

Co2mmunity RENCOPs

Summary Booklet

Co2mmunity
Co-producing and co-financing renewable community energy projects

R.EN.CO.P

Renewable ENergy COoperative Partnership

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Table of Contents

Introduction.....	2
Denmark	3
Estonia	7
Finland	10
Germany	16
Latvia	19
Lithuania	23
Poland.....	27
Sweden	32

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Introduction

A RENCOP is a practical tool for promoting, implementing, and enhancing Community Energy initiatives and projects within the region.

A **RENCOP** is the project name for a local partnership that initiates and supports CE projects based on renewable energy sources. In Estonia, Denmark, Finland (two), Germany, Latvia, Lithuania, Poland and Sweden (nine in total), the local Co2mmunity partners have initiated and managed a RENCOP. Depending on conditions in the specific region, the RENCOPs have used different strategies and focus areas. Examples of this are solar panels for housing cooperatives (SE and EE) and jointly purchased heat pumps (DK). What all RENCOPs have in common is that they involve citizens.

Definition of R.EN.CO.P
Renewable ENErgy COoperative Partnership:

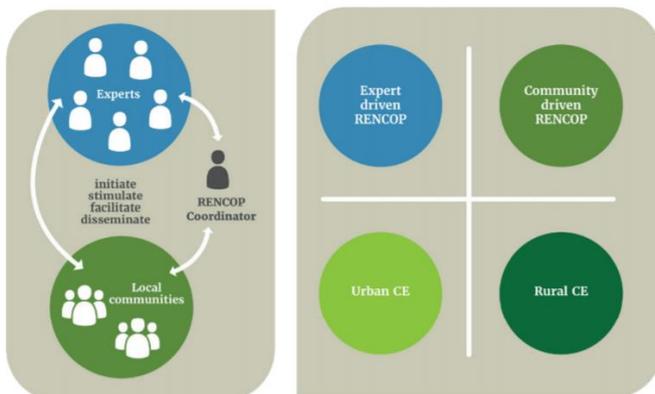


Figure 9. RENCOP-coordinator (Co2mmunity).



For further information, see the **Roadmap** on how to increase community energy using the RENCOP model which you can find on www.co2mmunity.eu

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Denmark

Current Status (30/09/2020)

The Middelfart Municipality has several RENCOPs - some are ongoing, others are finished. The RENCOPs in the Middelfart Municipality are: **Termonet**, **Føns District Heating**, **Common Purchase of Heat Pumps**, **Indslev – Large Scale Heat Pump** and **Sun Over Brenderup**. The *Common Purchase of Heat Pumps* and the case study in *Indslev* with a large scale heat pump are finished RENCOPs. The RENCOPs *Føns District Heating* and *Sun Over Brenderup* are ongoing. *Føns District Heating* has implemented their district heating and is supplying 49 households with heat from woodchips, but they are working on new projects. The PV park planned in Brenderup will be up and running from October 2020. The RENCOP *Termonet* is a little different from the other RENCOPs. The system is implemented in Brenderup and will supply 13 households with green heat, but to promote the technology, a Termonet Association has been founded and will hopefully inspire many others to use this technology in the future.

Challenges/Barriers

The stakeholders have been identified in different ways. Some were determined as stakeholders because they are “usual suspects” and well-established players in the Energy Transition. Others were found by public announcements while some came on their own out of interest and curiosity. All stakeholders have been analysed with the stakeholder mapping tool developed for the Co2mmunity project. The focus of the CE projects was chosen in different ways. Some RENCOPs such as *Common Purchase of Heat Pumps* were fixed in advance while others such as *Sun over Brenderup* evolved more spontaneously in the process through sharing of ideas and discussions.

In each type of RENCOP, different challenges have occurred. For *Common Purchase of Heat Pumps*, the biggest challenge was to convince people to join and to be ready to buy a new heat source at the same time. In the RENCOP *Sun over Brenderup*, the citizens were ready to do something, which means motivating citizens was not an issue, but technical details like where to install the solar panels and how to finance it have been challenges. With each type of RENCOP, new challenges and barriers appear and it is important to adapt to the different type of people and technologies you are working with.

RENCOP – Common Purchase of Heat Pumps

Specification

- **Technical Solution:** Individual heat pumps
- **Ownership Model:** Owned individually but bought commonly
- **Size (Number of households/housing units):** Around 7 households in the Middelfart Municipality and a few more in municipalities in the triangle area
- **Established since:** 2017

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To promote the transition to neutral heating in private homes, the Middelfart Municipality is running a campaign to inform citizens on the possibility to purchase heat pumps collectively. By purchasing as a group, the citizens can reduce their investment cost for heat pumps. The Middelfart Municipality offers support and advice for the citizens such as helping to find different suppliers and ensuring that the project development process moves forward. In the end, the citizens of course still control the direction in which the project develops and if they want to make use of an offer at all.

The common purchase of heat pumps takes place twice a year, in spring and in autumn. The one taking place in autumn is arranged in collaboration with the triangle municipalities. They are associated partners of Co2mmunity and the collaboration is a witness of spreading and sharing experiences with CE projects.

RENCOP – Sun Over Brenderup

Specification

- **Technical Solution:** Solar Panels
- **Ownership Model:** Owned by shareholders
- **Size (Number of households/housing units):** 1 MW
- **Established since:** planned for October 2020

The citizens of the village Brenderup decided to support the green transition. Currently, the Middelfart Municipality and some citizens from Brenderup are working on mapping the possibilities to make Brenderup a green city. The first goal is already clear: to become self-sufficient with CO₂ neutral electricity through the use of photovoltaics. The citizens of Brenderup have been working on realising a large solar park with the goal to supply the city with green electricity. In order to be included in a tender for financial support, the citizens of Brenderup had to submit the project idea for the solar park to the independent, public company called Energinet that operates the Danish transmission grid. The project proposal was submitted on the 1st November 2018. The tender decision was made on the 9th November 2018, granting Brenderup with financial support of 10 øre/kW over 20 years. The solar park is planned to cover an area of 20.000 km² and approximately 1/3 of the electricity consumption in Brenderup.

RENCOP - Termonet

Specification

- **Technical Solution:** Ground sourced heat pump combined in a common grid
- **Ownership Model:** The grid is owned by the 13 homeowners (the homeowner association), the heat pumps are owned individually
- **Size (Number of households/housing units):** 13 households
- **Established since:** 2017
- **Budget:** cost of the grid 750.000 DKK

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By combining existing technology in a new way of thinking, the district heating coverage in Denmark can increase from 64% to nearly 100%. This is done by creating collective organisations similar to district heating companies but with individual geothermal heat pumps across a neighborhood or even in each house. With the great advantage of using low-pressure and low-temperature grids, this is done with help from a supply network based on heat absorbing vertical and horizontal plastic tubes. We call this network **Termonet** which can be used for both heating and cooling. Together, the energy companies TREFOR and EWII production and the municipality form an 'expert' RENCOP.

Termonet, also called fifth-generation of district heating and cooling, is considered one of the most sustainable technologies to meet the heating and cooling demands of buildings in urban areas. It is suited for retro-fitting and new projects for spatial planning. Based on combined ground based geothermal pipes, combined with shallow geothermal drillings, it provides cheap, clean and reliable heating and cooling, all in a way that looks into delivering demand and response services to the grid. See www.termonet.dk for more information.

Termonet Union

In November 2019, the RENCOP Termonet evolved to a new level. People around Denmark (citizens, companies, and associations) showed interest in this technology and the Termonet Union was founded online on the 16th of March 2020 as a result. A lot has happened since the association was founded and it was finally time to meet the founders and both old and new members in person. The association started to take form, a homepage was designed, and new members have joined, but the association was still missing some cornerstones, basic things like defining the purpose of the association.

On the 20th of August 2020, the time finally has come and the association Termonet had its first physical meeting. On the agenda was amongst other things getting to know each other, defining the purpose, and discussing the structure of the association. The first physical meeting of Termonet Union has been a success and the enthusiasm of the participants promises for a bright future. There has already been a great interest from energy planners, municipalities, and other stakeholders to learn more. The Union's goal is to promote the knowledge of the Termonet technology in order to strengthen the transition to a more climate friendly heating system. Based on concrete solutions and the use of a known technology, this effort is expected to support FN's world goals and has the potential for national and global upscaling.

The concept of Termonet has been under development since 2014 and a number of public Danish projects have helped elucidate technical, legislative, and economical aspects around the establishment and operation of Termonet. In 2017, the first Termonet has been established near Silkeborg and in 2018 the Termonet in the Middelfart Municipality has been established and several more are planned all around Denmark. It is possible for both citizens and organisations to join the association.

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Føns District Heating – The First Movers

Specification

- **Technical Solution:** District heating, woodchips
- **Ownership Model:** Owned by the consumers
- **Size (Number of households/housing units):** 49 households are connected to the district heating system
- **Established since:** 2015

Føns Local Heating Plant is Denmark's smallest district heating plant. It has been operating since the 1st of October 2015. The heating plant supplies 46 households with around 400 kW heat, saving 280 tons of CO₂. In 2012, long before CO2mmunity, Føns started the process of finding a heating supply solution for the village. This resulted in a small district heating plant powered by woodchips. During the process of finding a common heating supply for the village, many challenges appeared, but in the end, Føns' citizens prevailed and obtained their district heating plant. The project got its inspiration from the city of Samsø, which has a small district heating plant. Føns was able to secure the necessary number of connected users by charging a small connection fee. After successfully implementing a small district heating plant, Føns is still not finished. The small village is working on becoming even greener as they are working on new and inventive ideas.

Indslev – Large Scale Heat Pump

Specification

- **Technical Solution:** Ground sourced heat pump, case study project
- **Ownership Model:** Not defined
- **Size (Number of households/housing units):** case study
- **Established since:** not established

Indslev is one of four cities that has been chosen as case city for the ATES project. The aim of the ATES project is to analyse the technical and economic possibilities of a low temperature distribution system for common supply of individual heat pumps.

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General Information

In Estonia, the development of community energy is still at a relatively early stage compared to countries such as Denmark or Germany. Initial attempts to establish energy cooperatives took place in 2015 and 2016 when the *Energy Cooperatives Mentor Programme* was implemented by the Estonian Development Fund. It was funded by ERDF and supports Estonian start-ups and their development through workshops, peer-to-peer learning, and mentorship programmes. The programme included 10 CE projects. Legislative gaps and obstacles to CE were identified in the programme and over the past couple of years, they were in part rectified by national law.

Currently, the Tartu Regional Energy Agency organises local RENCOP activities in Estonia. There is a relatively low level of awareness and preparedness in the field of energy cooperatives. The main activities and objectives of the Estonian RENCOP are:

1. Increasing the awareness of citizens, local municipalities, and communities about the possibilities of community energy cooperatives. The RENCOP shares the information about the benefits of cooperative production and consumption of energy, different technologies, and opportunities for communities.
2. Spotting the stakeholders and interested communities to involve in RENCOP activities in future and the CE issue in general.
3. Working with specific CE initiatives

The first RENCOP meeting was held in May 2018, targeting rural communities and associations of individual apartment buildings' residents. The workshop spread ideas and benefits of CE projects in addition to knowledge on CE and cooperatives in general. The aim was to initiate new projects, to provide expert knowledge, and to help to build a network among practitioners.

The knowledge shared included benefits of CE, activities for realising a CE project, lessons learned from the Estonian Energy Cooperatives Mentoring Programme and a crowd funding model. This was then followed by leaders from existing cooperatives sharing their experiences. The last part formed a discussion on CE obstacles and how to overcome such obstacles for the project realisation. The RENCOP focuses on experts as drivers of new projects as the interest among citizens was low at the beginning. Thereby, most of the experts can be sourced from TREA. In future, this is expected to change to establish community driven energy projects as well.

TREA's RENCOP experts have also visited eco-communities and shared the information and knowledge in the general meeting of Estonian eco-communities in January 2019. Simultaneously, TREA has identified local municipalities as important stakeholders and thus paid attention to disseminating information and raising awareness at this level. RENCOP experts have already visited and contacted some municipalities, more local municipalities will be contacted in the nearest future. By March 2019, two CE initiatives joined the Estonian RENCOP and now participate actively: **Lilleoru ecovillage** installing PV panels for central buildings and the

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Apartment Association Kalda 64 in Tallinn, also installing PV panels on the roof as part of a larger renovation project.

The need for RENCOP-like entities has clearly emerged from the activities. Potential communities that would have an interest in producing their own energy do not have enough knowledge of the possibilities of creating and managing energy cooperatives, and the complexity of legal space and lack of awareness of funding opportunities raises hesitations and fears. The free support and expertise of the RENCOP experts in such a situation is very important.

TREA RENCOP experts have established a specific Community Energy section on TREA's general webpage <https://www.trea.ee/kogukonnaenergeetika/> . It gathers information on the development of CE in Estonia, informs about upcoming events and advises those who have interest and questions about the CE field. The website and its possibilities are actively introduced at all events and meetings.

The TREA RENCOP expert group will continue to operate, to disseminate the information as well as to search and support new CE initiatives after the end of the Co2mmunity project.

Lilleoru

Specification

- **Technical Solution:** PV panels on the roof of a community centre building (total 15kW)
- **Ownership Model:** NGO, consisting of members of the community
- **Size (Number of households/housing units):** community leaning centre (main building)
- **Established since:** NGO was established in 2001
- **Budget:** Total EUR 12.000 (currently installed 9kW, EUR 7.200)

Current Status (30/09/2020)

The first phase of solar panels (9kW) was installed in July 2020, and the project is currently awaiting a permit from the network company, which should come in the near future. The next phase (8kW) will start as soon as possible. Additional 7 kW to be built on the roof of the extension are under discussion.



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Challenges/Barriers

1. Finances - Lilleoru is a self-sufficient community and thus one of the determining challenges is the availability of finances. No national grant was requested from any national support scheme for the implementation of the project. Therefore, the PV park project has been very much affected by the COVID-19 pandemic (initially, phase 1 was supposed to start already in March 2020).
2. Applying for a production permit takes more time than planned because the main network company is overloaded by a large number of applicants due to the rapid growth in the establishment of PV parks in Estonia.

Kalda 64

Specification

- **Technical Solution:** PV panels on the roof of an apartment building (part of a larger renovation project including replacement of enhanced heating and electricity systems, part-financed by a national support scheme), total size 40,26 kW
- **Ownership Model:** members of the apartment association/flat owners
- **Size (Number of households/housing units):** 56 apartments
- **Established since:** The apartment association Kalda 64 was established in 1998. No special organisation was established for joint electricity production as the NGO was already existing
- **Budget:** EUR 35.750

Current Status (30/09/2020)

The first procurement procedure (October 2019) was cancelled due to a lack of transparency. A new procurement was launched in December 2019 and the construction contract was signed in April 2020. One of the specialities of the project, which had to be taken into account in both design and procurement, is the fact that both, the architecture and the roof of the building, are more complex than in average residential buildings. Therefore, several inverters and optimizers have to be installed and thus the cost is higher than for conventional projects. The construction started in the middle of May 2020 and is currently in working process.

Challenges/Barriers

1. Involving members of the community – at the beginning, convincing the members of the cooperative of the necessity and the benefits of the whole renovation process (incl. PV park).
2. Procurement activities - the complexity of the required procurement documents and the procurement procedures when announcing the procurement. The first procurement process was cancelled which prolonged the whole process.

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South Ostrobothnia

Specification

- **Technical Solution:** Solar panels, but also micro-CHP, biogas, and heat pumps promoted with varying success
- **Ownership Model:** Private
- **Size (Number of households/housing units):**
 - *Expert driven RENCOP:* 25, attendees to solar energy events: 92 households
 - *Common purchases of solar panels:* Ilmajoki: 11 destinations (common purchase by a group led by local entrepreneur Lähdesmäki, another common purchase inspired in Ilmajoki with final number of households involved unknown), Alavus: supporting technical and financial material provided to 9 households
 - *Energy expert trainings:* 17 housing company representatives
 - *Other related communication and campaigning activities* (e.g. distributing the Finnish handbook on CE and the virtual bus tour videos in social media): more than 5.000 citizens reached
- **Established since:** Common purchases of solar panels: Alavus: spring 2017, Ilmajoki: spring 2018, new inspiration for housing companies and biogas filling station in 2020
- **Budget:** The total budget of the common purchase of solar panels is unknown as this is private information of the building owners

General Information

In South Ostrobothnia, an expert driven RENCOP was formed in the beginning of 2018 to further the development of renewable energy projects in the area. The responsibility of the management of the South Ostrobothnia RENCOP was divided between the regional partner organisations *Thermopolis Ltd.* – Energy Agency of South Ostrobothnia and the Regional Council of South Ostrobothnia. The large amount of active local communities, such as village associations around the region, formed an attractive environment for developing CE projects together with the experts. The first objective of the expert driven RENCOP in South Ostrobothnia was to increase the knowledge and discussion on CE projects among the RENCOP members, and by this way increase their capability to enhance and foster these projects among their own work.

An ambitious topic of micro-combined heat and power generation (CHP) with its new technological solutions was chosen in the hopes of making a real change and thus to accelerate the energy transition.

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Alpua villages: case example of a village association setting up micro-CHP to a village school and selling excess heat under the brand Farmivirta which was presented at the South Ostrobothnia RENCOP meeting on the 24th of September 2018 by Asko Karhunen, Alpua Development, in the hopes of furthering micro-CHP in South Ostrobothnia area. Pictures: Ruggiero Salvatore and Thermopolis Ltd.

In addition, the expert driven RENCOP acted as a catalyst in forming renewable energy projects connected to one of the following: biomass, biogas, solar energy, or geothermal energy. Throughout the meetings of the expert-driven RENCOP, the objective emerged to organise several open-RENCOPs for citizens in the region in order to distribute knowledge on community energy and to help forward individual CE projects. In rural areas, the most important stakeholder groups are village communities whereas in urban areas the focus is on housing companies. Nonetheless, also housing companies became of interest in 2020. In South Ostrobothnia, district heating is not fuelled by coal (like in many coastal cities of Finland) and the related Co2-emissions stem mainly from the use of peat. For some housing companies, different solutions with heat pumps and two-way district heating might be attractive in the future.



The Co2mmunity team at the community energy site AS OY Tampereen Pohjolankatu 18 – 20 in Finland. The award winning housing company showcases multiple energy renovations, including two-way district heating, geothermal heating, heat recovery systems, solar panels, and solar collectors. In the picture on the left, Pertti Vesterinen (Chairman of the housing company AS OY Tampereen Pohjolankatu 18 – 20) is giving us a tour in the beautiful yard that does not look any different even if there are bore holes underneath. Pictures: Pia Kattelus

The Co2mmunity partner organisations planned together the RENCOP work in the area, organised RENCOP meetings and gave presentations at RENCOP events as well as chaired these meetings. Several stakeholders were involved not only in the expert workshops but also in the community engagement processes. For instance, the development office for the municipality of Alavus was involved in the Sunny Alavus-project, organised in 2018, which provided the citizens of Alavus municipality a chance to get information on solar energy and to participate in a common purchase of solar panels.

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Reaching the grassroots level in South Ostrobothnia localities

The Co2mmunity partners have identified local communities in various ways to present and discuss the potentials for local CE projects. Furthermore, *Thermopolis Ltd.* – Energy Agency of South Ostrobothnia and Regional Council of South Ostrobothnia have been spreading the news on CE and their willingness to support particular CE projects at local events (fairs, village events) as well as in the media. Also, local papers and news as well as leads from individual conversations have been followed carefully to find possibilities for CE projects. Moreover, digital formats of knowledge dissemination and campaigning have been used increasingly in the South Ostrobothnia region and beyond nationally, as the main outputs, such as the Finnish handbook (produced in two national languages Finnish and Swedish), the RENCOP roadmap and policy recommendations (also translated in Finnish) have been distributed via e-mail and social media. Furthermore, the South Ostrobothnia RENCOP produced a virtual bus tour by filming inspirational renewable energy sites which displayed heat pumps, heat recovery, two-way district heating, biogas solutions, and solar PVs as well as local citizen action. Throughout the RENCOP process, if clear interest in particular form of renewable energy has been detected, such as solar energy in Ilmajoki, this local interest has been supported. In South Ostrobothnia, it has been evident that it is not practical to operate “from above”, but it is important to support local ideas and enthusiasm. Therefore, the RENCOP activities, which have started out as expert-led in South Ostrobothnia, have evolved towards community-led processes. Both approaches have been creatively used in South Ostrobothnia when seen necessary.



The virtual bus tour of the renewable energy sites in South Ostrobothnia and Pirkanmaa continues to inspire both housing companies and villagers in rural areas to set up community energy. First picture: Co2mmunity team members on their way to film the virtual bus tour. The other photos: filming of the biogas symbiosis Jepuan biokaasu Oy in Jepua and the managing director Kurt Stenvall who is giving us a tour. Pictures: Mira Perttula and Pia Kattelus

Current Status (30/09/2020)



Common purchases of solar panels continue to inspire others

Two solar energy processes carried out in Alavus and Ilmajoki municipalities have been successful and led to instalments of solar PVs in both municipalities. In Ilmajoki, the arranged solar energy evenings and the installed solar PVs have inspired others in the area to install solar PV, as they are visible in prominent places of the municipality. Furthermore, in summer 2020, the municipal council of Ilmajoki made the unanimous decision

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to obligate the municipality to consider solar energy in every construction project in the future. This decision can be seen as another indication of a solar-friendly atmosphere within the citizens and decision-makers of Ilmajoki.



Housing companies targeted to install heat pumps and solar panels

The promotion of housing companies towards community energy has begun in 2020. The energy expert trainings piloted in spring 2020 will continue in the regional energy counselling provided in the regions of Ostrobothnia, South Ostrobothnia, and Middle Ostrobothnia by *Thermopolis Ltd.* The Co2mmunity video of the good practice example of the housing company *As Oy Tampereen Pohjolankatu 18-20* and other virtual site visits will continue to inspire citizens to install renewable energy and engage in sustainable energy renovations (see a compilation video of the virtual bus tour at www.co2mmunity.eu).



Promotion of the increased use of biogas initiated

Biogas was the last renewable energy form promoted via Co2mmunity in South Ostrobothnia. Two biogas related site visits were filmed as part of a virtual bus tour designed to inspire citizens residing in rural areas. The first one was *Jepua Biogas*, a regionally significant and large biogas symbiosis with villagers and local stakeholders. Second was the dairy farm *Hietakorven tila* in the Vimpeli municipality with 160 cows and a successfully operating biogas plant providing inspiration for other farmers in the area. These videos will live on and reach people at a wide scale, as they will be used by the regional energy counselling (conducted by *Thermopolis Ltd.*) in the future and also by *FRANSU – Many possibilities of bioenergy*, a transnational project between France and Finland (conducted by *Thermopolis Ltd.* and the Finnish Forest Center in cooperation). Thereby, they will continue to impact citizens regionally as well as beyond the BSR region, as the information will reach a French audience as well. In addition, excitingly, the visit of the Jepua biogas plant brought up the brilliant idea of setting up a biogas filling station in Lapua. Initial discussions on the matter have been done and this idea can be promoted in the upcoming activities of *Thermopolis Ltd.*



Micro-CHP currently too difficult to promote

Micro-CHP was proven to be too difficult to promote under the prevailing legal constraints and technological development. However, a lot of people in the rural area of South Ostrobothnia would be interested in it, if the current barriers could be overcome.

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Challenges/Barriers

Micro-CHP

In Finland, CHP currently does not seem to be feasible even in bigger sizes, let alone in micro-CHP-level. Moreover, small scale distribution of heat is rather achievable in Finland (proven by a large amount of heat entrepreneurs), but for the small scale distribution of renewable electricity and in case you would like to distribute the electricity to more than one building, challenges arise. Legislation quite effectively prevents the forming of micro-grids for a renewable electricity distribution, as small micro-grids face the same heavy legislation and regulation as big grid operators. Electricity taxes and transfer fees that need to be paid prevent the feasibility of micro grids.

Furthermore, for instance, the system developed by a local manufacture of heat boilers presented that the micro-CHP devise would produce a large quantity of heat and only a little amount of electricity, so a site that would benefit from this should be carefully selected.

Housing companies and the use of solar electricity inside individual apartments

The housing companies in Finland still face the problem of not being able to use solar electricity produced with a common system inside individual apartments without running into electricity taxes and transfer fees. This problem has been raised in Co2mmunity in Finland and lobbied in the Uusimaa region via national media, thus there is a good chance that the related legislation will change in the future.

Helsinki

Specification

- **Technical Solution:** Hybrid energy generation system for aging block of flats housing companies
- **Ownership Model:** Housing company owns the system
- **Size (Number of households/housing units):** over 9.500 buildings in the Helsinki region / or 18.466.012 m² of living area
- **Established since:** RENCOP is not making investments

General Information

The expert-driven Helsinki-Uusimaa RENCOP was established in January 2018. Green Net Finland (GNF) is the coordinator of the RENCOP. The operational model of the RENCOP is flexible – combining face-to-face meetings and different parallel activities such as participation in relevant events in Finland and the wider Baltic Sea Region, communicating and disseminating the Community Energy Agenda. In total, there are nearly 40 experts involved in the Helsinki-Uusimaa RENCOP, diversely representing local public authorities, the academia sector and businesses, providing services and technologies for renewable energy and/or CE projects. For example, in the loop of the RENCOP are these organisations: the City of Helsinki, the Helsinki-Uusimaa Regional Council, Aalto University, the University of Helsinki, the Finnish Environmental Centre SYKE, the Finnish Innovation Fund SITRA, *Motiva Oy*, and the Finnish Heat Pump Association. GNF as the RENCOP

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coordinator continuously communicates and shares expertise and experiences from Co2mmunity with other public funded development projects. To mention some: *HUKATON*, *EKAT*, *Ilmastoviisat taloyhtiöt* (Energy-wise managing companies), *Cata3Pult*, Smart Energy Transition and *CORE*.

The City of Helsinki has developed the Carbon Neutral Helsinki 2035 Action Plan (CNH2035) and the Helsinki Climate Watch (*Ilmastovahti*) service, which will follow the implementation of the plan. According to this plan, the total consumption of district heating should be decreased, and the share of geothermal heat and solar PV should be increased to 15%, each from almost zero. Installations of Ground Source Heat Pumps (GSHPs) and solar PV systems into existing building stocks are the focus.

The work of the Helsinki-Uusimaa RENCOP is supported by the City of Helsinki, and the RENCOP is contributing to the implementation of the CNH2035 programme by promoting energy systems to housing companies of apartment buildings. A hybrid energy system is a combination of technologies/equipment for producing heating and electricity on-site at the building. An example of a hybrid system for an apartment building is the combination of GSHP, an exhaust air heat pump (EAHP), a wastewater heat pump (WWHP) and a solar PV/collector combined with heating demand flexibility automation.

The RENCOP coordinator Green Net Finland communicates and collaborates via meetings with other projects and initiatives that are related to the same focus – enhancing renewable energy and energy self-sufficiency within community housing or within blocks of flats buildings.

Current Status (30/09/2020)

The Helsinki-Uusimaa RENCOP – expert group developed a Co2mmunity concept of blocks of flats buildings, which are commissioned in the period from 1960 to 2000. These buildings are connected to a district heating network and have machine ventilation. The RENCOP developed a general set of technologies that is suitable for such kind of buildings: a hybrid energy generation system.

Challenges/Barriers

The identified challenges and barriers are the decision-making process in housing companies, putting together a set of technologies, and the lack of understanding complex solutions by regular citizens/owners of apartments. In older peri-urban blocks of flats, getting bank loans for renewable energy systems is difficult, because of existing major refurbishment debts of the housing company and as a consequence a lower property price. Moreover, existing monopoly on electricity and district heating networks forms a barrier for CE projects. In some cases, no harmonised permission practice is another barrier.

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Current Status (30/09/2020)

The **Klimanetzwerk - Rendsburg/Eckernförde** is a regional strategic (community renewable energy) network, which we initiated as a RENCOP. Strategically, we decided to try to engage with multipliers and civil society organisations that do not have a focus on the Energy Transition as such. The Network aims at reaching out to citizens via key regional civil society organisations and associations, and link these to energy experts: partners in this network are the *Evangelisch Lutherische Kirche* (Luth. Church), the *Heimatbund* (Heritage Association), the *Naturfreunde* (Nature Friends), the *Landfrauen* (Country Women's Association), the *Volkshochschule* (Adult Education Center), the climate management of the regional authorities (Kreis Rendsburg Eckernförde), as well as a number of various CE experts.

The German RENCOP in the Rendsburg-Eckernförde district is organised by **Energiebürger.SH**: the Co2mmunity partner in Germany (hosted by the *Heinrich-Böll-Stiftung Schleswig-Holstein*). Jointly with our RENCOP partners, we are pursuing how to foster the Energy Transition in the county of Rendsburg-Eckernförde, organising joint events, as well as bundling forces to enable each organisation to develop opportunities for citizens to engage.

Challenges/Barriers

One of the main conclusions of the climate concept of the county of Rendsburg-Eckernförde was the call for establishing local structures in which citizens can participate to shape the transition. We very much took this as a reference and a challenge when developing our goals relating to establishing the RENCOP. These have been:

- Establishing (new) partnerships: by building our RENCOP, we are looking to develop new alliances with multipliers within civil society.
- Providing knowledge about modes of renewable energy (wind, solar) and the possibilities for community, NGOs, and citizens, as well as enabling citizens to become active, i.e. develop a participatory guideline which people can use
- Building a RENCOP which sustains the project phase.

Hence relating to our goals, the challenges have been to identify and to develop a joint RENCOP - one that we, as initiators, can leave at a certain time. Hence, one of the main challenges in developing the RENCOP is, that already in an initial stage, we should think of how to develop the RENCOP in a way that it will outlast the time of the project. As we are not physically present in the region, we needed to make sure that by the end of the project, we have established the "*Energiebürger.sh*" approach to be known in the region among our key stakeholders, as well as to give guidance on how to develop and create a momentum for community energy and moreover, that the network of partners is carrying the cause.

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Our RENCOP – The “Klimanetzwerk – Rendsburg/Eckerförde”

Energiebürger.SH has the aim to enhance civic involvement: to inform citizens and honorary politicians about climate change, regional impacts, and opportunities relating to renewable energies, as well as to engage people to actively participate in the German Energy Transition. It is a union of various educational institutions and the Church, *Nordkirche*. The *Heinrich-Böll-Foundation* of Schleswig-Holstein is an agency for cross-party independent political education and is one of the key actors in *Energiebürger.SH*. The foundation strives to foster democracy and participation among citizens, and to empower people to become active in the Energy Transition.

Switching to renewable energies and climate protection are global issues that many people are itching to deal with on a local level. Therefore, many small steps need to be taken and not only great leaps. Thus how is it possible to make a local change? The education and project initiative *Energiebürger.SH* is designed to help citizens and people engaged in communal politics who wish to contribute to the Energy Transition process within their municipality and region. For more information have a look at their flyer.

Energiebürger SH is seen as a strategic partnership for fostering the Energy Transition and is currently engaged in the county of Rendsburg-Eckernförde to establish a RENCOP. Rendsburg-Eckernförde is politically committed to the Energy Transition and has published a climate concept for the region, the ‘*Klimaschutzkonzept Kreis Rendsburg-Eckernförde*’. Our goal with the RENCOP is to strengthen and empower citizens to take an active role in the Energy Transition in their community.

During 2019, we have organised numerous events in the region. To help inform and empower not only citizens but also politicians, we have organised seminars regarding the possibilities and potentials in initiating CE projects, and we have subsequently built-up the **Klimanetzwerk - Rendsburg/Eckerförde**.

Our Activities

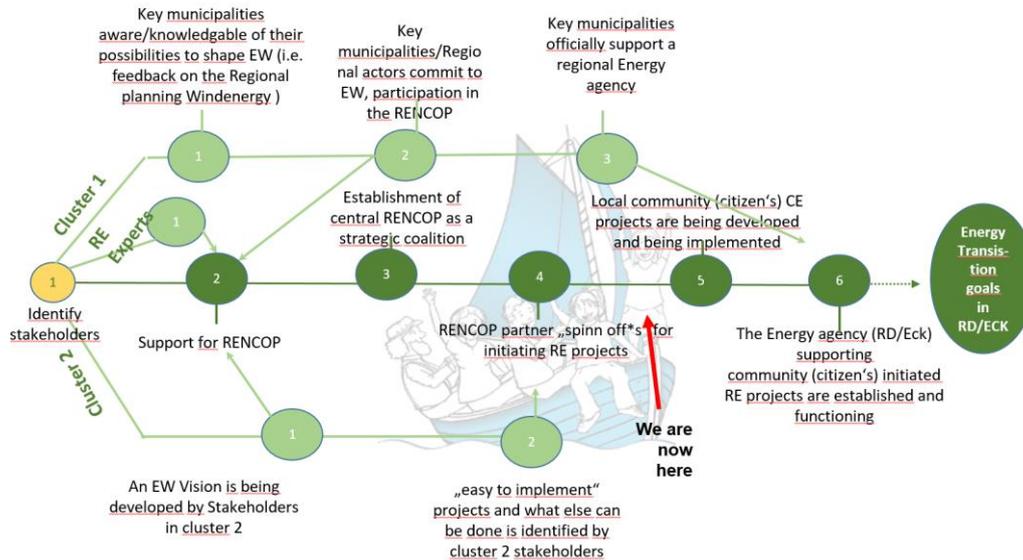
We started with highlighting the issue of wind power, which has been a politically challenging topic in the region. The government halted the expansion of wind energy until 2020, therefore, we felt that there was a need to disseminate information on the issue. We started with “wind seminars”, as well as additional seminars surrounding other sources of renewable energy production such as solar and bio thermal followed during autumn. In January 2020, we started the Energy citizen course in Rendsburg, a course designed to enable citizens to jointly develop and implement their own community energy projects. More information can be found at www.energiebuerger.sh.

During 2019 and beginning of 2020, we have built-up an informal central RENCOP with multiplier organisations, which are in the phase of developing local spin-off’s now. In these local RENCOPs, concrete CE projects will be developed and carried out. It was planned that each partner will host a series of CE related events in their networks during 2020. Furthermore, joint events were planned. However, due to the COVID-19 situation, these events are now being re-planned and re-scheduled.

In our strategy for establishing the RENCOP, we tested the participatory guidelines while being in the role of developing them. Our theory of change (see Fig. below) is a visualisation on how we thought that we would be able to implement our strategy, along which we planned our various activities.

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THE RENCOP STRATEGY FOR RENDSBURG-ECKERNFÖRDE S-H



Theory of change for establishing the RENCOP in Rendsburg-Eckernförde

The Covid 19 restrictions led to the fact that many activities which we and/or our RENCOP partners had planned for spring 2020 were put on ice. Also, the tandem meeting, a Latvian-German exchange, and a study trip to Schleswig-Holstein which we had jointly planned with the Riga Planning Region, could not take place. Together with our RENCOP partners, we held online meetings, but as a final event, as the COVID-19-situation allowed, we were able to organise a real physical event, while following the corona restrictions. The regional conference, which we organised together with our network partners, had the title **“Good Life thanks to Climate protection”**. This was the final grand meeting for the project. It had as a goal to manifest the RENCOP, as well as to open up the RENCOP, linking energy initiatives with experts, citizens, and politicians - opening-up for possibilities to pursue the roadmap for the further development of CE projects, and to look for specific options for joint actions in the fields of: housing, nutrition, mobility, purchasing, and for “good life as such”.

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Specification

- **Technical Solution:** Installation of rooftop solar panels and/or thermal collectors at two apartment buildings in the municipality of Mārupe to co-produce heat and electricity for local communities
- **Ownership Model:** Hybrid ownership model: the solar equipment is currently owned by the public partner Riga Planning Region. The solar facilities will be owned by the public contracting partners (Riga Planning Region and Mārupe municipality) for five consecutive years and handed over to the respective citizens' cooperatives afterwards, fully respecting regulative framework. Existing partnership agreements do not imply that a new company is established to run the pilot project. Instead, each signatory assumes certain responsibilities to guarantee the successful implementation of the demonstration projects with the purpose to introduce innovative approaches and solutions in CE in Latvia.
- **Size (Number of households/housing units):** Two sites - a three-storey residential house with 18 apartments and a row house with five semi-detached apartments
- **Established since:** 2019
- **Budget:** EUR 37,000.00

General Information

Latvia has a high share of renewable energy in its national energy mix. Hydropower accounts for 53% of the total power capacity and supplied about 33% of Latvia's electricity in 2015 (IEA, 2017). Biomass has gradually replaced fossil fuels as a source for the production of electricity and heat while the overall consumption rate has also increased. A positive characteristic is the wide use of local district heating systems.

On the other hand, most district heating companies are owned by local municipalities while individual households do not possess shares in these companies. As a result, many other community energy approaches are not well-known. To date, there are only few successful examples that demonstrate direct involvement of households in the production of heat or electricity.

As part of the Co2mmunity project activities in Latvia, our project partner Riga Planning Region in cooperation with its major stakeholder – the municipality of Mārupe – attempted to implement a pilot project in Mārupe by establishing and monitoring a citizen-driven RENCOP and thus demonstrating ways how the existing problems can be overcome in practice. It was also important to resolve the myths that hindered wide implementation of CE projects in Latvia, such as:

- renewable energy is expensive
- benefits are incomparable to the amount of investment needed
- there is a relatively small number of sunny days in Latvia, making the use of solar energy less profitable
- renewable energy projects should always be co-financed from the EU or other support instruments.

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Current Status (30/09/2020)

In 2018, two RENCOP's were established in Mārupe to allow local neighbourhood associations to cooperate with energy experts and public agencies, as well as to implement small-scale CE demonstration projects. To capitalise on that, two tripartite cooperation agreements (Riga Planning Region, the municipality of Mārupe, and a local household cooperative) were signed in spring 2020 to streamline the joint implementation of certain CE solutions at both pilot sites. The goal is to facilitate the implementation of renewable energy community demonstration projects, as well as to provide the monitoring and dissemination of project results (good practices) elsewhere in Latvia. Practical activities include the installation of rooftop photovoltaic panels at both pilot locations, as well as providing monitoring activities and dissemination workshops.

Challenges/Barriers

Energy production by local communities (energy self-production) is just beginning to take hold in Latvia. Energy cooperatives are neither popular nor well-known and the RENCOP approach is a new phenomenon. As the level of civic participation in energy production in Latvia is still moderate, the development of CE projects is facing several challenges. One of the largest obstacles to the increase of energy self-consumption in Latvia is the lack of incentive instruments, and the other – existing regulation does not favour local energy cooperatives. The initial costs to develop CE projects are high and the payback period of projects is relatively long, therefore CE projects only become available to a relatively small number of owners.

Pilot Project in Mārupe

To facilitate the introduction of the RENCOP concept in Latvia and to better understand the existing situation, the Riga Planning Region together with the Mārupe municipality conducted a survey in Mārupe in 2018, the results of which showed a generally positive attitude towards renewable energy. It appeared that the residents were well informed about various energy-efficient lighting or heating solutions but knew very little about community energy projects or energy cooperatives as such. To capitalise on that, two public participation workshops were organised, targeted at local citizens and NGOs as a follow-up activity in order to identify local household communities that were willing to participate in the RENCOP pilot project as well as to search for certain technical solutions. In parallel, several research studies that addressed the legal framework for renewable energy communities, the evaluation of economic potentials and the analysis of the existing situation in Mārupe, were initiated.

The results of these research studies show that there is a high potential for energy efficient local communities in Mārupe. The owners of many individual apartments already *de facto* exist within unified communities even if they are not aware of this and have not registered their communities as legal entities – cooperatives or household associations. However, to be able to introduce major energy efficiency improvements in an apartment house, it is also necessary that the owners of individual apartments come to an agreement with the owner of the building. This applies to both, the heat insulation of houses and the introduction of new renewable energy solutions for the development of local energy supply networks. Smaller energy communities can also be developed within the segment of detached houses, which are widespread in Mārupe, given the

Co2mmunity

fact that it is a typical suburban municipality where a high percentage of residents are daily commuters. Preliminary studies have shown that the systems of solar panels have the highest potential for the generation of power implementation in detached houses.

In order to perform the assessment of energy efficient solutions in various existing or potential communities in the Mārupe district, several house owners have been approached and initial technical solutions have been developed in order to introduce ecologically-friendly renewable energy solutions in the selected pilot sites. Six public participation workshops have been organised in Mārupe since 2019 to allow local citizens and NGOs coming together, discussing the urgent issues and, more importantly, select local household communities that are willing to participate in the RENCOP pilot project that includes both a public participation process and a demonstration of certain technical solutions. In the end, two sites were selected for an in-depth analysis and pilot activities. The project team, municipal experts, and external consultants guide these citizens and provide their expertise, including technical know-how.

RENCOPs and Pilot Sites in the Municipality of Mārupe

Apartment house at Mazcenu aleja 15, Jaunmārupe



The residential building at Mazcenu aleja 15 is located in the village of Jaunmārupe. The structure was built in 1980 and is connected to the district heat supply system. Heat supply is provided by the local energy company “Sabiedrība Mārupe”, Ltd. The building has undergone full-scale renovation in 2018. There are 18 apartments in the house and the total energy consumption for hot water production is ~100 MWh/year.

In order to estimate the necessary capacity of the solar collector, data on heat consumption for hot water production has been collected and a decision was made to install a system of solar collectors with a total surface area of 20m². The total annual production capacity of this system would then be 20 MWh which will correspond to around 20% of the total energy demand. The estimated installation costs are in the range of 12,000 EUR including all taxes. Given the current prices for heat (50 EUR/MWh), one can assume that the pay-back period of this equipment would be around 10 years.

Furthermore, it is important to consider the environmental factor, as the introduction of the proposed solution with the solar collectors will reduce the burning of the fossil energy resources, in this particular case – natural gas, by 2,100 m³, resulting in the reduction of CO₂ emissions by 4,000 kg/year.

Row house at Lielā iela 160



The row house project at *Lielā iela 160* was commissioned in 2016. The total living area of the house is 700 m². The heat is provided by local natural gas-fired heating boilers and the mean total gas consumption amounts to 4500 m³/year. The average electricity consumption of the house is ~ 6,000 kWh/year. Given the amount of the consumption of natural gas, the estimated energy efficiency of the building equals 73 kWh/m²/year. This energy efficiency index

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is much better than at most other locations in Mārupe, however, it should be assessed as average in comparison to the target of 30 kWh/m²/year set at the national level for the year 2021.

The proposed solution is the installation of a solar collector system with a total surface area of 42m². This would allow for the production of 20,000 - 30,000 kWh of heat energy. The estimated amount of costs ranges from EUR 10,000 to 15,000. Benefits are natural gas savings of 1,000 m³/year and a CO₂ reduction by 1,000 – 2,000 kg/year.

Taking international and local experiences to national policy-makers

In addition to activities on a local level, the project team has also had several meetings with the national energy policy maker – the Ministry of Economics - to discuss the content of the local outputs and participated in the matchmaking event at the National Energy and Climate Plan 2030 Conference in Latvia. The NECP 2030 is the most important strategic energy and climate policy document in Latvia that details goals, instruments, and actions that contribute to the development of a climate neutral national economy. For the first time, the plan clearly demonstrates the necessity to encourage the implementation of community energy approaches in Latvia. These events provided the Riga team an excellent opportunity to strengthen the existing links to national energy policy makers.

Moreover, based on the knowledge of other Co2mmunity partners and own experiences in Mārupe, the project team elaborated community energy policy recommendations that were forwarded to the national energy and climate change mitigation policy makers in May, 2020.

Dissemination of knowledge

Given the scarce amount of information about community energy projects in Latvia, project publicity and dissemination of project outputs become an important part of project activities in Riga / Mārupe. This is being done by regularly updating information on the partner websites and by publishing articles in the local newspaper “Mārupes vēstis” (News of Mārupe). In parallel to these publicity activities, the Riga team has organised discussions with a number of local stakeholders (local municipalities, non-governmental organisations, state agencies and private energy service companies) in search for ways that could facilitate the distribution of project-related information via their own professional networks.

In order to promote the project approach and encourage more active involvement of the local community, the municipality of Mārupe has developed a sub-section on their website to facilitate communication between the municipality and its citizens on issues related to community energy, climate change, green economy and energy efficiency on a local level (<https://www.marupe.lv/lv/sabiedriba/sabiedribas-lidzdalibas-pasakumi>). The main target group of the recent publication is the local population, irrespective of age and background.

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Presented in a clear and easily understandable way, the publication contains both, general information about the project and an update on Co2mmunity activities in Mārupe, including presentations from the recent RENCOP meetings and some audiovisual material. The purpose is to sustain the public participation process that has been established in Mārupe, to inform about local success stories and to give and get productive feedback to and from the local community. A special e-mail address dzivozali@marupe.lv (roughly translated into English as “Go green at Mārupe”) has been created to communicate on issues related to energy efficiency and use of renewable energy in the municipality.

For additional information on Co2mmunity / RENCOP activities in Mārupe, contact Ms Ilze Krēmere, Head of Development Division, Mārupe Municipality (ilze.kremere@marupe.lv) or Mr Ilgvars Francis, Co2mmunity administrative coordinator in Latvia (ilgvars.francis@rpr.gov.lv).

Lithuania

Specification

- **Technical Solution:** Solar PV electricity production
- **Ownership Model:** Community as legal entity
- **Size (Number of households/housing units):** Community house for elderly people’s needs
- **Established since:** *Pagramantis Community* was established in 2005, decision concerning solar PV in 2017, should be established in 2021.
- **Budget:** Financial support from the National Climate Change Program (possible up to 80%, own funds and municipality means up to 20%)

General Information

In Lithuania, the description of an energy community and the principles of its operation are defined by law (approved by the government of the Republic of Lithuania on October 30, 2019): *“Renewable energy community means any independent legal entity with the purpose of operating a non-profit organization that owns, develops, consumes, stores and sells energy from renewable sources in nearby renewable energy installations.”*

Collective electricity production in solar power plants is not sufficiently developed in Lithuania, however, very favorable conditions have been created for natural and legal persons to become prosumers. Prosumer initiatives (mainly solar energy) are widely developing in Lithuania - from natural persons to business entities. The creation of solar parks, along with opportunities to be shareholders in them, is more and more common.

In August 2020, 6943 prosumers were connected to the grid, and their total installed power was 64,1 MW (all types of RE).

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An expert-driven RENCOP has been established in Lithuania with members including two universities, representatives from municipalities and national associations (renewable energy, solar energy), and three private companies engaged in renewable energy technology. The work and strategies of the RENCOP has been to raise awareness of community energy projects, and to clarify the social, financial, and ecological benefits. A handbook has been developed, printed, and distributed.

Current Status (30/09/2020)

Activities:

- Intensive communication with the chairman of the Association of Lithuanian Communities
- Establishment of more contacts with municipalities (mayors and responsible persons for energy/environment)
- Direct communication with communities
- Discussions with technology and science experts
- Preparation of a list of trustworthy technologies and service providers for communities' needs
- Organising the Regional Conference for communities and all people who are interested in renewable energy (conference was held on the 26th of August 2020 and 34 people took part). In the first session – theoretical part – there were some important speakers from the Energy Ministry, the Confederation of Renewable Energies, and the Environmental Projects Managing Agency. In the second session – practical part – there were presentations and discussions about best practice and implemented CE projects.

Improvements – new RENCOP members were attracted

- Representatives of two universities - Kaunas Technology University (solar PV expert) and Vytautas Magnus University (biotechnology expert)
- Representatives of national associations (municipalities, communities, renewable energy, solar energy)
- 3 private companies engaged in renewable energy technology and service

Strategies – main directions

- Raising awareness of CE projects, consulting (in community places, personal, for groups)
- Clarification of social, financial, and ecological benefits for communities and group of individuals
- Distribution of the printed handbook using channels of associations of Lithuanian communities and municipalities

New opportunities

- Solar PV parks: who are they for?
 - For residents of apartment buildings who do not have space to install a solar power plant
 - Residents who own houses are not suitable for the production of electricity from renewable resources
 - For residents consuming electricity in different places (objects)
- Why is it useful?

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- The user will ensure a lower price of electricity for the next 20 years.
- It will not be necessary to take care of the existing solar power plant (or its part) - service and maintenance will be performed by a certified company.

The conditions for people who are willing to be a prosumer are continuously improving.

The main drivers are:

- an expanded list of technologies, including not only solar power but also wind and biomass power plants,
- an expanded list of people's potentials to become producing consumers – there is a possibility for not only natural persons, but also legal entities,
- a reduction in the bureaucratic burden by removing the need for some permits/documents, thus reducing the installation time,
- an increased quota for prosumers - total installed capacity of 100 MW, of which 70 MW for households and 30 MW for non-household customers, flexible pricing for grid access being created - producing consumers can choose from four different billing plans.

Challenges/Barriers

An important barrier is the historical sluggish mobilisation of the population of cities and regions in the country. It is difficult to accept unanimous support for community-level investment and benefit-sharing.

The **other main barriers** grouped in areas are:

- **political** (government interference in market relations, lack of citizenship and responsibility in society),
- **legal-administrative** (lack of legislation and regulation, too little or no authority power, bureaucratic barriers, legislative limitations),
- **financial-economic** (lack of funding and support programs, low funding intensity, insufficient market opportunities and poor investment conditions),
- **representation** (inadequate media coverage of RES benefits, inefficient responsible authorities, hostile behavior of conventional energy sources, inactive self-government position),
- **technical** (lack of technical regulation, lack of infrastructure, insufficient supply of technical experts, insufficient technological know-how of the community),
- **information and education** (lack of public awareness and education, too slow response of educational institutions to changing needs, conservative community attitude to innovation).

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A successful example of a community renewable energy project:

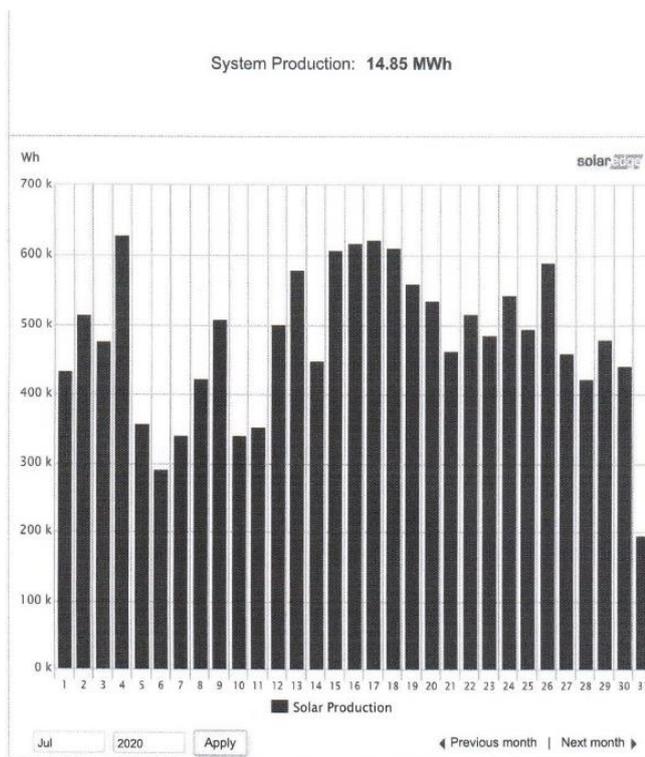
VšĮ Daugų Technologijos ir verslo mokykla

(Public Institution Daugai Technology and Business School)



The main activity of the school is vocational training. The school has 6 buildings at its disposal: the main training building, two dormitories, a canteen, a boiler room, and a training workshop. The total area of the premises is 10,773qm and the electricity consumption is 196,000 kWh/year. Electricity is not used directly for space heating, but it is used by a boiler house and electric water heaters installed in the dormitories.

The aim of the CE project is to increase the efficiency of utility costs which means to reduce costs while maintaining quality. Preparations started in summer of 2016, hoping a call for proposals in 2017. The initially prepared application was for a 50 KW solar power plant. In July 2018, the application was submitted to the funding organisation APVA, but has been adjusted to 100 kW.



The terms of the procurement were prepared using internal resources. According to the contract with APVA, the public procurement had to take place within three months. Eleven proposals were received for evaluation. The selection criterion is the most cost-effective. APVA allocated 80% to finance the project, and the school covered the remaining 20% of the required funds from its own budget (earned from various services). The grant was approved five months after the submission of the application.

Installation, adjustment works: the contract with the contractor was signed on April 25, 2019; on August 15, 2019 the production started. The permission to become a producing consumer was obtained on October 18, 2019.

In summary: It took three years from the original idea to the moment of launch. Currently, the purchase of solar power equipment and installation works is taking place and another solar power plant (29.7 kW) is under construction. The solar power plant will be fully self-financed. The installation and commissioning will be completed until November 2020.

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Perspectives:

1. It is planned to produce 100% of the electricity to meet the needs of the school in 2021.
2. The aim will be to move from the status of producing consumer to the status of an electricity supplier.

Poland

Specification

- Community energy definitions up to country specific:
 - Community energy (CE) projects offer enhanced production of renewable energies (RE) from local sources (wind, solar, biomass, hydropower, geothermal) through active participation of local communities. Together, citizens co-finance, co-develop, and co-operate RE plants, and foster sustainable energy distribution, like local heating networks or biogas filling stations.
 - In Poland energy cooperatives and energy clusters are the form of CE projects. Through active communication, transparent decision-making, and local benefit sharing CE projects have high social acceptance. Consequently, fostering CE projects is highly promising for increasing the share of RE in the Baltic Sea Region.
- The Polish RENCOP was set up in September 2018 as an expert-driven model in the formula of an open working group in cooperation with experts and project representatives.
- Participants:
 - representatives from different regions/initiatives/projects – voice of communities/projects
 - energy consultants – voice of experts/business
 - NGOs – support of development & social communication
 - Polish Confederation Lewiatan – voice of business
 - Bielany District of Warsaw
 - RES Council
- Coordination – Foundation for Sustainable Energy (FNEZ).

General Information

The Co2mmunity partner implementing the Polish RENCOP activities is the Foundation for Sustainable Energy (FNEZ). The work of the RENCOP is focused on the opportunities for the development of energy clusters, energy cooperatives and housing associations as forms of CE.

In Poland, the CE sector starts to develop a mainly based on prosumer and distributed energy sector. In the prosumer energy sector, the energy consumer produces heat or electricity for its own needs – it is both a producer and a consumer (prosumer). Producers can be households, farms, and small and medium-sized enterprises (SMEs), which are located mainly in rural and suburban areas. Prosumer power generation is based on small-scale installations of renewable energy sources, which produce electricity for the needs of a household or a company and can sell surpluses to the grid.

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For the energy revolution, it is necessary to involve the main stakeholders, i.e. citizens, who must be involved in building their own and local energy security. The result of the development of CE is to increase energy self-sufficiency, to strengthen the position of local communities, to create energy cooperatives, and to reduce the negative impact of energy on the environment. That is why RENCOP is needed so much!

Over the last decade, the interest in renewable energy sources in Poland has been steadily growing. The largest share of energy produced from renewable energy sources was recorded in the provinces of western and north-central Poland. The southern part of the country (Śląskie and Opolskie Voivodships) and Lubelskie Voivodship, for environmental and economic reasons (occurrence of mineral deposits of energy raw materials, development of mineral-based industry) are characterised by a much smaller share of renewable energy sources. The largest share of renewable energy sources in the Zachodniopomorskie, Pomorskie and Wielkopolskie Voivodships is mainly due to the capacity installed in wind power plants.

The distributed energy sector is a small and medium sized electricity and/or heat (including cold) generation system that can also operate in co-generation (simultaneous production of electricity and heat/cooling), supplying local communities. These systems are based on different primary energy carriers - conventional (coal, natural gas, oil) and alternative, renewable (sun, wind, water, production process gases, including biogas and biomass). The distributed energy has a community character if it is based on the use of RES.

The national CE sector is developed in 3 dominant formulas:



Current Status (30/09/2020)

More than 2 years of functioning of the Polish RENCOP Working Group in the expert driven model, bringing together experts, practitioners, legislators, and representatives of local authorities, allowed to take actions to change the functioning model of the group. Nowadays, the Polish RENCOP Working Group is a mixed model based on community as well as an expert driven group. This change was possible as a result of acquired experience and knowledge through the works of the RENCOP Working Group merged with the RES Council – led by the Lewiatan Confederation, one of the RENCOP members.

The combined works concerned a joint implementation of CE discussions on the conditions for the development of CE as well as recommendations for legal and organisational changes in the area. The joint works were to enable the creation and dissemination of good practices for its development among stakeholders and increase the ability to start projects, also by creating a favourable regulatory environment.

The mixed model RENCOP has been operating since September 2020. The first meeting in the new formula was held on the 24th of September 2020 as a closed online meeting organised in cooperation with a company

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for PV installations and addressed to housing associations in Warsaw. During the meeting, we tried to answer the following questions:

- How can CE projects be beneficial and profitable for citizens?
- What are the advantages and barriers for the development of CE projects?
- What do you need to know to implement an energy project?
- Where to draw the patterns from?
- How to start, where to seek help and what to look for CE projects?
- What are the costs?
- What are the possibilities for co-financing?
- Is it better to act individually or collectively?
- How to use own experience to popularise CE projects and build energy awareness in my "homeland"?

Our goal for the future is to support a community to create, invest, build, develop, and maintain CE projects based on RES.

Good practices in the development of CE in Poland – examples

A housing community (*Pszczelna* in Szczecin) and two housing cooperatives (*Śródmieście* in Szczecin and *Wrocław-Południe* in Wrocław) which have undertaken RES projects. The energy produced from roof-mounted PV installations is used for their own needs, in common parts of real estates, e.g. for lighting staircases.



„Pszczelna” in Szczecin



„Wrocław-Południe” in Wrocław

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Energy cluster from Bialogard (*Białogardzki Klaster Energii*) which operates a high-efficiency co-generation power plant, powered by natural gas from a local mine and a 15 kV distribution network with a length of 11 km. In next the years, the cluster plans to build 10 solar installations (1 MWp) and a biogas plant in rural areas. The work will be carried out on energy storage and the use of electric cars.

Challenges/Barriers

The main goals and challenges for the Polish RENCOP in Co2mmunity were focused on the opportunities for developing the initiatives of CE based on a current law.

The task of the RENCOP was to build a platform to cooperate with representatives and members of energy cooperatives, prosumers, energy clusters or initiatives as well as experts in the area of social energy projects (stakeholders interested in supporting CE projects) in order to:

- identify local/regional initiatives in Poland (during the whole Co2mmunity project lifetime)
- identify the potential of CE projects in Poland
- identify barriers, obstacles, and bottlenecks that limit starting or running CE projects
- identify stakeholders: representatives and members of CE-projects in Poland, experts in the area of CE projects or experts that are able to influence on or develop CE projects in Poland (during the whole Co2mmunity project lifetime)
- cooperate with stakeholders:
 - questionnaire and interviews,
 - meetings with representatives of energy projects/initiatives,
 - workshops with stakeholders, representatives, members and experts
- find solutions on how to handle difficulties and create tools to help implementing and running CE projects
- prepare the handbook, guidelines and recommendations as a result of cooperation with stakeholders
- change the model of the RENCOP into a community driven model

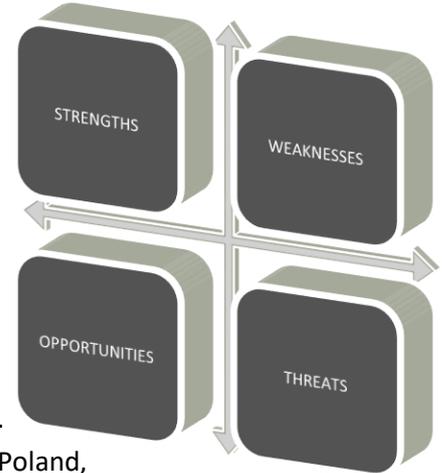
After the kick-off meeting in September 2018, the following barriers & challenges have been identified:

- increasing the knowledge about opportunities and advantages from local energy projects (energy clusters)
- legislative and regulatory changes are needed quickly
- financial sources – dedicated funds are needed
- functioning of the energy cluster in the power system and cooperation with the distribution system operators
- NIMBY effects – low society awareness regarding energy and ecology
- selection/acquisition of participants for the projects: local society, local/regional authorities
- local distribution system operators
- community energy models and guidelines for stakeholder are needed

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The RENCOP Working Group created a list of strengths and weaknesses of the conditions for the development of CE in Poland, as well as opportunities and threats related to its development:

- Legal context – analysis of strengths and weaknesses of renewable energy sources in Poland in the light of current regulations, energy policies as well as the identification of resulting opportunities and threats to the development of community initiatives in the field of renewable energy.
- Socio-cultural context – analysis of strengths and weaknesses of CE in Poland taking into account social, cultural, and historical conditions affecting them: mentality, perception and action, cooperative opportunities and abilities, social acceptance and awareness as well as the identification of resulting opportunities and threats to the development of CE initiatives in the field of RES.
- Economic context – analysis of strengths and weaknesses of RES in Poland, taking into account the financial aspect related to the installation of RES (outlays, costs, profits, savings) as well as the identification of opportunities and threats for the development of CE initiatives in the field of RES.



Details can be found in the Polish Handbook for CE available on www.co2mmunity.eu.

Goals for the future

Our goal for the future is to support a community to create, invest, build, develop and maintain the CE project based on RES.

The RENCOP is led by the RENCOP Coordinator, who performs executive, operational and administrative functions (depending on the model, stage of the project, and needs agreed upon in a democratic manner). The RENCOP Coordinator may support CE projects at all stages of their implementation: searching for ideas, verifying the possibility of obtaining financial support, motivating and identifying stakeholders (internal and external), organising meetings and consultations, inviting experts, conducting an information campaign and social dialogues (depending on needs). He/She can also support the process of obtaining necessary administrative decisions and/or concessions for a RES project.

If you would like to be a member of this RENCOP group or coordinator of your own RENCOP and support an energy transition focussing on local energy potentials – do not hesitate to join us. Please contact: sekretariat@fnez.pl.

Updates on recent activities and upcoming events in Polish can also be found on the FNEZ webpage: www.fnez.pl.

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General Information

Sweden has a national goal to have 100% renewable electricity production by 2040. This means that many new RE plants will be built over the next decades. Many of these will be large, but also small-scale projects are needed and play an important role to reach the postulated goal. The Energy Agency for Southeast Sweden is working to support small community-driven projects in the counties of Blekinge, Kalmar, and Kronoberg with a focus on housing cooperatives. The strategy is to provide expert input and show good examples. The advantage is that the housing cooperatives are existing community structures and it is easy to add on an energy part. Also, there is a large potential since about one fifth of all Swedes lives in approximately 1.000.000 apartments organised in housing cooperatives. While cooperatives have a long-standing tradition, especially in the agricultural and retail sectors in Sweden, challenges to energy cooperatives are that the overall national support framework and the grid regulations are not yet adopted to community-driven energy generation, such as solar PV. The new EU-directives (2019/944 and 2018/2001) will improve the situation but are not yet implemented.

There are national monetary support systems in place for renewable energy. A barrier is that these system changes often and makes it hard to make a long-term calculation for an investment.

To support as many housing cooperatives as possible, the approach of the Energy Agency for Southeast Sweden is that of an expert RENCOP. The RENCOP is active since 2017 and several meetings and workshops have been held.

- Initially open meetings were organised with all types of citizen organisations/associations being invited.
- Citizens were informed on possibilities for installing Solar-PVs and new rebates in tax law for small-scale RE-systems.
- Open sessions were held where experts and citizens came together to explore new options.
- Expert knowledge from the Lyckansberg housing cooperative (a good example), Linnaeus University, Swedenergy, local grid operators, and generation technology (biomass, PV etc.) experts were provided. Early in the project and onwards a cooperation with the County administrative board was started.

Quite early in the project it was decided to focus on housing cooperatives as target group and try to inspire these to install Solar-PVs. The activities have continued with open meetings throughout the Southeast Sweden region (Kronoberg, Kalmar and Blekinge). More than 200 individual persons have visited the open meetings. Experience shows that especially the contact with other housing associations that already have experience with a solar PV installation (Good practice), is an efficient way to stimulate additional projects. Caution is in place when inviting providers of PV panels and services as the RENCOP organiser should retain its credibility as an independent broker for the interests of the citizens.

In 2019, the RENCOP was reorganised. The network of energy advisers at the municipalities in Southeast Sweden were tied to the RENCOP and form the basis of the RENCOP experts. These advisers are active in most of the municipalities in Southeast and are early aware of new initiatives and can give guidance at first hand.

Co2mmunity

The Energy Agency for Southeast Sweden have through Co2mmunity arranged open inspiration meetings, given detailed advice, and monitored the progress and barriers for new initiatives.

In 2020 the Covid-19 pandemic has changed the game plan for meeting with people. The Co2mmunity activities has been changed to virtual on-line meetings. The benefit with this is that travel has been reduced and people living far away can attend the webinars. The final webinar included virtual site visits to three associations in southeast Sweden that have installed solar-PVs.

Current Status (30/09/2020)

The goal for the Swedish expert-RENCOP was to inspire housing cooperatives to install more Solar-PVs. After several open meetings across the Southeast part of Sweden, many cooperatives have received information and individual support. Since the Covid-19 outbreak, these open meetings have been replaced by webinars. A follow up by those who have attended the meetings shows that the meetings have been appreciated, but it is hard to link the meetings to concrete investments in solar-PVs. Many housing cooperatives have used the Energy and Climate Advisers (RENCOP experts) for support after the open meetings.

Challenges/Barriers

Covid-19 is of course a challenge since open meetings in person are no longer possible to arrange. Another challenge is that the national support system (20% of the total investment of solar-PVs) suddenly was closed in July 2020. This will probably lead to a halt in the investments.

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