable energy production: wind, PV, small hydro, cogeneration, wood pellets and brickets at national level. In more detail, there are 20 wind turbines (43 MW) and 340 solar installation (270 residential <10kWp; 70 >10 kWp; 7 MW), 3 small hydro installations (100 kW) and 1 wood pellet factory (24000 ton for household heating).* • *Supply of this renewable energy to the members of the cooperative in Flanders* • *Invest in district heating/cooling in Flanders* • *Supply of heating/cooling in Flanders* • *Advise members about energy efficiency, solar panels, pellet stoves and boilers* • *Research and development through participation in EU funded research projects e.g. on aggregation, storage, balancing, VPP, …* *In the near future, Ecopower plans to install more heating/cooling networks, VPP, more wind and solar production, storage, balancing, electric vehicle sharing.*
Energy technologies	*Wind, PV, small hydro, cogeneration, wood pellets and brickets.*
Key actors and stakeholders involved	*Ecopower was initiated by local citizens who set up the community as a concrete alternative to the production for nuclear power after the nuclear disaster in Chernobyl (1986). It started also due to the opportunity to invest in the restauration of the old (1902) hydropower installation of the watermill of Rotselaar that was acquired in 1985 by an NGO, involving Dirk Vansintjan, Relinde Baeten and Johan Hamels. Currently, Ecopower is governed by its members through the General Assembly, the Board of Directors, the group of controllers, its coordinator, the rest of the managing committee, volunteers and its 54 employees.*
Scope of participants	*There is only one category of members, which include households, SMEs, associations, schools, local authorities. The main beneficiaries are households and small businesses (low voltage clients).*
Key motivations	*The key motivation for the establishment of Ecopower was the investment in renewable energy as a response to nuclear energy. Moreover, the cooperative was established in order to provide green electricity to its members at a lower price and raise awareness with regards to climate change and citizen participation in the energy transition.*
Public leadership	*The City of Eeklo with its public tender was looking for a partner for a wind farm on their land including citizen participation, which was innovative and allowed Ecopower to build 3 wind turbines in 2001-2002. Since then, several cities and municipalities followed their example.*

Inclusiveness	*Ecopower has open and voluntary membership, meaning that all citizens, including vulnerable groups, can become a member of the cooperative. It supplies green electricity at cost (lowest price at the moment), which contributes to the alleviation of energy poverty. The special benefitting rules provided for vulnerable and low-income groups are the following:* ● *Buying of share in slices (e.g. 10 x 25 euro/month or 5 x 50 euro/month);* ● *Social tariff for low-income electricity users (system of the federal government, all suppliers have to do this);* ● *They don't use classic debt collection, but a social organisation that contacts the debtor to work on the complete debt to all companies without a system of ever-increasing interests.*
Institutional support and financial support	*Ecopower collaborates with local authorities e.g. Eeklo, Leuven, Mechelen, Antwerpen, Ninove, Asse, Beersel, though there is no established infrastructure of assistance and institutional support. It is rather Ecopower that supports local authorities to reach their commitments e.g. in frame of their energy/climate plans .* *Ecopower is mainly funded by its members and the following revenue streams:* • *sale of green electricity to members* • *sale of surplus green certificates to other suppliers* • *sale of surplus green electricity through BRP* • *sale of green electricity on market* • *grants for participating in EU funded projects Horizon 2020, Interreg* • *bridge loans* *Ecopower counts on support schemes like every renewable energy producer. The revenues of the production installations is the most important revenue stream. This pays for new developments and dividend. In the turnover the electricity supply is the largest part. Costs and revenue are equal for the electricity supply.*
Community support and acceptance	*Ecopower produces 100 GWh/year by wind turbines, PV panels and small hydro, 20.000 ton/year wood pellets made of locally sourced wood and supplies green electricity to 1,62% of the Flemish households. It also provides information and trainings to its members on the benefits of renewable energy and energy efficiency and puts a lot of work in informing people living around its installations, contributing to social acceptance for RES. An example of such social engagement is the 5 energy cafés that Ecopower organises each autumn across the Flemish Region to interact more closely and locally with its members. Finally, Ecopower cooperates closely with the local authorities, the Flemish Regulator VREG, other energy cooperatives, NGOs, energy market and system actors and financial institutions in order to promote the energy cooperative model and engage more people into the need to participate in the energy transition. In general, Ecopower works on the energy transition with and for the citizens. Their way of supplying electricity with readable invoices and excellent customer care are an example in the market. When the cooperative and the municipality work together, they find a large supporting base.*
Provision of additional environmental benefits	*Ecopower produces green electricity from its own installations, thus contributing to the reduction of the CO2 emissions. Moreover, Ecopower contributes towards the reduction of the energy consumption of its members and in this way increases their climate change awareness, as the average Ecopower member consumes half of the average Flemish household. Ecopower also removes waste out of the river Dijle at its watermill in Rotselaar.*
… economic benefits	*Ecopower supplies green electricity to its members and local society at a lower price (1,6% market share households). Moreover, when there is profit (all years since 2002, except for 2 years) a dividend goes to the members (legal maximum is 6%). In terms of the employment effects, at the moment 54 people work for Ecopower.*
… social community/ societal benefits	*Ecopower brings several social benefits to the local community where it operates. To start with, its membership is open to people from different socio-economic backgrounds, including vulnerable and low income groups. Moreover, it contributes to the reduction of energy poverty as it supplies green electricity at a lower price. Its price reflects the cost Ecopower has to bare in order to supply electricity, including a fair price for its own production so that the production installations are profitable and generate a fair dividend for the members. Often this results in a lower price than average. Finally, Ecopower contributes to social awareness raising with regards to renewable energy and climate change, as it provides information and advice to its members on renewable energy, energy efficiency and the reduction of their energy consumption (average consumption is*

	50% of average household in Flanders) and organizes social community activities, such as the energy cafés mentioned above.
Drivers and success factors	*The main driver for Ecopower was to unite people in a cooperative to invest in the production, and supply of renewable energy and to promote energy efficiency, in order to set a concrete alternative to nuclear power.* *The main success factors of Ecopower include the fact that it managed to actively involve more than 60.000 citizens in the energy transition by producing 100 GWh renewable energy per year and combining production and supply at cost. Another success factor is that it is raising awareness on the need for a democratic and decentralized energy transition, by showing that the citizen involvement in the energy sector is possible and very much necessary.*
Innovativeness	*Ecopower is active both in a broad range of activities (energy production & supply, energy efficiency, car sharing) and in research and development projects through participation in EU funded research projects (e.g. on aggregation, storage, balancing, VPP), which promotes social innovation. Moreover, it is very actively collaborating with municipalities and especially other cooperatives (Board of Cooperatives Europe etc.), striving to promote the cooperative economy. Finally, Ecopower contributed to the creation of the REScoop Federations at the Belgian and EU level. As a consequence, Ecopower is considered innovative at different levels, contributing to the energy transition at large and the circular economy.*
References	• *https://www.ecopower.be/* • *https://www.ecopower.be/statuten-en-intern-reglement* • *https://www.rescoop.eu/policy#transposition-tracker* • https://www.ejustice.just.fgov.be/cgi_loi/loi_a1.pl?language=nl&la=N&table_name=wet&cn=2019032309&&caller=list&N&fromtab=wet&tri=dd+AS+RANK&rech=1&numero=1&sql=(text+contains+(%27%27))#LNKR0237

b. Beauvent (Belgium)

Authors	*Erika Meynaerts & Kelsey van Maris – VITO*
Date	*22/10/2021*
Name of REC	*Beauvent*
Country	*Belgium (Flanders)*
Type of region	*Beauvent's registered office is located in Diksmuide, and there is an office in Oostende, both in the province of West-Flanders. The target region of Beauvent used to be West-Flanders, but nowadays Beauvent has invested in projects all over Flanders (& occasionally in Brussels Capital Region and Walloon Region)*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The legal term "renewable energy community" defined in RED II has been formally introduced into Flemish law (the Energy decree). The Energy Decree frames "energy communities" as a single concept, with CECs and RECs representing slightly different notions of this concept. Criteria of the EU definition are reflected in the national definition, nothing more, nothing less. Most principles contained in the EU criteria are not elaborated in detail. Furthermore, participation is limited to members that do not participate in energy communities as a primary professional activity. The legal entity allowed is not defined.* ○ *A renewable energy cooperative is a legal entity with an open and voluntary participation of its members.* ○ *A renewable energy cooperative has no profit motive that subordinates its main purpose. The main purpose is to provide environmental, economic and social benefits for its members and the environment in which it operates.* ○ *The renewable energy community's activities of energy production, self-consumption, energy sales and energy sharing shall only relate to energy from renewable energy sources.* ○ *The partners or members of the renewable energy community are natural persons, local authorities or small and medium-sized enterprises whose participation in the energy community does not constitute the main commercial or professional activity and who are located in proximity to the renewable energy projects of the renewable energy community.* ○ *The partners or members, in their capacity as customers, are each connected to an electricity network, a heat or cold network.* ○ *The partners or members have control over the activities of the renewable energy community.* ○ *The renewable energy community is autonomous with respect to its individual members and associates or other market participants who participate in it through other means, such as investment.* ○ *A renewable energy community shall limit participation on the basis of technical or geographical proximity, taking into account the function of the objectives or activities that the renewable energy community intends to achieve.* ○ *A renewable energy community shall own the property rights to the assets it uses to carry out its activities.* *Although, registration of REC's has not started yet and the Flemish regulator of the energy and gas market did not notify the legal entities that comply with the definition of a REC yet, it is to be expected that all renewable energy cooperatives that are member of REScoop Flanders (Flemish federation of Renewable Energy Cooperatives) comply with the definition in the Energy decree given the objective and scope of their activities as well as their commitment to the ICA principles, outlined by the International Cooperative Alliance.*
Foundation	*Beauvent was established on the 21st of June 2000. The first RES project was realized in 2005, namely two wind turbines in the municipality of Nieuwkapelle that supply green power to more than 1.000 families.*
Driving forces	*In the year 2000, 3 families from the "Westhoek" (region in the province of West-Flanders, between Ieper and Veurne) shared the idea of leading a dignified life using less energy without compromising on luxury. They found each other in their plans to convert their*

	house into a low-energy home using ecological materials. In addition, they wanted to provide for their own energy with solar panels on their roof and a wind turbine in the garden. As a small wind turbine did not appear to be profitable enough they encouraged like-minded people to co-invest in larger wind turbines. As a result, Beauvent was established and the first RES project was realized. The main driving forces for the growth of Beauvent are the possibility to participate in public tenders and the well-established cooperation and partnerships with actors of the public and private sector. Following milestones were important in the further development of Beauvent: ○ *End of 2017, the consortium of Beauvent and 5 other renewable energy cooperatives was awarded a public tender for installation of solar panels at Catholic schools in Flanders (Klimaatscholen 2050).* ○ *The heat network in Oostende became operational in 2019 and currently delivers (waste) heat to public buildings, industrial and residential clients.* ○ *In 2019, Beauvent together with the renewable energy cooperative Vlaskracht, won the public tender of the intermunicipal organisation Leiedal to install solar panels on the roofs of public buildings and schools in several municipalities that are located in the working area of Leiedal.* ○ *In 2020, Beauvent installed two additional wind turbines with a total capacity of 4,6 MWe, which more than doubled their wind capacity.* ○ *In 2020, a consortium of Beauvent and other renewable energy cooperatives in Flanders was awarded a framework contract of the Flemish Energy Company for the installation of solar panels with citizen participation on the roofs of public buildings in Flanders. Beauvent is the preferred partner for cities and municipalities in the province of West-Flanders.* ○ *Partnerships with private and public companies in the industrial and tertiary sector enabled Beauvent to increase its energy production capacity significantly in the past 10 years. In 2021, its solar portfolio exceeded 15 MWp.*
Organisational structure/ ownership model	*The organisational structure is a cooperative company with limited liability (or "CV" in Dutch). Beauvent is committed to the 7 ICA-principles, outlined by the International Cooperative Alliance, in the way they organize, manage, and develop their cooperative:* *1. Voluntary and open membership* *2. Democratic control by the members* *3. Economic participation by members* *4. Autonomy and independence* *5. Education, training and information* *6. Cooperation between cooperatives* *7. Attention to the community* *There is only one category of members. Every member has one vote in the General Assembly, irrespective of the amount of shares the member owns. Shares are worth 250 euro. Beauvent has currently 6.192 members (15/10/2021).* *Beauvent's staff consists of 13 employees, 77% is full time employed and 23% part-time. Gender balance: 85% male and 15% female. Age balance: 69% age 30 -40, 23% age 40 – 50, 8% age +50.*
Attributions of roles and functions in decision making	*Beauvent is organised by two bodies: the Board of Directors and the General Assembly.* ● *The General Assembly of all members (GA) assembles at least once a year on the topic of the general policy of the cooperation and all other matters that are relevant to the cooperation. Every member has one vote in the General Assembly, irrespective of the amount of shares the member owns. Additionally, the GA also elects the Board members and approves the accounts and the destination of profits.* ● *The Board of Directors consists of at least three persons, elected among the members at the GA, and mandated for 3 years. It has the most extended competences to do what is needed or what is deemed useful to attain the goal of Beauvent.* *Day-to-day management of Beauvent is executed by a General Manager who reports to the Board of Directors.*
Geographical scope	*Beauvent is active at the regional level. Beauvent has energy production installations across Belgium. The majority of its installations is located in the province of West-Flanders (target region).*

Activities in the energy system	*Electricity and heat production (most important), supply of heat, energy-efficiency.*
Energy technologies	*Beauvent invests in solar panels, wind energy, and energy-efficient applications such as cogeneration (CHP) and heat networks. Beauvent has more than 244 installations with an installed capacity of 33 MWe. The heat network in Oostende delivered 12 GWh of heat in 2020.*
Key actors and stakeholders involved	*Beauvent started with a dream of 3 families to produce renewable energy by means of a wind turbine. Throughout the years, Beauvent has evolved into a mature energy cooperative, in which **citizens** invest in renewable energy projects. Partnerships with public and private companies and collaborations with other renewable energy cooperatives enable Beauvent to increase its renewable energy production capacity.*
Scope of participants	*Beauvent has 6.192 cooperants, most of which are small savers. The participants are citizens and households which want to invest in renewable energy. Some SMEs hold a small amount of shares as well. Of the 6.192 cooperants only 60 are companies, mainly non-profit organisations and private limited companies (ltd). The non-profit organisations are mainly from the sustainability sector. The private limited companies are from different sectors.*
Key motivations	• *The key motivation for Beauvent is investing in renewable energy. The citizens obtain a fair dividend (between 3,25% and 6% historically), which is a nice dividend for the scale of the investment (one share = 250 euros).* • *With regard to district heating, Beauvent is a frontrunner as it is investing in the region in a technology which is necessary to provide low-carbon heat, but where there are no market parties taking up this role.* • *In the cooperative model, profits generated from operations are distributed to the local citizens and therefore benefiting the community. Additionally, through this cooperative model the renewable energy assets are more anchored in the community than through classic public or private ownership models.*
Public leadership	*Public actors do not take up a leading role in Beauvent, it is a bottom-up initiative. Nevertheless, Beauvent has several ad hoc partnerships with local authorities, e.g.:* • *Beauvent has been awarded several public tenders for the installation of PV on roofs of public buildings.* • *Beauvent won the public tender of the intermunicipal organisation Leiedal to install solar panels on the roofs of public buildings and schools in several municipalities that are located in the working area of Leiedal.* • *Being partner in the framework contract with the Flemish Energy Company, Beauvent is responsible for the installation of solar panels with citizen participation on the roofs of public buildings in the province of West-Flanders.* • *With the investments in PV and the district heating network in the city of Oostende they are considered as a key contributor to the energy and climate action plan (Covenant of Mayor) of the city of Oostende.*
Inclusiveness	*Beauvent has open and voluntary membership, meaning that all citizens, including vulnerable groups, can become a member of the cooperative. The price of a share is kept low (250 euros) so also low-income households can participate.* *Beauvent's staff: limited diversity in age (69% age 30- 40) and gender (85% male).*
Institutional support and financial support	• *Beauvent uses subsidy schemes at regional level (Flanders) such as the 'call residual/waste heat' to invest in district heating. Furthermore, renewable energy projects are eligible for green certificates (wind, solar) and the so-called 'call PV'.* • *Also, the EIB ensures that the bank loan for the district heating network in Oostende has a low interest rate (EU).*

Community support and acceptance	• *The cooperative model contributes to positive attitudes, public support and social acceptance. Through this cooperative model the renewable energy assets are more anchored in the community. The local community can enjoy the benefits (economic, environmental, social) created by the activities of the cooperative.* • *Also, by informing the community/neighborhood and communicating (through e.g. website, social media, folders, posters, news articles) about the benefits of their projects, Beauvent creates local support and acceptance.* • *The city of Oostende has adopted an energy and climate action plan in which the PV installations and heating network of Beauvent are key measures to increase local RE production and reduce the CO2 emissions.*
Provision of additional environmental benefits	• *Beauvent produces green electricity from its own installations, thus contributing to the reduction of the CO_2 emissions.* • *Cooperants of Beauvent can make use of the electric car sharing services offered by Partago and Coopstroom. By sharing EV the impact on the environment is reduced.* • *Beauvent only owns cars on alternative fuels (CNG, plug-in hybrid and electric). Their office is equipped with a solar installation and connected to a heat network. They have an office on a low-energy boat.*
… economic benefits	• *If there is profit, a dividend goes to the members of Beauvent (legal maximum is 6%).* • *Members can have the green electricity produced by Beauvent supplied to their homes via an agreement with Ecopower (a cooperative), at a competitive, if not lower price than the commercial energy suppliers are offering.*
… social community/ societal benefits	• *Beauvent distributes 1/40th of the annual net profit (after deduction of dividends) to charityThe projects that received support are a mix of projects in Flanders and the South, often energy related. Following projects received 4.000 euros in 2020: Ino Feliz (cares for children in Santa Cruz, Bolivia), Pirle weed (organises holidays for people in poverty) and Balunda ba Mikalayi (restoration of hydropower plant in Mikalayi, Congo).* • *Repetitive, administrative tasks are performed by persons with autism.*
Drivers and success factors	• *All citizens are eligible to join the energy cooperative. After purchasing a cooperative share and becoming a co-owner of the local RES production installation(s), the members share in the profits and are given the opportunity to buy goods and services provided by the energy cooperative at a fair price.* • *The members actively participate in the energy cooperative and are part of the decision-making process through the General Assembly.* • *Broad range of activities (PV, wind, CHP, district heating network) across Belgium.* • *Partnerships with other renewable energy cooperatives.* • *Beauvent has got a highly motivated team which goes the extra mile.*
Innovativeness	• *Beauvent is one of the oldest and largest renewable energy cooperatives in Flanders. Together with Ecopower, they set up a system in which the green electricity that Beauvent produces is sold to Ecopower, who supplies the electricity to the members of Beauvent. Today, this system is used by all the renewable energy cooperatives in Flanders.* • *Broad range of activities (PV, wind, CHP, district heating network) across Belgium.* • *Beauvent invests in a district heating network in the city of Oostende with a clear vision on a city-wide rollout of district heating, meanwhile fulfilling the Covenant of Mayors' targets (-40% CO_2 reduction by 2030) for the city.* • *Beauvent has some co-investments in solar installations on industrial sites.* • *Partnerships with other renewable energy cooperatives.*
References	*Jaarverslag 2020; https://www.beauvent.be/; https://www.mo.be/wereldblog/van-windmolens-de-westhoek-tot-warmtenet-oostende; https://www.rescoop.eu/policy#transposition-tracker*
Stakeholders interviewed	*Bram Pauwels (Beauvent)*

c. Zuidtrant (Belgium)

Authors	*Kelsey van Maris & Erika Meynaerts: VITO*
Date	*25/10/2021*
Name of REC	*ZuidtrAnt*
Country	*Belgium, Flanders*
Type of region	*Model region (Province of Antwerp) - Zuidtrant carries out projects in the cities and municipalities in and around the southern region of Antwerp.*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The legal term "renewable energy community" defined in RED II has been formally introduced into Flemish law (the Energy decree). The Energy Decree frames "energy communities" as a single concept, with CECs and RECs representing slightly different notions of this concept. Criteria of the EU definition are reflected in the national definition, nothing more, nothing less. Most principles contained in the EU criteria are not elaborated in detail. Furthermore, participation is limited to members that do not participate in energy communities as a primary professional activity. The legal entity allowed is not defined.* • *A renewable energy cooperative is a legal entity with an open and voluntary participation of its members.* • *A renewable energy cooperative has no profit motive that subordinates its main purpose. The main purpose is to provide environmental, economic and social benefits for its members and the environment in which it operates.* • *The renewable energy community's activities of energy production, self-consumption, energy sales and energy sharing shall only relate to energy from renewable energy sources.* • *The partners or members of the renewable energy community are natural persons, local authorities or small and medium-sized enterprises whose participation in the energy community does not constitute the main commercial or professional activity and who are located in proximity to the renewable energy projects of the renewable energy community.* • *The partners or members, in their capacity as customers, are each connected to an electricity network, a heat or cold network.* • *The partners or members have control over the activities of the renewable energy community.* • *The renewable energy community is autonomous with respect to its individual members and associates or other market participants who participate in it through other means, such as investment.* • *A renewable energy community shall limit participation on the basis of technical or geographical proximity, taking into account the function of the objectives or activities that the renewable energy community intends to achieve.* • *A renewable energy community shall own the property rights to the assets it uses to carry out its activities.* *Although, registration of REC's has not started yet and the Flemish regulator of the energy and gas market did not notify the legal entities that comply with the definition of a REC yet, it is to be expected that all renewable energy cooperatives that are member of REScoop Flanders (Flemish federation of Renewable Energy Cooperatives) comply with the definition in the Energy decree given the objective and scope of their activities as well as their commitment to the ICA principles, outlined by the International Cooperative Alliance.*
Foundation	*Zuidtrant was founded in 2016, after a series of local events in the neighboring cities and municipalities of Antwerp had brought together a group of engaged citizens that wanted to make a change. In November 2016 the first call for social capital was launched and mid-June 2017, the first renewable energy project was a fact with a PV installation of 13,8 kWp in the Art Centre and Music Theatre FENIKS-WALPURGIS.*

Driving forces	*Engaged citizens from local "transition groups", i.e., repair cafés, climate events, information evenings on energy, etc. were at the origin of Zuidtrant.The main driving forces for the growth of Zuidtrant are the possibility to participate in public tenders and European research projects and the well-established cooperation and partnerships with other renewable energy cooperatives and local authorities. Following milestones were important in the further development of Zuidtrant:* ○ *End of 2017, the consortium of Zuidtrant and 5 other renewable energy cooperatives was awarded a public tender for installation of solar panels at Catholic schools in Flanders (Klimaatscholen 2050).* ○ *In 2018, two Interreg projects were kicked off which enabled Zuidtrant to gain expertise with regard to solar energy and energetic renovation (RHEDCOOP) and solar energy and car sharing (Deeldezon). Mid-2018, Zuidtrant organized its first General Assembly.* ○ *In 2019, a new cooperative was established Zuidtrant-W for the realization of the first cooperative heating network in Flanders. Zuidtrant-W works closely together with the energy cooperative Ecopower for the realisation of this heating network.* ○ *In 2020, a consortium of Zuidtrant and other renewable energy cooperatives in Flanders was awarded a framework contract of the Flemish Energy Company for the installation of solar panels with citizen participation on the roofs of public buildings. Also, Zuidtrant entered into a contract with Ecopower, a cooperative energy supplier, to purchase the non-consumed electricity from the PV projects and make it available for the cooperants of Zuidtrant at a fair price.* ○ *In 2021, two research projects were kicked off: "H2 coop storage", that investigates the possibility of a renewable energy community with storage in stationary batteries and hydrogen, and "Stalins in the sun", that assesses the possibilities to share renewable energy among neighbours.*
Organisational structure/ ownership model	*The organisational structure is a cooperative company with limited liability and a social purpose (cvba so in Dutch). Zuidtrant is committed to the 7 ICA-principles, outlined by the International Cooperative Alliance, in the way they organize, manage, and develop their cooperative:* *1. Voluntary and open membership* *2. Democratic control by the members* *3. Economic participation by members* *4. Autonomy and independence* *5. Education, training and information* *6. Cooperation between cooperatives* *7. Attention to the community* *There is only one category of members. Every member has one vote in the General Assembly, irrespective of the number of shares they own (there is a maximum of 50 shares per member). Shares are worth 100 euro. In October 2021 (last available information) there were 626 members (including the founders).* *The activities of Zuidtrant are mainly volunteer-based, Zuidtrant's staff consists of 3 part-time employees.*
Attributions of roles and functions in decision making	*ZuidtrAnt is organised by two bodies: the Board of Directors and the General Assembly.* • *General Assembly of all members (GA): assembles at least once a year on the topic of the general policy of the cooperation and all other matters that are relevant to the cooperation. Every member has one vote in the General Assembly, irrespective of the amount of shares the member owns. Additionally, the GA also elects the Board members and approves the accounts and the destination of profits. It hence also decides to which (social) project part of the profits are invested in (this is the "SO" part, the social purpose* • *Board of Directors: this consists of at least three persons, elected among the members at the GA, and mandated for 4 years. It has the most extended competences to do what is needed or what is deemed useful to attain the goal of ZuidtrAnt. The Board appoints a chairman and a vice-chairman and assembles at least four times a year. Decisions are taken by consensus, if however no consensus can be reached, they will be taken by normal majority. The Board can decide to*

	delegate the day-to-day management to one or more persons (member of the Board or not).
Geographical scope	*ZuidtrAnt is active at the local level, they carry out projects in the cities and municipalities in and around the southern region of Antwerp (e.g. Aartselaar, Berchem, Boechout, Borsbeek, Edegem, Hove, Kontich, Lint, Mortsel, Ranst, Wijnegem, Wilrijk, …).*
Activities in the energy system	• *Renewable electricity production (most important)* • *District heating network (through separate cooperative ZuidtrAnt-W)* • *Combining PV and shared mobility (EV)* • *Workshops on energy and climate in schools* • *Renovation & renewable energy services* • *Research and development through participation in EU funded research projects, Interreg projects, … (on storage, H2, …)*
Energy technologies	• *PV (most important): 375,8 kWp (13/05/2020)* • *Electric vehicles (through partner - Partago)* • *District heating network (waste heat) (through separate cooperative ZuidtrAnt-W)* • *Storage and H2 (research project)*
Key actors and stakeholders involved	*Zuidtrant was founded by a group of engaged citizens. Currently, citizens are still the key actors and stakeholders of the cooperative. Partnerships with (local) governments that value citizen participation and with other (neighbouring) renewable energy cooperatives play an important role in the development of Zuidtrant as through these partnerships the activities of the cooperative are promoted, supported and reinforced.*
Scope of participants	• *The main beneficiaries are households.* • *In October 2021 (last available information) there were 626 members (including the founders), of which 80% lives in Antwerp or the surrounding areas.* • *Zuidtrant also carries out projects in close cooperation with municipalities. For example, they support municipalities to implement actions in the framework of their energy & climate action plans and increase the percentage of renewable energy production on their territory. Zuidtrant provides them with cheap renewable energy for their own use (e.g. solar roofs on public buildings). Companies and SMEs can also benefit from this service.*
Key motivations	• *The key motivation for the establishment of Zuidtrant was the drive of engaged citizens that were already involved in several "transition groups" (i.e. repair cafés, climate events, information evenings, etc.) to act and play an active role in the transition from a fossil-based to a low-carbon society.* • *In the cooperative model, profits generated from operations are distributed to the local citizens and therefore benefiting the community. Additionally, through this cooperative model the renewable energy assets are more anchored in the community than through classic public or private ownership models.*
Public leadership	*Public actors do not take up a leading role in Zuidtrant, it is a bottom-up initiative. Nevertheless, Zuidtrant has several ad hoc partnerships with local authorities:* • *ZuidtrAnt asks local authorities to promote the cooperative and the project that is realised in their municipality e.g. in local papers or information magazines.* • *If ZuidtrAnt concludes a contract for a solar roof on a public building, it also contains a number of specifications concerning communication. As such, they have more than the basic cooperation from the local authorities.* • *Governments play an important role in the establishment and growth of ZuidtrAnt as they are the owner of public buildings (e.g. swimming pools, sport & community centers, schools, library) which offer an investment opportunity to Zuidtrant (e.g. solar roofs), but they also provide funding and subsidies that enables ZuidtrAnt to do research and offer energy efficiency and renewable energy services.* • *Local authorities are also important partners in research projects e.g. RHEDCOOP.*

Inclusiveness	• *ZuidtrAnt has open and voluntary membership, meaning that all citizens, including vulnerable groups, can become a member of the cooperative. In October 2021 (last available information) there were 626 members (including the founders). The majority of the members are between 40 and 70 years old (3 age groups together 69% of the total, with for every age group a share of 20% or more). There is no information on gender balance of the members.* • *The price of a share is kept low (100 euros) so also low-income households can participate.* • *The social and inclusive aspect is very explicit in Zuidtrant, as the legal form they have – a cvba-so – implies that (at least 15% of) the profits will be used for a social purpose. As 2020 was the first year with a profit, the REC ensured their social purpose in the previous years by their inclusive operation. In this way, everyone can benefit from the renewable energy produced by Zuidtrant, regardless of whether they are cooperants or not.* • *Zuidtrant works together with social welfare offices and social housing companies and they participate in projects which have a social aspect or focus. Examples are: the organisation of repair cafés, the model renovation of a house together with the social welfare office in Mortsel, a renovation coaching process for vulnerable house owners with the social welfare office of Kontich, making a financial contribution to a citizens initiative that aims at enhancing energy efficiency in rented dwellings, and the participation in the research project RHEDCOOP, which is testing a model for increasing the sustainability of and installing renewable energy in family homes and social housing.*
Institutional support and financial support	*ZuidtrAnt collaborates with local authorities, though there is no established infrastructure of assistance and institutional support. ZuidtrAnt is mainly funded by its members & bank loans (district heating network through ZuidtrAnt-W) and the following revenue streams:* • *investment in PV (on roofs of public buildings) and rent out afterwards* • *sale of electricity to Ecopower* • *sale of surplus green power certificates to other suppliers* • *margin on near-zero energy renovation advice by third party* • *margin on workshops for schools* • *grants for participating in EU funded projects e.g. Horizon 2020, Interreg*
Community support and acceptance	• *The cooperative model contributes to positive attitudes, public support and social acceptance. Through this cooperative model the renewable energy assets are more anchored in the community. The local community can enjoy the benefits (economic, environmental, social) created by the activities of the cooperative.* • *Also, by informing the community/neighborhood and communicating (through e.g. website, social media, folders, posters, news articles) about the benefits of their projects, Zuidtrant creates local support and acceptance.*
Provision of additional environmental benefits	• *Zuidtrant produces green energy from its own installations, thus contributing to the reduction of the CO_2 emissions.* • *In the project 'Deeldezon' ("Share the sun"), the REC provides the electricity from its PV-installations in certain locations directly to the smart charging infrastructure, electric vehicles (car sharing) and e-cargo bikes (bike sharing) of its project partners. Hereby, the REC contributes to environmental benefits in the realm of mobility: lowering emissions because of a fuel switch to electric vehicles, facilitating a modal shift by replacing cars with bikes, creating small mobility hubs, and also focusing on shared economy by car and bike sharing.* • *The focus on energy efficiency projects in schools and residential buildings also contributes to raising awareness and the lowering of CO_2-emissions.*
… economic benefits	• *Members can have the green electricity produced by ZuidtrAnt's solar roofs supplied to their homes via an agreement with Ecopower, at a competitive, if not lower price than the commercial energy suppliers are offering.* • *If there is profit, a dividend goes to the members (legal maximum is 6%). 2020 was the first year with a profit and ZuidtrAnt could give a dividend of 3%.* • *In terms of the employment effects, Zuidtrant has 3 part-time employees.*

	• *During their first years of operation the cooperants of Zuidtrant made use of the Tax shelter from Flanders Innovation and Entrepreneurship. Through this measure, private persons are eligible for a tax deduction of 30 to 45% in case they buy shares in a starting company or via a crowdfunding platform.*
… social community/ societal benefits	• *There are several examples of societal benefits generated as a result of the activities of Zuidtrant: one is the sharing of electricity generated from PV with the neighbourhood. Another example is the project of the car and bike sharing, bringing people together that would otherwise not have interacted but now are making use of the mobility hub that was created at, for example, the local library. Also, the repair cafés are a good example in this case, providing an opportunity for people from different backgrounds to meet.* • *ZuidtrAnt actively cooperates with Public Welfare Centers, social housing companies and other non-profit organisations that work with people in need.* • *As ZuidtrAnt is a cooperative with an explicit social purpose, part of the profits (at least 15%) is used for a social purpose. In 2020, ZuidtrAnt supported 21 projects on energy, climate and poverty, which were suggested by its cooperants and Board members.*
Drivers and success factors	• *All citizens are eligible to join the energy cooperative. After purchasing a cooperative share and becoming a co-owner of the local RES production installation(s), the members share in the profits and are given the opportunity to buy goods and services provided by the energy cooperative at a fair price.* • *The members actively participate in the energy cooperative and are part of the decision-making process through the General Assembly.* • *Broad range of activities contributing to the energy transition, supported by the non-profit organisation which organizes community activities and does research with a broader scope on sustainability.* • *They limit their geographical expansion or try to set up a partnership with the locally anchored energy cooperatives to maintain their local identity and keep the connection with the citizens and the local context.* • *Close cooperation with local governments that value citizen participation.* • *Sharing knowledge and skills with other energy cooperatives to reinforce each other.*
Innovativeness	• *Broad range of activities: energy production (PV on roofs of public buildings, district heating network), near-zero energy renovation advice, workshops for schools on energy and climate, shared electric mobility.* • *Research projects to explore new business models and contribute to the energy transition at large, e.g. storage and H2.* • *Partnerships with other renewable energy cooperatives, local municipalities & knowledge/research institutes* • *The cooperative also has a non-profit organisation that organises awareness raising activities such as repair cafés, information sessions on climate change & participates in research projects on climate, energy and circular economy*
References	*https://www.zuidtrant.be/* *presentation of General Assembly (13/05/2020)* *press article "Energiecoöperatie ZuidtrAnt steunt 21 lokale initiatieven rond energie – klimaat en armoede voor 11.700 EUR met de winst uit haar energieprojecten!" (2020)* *https://www.vlaio.be/nl/subsidies-financiering/subsidiedatabank/tax-shelter-voor-startende-ondernemingen* *https://www.rescoop.eu/policy#transposition-tracker*
Stakeholders interviewed	*Sophie Loots & Liesbet Veulemans (Zuidtrant)*

d. Community wind farm Neuenkirchen (Germany)

Authors	*Michael Krug, Ana María Isidoro Losada & Maria Rosaria di Nucci – Freie Univesitat Berlin*
Date	*12.October 2021*
Name of REC	*Community wind farm Neuenkirchen*
Country	*Germany / Schleswig Holstein*
Type of region	*Model region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The legal term "renewable energy community" defined in RED II has not yet been formally introduced into German law and accordingly no eligible legal forms have been defined.* *It is difficult to predict whether there will be any changes to the legal form of the community wind farm in Neuenkirchen in the future.* *The extent to which Bürgerwindpark Neuenkirchen or the company would currently meet the criteria of a REC defined in RED II, in particular the requirement that the main purpose of the community should be "to provide environmental, economic or social benefits to its shareholders or members or to the local areas in which it operates, and not merely to make financial profits" (RED II, Article 2,16c) cannot be answered with certainty.*
Foundation	*2013 foundation of the operating company Bürgerwindpark Neuenkirchen UG (haftungsbeschränkt) & Co. Kommanditgesellschaft (KG).* *2015 commissioning of the community wind farm with 12 wind turbines and a total installed capacity of 26 MW.* *The civic non-profit association was established in 2016.*
Driving forces	*The wind farm was initiated by local investors (mostly farmers and landowners).* *After initial resistance under the previous mayor, a change began with new municipal election. Subsequently, the new mayor of the municipality became one of the key facilitators of the acceptance measures in Neuenkirchen.* *In 2011, after previous initiatives and referendums had failed, the mayor and local council initiated a second referendum about the designation of four suitability areas for wind energy in the community, which was successful.* *Three of the four proposed suitability areas were considered in the regional plan that came into force in 2012. This, among other things, provides the framework for strategic planning and land use as well as for planning for future needs for infrastructure, housing, jobs and a healthy environment.*
Organisational structure/ ownership model	*The legal form is a so called limited partnership with a modified private limited liability company as general partner (UG & Co. Kommanditgesellschaft). Although the wind farm can be regarded as a community wind farm in the broader sense, the majority of the shares is held by land owners and founding shareholders. Two initiating land owners act as the managing directors of the company Bürgerwindpark Neuenkirchen UG (haftungsbeschränkt) & Co. KG. Furthermore, they provide debt capital (210,000 EUR) to the company.* *Six further founding partners are involved as limited partners.* *Local citizens and landowners registered in Neuenkirchen had the opportunity to purchase shares and participate directly as limited partners.* *The maximum deposit per investor was set at 150,000 EUR.* *The acquisition of further limited partner's shares at a later point in time is not excluded by this. The contribution of a shareholder may not exceed a total of 25.00% of the voting rights.*

	Although the wind farm is a citizens' wind farm in the broader sense, the majority of shares are held by landowners and founding shareholders.
Attributions of roles and functions in decision making	*The role of the managing directors of the company Bürgerwindpark Neuenkirchen UG (haftungsbeschränkt) & Co. KG is attributed to two of the landowners that initiated the venture.* *Six further founding partners are involved as limited partners.* *The majority of the shares is held by land owners and founding shareholders.*
Geographical scope	*Neuenkirchen is a municipality with approximately 1,100 inhabitants, located in the western part of the Dithmarschen district in Schleswig-Holstein, near the North Sea coast.* *The geographical scope of the community wind farm corresponds to the municipal level.*
Activities in the energy system	*The main activity of the wind farm is the production of electric power.*
Energy technologies	*The fundamental energy technology is wind power. It is a park with 12 turbines and a total installed capacity of 26 MW.*
Key actors and stakeholders involved	*Apart from the crucial role of the mayor in gaining community members' support for a community wind farm, the key initiators and investors were mostly farmers and landowners.* *In addition, key stakeholders included the following* • *Municipal council;* • *Company operating the community wind park (Bürgerwindpark Neuenkirchen UG (haftungsbeschränkt) & Co. KG);* • *Planner/developer (IMS Ingenieurbüro Michael Schmidt, WES Energy GmbH).* *In the meanwhile, the civic non-profit association (Bürgerverein Neuenkirchen e.V.) has also become an important actor.*
Scope of participants	*By July 22, 2014, a total of 145 citizens had registered as limited partners ("Kommanditisten") in the operating company.* *The spectrum of actors involved also comprises:* • *Regional banks;* • *Permitting authority;* • *Federal Grid Agency;* • *Local construction companies;* • *Distribution System Operator (Schleswig-Holstein Netz AG);* • *Wind turbine manufacturers and service companies: (Senvion), Enercon GmbH, Siemens-Gamesa GmbH;* • *Direct electricity marketing company ARGE-Netz GmbH & Co. KG;* • *Infrastruktur- und Erlöspool Tödienwisch GbR;* • *Kabelgesellschaft Neuenkirchen-Stelle-Wittenwurth UG (haftungsbeschränk) & Co. KG;* • *Bundesverband Windenergie;* • *Insurance companies.*
Key motivations	*The main driver for founding the wind farm was to avoid the involvement of and dependency on external investors for energy production.* *Another incentive was the prospect of income diversification and additional profit generation from agricultural areas.*
Public leadership	*The public leadership was taken by the mayor of the municipality who acted as the key facilitator in gaining the community members' successful support for a community wind farm. He played a pro-active role and reached a balance between the interests of the investors and those of the community.*

	In 2011, after previous initiatives and referendums had failed, the mayor and municipal council initiated a second referendum about the designation of four suitability areas for wind energy in the community, which was successful. *The mayor facilitated the development of informal participation formats (information events on the wind farm and regarding the financial participation options). He also assisted in the direct (as a shareholder) and indirect (via the civic' association) financial participation of the citizens resp. the community.*
Inclusiveness	*In order to avoid conflicts among land owners, the investors decided to develop a "land lease pooling model" (Flächenpoolmodell) which allows those land owners whose property was not envisaged for turbine installations to benefit from land lease payments.* *Citizens had also the opportunity to obtain shares and participate directly as partners with limited liability. In order to enable a large number of citizens to participate financially, it was possible to buy shares from 500 EUR.* *The municipality also obtained shares amounting to 20,000 EUR (maximum amount which was legally allowed).* *Lower-income households benefit, at least indirectly, from the civic association and trade tax revenues.*
Institutional support and financial support	*The community wind farm initiative in Neuenkirchen counted on the support of the mayor and the municipal council, which was particularly proactive, especially in organising various participation and information formats in the municipality, thus making a decisive contribution to the acceptability of the project.* *The municipality participated financially in the project to show its commitment and the trustworthiness of the initiators.* *However, no further financial or institutional support was provided beyond this.*
Community support and acceptance	*One of the factors that ensured community support and acceptance was that the whole community benefited from the wind farm, not just the landowners and founding shareholders.* *The promotion of the civic association was also particularly well received and led to positive attitudes towards wind energy and the venture.*
Provision of additional environmental benefits	*Compensation measures in renaturation, but no distinctive, additional environmental benefits are noted.*
… economic benefits	• *Direct financial participation of citizens with small shares;* • *Pool model for land owners;* • *Benefit sharing via a non-profit civic association to support social community projects;* • *Involvement of local businesses and regional banks;* • *Local value creation and job generation.* *In 2020, the company's profit after tax was EUR 4.99 million, which corresponds to a profit margin of 45.7 %.* *To avoid conflicts among landowners, the investors decided to develop a pool model that allowed also those landowners in the surroundings of the wind farm whose land was not directly earmarked for the construction of wind turbines to benefit from the lease payments.* *The land owners receive a financial compensation for the use of their land amounting to 5% of the annual remuneration for the electricity fed into the grid. This amount is distributed among the landowners according to a specific allocation formula: 20% are allocated to the land owners on whose land the turbines are installed, 70% are distributed among all land owners in the suitable zone, and 10% to the owners of land used for road transport and other infrastructure measures.* *Business tax payments of the community wind farm amounted to 600,000 EUR in 2019 and 623,000 EUR in 2020.*

	In Germany, however, the municipal fiscal equalisation scheme (kommunaler Finanzausgleich) allows that only part of the tax revenue remains in the municipality of Neuenkirchen.
… social community/ societal benefits	*The mayor reached an agreement with the initiators of the wind farm to establish a non-profit citizens' association (Bürgerverein Neuenkirchen e.V., founded in 2016), which receives 1% of the annual revenues as donations and which supports social and cultural projects in the community.* *The association also receives donations from other local organizations.* *The mayority of the association's revenue goes to community organisations, associations and social services (e.g. purchase of a citizens' bus, IT equipment for the school, construction of a multifunctional room for the community, church renovation, etc.).*
Drivers and success factors	*The main driver for founding the wind farm was to avoid the involvement of and dependency on external investors for energy production.* *One of the success factors was to ensure that the whole community benefits from the wind farm, not just the landowners and founding shareholders.*
Innovativeness	*The targeted promotion of civic associations or charitable (non-profit) foundations can serve as an incentive for the establishment of a community wind park, especially where direct financial participation by citizens/rural communities is difficult, e.g. due to financial constraints.* *Despite the local significance of the civic association (social innovativeness) and the positive local acceptance, the degree of innovation is to be assessed as moderate.*
References	• *Bürgerwindpark Neuenkirchen UG (haftungsbeschränkt) & Co. KG Neuenkirchen (2021): Jahresabschluss zum Geschäftsjahr vom 01.01.2020 bis zum 31.12.2020 (www.bundesanzeiger.de)* • *http://www.lvif.gov.lv/uploaded_files/sadarbiba/WinWind/TW2_10_okt/2_M.Krug_WinWind%20Transferworkshop%20Riga_Neuenkirchen_10102019.pdf* • *https://winwind-project.eu/fileadmin/user_upload/Resources/Posters/WinWind-case-study-poster_SchleswigHolstein.pdf* • *http://www.buergerwindpark-neuenkirchen.de/projekt/infos/* • *https://www.amt-heider-umland.de/gemeinden/neuenkirchen.html*
Stakeholders interviewed	

e. Wind farm Uthleben (Germany)

Authors	*Ana María Isidoro Losada, Michael Krug, Maria Rosaria di Nucci – Freie Universitat Berlin*
Date	*Draft version 29 October 2021, amended version 19 November 2021*
Name of REC	*Wind Farm Uthleben (Windpark Uthleben)*
Country	*Germany / Thuringia*
Type of region	*Target region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The legal term "renewable energy community" (REC) defined in RED II has not yet been formally introduced into German law and accordingly no eligible legal forms have been defined. However, it does not appear likely that the wind farm would currently fully meet the criteria of a REC as defined in RED II. This refers in particular to Article 2,16c, RED II. The generation of profits and the provision of annual disbursements to the shareholders are certainly key objectives of the operating company and very likely its main purpose. But this issue may be contested and there is no fully clear answer to this question.* *According to RED II, a REC should be an "autonomous" legal entity which means that no single shareholder should dominate the entity. Currently, the majority of the shares is held by the municipal utility company Stadtwerke Nordhausen – Holding für Versorgung und Verkehr (HVV) GmbH (51%). Hence, the principle of autonomy cannot be considered as fulfilled.* *Another open issue is the question whether the municipal utility Stadtwerke Nordhausen can be regarded as a "local authority". Taking into account that the municipal utility company is fully owned (100%) by the municipality of Nordhausen, this criterion could be regarded as fulfilled. The proximity criterion also appears to be less problematic: The RED II requires that the legal entity is effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity. Considering that Stadtwerke Nordhausen which already holds 51% of the shares and at least three of the five energy cooperatives are located in the vicinity of the wind farm, this principle can be considered as fulfilled. If one takes into account the compliance defaults as outlined above, the operating company could qualify rather as a CEC pursuant to the Internal Electricity Market Directive than a REC.*
Foundation	*The establishment of the wind farm „Windpark Uthleben Gesellschaft mit beschränkter Haftung [GmbH] & Co. Kommanditgesellschaft [KG]" took place on November 21, 2011.* *Uthleben wind farm started operation in 2016 (nominal power 6 MW).* *In May 2018, the project developer Energiequelle GmbH (Energiequelle) sold the Uthleben wind farm to the municipal utility company Stadtwerke Nordhausen. This was subject to the condition that Stadtwerke Nordhausen sells 49% of the shares to Thuringian citizens' energy cooperatives in the following three years, i.e. by 2021. After all, this wind farm project was planned as a citizens' participation project from the very beginning. As of 2021, six citizens' energy cooperatives are involved as shareholders (limited partners).* *The total cost of the takeover by Stadtwerke Nordhausen was 12.6 million euros, a large part of which was contributed by Deutsche Kreditbank (DKB). The municipal utility invested 2.7 million euros, and the cooperatives can participate in this contribution with up to 49%.*
Driving forces	*The wind farm project was initiated by the project developer Energiequelle with headquarters in Zossen/Kallinchen in the federal state of Brandenburg close to Berlin.* *The commissioning of the first turbine occurred in 2016. To mark its 20th anniversary, the project developer erected a second wind turbine in 2017, which was to be partly owned by the company's employees (200 employees). With a minimum investment of 2,500 euros, all employees who wanted to become investors could join the wind farm operating company.* *Energiequelle initiated the partnership between the municipal utility company Stadtwerke Nordhausen and various energy cooperatives. The Energy Agency of the State of*

	Thuringia (Thüringer Energie- und GreenTech- Agentur GmbH - ThEGA) supports the municipalities and cooperatives in preparing the shares to be subscribed.
Organisational structure/ ownership model	*The legal form of the wind farm operating company is a GmbH & Co. KG, i.e. a hybrid of a limited partnership and a limited liability company. In this partnership, a limited liability company (GmbH) has the role of the general partner (Komplementär), whereas citizens, enterprises and other shareholders are usually involved as limited partners (Kommanditisten). In contrast to the general partner, the limited partners are not personally liable. The general partner in the hybrid company is represented by Stadtwerke Nordhausen - Managementgesellschaft für Erneuerbare Energien mbH (MEE), based in Nordhausen. Until recently, the sole limited partner was Stadtwerke Nordhausen - Holding für Versorgung und Verkehr GmbH (HVV).* *In 2018 Stadtwerke Nordhausen - HVV held 100% of the shares as a limited partner (Kommanditistin). The purchase agreement between Energiequelle and Stadtwerke Nordhausen envisaged that up to 49 % of the wind farm's limited partner shares should be sold to citizens' cooperatives within three years. By 26 October 2021, in total, five citizen energy cooperatives with 450 members were participating in the ownership of the two turbines, each with an output of 3 MW.* *Shares (Kommanditanteile) in Windpark Uthleben GmbH & Co. KG are currently held by Energiegenossenschaft Helmetal eG (7%), Energiegenossenschaft Harztor eG (5%), Erste Erfurter Energiegenossenschaft eG (17%), Solidarische Energiegenossenschaft Thüringen eG SOLide (1%), Meyer Vermögensverwaltung GbR (2%) and Energiegenossenschaft Ilmtal eG (14%). The municipality of Heringen/Helme and a farmer also hold limited partner shares and benefit financially from the wind farm.* *The bodies of the company comprise the partners' meeting and the management. The partners' meeting consists of the general partner and the limited partners.*
Attributions of roles and functions in decision making	*Since the acquisition of the wind farm on 1 May 2018 until mid-July 2021, the wind farm has been represented by Stadtwerke Nordhausen - MEE (general partner – personally liable partner), which is responsible for the management of the company and represented by the sole managing director. The management of the limited partner Stadtwerke Nordhausen - HVV was carried out by the sole managing director.* *Currently, the majority of the shares is held by Stadtwerke Nordhausen (51%).*
Geographical scope	*Uthleben is a local district of the rural municipality of Heringen/Helme located in the Nordhausen district in Thuringia and has 1,231 inhabitants. The geographical scope of the community wind farm corresponds to the municipal level.*
Activities in the energy system	*The main activity of the wind farm operating company is the production of electric power. The annual average electricity generation of the Uthleben wind farm is 14.65 MWh[4], and around 4.000 three-person households are supplied.*
Energy technologies	*The energy technology comprises wind turbines. The wind farm includes 2 turbines with a total installed capacity of 3 MW (type Enercon E115). The wind farm could still be expanded. The aforementioned actors are waiting for the new spatial development plan (Raumordnungsplan) to take effect in order to be able to start concrete planning.*
Key actors and stakeholders involved	*The project developer Energiequelle played a crucial role in this project as it initiated and developed the project.* *Additional key stakeholders include the following:* • *Stadtwerke Nordhausen;* • *The energy cooperatives Energiegenossenschaft Helmetal eG, Energiegenossenschaft Harztor eG, Erste Erfurter Energiegenossenschaft eG, Solidarische Energiegenossenschaft Thüringen eG SOLide and Energiegenossenschaft Ilmtal eG (for their individual shares in the operating company see above);* • *Meyer Vermögensverwaltung GbR (2%) (owns 14%)* • *City/Municipality of Nordhausen (owner of Stadtwerke Nordhausen)* • *City of Heringen (owns 3% of the operating company)*

[4] See footnote 1

	• *Thuringian Energy and GreenTech Agency (ThEGA)*
Scope of participants	*In addition to Stadtwerke Nordhausen, six citizen energy cooperatives with a total of approx. 450 citizens, the municipality of Heringen, and a farmer had registered as limited partners ("Kommanditisten").*
Key motivations	*The main motivation for Energiequelle to establish the wind farm was to promote renewable energy projects in Thuringia. One of the companies' basic principles is that citizens must be made aware of and involved in the energy transition, so that Energiequelle always includes citizen participation in its projects. Another motivation was the prospect of profit generation.*
Public leadership	*The wind farm in Uthleben is based on an intense cooperation between the project developer, the Nordhausen municipal utility company and the Thuringian energy cooperatives.* *In the discussion between the local district of Uthleben and Heringen about repowering of the wind farm in 2020, Heringen's mayor played a mediating role.*
Inclusiveness	*Energiequelle GmbH established in 2016 the Energiequelle GmbH Foundation. The main purpose of the foundation is to enable people to participate locally and thus support acceptance of renewable energy projects. The foundation's Management Board, together with local committees, decide how the funding is awarded and select the projects. Non-profit associations and institutions in the project regions of Energiequelle can in principle submit applications to the foundation.* *From 2021, energy cooperatives had the opportunity to obtain shares and participate directly as partners with limited liability.* *Lower-income households benefit, at least indirectly, from local business tax paid by the wind farm operating company to the municipality where the company is registered. Municipal majority ownership of the wind farm may also be seen - at least indirectly - as an enabler for a passive financial participation of citizens and local communities.*
Institutional support and financial support	*The wind farm operators benefit from financial incentives under the Renewable Energy Sources Act (feed in tariff/premium).* *Energiequelle initiated the partnership between the municipal utility company and various energy cooperatives.* *ThEGA supports the municipalities and cooperatives in preparing the shares to be subscribed.* *In recent years, the majority of wind farms in Thuringia have been realized by external project developers and the actual profits do not remain in the region. The municipalities where the wind farms are located, in turn, collect rent and business taxes. However, citizens often do not feel involved in the planning process. The Service Agency Wind Energy, established on behalf of ThEGA, has developed specific guidelines for project developers and introduced the voluntary label "Fair Wind Energy Thuringia". So far, more than 50 project developers and planners have been awarded the label and have committed themselves to implementing the guidelines and principles laid down in the guide. The guidelines aim to promote the participation of all affected parties and a transparent information policy.* *As holders of the label, companies in the wind energy sector can point to the credible implementation of co-determination and the strengthening of regional value creation - and benefit from the credibility of the label. Wind energy projects with label partners also proceed more conflict-free, as the participation of all stakeholders is ensured from the outset. Energiequelle is also one of the companies which have successfully applied for the label.*
Community support and acceptance	*No information available*
Provision of additional environmental benefits	*Compensation measures for the intrusion into landscape and nature in renaturation, but no distinctive, additional environmental benefits are noted.*

… economic benefits	*The Wind Farm Uthleben shows that good cooperation between the project developer, the municipal utility company and energy cooperatives can lead to local financial participation and thus to local value creation. For the cooperatives, the shares represent a good interest-bearing investment that yields returns in the mid-single-digit percentage range.* • *Direct financial participation of citizens' energy cooperatives; Indirect financial participation of the municipality of Nordhausen.* • *Direct financial participation of the municipality of Heringen/Helme.* • *Land lease payments to the landowners.* • *Business tax (Gewerbesteuer) payments.* • *Local value creation.* *In 2019, the company's (Windpark Uthleben GmbH & Co. KG) net profit was EUR 199,000. In 2020, the company's profit was EUR 44,000.* *The balance sheet total in 2020 was EUR 9,168,555 (2019: EUR 9,806,478). Business tax payments of the wind farm amounted to 40,000 EUR in 2020 (2019: 11,000 EUR). The business tax revenues accrue to the municipality where the wind farm operating company is registered (Heringen/Helme).* *Uthleben, a district of the rural municipality Heringen/Helme, was able to renovate its day-care centres and sports arena solely through the business tax revenues from the wind farms on its territory including the Uthleben wind farm.*
… social community/ societal benefits	*Business tax revenues and profits from the active, direct financial participation in the wind farm at least theoretically increase the possibilities of the municipality of Heringen/Helme for public spending including for social purposes. The same applies to the municipality of Nordhausen which is the sole owner of Stadtwerke. The Wind Farm Uthleben provides greater security of supply for the population, since in addition to the electricity produced by the city of Nordhausen in its own combined heat and power plants via EVN, the two wind turbines also secure the supply of electricity.*
Drivers and success factors	*One of the success factors was Energiequelle GmbH's precondition that Stadtwerke Nordhausen should sell 49% of its business shares to energy cooperatives after three years at the latest.*
Innovativeness	*The degree of innovation is to be assessed as medium.* *The cooperation of project developer, municipal utility and energy cooperatives is a special feature. The fact that a project developer ties the sale of a wind farm to the financial participation of energy cooperatives can also be considered innovative.*
References	*Mund, Thomas (2021): Der Windpark Uthleben. Eine erfolgreiche Bürgerbeteiligung. Presentation delivered to the COME RES German Country Desk Status Meeting, 30 September 2021, available from https://come-res.eu/resource?uid=1162* *Further weblinks:* • *http://www.energiegewinner-thueringen.de/energiegewinner/details-zu/offen-fuer-alle.html* • *http://www.buergerenergie-thueringen.de/neue-termine/349-5-thueringer-buerger-energie-tag* • *https://www.thueringer-allgemeine.de/regionen/nordhausen/stadtwerke-nordhausen-verkaufen-anteile-am-windpark-in-uthleben-id232489925.html* • *https://www.zfk.de/energie/strom/stadtwerke-nordhausen-schliessen-buergerenergieprojekt-ab* • *https://www.stadtwerke-nordhausen.de/detailansicht/news/neuigkeiten-von-der-veraeusserung-der-kommanditanteile-der-windpark-uthleben-gmbh-co-kg/?tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Baction%5D=detail&cHash=c9349839deb7dfb025ed363112f8ead7* • *https://www.thega.de/fileadmin/user_upload/Publikationen/thega_wertschoepfungsgipfel_04062019.pdf*

	• https://w3.windmesse.de/windenergie/pm/24811-energiequelle-mitarbeiter-thuringen • https://www.northdata.de/Windpark+Uthleben+GmbH+%26+Co.+KG,+Heringen%2FHelme/Amtsgericht+Jena+HRA+503027 • https://www.energiequelle.de/wp-content/uploads/2019/09/EQ_Thüringen_deutsch.pdf • https://www.thueringer-allgemeine.de/regionen/nordhausen/burgfrieden-statt-streit-id231150182 • https://www.nordhausen.de/news/news_lang.php?ArtNr=28336 • https://www.nordhausen.de/_daten/mm_objekte/2021/02/19569_0225_44739062.pdf • https://blog.thueringer-landstrom.de/newsleser/38.html • https://www.energiequelle.de/en/content/the-energiequelle-gmbh-foundation-breaks-the-500000-euro-funding-mark/ • https://www.lr-online.de/nachrichten/wirtschaft/energiewende-in-ostdeutschland-thueringens-umweltministerin-will-mehr-laenderkooperation-bei-gruenen-technologien-59690315.html
Stakeholders interviewed	*No interviews, but the case has been presented by Thomas Mund, managing director of Stadtwerke Nordhausen, as a good practice example at the COME RES German Country Desk Status Meeting on 30 September 2021 (see Mund 2021).*

f. Grenzland Pool (Germany)

Authors	*Michael Krug, Ana María Isidoro Losada, Maria Rosaria di Nucci – Freie Univeristat Berlin*
Date	*First draft of 2 November 2021, amended version of 19 November 2021*
Name of REC	*Pool of community wind and PV farms in Northern Friesland ("Grenzland-Pool")*
Country	*Germany / Schleswig Holstein*
Type of region	*Model region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The legal term "renewable energy community" (REC) defined in RED II has not been formally transposed into German law yet. The extent to which the different community wind farms (CWF) under scrutiny (with regard to the respective operating companies) would currently meet the criteria of a REC defined in RED II cannot be answered with certainty. This refers in particular to Article 2,16c, RED II. The generation of profits and the provision of annual disbursements to the shareholders are certainly key objectives of the company. However, the projects are not merely based on economic efficiency rationales, but pursue also social and environmental targets. It may be contested what constitutes the main purpose of those companies. Nevertheless, the CWF appear highly beneficial in terms of local sustainable development. Compliance with other criteria of RECs specified by RED II including membership, effective control/proximity or autonomy seems to be less problematic.*
Foundation	*This portrait covers a "pool" of five CWF in Northern Friesland in the federal state of Schleswig-Holstein which share in almost all five cases the same managing directors. In several cases, these managers were also the initiators. In others they supported the development of the CWF and were asked by the initiators to act as managing directors. At the same time, these persons can be regarded as pioneers in the field of citizen/community wind energy in Germany. They also share the corporate office.* *The five wind farms (including the year of commissioning) are:* • *Community wind farm Ellhöft (2000)* • *Cross-border community wind farm Grenzstrom-Vindtved (2007/2009)* • *Community wind farm Süderlügum (2014)* • *Community wind farm Brebek (2015 & 2017)* • *Community wind farm Grenzstrom Bürgerwind (2020)* *Each CWF is operated by an independent company that is 100 % owned and operated by local residents. The initiators have partly jointly, partly individually developed a number of related resp. follow up projects including the construction and operation of a substation, of ground-mounted community solar farms (one commissioned in 2010, one planned) and sector coupling projects including the production of hydrogen from wind based electricity (onsite and offsite). In the case of the CWF Ellhöft, the operating company Windpark Ellhöft GmbH & Co. KG was established in November 1995. The other four farms were established in 2005, 2007, 2009 and 2016 respectively.*
Driving forces	*In addition to tourism, wind energy and agriculture are among the leading economic sectors in Northern Friesland. The idea of a CWF in Ellhöft was borne by municipal councillors and local farmers in summer 1994. The other four wind farms were partly initiated by the same persons, partly by other local actors and investors (often farmers and landowners). The initiators/managers of the Ellhöft and Grenzstrom Vindtved supported the development of the CWF Süderlügum and Brebek and were invited to perform the management of those wind farms as well.*
Organisational structure/ ownership model	*Each CWF is being operated by an independent company under the legal form of a limited partnership with a private limited liability company as general partner (Gesellschaft mit beschränkter Haftung & Compagnie Kommanditgesellschaft, acronym: GmbH & Co. KG). This represents a hybrid form consisting of a private limited company (Gesellschaft mit beschränkter Haftung, GmbH) and a limited partnership (Kommanditgesellschaft, KG). It can be regarded a modification of a limited partnership in which the fully liable partner (called general partner) is not a natural person but a limited liability company with the intention of limiting the liability for the persons behind the company. The legal form allows for a broad participation. Under this model, citizens provide capital as limited partners (Kommanditisten) without being liable with their private assets. Local residents had the*

	opportunity to participate directly as limited partners. Voting rights increase proportionally with the number of shares. *The ownership models are quite similar in all five cases. In the case of Grenzstrom Vindtved, the initiators/founders are acting as managing directors of the wind farm. Together they do not hold more than 3% of the shares. No investor could purchase more than 5% of the shares in order to avoid that individual investors gain control or exerting influence over the company. All limited partners are participating on more or less equal terms. In the case of Grenzstrom Vindtved, which included a repowering project, the owners of those wind turbines which were dismantled were offered significantly higher shares reflecting the residual value of their dismantled assets. Initially, each limited partner was allowed to acquire maximum one business share (1 business share: EUR 26,000 = 26 voting shares). No one could subscribe more than 5% of the shares. The company belongs 100% to the citizens of the region. The profits of the company flow directly to locally anchored limited partners, none of whom has a determining influence on the company. There is no capital fund or institutional investor involved in the company.*
Attributions of roles and functions in decision making	*In all five cases, the legal form of the operating company is a GmbH & Co. KG, i.e. a hybrid of a limited liability company (GmbH) and a limited partnership (KG) (see above for more details). In practice, a GmbH & Co. KG is often organised in such a way that the management of the limited liability company also takes over the management of the limited partnership. It is appointed by the general meeting of the partnership. In contrast to the general partner, the limited partners are not personally liable with their private assets. However, in this specific model, the general partner is a limited liability company and not a natural person. Therefore, this model has the advantage that no natural person is fully liable with its private assets. The decision-making bodies comprise the partners' meeting and the management. The partners' meeting consists of the general partner and the limited partners. Voting rights increase proportionally with the number of shares.* *In the following, we illustrate the case of the CWF Grenzstrom Vindtved. The general partner is the limited liability company Grenzstrom Bürgerwind GmbH which is represented by the founders and managers of the wind farm, whereas the citizens and other actors like local SMEs act as limited partners. Important decisions are made jointly at partners' meetings. The work in the partnership is essentially based on the relationship of trust built up between the management and the limited partners. Since the managing directors live in the vicinity of the plants, there is a high level of social control. The management is usually appointed from among the investors, advised by a planning council and controlled by a supervisory board. All governance bodies are made up of limited partners of the company.*
Geographical scope	*The CWF are located in the municipalities of Ellhöft, Westre and the neighbouring villages. These villages are part of the district of Northern Friesland in Schleswig-Holstein, not far from the North Sea coast and very close to the Danish border.*
Activities in the energy system	*So far, the main activity of the CWF was the production of electric power and the sale of electricity based on a feed in tariff/premium. In most cases, the electricity is sold to a direct marketing company. This company sells the electricity to the regional energy supplier, Schleswig-Holstein Netz AG. In the case of the CWF Grenzstrom Vindtved, direct marketing companies have so far been Spanish Iberdrola, Norwegian Statkraft and Nordgröön, a regional company.* *<u>Community wind farm Ellhöft</u>* *Due to the expiration of the legally guaranteed remuneration (feed in tariff for 20 years), the operators looked for new possibilities to market the electricity from 2020 onwards. Being pioneers in this field, in 2018, they concluded the first Power Purchase Agreement (PPA) with the energy cooperative Greenpeace Energy eG, a green electricity and gas supplier (since September 2021: Green Planet Energy eG). The contract for the supply of wind power entered into force on 1 January 2021 and lasts five years. During this time, the operating company is going to sell its electricity to Green Planet Energy eG at a fixed price per kWh. The value can be adjusted during the term of the contract if the stock exchange prices rise above or fall below a certain threshold, with the wind farm operators and Greenpeace Energy sharing the risks and benefits. Part of the electricity generated is going to be fed via a direct connection cable to an electrolyser where green hydrogen is produced, stored and supplied to cars with fuel cells. E-cars with battery technology may also be charged at a fast charger (see details in the next section).*
Energy technologies	*Wind turbines of different capacities, sizes, manufacturers and types represent the key energy technology. In the case of the oldest of the five CWF, Ellhöft, 6 x 1.3 MW turbines (Bonus) were installed, in the case of the newest wind farm (Grenzstrom Bürgerwind), 5*

	x 3.2 MW turbines (Siemens Gamesa). Two existing AN Bonus turbines (1,3 MW) were replaced. Later, the management decided to change the type of one turbine and replaced it (1x SWT-DD-130 turbine with 4.3 MW instead of SWT-3.6-130 with 3.6 MW). *In the case of the wind farm Grenzstrom-Vindtved, 4 x 2.3 MW turbines and 3 x 6.2 MW turbines are in operation.At the community wind farm Süderlügum and the community wind farm Brebek, 12 x 3 MW turbines in each case are operated.* *<u>Cross-sector electricity use and hydrogen production - the case of the CWF Ellhöft</u>* *In the future, part of the electricity will be used in an electrolyser (PEM [proton exchange membrane] electrolyser from H-TEC – ME 100/350) that will be installed close to the wind farm. Commissioning is planned in November 2021.[5] With a nominal production rate of 100 kg of H_2 per day, a peak electric load of 350 kW, an overall efficiency of up to 95% using heat extraction, the electrolyser may be used on-site, directly at the wind turbine. The hydrogen produced will be used to supply a H_2 filling station at the municipality of Westre. Fuel cell vehicles will be able to fill up with hydrogen. In addition, it will be possible to use the 75 kW charging station for electric vehicles at this location.* *The founder and managing director of the CWF Ellhöft is co-founder and one of the managing directors of the company Energie des Nordens GmbH & Co. KG (EdN). In cooperation with Greenpeace eG, EdN is currently implementing a project for the cross-sector use of electricity from renewable energies, the power-to-gas project Windgas Haurup. This envisages, inter alia, the construction and operation of a electrolyser in the municipality of Handewitt near Flensburg developed and manufactured by H-TEC SYSTEMS. The annual production volume of 3 million kWh of H_2 is purchased by Green Planet Energy eG for its approximately 30,000 proWindgas customers. The electrolyser started regular operation in 2021 and uses surplus electricity from nearby wind turbines, also including the CWF Ellhöft. In addition, the fast-reacting electrolyser stabilises the electricity grid by keeping the electricity supply in balance with the electricity demand in the grid area by ramping up or down hydrogen production. EdN is both the project initiator of Windgas Haurup and the owner and operator of the electrolyser. The gas grid operators responsible for gas feed-in, Gasunie and Open Grid Europe, are also involved in the project implementation.* *Together with other partners, the management of the CWF in Ellhöft has developed further plans for a large-scale, integrated energy park based on renewable energy sources and hydrogen production and use. The project "Grenzland Energieprojekt" aims to develop a fully RES-based hydrogen value chain in the districts of Northern Friesland, Schleswig/Flensburg and the city of Flensburg. This includes H_2 production, refinement, storage and use in novel dimensions the centrepiece being the construction of the "Grenzland Energy Park".*

[5] Personal communication with Reinhard Christiansen, managing director of the community wind farm Ellhöft.

Key actors and stakeholders involved	• *State planning authority (responsibility for developing the regional plans designating wind energy suitable areas/priority zones) and district administrations (up to 2015 responsibility for the development of informal wind energy concepts and for proposals for the designation of wind energy suitable areas/priority zones)* • *Initiators of the farms (land owners, local citizens etc.)* • *Other landowners* • *Citizens in their role as limited partners/shareholders* • *Mayors, municipal councils in Ellhöft, Westre and neighbouring municipalities* • *Companies operating the community wind farms (including general partner)* • *Technical planners/developers* • *Promotional banks (e.g. KfW, Landesbank Baden-Württemberg)* • *Development Agency for Agribusiness and Rural Areas (Landwirtschaftliche Rentenbank) and local/regional banks (e.g. VR Bank Niebüll)* • *Federal Grid Agency* • *Local construction companies, service providers* • *Distribution System Operator (Schleswig-Holstein Netz AG)* • *Wind turbine manufacturers and service companies* • *Direct electricity marketing company ARGE-Netz GmbH & Co. KG* • *Greenpeace eG (today: Green Planet Energy eG) and Energie des Nordens GmbH & Co. KG (EdN, an association of around 80 companies in the regional renewable energy sector)* • *Insurance companies* • *Foundation B.E.N.T.U.S.S (Citizens-Energy-Nature-Tourism-Environment-School-Social) (see below).* • *Nature conservation association „Verein Naturengagement Bürgerwindparks Nordfriesland“ (NBN e.V.) (see below).* • *Gasunie, Open Grid Europe (hydrogen project Ellhöft)*
Scope of participants	*In total, 1,069 persons are participating financially as limited partners in the communities wind farms (Ellhöft (51), Grenzstrom-Vindtved (220), Süderlügum (400), Brebek (280), Grenzstrom Bürgerwind (260)). These represent almost 25% of the residents in the respective villages (Leithoff 2021).*
Key motivations	*In the case of the CWF Grenzstrom Vindtved the following motivations were relevant:* • *Create a profitable, clean energy investment.* • *Generation of stable business tax revenues for the local municipalities.* • *Bring economic power and added value back to the region and allow the communities a certain degree of independence and freedom of action again.* • *Avoid the involvement of and dependency on external investors for energy production.* • *Diversify income from agricultural areas.* *These motivations were guiding also the development of the other projects.*
Public leadership	*In all cases the municipalities (mayors, councils) played a key role as facilitators and supporters of the projects. As a rule, the municipalities are also financially participating in the wind farm projects. The municipalities participated financially in the project to show its commitment and the trustworthiness of the initiators.*
Inclusiveness	*In the following, we refer to the example of the wind farm Grenzstrom Vindtved:* *The local residents were timely informed and actively involved in the planning of the wind farm. A planning committee, an advisory and supervisory board have each been set up in which local citizens participate. In order to avoid conflicts among land owners, the initiators decided to develop a “land lease pool model” (Flächenpoolmodell) which allows also those landowners in the vicinity of a wind turbine whose property was not envisaged for turbine installations to benefit from land lease payments.* *Citizens had the opportunity to obtain shares and participate directly as partners with limited liability. In order to enable a large number of citizens to participate financially, it was possible to buy shares from 500 EUR. In the other cases, similar amounts were required (e.g. community wind farms Süderlügum and Brebek: 1,000 EUR).* *The project pursues also social and environmental targets. Therefore, the project has the acronym B.E.N.T.U.S.S (Citizens-Energy-Nature-Tourism-Environment-School-Social). Part of the revenues is used to support charitable and social projects.*

	Although the entrance thresholds in terms of minimum investment appear too high for low-income households, these and other vulnerable households benefit mainly indirectly from the trade tax revenues (Gewerbesteuer) paid by the wind farm operators to the local municipalities, and directly from in-kind benefits, donations or the disbursements of local foundations like the B.E.N.T.U.S.S foundation which receives parts of the revenues of the wind farm.
Institutional support and financial support	*The wind farm operators benefit from financial incentives under the Renewable Energy Sources Act (feed in tariffs/premiums). Financing was partly provided by the promotional bank KfW, the Development Agency for Agribusiness and Rural Areas and local/regional banks. In most cases, the councils of the affected municipalities (e.g. Ellhöft, Westre, Ladelund, Bramstedtlund, Karlum a.o.) have supported the projects by large majorities. The municipalities participate financially in the projects showing both their commitment and trustworthiness of the initiators.* *Part of the electricity generated at the CWF Ellhöft is going to be fed via a direct connection cable to an electrolyser where green hydrogen is produced, stored and supplied to cars with fuel cells. This on-site hydrogen project is supported by the Ministry of Transport under the National Innovation Programme Hydrogen and Fuel Cell Technology (https://enargus.de/). The project Windgas Haurup is supported by the Federal Ministry of Economy and Energy under the "North German Energy Transition 4.0" (NEW 4.0) programme (for more information see https://www.new4-9.de/). The project is also supported by the two state governments of Hamburg and Schleswig-Holstein with the ultimate goal to supply Hamburg and Schleswig-Holstein completely with renewable energies by 2035.*
Community support and acceptance	*The local municipalities participate financially, a fact that shows commitment and trustworthiness of the initiators/operators. None of the five projects faced any serious opposition from local citizen groups. One of the factors that ensured community support and acceptance from the very beginning was that the whole community could benefit from the projects, not just the landowners and founding shareholders. The community members were continuously informed and there is a relatively high level of identification with the projects among the local residents. However, a high level of community acceptance does not mean that there were no administrative barriers to overcome. In almost all cases planning of the community wind farms was accompanied by political, administrative, regulatory and planning obstacles which could be finally overcome.*
Provision of additional environmental benefits	*According to the Federal Nature Conservation Act, significant intrusions of nature and landscape that cannot be avoided must be compensated by compensatory or substitute measures. If such measures are not possible, monetary compensation is envisaged. Also the operators of wind farms have to compensate for intrusions of nature and landscape. The CWF Grenzstrom Vindtved provides a Good Practice case in terms of compensatory measures providing additional environmental benefits (see also https://ae-beispiele.fachagentur-windenergie.de/massnahmen/grenzstrom-vindtved-windpark-schleswig-holstein). To compensate for intrusions of the habitats of amphibians and meadow birds, the operators of the wind farm reached an agreement with the nature protection authority that payments to offset the negative impact on landscape should be spent for local nature protection measures in the community, e.g. through natural/extensive use of arable land. 22 ha of land were initially acquired in consultation with the lower nature conservation authority to be managed in a nature-oriented way. A non-profit nature conservation association (NBN e.V.) was founded by the managers of the wind farm for the maintenance and management of the areas. Its purpose is to further develop this basic stock of compensation areas into a nature conservation project that is as coherent as possible. In the meantime, ecological compensation payments from other CWF have been used to purchase additional 80 ha as amphibian and meadow bird protection areas, which in turn are leased to farmers for nature-oriented management. The lease income is administered by the association and flows entirely into the maintenance and further development of the conservation concept.*
… economic benefits	• *Direct financial participation of citizens with relatively small shares;* • *Land lease payments to landowners based on a pool model;* • *Business tax payments;* • *Benefit sharing via donations, in kind benefits and foundations to support social projects;* • *Involvement of local businesses and regional banks;* • *Development of local infrastructure (e.g. road construction, broadband infrastructure);*

	• *Technology innovation and development (e.g. hydrogen production);* • *Local value creation and job generation.* • *Diversification of income from agricultural land.* *For four of the five CWF (without Grenzstrom Bürgerwind), total dividend payments in 2020 reached 9.1 million EUR. In the case of the community wind farm Ellhöft, shareholders did benefit from annual returns on investment of up to 12 to 16 % (see https://edison.media/ertraeumen/ellhoeft-ein-wind-dorf-setzt-auf-wasserstoff/23627132.html). To avoid conflicts among landowners, sophisticated pool models have been developed that enable also those landowners in the vicinity of the wind turbines (whose land was not directly earmarked for the construction of wind turbines) to benefit from the lease payments. For four wind farms (without Grenzstrom Bürgerwind), total land lease payments in 2020 reached 1.7 million EUR (Leithoff 2021).* *Usually, the local municipalities hosting the CWF benefit from annual local business tax payments. The revenues are generally allocated fairly between the municipalities, as in the case of Brebek, according to their respective share of the installed capacity. As a rule, the business tax revenues are not set aside for any special purposes, but form part of the general budget of the municipalities. For the four wind farms, total business tax payments in 2020 amounted to 1.9 million EUR (Leithoff 2021). In Germany, however, the municipal fiscal equalisation scheme (kommunaler Finanzausgleich) allows that usually only part of the tax revenues remain in the municipalities.* *In the case of Grenzstrom Vindtved, each limited partner receives an annual distribution of approximately 5,000 EUR. Since there are 200 limited partners, the purchasing power of the region is increased by about 1 million EUR which means a significant increase in purchasing power for the structurally weak region of Northern Friesland.* *The initiators of the CWF have developed a number of further CWF and ground based PV projects in the region including the cross-border project Grenzstrom Vindtved. The managers are highly committed to link the energy transition with a sustainable mobility transition based on electric battery vehicles and vehicles with fuel cell drive. They launched a sector coupling project which envisages the cross-sector use of electricity based on an electrolysis facility and H_2 filling station. Wind power based H_2 can be regarded a new product which opens up new markets, including mobility.* *In all five cases, local construction companies were at least partly involved in the construction works. The operators of the CWF in Ellhöft pursued a consequent local contracting strategy, not only for the construction of the wind farm, but also for planning, financing, maintenance etc. Furthermore, in most cases, local/regional banks were involved for securing debt capital.* *The CWF Ellhöft and Grenzstrom Vindtved helped to create regional jobs. So, a Siemens service station was established in Northern Friesland. An engineering company set up a field office for the maintenance of substations in the neighbouring village. Another engineering company was able to expand its technical operations management department.*
… social community/ societal benefits	*The operating companies provide in-kind benefits to local environmental and social associations and initiatives. This can be illustrated by the example of the CWF Grenzstrom Vindtved. The company managers set up the Foundation BENTUSS (capital contribution 70,000 EUR), which is intended to support social purposes and energy-saving measures including PV based street lighting at bus stops and school routes. Charitable (non-profit) foundations provide benefit sharing opportunities to those households which cannot directly participate, e.g. due to financial constraints. The wind farm also invested in the development of a local broadband network. It provides regular donations to local and regional associations including Lebenshilfe, for children's festivals, the fire brigade etc. Grenzstrom Vindtved was the first wind farm in Germany to publish a Common Good Balance Sheet, a form of corporate sustainability reporting.* *In the case of the CWF Ellhöft, the operators of the plant supported the development of a new recreation area in the community, as well as a hiking, riding and bicycle path. The operating company also supported the development of a local broadband network. Each household obtained a connection worth 1,200 EUR free of charge (Sorge 2016). Further, the community is supported by the wind farm operating company through donations in kind (e.g. renewal of community paths, improvements to local childrens' playground).* *In the case of the Brebek CWF, the operators committed themselves to dedicate a certain share of the revenues towards social projects, as not all citizens were able to benefit directly from the wind farm through their shares. This includes the purchase of a van for*

	the local food bank ("Tafel"), support to a volunteer organisation distributing food to people in need, and high-speed Wi-Fi for public use. *For four of the five wind farms (excluding Grenzstrom Bürgerwind), a total of 600,000 EUR has been paid in 2020 for such social and infrastructural purposes in the region (Leithoff 2021).*
Drivers and success factors	*<u>Drivers:</u>* • *Creation of a profitable, clean energy investment* • *Every local resident or landowner should have the possibility to become a member of the operating company.* • *Entire community benefits from the wind farm, not just the landowners and founding shareholders.* • *Hosting municipalities benefit from local business taxes paid by the wind farm operators.* • *Aim to strengthen the regional economy and to promote local added value creation.* *<u>Success factors:</u>* • *Procedural and distributional fairness* • *Trust in the initiators/managers.* • *The entire community profits via benefit sharing measures* • *Commitment and support by the municipalities* • *Favourable policy and regulatory framework (feed in tariffs/premiums under the Renewable Energy Sources Act provide long-term investment security).*
Innovativeness	*The managers of the CWF belong to the pioneers in Germany in the field of citizen/community wind energy. The CWF Ellhöft is among the first CWF in Germany and the first wind farm to conclude a Power Purchase Agreement after expiry of the financial support period of 20 years. Furthermore, the wind farm is a frontrunner in the field of sector coupling and the cross-sector use of electricity for hydrogen production.* *Grenzstrom Vindtved is the first cross-border wind farm in Germany and represents one of the first wind energy repowering projects in Germany. It was also the first wind farm in Germany to publish a Common Good Balance Sheet. The wind farm owners were among the first in Germany to set up a community foundation disbursing a certain share of wind farm revenues for social purposes and energy saving measures (Foundation BENTUSS). Another innovative element is that the managfers founded a local non-profit nature conservation association for the management of the ecological compensation activities of the wind farm and other CWF. The managers are among the initiators of a voluntary label for "fair wind farm developers" in Schleswig-Holstein. They also developed a scorecard for managers/members of community wind farms in Germany to self-assess their business activities.*

References	*Leithoff, Horst (2021): Bürgerprojekte im hohen Norden (Best Practice-Beispiele). „Wind & Sonne gemeinsam nutzen". Presentation delivered to the COME RES German Country Desk Status Meeting, 30 September 2021, available from https://come-res.eu/resource?uid=1162* *Sorge, Nils-Viktor (2016): Schleswig-Holstein - Wie Windkraft ein 113-Seelen-Dorf reich machte. Spiegel Online 22.02.2016* *<u>Further Weblinks:</u>* *https://winwind-project.eu/fileadmin/user_upload/Resources/Deliverables/Del_4.3.pdf* *https://windpark-ellhoeft.de/weitere-parks/* *https://www.reinhard-christiansen.de/* *https://grenzland-energieprojekte.de/* *http://www.spiegel.de/wirtschaft/soziales/energiewende-wie-windkraft-ein-113- seelen-dorf-reich-machte-a-1078759.html* *https://docplayer.org/177848484-Gemeinwohlbilanz-nach-abschluss-der-auditierung-mit-testat-gueltig-bis.html* *https://www.shz.de/lokales/nordfriesland-tageblatt/vorreiterrolle-in-sachen-windenergie-id11044461.html* *https://grenzland-energieprojekte.de/* *https://www.ulrich-jochimsen.de/files/Grenzland_Energieprojekt_noerdliches_SH.pdf*

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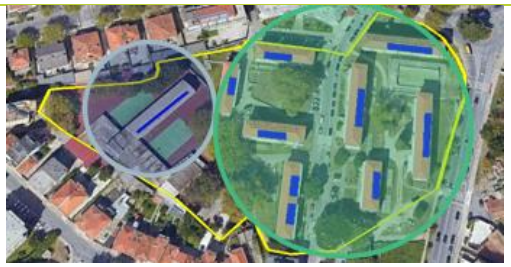
Stakeholders interviewed	*No interviews, but a presentation by Horst Leithoff, one of the managing directors of the community wind farms, delivered to the COME RES German Country Desk Status Meeting on 30 September 2021 (Leithoff, 2021).*

g. Energy Community "Agra do Amial" (Portugal)

Authors	*Isabel Azevedo (INEGI); Bruno Carvalho (AdEPorto)*
Date	*29/10/2021*
Name of REC	*Comunidade de Energia de Agra do Amial (Energy community "Agra do Amial")*
Country	*Portugal / City of Porto*
Type of region	*Target region (Portuguese Desk)*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The legal definition of REC was established in Portugal by the DL nº 162/2019 (October 2019), being aligned with the requirements from RED II.* *The energy community "Agra do Amial" is currently being established according to the national legislation, guaranteeing the full compliance with the requirements from REDII.* *- open and voluntary participation to all the inhabitants of the social housing blocks that will comprise the REC.*
Foundation	*The concept of this energy community was developed by the municipality of Porto in the context of an innovation project, funded by the EEA grants with the goal of creating the most sustainable neighbourhood in Europe. This concept was developed in 2020, with the collaboration of different technology providers, RTOs, an energy cooperative and the local energy agency.* *The tendering for the installation of the PV panels is currently in place, and the REC is expected to be launched in early 2022. In 2021, the initiative has been recognised by the National Regulatory Entity (ERSE) as a "pilot project", which allows for the testing of new regulatory models, additional to what has been already established.*
Driving forces	*The municipality of Porto (local authority), supported by AdEPorto (local energy agency), was responsible for the development of the concept and is the entity that will finance the installation of the electricity production unit.* *The implementation of the initiative will be coordinated by AdEPorto, and will have the support of a diversified group of stakeholders, including innovative solution providers to be tested in REC's integrated operation (storage systems, EV chargers and virtual power solutions) and RTOs.*
Organisational structure/ ownership model	*The organizational structure model of REC will be based on what is foreseen with the legal definition established in DL nº162/2019 where the communities can be owned by the local authorities, given that they are the owners of the buildings and they will also be the financial promoters of the photovoltaic systems.* *Additionally, the municipal company Águas e Energia do Porto will be the managing entity of self-consumption.* *Community members who will benefit openly and voluntarily to take advantage of the measures to be implemented will be the tenants of the buildings.*
Attributions of roles and functions in decision making	*The buildings are owned by the municipality, and for that it? has the decisions on the implementation and functioning of the REC.* *Tenants for their voluntary membership process will have to sign an internal regulation specifying the boundary of rights and duties of all entities involved.*
Geographical scope	*The community is to be developed in a local neighbourhood of around 20k m^2, comprising a social housing condominium of 8 building blocks (181 dwellings) and a public school.*

	
Activities in the energy system	*- Electricity generation from the PV panels installed on the roofs, which will be consumed within the community and the excess will be sold to the grid (the aim is to use all the electricity within the community);* *- Electricity storage, with the storage units installed as part of the project to maximize the use of locally produced renewable energy;* *- Electric-vehicle charging stations that promote the use of renewable energy produced or stored within the community;* *- Energy services associated with Energy Efficiency and Demand Response, to maximise the use of local generation and to promote the participation of the community members in the provision of system services.*
Energy technologies	*Two installations of solar PV: (1) 13kWp in the school; and (2) 101kWp in the social housing building blocks* *Two storage units: (1) one 15kVA/21kWh second-life (previously used in electric vehicles) Li-ion storage unit in the school; and (2) one 100kVA/133kWh Li-ion storage unit in the social housing building blocks* *Three electric-vehicle charging stations installed in the street, in a parking area dedicated to the residents from the social housing dwellings.*
Key actors and stakeholders involved	*- Municipal authority: main promotor, investor – there are several departments from the local authority which are involved, including water and energy, social housing and other. The promotor is the entity of the municipal authority as a whole.* *- Local energy agency: technical support, electricity production and supply studies, technical coordinator of the project as a whole* *- Other municipal entities (social housing management entity): citizen engagement and characterisation of the existing building stock* *- Technology providers: provision of the technology, testing of innovative solutions of management and operation of the community*
Scope of participants	*Members of the community comprise the following:* *- Câmara Municipal do Porto (municipal authority)* *- inhabitants of the social housing building blocks (181 families)* *Within the implementation phase, there will be other entities that will participate in the implementation of the community by providing innovative technologies and testing their integration. This support will also include the implementation of different solutions on storage, EV charging, management and monitoring online platforms, grid management and data analysis.*
Key motivations	*- Increase RES-electricity generated locally* *- Mitigation of energy poverty (reducing energy costs and promote energy efficiency)* *- Inclusion of vulnerable population in the local community* *- Serve as Living Lab to test the solution to be replicated to the remaining municipal social housing (total of 12 500 dwellings)*
Public leadership	*The Municipality of Porto, as a public entity, has a preponderant role in the decisions taken in the territory about its management, and for this reason it has assumed the*

	commitment to create a living laboratory for decarbonisation that goes further, allowing the study of innovative solutions that present impact on the energy transition, decarbonization and combating energy poverty. The models will be tested and their feasibility of implementation and replication will allow the municipality to support its citizens.
Inclusiveness	*The REC, being developed within a social housing neighbourhood, is necessarily focused in involving socially and economically vulnerable residents.. The community has dedicated activities to promote the participation of the 181 families, which also comprise awareness and information activities to increase the family energy-related knowledge and capacity to act.* *There will also be activities targeting the young consumers, with the implementation of a monitoring, management and gamification system in the public schools.*
Institutional support and financial support	*Assistance and institutional support: the establishment of the community has the support of several entities, including the local energy agency, a RES energy cooperative, RTOs and technology providers. (Please see the text of key actors)* *Financial support: the REC is being implemented in the context of a R&D project, partially funded by the EEA grants (financial mechanism through which Iceland, Liechtenstein and Norway support some Member States in reducing social and economic inequalities).*
Community support and acceptance	*As the REC is still being established, it is not possible to assess its impact on the community behaviour, public support and social acceptance. Nonetheless, the REC is expected to promote the visibility and integration of the local community within the Asprela district (which also includes the University campus, public hospital, several R&D organisations, and other)*
Provision of additional environmental benefits	*The REC provides the opportunity, at environmental level, to prompt citizens to use renewable energy produced locally, taking advantage of existing infrastructures, and in this way will also allow raise awareness on the importance of energy efficiency in homes and reduction of unnecessary energy consumption. Additionally, it also allows the municipality to take another step towards achieving the defined goals for reducing GHG in the territory.*
… economic benefits	*The REC will provide rebates on the energy bills of the families integrating the community. Within the first 5 years, the electricity generated will be distributed free-of-charge to the members of the community. Once the Living Lab period ends, the electricity produced locally will be supplied to the members of the community at a lower rate than the one from traditional suppliers.* *It is also expected to increase visibility and attractiveness of the neighbourhood, attracting the establishment of new businesses, which will result in local economic benefits.*
… social community/ societal benefits	*The REC is expected to promote the participation of lower income groups in the energy transition, as members of the community, and build capacity of local inhabitants on energy and indoor air quality to improve their living conditions.* *It is also aimed the increased integration of the population living in the social housing blocks with the population living in the surrounding area.*
Drivers and success factors	*The municipality being the single owner of the building blocks where the PV generation unit is being installed can be considered as an advantage, as it prevented the need for coordination between different actors.*

	The support of the different stakeholders in the implementation of the REC and the establishment of the operational procedures may be key, as this is a new concept without considerable experience in Portugal.
Innovativeness	*The involvement of lower income groups, using the REC concept as a way to promote better practices on energy use and mitigate energy poverty, can be seen as innovative.* *The involvement of the municipality can also be seen as innovative, as the municipality is the main promotor and investor of the REC. While directly investing in electricity generation from RES, the municipality is indirectly acting towards the mitigation of energy poverty and the inclusion of most vulnerable groups in the energy transition.*
References	*Project proposal; Public presentations of the project; Direct communication* *EEA 2020 call on the topic: "Implementação de projetos piloto de laboratórios vivos de descarbonização e mitigação às alterações climáticas" (Implementation of pilot projects of Living Labs for the Decarbonization and Mitigation of Climate Change)*
Stakeholders interviewed	*Bruno Carvalho (AdEPorto) – entity responsible for the management of the project*

h. Energy Community "Condomínio da Torre" (Portugal)

Authors	*Niccolò Primo, Ana Rita Antunes (Coopérnico) / Isabel Azevedo (INEGI)*
Date	*2/12/2021*
Name of REC	*Comunidade energética Alta de Lisboa - Condomínio da Torre 15.3*
Country	*Portugal / City of Lisbon*
Type of region	*Model region – Municipality of Lisbon (Portuguese Desk)*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*This initiative meets the requirements of the Article 2(16) and 22 of REDII: the initiative involves citizens that are taking decision in a democratic form (through condominium general assemblies); it is open and voluntary (although restricted to members of the condominium for physical constrains reason).* *The legal definition of REC was established in Portugal by the DL nº 162/2019 (October 2019), being aligned with the requirements from REDII.*
Foundation	*The condominium had already previously invested in solar PV generation to suppress energy needs of the buildings' common areas. (Previously legislation did not allow the use of electricity generated from PV panels installed in common areas, as apartment buildings roofs, for the individual consumption of building inhabitants. With the new collective self-consumption and REC legislation, the share of electricity among the condominium inhabitants is now possible).* *In 2019, with the initiative of a proactive owners and Coopérnico's support, started the creation of the collective self-consumption. Coopérnico is a RES energy cooperative, with national scale, which fosters collective investment in renewable energy. The cooperative also acts as supplier and energy services provider. The idea was to further expand the current solar PV installation and to share the electricity between common areas as well as all the 150 apartments present in the condominium. The process is currently ongoing and the estimated start of operation is Q1 of 2022.*
Driving forces	*Inhabitants of a condominium had already invested in solar PV generation (total of 9KWp), to cover the energy needs of the common areas of the building (associated with lighting, elevators and HVAC systems). They are currently willing to implement the REC, gathering the installations from the different blocks and investing in additional generating capacity, to allow for a better management of the electricity generated by the different generation units and the use of the generated electricity by the local inhabitants.* *Coopérnico, as coordinator and supporter of the project, is also a key stakeholder in the establishment of the REC, supporting local inhabitants with the regulatory, legal and technical issues.*
Organisational structure/ ownership model	*This REC does not have a formal format, since the Portuguese legislation does not oblige to that to build a collective self-consumption project. The collective self-consumption projects are ruled by an internal regulation document. The voting rule is the same as the one of the condominium general assembly.*
Attributions of roles and functions in decision making	*Each owner participating in the collective self-consumption has voting right.* *The condominium administration is the entity in charge of iterating with the national authorities and to communicate eventual changes in the collective self-consumption. Coopérnico is taking over these activities for the initial phase and it will be available in the future for support.*
Geographical scope	*The scope of the Energy Community "Condomínio da Torre" is restricted to a residential condominium of 150 dwellings (400 citizens), located in the city of Lisbon.*

Activities in the energy system	*- Electricity generation (to self-consumption, the surplus will be sold to the grid)* *- Electricity sharing within the community* *- EV charging*
Energy technologies	*- Current Eight solar PV generation units (9kW$_p$) and additional capacity that will be installed in the future.* *- Two EV charging points*
Key actors and stakeholders involved	*- Proactive residents, who decided to invest in the PV generation units* *- Coopérnico, that has been supporting the citizens with the establishment of the REC.*
Scope of participants	*Inhabitants of the residential condominium (150 apartments comprising 400 citizens)*
Key motivations	*- Reduction in the energy costs for the residential consumer* *- Environmental benefits (associated with the reduction of GHG emissions from the increase in RES electricity generation)*
Public leadership	*There has been no interaction with public authorities in this project. This project has been led by active citizens (dwelling owners), inhabitants from the condominium.*
Inclusiveness	*Due to physical constrains, this initiative is open only to the citizens living in the condominium.*
Institutional support and financial support	*Even though the investment* In the first generation units, the ones already installed, *was fully supported by the local residents, the establishment of the energy community will be accomplished in the context of Compile project, and EU project funded under the H2020 Programme. Thus, the CSC will be supported through EU funding, and the creation of the CSC will have the support from different consortium partners and will benefit from the access to the supporting tools developed in the context of Compile project.*
Community support and acceptance	*By directly effecting each participant, this initiative brings RES one step closer to the citizens allowing them to better understand their functioning and benefits.*
Provision of additional environmental benefits	*Emissions reduction, promotion of sustainable mobility*
… economic benefits	*The REC is expected to lead to rebates on energy bills of local residents.*
… social community/ societal benefits	*Engagement of citizens in the energy transition.*
Drivers and success factors	*A key success factor has been the involvement of the residents of the condominium from the first phases of the project (they have been the initial driving force) till the definition of the internal regulation and the decision of which technical solution to implement.* *The support provided by Coopérnico may also be one of the factors to move from a collective investment to suppress the energy needs from common areas to the additional investment in generation units, energy sharing and the establishment of a REC.*
Innovativeness	*The proactive behaviour of residential consumers to collectively invest in RES electricity generation units is still not common practice in Portugal. Moreover, the willingness to go beyond state-of-the art (which would correspond to the use of the generated electricity to*

	suppress energy needs from the common areas) can be seen as a novel practice of citizen engagement.
References	*https://www.compile-project.eu/sites/pilot-site-lisbon/*
Stakeholders interviewed	

i. Pinerolese Energy Community (Italy)

Authors	Elena De Luca (ENEA)
Date	10/11/2021
Name of REC	*Comunità energetica del Pinerolese: Pinerolese Energy Community*
Country	*Italy, Piedmont Region*
Type of region	*Target region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The REC is in compliance with the provisions. It is autonomous and open to voluntary membership. Italy has very recently completed the transposition of the RED II and its national regulations are in compliance with REDII.*
Foundation	*Launched in 2020 but still not formally established due to the current limit of 200 kW for the power of the single community established by national regulation.* *This community belongs to a wider initiative the Oil Free Zone (OFZ) "Territorio Sostenibile" formally and publicly presented in Turin on the 16th April 2019. Currently the member municipalities are about thirty out of the 45 municipalities of the Pinerolo area. The municipality members have approved "memorandum of understanding". Among the "experiments" planned for the OFZ there is the establishment of one energy community. Within the OFZ "Territorio Sostenibile", it has been hypothesised to promote more than an energy community and then to federate the different communities, providing for an exchange between them in ways similar to that within every single cooperative.*
Driving forces	*The Pinerolo Energia Consortium together with the Polytechnic of Turin and ACEA initiated the establishment of the community.*
Organisational structure/ ownership model	*The institutional form envisaged in the start-up phase is that of a "Temporary Association of Purpose" to be transformed into a cooperative. (Costituzione Associazione Temporanea di Scopo ATS fissata per mercoledì 27/10/2021, Scalenghe). The legal form of cooperative is in compliance with the RED II provisions for RECs.*
Attributions of roles and functions in decision making	*The ATS is an agreement on the basis of which the participants confer to one of them (defined as Lead Partner) a mandate of representation, for the realization of a project of common interest.* *As a result of this agreement, the Associates confer to the Lead Partner:* • *the mandate to present the project;* • *the general coordination of the project, the representation and the technical, administrative and financial responsibility of its management towards the financier;* • *the power to sign the documents relating to the execution of the project in the name and on behalf of the ATS;* • *the right to collect the sums disbursed by the lender.*
Geographical scope	*Coverage: 116km^2* *Size: 5 Municipalities corresponding to about 17.000 inhabitants*
Activities in the energy system	*The main activities of the REC in the electricity system are generation, consumption and energy sharing.*
Energy technologies	*The resources in the community are:* *13 PV systems of public and private ownership with an installed power ranging from 8.4 kW to 62 kW. There is also an additional PV system, owned by API, with 113 kW installed power.* *All these technologies will be ownership of the cooperative.*

Key actors and stakeholders involved	*The stakeholders involved in the community are:* *• Consortium "Pinerolo Energia", "ACEA Pinerolese Industriale SpA" and Municipality of Scalenghe who promote the community* *• Municipalities of Frossasco, Roletto, San Pietro Val Lemina, Scalenghe and Vigone with related citizens which benefit from community services.*
Scope of participants	*Consumers, prosumers, producers, and several types of users (companies, municipal and residential public users) in the municipalities of Frossasco, Roletto, San Pietro Val Lemina, Scalenghe and Vigone can participate in the community, by taking part of the association or, in the future, being member of the cooperative.*
Key motivations	*The aim is to build an energy community among different municipalities of the metropolitan city of Turin which, through the involvement in the "Oil Free Zone", have already reduced the production of energy from fossil sources by leading their ability to self-produce energy. The goal of the project is to bring this percentage to 100%.*
Public leadership	*The Municipality of Scalenghe is the leader of the initiative. It launched firstly the initiative acting as a catalyst for other Municipalities. Actually, many neighbourhood Municipalities are promoting an accurate study of the entire Pinerolese area, to be completed by 2022, that highlights the resources and critical issues to lay the foundations for a real energy conversion plan.*
Inclusiveness	*All citizens are allowed to join the REC, but actually no particular forms of involvement are designed for vulnerable groups.*
Institutional support and financial support	*Even though local authorities are involved and support the projects of REC they are not able to give technical and regulatory support because the administrative staff is not trained about REC. The University of Polytechnic of Turin give some technical support to the initiatives.* *The Municipality of Scalenghe provided a starting fund of 16,125€. The community participated in funded programs:* • *ENER.COM: a regional operational program F.E.S.R. 2014/2020 to realize the feasibility study whit a financing of 194,618€;* • *E-CREW : an Horizon 2020 research and innovation programme under grant agreement No 890362. ACEA Pinerolese participate in the project and contribution is 72,500€.*
Community support and acceptance	*The intention is to federate the energy communities present in the territory into a 'community of communities' including the Pinerolese Community. A barrier is represented by the local authorities which do not have enough data or competences to address the questions posed by citizens that are interested in REC.*
Provision of additional environmental benefits	*The environmental benefit due to the existing PV are related to the reduction of consumption of fossil fuel. The enlargement of the energy community which will be integrated by systems for the production of biogas through the anaerobic digestion of matrices coming from the separate collection of municipality wastes will make it possible to associate the recovery of material with the production of energy, favouring the circular economy of the territories involved.*
… economic benefits	*The economic benefits of the REC are mainly the rebates on energy bills (e.g. value added, employment effects, local tax revenues,). The community will allow reaching very high targets of energy provided by RES..*
… social community/ societal benefits	*The social benefit to the community is mainly the benefit sharing. Hopefully the enlargement of the community will have positive effects on the labour market by favouring the emergence of new business initiatives.*
Drivers and success factors	*Public and private participation with the technical assistance of a research institution. Actually, the neighbouring municipalities are joining the initiative which is felt as an important step to the energy sufficiency by the entire territory.*
Innovativeness	*In Piedmont, the Pinerolo Energia Consortium (CPE), together with the Polytechnic of Turin and ACEA, is laying the foundations for creating an energy community between different municipalities of the metropolitan city of Turin which, already involved in the "Oil Free Zone Sustainable Territory" project, they have reduced the production of energy from fossil sources bringing their energy self-production capacity to 42%. The goal of the project is to aim for 100%.*

References	*https://www.comunirinnovabili.it/acea-pinerolese/* “La comunità energetica del Pinerolese”, paragrafo 10.5.1 del 9° Rapporto Annuale sull’Efficienza Energetica, 2020, pp. 277-282, ENEA https://www.aceapinerolese.it/ https://www.consorziocpe.it/aderenti/
Stakeholders interviewed	*Giulia Fontanazza, Acea Pinerolese Industriale SpA*

j. Energy City Hall REC-1 (Italy)

Authors	Elena De Luca (ENEA)
Date	10/11/2021
Name of REC	*Energy City Hall REC-1*
Country	*Italy, Piedmont Region*
Type of region	*Target region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The REC is in compliance with the provisions. It is autonomous and open to voluntary membership. The implementation of REC is completed. On February 28 2020 with the publication of the Milleproroghe 2020 Decree, entered into force in March 2020, the definitions of "Renewable energy self-consumers who act collectively" were introduced for the first time in Italian legislation. "Renewable Energy Community" (REC) and rules that define the pilot phase have been settled. Italy has very recently completed the transposition of the RED II and its national regulations are in compliance with REDII*
Foundation	*The REC-1 was founded in 2020.* *Two additional RECs will be established in Magliano Alpi in 2021: REC-2 "Sporting Center" and REC-3 "Citizen Endeavor"*
Driving forces	*The involved stakeholders of REC-1 (who is already a legal entity) are:* - *The Municipality Magliano Alpi who promotes the community and benefits from community services* - *Private consumers (5 families, library, schools, gym) who benefit from community services. Other 5 locals are going to join.*
Organisational structure/ ownership model	*The REC-1 was established as an association (named ANR, according to the Italian Law). REC-2 and REC-3 will also be ANR association.*
Attributions of roles and functions in decision making	*The President is the Mayor of Magliano Alpi.* *The Responsible of Business&Finance Innovation is the Energy Centre, a start-up of the Politecnico di Torino.* *There is a Scientific Committee which addresses and supports technical issues related to the REC constitution. It is composed by a President and the members:* ● *A Senator* ● *A Professor of the University of Naples Federico II* ● *SME* ● *GD Comunità Collinare del Friuli* ● *A JRC expert* ● *An expert in insular energy systems* *At the moment there is a statute compliant with article 42bis of the decree 76/2020, but with adoption of the legislative decree 199/2021 and the extension to the limit of the AT cabin it will be necessary to have CERs with management skills and with legal personality. Above all, the game changer will be the National Recovery and Resilience Plan (NRRP) that finances the CERs: having to manage significant budgets, corporate governance will be needed, so cooperatives will not always be suitable. In summary, the participation mechanisms are evolving. The two new CERs in Magliano and 1 in San Daniele will act as test sites.*
Geographical scope	*Magliano Alpi counts 2,2300 inhabitants with a surface of 32,6 km².* *As coordinator and prosumer of the REC, the Municipality of Magliano Alpi has made available a 20 kWp photovoltaic system built after 1 March 2020. Installed on the roof of the Town Hall, the system is connected to the electricity withdrawal point of the Town Hall and can share the energy produced and not self-consumed with the REC. The two EV charging columns will also be connected to the same system, which can be used free of charge by residents.*

Activities in the energy system	*Provide energy for public use starting by installing PV on public buildings.* *Thanks to the awareness raised by REC-1 "Energy City Hall" (2020), many citizens and Small Enterprises (SE) asked to become partners. Because the present MV/LV substation constraints many RECs are necessary.*
Energy technologies	*Solar PV.* *REC-1 "Energy City Hall". In 2020, The Municipality of Magliano Alpi and 5 private consumers initiated the establishment of the community, with a PV resource of 20kW on the roof of the City Hall. Other 5 users have expressed their will to become partners. One prosumer with additional 20kW will be soon operational. Other citizens are expected to join by 2021.* *REC-2 and REC-3 will be established by October 2021, with an overall PV worth 60k€, involving 7 prosumers and 40 users.* *REC-4 and REC-5 are in their design phase, expected in 2022.* *The RECs are equipped with an IoT platform to manage energy flows and to allocate benefits coming to shared energy to its members, according to specific rules and requirements tailored upon sustainability approaches.*
Key actors and stakeholders involved	*The Major of Magliano Alpi was the promoter of the community energy initiative. The Energy Center Initiative (ECI) launched since 2016 by Politecnico di Torino to support and stimulate series of actions and projects that will provide support and advice to local, national and transnational authorities on energy policy and technology.*
Scope of participants	• *Municipality of Comune di Magliano Alpi* • *Citizens* • *Small Enterprises / SMEs*
Key motivations	*The REC-1 and REC-2 are aimed at guaranteeing the self-sufficiency of the city hall, the library, the gymnasium and the municipal schools and exchanging surplus energy with participating families and Small Enterprises (which consist of craftsmen, businesses and professionals who benefit from community services). The REC-3 is entirely composed of private members.*
Public leadership	*The relevance of public participation is attested by the fact that the president of the community is the mayor. This helps to increase confidence in the initiative that is replicating itself as a model in other contexts.*
Inclusiveness	*Among the benefits of RECs there is a significant reduction in the cost of energy. This reduction will also be conveyed through fair and supportive initiatives to significantly reduce the costs of bills for the weakest classes.*
Institutional support and financial support	*The RECs are starting a cooperation with the Smart Grid Interoperability Lab of the Joint Research Center (JRC) of the European Commission and with the Smart Cities & Communities Laboratory of ENEA, with local Energy Utilities and with several Cities who asked support to design, create and manage their own RECs.* • *REC-1: investment € 100,000(public funding- municipality)* • *REC-2: investment € 80,000 (public funding - municipality and financial foundation- and private funding)* • *REC-3: investment € 50,000 (private funding)*
Community support and acceptance	*The local community accepted and participated in the initiative that two more RECs (REC-2 and REC-3) are starting with the financial participation of privates like SMEs.*
Provision of additional environmental benefits	*The environmental benefits are due to the reduction of energy consumption.*
… economic benefits	*Energy cost reduction is the main benefit for citizen involved.* *The RECs are catalysts for 'local short supply chains', with high added value and a high cognitive and technological value. In fact, the RECs involve not only private citizens, but also local SMEs, designers, technicians.* *The RECs are acting as catalyst of a boom in PV installation: a percentage of the profit margins will be shared with REC-1 and REC-2 (coordinated by the Municipality) in order to get resources to be used to cope with energy poverty and to provide additional service to the citizens.* *It is estimated that the community will be able to save up to 30% of electricity consumption. A charging station for electric vehicles is made available for free for REC members.*

… social community/ societal benefits	*The municipality is supporting the creation of a "GOC "(Community Operational Group), a cooperative entity that is aimed at creating a "short supply chain of technicians, designers, installers and maintenance workers. The RECs therefore represent the catalyst for this process of aggregation of skills on the territory, essential for creating development and jobs in the post-pandemic phase.*
Drivers and success factors	*Public and private participation with the technical assistance of a research institution.* *The role of municipalities is central, especially in Italy, whose administrative fragmentation in this case is a value because it facilitates communication and involvement of citizens thanks to the proximity between voters and elected representatives.* *The Municipality of Magliano Alpi has a complexity level of management to ensure the significance of the results. The characteristics of territorial limitation and governability allow to operate as a local ecosystem devoted to acting as a catalyst for change with a view to technological and organizational replicability.*
Innovativeness	*The RECs are equipped with an IoT platform to manage energy flows and to allocate benefits coming to shared energy to its members, according to specific rules and requirements tailored upon sustainability approaches.* *CER Energy City Hall has signed a collaboration agreement with the innovative start-up with a social value Energy4Com for the technical-operational management of activities.*
References	https://cermaglianoalpi.it/?lang=en https://www.legambiente.it/wp-content/uploads/2021/07/Comunita-Rinnovabili-2021.pdf https://www.rescoop.eu/news-and-events/news/rescoop-eu-welcomes-new-member-6 https://www.wec-italia.org/wp-content/uploads/2021/05/Programma-evento-lancio-IFEC.pdf https://www.eranet-smartenergysystems.eu/Partners/Living_Labs https://energy4com.eu/
Stakeholders interviewed	Sergio Olivero, President of the Scientific Committee of the Renewable Energy Community "Energy City Hall" - Magliano Alpi (CN)

k. GECO – Green Energy Community (Italy)

Authors	Gilda Massa (ENEA)
Date	10/11/2021
Name of REC	*GECO – Green Energy Community*
Country	*Italy*
Type of region	*Emilia Romagna Region, Bologna city*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The REC is under creation and will be in compliance with the provisions.On February 28 2020 with the publication of the Milleproroghe 2020 Decree, entered into force in March 2020, the definitions of "Renewable energy self-consumers who act collectively" were introduced for the first time in Italian legislation. "Renewable Energy Community" (REC) and rules that define the pilot phase have been settled. Italy has very recently completed the transposition of the RED II and its national regulations are in compliance with REDII* *GECO is a project launched in 2019, the project has a REC in it meaning that it a several stakeholders (citizens and local activities) with a rule of prosumers but a REC is not formally established and the legal entity is under definition and experimentation in the project.*
Foundation	*No foundation for GECO community at the moment, this is one of project's goals.*
Driving forces	*GECO project is implemented by a consortium that includes the Energy and Sustainable Development Agency (AESS), the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) and the University of Bologna (UniBo).* *GSE, Terna, SRE and Emilia Romagna Region are involved in GECO to gather the results and try to apply the results in the national regulatory framework, they will also attract the potential members among the district actors: citizen, private companies, associations, public authorities and the university.*
Organisational structure/ ownership model	*There isn't an organisational structure/ownership model in place yet.*
Attributions of roles and functions in decision making	*There aren't a governance structure and voting rights in place yet.*
Geographical scope	*The GECO community will be established in Pilastro-Roveri, a suburb district located in Bologna City and it is characterised by different areas:* *- Residential area with 7.500 inhabitants (1400 inhabitants in social housing);* *- Commercial area of about 200.000 m^2 composed by commercial centres (Pilastro, Meraville and FICO);* *- Industrial area of about 1.045.500 m^2 (CAAB, Granarolo, Roveri).* *more than16 MWp of photovoltaic plant (PV) have been installed. In CAAB is moreover available a storage plant of 50 kW (210 kWh of capacity).*
Activities in the energy system	*Many renewables energy plants have been installed in the district, in particularly by CAAB/FICO and 5 companies in Roveri.* *In Roveri district 2 companies already installed smart metering and remote-control systems.* *Stakeholders demonstrated their interest in the installation of renewables, in the short-term period, for the electricity production, in particularly:* *- CAAB will install 1 MW of PV plant and 1 Biogas plant of 75 kW with storages;* *- Agenzia del pilastro, will install 40 kW of PV plant with storage and electric vehicles;* *- The residential buildings are interested in installing 4 PV plant with storage.*

	The activities point to increase the usage of renewable energy locally produced and balance the grid, to implement innovative solutions for the integration of renewable energy sources in the national grid, supported by artificial intelligence, high-quality demand-side management and storage technologies, and to provide services like voltage balancing control, congestion management, flexible load and peak demand shaving, energy saving.
Energy technologies	• *Biogas Plant* • *Photovoltaic Plants with storage* • *Technologies for demand side energy management* • *From a technical point of view the project will maximize the production of renewable* • *and extend the storage installation, selecting financing mechanism that will support the investment.*
Key actors and stakeholders involved	*AESS, ENEA and UNIBO are supporting the creation of GECO community, defining the legal framework, the business model and the technical assistance.* *The project counts with the participation of citizens, local companies and associations (Agenzia locale di Sviluppo Pilastro Distretto Nord Est, CAAB, Bastelli, Confcooperative, Confindustria Emilia Romagna, Innovacoop, NUTE)* • *City of Bologna* • *Emilia Romagna Region* • *GSE (is the national public company identified by the State to pursue and achieve environmental sustainability through the two pillars of renewable sources and energy efficiency)* • *RSE (RSE is a total publicly-controlled company, where the sole shareholder is GSE S.p.A. RSE carries out research into the field of electrical energy with special focus on national strategic projects funded through the Fund for Research into Electrical Systems)*
Scope of participants	*CAAB will invest in a biogas plant and PV generation with own resources, Agenzia del Pilastro which applied to 'Carisbo foundation' to finance the installation of photovoltaic plant in public buildings, local residents which demonstrated their interest in the photovoltaic plant installation in the condominiums, Roveri companies that will join the initiative.* *The Emilia Romagna Region express its interest in being involved in the project by participating in national discussions committee to share the GECO project outcome and deliverables with other authorities and stakeholders and disseminating results.* *GSE express its interest in being involved in the project by participating in national discussions committee to share the GECO project outcome and deliverables with other authorities and stakeholders and disseminating results, receiving feedback from the pilot project and contribute to the development of the new regulation.* *Within GECO project RSE will contribute to the community development and will attend the national discussions committee and disseminate the project outcome and results.*
Key motivations	*Increase the number of renewable energy plants and storages designed for the public and private organizations of the district and access to the dispatching market applying for UVAM.* *Reduction of the cost of electricity for the social housing affecting the fuel poverty and improving local business, optimize the flow of electricity in the local substation, increase the self-consumption of renewable energy and also reduce the demand peaks.*
Public leadership	*The City of Bologna supports the project from the beginning as a third part, however it does not foreseen leadership position. Within GECO the City will support the engagement of the local stakeholders and of the citizen and the pilot of the GECO in Bologna and will increase the installation of renewable energy and storage in the public buildings. During the project implementation the City will also disseminate the project outcome and results.*

Inclusiveness	*The engagement, training, dissemination, and promotion of behavioural changes among all the community stakeholders and all size of consumers. The consumers can benefit of a reduction of the cost energy through self-production and sharing.*
Institutional support and financial support	*GECO PROJECT has a total funding of €2.466.403,00 (60% from EIT funding and 40% from cofounding)* *GSE, RSE and Emilia Romagna Region will support the development of a national legislation, act against the fuel poverty and improve the local business by optimizing the flow of electricity in the district area, increasing the self-consumption of renewable energy and also reduce the demand peaks.* *CAAB should invest 500.000€ for increasing their energy production (PV and biogas) and installation of storage.*
Community support and acceptance	*The students and citizens are trained and educated to increase their awareness. Several activities are in place to create the community and to make citizens conscious of the rule of prosumers to reduce their energy costs improving actions of energy saving and flexibility.*
Provision of additional environmental benefits	*Reduction of the CO2 emissions of 70.048 t in 2022, development of a tool and the business model for the communities to set-up a local energy community and create a cost effective scaling model for local businesses and citizens to reduce their emissions.*
… economic benefits	*Energy cost reduction is the main benefit for citizen involved. The main elements to reach these goals are:* ● *Renewable energy plants, storages, electric mobility integrated in the community realized* ● *Smart devises and a system developed for the optimal management of the distributed resources* ● *Blockchain technology developed for energy communities*
… social community/ societal benefits	*The social impact will be related to the opportunity for low-income families and citizen to fight the fuel poverty, to the increased awareness provided related to the energy saving, sustainability and circular economy through the establishment of a community and the educational and information activities.*
Drivers and success factors	*Public and private participation with the technical assistance of research institution*
Innovativeness	*To allow consumers of all sizes to interact with the support of the blockchain system by making their demand more flexible.* *It is also expected that the legal community entity will identify the services to be provided to its members related to the energy brokerage, smart contracts, district energy management, energy saving and renewable energy production .*
References	GECO Project documents https://www.gecocommunity.it/
Stakeholders interviewed	

I. Energy communities in apartment buildings (Latvia)

Authors	*Ivars Kudreņickis, Gaidis Klāvs (IPE), Aija Zučika (LEIF)*
Date	*01/12/2021*
Name of REC	*Energy communities in apartment buildings: pilot projects*
Country	*LATVIA*
Type of region	*Model region. Mārupe local municipality is the first one in Latvia in which the energy communities pilot projects have been implemented. Mārupe local municipality is on the outskirts of the municipality of capital city Riga and had around 21 thousand residents in 2020.*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*Latvia has not yet transposed the REDII provisions regarding the RECs. The Draft Amendments to the relevant Energy Law and Electricity Market Law are still under the process of harmonization.* *Particularly, the provisions on electricity sharing and P2P trading are not still in place, which an important enabling role for the installation of solar PV technologies (the type of technologies to be used for the potential energy communities of apartment buildings).* *What is presented in this good practice is the two energy communities in apartment buildings, with an autonomous foundation and demonstrate residents co-operation.*
Foundation	*The promotion of the described energy communities have been done within the framework of the "**Co2mmunity**: co-producing and co-financing renewable community energy projects" and its follow-up extension "**Energize Co2mmunity:** real-life implementation of renewable community energy projects" which are the projects within the framework of EU Interreg VB Baltic region programme for the years 2014-2020. Riga region planning authority has been the project partner in Latvia, self-government of Mārupe municipality – the associated partner [1].* *The activities of the Co2mmunity project in Mārupe municipality had started in 2018. In Autumn 2018 a local survey was conducted and a discussion on the development of community energy projects was organized. In September 2019 Mārupe municipality Council held a discussion on community renewable energy project ideas. In December 2019 the Feasibility study [2] was been finished. On 26th November 2019, a decision was made on the format and sites of the pilot projects. **Roof-top solar technologies in both pilot projects have been installed in 2020**. On 18th September, 2020, event took place introducing residents of the municipality to the pilot projects' results and sharing the experience. Starting from October 2020, the monitoring of produced solar energy in the pilot projects' buildings are done.* ***Pilot projects are sited in**:* *1. the multi-apartment building (18 apartments), Mazcenu alley (aleja) 15, Jaunmārupe, Mārupe local municipality, and* *2. the row-houses building (6 sections-apartments). Lielā iela (Lielā street) 160, Jaunmārupe, Mārupe local municipality.*
Driving forces	*(1) EU funded Co2mmunity project,* *(2) regional planning authority (Riga planning region[6]),* *(3) local authority – self-government of Mārupe municipality,* *(4) the associations of apartment owners of pilot projects' buildings - have demonstrated residents' community willingness to engage in a joint partnership and ensure the maintenance of the installed solar equipment in the long run,* *(5) local leaders of these associations – very actively motivated and encouraged the other residents; both local leaders have relevant knowledge in the energy sector issues as well as project management skills [3,4],*

[6] Currently there are no regional governments in Latvia, only regional planning authorities exist.

	(6) The development and adoption of national Energy-Climate Plan 2030, the necessity to transpose the REDII Directive provisions. Thorough the Co2mmunity and Energize Co2mmunity projects implementation, the Latvia's Ministry of Economics followed the progress of them, the results of the pilot projects have been also used as one of the information sources for developing REC legislative framework.
Organisational structure/ ownership model	*1. The association of apartment owners of particular multi-apartment building (Association "Mazcenu 15", [5]).* *2. The community of apartment owners of particular row-houses building.* *Only apartment owners of the particular apartment house can join the association or community - one apartment is one member (one vote). At the same time the pilot projects have different legal forms for organisation of apartments' co-operation.*
Attributions of roles and functions in decision making	***The multi-apartment building (18 apartments): association of apartment owners.*** *Latvia's Associations and Foundations Law [6] contains a general regulation, while Latvia's Law on Administration of Residential Houses contains special legal norms. The administrative bodies of an association are the members' meeting (supreme body) and the executive body (board). As it is required the support of 51% of members of the association in order to make a positive decision, regarding the installation of roof-top solar technologies the head of the association performed individual meetings with the apartments' residents explaining the expected benefits. After that, a decision has been made at the general meeting of members.*
	The row-houses building (6 sections-apartments): community of apartment owners. *The status, competence, conditions and procedures for decision making by community of apartment owners is in accordance with the provisions of Law on Residential Properties, chapter III "Community of Apartment Owners" [7]. The decision to implement the pilot project and to authorise the respective person to sign the agreement on implementation of the pilot project had been adopted unanimously at a general meeting of apartment owners. The general meetings related to such issus are protocoled and the protocol signed by apartment owners.*
Geographical scope	***Micro-scale level:*** *two pilot projects, each of them covers one particular apartment building (see scope of participants below).*
Activities in the energy system	*Production of electricity and heat energy for self-consumption to partially cover energy demand.*
Energy technologies	***Roof-top solar technologies*** *have been chosen as a technologically simple solution for the pilot projects, having previously conducted interviews with the buildings' residents and, in cooperation with experts, selecting a technically and economically feasible solution that respected the residents' wishes.*
	Multi-apartment building *[8]* • *4 solar PV panels with total installed capacity 1.32 kWp. Anticipated annual production of electricity 1.3 MWh.* • *18 solar heat panels with total installed capacity 27 kW. Anticipated annual production of heat energy 20 MWh.* *The produced electricity is used to cover electricity consumption in the common areas of the apartment building. The produced heat energy is used for pre-heating of hot water for the needs of all residents of the house.*
	Row-houses building *[9]* *Six **rooftop PV** panel systems (4 PV panels * 0.330 kWp = 1.32 kWp capacity of each). Thus, the total PV system comprises 24 PV panels with the total capacity 7,92 kWp, anticipated annual production of electricity 7,8 MWh. Each of the six PV panel system has its own inverter connected to the inner power grid of the particular section–apartment of the row-houses building. In summer season the produced electricity corresponds to the electricity consumption.* *The produced electricity is used also for the charging of electrical vehicles owned by residents of the houses (in summer 2021 there have been two electrical vehicles).* *The results of real-time monitoring of produced solar electricity are publicly available.*

Key actors and stakeholders involved	***Key actors responsible for initiating and implementing the pilot projects:*** *(1) regional planning authority of Riga region,* *(2) local authority – self-government of Mārupe municipality,* *(3) association or community of apartment owners as the legal and organizational framework for local residents co-operation,* *(4) the interests of the residents associations are represented by the competent and active leaders, who encouraged other residents, .* *(5) highly qualified experts, both: (i) contracted by the Co2mmunity project, and (ii) the range of energy sector professionals, living in Mārupe municipality, had provided free-of-charge technical consultations for the pilot projects. The representatives of professional NGO, such as Solar energy association, and solar energy companies have contributed in the development of technical solutions.*
Scope of participants	*1) multi-apartment building (18 apartments),* *2) row-houses building (6 sections – apartments)*
Key motivations	*1) cut the bill for energy supplied from an external supplier (economic motivation),* *2) act in a climate- and environment-friendly way, promote green life-style, reduce CO_2 emissions.*
Public leadership	*The involvement of the self-government of the local municipality was the most important success factor and the strong example of public leadership.* *Mārupe municipality positions itself as a green municipality focused on smart solutions and actively organizes public campaigns regarding green energy. Mārupe municipality has adopted in 2020 the sustainable energy and climate action plan (SECAP).* *Throughout the Co2mmunity project a range of events were organized to involve both the particular communities of pilot projects' buildings and the public in general. Important, the concept of energy community had been discussed not only within the citizens audience, but in the wide context. The self-government provided high leadership for involving all parties in the discussion to use the expertise of high-level professionals, NGOs and local businesses/their associations.* *Green Energy Weeks was organized in September 2020 and 2021, on 18th September 2021, as part of the Green Energy Week, talks-festival devoted to the development of renewable energy communities took place in Jaunmārupe.* *Mārupe municipality has installed in 2014 a solar heat panels system and a solar PV panels system in a municipal public building – Jaunmārupe Primary school.*
Inclusiveness	*All apartments of particular apartment buildings participate and receive benefits in the described pilot projects.*
Institutional support and financial support	***Institutional Support*** *(1) Riga region planning authority (Riga planning region) – leadership of project management, consultations,* *(2) Self-government of Mārupe municipality – information and motivation of residents, consultations on legal aspects and technical aspects, leadership for involving all parties in the discussions.* ***Public Funding*** *Investment in each of the pilot projects has been around EUR15,000 (including VAT), of which EU funded project "Energize Co2mmunity" – 85% and national financing -15%.* *No investment provided by residents (as they are the demonstration projects). At the same time, the local residents will cover maintenance costs (see next paragraph).* *As the funding has been provided by a specific EU source, a tripartite agreement has been signed. The owner of the installed solar equipment (Riga planning region) lends them to self-government of Mārupe municipality which in turn gives the use of them to the residents association of the particular apartment building. After the end of the agreement (5 years after the end of the Co2mmunity project), the solar energy technologies will become the property of the association, providing for the liability of the association the full-fledged maintenance of the equipment.*

Community support and acceptance	***Use of renewable resources, reduction of impact on climate and environment, promotion of green lifestyle.*** *In March 2021, a local survey has been conducted to find out how "green' the residents of Mārupe municipality are. Respondents from 345 households had participated in the survey and the results showed the importance of the noted factors in the formation of community acceptance [10].* *Local residents has strengthened communication and cooperation with the self-government by using new opportunity, provided within the Co2mmunity project, that has not been practiced so far.*
Provision of additional environmental benefits	• *decrease of consumption of fossil resource - natural gas – utilized by external to the particular buildings energy suppliers (district heating system and power supply system) and related reduction of CO_2 emissions,* • *in case of row-houses building – also promotion of climate-friendly transport in households (use of self-generated electricity to charge two electric cars).*
… economic benefits	*Rebates on energy bills. Furthermore, indirect economic benefit might relate to that due to development of community energy projects the relevant niches for businesses increases and the cooperation networks of local entrepreneurs strengthens.*
… social community/ societal benefits	*Cooperation of apartment buildings residents for joint solar energy technologies installations is new in Latvia. Before pilot projects, no examples related to joint solar PV technologies exist.* *Furthermore, regarding the implementation of new joint activities by the apartment associations of particular buildings, directly resulting from the pilot project, it is too early to provide conclusions. These new joint activities could be developed once the local community has gained full confidence on the benefits in the medium to longer run.* *Important factor – benefits of households cooperation compared to individual actions - has to be underline regarding the pilot project in row-houses building. Namely, it was adopted the decision to place all solar PV panels on the roof of the central building (section) which is the most efficient site. The no-cooperation alternative could be individual actions (PV panels placement on the roof of each of sections of the row-houses building), however in such alternative, due to both the orientation and restrictions on the use of roofs, the total electricity produced would be lower compared to the co-operation project.*
Drivers and success factors	***Key drivers*** • *Economical benefits (rebate on energy bills),* • *Possibility to act climate and environmentally friendly,* • *Access to public funding,* • *Appropriate legal form for local residents' cooperation,* • *Success factors listed below.* ***Success factors*** • ***Public leadership and support provided by local self-government*** *(motivation of residents, consultancy on legal and technical issues),* • ***Local leader:****- a motivator or activist within the residents' community itself is a crucial factor, important is also that the local leaders have knowledge on energy sector issues as well as project management skills,* • *The building residents' community willingness to engage in a joint partnership for new technologies and to ensure the maintenance of them in the long run,* • ***Legal arrangement provided:*** *taking into account that REC legal framework is not yet adopted in Latvia**,** public authorities (Riga planning region and self-government of Mārupe municipality) had looked for and established the legally correct form for implementation and ownership of installed solar technologies and provided legal consultations,* • *Availability of* ***highly experienced experts-consultants.*** *Their role was mainly related to the choice of technical solution and well-based economical justification,* • *Another important factor was that all supporting parties - representatives of the region, municipalities, experts and technology companies - took part in the meetings with local residents, thus confirming the willingness of all parties to support the implementation of the pilot projects.*
Innovativeness	*Based on available public information, these are the first projects in Latvia regarding apartment buildings' residents cooperation to instal the roof-top solar PV.*

	The social innovation created by the pilot projects is the promotion to think in the terms of community. This could lead to the development of other local initiatives in any sector. Information on community projects (not only in the field of energy) has shown that community projects is still underdeveloped area in Latvia.
Further perspective developments	*The described in this good practice pilot projects can be considered as a model for other apartment buildings, as they show a possible pathway and set of measures for the implementation of another REC pilot projects, including economical feasibility. The experience also shows that different technical or economical solutions may be appropriate for certain apartment buildings; this means that a feasibility study should be based on a case-by-case basis.* *The Riga region planning authority has performed in 2021 the Study to develop energy community projects in multi-apartment buildings [11,12]. In this Study several other possible pilot projects for REC are identified, SWOT analysis and economical-technical feasibility study are performed for three different types of apartment buildings, This analysis has been submitted to the Ministry of Economics to serve as a source of information in the development of both regulatory and financial support instruments.* *In its turn, as underlined in this Study, already within the existing legal framework, electricity sharing could be provided in those apartment building which have single connection point to power distribution grid. Although such apartment buildings constitute only minority, this shows the availability of the technical framework for several immediate pilot projects by putting the motivation and organization of residents' cooperation in a central place.*
References	1. https://www.marupe.lv/lv/viedie-risinajumi/projekts-co2mmunity (on Co2mmunity project activities in Mārupe municipality) 2. "Feasibility study on the possibilities for energy efficiency improvement and renewable energy in Mārupe municipality" (*"Priekšizpēte par energoefektivitātes uzlabošanas iespējām un atjaunojamās enerģijas uzlabošanas iespējām Mārupes novadā*"), by IK "eBIOpowers" within the Co2mmunity project, December 2019, https://rpr.gov.lv/wp-content/uploads/2020/04/2-Eso%C5%A1%C4%81-situ%C4%81cija-M%C4%81rupe-Co2mmunity-LAT.pdf 3. Renewable energy in Mārupe municipality: Experience stories: interview with Pāvels, pilot project in 18-apartment building (*Atjaunojamie energoresursi: pieredzes stāsti: Mārupes iedzīvotājs Pāvels*), https://www.marupe.lv/index.php/lv/viedie-risinajumi/atjaunojami-energoresursi/pieredzes-stasti 4. Renewable energy in Mārupe municipality: Experience stories: interview with Jānis B, pilot project in row-houses building (*Atjaunojamie energoresursi: pieredzes stāsti: Mārupes iedzīvotājs Jānis B*), https://www.marupe.lv/index.php/lv/viedie-risinajumi/atjaunojami-energoresursi/pieredzes-stasti 5. Association "Mazcenu 15". National Lursoft register: https://company.lursoft.lv/lv/mazcenu-15/40008177448 6. Associations and Foundations Law, (*Biedrību un nodibinājumu likums*), https://likumi.lv/ta/id/81050 7. Law on Residential Properties (*Dzīvokļa īpašuma likums*), https://likumi.lv/ta/id/221382 8. https://www.marupe.lv/lv/viedie-risinajumi/atjaunojami-energoresursi/sarazota-saules-energija-dati/saules-panelu-sistema – data on installed solar heat panels and solar PV capacities in 18-apartment building 9. https://www.marupe.lv/lv/viedie-risinajumi/atjaunojami-energoresursi/sarazota-saules-energija-dati/saules-panelu-sistemas - data on installed solar PV capacities in 6-sections row-houses building 10. https://www.marupe.lv/index.php/lv/viedie-risinajumi/atjaunojami-energoresursi/aptaujas-rezultati (results of the 2021 local survey) 11. "Study on the identification of projects for RECs and their technical and economical feasibility evaluation: final version" (*Atjaunojamās enerģijas kopienu projektu identificēšana, to īstenošanas tehnisko un finansiālo aspektu novērtējums: gala versija un pielikumi*), by IK "eBIOpowers" within the Energize Co2mmunity project, 2021. 12. Information based on the presentations of the noted above study: workshop organized by the Ministry of Economics and Riga Planning Region, 26th October 2021.
Stakeholders interviewed	The leader of the *Co2mmunity/ Energize Co2mmunity* projects in Latvia

m. Reinli small-scale hydropower plant (Norway)

Authors	*Stine Aakre and Karina Standal (CICERO)*
Date	*First draft 25 October 2021, amended 22 November 2021*
Name of REC	*Reinli small-scale hydropower plant*
Country	*Sør-Aurdal municipality, Innlandet county, Norway*
Type of region	*Target region (Norway)*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*Since Norway is not a member of the EU, but only the European Economic Area (EEA), directives and EU policies do not automatically apply to Norway but depend on individual procedures and negotiations between the EU and the EEA/EFTA. The REDII (Directive (EU) 2018/2001) is still under review by the EEA/EFTA. RECs have not been formally introduced in Norwegian legislation, and no eligible legal forms have been defined.* *The Reinli small-scale hydropower plant is a community-initiated renewable energy project organized as a legal entity* *At present, it is difficult to judge whether the Reinli small-scale hydropower plant could potentially constitute a REC, as REDII and key provisions of relevance to RECs have not been transposed and implemented in Norway. However, compliance with the principles of effective control, autonomy and proximity may be especially critical in the case of the Reinli small-scale hydropower plant:* *Småkraft AS, the largest operator of small-scale hydropower plants in Norway, owns 51% of the shares in Reinli Kraft AS. Småkraft AS' headquarters are not located in the same county as the Reinli small-scale hydropower plant. Thus, the majority shareholder is a company which is not necessarily located in the proximity of the project (depending on how proximity is defined). Småkraft AS is owned by long-term investments funds managed by the German investment management company Aquila Capital. Its majority owner is the Dutch pension investment company APG.*
Foundation	*Reinli is a small village (433 inhabitants) located in Sør-Aurdal municipality in Norway. The Reina River runs through the village and has for centuries been utilised by local residents to sustain farming activities. In 2002, 35 local landowners established a general partnership with shared liability, Reinli fallag DA, to manage the waterfall rights of the Reina River (Public consultation letter 2019). A license to develop a small-scale hydropower plant was given by the Norwegian Water Resources and Energy Directorate (NVE) in 2003, and the hydropower plant became operational in 2008, with a current total installed capacity of 3.2 MW.*
Driving forces	*Actors that have been key in realising the project include the local landowners, other local investors, and the power company Småkraft AS. Småkraft AS is the largest operator of small-scale hydro power projects in Norway, and helps finance, construct, monitor and service the plants, and sell the electricity generated. 28 local households also invested in the project (Public consultation letter 2019).*
Organisational structure/ ownership model	*The Reinli hydropower plant is owned by Reinli Kraft AS, a stockbased limited company. Stockbased limited companies are regulated by the Companies Act (Aksjeloven, 1997). Ownership data from the Norwegian Tax Administration shows that Småkraft AS (a private limited company with headquarters in Bergen, Norway) owns 51% of the shares in Reinli Kraft AS, while 49% is owned by residents located in the same village as the power plant. Local shareholders of Reinli Kraft AS include both men and women. Board members are currently all men.* *Local landowners have established a general partnership to manage the waterfall rights (Reinli Fallag DA), which receives annual revenues from leasing out the waterfall rights to the owner of the hydropower project, Reinli Kraft AS. Data from the Brønnøysund*

	Register Centre shows that members of Reinli Fallag DA include both men and women, while board members are currently all men.
Attributions of roles and functions in decision making	*The Reinli hydropower plant is owned by the private limited company Reinli Kraft AS. According to the Companies Act, the general assembly is the company's supreme authority, and shareholders have the right to attend and vote in these meetings. The general rule is that shareholders have votes according to the number of shares owned, and decisions are reached through a **simple majority**. The board of directors is responsible for managing and running the company. The board of directors can appoint a general manager. The general manager of Reinli Kraft AS is a representative from Småkraft AS.* *Småkraft AS has 51% of the **voting share** in Reinli Kraft AS (Småkraft 2019).* *The current board of directors includes representatives from Småkraft AS and local residents (the chairman is a representative from Småkraft AS, while the remaining three board members are local residents).*
Geographical scope	*The hydropower plant is located in the Reinli village (433 inhabitants) in Sør-Aurdal municipality, Innlandet county. Participants in the community energy initiative include landowners and other citizens residing in the village, and Småkraft AS (with headquarters in Bergen municipality, Vestland county, Norway).*
Activities in the energy system	*RES-based electricity production and sales.*
Energy technologies	*Small-scale hydropower, 3.2 MW installed capacity (average annual electricity production 10600 MWh).*
Key actors and stakeholders involved	*Local landowners, other local citizens, and the professional partner Småkraft AS. Local households are involved as investors and owners in Reinli Kraft AS. A local contractor was involved in the construction of the plant, and a local farmer and owner of waterfall rights oversees the local practical maintenance at the Reinli power plant (smaakraft.no)* *.*
Scope of participants	• *Local citizens as investors and owners in Reinli Kraft AS* • *Local landowners as owners of the waterfall rights* • *The external power company Småkraft AS as investor and majority owner in Reinli Kraft AS* • *Local contractor Brødrene Dokken AS (an SME) has been involved in plant construction* • *A local farmer and owner of waterfall rights oversees local practical maintenance*
Key motivations	*Local landowners came together with a desire to construct a small-scale hydropower plant in order to utilize the power in the local river in a way more adapted to meet modern needs in the village (Public consultation letter 2019). In addition to the renewable energy production, a key motivation has been the income generated from the project to the local landowners, which can be invested in the local farms for current and future generations (ibid.; Småkraft n.d.).*
Public leadership	*No notable example of public leadership has taken place in this case.*
Inclusiveness	*The project has entailed broad citizen engagement in renewable energy development, as many local villagers are shareholders in the company and/or local landowners with waterfall rights (smaakraft.no).*
Institutional support and financial support	*Institutional support: N/d.* *Financial support: National support schemes (electricity certificates, a market-based scheme to promote RES, where RES-based electricity producers receive one certificate per MWh produced which sellers of electricity to end consumers are required to buy).*
Community support and acceptance	*Broad citizen engagement in renewable energy development and local economic benefits (e.g. host municipality tax income) are likely drivers of community acceptance of the community energy project.*

Provision of additional environmental benefits	*Renewable electricity generation for central grid supply.*
… economic benefits	*Småkraft AS offers the expertise and long-term finance needed to realize small-scale hydropower projects in cooperation with local communities. The business model of Småkraft AS is that local communities that live in the proximity of the small-scale hydropower projects receive a share of the benefits generated by the electricity production (Småkraft 2020):* • *Revenues are distributed between the investor, the landowners, the host municipality and local businesses and contractors.* • *Landowners receive annual payments based on the revenues generated by the small-scale hydropower plant.* • *Host municipalities receive tax revenues.* • *Småkraft AS has a goal to use local construction companies to construct the plants, and local expertise to conduct local practical maintenance of the plants once operational.*
… social community/ societal benefits	*Broad local citizen engagement in renewable energy development.*
Drivers and success factors	*In addition to locally produced RES-based electricity, a main driver in the case of the Reinli small-scale hydropower project includes the local economic benefits that such a project could entail for the community (including tax revenues to the host municipality, income to local landowners). The income generated can be invested in the community, including in local farms for current and future generations. The local landowners retain ownership rights to the waterfall, and once the leasing period with Reinli Kraft AS ends, they may decide to either continue to lease out the waterfall rights, or the acquire the power plant infrastructure.*
Innovativeness	*Norway has a long history of publicly owned renewable electricity production, and community owned small-scale renewable electricity production has increased in recent years (Standal et al. 2021). Possibly innovative elements in the case of the Reinli include the broad local involvement in the project (citizens as shareholders and/or landowners with waterfall rights), and the cooperation with Småkraft AS to help overcome possible barriers to development of the project (e.g. high upfront investment costs and a technically challenging project). Local residents own 49% of the shares in Reinli Kraft AS, and also own the waterfall rights. Data from the Norwegian Tax Administration suggests that the majority of the small-scale hydropower projects where Småkraft AS is involved elsewhere in Norway, are fully owned by Småkraft AS.*
References	*Aksjeloven (1997). Lov om aksjeselskaper (LOV-1997-06-13-44). Available at: https://lovdata.no/dokument/NL/lov/1997-06-13-44/*#&.* *Public consultation letter (2019). Åpent brev til dem som bestemmer. Available at: https://www.regjeringen.no/no/dokumenter/horing---nou-201916-skattlegging-av-vannkraftverk/id2670665/Download/?vedleggId=121d9470-fb85-434f-bbfd-752cfda47644* *Småkraft (2020). Småkraft AS Sustainability Report 2020. Available at: https://smaakraft.no/wp-content/uploads/2021/05/sustainability_report_2020_smakraft.pdf* *Småkraft (2019). Småkraft AS Annual Report 2019. Available at: https://smaakraft.no/wp-content/uploads/2020/03/smkraft-as-annual-report-including-audit-opinion.pdf* *Småkraft, n.d. Reinli. A hydropower village in Valdres (video). Available at: https://smaakraft.no/?lang=en* *Standal et al. (2021). COME RES Deliverable 2.1. Assessment report on technical, legal, institutional and policy conditions. Available at: https://come-res.eu/fileadmin/user_upload/Resources/Deliverables/COME_RES_D2.1__Assessment_report_FINAL.pdf*

n. Røverkollen housing cooperative (Norway)

Authors	*Stine Aakre and Karina Standal (CICERO)*
Date	*First draft 25 October 2021, amended 22 November 2021*
Name of REC	*Røverkollen housing cooperative*
Country	*Oslo, Norway*
Type of region	*Target region (Norway)*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*RECs have not been legally defined in Norway, as RED II is still under review by EEA/EFTA (Standal et al. 2021). Since RED II has not been transposed into Norwegian law, and no eligible legal forms for RECs have been defined, it is difficult at present to establish with certainty the extent to which the Røverkollen housing cooperative's community energy initiative could qualify as a REC* *The Røverkollen housing cooperative is a **legal entity** (Borettslag (BRL) in Norwegian). Participation in the community energy initiative is **open** to all shareholders of the housing cooperative (membership is based on the household unit and not number of residents) based on objective, transparent and non-discriminatory criteria (limited, with some exceptions, to residents in the housing cooperative), but **not voluntary** (members of the housing cooperative are also members of the energy community). The legal entity is **autonomous** and **effectively controlled** by shareholders (residents) located in the **proximity** of the renewable energy project.* *Based on the description above, compliance with REDII Article 2(16), (a) and (b), is generally good, with some possibly critical issues regarding participation. REDII (Article 2(16), (c)) requires that the primary purpose should be "to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits". Economic, social and environmental benefits have not been elaborated in national legislation or guidance. A main motivation of the Røverkollen energy initiative has been to provide EV charging services to residents at reduced costs. According to RESCoop (2020), reduced electricity costs could constitute an example of an economic benefit (as opposed to financial profits) to shareholders and/or members, at least for households and non-professional customers.*
Foundation	*The housing cooperative was established in 1974. The implementation of the community energy system started through participating as a pilot site in the EU H2020 project Green Charge. The Green Charge project commenced in September 2018 and will end in February 2022. Previously the Røverkollen housing cooperative had installed 4 charging stations for Electrical vehicles (EV) in the outside parking area.*
Driving forces	*Key stakeholders/decision-makers in supporting/realising the project have likely been residents in Røverkollen housing cooperative, including the board director, and project participants in the Green Charge project, including research partner SINTEF and Oslo municipality (Røed 2020). The overall objective of the community energy system has been to provide environmentally friendly electricity for charging residents' EVs at reduced costs. The main drivers are to accommodate charging infrastructural needs from the anticipated increase in EVs in Norway, especially in urban areas. In August 2021, 8 out of 10 new cars sold were EVs. The opportunities from participating in the Green Charge project has also been a driver (Røed 2020).*
Organisational structure/ ownership model	*Røverkollen is a housing cooperative (Borettslag (BRL) in Norwegian), which is a common legal form for many residential apartment buildings in Norway. A housing cooperative is similar to the legal form cooperative but is subject to the law on housing cooperatives[7]. The law on housing cooperatives states that shareholders should be*

[7] Available (in Norwegian): https://lovdata.no/dokument/NL/lov/2003-06-06-39)

	natural persons (with some exceptions) and all household members constitute one share only.
Attributions of roles and functions in decision making	*As stated in the law on housing cooperatives, each household owns a share in the housing cooperative. The housing cooperative is managed by a steering board of elected residents. The shareholders' democratic rights are safeguarded through the general assembly where major decisions are made. Residents own their apartments but pay a monthly fee (shared costs) to the housing cooperative and major decisions concerning maintenance and new investments take place in a general assembly meeting.*
Geographical scope	*The housing cooperative consists of 246 apartments/shareholders in 5 buildings (land plot size 26 500 m^2). Participation in the energy community is limited to shareholders of the housing cooperative.*
Activities in the energy system	*Renewable electricity generation, storage and consumption.*
Energy technologies	*To adapt to an increasing share of EVs among the residents, Røverkollen housing cooperative has installed a 70 kWp rooftop PV (estimated annual electricity production 55,000 kWh), a 50kWh battery which stores the electricity produced and enables EV charging even when the sun does not shine, and 64 EV charging points. A smart EV charging system has been implemented, applying predictive planning where the residents provide information on when they need the EVs charged. The system balances input from the produced electricity and the needed electricity consumption from the grid to ensure optimal energy efficiency and avoiding peak demand.*
Key actors and stakeholders involved	*Residents/shareholders, in cooperation with partners in the H2020 project GreenCharge:* • *SINTEF Energy, research partner* • *Oslo municipality, partner* • *ZET -Zero Emission Transport, tech company* • *E-Smart Systems, tech company working on AI systems* • *Fortum Charge and Drive, power company*
Scope of participants	*Members of the community (households). Participants in the H2020 project GreenCharge include Oslo municipality, SMEs and research institutes.*
Key motivations	*Key motivations include the provision of environmentally friendly electricity (rooftop PV) for charging residents' EVs at reduced costs, predictability and security concerning residents' charging needs. The opportunities from participating in the Green Charge project can also be assumed to be a driver. For Oslo municipality, the system provides flexibility in the power system by reducing peak loads. Such systems can facilitate the uptake of EVs.*
Public leadership	*Oslo municipality is a partner in the H2020 Green Charge project, and has been involved in installing the smart EV charging system at the Røverkollen housing cooperative (Røed 2020).*
Inclusiveness	*Røverkollen housing cooperative includes the residents in the housing cooperative.*
Institutional support and financial support	*Institutional support: N/d* *Financial support: Oslo municipality has most likely provided support for the up-front costs of the investment (Røverkollen, n.d. This information needs to be confirmed). The community energy system is part of the Green Charge project financed by H2020 grant agreement No 769016.*
Community support and acceptance	*N/d.* *Community support and acceptance: The Røverkollen housing cooperative has installed rooftop PV on existing buildings. Compared to wind energy, support for rooftop solar PV is high in Norway; 88% think that rooftop PV should be increased (Kantar 2020).* *Support and acceptance among residents: To our knowledge, a stakeholder acceptance and evaluation of the pilot in the Røverkollen housing cooperative will be undertaken as part of the H2020 project Green Charge (Natvig et al. 2019). Possible drivers of acceptance in the case of Røverkollen include the provision of an environmentally friendly and low-cost resource (solar PV) for charging EVs, a smart charging system which provides residents with predictability and security regarding EV charging.*

Provision of additional environmental benefits	*The project entails renewable electricity production (rooftop solar PV, installed on an existing building), and the smart EV charging system (battery storage of electricity and predictive planning) balances demand with available supplies to ensure optimal energy efficiency and avoid peak demand in the electricity system in Oslo. Such systems could help avoid grid upgrades. The share of EVs is increasing in Norway, and energy systems such as that installed in the Røverkollen housing cooperative could help facilitate the uptake of EVs of residents, contributing to reducing emissions from transport.*
… economic benefits	*The community energy system provides residents with a low-cost resource (solar PV) for charging their EVs. From January 1st, 2022, new price mechanisms for grid tariffs will be introduced and the investment made by Røverkollen could possibly reduce the grid tariff costs for the residents/housing cooperative. Energy systems such as that installed at Røverkollen housing cooperative could also help avoid costly grid upgrades.*
… social community/ societal benefits	*The energy community brings together all residents of the Røverkollen housing cooperative. Services include renewable electricity generation, storage and consumption.*
Drivers and success factors	*Overall objective of the community energy system is to provide environmentally friendly electricity for charging residents EVs at reduced costs. The main drivers are to accommodate charging infrastructural needs from the anticipated increase in EVs in Norway, especially urban areas. In August 2021, 8 out of 10 new cars sold where EVs. Likely success factors in the case of the Røverkollen housing cooperative include local leadership and the participation in the Green Charge project.*
Innovativeness	*The community energy system at Røverkollen is a pilot living lab in the H2020 Green Charge project which combines RES-based electricity production, storage and smart EV charging. It is an innovative approach to addressing multiple local needs and societal goals (increased production of RES electricity, facilitating the uptake of EVs and reduced emissions from transport, cost-efficient home charging facilities for residents in apartment buildings with limitations in the local grid, smart EV charging systems which can help avoid peak demand and costly grid infrastructure investments). The pilot will provide knowledge on this form of energy systems in urban Norway. In terms of social innovation, the project brings together residents in the Røverkollen housing cooperative.*
References	*https://www.greencharge2020.eu/* *http://www.roverkollen.no* *Kantar (2020) Klimabarometeret 2020. Available at: https://www.forskningsradet.no/contentassets/b8513ab2d46f47769707649e4c941f9e/klimabarometer-2020-kantar.pdf* *Natvig et al. (2019). Green Charge Deliverable D5.1 & D6.1. Evaluation Design / Stakeholder Acceptance Evaluation Methodology and Plan. Available at: https://www.greencharge2020.eu/wp-content/uploads/2020/06/D5.1D6.1-Eval-DesignStakeholder-Acceptance-Eval-Methodology-and-Plan.pdf* *REScoop.eu (2020). Energy Communities under the Clean Energy Package. Transposition Guidance. Available at: https://www.rescoop.eu/uploads/rescoop/downloads/Energy-Communities-Transposition-Guidance.pdf* *Røed (2020) Lade bilen hjemme? Ja takk! Available at: https://magasin.oslo.kommune.no/byplan/lade-bilen-hjemme-ja-takk#gref* *Røverkollen.no, n.d. GreenCharge H2020. Infomøte for beboere i Røverkollen brl. Romsås, 23.04.2019. Available at: http://www.roverkollen.no/wp-content/uploads/infomote-lading-april-2019-presentasjon.pdf?x43909* *Standal et al. (2021). COME RES Deliverable 2.1. Assessment report on technical, legal, institutional and policy conditions. Available at: https://come-res.eu/fileadmin/user_upload/Resources/Deliverables/COME_RES_D2.1__Assessment_report_FINAL.pdf*
Stakeholders interviewed	*N/A*

o. energyRegion Michałowo (Poland)

Authors	*Anna Piórkowska, Piotr Nowakowski (KAPE)*
Date	*12.11.2021*
Name of REC	*energyRegion Michałowo*
Country	*Poland*
Type of region	*The energy cluster represents one of model regions selected in Poland. The energyREGION Michałowo (Podlaskie Voivodeship) is a dynamically developing local energy market with balanced energy demand and production, which establishes cooperation of local energy producer with consumer entities. The cluster consists of four communes - the Commune of Michałowo, the Commune of Zabłudów, the Commune of Tykocin and the Commune of Gródek*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The position of RECs in national legislation and in national and/or regional policies is just beginning to take form. In current legislation and policy the operational position of RECs is not explicit. Despite the fact that energy clusters and energy cooperatives have been introduced into the national legislation, there are only a few successful implementation of such solutions.* *An energy cluster is a civil law agreement – both a cooperation agreement and a commercial partnership agreement between its participants that does not have legal personality. It includes a large membership base: natural persons, local government units, entrepreneurs, research institutes, universities. It is technology-neutral and focuses on energy generation and balancing, within a distribution network with a rated voltage lower than 110 kV. The main societal value of a cluster is that it contributes to the local economy. The cluster has open and voluntary membership.* *The definition of energy cluster is in line with Article 2 (16) except for one point: it does not include ownership due to lack of its legal entity. For that reason, energy cluster is does not include the rights and activities listed in the Article 22, or at least not in a direct way. Furthermore energy cluster has limited operation area and cross-border cooperation is forbidden.*
Foundation	*The cluster was initiated in 2015 and launched on June 12, 2017.*
Driving forces	*A direct idea for the Michałów cluster was the need to improve the economic efficiency of an agricultural biogas plant. Through an agreement with local authorities, the producer of biogas receives additional revenues from the sale of heat, and the commune has half the cost of heat for heating the swimming pool and the school complex. Types of stakeholders, who were key in supporting/realizing it were private companies and Communes. Founder members were:* • *Green Energy Michałowo – leader of the cluster,* • *IEN Energy – coordinator.*
Organisational structure/ ownership model	*. The base of cluster functioning is an agreement, started on the 12th June 2017 by Green Energy Michałowo and IEN Energy, two companies from the energy industry. It defines the claims and duties of each member and gave the beginning of showcase cluster encompassing founder members:* • *Green Energy Michałowo – leader of the cluster, main electricity and heat producer in agricultural biogas plant with a capacity of 0.60 MWe and electricity producer in a photovoltaic power plant with a capacity of 0.66 MWe. GE Michałowo also is the owner of the heating network in Michałowo,* • *IEN Energy – coordinator. It is a trading company that provides services on the Polish energy market, mainly in the field of renewable energy and energy clusters [2]. The company provides support in consulting, organizing in the field of energy trading, energy distribution and its balancing, and also is responsible for trade balancing of energy cluster members,*

	and members, which joined in 2018 and 2019 – municipalities Michałowo, Gródek, Tykocin, Zabłudów also Social Welfare House "Jawor" in Jałówka and Municipal Culture Center in Michałowo. *The cluster has one coordinator (private company), which is responsible for electricity trading, knowledge and experience transfer between the cluster members, and development and updating of the cluster documentation. Coordinator is a representative unit and is responsible for contacts with municipalities. Municipalities are other cluster members, which are receivers of the electricity and heat.*
Attributions of roles and functions in decision making	*At the top of the hierarchy there is a coordinator, who has the key position in the cluster. The coordinator is the binder between local energy producers and consumers, and it will also be the entity responsible for knowledge transfer to the cluster. Citizens are engaged in projects realized in the cluster, but they do not have any decisive power.*
Geographical scope	*The cluster includes 4 communes from Podlaskie voivodship. In the second stage of the cluster's life, it is planned to extend the territorial range of the cluster by further communes in the entire Białostocki district.* *The range of activity of the cluster is at the regional level. Member communes are medium size regarding population.*
Activities in the energy system	*The coordinator of the REC is responsible for electricity trading. His tasks include e.g. expansion of the heating network in the cluster and construction of a local power grid. Green Energy Michałowo sp. z o.o. is the main producer of electricity and heat. GE Michałowo Is the owner of the agricultural biogas plant with a capacity of 0,6 MWe and the photovoltaic power plant with a capacity of 0,66 MWe.The Commune of Michałowo, the Commune of Zabłudów, the Commune of Tykocin and the Commune of Gródek are the main receivers of the electricity and the heat.*
Energy technologies	*Technology used in REC energyRegion Michałowo is focused on solar energy and bioenergy. Currently, REC use agricultural biogas plant with a capacity of 0.6 MWe and a photovoltaic power plant with a capacity of 0.66 MWe.* *There have been also implemented other projects e.g. construction of the second biogas plant with a power capacity of 0,6 MW, electromobility and construction of energy storage in Michałowo.*
Key actors and stakeholders involved	*The coordinator (IEN Energy) is the main key actor for initiating and implementing the REC. The tasks of the coordinator will include developing and updating the strategy (concept) of the cluster operation, responsibility for the implementation of the cluster strategy, and sharing knowledge and experience to help other members.* *Green Energy Michałowo is the other key actor, who is the main producer of electricity and heat. GE Michałowo main tasks are energy production, ensuring local fuel logistics and organization of this market.* *The Commune of Michałowo, the Commune of Zabłudów, the Commune of Tykocin and the Commune of Gródek are members of the cluster.*
Scope of participants	*The cluster coordinator is IEN Energy, it's features are: connect local energy producers and consumers, transfer of knowledge and experience of the energy market to the cluster, and develop strategy program.* *Green Energy Michałowo is the leader of the cluster and the main producer of energy and heat.* *The Commune of Michałowo is one of energy and heat receiver and a promoter of energy awareness among the cluster inhabitants.* *The Commune of Zabłudów is one of energy and heat receivers.* *The Commune of Tykocin is one of energy and heat receivers.* *The Commune of Gródek is one of energy and heat receivers.*
Key motivations	*The main motivation of REC energyRegion Michałowo is to increase the energy security and the energy availability, to increase employment opportunities (more work places after the creation of the Technology and Industry Park energyREGION Michałowo), to increase energy and environmental awareness and to stimulate rural areas to activity.* *Moreover the cluster is aimed at reducing energy costs, developing of the local electromobility, developing innovative tools for electricity management in the cluster on the OH and OHT plane.*

Public leadership	*Communes belonging to the cluster are connecting public buildings (e.g. recreation center, City Hall) to the network of electricity and heat consumers. It contributes to the expansion of the cluster activity.*
Inclusiveness	*The coordinator (IEN Energy) of the cluster is responsible for connecting local energy producers and consumers, commercial balancing of energy cluster members and acquiring new cluster members.* *In the Commune of Michałowo, there are many public buildings which are consumers of electricity and heat (e.g. Center of Sport and Recreation, sewage farm).*
Institutional support and financial support	*European funds for construction of PV and solar collectors supported projects in the Commune of Gródek.* *The Regional Operational Programme of the Podlaskie Voivodeship supported the expansion of the heating network in Michałowo, modernization of lighting and installation of an air quality monitoring station.* *The National Fund for Environmental Protection and Water Management and the National Centre for Research and Development might be considered as institutions, which potentially could support some of projects in the cluster.* *National Fund for Environmental Protection and Water Management for "Green Public Transport" is supported projects in the cluster.*
Community support and acceptance	*One of the aspects, which lead to positive attitude is utilization of heat of biogas installation for heating purposes of public buildings and it leads to increased public acceptance of the investment. The next aspect is to create a comprehensive program for activating the local community and it also leads to increased public acceptance of the investment. Another aspect is a construction of a local renewable energy congress and educational center in Michałów, what led to increase of public acceptance.*
Provision of additional environmental benefits	*One of the ecological benefits is supporting the production and distribution of energy derived from renewable sources, promotion high-efficiency use cogeneration of heat and energy electricity based on useful heat demand. Moreover, there are other projects, which will add environmental benefits e.g. electromobility, low-emission buses, electric bikes for transport.* *These actions will bring following benefits to the environment: phasing-out from fossil fuels, what will reduce fossil fuels utilization and improve air quality, will reduce the emission of pollutants from transport sector and improve air quality.*
… economic benefits	*One of the economic benefits of the REC is greater employment opportunities and stimulation of rural areas to activity e.g. a construction of energy installations by farmers and including these installations in the structure of the cluster. Moreover, if energy is more available (what is the key motivation of the cluster), the cost of the energy will be reduced.* *The development of the accommodation and catering services would also bring financial benefits to local community of Michałów. This can be achieved by construction of the local renewable energy congress and education center.*
… social community/ societal benefits	*Farmers could engage with the cluster by means of constructing energy installations, which could be included in the structure of the cluster. There is a lot of emphasis on meetings conducted by cluster members to citizens to increase their knowledge in the field of renewable energy sources and energy efficiency, and shaping pro-ecological attitudes. Moreover, the construction of local renewable energy congress and education center in Michałów, could have a positive influence on the activation of the local community through the development and adjustment of the accommodation and catering services.*
Drivers and success factors	*One of the success factors was cooperation between initial members (Green Energy Michałowo and IEN Energy). It ensures a dynamic development of the cluster .* *Another success factor was dynamic development of the network of partners. It causes joining a few municipalities in 2018 and 2019.* *Moreover, one of the keys to success of the cluster was consistent implementation of the cluster projects, determined by the coordinator.*
Innovativeness	*In cooperation with the Warsaw University of Technology, as research unit, R&D projects will be launched to develop innovative tools for electricity management in the cluster on*

	the OH (virtual trading) and OHT (physical control of production units, energy receipts and storage in the cluster) planes. *Construction of technology parks, centers of improvement and competences, and technology transfer centers to support transfer of knowledge.*
References	*https://klastermichalowo.pl/* *https://magazynbiomasa.pl/klaster-energii-michalowo/* *https://klastermichalowo.pl/wp-content/uploads/2019/03/ME_Klaster-Micha%C5%82owo-wyja%C5%9Bnienia-do-RPO.pdf* *https://www.kierunekenergetyka.pl/artykul,86506,lokalny-rynek-energii-w-michalowie.html?refresh_cache=1*
Stakeholders interviewed	

p. Słupski Klaster Bioenergetyczny (Poland)

Authors	*Anna Piórkowska, Piotr Nowakowski (KAPE)*
Date	*12.11.2021*
Name of REC	*SŁUPSKI KLASTER BIOENERGETYCZNY*
Country	*Poland*
Type of region	*The energy cluster is located in Pomorskie voivodeship. Despite the fact, that the region was not indicated as model region, it consists of successful examples of energy communites.The cluster consists of 4 private and municipal companies – WODOCIĄGI SŁUPSK, ENGIE, PARR and BALTIC WIND, Słupsk City and 20 local entrepreneurs.*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The position of RECs in national legislation and in national and/or regional policies is just beginning to take form. In current legislation and policy the operational position of RECs is not explicit. Despite the fact that energy clusters and energy cooperatives have been introduced into the national legislation, there are only a few successful implementation of such solutions.* *An energy cluster is a civil law agreement – both a cooperation agreement and a commercial partnership agreement between its participants that does not have legal personality. It includes a large membership base: natural persons, local government units, entrepreneurs, research institutes, universities. It is technology-neutral and focuses on energy generation and balancing, within a distribution network with a rated voltage lower than 110 kV. The main societal value of a cluster is that it contributes to the local economy. The cluster has open and voluntary membership.* *The definition of energy cluster is in line with Article 2 (16) except for one point: it does not include ownership due to lack of its legal entity. For that reason, energy cluster is does not include the rights and activities listed in the Article 22, or at least not in a direct way. Furthermore energy cluster has limited operation area and cross-border cooperation is forbidden.*
Foundation	*The cluster was initiated in October 2017 and was certificated in 2018.*
Driving forces	*Słupsk Bioenergy Island is a group of related projects in the field of distributed energy, which the goal is to build a community energy within the meaning of Art. 22 RED II, creating a common market for services energy and local use renewable energy sources.*
Organisational structure/ ownership model	*The cluster consist of the cluster representative, the cluster council, the cluster office and the cluster leader. The cluster leader (municipal company WODOCIĄGI SŁUPSK) is the originator and inspirer of the cluster. The cluster is a cooperation platform that coordinates and initiates projects in the field of renewable energy, CHP and civic energy development and the Low Emission Economy Plan. Energy communities are being formed within the cluster integrating groups of prosumers, producers, investors, R&D units and end-users.*
Attributions of roles and functions in decision making	*At the top of the hierarchy, there is the leader of the cluster (WODOCIĄGI SŁUPSK), who has the key position in the cluster. There is also the cluster council, which is responsible for decision-making.*
Geographical scope	*The cluster includes Słupsk, 4 private and municipal companies and 20 local entrepreneurs. The range of activity of the cluster is at the regional level. Member communes are medium size regarding population. It is planned to extend the territorial range of the cluster by further communes in the entire Słupsk district.*
Activities in the energy system	*Main activities of the cluster in the electricity system are generating, distribution and consumption. Nowadays, the cluster's estimated electricity production is equal 40 GWh per year. The cluster's estimated demand for electricity is equal 43 GWh per year. Energy in the cluster is generated from biogas plant, photovoltaic and CHP.*
Energy technologies	*Technologies used in SŁUPSKI KLASTER BIOENERGETYCZNY are focused on CHP , bioenergy and photovoltaic. Sample implementation projects of the cluster are gas cogeneration system power up to 20 MW, new biogas plant and photovoltaic installation power up to 30 MW.*

Key actors and stakeholders involved	*The cluster leader (WODOCIĄGI SŁUPSK) and the cluster council are the main key actors for initiating and implementing the REC.*
Scope of participants	*The cluster leader (WODOCIĄGI SŁUPSK) is the main key actor for initiating and implementing the REC.* *ENGIE is a private, local heating company. ENGIE is responsible for implementation of CHP.* *PARR is a private company and is responsible for implementation of PV.* *BALTIC WIND is a private company and owner of wind turbines. BALTIC WIND is responsible for implementation of wind energy.* *Słupsk is a local government and is the aggregator of the cluster.* *There are 20 local entrepreneurs, who are signatories of the cluster.*
Key motivations	*Main keys motivations for the establishment of the REC are: to decrease cost of the energy, to create better conditions for the development of the local renewable energy, to increase the energy security and the energy availability, and to improve reliability and energy safety. Additionally, programs, which the cluster would like to develop are electromobility programs and other local programs like renewable energy storages or low-emission public transport.*
Public leadership	*The leader of the cluster and Słupsk City are connecting prosumer of renewable energy and create a group of renewable energy projects "Słupska Wyspa Energetyczna". "Słupska Wyspa Energetyczna" associates renewable energy projects, which goal is to build an energy community and to create a common market for renewable energy sources. Almost every investment is located in the Słupsk.*
Inclusiveness	*The cluster leader and Słupsk City are aggregating local renewable energy prosumers. Currently, the cluster associates 20 signatories.* *In the Słupsk, there are many public buildings, which are consumers of electricity and heat (e.g. water park, sewage farm).*
Institutional support and financial support	*European Regional Development Fund (ERDF) is co-funding use of heat waste from biogas CHP.* *The remaining investments will be financed by loans, bonds or subsidies from regional and local support programs.*
Community support and acceptance	*One of the cluster projects, "ENERGIA DLA OBYWATELI" aims at eliminating energy poverty in Słupsk City. The project is aimed at property owners, who form housing communities in multi-unit buildings managed by a municipal company. It leads to increased public acceptance of the investment.* *Another cluster project is a development of electromobility at local level, which leads to increased public acceptance of the investment.*
Provision of additional environmental benefits	*The cluster will bring the following benefits to environment: phasing-out from fossil fuels what will reduce fossil fuels utilization and improve air quality, will reduce the emission of pollutants from transport sector and improve air quality.*
… economic benefits	*Several economic benefits of the REC are to decrease cost of the energy, to create better conditions for the development of the local renewable energy prosumers and to create permanent economic and social relations.* *Other benefits of the REC are greater employment opportunities and stimulation of rural areas to activity e.g. construction of energy installations by farmers and including these installations in the structure of the cluster.*
… social community/ societal benefits	*Participation in the cluster is directed to the conscious and cooperation-oriented prosumer. The signatories of the cluster are varied local entrepreneurs. One of the cluster's project* "ENERGIA DLA OBYWATELI" *aims at eliminating energy poverty in Słupsk City. Benefits of the project are sharing with housing communities and social community activities.*
Drivers and success factors	*One of the success factors was a good cooperation between the leader of the cluster (WODOCIĄGI SŁUPSK) and Słupsk City. It caused dynamic development of the cluster. Other success factors were well-formulated principles and main strategic goals, which take into account all of the most important aspects. Next success factors were experienced and having considerable knowledge the leader.*
Innovativeness	*R&D projects will be launched to develop innovative tools for electricity management in the cluster. Another implementation of innovative practices is project "ENERGIA DLA OBYWATELI", which aims at eliminating energy poverty in Słupsk City. Other innovative practices, which are planned to be implemented are developing electromobility at local level and biorefinery project in Słupsk.*
References	*https://www.bonusreturn.eu/wp-content/uploads/2020/01/BonusReturn_PolicyBrief2020_POLAND_POL_Digi_compressed.pdf*

	https://forum-rozwoju-lokalnego.pl/uploads/frl/material/file/314/A.Wojtowicz.pdf *http://archiwum.zlotow.pl/Dokumenty/konferen_en_2017/14.Slupski%20Klaster%20Bioenergetyczny_Wagrowiec%202017.pdf* *"Słupski Klaster Bioenergetyczny. Idea i rozwój projektu" – A. Wójtowicz, Wodociągi Słupsk, Lider Klastra – konferencja, 28.08.2018 Słupsk*
Stakeholders interviewed	

q. COMPTEM- Enercoop (Spain)

Authors	*Francisco Rueda, Pouyan Maleki-Dizaji (Ecorys Spain)*
Date	*12.October 2021*
Name of REC	*COMPTEM- Enercoop*
Country	*Spain*
Type of region	*Model region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The Spanish state has partially transposed RED II, although this transposition is still ongoing. The definition of renewable energy community in Spanish legislation (Royal Decree-Law 244/2019 of April 5 2019) is fully compliant with of Art. 2(16) of RED II.*
Foundation	*The pilot project was officially launched in 2020 and inaugurated in September 2021. The extension of this pilot project to the whole village of Crevillent (village-wide REC) will span through the period 2021-30.*
Driving forces	*The establishment of this REC was a collaboration between the energy cooperative Enercoop and the local government of Crevillent. The support of the EU through the H2020 project MERLON was also key in developing the first pilot project.*
Organisational structure/ ownership model	*The organisational form of the REC is that of a cooperative (Enercoop), being its costumers also members and owners. There are currently 11,000 members in Enercoop, out of which approximately 65 households make part of this REC pilot project.*
Attributions of roles and functions in decision making	*Members can take part in the decision making of the cooperative on the basis of 1 member 1 vote. The administrative bodies (Council and Control body) are democratically elected by members.* *There are no dividends or profits for members since the cooperative must be a non-for profit company in compliance with Spanish legislation. The lands continue to be of public ownership and the energy installations are left to the village. Given that the land continues to be of public ownership, the legal form in which the installation has been built is through that of a cession (public tender). Enercoop can exploit this land and the installation it has built (in this case a REC), but the facility becomes publicly owned.*
Geographical scope	*The pilot project covers a small neighbourhood of Crevillent and gives access to 65 households (250 people). The expansion through 2021-2030 will eventually cover the whole village (30,000 people). Nevertheless, participation in the REC is voluntary and therefore it is difficult to give a number on the members that will finally benefit from them. The current number of members of Enercoop is 11,000 (these are citizens who have their energy supply contracted with the cooperative through the old cooperative model, not necessarily the same number of members of the REC once this expands to the whole municipality).*
Activities in the energy system	• *Collective self-consumption of renewables: installation of PV solar energy generation facilities in public and private building roofs that will provide energy for consumers in the vicinity and in larger previously unused public land.* • *Storage: hybrid medium capacity storage facilities of ion-lithium with a 240kW capacity.* • *Simplified compensation: excess energy is released into the general grid for a compensatory payment.* • *Energy efficiency: optimization of the energy and economic flows of the installation.* • *E-mobility charging facility: two semi rapid charging facilities of 22KW (44KW in total).* • *Electricity sharing/ peer-to-peer energy transactions using blockchain technology.* • *A digital information tool: mobile application for citizens with information about their energy consumption.*

	• *Energy divulgation facilities: public digital information panels for the divulgation of information about the energy sector in order to empower citizens.*
Energy technologies	*PV solar energy generation facilities with storage and two EV mobility charging facilities.*
Key actors and stakeholders involved	*The main actors are the energy cooperative Enercoop, the local government of Crevillent and the H2020 project MERLONN. Other actors involved are the private companies Neuroenergía (energy consultancy services), Atos (digital services), Cobra (installation and maintenance of electric networks), Home (architecture); the regional government of Valencia and the cooperative bank Caja Rural Central.*
Scope of participants	*The participants in the REC are consumers-members of Enercoop (this includes households, the local government of the municipality and local companies).*
Key motivations	*The main objectives of this pilot project and its expansion are (1) collaborate towards the green transition by achieving a 100% renewable origin in the electricity mix of Crevillent by 2050, (2) produce rebates in the electricity bills of users, (3) democratise the access and management of regular citizens to energy.*
Public leadership	*The collaboration of the local government of Crevillent was key in the establishment of the pilot project (and in its future expansion). The municipality gave administrative support to Enercoop and ceded previously unused public land for the construction of the facility. The municipality will allow for the installation of PV solar panels in local government roofs and will cede public unused land for the construction of larger solar energy generation facilities.* *The regional government provided two e-mobility charging stations.*
Inclusiveness	*Given its condition as a pilot project, this REC is small and gives coverage to a very small number of citizens (65 households). This necessarily limits broad participation. Nevertheless, the local government of Crevillent has actively participated in the name of the whole village.*
Institutional support and financial support	*The REC counted with the administrative support of the local municipality and the cession of public land for the installation of the facilities.* *The REC benefitted from EU funds through the H2020 project MERLON, that provided the technological equipment and financed up to 75% of the pilot project (300,000€).*
Community support and acceptance	*Among the factors that could have created community support and acceptance for the REC are: (1) revitalization of a previously unused plot of land (incl. construction of sports facilities and green areas), (2) participatory process in the design of the installation, (3) rebates in the energy bill, (4) no initial investment needed (see Drivers and success factors), (5) contribution to local carbon neutrality.*
Provision of additional environmental benefits	*The pilot project was the first step in the ecological transition of Crevillent and is framed in the objective of the municipality to reduce its energy CO2 emissions by 50-55% by 2030 and to become carbon neutral by 2050 (mainly through the expansion of the REC).* *The project also led to a revitalization of previously unused public land by transforming it into a green space with sport facilities.*
… economic benefits	*The current pilot project produces energy savings of an estimate 15-20% for 65 households (250 people) thanks to limiting grid losses and optimising energy flows.*

	The facility will produce rebates in the energy bill of consumers without the need of these to make any initial investment (as it is the cooperative the one who makes them). *The pilot project has given value to a previously unused plot of land, in which, apart from the PV solar panels, green spaces and sport facilities have been built. The expansion of the REC to the whole village will mean the use of currently empty roofs and public lands.* *Some local companies have been involved in the construction of this local project, what has produced economic value in the village.*
… social community/ societal benefits	*There has been citizen participation in the design of the space that this first pilot project occupies, which also includes green spaces and sports facilities.*
Drivers and success factors	*The main success factor in the establishment of the REC has been the use of an energy cooperative for the development of the REC project. Through this energy cooperative, consumers are also members, and therefore owners of the REC. The cooperative organizational structure makes it very easy to transition towards a REC.* *Moreover, initial investment cost for members that could had desincentivised the establishment of the REC have been avoided. Members of Enercoop did not have to make any payment for the establishment of the REC as the 25% of it that was not financed by the EU has been financed by Caja Rural Central through a loan. The rebates in the energy bills of members that the REC produces will be used to repay the loan. This way, consumers-members will not see any change in their energy bill for the next 7-8 years but they will also not have to face any investment costs.* *The cesion of public land for the construction of the project has also meant a significant reduction in what would be the usual investment costs for such a facility.* *The EU financing has also been key in reducing the investment costs (75%).*
Innovativeness	*The constitution of this pilot project for a REC is considered innovative because it is the first viable and successful one in Spain. This has attracted the attention of several institutional actors (among them the Ministry for the Ecological Transition) that see it as an innovative example of the way forward for energy transition in Spain.*
Adaptation and Transferability	*In principle, the establishment of an energy cooperative in which consumers are also members could be replicated elsewhere. This makes it very easy to create a REC, as the organizational structure leads to a natural transition to it.* *The investment costs that could disincentivise the establishment of REC for members have been avoided by redirecting the rebates in the energy bill to the repayment of the loan. This could also be replicated elsewhere.* *The cession of public land (that has led to significant reductions in investment costs) could also be replicated, although it will of course depend in the availability of unused public land. This could be more difficult in denser urban areas.* *EU funds could also be replicated elsewhere.*
Model character for other regions	*Again, the cooperative organizational structure, the use of rebates on the bill to repay the loans and the cession of public land could serve as a model for overcoming the barriers that hinder the development of RECs (organizational form and initial investment). The support of EU funding has also been key in reducing the initial cost.*
References	https://www.boe.es/boe/dias/2019/04/06/pdfs/BOE-A-2019-5089.pdf https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN https://www.grupoenercoop.es/wp-content/uploads/2021/06/Memoria-Enercoop-2020.pdf & https://www.youtube.com/watch?v=J2Ytl-PHPhs

r. Hacendera solar (Spain)

Authors	*Francisco Rueda, Pouyan Maleki-Dizaji (Ecorys Spain)*
Name of REC	*Hacendera Solar*
Country	*Spain*
Type of region	*Model region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*The Spanish state has partially transposed RED II, although this transposition is still ongoing. The definition of renewable energy community in Spanish legislation (Royal Decree-Law 244/2019 of April 5 2019) is fully compliant with of Art. 2(16) of RED II.*
Foundation	*The pilot project was officially launched in December 2019 and inaugurated in October 2020. There will be a second phase of the project, although no clearly defined plans are available yet.*
Driving forces	*The establishment of this REC was a collaboration between the Spanish grid operator Red Eléctrica de España (REE), the energy cooperative Megara Energía and the local government of Castilfrío de la Sierra.*
Organisational structure/ ownership model	*The organisational form of the REC is that of an association. A Core Group team developed the initial plans and the discussions with citizens.* *According to Spanish legislation, an association is a group of people with a collective objective for which they develop collective activities. The activities cannot be economic, and they should be non-for-profit organizations. Its administration procedures must be democratic.*
Attributions of roles and functions in decision making	*The REC is administered by a local association with its own statutes and internal procedures.*
Geographical scope	*The project covers a series of public buildings in the village: the civic centre, a social protection house, the water lift facility and the medical office. The second phase is expected to include private buildings.*
Activities in the energy system	*The activities of this REC ranked by order of importance are:* 1. *Collective self-consumption of renewables: installation of 13kWp PV solar energy generation facilities in two locations and installation of a 200W wind mini-turbine.* 2. *E-mobility charging facility.* 3. *Simplified compensation: excess energy is released into the general grid for a compensatory payment.*
Energy technologies	*PV solar energy generation facilities (13kWp), one wind mini-turbine (200W) and one e-mobility charging facility.*
Key actors and stakeholders involved	*The main actors are the Spanish grid operator REE, the energy cooperative Megara Energía, the local government of Castilfrío de la Sierra and the regional cooperative bank Caja Rural de Soria.*
Scope of participants	*The participants in the REC are the local government and the neighbours of the village.*

Key motivations	*The main objectives of this project are (1) to test the viability of a REC in Castilfrío de la Sierra, (2) to foster PV installations of shared autoconsumption with grid suppport, (3) to estimulate investments in low-carbon economies that reduce the emissions and expenditures of municipalities, (3) to define the complementarity of energy demands of the different buildings that the local government owns or manages.*
Public leadership	*The impulse and financing of the Spanish grid operator, REE (Spanish government as main shareholder), was key in the establishment of the project.* *The local government of Castilfrío de la Sierra also collaborated in its development.*
Inclusiveness	*The initial plans were designed by the Core Group of neighbours more interested in the project. The concretization of the project was done together with the rest of the community through a co-creation project.*
Institutional support and financial support	*The REC counted with the institutional support of REE and the local government.* *The REC benefitted from an investment by REE, as well as from the financing of the engineering costs by Caja Rural de Soria.* *The support of REE was very important for the successful establishment of this REC.*
Community support and acceptance	*Among the factors that could have generated community support and acceptance are: (1) the creation of a Core Group of neighbours that designed the initial plan, and (2) the co-creation phase through which the actual project was designed. This way, the REC countes with the active participation of the village and was tailored to local interests and circumstances.*
Provision of additional environmental benefits	*The project reduces the CO2 emissions of the village by 6.8 tonnes/year.*
… economic benefits	*The project produces a rebate on the energy bill of the local government of about 60%.*
… social community/ societal benefits	*The constitution of the REC has allowed for the mobilization of neighbours around a common goal. This has mainly been done by the Core Group and through the co-creation process.*
Drivers and success factors	*The main success factor in the establishment of the REC has been the impulse and financing of REE, that sees it as a pilot project and a role model for similar rural communities.*
Innovativeness	*The REC is relatively innovative, especially in the region where it has been installed (Soria is a depopulated area scattered with very small villages with a very aged population, due to its very low number of inhabitants and its low density it sometimes lacks sufficient coverage of certain services). This REC is seen as a pilot for what could be a model of collective self-consumption for similar villages in the region.*
Adaptation and Transferability	*It is unlikely that this model can be replicated elsewhere given the strong involvement of REE that has been necessary for it to work out. Grid operators are unlikely to widespread finance RECs, neither in Spain nor abroad.*
Model character for other regions	*The project has started given coverage to public buildings and will later cover private ones. This could be a model for other small rural communities (Castilfrío de la Sierra has a population of 37 inhabitants) in which the acceptance of new technologies and organisational forms might be difficult. By beginning with public buildings, an example is established for the rest of the community.*

References	https://www.boe.es/boe/dias/2019/04/06/pdfs/BOE-A-2019-5089.pdf https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN http://www.premioconama.org/bo/bancorecursos/banco_imagenes/premios20/inscripciones/14_HacendSolar_Castilfrio_25OCT19-V6.pdf

s. Energy Cooperative Loenen (Netherlands)

Authors	*Luc F.M. van Summeren (Tu/e), Kellan Anfinson (TU/e)*
Date	*18-10-2021*
Name of REC	*Energy Cooperative Loenen*
Country	*The Netherlands*
Type of region	*Other region in COME RES country (Gelderland, the Netherlands)*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*While The Netherlands has not fully completed the transposition process, the Energy Cooperative Loenen does comply with the provisions as they are expected to be transposed.*
Foundation	*The community was first organized as a foundation: 'Loenen Energy Neutral'.* *For the project another organization was set up: 'Duurzame Projecten Loenen'.* *Only recently (2019), Energy Cooperative Loenen was founded, which initiates collective energy projects.*
Driving forces	*Villagers / community members, mostly with an entrepreneurial background which enabled them to bring a relevant skill set to the project and included connections to businesses* *Qirrion (daughter company of the DSO Liander) was strongly involved in the set-up of the cVPP.* *Translyse: the company of one of the initiators of the cooperative. This company was hired to work on the cVPP project (because it had come to rely too much on volunteer work only)* *Municipality of Apeldoorn: They set up a competition for the best idea for making your village sustainable. 'Loenen Energie Neutraal' won this competition (200,000 Euro), which the community used to set up a revolving fund to invest in solar PV, insulation, heat pumps, etc.* *Province of Gelderland: providing funding.* *cVPP (Community-based Virtual Power Plant Loenen) project partners: expertise, EU funding*
Organisational structure/ ownership model	*Energy Cooperative Loenen = cooperative* *Loenen Energie Neutraal = foundation* *Duurzame Projecten Loenen = foundation* *Members in the Cooperative pay a membership fee of 10 euros per year, which gives them the right to vote at the members' meeting and contribute ideas about making Loenen more sustainable. Membership is free through volunteering (on average more than 2 hours per week) or participating in the cVPP project.* *Members will also be able to invest in cooperative projects, such as the construction of a solar roof and receive a return on it. A prospectus is drawn up for each project in which the possible risks and the annual return are mentioned.*
Attributions of roles and functions in decision making	*Open and democratic with a focus on compromise. Membership gives one vote and though the cooperative does not formally follow a consensus voting model, the focus on compromise is used to broaden the appeal to community members and avoid steering by a central clique.*
Geographical scope	*Loenen (rural village) of about 1,300 households covering an area of about 37 km^2.* *Resources have come from outside the village, but direct participation and activities are limited to the village.*

Activities in the energy system	*Generation. They are also experimenting with managing energy demand and supply within the community (e.g. controlling when heat pumps and electric vehicles use energy). They are not big enough yet, but they want to explore setting up a cooperative aggregator to sell flexibility on behalf of energy communities.* *They want to supply energy to their community in the future. Currently they do this through OM Nieuwe Energie, a cooperative energy supplier.* *Distribution, consumption, and energy sharing through the virtual power plant.*
Energy technologies	*EMS (Energy Management System) – the suite of technologies from smart meters to community dashboards enabling the virtual power plant.* *Solar 2.2 MWp, electric vehicles (owned by members), heat pumps.* *They are exploring if they can also include industrial appliances, to shift when energy is consumed (e.g. flexibility).*
Key actors and stakeholders involved	*Several community members, mostly with an entrepreneurial background. Companies: Qirrion, Translyse. Public: Municipality of Apeldoorn, Province of Gelderland.*
Scope of participants	*Mainly citizens, but they were also exploring collaboration with local SMEs (to involve their flexibility assets). Size is about 275 households.* *Companies on whose roofs solar panels are placed, the main current case being the Thomassen Kanal-Zuid distribution centre.*
Key motivations	• *Community ownership and having a larger say in local energy generation projects (who gets benefits, locations, etc.).* • *Self-sufficiency in terms of energy.* • *Decarbonization.* • *Reduction of costs (both for community and for wider society).*
Public leadership	*Municipality of Apeldoorn and Province of Gelderland are involved, but more in the background by providing financial support.*
Inclusiveness	*They aim to include not only citizens with solar panels, heat pumps, electric vehicles, but anyone who would like to join. They also seek collaboration with the social housing association to also include their tenants in sustainable projects.* *Their revolving fund included both a loan and a gift for community members, to lower the costs and to allow citizens to pay back the loans with the cost savings. This supports investment by lower-income community members in sustainable energy technology.*
Institutional support and financial support	*Financial support from municipality of Apeldoorn (prize money, was part of an EU funded project).* *cVPP project is funded by the EU (Interreg NWE) and by the province of Gelderland.* *The energy cooperative is also involved in Energie Samen and REScoop.EU (also part of the REScoop Flexibility Working group).* *Qirrion and Liander were project partners, who provided expertise and knowledge.* *Loenen faced issues with the EU funding. You first have to spend it before you can reclaim it. But this means that you need to have money in the first place. The province of Gelderland provided financial support to cover this.*
Community support and acceptance	*Based on informal observation, the people in Loenen are positive about the initiative. The revolving fund created a lot of positive energy and support. The cooperative also put a lot*

	effort into engaging the community members in the design of the cVPP, and received got a lot of positive feedback.
Provision of additional environmental benefits	*Minimal: they take into account surrounding nature when deciding where to locate RE generation.*
… economic benefits	• *Revolving fund: lower energy bills* • *Collective energy generation: lower energy bills / financial revenues* • *Employment: Translyse is being hired to do work for the community.*
… social community/ societal benefits	• *Increase energy independence.* • *Shared activities and undertaking.* • *Developing community values and goals* • *Having a larger say in how/where/when energy generation projects are developed in their local surroundings.* • *Profit with returns based on individual investment in projects. Other profits are used to help fund new projects.*
Drivers and success factors	*Local community members with expertise.* *Prize money (200,000 Euro): this revolving fund allowed for large investments in terms of energy generation (they generate +/- 25% of their electricity demand, this will go up towards 50% in the near future)*
Innovativeness	*cVPP/flexibility can be seen as a social innovation in the sense that it adopted a technology (VPP), but adapted it to make it better fit with community values.* *They are one of the first energy communities experimenting with flexibility and demand response. Previous projects were initiated and largely driven by incumbents like the DSO.*
References	*Van Summeren, L.F.M., Wieczorek, A.J., Bombaerts, G.J.T., Verbong, G.P.J., 2020. Community energy meets smart grids: Reviewing goals, structure, and roles in Virtual Power Plants in Ireland, Belgium and the Netherlands. Energy Res. Soc. Sci. 63. https://doi.org/10.1016/j.erss.2019.101415* *Van Summeren, L.F.M., Wieczorek, A.J., Verbong, G.P.J., 2021. The merits of becoming smart: How Flemish and Dutch energy communities mobilise digital technology to enhance their agency in the energy transition. Energy Res. Soc. Sci. 79, 102160. https://doi.org/10.1016/j.erss.2021.102160* *Mourik, R.M., Breukers, S., van Summeren, L.F.M., Wieczorek, A.J., 2019. The impact of the institutional context on the potential contribution of new business models to democratising the energy system, in: Lopes, M., Henggeler, C., Janda, K. (Eds.), Energy and Behaviour: Challenges of a Low-Carbon Future. Elsevier. https://doi.org/10.1016/B978-0-12-818567-4.00009-0* *https://www.rescoop.eu/news-and-events/news/webinar-recap-unlocking-community-based-flexibility-to-transform-the-energy-system* *https://www.rescoop.eu/uploads/3.-Loenen-cVPP-for-RESCOOP-webinar-on-flexibility-20-11-2020-v0.2.pdf* *https://loenenenergie.nl/*
Stakeholders interviewed	*Luc F.M. van Summeren interviewed several community members, and followed them for over 3 years. One of the key contacts: André Zeijseink andre.zeijseink@translyse.nl*

t. Energy Gardens (Netherlands)

Authors	*Sandor Lowik (Milieudefensie), Erik Laes (TU/e)*
Date	*25 October 2021*
Name of REC	*Energy Gardens (concept to increase ecological value of REC initiatives)*
Country	*The Netherlands*
Type of region	*Target region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*Yes*
Foundation	***Energy Gardens** is a concept of the Dutch Nature and Environmental Federation (Natuur en Milieufederaties - NMF), which is a non-profit foundation and aims to design and realize multifunctional and biodiverse energy parks for and with the local community. The energy parks are open to the public, offer recreational and educational services, involves the local community from design to exploitation and maintenance. Three pilot Energy Gardens started in 2019 and more Energy Gardens projects are getting started.*
Driving forces	*The main driver is the NMF who owns and promotes the Energy Garden concept. In each project there are multiple stakeholder drivers. In all cases a local energy initiative, a municipality, local nature and environmental volunteer groups are involved, and in most a commercial developer (interested in investing in renewable energy as a profitable activity).*
Organisational structure/ ownership model	*For each Energy Garden, the organizational structure/ownership model can be different, depending on local circumstances. The developer can be a local energy cooperative or a private company, or a joint venture of these two. The management and maintenance of the Energy Garden will be allocated to a management foundation in which the developer, the NMF and the local community are represented. In this way the identity of the Energy Garden and local involvement with volunteers are secured.*
Attributions of roles and functions in decision making	*The decision making process changes over time. During the development phase, the project team with developer and NMF closely involve citizens and stakeholders in a co-creation process in designing the Energy Garden. Formal decision making power lies with the developer. During the management and maintenance phase, the management foundation has decision making power. Citizen volunteers are represented in the board of the management foundation.*
Geographical scope	*The geographical area and coverage differ per Energy Garden. For the time being, three energy gardens are under development: Mastwijk, Assen-Zuid and De Noordmanshoek. There are multiple ways for citizens to participate. During the co-creation design sessions at least the immediate neighbourhood is represented, as well as local stakeholder groups, such as nature and environmental associations. Depending on the geographical scope of the involved local energy initiative more citizens are involved, for instance as participant in the local energy initiative. The Energy Gardens project itself has a national scope and aims to reach as many citizens as possible.*
Activities in the energy system	*The main activities in the energy system currently are electricity generation and supply (electricity produced by the solar power installations is sold to the electricity grid).* *In the future activities such as energy storage and energy sharing are possible.*
Energy technologies	*For now, the Energy Gardens focus on solar energy on land. The actual solar power installations have not yet been built. Data about planned capacities are however available. The energy garden in Mastwijk will have a capacity of 10.9 MW (occupying 12 ha), Assen Zuid will have a capacity of 21.3 MW (23 ha), De Noordmanshoek will have a capacity of 7.8 MW (8 ha).*

Key actors and stakeholders involved	*The main driver is the NMF who owns and promotes the Energy Garden concept. In each project there are multiple stakeholder drivers, in any case a local energy initiative, a municipality, local nature and environmental volunteer groups, and mostly a commercial developer*
Scope of participants	*Participants: members of the local energy initiative, local nature and environmental associations (for design, maintenance and monitoring biodiversity), local schools (for educational programmes), holidaymakers/tourists (who visit Energy Gardens), citizens, municipalities.*
Key motivations	*The main motivations for Energy Gardens are* *1) to involve local citizens and stakeholders directly from the start in the design project to capture the main local nature-, landscape-, cultural-historical values in the project area and* *2) to create and maintain a renewable energy generation project with multiple functionalities (due to scarce land) and is co-owned by the local communities.* *Overall, these serve promote acceptance for large renewable energy projects in landscapes and promote biodiversity.*
Public leadership	*Municipality is always involved in implementing a particular energy garden. They help with finding suitable locations and organizing co-creation activities.*
Inclusiveness	*The Energy Gardens are (partly) accessible for wheelchairs, the educational program on energy generation and biodiversity is aimed towards school children and illiterate people.*
Institutional support and financial support	*The Energy Garden pilot projects are mainly funded by a donation of the Dutch Nationale Postcode Loterij. For the pilot project in Utrecht the local community successfully applied for a Leader subsidy (a subsidy available for innovative energy projects). Other financial sources are donations and crowdfunding. The energy generation installation has SDE subsidy.*
Community support and acceptance	*The process of participative design has led in all three pilot projects to social involvement and acceptance. No formal objections have been filed to the required permits. Citizens also have taken initiative to realize additional functionalities, such as an "innovation energy path" with exhibitions of novel energy solutions to inform and educate visitors of Energy Gardens.*
Provision of additional environmental benefits	*Enhancing ecological value and biodiversity is one of the pillars of Energy Gardens. For each Energy Garden specific ecological design sessions lead to special attention to local species, such as birds, reptiles, insects and flowers.* *Local nature and environmental volunteers are consulted and involved in the design and practical maintenance and monitoring of biodiversity. Energy gardens are built e.g. on unused industrial terrain, or in one case on a remediated landfill.*
… economic benefits	*Several economic benefits relate to energy production and distribution, such as financial participation with shares or certificates in the project by citizens and local companies, employment for local companies, and a financial fund for the local community.*
… social community/ societal benefits	*The Energy Garden in itself adds value to the community, since it is open to the public, offers recreational and educational activities, is a nice place to recreate and is very well ecologically and landscape embedded. By involving volunteer groups in management and maintenance, the Energy Garden is co-owned by the community. Involving local nature and environmental associations for maintenance and monitoring of biodiversity, the community keeps ownership over nature and landscape.*
Drivers and success factors	*1) to involve local citizens and stakeholders directly from the start in the design project to capture the main local nature-, landscape-, cultural-historical values in the project area and* *2) creation and maintenance of a renewable energy generation project with multiple functionalities (due to scarce land)*

	3) co-ownership by the local communities.
Innovativeness	*The Energy Garden project is innovative in a) making solar parks accessible to the public with functionalities such as recreation and education and b) applying participatory design processes in which local values define the design principles and energy generation is regarded as an ingredient to increase environmental and social value, thereby involving local communities and citizens from the start in true co-creation processes*
References	*www.energietuinen.nl*
Stakeholders interviewed	*n/o*

u. Citizen wind farm “de Spinder” (Netherlands)

Authors	*Erik Laes (TU/e)*
Date	*12 October 2021*
Name of REC	*Burgerwindpark de Spinder (Citizen wind farm “de Spinder”)*
Country	*The Netherlands*
Type of region	*Target region*
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*Yes*
Foundation	*In 2015, the company Spinderwind BV was set up, a partnership between the Energiefonds Brabant and 11 local energy cooperatives united in Burgerwindpark de Spinder. The wind farm started operation in April 2020.*
Driving forces	*In 2012, the Municipality of Tilburg decided to map out how and where it was possible to save energy and generate sustainable energy. One of the possible locations was the Spinder area near the Attero waste mountain on the site of the De Dommel water board. This is the current location of “Burgerwindpark De Spinder”. In 2014, the municipality of Tilburg invited local energy cooperatives to play a role in the development and realization of a citizen wind farm. They responded positively. However, the eleven energy cooperatives did not want to play only a supporting role, they wanted the leading role and as a result they joined forces.* *At the end of 2015 the organization was strengthened thanks to the collaboration with Energiefonds Brabant (public investment fund). Since Energiefonds Brabant wanted to become the owner of the wind farm together with one partner, the eleven energy cooperatives united in Burgerwindpark De Spinder U.A.. In order to properly arrange the financial aspects of the wind park investment, the company Spinderwind BV was set up. Within this company, the necessary money has been raised and the administration is managed.*
Organisational structure/ ownership model	● *Burgerwindpark de Spinder is an alliance of 11 local energy cooperatives (LECs).* ● *Each member of the 11 LECs was offered the opportunity to buy one or more shares (so-called Spinderdelen) in the wind farm, up to a maximum of 80 shares.* ● *Burgerwindpark de Spinder is 50% owner of the company Spinderwind BV, that owns and manages the wind farm.* ● *The other 50% is owned by the EnergieFonds Brabant (public investment company)* ● *Profit is split between EnergieFonds Brabant and Burgerwindpark de Spinder* ● *Each owner of a ‘Spinderdeel’ (a ‘Spinder share’) of 250 euro gets a maximum yearly dividend of 18,5 euro.* If there *are excess profits, these go to the 11 LECs, to be used in the financing of other local energy projects.*
Attributions of roles and functions in decision making	*Four members of the 11 LECs composing the Burgerwindpark de Spinder are elected as administrators of the 50% ownership interest in the wind farm.*
Geographical scope	*Burgerwindpark de Spinder is an alliance of 11 local energy cooperatives from 10 municipalities in the ‘Hart van Brabant’ region. In total, 619 households invested in the wind farm.*
Activities in the energy system	● *Sale of electricity production by the wind farm (In 2020, 24345 MWh of electricity was produced) to the wholesale market.* ● *Spinderwind BV is also a licensed energy supplier, so the members of the energy cooperatives can also directly contract their electricity from Spinderwind.*

Energy technologies	*A wind farm, consisting of 4 wind turbines, with a combined power of 14,4 MW.*
Key actors and stakeholders involved	*The collaboration with Energiefonds Brabant (public investment fund) was vital to realize the wind park. Since Energiefonds Brabant wanted to become the owner of the wind farm together with one partner, the eleven energy cooperatives united in Burgerwindpark De Spinder U.A.. The municipality of Tilburg has been active in reaching out to the local energy cooperatives for collaboration in the project.*
Scope of participants	*Windpark de Spinder is an association of 11 local cooperatives with citizen participants.*
Key motivations	*The objectives of the cooperative Windpark De Spinder U.A. are laid down in the articles of association of the cooperative. These articles of association include the following:* ● *Producing or causing the production of sustainable energy in the Hart van Brabant region, directly or indirectly for the benefit of the members;* ● *Contributing to the local energy transition and increasing sustainability awareness within the local community in general and the cooperation of the members in particular;* ● *Stimulating the supply of sustainable, locally generated energy in the Hart van Brabant region.*
Public leadership	● *Energiefonds Brabant is 50% owner of the wind farm. This is a public investment fund, managed by the province of Brabant. Energiefonds Brabant provided the risk-bearing capital for the project, which was crucial to get the wind park started. For instance: public consultation, licensing etc. cost more than 700kEuro. It is almost impossible for citizens to come up with this amount of money.* ● *The city of Tilburg played a vital role in mapping out the suitable location for the wind park, and in actively reaching out to local energy cooperatives for cooperation.*
Inclusiveness	*Spinderwind BV gives all residents from seven municipalities in the Tilburg area the opportunity to participate financially in the project through the sale of so-called 'Spinderdelen' (i.e. shares of 250 Euro). They raised a total of €1.5 million from private households (619 in total). These individuals are the holders of Spinderdelen and, through their membership of one of the eleven affiliated energy cooperatives, they own part of the wind farm. They were approached through a large, local recruitment campaign. Thanks to the great interest, it was possible to raise sufficient equity capital. Banks provided additional loans needed to raise the necessary capital.*
Institutional support and financial support	*Energiefonds Brabant provided the risk-bearing capital for the project, which was crucial to get the wind farm started. It also has a lot of experience in setting up renewable energy projects.* *The main financial enabling instrument is the Sustainable Energy Production Incentive Scheme (SDE+), implemented by the Ministry of Economic Affairs. For the cooperative Burgerwindpark De Spinder U.A. the SDE+ was awarded in November 2017. An annual amount is provided for a period of 15 years to make up for the difference in production price between the wind power and 'grey power'. This scheme has been changed in 2020 but Burgerwindpark De Spinder can enjoy the original conditions for 15 years.*
Community support and acceptance	● *Contributing to the local climate action plans of the city of Tilburg and the energy region of Hart van Brabant.* ● *Intensive period of public consultation, ahead of the official licensing process. This allows for taking into account the public concerns in the application for a license. License was delivered without appeal to a higher court.* ● *Direct value for the members of the cooperatives (value of one share initially 250 Euro, yearly dividend is paid).* ● *Members of the cooperative can also use Spinderwind as they energy supplier.*
Provision of additional environmental benefits	*Environmental benefits are mainly the reduction of CO2 emissions. The wind farm is located at a distance of 3 km. from the nearest Natura2000 area; therefore, the ecological impact is minimal.*

… economic benefits	• *Direct value for the members of the cooperatives (value of one share initially 250 Euro, yearly dividend is paid).* • *Members of the cooperative can also use Spinderwind as their energy supplier.* • *EnergieFonds Brabant only invests in proven technologies (wind, solar, biomass) with solid business plans.*
… social community/ societal benefits	*Excess profits (beyond the profit attributed to the owners of the 'Spinderdelen') goes to the 11 LECs, who can use this money to realize local projects with additional societal benefits (e.g. organization of local energy bureaus to give advice to citizens on energy use).* *In addition, the realization of Spinderwind led to the signing of a cooperation agreement between the municipalities of the Hart van Brabant region and the local energy cooperatives for realizing the goals as set down in the regional sustainable energy strategy.*
Drivers and success factors	• *Local government (Tilburg) looking for suitable locations for RES investment + outreach to LECs for partnership.* • *Intensive period of public consultation, ahead of the license application.* • *Participation of EnergieFonds Brabant to offer risk capital and experience.* • *Guaranteed ROI once the windmills are operational through the SDE+ scheme.*
Innovativeness	*Coalition of 11 small energy cooperatives to realize a large wind project, with help from the province (funding).*
References	*Spinderwind - samen toekomst met wind*
Stakeholders interviewed	*n/o*

Annex 2: All self-evaluation matrices

2.1. Ecopower (Belgium)

Authors	*Meynaerts Erika, van Maris Kelsey, Pappa Stavroula, Dirk Vansintjan*		
Date	*11/10/2021*		
Selection Criterion	**Guiding Question**	**Self-Evaluation ***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	national & European level broad range of activities: energy production & supply, energy efficiency, car sharing; participation in (European) research projects that contribute to the energy transition at large and circular economy
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II?* *(e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	all renewable energy cooperatives, member of REScoop Vlaanderen are considered to comply with the provisions
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	medium	Ecopower is partner in the European research project Circusol to develop and demonstrate business solutions for circular economy in the solar power sector Ecopower produces green electricity from its own installations, thus contributing to the reduction of the CO2 emissions. Moreover, Ecopower contributes towards the reduction of the energy consumption of its members and in this way increases their climate change awareness, as the average Ecopower member consumes half of the average Flemish household. Ecopower also removes waste out of the river Dijle at its watermill in Rotselaar.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	high	Already operational since 1991; more than 60.000 cooperative members; more than 50 FTE; social capital raised > 55 mio euros
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	medium	Ongoing work done by the cooperative energy supplier to help households that have a budget meter. research projects with city of Eeklo and Energent that focus on lower-income groups

Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	Vulnerable customers can pay a small amount extra on the energy bill, that enables the acquisition of the share in two years Electricity at cost, clear invoices, good communication Ecopower is a driver for the collaboration between cooperatives and contributed to the creation of both the Belgian and the EU Federations of energy coops.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	high	Cf. next comment
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	high	The producer/supplier model seems interesting for other regions, especially if the coop succeeds in being one of the cheaper suppliers. Also the legal form of a cooperative is well known and recognised both in Belgium and around the EU, which contributes to the transferability of the case.

* The REC fulfills the criteria “fully – in average – poorly”.

** By social innovation we refer to “*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*”.

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.2. Beauvent (Belgium)

Authors	*Meynaerts Erika, van Maris Kelsey*		
Date	*12/10/2021*		
Selection Criterion	**Guiding Question**	**Self-Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	National & European level: -broad range of activities: energy production (PV, wind, CHP, district heating network) Operational across Flanders
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	all renewable energy cooperatives, member of REScoop Vlaanderen, are considered to comply with the provisions
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	medium	Beauvent produces green electricity from its own installations, thus contributing to the reduction of the CO2 emissions. Beauvent only owns cars on alternative fuels (CNG, plug-in hybrid and electric). Their office is equipped with a solar installation and connected to a heat network. They have an office on a low-energy boat
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	high	13 FTE; dividend in case of profit; > 5.600 cooperants
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	medium	Beauvent distributes 1/40th of the annual net profit (after deduction of dividends) to charity; Repetitive, administrative tasks are performed by persons with autism
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	low	Beauvent has open and voluntary membership, meaning that all citizens, including vulnerable groups, can become a member of the cooperative. FTE: limited diversity in age (69% 30- 40 years) and gender (85% men)
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the	medium	Cf. next comment

	uptake of renewable community energy projects?		
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	The legal form of a cooperative is well known and recognised both in Belgium and around the EU, which contributes to the transferability of the case. Broad range of activities; operational since 2000 and energy production installations across Flanders

* The REC fulfills the criteria "fully – in average – poorly".

** By social innovation we refer to "*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*".

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.3. Zuidtrant (Belgium)

Authors	*Meynaerts Erika, van Maris Kelsey*		
Date	*12/10/2021*		
Selection Criterion	**Guiding Question**	**Self-Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	National & European level: -broad range of activities: energy production (PV on roofs of public buildings, district heating network), near-zero energy renovation advise, workshops for schools on energy and climate, shared electric mobility -cooperative also has a non-profit organisation that organises awareness raising activities such as repair cafés, information sessions on climate change & participates in research projects on climate, energy and circular economy
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	all renewable energy cooperatives, member of REScoop Vlaanderen, are considered to comply with the provisions
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	medium	repair cafés; awareness raising activities on climate, energy and circular economy Zuidtrant produces green electricity from its own installations, thus contributing to the reduction of the CO2 emissions. Moreover, Zuidtrant contributes towards the reduction of the energy consumption of its

			members and in this way increases their climate change awareness
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	Mainly volunteer-based; first years of operation cooperants could benefit from tax shelter; dividend in case of profit;> 500 cooperants
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	high	cooperative with social purpose, i.e. at least 15% of the profit is invested in community projects; the not for profit organisation organizes activities with social added value
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	low	Zuidtrant has open and voluntary membership, meaning that all citizens, including vulnerable groups, can become a member of the cooperative.low price per share (100 euros per share); limited diversity in age, gender and social-cultural background
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	medium	Cf. next comment
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	The legal form of a cooperative is well known and recognised both in Belgium and around the EU, which contributes to the transferability of the case. Broad range of activities; Also, being a cooperative with social purpose makes Zuidtrant an interesting, social innovative case.

* The REC fulfills the criteria “fully – in average – poorly”.

** By social innovation we refer to “*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*”.

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.4. Community wind farm Neuenkirchen (Germany)

Authors	*Michael Krug, Ana Maria Isidoro Losada, Maria Rosaria di Nucci*		
Date	*12/11/2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation ***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	The targeted promotion of civic associations or charitable (non-profit) foundations represents an incentive for the establishment of a community wind park, especially where direct financial participation by citizens/rural communities is difficult, e.g. due to financial constraints. Despite the local significance of the civic association (social innovativeness) and the local acceptance, the degree of innovation is to be assessed as moderate.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	low	The legal term "renewable energy community" defined in RED II has not yet been formally introduced into German law and accordingly no eligible legal forms have been defined. It is difficult to predict whether there will be any changes to the legal form of the community wind farm in Neuenkirchen in the future. The extent to which Bürgerwindpark Neuenkirchen or the company would currently meet the criteria of a REC defined in RED II, in particular the requirement that the main purpose of the community should be "to provide environmental, economic or social benefits to its shareholders or members or to the local areas in which it operates, and not merely to make financial profits" (RED II, Article 2,16c) cannot be answered with certainty.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	low	Compensation measures in renaturation, but no distinctive additional environmental benefits.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	high	In 2020, the company's profit after tax was EUR 4.99 million, which corresponds to a profit margin of 45.7 %. To avoid conflicts among landowners, the investors decided to develop a pool model that allowed also those landowners in the surroundings of the wind farm whose land was not directly reserved for the construction of wind turbines to benefit from the lease payments. The land owners receive a financial compensation for the use of their land amounting to 5% of the annual remuneration for the electricity fed into the

			grid. This amount is distributed among the landowners according to a specific allocation formula: 20% are allocated to the land owners on whose land the turbines are installed, 70% are distributed among all land owners in the suitable zone, and 10% to the owners of land used for road transport and other infrastructure measures. Business tax payments of the community wind farm amounted to 600,000 EUR in 2019 and 623,000 EUR in 2020. In Germany, however, the municipal fiscal equalisation scheme (kommunaler Finanzausgleich) allows that only part of the tax revenue remains in the municipality of Neuenkirchen.
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	medium/ high	The mayor reached an agreement with the initiators of the wind farm to establish a non-profit citizens' association (Bürgerverein Neuenkirchen e.V., founded in 2016), that receives 1% of the annual revenues as donations and supports social and cultural projects in the community. The association also receives donations from other local organizations. The mayority of the association's revenue goes to community organisations, associations and social services (e.g. purchase of a citizens' bus, IT equipment for the school, construction of a multifunctional room for the community, church renovation, etc.).
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	In order to avoid conflicts among land owners, the investors decided to develop a "land lease pooling model" (Flächenpoolmodell) which allows those land owners whose property was not envisaged for turbine installations to benefit from land lease payments. Citizens had also the opportunity to obtain shares and participate directly as partners with limited liability. In order to enable a large number of citizens to participate financially, it was possible to buy shares for 500 EUR. The municipality also obtained shares amounting to 20,000 EUR (maximum amount which was legally allowed).
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the	medium	Providing funding for civic associations or non-profit foundations can serve as a model for other regions, including other COME RES target or model regions, especially where direct financial participation of citizens/municipalities is difficult, e.g. due to financial constraints.

	barriers inhibiting the uptake of renewable community energy projects?		
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	Adaptation and transferability based on financial participation and promotion of civic association can be considered high. However, it should be noted that in this specific case, the initiative and support of the mayor and the municipal council was decisive in the implementation of these measures.

* The REC fulfills the criteria “fully – in average – poorly”.

** By social innovation we refer to “*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*”.

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.5. Wind farm Uthleben (Germany)

Authors	*Ana Maria Isidoro Losada, Michael Krug, Maria Rosaria di Nucci*		
Date	*29. October 2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation ***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	The cooperation of project developer, municipal utility company and energy cooperatives is a special feature. The fact that a project developer ties the sale of a wind farm to the financial participation of energy cooperatives can also be considered innovative.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	low	The legal term "renewable energy community" defined in REDII has not yet been formally introduced into German law and accordingly no eligible legal forms have been defined. However, it does not appear likely that the Wind Farm Uthleben resp. the municipal utility would currently fully meet the criteria of a REC as defined in REDII. One key point is the requirement that the main purpose of the community should be "to provide environmental, economic or social benefits to its shareholders or members or to the local areas in which it operates, and not merely to make financial profits" (REDII, Article 2,16c). According to REDII, a REC should be an “autonomous” legal entity which means that no single shareholder should dominate the entity.

			Currently, the majority of the shares is held by Stadtwerke Nordhausen – Holding für Versorgung und Verkehr GmbH (51%). Hence, the principle of autonomy cannot be considered as fulfilled. Another open issue is the question whether the municipal utility Stadtwerke Nordhausen can be regarded as a "local authority". Taking into account that the municipal utility fully owned (100%) by the municipality of Nordhausen, this criterion could be regarded as fulfilled. The proximity criterion is definitively met: The REDII requires that the legal entity is effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity. Considering that the municipal utility Stadtwerke Nordhausen which already holds 51% of the shares and at least three of the five energy cooperatives are located in the vicinity of the wind farm, this principle can also be considered as fulfilled. If one takes into account the compliance defaults as outlined above, the operating company could qualify rather as a CEC pursuant to the Internal Electricity Market Directive than a REC.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	low	Compensation measures in renaturation, but no distinctive, additional environmental benefits are noted.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	The Wind Farm Uthleben shows that good cooperation between the project developer (Energiequelle), the Nordhausen municipal utility company (Stadtwerke Nordhausen) and the Thuringian energy cooperatives can lead to local financial participation and thus to local value creation. For the cooperatives, the shares represent a good interest-bearing investment that yields returns in the mid-single-digit percentage range. • Direct financial participation ofcitizens' energy cooperatives; Indirect financial participation of the municipality of Nordhausen (51 percent ownership of Stadtwerke Nordhausen which in turn are fully owned by the municipality). • Direct financial participation of the municipality of Heringen/Helme. • Land lease payments to the landowners • Business tax (Gewerbesteuer) payments. • Local value creation.

			In 2019, the company's (Windpark Uthleben GmbH & Co. KG) net profit was EUR 199,000. In 2020, the company's profit was EUR 44,000. The balance sheet total in 2020 was EUR 9,168,555 (2019: EUR 9,806,478). Business tax payments of the wind farm amounted to 11,000 EUR in 2019 and 40,000 EUR in 2020. The business tax revenues accrue to the municipality where the wind farm operating company is registered (Heringen/Helme).
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	low	Business tax revenues and profits from the active, direct financial participation in the wind farm at least theoretically increase the possibilities of the municipality of Heringen/Helme for public spending including for social purposes. The same applies to the municipality of Nordhausen which is the sole owner of Stadtwerke Nordhausen that holds 51% of the shares of the wind farm. The Wind Farm Uthleben provides greater security of supply for the population, since in addition to the share of electricity produced by the city of Nordhausen in its own combined heat and power plants via EVN, the two wind turbines have also secured the supply of electricity.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	Energiequelle GmbH established in 2016 the Energiequelle GmbH Foundation. The main purpose of the foundation is to enable people to participate locally and thus support acceptance of renewable energy projects. The foundation's Management Board, together with local committees, decide how the funding is awarded and select the projects. Non-profit associations and institutions in the project regions of Energiequelle GmbH can in principle submit applications to the foundation. From 2021, energy cooperatives had the opportunity to obtain shares and participate directly as partners with limited liability. Currently six energy cooperatives with approx. 450 members (mostly citizens) are directly participating as limited partners. Lower-income households benefit, at least indirectly, from trade tax revenues paid by the wind farm operating company to the municipality where the company is registered. Municipal majority ownership of the wind farm may also be seen - at least indirectly - as an enabler for a passive financial participation of citizens and local communities.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches*	medium	The selected case indicates that joint planning or collaboration between project developers project developers, municipal utilities and energy cooperatives or citizen initiatives, is a possible transferable approach to promote the deployment of renewable energy projects in communities. In this sense, the example of the Uthleben wind farm can serve as a model. A similar wind farm project with the respective participation of key stakeholders is currently being developed in Großschwabhausen, Thuringia.

	*used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*		
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	The cooperation between project developers, municipal utilities and energy cooperatives is a special feature, but in principle it is certainly transferable to other regions. The fact that a project developer ties the sale of a wind farm to the financial participation of energy cooperatives is also quite transferable.

* The REC fulfills the criteria "fully – in average – poorly".

** By social innovation we refer to "*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*".

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication

2.6. Grenzland Pool (Germany)

Authors	*Michael Krug, Ana Maria Isidoro Losada, Maria Rosaria di Nucci*		
Date	*2 November 2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation ***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	High (national and EU)	The managers of the community wind farms under scrutiny (and in several cases the initiators) belong to the pioneers in Germany in the field of citizen/community wind energy. The community wind farm Ellhöft is among the first community wind farms in Germany and was the first wind farm in Germany to conclude a Power Purchase Agreement after expiration of the support period of 20 years. Furthermore, the wind farm is a frontrunner in the field of sector coupling and the cross-sector use of electricity for hydrogen production. After the expiration of the financial support under the Renewable Energy Sources Act (feed in tariffs), the operators started to convert part of the electricity into green hydrogen and to sell it to the transport sector/gas suppliers. The project Windgas Haurup started regular operation in 2021 and uses surplus electricity from nearby wind turbines including from the community wind farm in Ellhöft. The wind farms are otherwise often switched off due to grid congestions when there is a lot of wind. The nearby Ellhöft community wind farm can continue its operation because its electricity is purchased by the electrolyser. The managers of the plant in Ellhöft and the other sites are highly committed to link the Energiewende with a sustainable mobility transition based on electric battery vehicles and vehicles with fuel cell drive.

			Grenzstrom Vindtved is the first cross-border wind farm in Germany and represents one of the first wind energy repowering projects in Germany. Grenzstrom Vindtved was also the first wind farm in Germany to publish a Common Good Balance Sheet (a form of corporate sustainability reporting). The wind farm owners were among the first in Germany to set up a community foundation disbursing a certain share of wind farm revenues for social purposes and energy saving measures (Foundation BENTUSS). Another innovative element is that the wind farm operators founded a local non-profit nature conservation association for the management of the ecological compensation activities of the wind farm and other community wind farms. The managers are among the initiators of a voluntary label for “fair wind farm developers” in Schleswig-Holstein. They also developed a scorecard for managers/members of community wind farms in Germany to self-assess their business activities.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	Medium	The legal term "renewable energy community" defined in RED II has not been formally transposed to German law yet and accordingly no eligible legal forms have been defined. The extent to which the companies would currently meet the criteria of a REC defined in RED II, in particular the requirement that the main purpose of the community should be "to provide environmental, economic or social benefits to its shareholders or members or to the local areas in which it operates, and not merely to make financial profits" (RED II, Article 2,16c) cannot be answered with full certainty.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	Medium to High	The community wind farm Grenzstrom Vindtved provides a Good Practice case in terms of compensatory measures providing additional environmental benefits (https://ae-beispiele.fachagentur-windenergie.de/massnahmen/grenzstrom-vindtved-windpark-schleswig-holstein/). To compensate for intrusions of the habitats of amphibians and meadow birds, the operators of the wind farm reached an agreement with the nature protection authority that payments compensating for the negative impact on landscape should be spent for local nature protection measures in the community, e.g. through natural/extensive use of arable land. 22 hectares of land were initially acquired in consultation with the lower nature conservation authority to be managed in a nature-oriented way. A non-profit nature conservation association was founded by the managers of the wind farm for the maintenance and management of the areas (Verein „Naturengagement Bürgerwindparks Nordfriesland“ (NBN e.V.). Its purpose was to further develop this basic stock of compensation areas into a nature conservation project that was as coherent as possible. In the meantime, ecological compensation payments from other community wind farms have been used to purchase additional 80 hectares as amphibian and meadow bird protection areas, which in turn are leased to farmers for nature-oriented

			management. The lease income is administered by the association and flows entirely into the maintenance and further development of the conservation concept.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	High	• Direct financial participation of citizens with relatively small shares (profits for shareholders) • Land lease payments to land owners based on a pool model • Business tax payments of the community wind farm amounted to 600,000 EUR in 2019 and 623,000 EUR in 2020. • Benefit sharing via donations, in kind benefits and foundations to support social projects; • Involvement of local businesses and regional banks; • Development of local infrastructure (e.g. road construction, broadband infrastructure) • Technology innovation and development (e.g. hydrogen production) • Local value creation and job generation. For four of the five wind farms (without Grenzstrom Bürgerwind), total dividend payments in 2020 reached 9.1 million EUR. In the case of the community wind farm Ellhöft, between 2000 and 2020, shareholders did benefit from returns on investment of up to 12 to 16 % (see https://edison.media/ertraeumen/ellhoeft-ein-wind-dorf-setzt-auf-wasserstoff/23627132.html) To avoid conflicts among landowners, in the five cases sophisticated pool models have been developed that enable also those landowners in the vicinity of the wind turbines whose land was not directly earmarked for the construction of wind turbines to benefit from the lease payments. For four of the five wind farms (without Grenzstrom Bürgerwind), total land lease payments in 2020 reached 1,7 million EUR (Leithoff 2021). Usually, the local municipalities hosting the community wind farms benefit from annual business tax (Gewerbesteuer) payments. Usually, like in the case of Brebek, the revenues have been fairly divided between the municipalities according to the respective shares of installed capacity. As a rule, the business tax revenues are not earmarked to any special purposes, but form part of the general budget of the municipalities. For four of the five wind farms (without Grenzstrom Bürgerwind), total business tax payments in 2020 amounted to 1.9 million EUR (Leithoff 2021). In Germany, however, the municipal fiscal equalisation scheme (kommunaler Finanzausgleich) allows that usually only part of the tax revenues remain in the municipalities. In the case of Grenzstrom Vindtved, each limited partner receives an annual distribution of approximately 5,000 EUR. Since there are 200 limited partners, the purchasing power of the region is increased by about 1,000,000 EUR which means a significant increase in purchasing power for the traditionally structurally weak region of Northern Friesland.

			In the case of the community wind farm Ellhöft, the operators of the plant supported the development of a new recreation area in the community, as well as a hiking, riding and bicycle path. The operating company also supported the development of a local broadband network. Every household obtained a connection worth 1,200 EUR free of charge (Sorge 2016). Further, the community is supported by the wind farm operating company through donations in kind (e.g. renewal of community paths, improvements to local childrens' playground). The initiators of the wind farm have developed a number of further wind farm and ground based PV projects in the region including the cross-border wind farm project Grenzstrom Vindtved. The managers of the community wind farms are highly committed to link the energy transition with a sustainable mobility transition based on electric battery vehicles and vehicles with fuel cell drive. They launched a sector coupling project which envisages the cross-sector use of electricity based on an electrolysis facility and hydrogen gas station. Wind power based hydrogen can be regarded a new product which opens up new markets including mobility. In all five cases, local construction companies were at least partly involved in the construction works. The operators of the farms Ellhöft pursued a consequent local contracting strategy, not only for the construction of the wind farm, but, also for planning, financing, maintenance etc. Furthermore, in most cases, local/regional banks were involved for securing debt capital. The community wind farms Ellhöft and Grenzstrom Vindtved helped to create regional jobs. So, a Siemens service station has been established in Northern Friesland. An engineering company has set up a field office for the maintenance of substations in the neighbouring village. Another engineering company has been able to expand its technical operations management department.
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	Medium to High	Besides business tax payments to the municipalities, the operating companies provide in kind benefits to local environmental and social associations and initiatives. This can be illustrated by the example of the community wind farm Grenzstrom Vindtved. The company managers set up the BENTUSS Foundation (capital contribution 70,000 EUR), which is intended to support social purposes and energy-saving measures including PV based street lighting at bus stops and school routes. Charitable (non-profit) foundations and civic associations provide benefit sharing opportunities to those households which cannot directly participate, e.g. due to financial constraints. The wind farm also invested in the development of a local broadband network. It provides regular donations to local and regional associations including Lebenshilfe, for children's festivals, the fire brigade etc. Grenzstrom Vindtved was the first wind farm in Germany to publish a Common Good Balance Sheet, (a form of corporate sustainability reporting).

			In the case of the Brebek community wind farm, the operators committed themselves to dedicate a certain share of the revenues towards social projects, as not all citizens were able to benefit directly from the wind farm through their shares. This includes the purchase of a van for the local food bank ("Tafel"), support to a volunteer organization distributing food to people in need, and high-speed Wi-Fi for public use was built together with all other wind farm operators in the region. For four of the five wind farms (without Grenzstrom Bürgerwind), total payments to such social and infrastructural purposes in the region reached 600,000 EUR in 2020 (Leithoff 2021).
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	Medium	Below we included the number of citizens and SMEs that had registered as limited partners ("Kommanditisten") in the different wind farms. In total, 1,069 persons are financially participating as limited partners. These represent almost 25% of the local residents in the respective municipalities (Leithoff 2021). • Community wind farm Ellhöft (51) • Cross-border community wind farm Grenzstrom-Vindtved (220) • Community wind farm Süderlügum (400) • Community wind farm Brebek (280) • Community wind farm Grenzstrom Bürgerwind (260) In the following, we refer to the example of the community wind farm Grenzstrom Vindtved: The local residents were timely informed and actively involved in the planning of the wind farm. A planning board, advisory board and supervisory board were established where local citizens do participate. In order to avoid conflicts among land owners, the initiators decided to develop a "land lease pool model" (Flächenpoolmodell) which allows also those land owners in the vicinity of a wind turbine whose property was not envisaged for turbine installations to benefit from land lease payments. Citizens had the opportunity to obtain shares and participate directly as partners with limited liability. In order to enable a large number of citizens to participate financially, it was possible to buy shares from 500 EUR. In the other cases, similar minimum amounts were required (e.g. community wind farms Süderlügum and Brebek: 1,000 EUR) The project is not only based on economic efficiency rationales, but aims to pursue social and environmental targets. Therefore, the project has also the acronym BENTUSS (Bürger-Energie-Natur-Tourismus-Umwelt-Schule-Sozial) (Citizens-Energy-Nature-Tourism-Environment-School-Social). Part of the revenues is used to support charitable and social projects. Lower-income households benefit mainly indirectly from the trade tax revenues (Gewerbesteuer), and directly from in-kind benefits, donations or the disbursements of local foundations like the

			BENTUSS foundation which receives parts of the revenues of the wind farm. The authors lack information about the individual shares of women, persons with migration background, or disabled persons as limited partners in the community wind projects.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** *way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	Medium to high	The model character and relevance for other regions is relatively high, but replicability of the community wind farm model itself is limited, also in a German context, due to the different frame conditions today (i.e. auction system based on competitive bidding replaced feed-in tariffs/premium system). Long-term investment security for small players including community groups is no longer given as under the price bases support scheme. The showcases provide examples for grassroots initiatives under very specific socio-economic, planning and regulatory frame conditions and actor constellations. They are certainly not completely transferable 1:1 but have to be accommodated to the specific context. There are several elements which have model character and which may be more easily transferable. Providing funding for civic associations or non-profit foundations can serve as a model for other regions, including other COME RES target or model regions, especially where direct financial participation of citizens/municipalities is difficult, e.g. due to financial constraints.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	Medium	Transferability/replicability of the specific community wind farm model itself is limited, also in a German context, due to the different frame conditions today (i.e. auction system based on competitive bidding replaced feed-in tariffs/premium system). Long-term investment security for small players including community groups is no longer given as under the price bases support scheme. The showcases provide examples for grassroots initiatives under very specific socio-economic, planning and regulatory frame conditions and actor constellations. They are certainly not completely transferable 1:1 but have to be accommodated to the specific context. There are several elements which have model character and which may be more easily transferable. Providing funding for civic associations or non-profit foundations can serve as a model for other regions, including other COME RES target or model regions, especially where direct financial participation of citizens/municipalities is difficult, e.g. due to financial constraints. Replicability of the PPA as in the case of the Ellhöft wind farm is high at least in the German context. PPAs provide a promising business model for wind energy plants which are no longer eligible for remuneration based on the Renewable Energy Sources Act. In 2021 alone, 4,400 MW of wind power generation capacity in Germany will be affected by the expiry of the 20 years support period, and by 2025 this will be around 16,000 MW. Without having a perspective for the sales of the electricity, many of these plants would need to be dismantled.

			Sector coupling projects based on power to gas or power to heat may offer promising business cases with a relatively high replication potential in regions with a high production of renewable energy including wind energy. With the recently adopted Ordinance to the Renewable Energy Sources Act (Erneuerbare-Energien-Verordnung, EEV) of 14 July 2021, the federal government took measures to make hydrogen production based on electricity renewable energy sources more attractive. To facilitate the development of electrolysers, they will be partially exempt from the renewable energy surcharge (so called EEG levy, EEG-Umlage). This helps to make the electricity used in the process cheaper. The surcharge is paid by all electricity consumers with their electricity bills to pay for the financial support for renewable installations

* The REC fulfills the criteria “fully – in average – poorly”.

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*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.7. Energy Community “Agra do Amial” (Portugal)

Authors	*Isabel Azevedo*
Date	*29/10/2021*

Selection Criterion	Guiding Question	Self Evaluation*	Comments
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	High	Technological innovation, with the integration of different technologies (solar PV, storage and EV charging) and using energy efficiency and demand response actions to assist in the management of the REC Social innovation, with the inclusion of lower income groups (social housing) and integrate them in the local community.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e.g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	High	The REC fully complies with the requirements that are established in the Portuguese legal definition of REC, as well as with the provisions of REDII.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e.g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	Medium	The REC has environmental benefits at the local level, associated with the decrease in GHG emissions from electricity generation (promoting the generation from RES) and by promoting energy efficiency among the local residential consumers (members and non-members of the REC).

… economic benefits	*To what extent does the REC provide economic benefits? (e.g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	High	It aims at significantly reducing the energy bills of the inhabitants of social housing, also mitigating energy poverty in the local community
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	High	The REC targets specifically lower income groups, providing them not only economic benefits but also capacitating them to take action in the reduction of their energy needs (with energy efficiency quick fixes)
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	High	Involvement of different associations and local entities to engage the local community (social housing inhabitants) to participate/integrate the REC
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	Medium	This may be an effective approach to involve local authorities/municipalities in the implementation of RECs, as they own and manage a large number of buildings (administrative and social housing). As the implementation is still ongoing, it is not possible to assess in full the barriers to the implementation of this initiative.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	High	There is large potential for transferability of the solution within the city of Porto and to other municipalities in Portugal, due to the relevance of energy poverty in the country and the fact that all municipalities own and manage social housing buildings.

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*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.8. Energy Community "Condomínio da Torre" (Portugal)

Authors	*Isabel Azevedo*
Date	*29/10/2021*

Selection Criterion	Guiding Question	Self Evaluation*	Comments
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	Medium	The way individuals gathered, without any external push, can be seen as innovative within the country, as citizen-led RES initiatives are not common in Portugal.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e.g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	High	If fully complies with the requirements from REDII
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e.g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	Low	No additional environmental benefits are foreseen. The only environmental benefits are the ones associated with the RES-e generation from solar PV.
… economic benefits	*To what extent does the REC provide economic benefits? (e.g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	Medium	It aims at reducing the energy costs of local residents. The existing PV installations are sufficient to cover the energy needs from the buildings' common areas (lighting, elevators and HVAC).
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	Low	Due to physical constraints, only the inhabitants from the condominium are involved, and thus there is no involvement of vulnerable citizens and the sharing of benefits with the larger community.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	Medium	Involvement of different associations and local entities to engage the local community (social housing inhabitants) to participate/integrate the REC
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries? To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	Medium	This model is relevant to promote the implementation of RECs in low development areas, as this is seen as an effective way to promote joint investments in RES generation in urban areas. The establishment of the legal definition of RECs allows households to share the energy generated within the building (and between buildings in the same neighbourhood), which was not possible with the previous legal figure of "prosumer", increasing the opportunities of individual citizens for participation in the electricity system.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	High	The potential for transferability in Portugal is significant, especially in urban areas, where individual citizens can jointly invest in PV generation units, to be installed in the roofs.

* The REC fulfills the criteria “fully – in average – poorly”.

** By social innovation we refer to “*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*”.

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.9. Pinerolese Energy Community (Italy)

Authors	Elena De Luca and Gilda Massa		
Date	*10/11/2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	low	
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	Autonomy Territoriality Voluntary membership
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	high	Coupling energy production with wastes reuse
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	Value added, employment effects, local tax revenues
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	low	No specific initiatives. Possible effects on the labour market by favouring the birth of new business initiatives
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	low	No particular forms of involvement are designed for vulnerable groups
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	high	Within the participation in the Horizon projects feasibility study and different tools are implementing to create replicable methods on municipal scale.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	New initiatives are spreading on the same model outside the region.

* The REC fulfills the criteria “fully – in average – poorly”.

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*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.10. Energy City Hall REC-1 (Italy)

Authors	Elena De Luca and Gilda Massa		
Date	*10/11/2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	high	The RECs are equipped with an IoT platform to manage energy flows and to allocate benefits coming to shared energy. Collaboration agreement with the innovative start-up with a social value Energy4Com for the technical-operational management of activities.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	It is the first REC in Italy according to national law which is in line with REDII
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	low	The environmental benefits are due to the reduction of energy consumption.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	high	Energy cost reduction and catalysis of local short supply chains
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	medium	The REC is a catalyst for the aggregation of skills on the territory, essential for creating development and jobs in the post-pandemic phase. The GOC (Community Operational Group) gathers local designers, installers and maintainers: the REC acts as the catalyst of local supply chains, so that the added value remains at local level (new jobs, sustainable local development)
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	No specific initiatives addressed to vulnerable groups. It is planned to convey the benefits due to the reduction of energy costs through fair and solidarity initiatives to significantly reduce the costs of bills for the weaker classes.

Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	high	The model is already replicated in the Region. Two additional RECs will be established in Magliano Alpi: REC-2 “Sporting Center” and REC-3 “Citizen Endeavor”.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	high	The approach is being replicated through the RECOCER funded by the Autonomous Region of Friuli Venezia Giulia. Other 10 RECs in other Cities that signed the agreement with the City of Magliano Alpi.

* The REC fulfills the criteria “fully – in average – poorly”.

** By social innovation we refer to “*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*”.

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.11. GECO – Green Energy Community (Italy)

Authors	Gilda Massa and Elena De Luca		
Date	*10/11/2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	GECO allow consumers of all sizes to interact with the support of the blockchain system by making their demand more flexible. it is also expected that the legal community entity will identify the services to be provided to its members related to the energy brokerage, smart contracts, district energy management, energy saving and renewable energy production
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	GECO will also build the bases for an entity that can exploit the opportunities of new segments of the energy market, which will be opened after the internalization of the CEP (Art. 22 of the Renewable Energy Directive and art. 16 and 17 of the Electricity Directive). GECO in fact will simulate the aggregation of generation and demand, allowing consumers of all sizes to interact with the support of the blockchain system by making their demand more flexible.
Provision of additional	*To what extent does the REC provide environmental*	low	Reduction of the CO2 emissions of 70.048 t in 2022, develop tools and

environmental benefits	*benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*		the business model for the communities to set-up a local energy community and create a cost effective scaling model for local businesses and citizen to reduce their emissions.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	Energy cost reduction is the main benefit for citizen involved. The main elements to reach these goals are: • Renewable energy plants, storages, electric mobility integrated in the community realized • Smart devises and a system developed for the optimal management of the distributed resources • Blockchain technology developed for energy communities
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	low	The social impact will be related to the opportunity for low-income families and citizen to fight the fuel poverty, to the increased awareness provided related to the energy saving, sustainability and circular economy through the establishment of a community and the educational and information activities.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	low	To allow consumers of all sizes to interact with the support of the blockchain system by making their demand more flexible. it is also expected that the legal community entity will identify the services to be provided to its members related to the energy brokerage, smart contracts, district energy management, energy saving and renewable energy production
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	high	The GECO model developed aims to be suitable all over Italy. The aim of the project is to contribute do the definition of legal and technical framework, involving different stakeholders and to be in future easly applied in different districts and different cities.

Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	high	GECO project will be embedded in the national regulatory framework, providing support to the national stakeholder (GSE, Terna, SRE an Emilia Romagna Region) as experiment project to address the national legislation development and it Will attract potential members among the district stakeholders: Citizen, Private companies, Associations, City Authority, Public Authorities, University.

* The REC fulfills the criteria "fully – in average – poorly".

** By social innovation we refer to "*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*".

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.12. Energy communities in apartment buildings (Latvia)

Authors	*Ivars Kudreņickis, Gaidis Klāvs, Aija Zučika*		
Date	Revised 30th November 2021		
Name of REC	Energy communities in apartment buildings: pilot projects		
Country	LATVIA		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	Medium – in national level Low- in EU level	The first projects in Latvia regarding apartment building residents' cooperation to jointly instal the roof-top solar PV technologies. Even joint solar heat panels installations in apartment buildings are very rare in Latvia[8].
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an*	Medium	Latvia has not yet transposed the REDII provisions regarding the RECs. At the same time, the associations of apartment-owners could be the one of the initiators of renewable energy communities development in Latvia.

[8] We have checked (30 November 2021) the database of state-owned development finance institution ALTUM which contains the information on the projects on energy efficiency improvement in multi-apartment buildings co-financed by the ERDF in 2014-2020 planning period. This database contains information on 816 projects in only in 2 projects the installation of solar heat technologies have been indicated.

	open and voluntary membership, proximity, etc.)		
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	Low	Relates to CO_2 emission reduction.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues,* ***rebates on energy bill)?***	Medium	Medium – in overall. Local residents have significant rebate on energy bill. Economic benefits regarding self-production of electricity depends on a case. Namely, if the solar PV technologies is installed in limited capacity to provide only the needs of common-used premises (not consumed in individual apartments) the benefits on electricity bill will be limited.
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	Medium	Cooperation of apartment buildings residents for common roof-top solar energy installations is new phenomena in Latvia.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	Medium	All apartments of particular apartment buildings participate and receive benefits in the described pilot projects.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** *way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	**High** – in relation to the practice to organize energy community in apartment building **Low-** regarding installation scheme of particular solar PV technologies (this should be evaluated on case-by-case basis)	To get the trust for the energy community concept and communicate on the benefits of it is the most important challenge. The described pilot projects can be considered as a relevant model for other apartment buildings, as they show a possible pathway and set of measures for the implementation of another REC pilot projects. However, the experience of the pilot projects shows that a feasibility study should be based on a case-by-case basis. In 2021, Riga planning region in the particular Study has identified and analysed several other possible pilot projects for REC in apartment buildings. The described pilot projects however do not provide the model for electricity sharing. To have economically feasible electricity sharing system, the amendments in Latvia regulation to define sharing provisions is necessary.

			However, there is certain minor share of apartment buildings in which electricity sharing could be provided also within the existing regulation (these buildings have single connection point to power distribution grid). In these buildings use of the experience of described pilot projects on organization of residents cooperation could be used already now.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	**High** – in relation to the practice to organize energy community in apartment building **Low-** regarding installation scheme of particular solar PV technologies (this should be evaluated on case-by-case basis)	The following pre-conditions is of high importance: (1) clear legal regulation, (2) availability of support, both financial and non-financial ones, (3) a detailed roadmap for implementers of potential projects. Implementation of described pilot projects has also shown that a significant factor hindering the implementation of energy community projects is also lack of cooperation between the residents. Without external incentives, the energy communities is currently difficult to implement.

2.13. Reinli small-scale hydropower plant (Norway)

Authors	Stine Aakre and Karina Standal (CICERO)		
Date	25 October 2021		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	low	Norway has a long history of publicly owned hydropower electricity production, and community owned small-scale renewable electricity production has increased in recent years. Innovative elements in the case of the Reinli include the broad local involvement in the project, and cooperation with a professional partner to help overcome possible barriers to development of the project.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II?* *(e. g. is it autonomous, does it have an open and*	low	RECs not formally introduced in Norway. Potential critical points are effective control, autonomy, and proximity (although these are not currently defined/specified in Norway). See Good practice portrait discussion.

	voluntary membership, proximity, etc.)		
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	low to medium	Local RES electricity production (small-scale hydropower).
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	Economic benefits to shareholders (incl. local citizens), landowners (leasing out waterfall rights), municipality (tax). Local contractors.
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	low	Fairly broad local involvement in local RES production. Electricity sold to central grid.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	low	Local residents own 49% of the shares in the company owning the power plant, and also own the waterfall rights. Participants include both women and men. The professional partner Småkraft AS (headquarters not located in the same county as the RES project) owns 51% of the shares.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	medium	Project operational since 2008. Model of cooperation between local residents (landowners, members of local community) and professional partner Småkraft AS has been replicated elsewhere in Norway.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	low	Uncertainty regarding whether the Reinli community energy approach could qualify as a REC.

2.14. Røverkollen housing cooperative (Norway)

Authors	Stine Aakre and Karina Standal (CICERO)		
Date	25 October 2021		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium to high	Novelty at national level. Røverkollen is a pilot living lab in the H2020 project Green Charge. Collaboration to develop and implement smart energy systems (rooftop PV electricity generation, battery storage, predictive planning) for charging electric vehicles (EVs). Initiative includes residents in the Røverkollen housing cooperative. PV low share of electricity mix in Norway.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	medium	See Good practice portrait for a discussion.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	high	Local RES electricity production which utilises existing construction (rooftop). Smart energy system and EV charging could help facilitate the uptake of EVs among residents (green transport).
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	Reduced cost EV charging for residents. Limited data available regarding investments/upfront costs and return on investments.
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	medium	Provision of different services (PV, storage and predictive planning provides predictability and security concerning residents' EV charging needs)
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	Participation open (but limited) to residents of Røverkollen housing cooperative. Participants include both women and men. The housing cooperative is located in a low to middle class area of Oslo and has diversity of residents including, different socio-economic background, immigrant population and different age groups.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome	medium to high	PV low share of electricity mix in Norway, housing cooperatives have a high technical potential for rooftop PV. In combination with EV charging points, such systems could facilitate increased RES production and the uptake of EVs in urban areas. The pilot has already been implemented in the Røverkollen housing cooperative.

	the barriers inhibiting the uptake of renewable community energy projects?		
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	Should be adaptable/transferable to other regions in Norway, esp. urban areas. Røverkollen community energy initiative is a pilot in the GreenCharge EU H2020 project. Project consists of 3 pilots, working with 12 uptake cities (focus on electric mobility, not on RECs)

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*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.15. energyRegion Michałowo (Poland)

Selection Criterion	Guiding Question	Self Evaluation*	Comments
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	high	The cluster itself is an innovative idea, not appearing anywhere else. An energy cluster is an agreement that may include natural persons, persons legal entities, scientific units, research institutes or local government units regarding the production and balancing of demand, distribution, or trade in energy from renewable energy sources. Moreover, one of the projects in the cluster is to create a comprehensive program for activating the local community and it leads to increased public acceptance of the investment.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	medium	Almost all the terms and definitions cited in the articles are met.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	medium	The REC provides enhanced ecological rehabilitation of the area in the form of improvement of air quality and reduction of pollutant emissions from the transport sector.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	One of the benefits is the reduction of the price of heat and electricity. Another benefit is a positive employment effect correlated with realization of projects (e.g. local renewable energy congress and educational centre).

… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	high	The cluster provide social community benefits by creating a comprehensive program for activating the local community, what can be related to increasing public acceptance of the investment.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	One of the cluster goals is to activate the local community and cause the development of the region by creating incentives for new investments.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	high	On the cluster area a biogas plant and photovoltaics farm are operating and cover 80% of electricity demand. Because of high production potential of agricultural biomass, there is a high potential of development of biogas plant.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	The case of energyREGION can be adapted and transferred to other regions with handicaps. Regions without production of agricultural biomass or with poor insolation could have issues with adaptation and transfer the case.

* The REC fulfills the criteria “fully – in average – poorly”.

** By social innovation we refer to “*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*”.

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.16. Słupski Klaster Bioenergetyczny (Poland)

Selection Criterion	Guiding Question	Self Evaluation*	Comments
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	The cluster itself is an innovative idea, not appearing anywhere else. An energy cluster is an agreement that may include natural persons, persons legal entities, scientific units, research institutes or local government units regarding the production and balancing of demand, distribution or trade in energy from renewable energy sources. One of innovative projects is e.g. “ENERGIA DLA OBYWATELI”, which aims at eliminating energy poverty in Słupsk City.

Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	medium	Almost all the terms and definitions cited in the articles are met.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	high	The REC provides enhanced ecological rehabilitation of the area in the form of improvement of air quality and reduction of pollutant emissions from the transport sector.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	One of the benefits is the reduction of the price of the electricity. Another possible benefit, which might occur is positive employment effect correlated with realization of projects (e.g. local renewable energy sources). Combining investments related to the PV installation is also an economic benefit due to lower costs of one investment instead of several.
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	medium	The cluster plans to provide social community benefits by implementation of low/zero emission transport, what might increase public acceptance of the investment.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	One of the cluster goals is to activate the local community and cause the development of the region by creating incentives for new investments.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	high	The cluster have high production potential of agricultural biomass and have a good insolation. It can be related to the high potential of development of biogas plant and photovoltaics.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	The case of Słupski Klaster Bioenergetyczny can be adapted and transferred to other regions with handicaps. Regions without production of agricultural biomass or with poor insolation could have issues with adaptation and transfer the case.

* The REC fulfills the criteria “fully – in average – poorly”.

** By social innovation we refer to “*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*”.

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.17. COMPTEM- Enercoop (Spain)

Authors	*Francisco Rueda, Pouyan Maleki-Dizaji,*		
Date	*21 October 2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	The REC is novel in the Spanish in context because it is one of the first successful RECs in the country. Moreover, the REC has been able to find a suitable organisational form (cooperative) and a successful financing structure that has allowed for the social acceptance of the project and the enthusiasm of the cooperative members. In terms of social innovation, the result is more mixed. From one point of view, it has revitalized a previously unused plot of land and transformed it into a valuable resource for the community, with green spaces and sports facilities. Moreover, citizens have been able to take part in a participatory process for the design of this space. On the other hand, there has been no reference to vulnerable groups, and these are not an objective of the REC (at least directly).
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	The REC perfectly complies with the requirements of Art. 2(16) and Art. 22 of RED II. It is open and voluntary, autonomous, and controlled by members located in the proximity. Members are natural persons, SMEs or local authorities. Its primary purpose is to provide environmental and economic benefits for its members.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	medium	The REC provides ecological benefits in the sense that it is a key piece in the objective of the municipality of becoming carbon neutral by 2050. Additionally, it has allowed for the revalorization of a previously unused plot of land, creating green spaces.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	high	The current pilot project produces energy savings of an estimate 15-20% for 65 households (250 people). The facility will produce rebates in the energy bill of consumers. The pilot project has given value to a previously unused plot of land, in which, apart from the PV solar panels, green

			spaces and sport facilities have been built. The expansion of the REC to the whole village will mean the use of currently empty roofs and public lands. Some local companies have been involved in the construction of this local project, what has produced economic value in the village.
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	low	There has been citizen participation in the design of the space that this first pilot project occupies, which also includes green spaces and sports facilities.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	low	Given its condition as a pilot project, this REC is small and gives coverage to a very small number of citizens (65 households). This necessarily limits broad participation. Nevertheless, the local government of Crevillent has actively participated in the name of the whole village. There has been no specific reference to vulnerable groups.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	high	The main asset for the success of this REC is the economic and organizational structure of the entity that is developing it (cooperative and no initial investment by members needed), the cession of unused public land, the support of H2020 by funding 75% of the costs. These three factors were successful in overcoming the barriers for the creation of a REC: organizational barrier (cooperative), individual incentive barrier (no initial individual investment needed), cost barrier (cession of public land and H2020 funds).
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	high	The success factors of this REC are generally transferable and can be replicated in other regions: - Organisation and management through a cooperative. - No need for initial individual investment: the loan used to finance part of the installation will be repaid through the rebates in the energy bills of consumers-members. This way, members do not have to make any investment and will pay the same as they do now for the next 7-8 years.

			- Cession of public land (maybe more difficult in denser urban areas where unused public land might be scarcer) - EU funding: 75% of the costs have been financed through H2020.

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*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.18. Hacendera solar (Spain)

Authors	*Francisco Rueda, Pouyan Maleki-Dizaji,*		
Date	*21 October 2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	The REC could be considered an innovation within its regional context. This REC is established in a very small village (population 37) in a depopulated region with a very aged population. In this sense, this could be a model of collective self-consumption to other similar villages in the region.
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II?* *(e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	The REC perfectly complies with the requirements of Art. 2(16) and Art. 22 of RED II. It is open and voluntary, autonomous, and controlled by members located in the proximity. Members are natural persons, SMEs or local authorities. Its primary purpose is to provide environmental and economic benefits for its members.
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	low	The project reduces the CO2 emissions of the village by 6.8 tonnes/year.
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation,*	low	The project produces a rebate on the energy bill of the local government of about 60%.

	employment effects, local tax revenues, rebates on energy bill)?		
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	low	The constitution of the REC has allowed for the mobilization of neighbours around a common goal.
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	The initial plans were designed by the Core Group of neighbours more interested in the project. The concretization of the project was done together with the rest of the community through a co-creation project.
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries?* *To what extent has the case selected demonstrated that the approaches used are an effective*** *way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	medium	The project has started given coverage to public buildings and will later cover private ones. This could be a model for other small rural communities in which the acceptance of new technologies and organisational forms might be difficult. By beginning with public buildings, an example is established for the rest of the community.
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	low	It is unlikely that this model can be replicated elsewhere given the strong involvement of REE (Spanish grid operator) that has been necessary for it to work out. Grid operators are unlikely to widespread finance RECs, neither in Spain nor abroad.

* The REC fulfills the criteria “fully – in average – poorly”.

** By social innovation we refer to “*novel combinations of ideas and distinct forms of collaboration that transcend established institutional contexts with the effect of empowering and (re)engaging [stakeholders including] vulnerable groups either in the process of the innovation or as a result of it*”.

*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

2.19. Energy Cooperative Loenen (Netherlands)

Authors	*Kellan Anfinson*		
Date	*October 22, 2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	medium	Primarily the adoption of VPP tech to community needs
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	medium	
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	high	
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries? To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	medium	Should be transferable, though funding is a large barrier that was overcome in this case
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	See above

* The REC fulfills the criteria “fully – in average – poorly”.

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2.20. Energy Gardens (Netherlands)

Authors	*Sandor Lowik*		
Date	*25 October 2021*		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	high	National and European
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	high	
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	medium	Comparable to regular energy projects
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	high	The whole concept is aimed at providing social, biodiversity and community benefits
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	high	Energy gardens can offer social work opportunities
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries? To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	high	Pilots show that there is high social acceptance
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	high	The approach can help to establish new RECs

* The REC fulfills the criteria “fully – in average – poorly”.

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2.21. Citizen wind farm “de Spinder” (Netherlands)

Authors	*Erik Laes*		
Date	*2021-10-12*		
Selection Criterion	**Guiding Question**	**Self Evaluation***	**Comments**
Innovativeness	*To what extent is the REC itself innovative also in terms of social innovation**? Please indicate whether this is a novelty at a national level and/or at a European level as well.*	high	Empowering local RECs through association; crowdfunding
Compliance with the provisions of Article 2(16) and Article 22 of RED II	*To what extent does the REC meet the requirements of the Articles 2(16) and 22 of RED II? (e. g. is it autonomous, does it have an open and voluntary membership, proximity, etc.)*	high	50% ownership of a wind farm
Provision of additional environmental benefits	*To what extent does the REC provide environmental benefits? (e. g. specific packages providing for high ecological valorisation, enhanced ecological rehabilitation of the area?)*	medium	Localisation on an existing industrial site
… economic benefits	*To what extent does the REC provide economic benefits? (e. g. local added value creation, employment effects, local tax revenues, rebates on energy bill)?*	high	Excess profits can be used by LECs for local added value
… social community/ societal benefits	*To what extent does the REC provide social community benefits? (e. g. particularly lower-income groups being included, benefit sharing, social communal activities)*	high	Alliance between LECs of the region and municipalities to realize regional energy transition goals
Inclusiveness	*To what extent does the REC contribute to and foster the participation of different actors, including also vulnerable groups in community energy initiatives?*	medium	Open to participation by members of LECs (no special effort to involve low-income groups)
Model character/ relevance	*To what extent is the REC relevant/a model for regions with low REC development, including COME RES target regions or any other regions/countries? To what extent has the case selected demonstrated that the approaches used are an effective*** way to overcome the barriers inhibiting the uptake of renewable community energy projects?*	medium	Association depends on already existing LECs
Adaptation and transferability	*To what extent can the case be adapted and transferred to other regions of the same country or regions in other countries, particularly regions with low REC development?*	medium	Within the Netherlands ok, regions with low REC development more difficult

* The REC fulfills the criteria “fully – in average – poorly”

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*** Here, "effective" means that the selected case demonstrated that there were no serious barriers to implementation (and thus to replication).

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