Co2mmunity

Co-producing and co-financing renewable community energy projects

How to increase Community Energy using the RENCOP-model

Roadmap for municipalities and regional actors

Interreg
Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

By

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Foreword

Transnational cooperation highlights the importance of community energy (CE) as a core pillar of the Green Deal in the Baltic Sea region. Therefore, the consortium of the Co2mmunity project has established an organisational model called RENCOP, where the impact of citizen engagement in renewable power production and consumption is clearly outlined.

This Roadmap filters down and combines the findings of the Co2mmunity project into an informative and detailed report, targeting relevant stakeholders. In essence, it will guide and encourage organisations to implement similar steps, i.e. encourage a higher production of renewable energies through energy-cooperative models and approaches, by setting up structures such as a RENCOP.

Furthermore, the Roadmap illustrates a participatory mobilisation process, with general and country-specific steps, in order to develop CE in regions and municipalities across the BSR and beyond: "The RENCOP model" addresses local and regional actors such as municipal climate managers, energy agencies and other BSR/EU-wide actors interested in promoting RE and CE.

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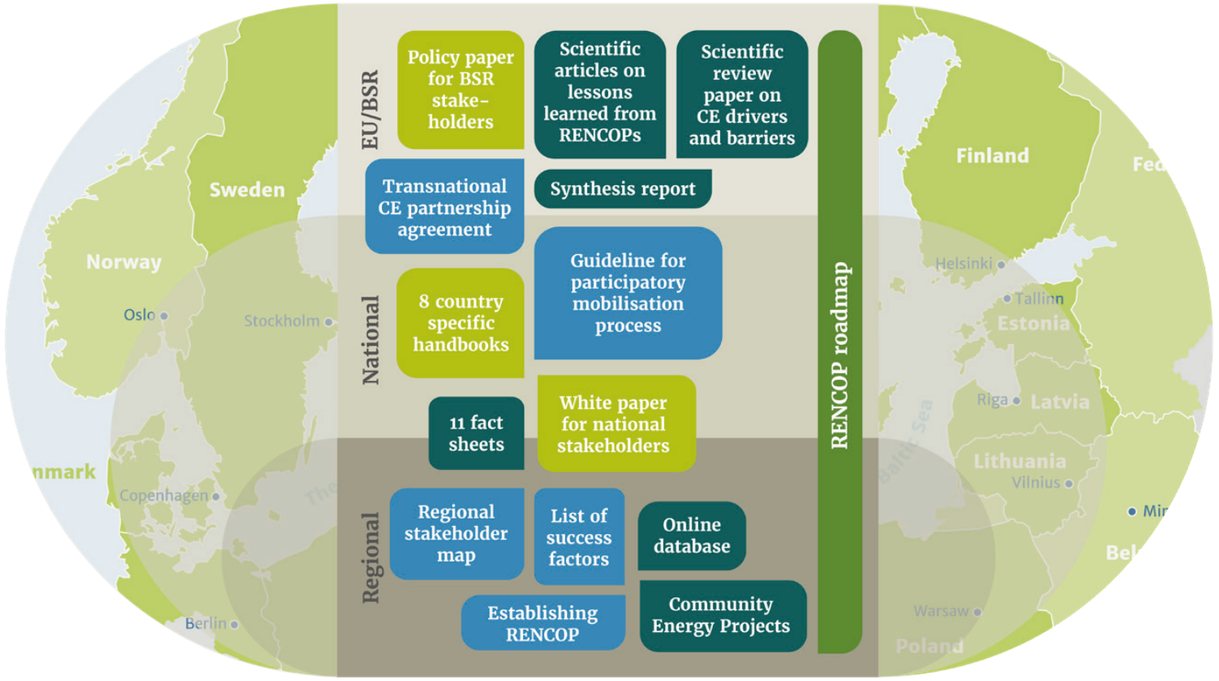


List of abbreviations

BEMIP	Baltic Energy Market Interconnection Plan
BSR	Baltic Sea Region
CE	Community Energy
CEC	Citizen Energy Community (as defined in EMD)
CEP	Clean Energy for all Europeans package
CBET	Cross-border energy trade
CHP	Combined Heat and Power
DSO	Distribution System Operator
EMD	Electricity Market Directive (EU) 2019/944 (recast)
EU	European Union
EUSBSR	European Union Strategy for the Baltic Sea Region
NGO	Non-governmental organisation
Prosumer	Producer-consumer: Individual or organisation that both produces and consumes energy within the same property (point of connection).
PV	Photovoltaic (standard technology for producing electricity from solar panels)
RC	RENCOP Coordinator, a person who coordinates the local energy partnership.
RE	Renewable energy
REC	Renewable energy community (as defined in RED)
RED	Renewable Energy Directive (2009/28/EC), Updated to (2018/2001)
RES	Renewable Energy Source
RENCOP	Renewable Energy Cooperative Partnership. A project-specific name for cooperations within renewable energy
SME	Small or medium enterprise
TSO	Transmission system operator

Summary

The EU has launched a vision for a ***Climate Neutral Europe in 2050 through a just transition.***

In the ***European Green Deal,*** *and the new directives related to this, Community Energy is highlighted as an important pillar of this transition. This Roadmap describes the path to a goal of "a low-carbon society were Community Energy plays a significant role"*

Community energy (CE) generally refers to projects in which citizens own or participate in the production of renewable energy (RE).[1] There are different ownership models that citizens use to manage RE projects, including cooperatives, housing associations and SMEs. In Europe, CE has attracted the attention of both policymakers and researchers for the role it can have in accelerating the energy transition.

The Green Deal and The Clean energy for all Europeans package[2] (CEP) include new directives where community energy is highly recognised as an important driver for the energy transition in the EU. Two examples from the 2018/2001 RE directive are: "Renewable energy communities should be able to share between themselves energy that is produced by their community-owned installations;" and: "Member States shall provide an enabling framework to promote and facilitate the development of renewable energy communities."

Community energy offers benefits such as investments by local actors in the local economy, lower energy cost, increased cohesion, and increased acceptance for the necessary energy transition. The Co2mmunity *Working Paper* on Drivers and Barriers revealed that CE has numerous benefits that can be divided into five main categories: Benefits for the local economy, behavioural change of the people involved in the project, environmental benefits, increased social cohesion and acceptance of renewable technology. The benefits include energy cost reductions, financial gains from the energy sales and renting of land, the creation of jobs in the construction and maintenance of RE infrastructures, and tax income for municipalities.

Also, on a larger system scale, CE has the positive effect of more distributed energy production often close to the consumers. This decreases the load on the grid and when supplemented with storage facilities, will enable local "energy island" solutions and self-sufficient communities. This will give a more robust energy system that is less vulnerable to external disorders.

Finding and supporting engaged local enthusiasts (Champions) is key. CE leaders have better chances to succeed in RE projects if they involve the local people in their initiatives.

Therefore, engaging early on with the local community is a way to reduce opposition and increase transparency and trust towards an initiative or technology.

Collective decision making and sharing of benefits are also important success factors. Local acceptance improves when benefits are shared with the members of the local community. The communication of a clear focus for activities across the partnership is also a success factor.

RENCOP is a systematic approach to initiating and supporting CE projects. The tool, developed and tested in the Co2mmunity project, can increase both the amount of RE installed and the quality of the installations. Driven by citizens or experts and adapted to the local context, it will create values beyond the energy produced. The nine RENCOPs established in Co2mmunity partner regions around the Baltic Sea vary in type and size. Among the examples are new solar-PV installations, common purchases of heat pumps, building/area hybrid RE systems, and raising general awareness of CE.

Despite the benefits provided by CE projects, they continue to face many challenges. Policy, regulatory, cultural, and financial barriers continue to hinder the diffusion of CE initiatives. A cultural change is also needed in the mindset of policymakers. CE is an expression of a different set of values and needs. The same policies employed to promote commercial projects might not work for RE projects set up by local communities. Moreover, *policymakers need to realise that without the participation of citizens in the energy transition - for example through RE investments - climate change mitigation goals may not be achieved due to local resistance to RE projects.*

Miroslavas parish 15 kW solar PV supplying the needs of church and community house. Photo by KREA.

1 http://co2mmunity.eu/wp-content/uploads/2019/01/co2mmunity-working-paper-No.-2.1-v04.pdf
2 https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en

Co2mmunity has developed a Policy Paper with recommendations to help harness the potential of CE in the BSR. In summary, to promote the expansion of CE, the following actions are crucial:

1. **Create a stable policy framework**

   Energy policy and other relevant policies (such as taxation) should be kept stable to provide a long-term outlook for investors. Necessary changes should be phased in over time.

2. **Eliminate regulatory barriers**

   Authorities need to remove regulatory barriers, such as the levying of electricity taxes and grid fees on the self-consumption of solar power within an apartment building. Permitting and grid connection procedures can also be streamlined, including setting targets or limits for process lengths, and establishing a one-stop-shop for permitting projects.

3. **Ensure access funding**

   Dedicated schemes could be set up to provide early-stage funding for feasibility studies and technical expert services, for example. CE projects should be guaranteed access to affordable financing, including loan guarantees, risk-sharing tools, or low-interest loans. One option is a fund guaranteed by the state, with proceeds feeding back to finance new projects.

Further capacity building and information campaigns are needed:

- Promotion of CE in society and at responsible institutions on the national and regional level
- Establish advice and technical support services for CE projects

Proud owners of Solar-PVs in Karlshamn Sweden. Photo Johanna Wallin.

Introduction

What is Community Energy, and why is it needed? What has happened in the Co2mmunity project and what can we learn from it? Answers to these questions and more can be found in this chapter, together with the history and current status of Renewable energy in the EU.

Community energy (CE)

There are several definitions of CE on the market. In the Co2mmunity project, no specific one has been chosen, but a more inclusive attitude was adopted. However, most people understand CE in terms of *citizens' participation in renewable energy projects and local sharing of benefits.*[3] The key is that it is done together and that more than one person is required - often at least three people.

CE projects offer the generation of renewable energy (RE) from local sources such as wind, solar, biomass, hydropower, and geothermal. Projects are developed and implemented through the active participation of local communities, in which citizens work together to co-finance, co-develop, and co-operate RE plants. Production facilities are then co-owned and maintained, and benefits are shared among the owners in the community. Energy is co-used by the owners, and any excess energy is normally delivered to the local/regional grid and sold on the regular market. Ownership models can vary and also depend on national regulations. The cooperative model is most common, but the setup can be organised differently depending on the possibilities in respective country.

Sustainable energy distribution, such as local heating networks and biogas filling stations, have a greater chance of success as CE projects. Furthermore, through active communication, transparent decision making, and local benefit sharing, CE projects gain high social acceptance. All in all, fostering CE projects is highly promising for increasing the share of RE in the BSR.

Most people involved in CE projects are prosumers of energy. This means that they produce electricity or heat and partly consume it themselves and partly sell to the local electricity grid or heating network companies.

3 *Walker, G., & Devine-Wright, P. (2008). Community renewable energy: What should it mean? Energy Policy, 36(2), 497–500. doi:10.1016/j.enpol.2007.10.019*

What are the benefits of CE? Why is it important for the energy transition?

Investment in the local economy. A CE project often has a larger local content compared to external projects. This will benefit the local economy and create local green jobs.[4] It also increases knowledge and skills and makes the community more self-sufficient and less vulnerable to crises.

Lower energy costs are to be expected for the community members as a lower return rate is expected, and revenue from the project stays within the community.

Improved value of houses. When, for example, solar panels are assembled on a building, the value of the building often increases by more than the cost of the investment in RE.

Increased social cohesion and cooperation between the community members ("making friends").

Democracy. The possibility of participating in decision making at all levels fosters democracy.

Distribution of ownership. Power plants constitute strategic infrastructure, and local ownership secures energy production in the community.

Stabilise the grid. Decentralised production of energy can help to stabilise the grid.

A good idea leads to more good ideas. Interest and engagement in producing RE will increase a general interest in green issues, such as green transportation and energy efficiency.

Increased acceptance. CE projects raise the awareness and acceptance of RE and thereby also the understanding of the importance of an energy transition.

A literature study made within the Co2mmunity project *Working Paper on Drivers and Barriers* divides the benefits into five categories. These are (in parentheses: number of occurrences in references):

- benefits for the local economy (16 times)
- behavioural changes in the people involved in the project (11)
- environmental benefits (10)
- increased social cohesion (8)
- acceptance of renewable technology (7)

Many of these are difficult to measure and even difficult to define. What is the environmental benefit of my solar panels? Economic benefits can be easier to measure and be of different types; lower energy cost, local jobs created or more tax income to the municipality.

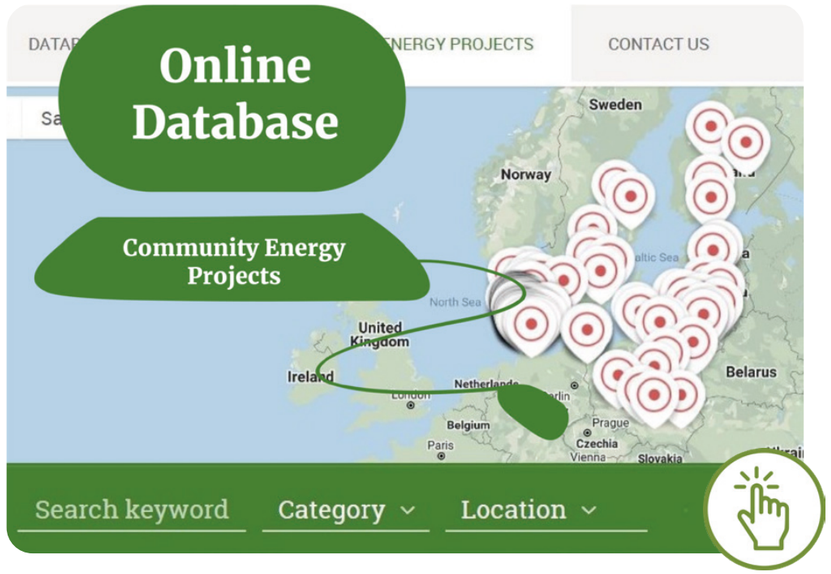
Figure 1. There are many benefits of CE (Co2mmunity energy).

4 *https://www.sun-stadtwerke.de/*

Examples of Community Energy

In principle, CE does not have to be related to RE. Building an electrical grid or a battery storage does not have to be linked to renewable production of energy. The Electricity Directive even talks about "energy efficiency services" as an activity in a "Citizen Energy Community". However, most projects under the CE label are linked to RE. There are hundreds of wind energy cooperatives in Germany alone, and today the commonly-owned solar PV plant is by far the most common new type of CE project in the BSR region.

The Co2mmunity project has identified and investigated in detail some community energy cases from the BSR region. Three of these are detailed in the chapter *Community Energy Projects*. These are good examples and show the variation of energy source, type of cooperation, size, and other parameters you can find within CE projects. Further, Co2mmunity has collected many more good examples and placed these in an online *database*, from which it is easy to find an example close to you.



Potential for CE in the Baltic Sea Region (BSR)

The lower costs, technical evolution and supporting policies are creating huge potential for CE. A *study made by CE Delft found* that half of the citizens in the EU (including local communities, schools and hospitals) could be producing their own renewable electricity by 2050. This would correspond to 45% of their energy demand.5 Even more can contribute and benefit from CE, providing demand flexibility with their electric vehicles or stationary batteries.

With a population of about 500 million and an annual electricity production of more than 3000TWh, it is easy to understand that CE will lead to large investments and have a great impact on local energy systems and economies.

Moreover, the concept of CE will lead to increased local and regional cohesion. The potential varies from one region to another depending on many factors, but looking at Germany and Denmark as forerunners gives an indication of what can be achieved in other places as well.

5 *The potential of energy citizens in the European Union, CE Delft 2016*

CE outside BSR

The BSR is a representative part of Europe, with both regions that are frontrunners and followers. All types of energy sources can be found and many different means to organise exist to start and run CE projects. In other parts of Europe, similar divisions exist, with frontrunners such as the Netherlands, and followers with lower shares of CE today. Many regions are much more crowded compared to most of the BSR, which causes limitations. But on the other hand, solar radiation is higher, with increased output per m2. Wind is a natural resource, with best potential in northern and western parts of Europe.

Many good examples can be found at *https://www.rescoop.eu/*, an organisation gathering a network of more than 1500 renewable energy cooperatives across Europe.

Co2mmunity

This report is one of the main outputs of the Co2mmunity project. Implemented from 2017 to 2020 to explore the potential of community-owned renewable energy production in the Baltic Sea Region, the project contributed with important research and analyses relevant to sustainable energy generation under community ownership in the Baltic Sea Region. Furthermore, the project, through the RENCOP model, initiated and supported local energy initiatives in all partner regions. The Co2mmunity project is co-funded under the INTERREG programme by the European Regional Development Fund, alongside the project partners' own contributions.

Co2mmunity can also be described as a network of organisations scattered across eight different countries in the Baltic Sea Region (BSR). Our mission is to facilitate community energy (CE) project development as part of a transition to renewable energy sources. To achieve this mission, we create local partnerships for energy project development, provide knowledge, develop tools, and organise stakeholder meetings. Instead of working in isolation, we exchange ideas and experiences while continuously supporting one another. Doing so will help us improve our understanding of CE barriers and enablers, and thus relay the acquired knowledge to policy makers. The Co2mmunity project thereby contributes to the European Union's vision of providing *Clean Energy for all Europeans*. The infographic below shows the different outputs of our project, and you will find much more information in the text that follows.

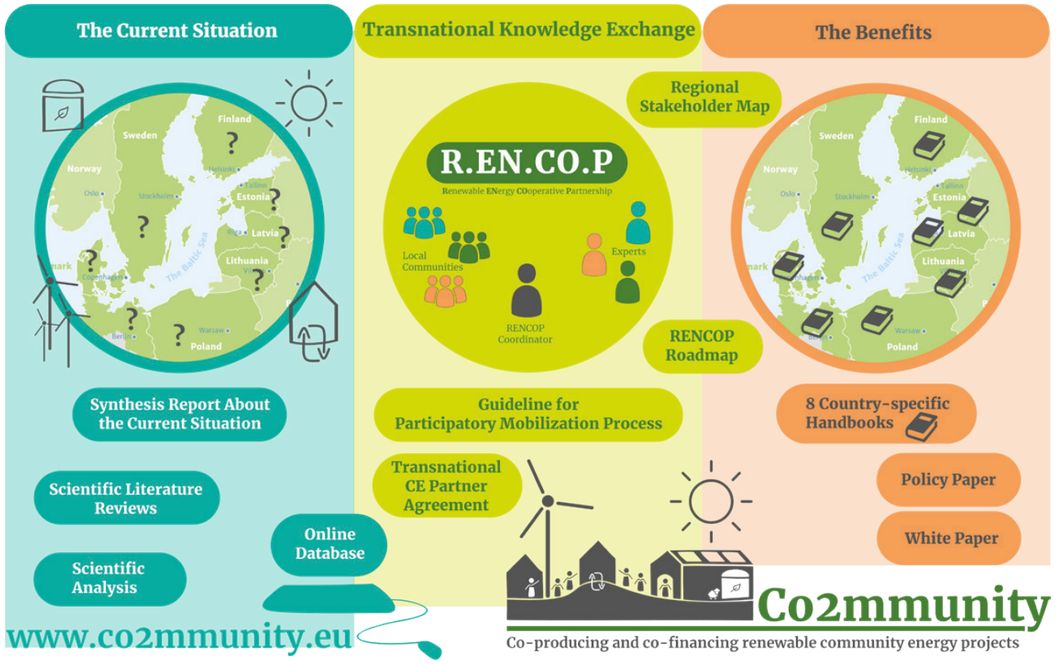


Figure 2. Co2mmunity in a nutshell (Co2mmunity).

During the project's life, several transnational events have been arranged. Knowledge transfer and networking among partners and stakeholders has been supported through study visits, discussions and workshops.

Several interesting reports and data have been developed from the project and are available on the project's web site: *http://co2mmunity.eu/* . Also, see the final chapter in this document.

Examples of output are; Synthesis report on the current CE situation in the BSR (including a compilation of case studies), locally specific CE handbooks, the *project database* and white papers for public stakeholders. Co2mmunity's outputs are summarised in chapter 4.

The project partners comprise 15 organisations, including government, energy agencies, a municipal utility, and universities from eight different countries within the BSR. More info can be found on the *Project Partners* page.

Project partners

DE CAU Kiel, AG Wirtschaftsgeographie, *Lead partner*
DK Middelfart Municipality
FI Thermopolis
DE Green City Experience München
LV Riga Planning Region
DE Heinrich-Böll-Stiftung SH
LT Kaunas Regional Energy Agency
EE Tartu Regiooni Energiaagentuur
LT Lithuanian Energy Institute
FI Aalto University
FI GreenNet
FI Regional Council of South Ostrobothnia
PL Foundation for Sustainable Energy
SE Energy Agency for Southeast Sweden
SE Lund University

In addition, the project consortium was supported by 33 associated organisations, which included: municipalities in Denmark and Germany, county administrative boards in Sweden, NGOs in Finland, Germany and Latvia, SMEs and a range of agencies and institutions across the BSR with an interest in renewable energy.

What is renewable energy?

Renewable energy (RE) is energy that is collected from *renewable resources*, which are naturally and constantly replenished on a *human timescale*, such as *sunlight*, *wind*, *rain*, *tides*, *waves*, and *geothermal heat*. RE often provides energy in four important areas: *electricity generation*, *air* and *water heating/cooling*, *transportation*, and *rural (off-grid) energy services*. Some renewable Energy sources are disputed, but the ones used by Eurostat are:

Hydropower: the electricity generated from the potential and kinetic energy of water.

Tide, wave, ocean energy: mechanical energy derived from tidal movement, wave motion or ocean current.

Geothermal energy: the energy available as heat from within the earth's sub-surface.

Wind energy: the kinetic energy of wind converted into electricity in wind turbines.

Solar energy: solar *thermal* energy and *solar photo-voltaic* energy for electricity production.

Ambient heat (heat pumps): heat pumps that are driven by electricity or other supplementary energy, to extract (stored) energy from the air, the ground, or the water.

Combustible renewables

- **Fuels from** *Biomass* (*biofuels*)
- **Fuels from Renewable municipal waste** (*biogas etc*)

Renewable energy in the EU

"Becoming the world's first climate-neutral continent by 2050" is the objective behind the *European Green Deal* (*COM(2019) 640 final*), the most ambitious package of measures that should enable European citizens and businesses to benefit from a sustainable green transition.

The use of renewable energy has many potential benefits, including a reduction in *greenhouse gas* emissions, the diversification of energy supplies, and a reduced dependency on *fossil fuel* markets (in particular, oil and gas). The growth of renewable energy sources may also stimulate employment in the EU, through the creation of jobs in new 'green' technologies."[6]

Renewable energy has existed since the first fire was used by humans to get warm and cook their food. It has been a natural part of life ever since. The use of fossil coal, oil and gas increased during the 19th century and today it represents 80% of global primary energy consumption.[7] However, during the last three decades, several initiatives have slowly started to change this picture. Environmental and climate awareness, political initiatives, a desire for less dependency on the oil supply from other regions, and technological developments are some of these drivers. Europe is today seen as a frontrunner for RE, and the origin for modern wind power and Solar-PV technology.

Overall/country share

The picture below shows each EU member state's share of RE in the respective final energy consumption. The share for the EU as a total is getting close to the 2020 target of 20%. The variation between countries is large, depending on tradition, political decisions, and access to natural resources. The share varies from 6% to over 50%.

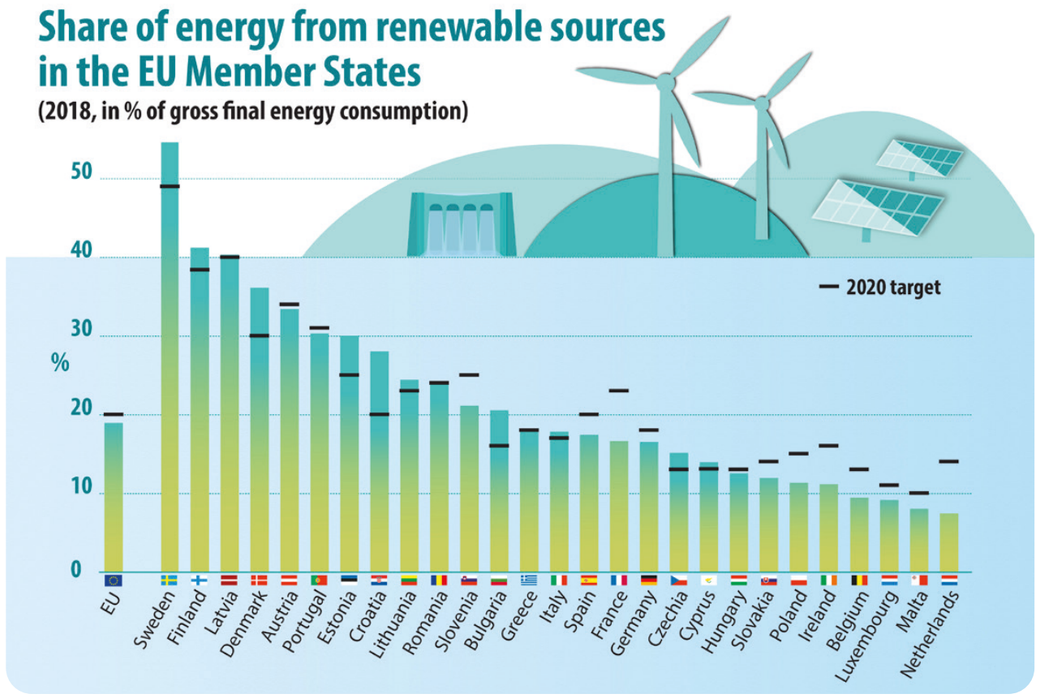


Figure 3. Share of renewable energy for EU members (ec.europa.eu/eurostat)

Goals and directives

The first binding targets for EU states were set in the Renewable Directive of 2009 and aimed for 20% share of final energy consumption in 2020 (20/20/20 goals).[8] The directive forced the states to make national RE action plans and outline a roadmap to reaching national targets for 2020. As time went by and 2020 approached, discussions for new targets were initiated, and in 2018 a target for 32% RE in 2030 was agreed upon.[9]

6 *https://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics*
7 *IEA Statistics © OECD/IEA 2014*
8 *https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32009L0028&from=EN*
9 *https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN*

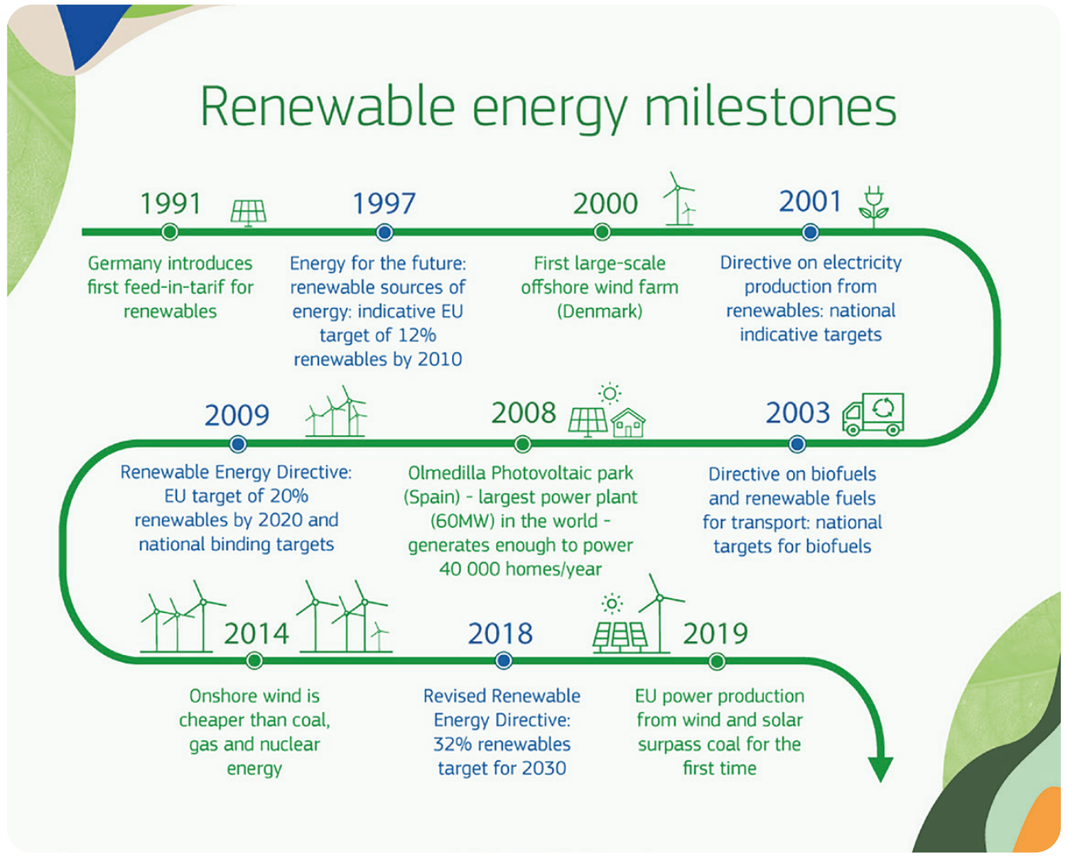


Figure 4: Directives≤ and targets EU, https://ec.europa.eu/info/news/focus-renewable-energy-europe-2020-mar-18_en.

A directive is an EU-level document that all members must comply with. The states must incorporate the directive in their own legislation and make adaptations that match the countries laws and regulations.

The Renewable Energy Directive (2009/28/EC) for example, establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It also set scorresponding targets for transportation. In 2018, the directive was updated[10] (2018/2001) with new targets as part of the Clean Energy for all Europeans package[11] (CEP).

The CEP contains two definitions of energy community based on two different directives: the Citizen Energy Community (CEC), which is contained in Directive (EU) 2019/944 (recast Electricity Market Directive), the and Renewable Energy Community (REC), which is contained in Directive (EU) 2018/2001 (the recast Renewable Energy Directive). They are similar, but not totally consistent. Details of these directives are not studied here, but it can be noted that community energy is highly recognised as an

10 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC

11 https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en

important driver for the energy transition in the EU. Two examples from the 2018/2001 directive:

- Renewable energy communities should be able to share between themselves energy that is produced by their community-owned installations.
- Member states shall provide an enabling framework to promote and facilitate the development of renewable energy communities.

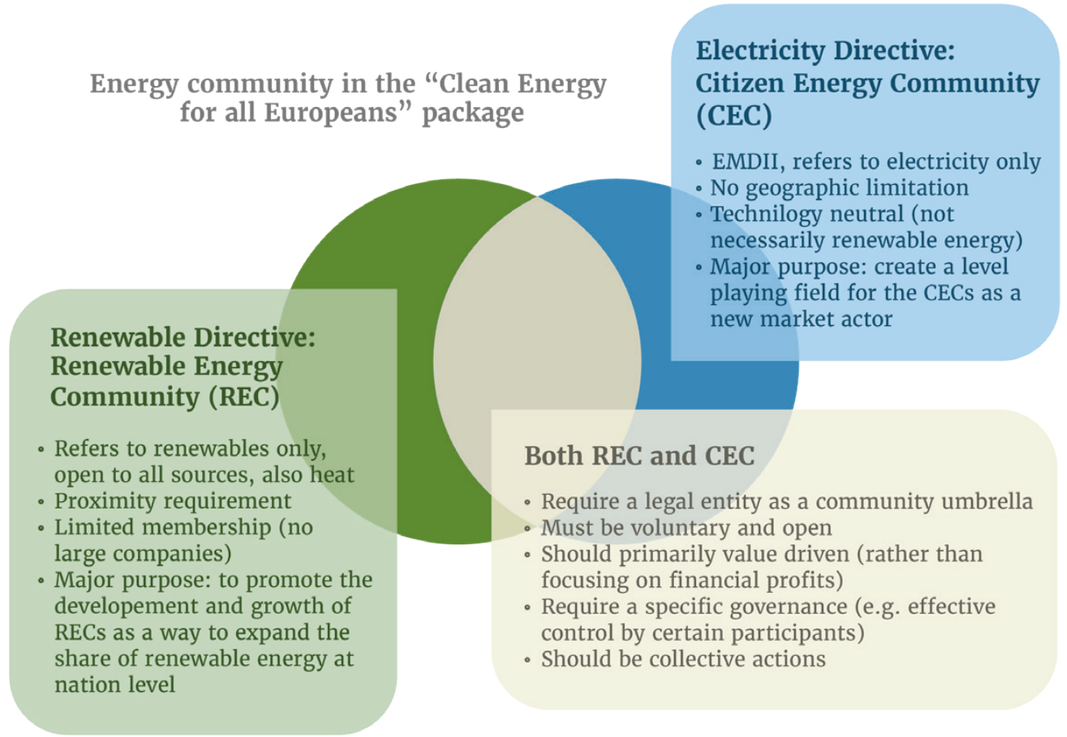


Figure 5. Definitions of Energy Community. COMPILE, Explanatory Note, May 2019.

In 2011, a study[12] was released by the European Commission describing alternative paths to reducing greenhouse gas emissions to 80–95% below 1990 levels by 2050. In three of the scenarios, the share of RE must increase substantially from today's levels. Becoming the world's first climate-neutral continent by 2050, stated by the European Green Deal introduced in 2019, is an even tougher goal and will most likely require higher shares of RE to be reached.

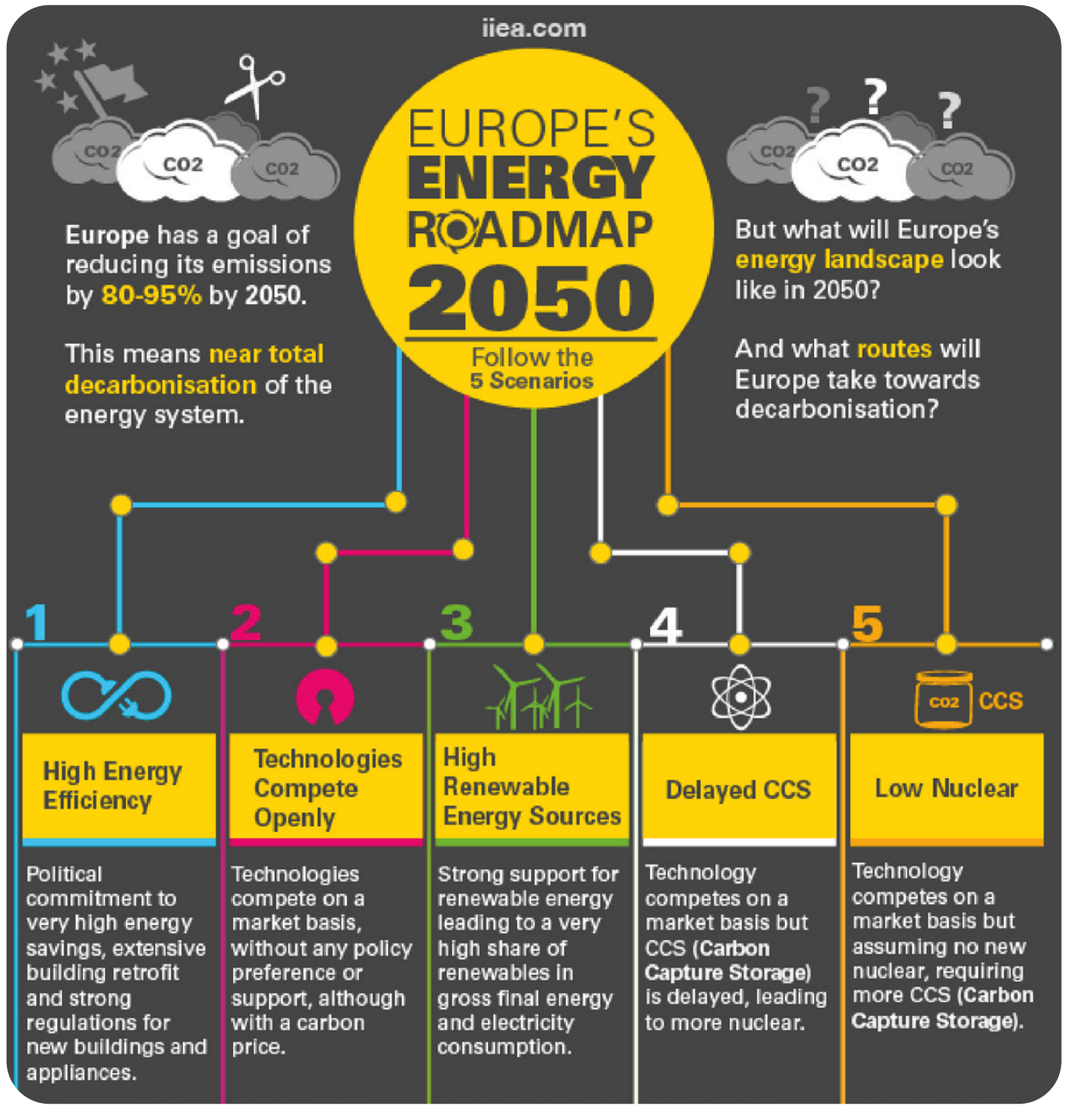


Figure 6. Five scenarios for EU Energy to 2050.[13]

The European Green Deal

Climate action is at the heart of the *European Green Deal* – an ambitious package of measures ranging from ambitiously cutting greenhouse gas emissions, to investing in cutting-edge research and innovation, and to preserving Europe's natural environment.

By 2050, Europe aims to be the first climate neutral continent through a just transition.

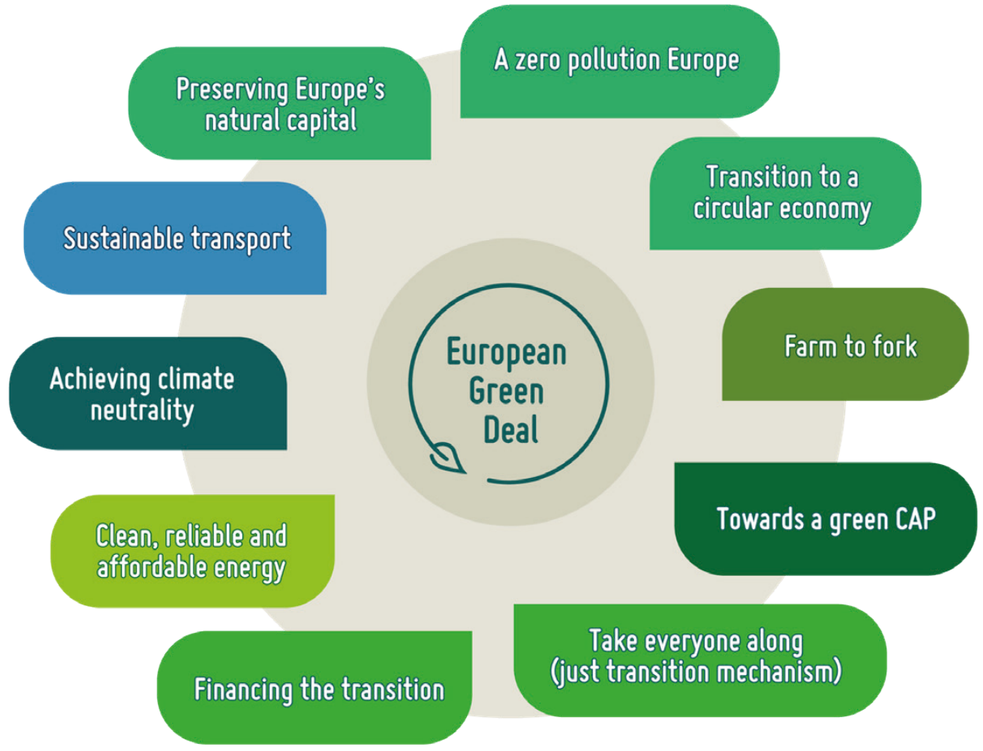


Figure 7. Core elements of the European Green Deal, European Commission.

12 *European Energy roadmap 2050, https://www.roadmap2050.eu/project/roadmap-2050*
13 *Can Renewable Energy Sources Produce All the Global Electricity by 2050? Decarbonisation, ambitious climate goal by reducing carbon intensity of the electricity power sector, Valavanidis, Athanasios 2020*

Supplying clean, affordable, and secure energy is one the core elements of the EU Green Deal, a package of measures and actions aiming to reduce greenhouse gas emissions in Europe. Those that are most related to energy are the directives included in the 2016 Winter Package[14]:

1. **Citizen Energy Community (CEC), which is contained in Directive (EU) 2019/944 (recast Electricity Market Directive- EMD),** *and*
2. **Renewable Energy Community (REC), which is contained in Directive (EU) 2018/2001 (the recast Renewable Energy Directive, RED)**

The EU is preparing a climate law that will secure that the actions outlined in the Green Deal are delivered. The law will include a target for EU 2030 greenhouse gas emissions reductions.

From a CE perspective, another part of the Green Deal is of great importance – the European Climate Pact. "The European Climate Pact aims to inform, inspire and foster cooperation between people and organisations ranging from national, regional and local authorities to businesses, unions, civil society organisations, educational institutions, research and innovation organisations, consumer groups and individuals."[15]

Reaching the goal of being a climate-neutral continent in 2050 will not be an easy task. The Green Deal consists of many parts, together transforming the EU's economy for a sustainable future. One of the main parts is *Supplying clean, affordable, and secure energy.* Production and use of energy stand for 80% of all climate gas emissions in the EU[16], meaning that to stop using fossil fuel and replace it with renewables is the single most important action to take. In the deal, the EU says that *the clean energy transition should involve and benefit consumers.* CE is then the natural answer to that call.

14 *The Winter Package consists of legislative measures to facilitate the transition to a clean energy economy. The objectives are briefly outlined in the Commission Communication 'Clean Energy for all Europeans', COM (2016) 860 final.*
15 *https://ec.europa.eu/clima/policies/eu-climate-action/pact_en*
16 *https://www.eea.europa.eu/data-and-maps/indicators/eno1-energy-related-green-house-gas-emissions*

R.EN.CO.P

Renewable **EN**ergy **CO**operative **P**artnership

Community energy in practice – RENCOPs

This chapter describes the practical work done within the Co2mmunity project in eight Baltic Sea Region countries. It describes Renewable Energy Cooperative partnerships (RENCOPs), which are the core of Co2mmunity activities in the field in each partner country.

A practical guideline for the important process of mobilisation is also given. And lastly, examples of CE projects are described as inspiration and templates for others.

RENCOP models - one agenda, different approaches

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.*

RENCOP – a practical tool

CE projects are often initiated at the grass root level, independent of campaigns and other initiatives. General awareness however needs to increase, and many existing CE initiatives can benefit from support from authorities and other parties. To unlock the full potential of CE, much work must be done on information and support in many ways.

Co2mmunity recommends a structured approach and and the use of tools developed by the project.

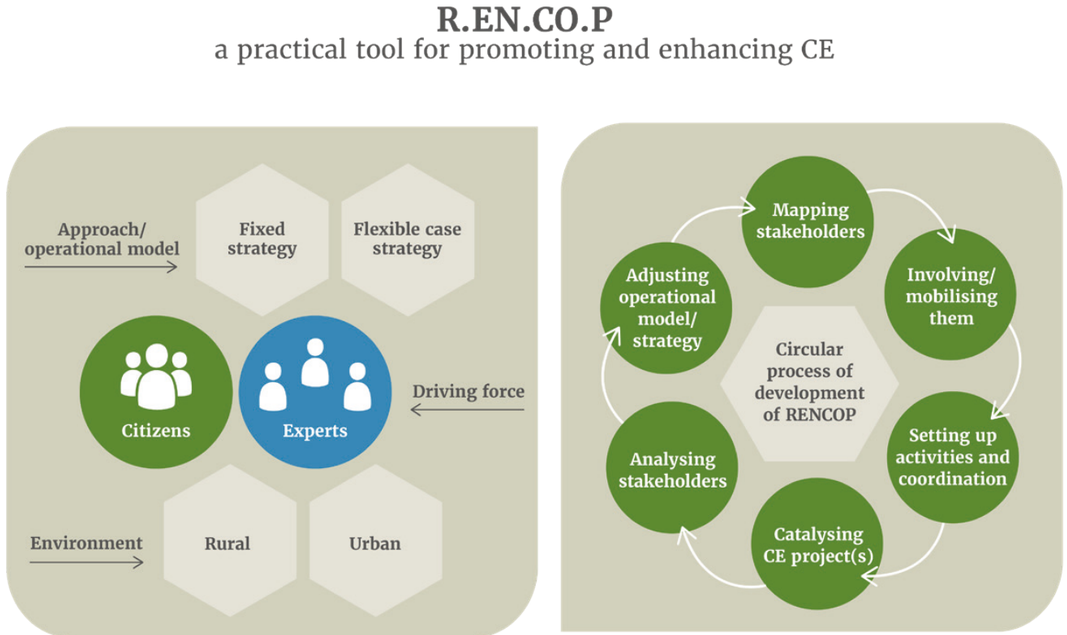


Figure 8. RENCOP: a practical tool (Co2mmunity).

The RENCOP coordinator (RC)

The RCs coordinate the work of the local partnerships. The role of an RC includes setting up, mapping, involving, analysing, running, and identifying the success factors of RENCOP. An RC can for example be a climate or energy expert from the municipality (or local public authority), the regional council (or regional public authority) or the regional energy agency.

Despite the different approaches, the work of the RENCOPs includes a few general steps in the development and establishing/setting up or building up and managing/running the RENCOPs:

- Mapping stakeholders
- Involving stakeholders
- Participatory mobilisation process
- Creating a flexible strategy to be able to adjust practical activities according to current situation
- Analysing stakeholders continuously and systematically
- Identifying successful factors and keeping those in mind
- Learning from Existing CE projects
- Adjusting practical activities to current signals/needs

Based on the driving forces of the RENCOPs within Co2mmunity, two main models of RENCOP are defined: the **community-driven** and the **expert-driven.**

Based on the types of CE projects and applying environment within Co2mmunity, two main definitions of CE projects are adopted: **rural** and **urban**

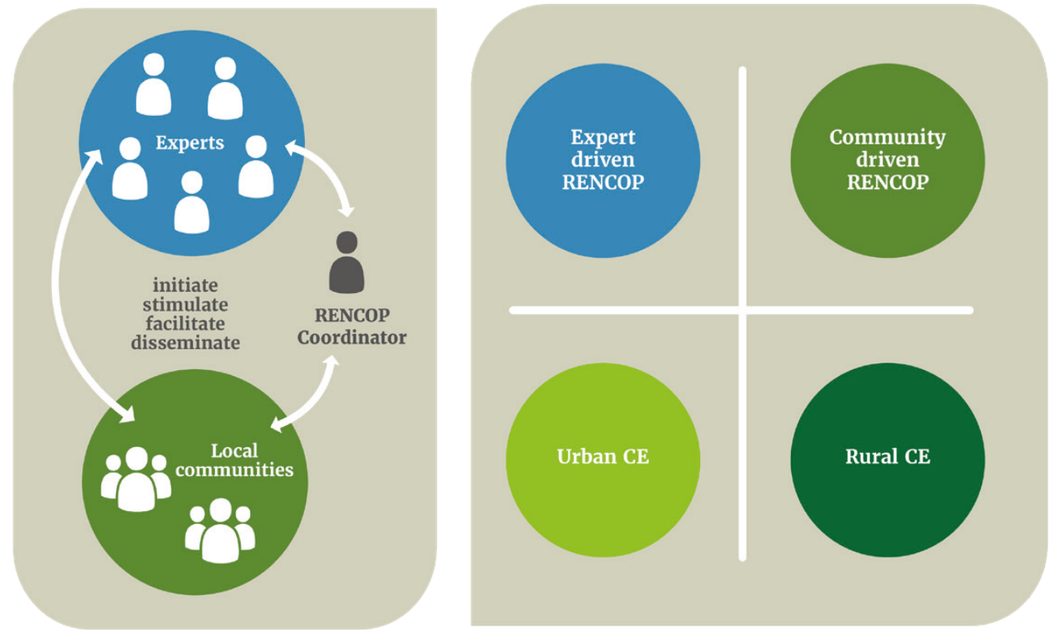


Figure 9. RENCOP-coordinator (Co2mmunity).

In the **community driven RENCOP model**, the local communities are the initiators, stimulators and often the facilitators of the community energy (CE) project. The ideas arise from the local communities. The RENCOP coordinators supporting the CE projects in all the steps of the way: finding ideas, motivating, and gathering interested people, organising CE field trips, or bringing CE experts to meetings, communicating and campaigning, aid the local community in the planning of the project, give advice on the permits needed and assist with the financial planning.

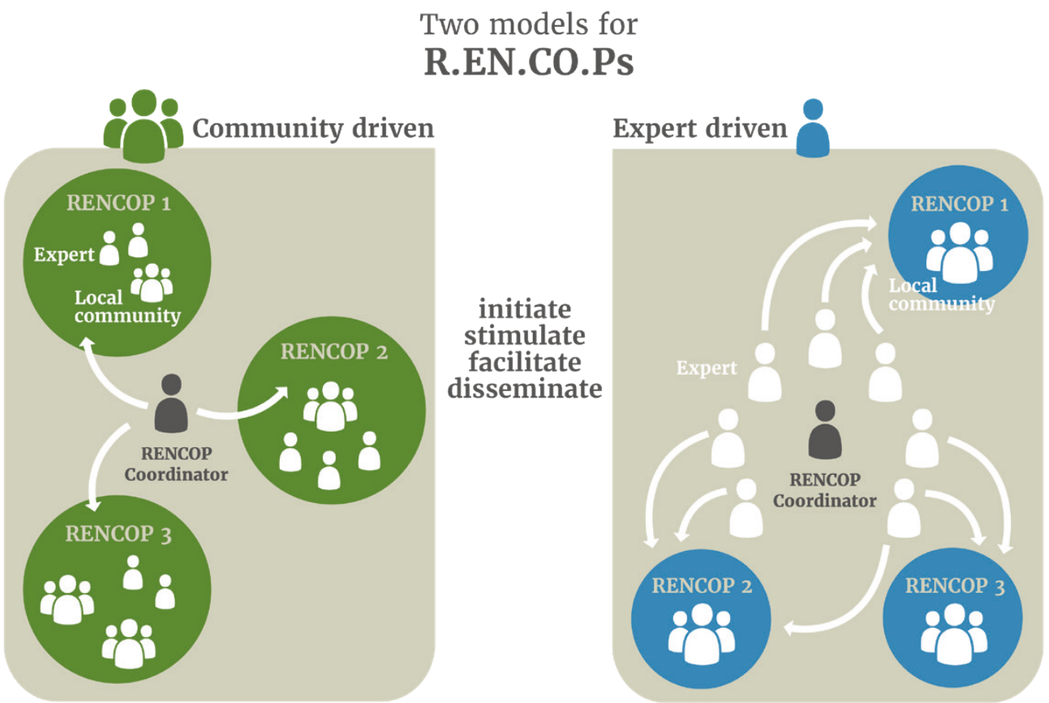


Figure 10. Two models of RENCOPs: expert and community (citizen)-driven.

The **expert-driven model of RENCOPs** also includes a coordinator, who gathers an expert group designed to serve as a catalyst in forming CE projects. Regular meetings for these experts are arranged. They are presented with information on CE and its possibilities and they serve as idea innovators for possible CE projects in the area. The experts can represent renewable energy companies or technical experts, end users of CE, municipality or regional representatives, citizen associations, research and development organisations, or financial and other organisations. The members of the expert group then give their expertise to individual CE projects. Along with the RENCOP coordinator, experts can support the local communities in the starting and maintaining of CE projects.

Social benefits

A common factor in all RENCOP approaches is the "local champion". This is a person with commitment, knowledge, and an ability to convince others. Often, we have seen the local champion being able to address issues relating to social norms and values that determine directions and processes of change such as:

- Climate protection
- Social policy as a driver of transformation in the local community
- Social reproduction and the economy of care in the local community
- Equality of opportunity and of outcomes – just transition
- Social and solidarity economy – fairness
- Empowerment, effective participation, and accountability

Discussions with Pagramantis community regarding solar PVproject. Photo KREA

These issues are often brought into play by the champion(s) being balanced in a very fine-tuned understanding of what is possible to build alliances around.

Stakeholders mapping and analysing tool

A stakeholder is a person that is influenced by or can influence the CE project. The influence can be both positive and negative. Types of RENCOP stakeholders defined in Co2mmunity are for example:

- Potential end-users or CE project owners
- RE/CE researchers and experts
- Service or technology providers
- Local or regional public authorities

As a part of the operational model of managing or running RENCOPs, an **Internal Dynamic Stakeholder Mapping Tool** was created in the Co2mmunity project to analyse the involvement level of various stakeholders. The main objective of the tool is to keep track of the dynamics of regional RENCOPs and CE projects. The tool helps RENCOP coordinators to analyse if changes in attitudes and participation occur (see an example of the results in Figure 11 below). In this tool, for each stakeholder the RC scores:

- influence – how strong an impact is there?
- opinion – positive, negative, or neutral?
- uncertainty – how sure is the RC about the score for influence and opinion?

Giving the scores (-10 to +10) is based on the RC's expert opinion, basically on stakeholders' public/official/open signals, strategies, actions, results, statements, etc.

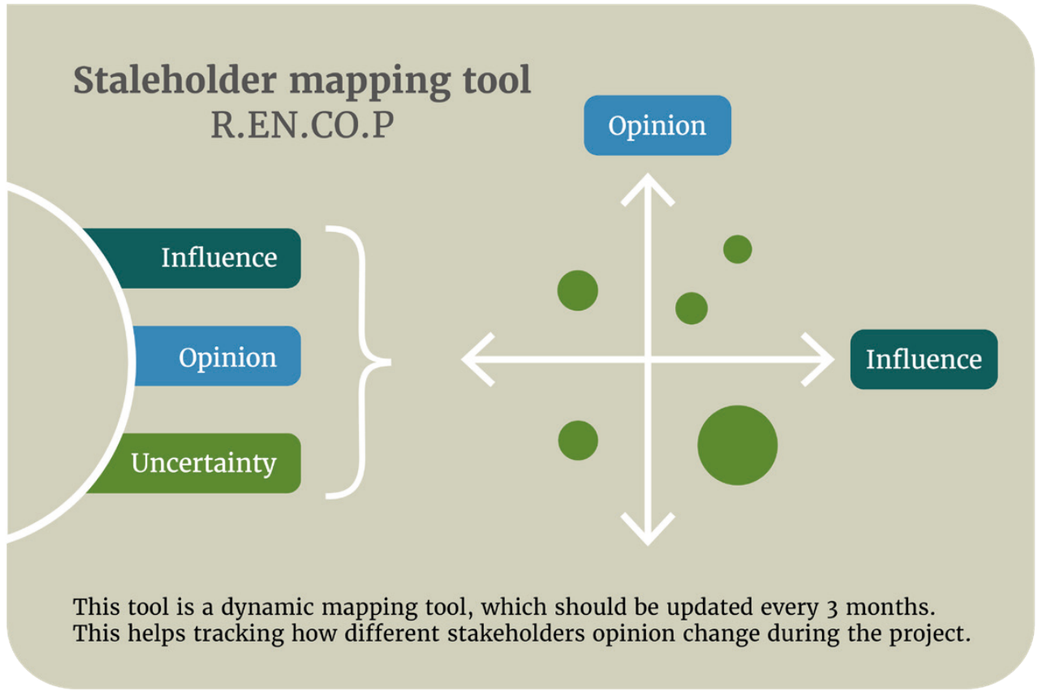


Figure 11.

This dynamic tool should be utilised as an internal tool only, as a support for the work of the RC. The actual detailed mapping may include sensitive analyses on stakeholders. The overview results of mappings are presented as summary descriptions of the each RENCOPs stakeholder analyses in each region and include:

- **the number of stakeholders in each stakeholder type**
- **an overall analysis of opinions and influences in each stakeholder type**
- **an overall analysis of strengths and weaknesses in each stakeholder type**

for Co2mmunity the numbers was summarised by stakeholder type, and an overall composition from the nine different RENCOPs was compiled and showed that RE experts and service technology providers was the largest group represented.

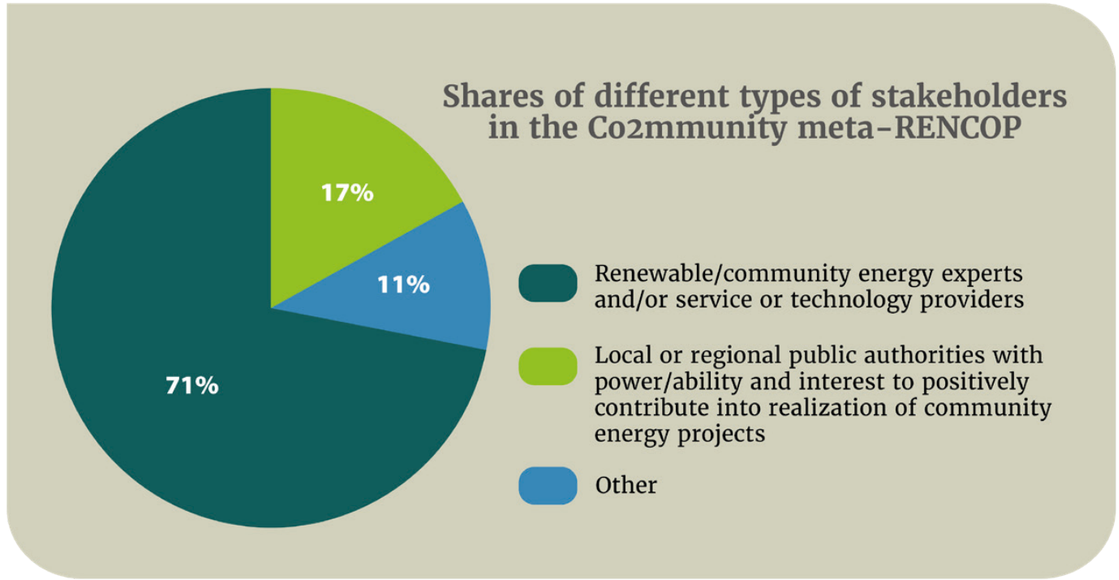


Figure 12. Overall composition of the Co2mmunity meta-RENCOP.

Focus areas for Co2mmunity RENCOPs

The Co2mmunity RENCOP regions have had different focus areas for RE. Here is a summary *(for more details on each region, see chapter Country Specifics)*:

Heinrich-Böll Foundation Schleswig-Holstein e.V (Germany) initiated a RENCOP in the form of a regional network to foster strategic community renewable energy partnerships.

Municipality of Middelfart (Denmark) focused on common purchases of heat pumps and solar PVs, but also small-scale district heating.

Tartu Regional Energy Agency TREA (Estonia) focused on solar PV and more generally raising awareness of communities about CE projects.

Green Net Finland in Helsinki-Uusimaa (Finland) focused on hybrid energy systems for housing companies with ageing block of flats (for a more detailed definition of hybrid energy systems, see chapter *Country specifics - the Helsinki-Uusimaa RENCOP)*

South Ostrobothnia (Finland), Energy Agency of South Ostrobothnia Thermopolis Ltd., and Regional Council of South Ostrobothnia focused on solar PV, heat pumps, biogas and biomass (especially biofuel small scale-CHP).

Riga Planning Region focused on solar panels for the community in Marupe (a suburb of Riga, Latvia).

Regional Energy Agency and Lithuanian Energy Institute in the Kaunas region (Lithuania) focused on raising awareness of community energy projects and their benefits.

Foundation for Sustainable Energy FNEZ (Poland) has a wide approach covering different technologies such as solar, bio energy, wind, geothermal, and energy storage.

Energy Agency for Southeast Sweden focused on grid-connected solar PV for housing associations.

Participatory mobilisation - a strategic approach

In this section, you will find a summary of 10 steps to enable *a strategic approach to building up RENCOPs that promote the energy transition.*

In the Co2mmunity document *Guidelines for a participatory mobilisation process to set up a RENCOP*, the process is described in 10 steps (*see Figure* 14). These guidelines should enable a strategic approach to building up longer or shorter-term RENCOPs that promote the energy transition. We believe this method works both for an expert and a community-driven RENCOP. A strategic approach will make your work much more efficient. Think of starting as initiating a campaign, which also needs a robust action plan. The guidelines can be used for example as:

1. an internal tool to develop an action plan with a strategy for developing a participatory mobilisation process to set up a RENCOP.
2. a learning tool. The questions to be answered should stimulate thinking and a discussion between those who want to build up the RENCOP.

In this chapter you will find a summary of these ten steps. Write down your answers to each step. These, together with the suggested output, will help you structure your action plan and develop your strategy.

Identified success factors of RENCOP

Identifying success factors is a part of managing and developing a RENCOP. Results of such work within the Co2mmunity RENCOPs are presented here:

Co2mmunity RENCOP coordinators are seeing the following as the most important factors:

→ Creation of an atmosphere of cooperation within the partnership.

→ Finding clear focus and defining objectives of the partnership.

→ Forming a clear, convincing and positive message towards targeted communities.

→ Existing interest towards renewables of active persons within the community

→ Capability of active persons to convince passive members of the community and lead a process of decision making towards consensus on investments in renewable energy.

→ Good flow of information across the partership.

Figure 13. Success factors of RENCOP identified in Co2mmunity.

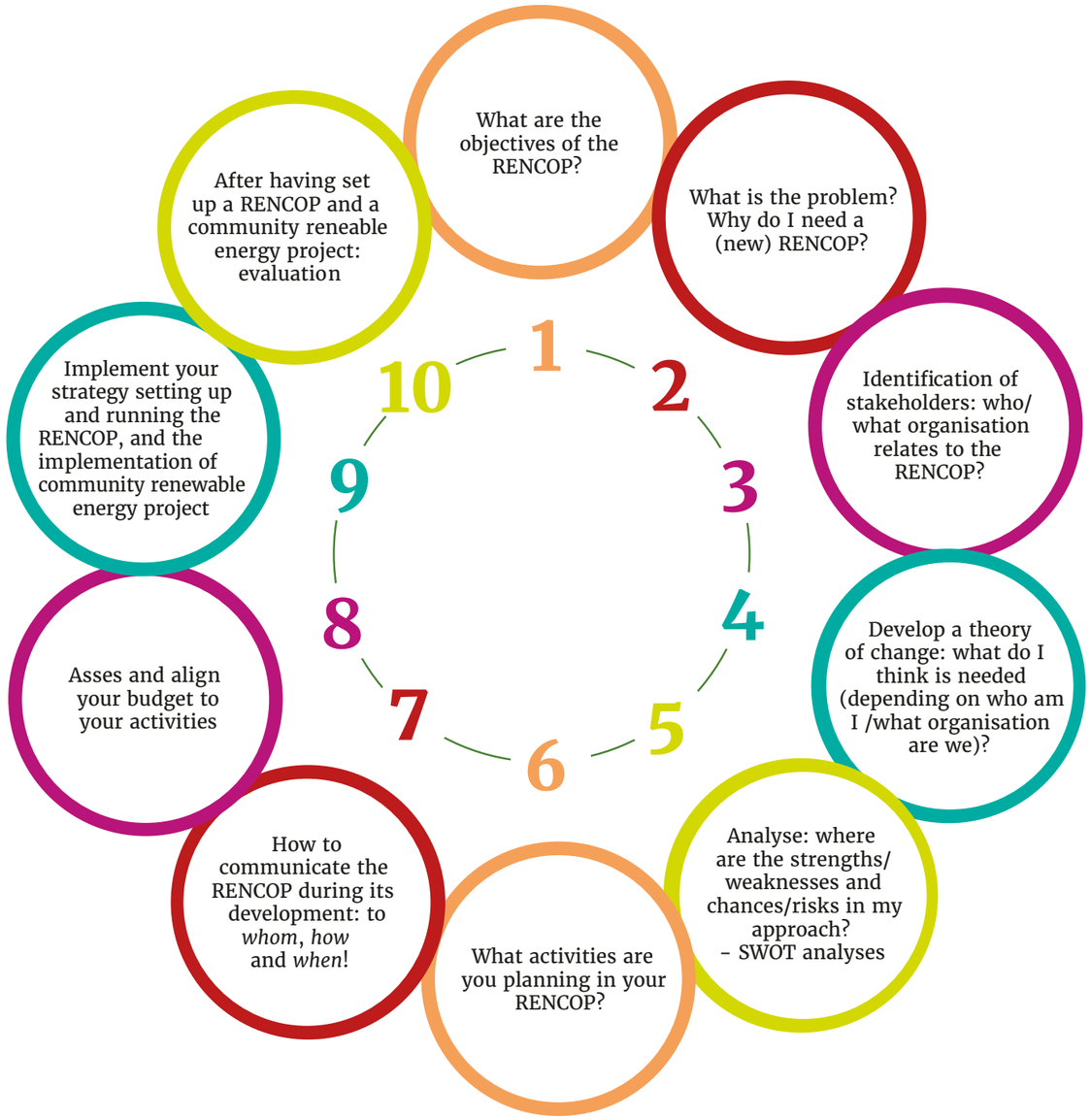


Figure 14. 10-step participatory mobilisation process to build up a RENCOP.

1 — *What is the problem your RENCOP wants to focus on?*

Problem statement

What part of the problem are you trying to solve? How does resolving this issue address the underlying problem. *Output: one or two sentences.*

Situational analysis

Identify and specify the context in which you want to develop your RENCOP.

- ➔ What political, economic, cultural, or other factors are creating or maintaining the problem?
- ➔ What is the national/regional political situation relating to policies towards CE and RE?
- ➔ What are communities doing about the situation?
  Output: ~ 1-page description.

Campaign/RENCOP focus – what is your suggested solution?

Do you want to focus on a specific technology? Do you want to have a specific outcome of the RENCOP, or do you want to use it for creating a broad coalition for the energy transition?

- ➔ Name the FOCUS AREAS of your RENCOP.

Read local newspapers and keep an eye on news about people being interested in community energy (e.g. common purchase of solar panels). EMPOWER local PEOPLE and support local ideas!

Gather information (technical information on the site, financing, permits etc.).

Think of how you would like to organise the RENCOP. Do you see your RENCOP as a strategic partnership and enabler of CE in general, or does your RENCOP have a specific goal? *Output: one or two sentences.*

2 — *What shall the RENCOP achieve?*

What is the goal of the RENCOP? Every step forward in the campaign must be taken with the achievement of your goal in mind. Limiting to one or two goals will allow for a more focused and powerful effort. If possible, your goals should be strategic, measurable, achievable, realistic, and time-specific (SMART). *Output: 1-2 sentences to justify each goal.*

Long-term considerations

How will the campaign continue to have an impact after your planned work ends? How will you build up other groups' capacity, and increase local ownership? *Output: one or two sentences.*

3 — *Who is your target?*

Who can change the situation? Identify key individuals and groups that have an effect/ influence.

You need to identify three categories of people:

- List potential *allies*. Select important and less important ones. Non-governmental organisations, political parties, university professors, trade unions, private companies....
- List *opponents*. Who opposes your solution? Political parties, politicians, businesspeople, farmers, ... Why and what arguments are they using?
- *Your communication target group* is the group of people you want to motivate to join you in the efforts to foster CE projects.

Identify networks in which you can share your ideas: a housing company, village events, social media, birthday parties, the development company of the municipality. Contact and visit motivated people. Think of how to engage with the stakeholders.

Key players: allies, opponents, supporters, targets

Key for establishing your RENCOP might not be the city council; it might be the chair of the city council and perhaps a specific council member.

A key stakeholder can be a champion (someone who is a strong supporter), an opponent or something in between. Identify community personalities and convince them of your CE efforts.

Engage with experts (within and outside the community) who are valuable in setting up and running community energy.

Are there other networks of regional organisations engaged in energy? Often, you can get expert advice from them for free. *Output: Dynamic stakeholder map.*

4 — *Develop a Theory of Change (ToC)*

ToC is a specific type of methodology for planning, participation and evaluation that is used in companies, philanthropy, not-for-profit and government sectors to promote social change. It defines long-term goals and then maps backward to identify necessary preconditions. It is a forecast, a hypothesis - a model that shows what conditions we believe must exist for other conditions to come into being. It can be used to discuss and develop your STRATEGY for setting up the RENCOP and making it run. For more info, this is a good primer.

Output: Diagram and text, 1-2 pages.

5 — *Analyse and assess your organisational capacity*

What are your philosophies and policies? What experience do you bring to the table? How much time do you have to dedicate to this campaign? What additional capacity might you need to build? Do you need help from outside experts? Conduct a SWOT analysis, a powerful tool to help you develop the strategy for your RENCOP.

Strengths and weaknesses are internal to your organisation or your community team. They include change (e.g. who is on your team), your internal skills and knowledge, and your location. Opportunities and threats are external, i.e. things that are going on in society at large. You can take advantage of opportunities and protect against threats, but you cannot change them (directly). Examples include legislation, prices of CO2, or the general awareness of climate change. A SWOT gives you an organised list and is usually presented in a simple two-by-two grid.

Output: SWOT analysis chart.

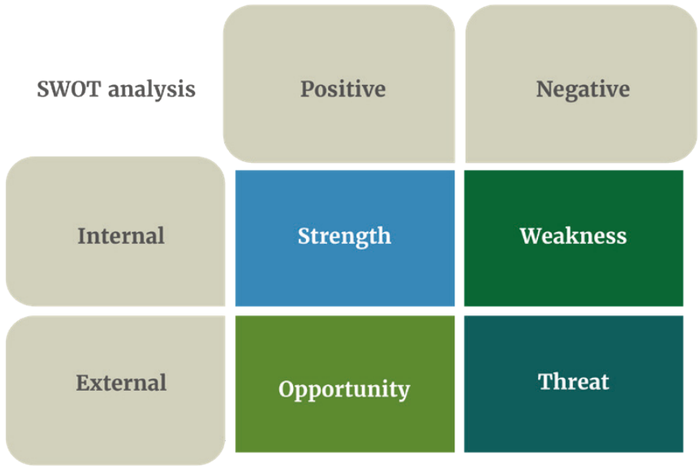


Figure 15: SWOT analysis, (Co2mmunity).

6 — *Description of activities*

This element is the actual thinking about what you want to do based on your capacity. Brainstorm and make a list of your planned activities (with a schedule) to develop your RENCOP.

- **Learn from others**, organise, and support meetings, seminars, workshops, fairs etc. to show and discuss successes (and failures). Invite CE experts to share information at your meeting/event. Organise field trips to pilot sites, ecovillages etc...
- Start regional CE campaigns to raise awareness and acceptance for CE and to mobilise stakeholders to become RENCOP members

Output: Table or short description of activities, including a timeline

7 — *Motivate and gather interested people*

Communication: Think of HOW you want to communicate the RENCOP during its development, to WHOM, and WHEN! *Output: Table/description of the communication strategies you plan to use.* For concrete examples, see: *Guidelines for a participatory mobilisation process to set up a RENCOP*

8 — *Develop your Budget*

Make a rough calculation of how much your activities around the RENCOP might cost. Try to be realistic and adjust your activities. Include financial and pro bono contributions. Also think of the financial implications for people/organisations joining in and the financing possibilities for citizens: crowdsourcing, loans, funding from leader groups, voluntary work, own money, subsidies, support from governmental institutions, and so on.

Output: Table with cost forecast

9 — *Implement your plan*

The timing is often key as to whether the implementation of your action plan will be successful or not. So, think of when you plan to launch your RENCOP and start the different related activities. Can you align to specific external events? Are these events, at specific times, interesting for local media?

Bus campaign in Finland for community energy. Photo: Mira Perttula/Thermopolis.

10 — *Evaluate*

Evaluating the outcome of your efforts can be difficult, but it is important to try to follow up your work. The evaluation should be directly linked to the goals you want to achieve. And, as Rome was not built in a day, you might have to think and rethink your strategy, and to revisit your Theory of Change (step four). However, below is a list of examples of things you can measure and evaluate.

1. Campaign activities: the number of events held, advertisements placed, publications produced, press releases issues, radio interviews given etc.
2. Media and online monitoring: mentions in media and/or on websites, visitor statistics on websites, content analysis etc.
3. Change in knowledge, attitude, and behaviour: tricky to assess; most commonly this can be done through interviews/surveys before, during and after your activities. How many people have registered for a newsletter etc.
4. Changes in politics, activities, and practices of targeted institutions: Case studies, monitoring of support and changes at targeted institutions (private and public sector).

Output: Description (1–2 pages)

Policy framework and regional examples

Generally, in the Baltic Sea Region countries, there are no specific policies for CE. This field is usually governed by several other legislative acts, and has mainly been enforced in related fields like renewable energy, electricity market, grid regulations etc. All countries have set renewable energy share targets in their ***National Energy and Climate Plans for 2030*** *or for 2040/2050. The targets are different and vary between more ambitious and moderate.*

The same regulations apply for CE projects as for other RE projects, so there are generally no specific legal barriers for CE development in BSR countries. Tougher requirements on the distance from onshore wind farms to residential buildings, nature parks and so on, as well as limitations on the height of turbines apply to all. However, regulations may be more difficult for communities to comply with since they suit larger projects better. An example of this is the new auctioning system in Germany.

Depending on both the size and governing system of the country, there may be one or more levels of policy decision making (including energy decision making). Usually, the responsibility for overall energy targets and energy policy framework in the country lies with the national level ministries or state government.

It is important to have a good mix of policies. When considering a new policy, you should then look at the total legal framework. For example, a subsidiary for one energy source can create difficulties for other sources and projects.

BSR country specifics

Setting up/establishing/building up and running/managing a RENCOP may be different in different countries and regions. And the RENCOPs within Co2mmunity are not exceptions. The previous two chapters described the RENCOP models and steps in the participatory mobilisation of the process of stimulating CE projects, as well as some examples of CE projects initiated and supported by Co2mmunity.

This chapter will describe the background, status, and plans for CE and RE for each country/region, focuses and operational models, strategies, and the results of each of nine Co2mmunity RENCOPs.

The BSR countries are different in many ways, as can be read below. History, ambitions, and natural resources are some components of the variations in RE share between countries today. Figure 16 below shows that the trend is overall positive, with an increased share of RE in the energy mix.

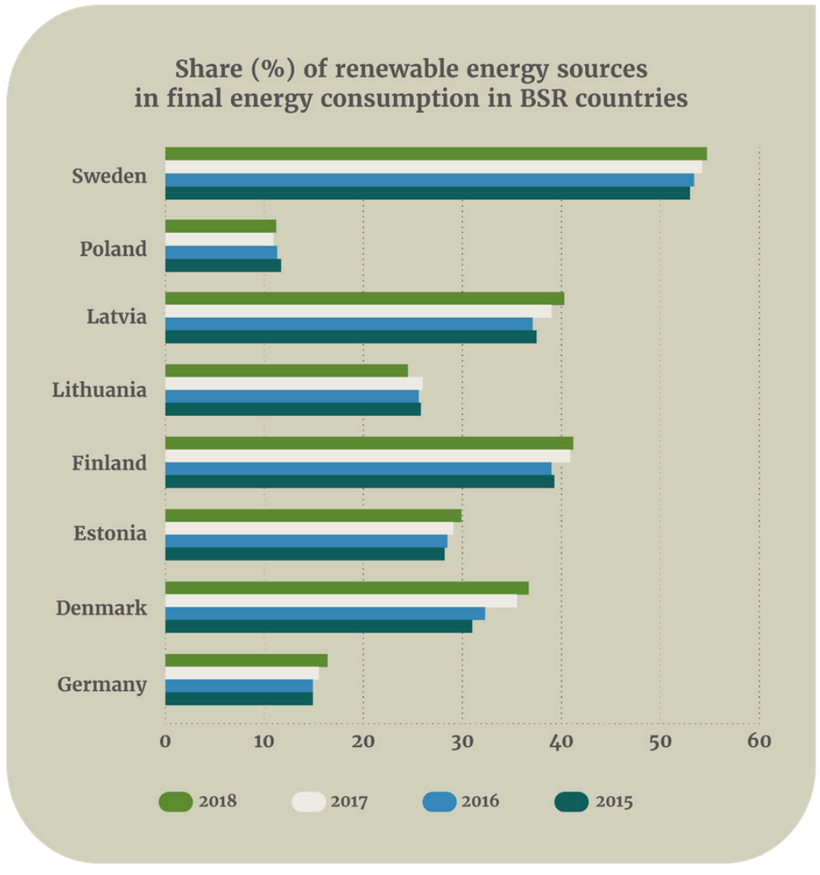


Figure 16. Shares of RE [% of final consumption] in the energy mix.

Denmark and Middelfart RENCOP

According to statistics from the Danish Energy Agency, 34% of Danish energy production comes from renewable energy, which is a step in the right direction in order to achieve the goal to reduce greenhouse gas emissions by 70% (compared to 1990) by 2030. Today, Denmark has reduced greenhouse gas emissions by around 32%,[17] which is close to halfway, but all of the actions taken so far have been the easy ones, which means there is still a long way to go.

In Denmark, community energy has been a part of everyday life for many years. Cooperatives can for example be found in district heating and electricity companies. As the cooperative spirit is already known in Denmark, the foundation to go further with community energy is in place and can be developed not only to think about economy and profit, but also about climate.

But it is not only the experience with cooperatives, which promotes the possibilities for community energy, but also that the technology is available and that both the municipalities and the government are motivated to support CE projects, with for example financial support and counselling.

In Denmark there are some regulatory matters that can make it difficult to start up a RENCOP, but there are also some that promote them. One of the main barriers if you want to start up a project, is that you cannot always be sure that the legislation existing at that time will be there in a year or two. A "stop-and-go" support package from the government can make an investment uncertain. There are other regulatory matters that can make a project difficult, but they are mostly specific to the type of project.

Based on the climate challenges we face, the Danish government is working on a "Climate Law". The goal of this law is to secure the green transition, and it has the potential to make a big difference. But the details of the law and how much it will be able to change remain uncertain.

One of the stronger drivers in Denmark is the many smaller local communities that exist. They are often committed to achieving something together. They know each other, they talk among each other and often there is a climate enthusiast (a climate champion) among them, who is eager to start a new project for the benefit of the community.

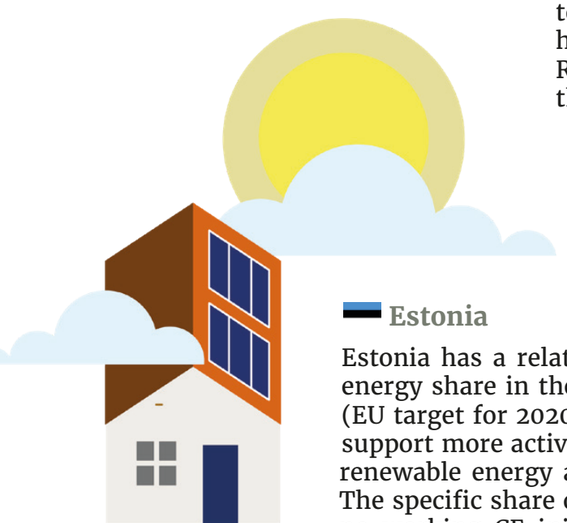
Lately there has been a lot of focus on climate change, and there is strong political support for doing something about it. This, combined with active local communities and champions, means that there is a large potential to create more community energy projects.

In larger cities, this type of community that can be found in small cities and rural areas is less common. People do not communicate in the same way. But this does not mean that it is impossible to start a CE project in larger cities, they sometimes just need a little more support from the outside, someone who can get people together and give them a push.

In Middelfart Municipality, both expert-driven and community-driven RENCOPs have been started. One of the community-driven RENCOPs is in the small village of Føns, where the locals established a small district heating system fuelled by wood chips. Another

17 https://kefm.dk/klima-og-vejr/klimaindsatsen-i-danmark/

example is the community-driven RENCOP in Brenderup, where the locals are working on establishing a solar park to supply the village with green energy. One of the expert-driven RENCOPs is the heating system called Termonet, also established in the village Brenderup, where it is ready to supply 13 housings with heat from a ground source heat pump, with shallow drillings. These drillings are connected to horizontal tubes and the whole system works like a small district heating system. In general, the people of the municipality of Middelfart are eager to support the green transition, and if possible, they want to do it together. In Middelfart, the approach is often to "go for it" if someone has an idea. The municipality is ready to help as much as possible and try to support citizens' ideas. This method gives citizens the courage to contact the municipality for help, even if the idea has just started to form. With this approach, several RENCOPs were able to start up with nothing more than an idea or just the desire to make something.



Estonia

Estonia has a relatively ambitious goal for 2030, of 42% renewable energy share in the final consumption. The share in 2017 was 29%[18] (EU target for 2020 is 25%). Such an ambitious goal should probably support more active CE development. In Estonia, the main sources of renewable energy are wind, sun, water, biomass, biogas and waste. The specific share of CE in RE in Estonia is not known, as there were no working CE initiatives until recent years. Currently in Estonia, there are neither legal barriers nor dedicated regulation for CE.

The first attempt to introduce CE in Estonia was the Energy Cooperation Mentor Programme, which was organised by the Estonian Development Fund in 2015 – 2016. 10 CE initiatives were selected and supported on their way to becoming energy cooperatives. Unfortunately, not a single CE project started from this mentoring programme - it was too short (only 1 year), and legislation was not supportive at that time. However valuable analyses and research came out of the project.

The main barriers for CE in Estonia are a low awareness about it, a lack of experience, knowledge, and skills in creating a CE project (including expert knowledge), and few good examples to learn from. There is also a lack of financing schemes, and some cultural barriers, such as scepticism towards the cooperation and joint action.

The main drivers are the development of the first pilots that would motivate other interested citizens, and a general increased awareness of the possibilities with CE.

An expert-driven RENCOP was established by the Tartu Regional Energy Agency (TREA). Since the number of active communities and potential CE initiatives were relatively low, the expert-driven approach was the best solution. But both types of RENCOPs are possible in the future. The work has focused on general awareness raising and solar PV.

18 *Estonia's NECP 2030, https://ec.europa.eu/energy/sites/ener/files/documents/ee_final_necp_main_en.pdf*

The RENCOP has 3 main objectives: 1) to raise general awareness and motivation to make the CE topic visible in society, 2) to search for, select and work with some specific CE initiatives – advising, mapping the stakeholders, providing expertise etc., and 3) to provide more CE-specific advice and expertise to citizens who are aware and would like to initiate a CE project.

At the same time, work is focused on finding and determining the target group and key persons – both for raising awareness and for initiating a real project. At the first stage, the work focuses on some selected target groups, such as apartment associations, eco-communities, and island communities seen as the initiators with highest potential. But later, focus has shifted towards key citizens with a higher interest in RE who have emerged from different target groups.

The Estonian expert RENCOP has organised several public, expert and working meetings during 2018-2020.

Developing and running a RENCOP can be a complicated task, and some facts must be considered continuously in the daily work (the list is not exhaustive):

1. Awareness and motivation are still low and the cultural and social context is not favourable.
2. There is a need to explain the benefits (especially financial, ecological, and social) of CE to communities to create more motivation in parallel with awareness raising.
3. Generally, there are limited financial possibilities, so funding schemes should be considered.
4. It is hard and might take a lot of time and energy to convince citizens or communities to initiate, be involved in or contribute to a CE project.

On the positive side, a recent increase in interest towards CE amongst citizens in Estonia can be noticed. An example is in Lillerou, where a combination of RE is in the planning phase now.

FINLAND and its two RENCOPs - Helsinki-Uusimaa and South Ostrobothnia.

Finland's share of renewable energy sources in final energy consumption is one of the highest in the EU (41.2 % in 2018). Wood-based fuels are traditionally the most important renewable energy source in Finland, accounting for 27% of the final energy consumption. Wind and hydro power account for 5% of the Finnish final energy consumption. Renewable energy sources that are gaining ground in the renewable energy mix are mainly heat pumps, biofuels, and wind power.

The vast majority of energy is produced in large centralised plants owned by large utilities, but there are also examples of community energy, especially in the rural regions of Finland. The most typical form

of community energy is found among the heat entrepreneurs. From the heat entrepreneur sites, 284 were community-owned in 2001.

There is a new trend in Finland for housing companies to exchange existing heating systems for a geothermal heat pump. The Finnish Heat Pump Association (SULPU) estimates that between 2014 and 2019, around 1000 multi-apartment buildings changed to geothermal heat pumps or combinations of geothermal and exhaust air heat pumps, and around 5000 terraced houses changed to geothermal heat pumps. In addition, individual cases of community energy can be found through wind power plants, biogas symbioses, village houses, ecovillages, and pilots.

Coal will not be permitted for use in Finnish energy production after the year 2029, and needs to be replaced in the district heating systems in many of the biggest cities in Finland. Community spirit can be found in the Finnish countryside among the village societies and recreational activities. Also, new forms of community action are forming, especially in the big cities. Technical experiments exist, for which the platform of information sharing can be found on social networks on the Internet. In Finland there is a strong tradition for cooperatives, which is also a good organisational structure for community energy.

Unfortunately, there are still barriers that prevent the wider spread of community energy in Finland, including heavy regulation, surveillance, costs related to renewable energy production plants and distribution networks, the difficulty of being a local champion facing big centralised energy producers and distributors, legal difficulties in sharing renewable energy among neighbours, and the short-term nature of financial support systems of renewable energy.

The Finnish government published a roadmap, "*A fair transition to a carbon neutral economy*" on 3 February 2020. The roadmap specifies the timetable and objectives for the preparation of climate measures, and outlines new actions to achieve carbon neutrality.

During the Co2mmunity project, RENCOP activities were carried out and community energy projects initiated in two regions: the urban area of the Uusimaa region and the rural area of the South Ostrobothnia region. Both regions started with an expert-driven RENCOP model, but later, South Ostrobothnia also benefitted from community-driven processes.

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 stock 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 into 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 a 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.* In total, there are nearly 40 experts involved in the Helsinki-Uusimaa RENCOP, diversely representing local public authorities, academia and businesses-providing services and technologies for renewable energy and/or community energy projects. 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 apartment buildings.

In the rural region of South Ostrobothnia there is a strong cluster of heat entrepreneurs using wood chips for producing heat. These heat entrepreneurs would also be interested in micro-CHP solutions, if the related technology were to evolve. *The South Ostrobothnia RENCOP* aims to support this with knowledge sharing. The region already has wind power, solar energy, and biogas, and there is a lot of potential for more cases. Agriculture and forestry in the area produce side streams that could be used more widely to produce various forms of renewable energy. Unlike the Helsinki-Uusimaa region, in the South Ostrobothnia region coal is not burned as a fuel for district heating. Instead, the region's district heating uses biomass and peat. Thus, district heating-related CO2-emissions stem mainly from the use of peat.

During the Co2mmunity project, it was evident that people in South Ostrobothnia are very interested in solar energy, particularly solar-PVs. In South Ostrobothnia, it was considered best to support the local ideas and interests, and the RENCOP evolved during its lifetime from an expert-driven to a community-driven RENCOP. Due to the high interest, two solar energy projects were carried out in the municipalities of Alavus and Ilmajoki with common purchases of solar-PVs. Also, recreational associations (such as hunting clubs) were guided towards renewable energy solutions in their buildings. They were especially interested in setting up heat pumps. In South Ostrobothnia, community energy was campaigned and made visible in media articles and local events at a grass root level, to raise awareness and to inspire different citizen groups to take action.

Germany and the Schleswig-Holstein RENCOP

Once a front runner in fostering a bottom-up, decentralised energy production, Germany has in recent years lost its momentum in promoting the comprehensive energy transition strategy, known as the "Energiewende". Renewable energy production received its boost in Germany at the turn of the millennium. The production of electricity was a particular success story, and in 2019 renewables (mainly through sun and wind) accounted for 42.1 % of the production of electricity. In contrast, the shares of renewables in the heating and transport sector have been stagnating for the last 10 years, at rather humble shares of approximately 14% each. Though there are positive tendencies, the total emissions are not really declining - other measures are therefor also needed.

The core legislative instrument underpinning the Energiewende is the Renewable Energy Act (Erneuerbare-Energien-Gesetz – EEG), which sets very ambitious targets. The German goals have since 2019 been legally binding and are captured in the „Klimaschutzgesetz", i.e. the climate protection law. Greenhouse gases are to be reduced by 55% by 2030. In the climate protection law, the expansion of renewable energies is a key legislative corner stone. And by 2030 it is envisioned that 65% of the electricity will be produced through renewable energy sources, and that the heating systems will be transformed towards renewables.

For community energy initiatives, the German government's decision to introduce an auctioning system in 2014 for nearly all RE sources was a fundamental shift from a system based solely on feed-in tariffs, and it gave the decentralised movement a stab in the back. An example: the introduction of tendering is one of the laws, which has

become a barrier to citizens' energy because the bidding processes are too complicated and costly for many small citizen-driven projects. The EU Clean Energy for all Europeans package marks a new step within the EU to foster community energy. What these frameworks will look like in Germany is still to be developed. However, a key issue will be to raise the acceptance for renewables, and to counter the NIMBY (not-in-my-backyard) perception, which is still prevailing among parts of society.

The German Advisory Council on Global Change (WBGU) sees that an overall success towards an energy transition can only be secured with a broad consensus in society and the collective commitment to a transformation to sustainability (WGBU, 2016).

Within the Co2mmunity project, Energiebürger.SH has initiated the RENCOP, Klimanetzwerk, Rendsburg-Eckerförde, which is a regional strategic (community renewable energy) network to foster the energy transition. It now entails key regional civil society organisations like the Heimatbund Schleswig-Holstein, Naturfreunde Ortsgruppe Büdelsdorf, KreisLandFrauenVerband Rendsburg-Eckernförde, Volkshochschule Rendsburger Ring E.V., the climate management of the regional authorities (Kreis Rendsburg-Eckernförde), as well as a number of community energy experts. We developed and tested the Participatory guidelines (s*ee Chapter 2*) while setting up the RENCOP.

Latvia and Riga Region - Marupe RENCOP

Latvia is internationally acknowledged as a country with a high level of biological diversity, and it produces around 40% of its annual energy consumption from renewable energy. The two most important renewable energy sources in Latvia are biomass and hydropower; there are also large potentials and opportunities for projects that can be developed in the wind power and solar energy segments. However, energy production by local communities is just beginning to take hold. Energy cooperatives are neither popular nor well-known in Latvia, and the RENCOP approach is a new phenomenon.

During the implementation of the Co2mmunity project in Latvia, Riga Planning Region, in cooperation with the suburban municipality of Mārupe and three neighbourhood associations, established and ran a community- driven RENCOP. In addition, we launched several small-scale pilots at Mārupe that included a demonstration of renewable energy production technologies in practice. The practical examples included the installation of solar energy collectors and panels to allow for water heating and the production of electric energy in cooperation with neighbourhood associations. These demonstration sites are significant "sandboxes" for understanding practical, technical, and institutional steps towards community formation. The emphasis was put on community work rather than on sophisticated technical solutions.

The ultimate goal of the RENCOP activities was to demonstrate in practice that citizen-driven energy initiatives can be based on cooperation among private partners or individuals, and they can be successfully implemented in Latvia and thus serve as good examples for similar initiatives.

As the level of civic participation in energy production in Latvia is still moderate, the development of community energy projects faces several challenges. Two of the largest obstacles are the lack of incentive instruments, and regulations that do not encourage local initiatives. CE will then look less profitable compared to traditional (fossil) energy sources. Another barrier is that the current net metering system offers favourable terms only to individual households.

Experience from the Co2mmunity pilot projects in Mārupe has highlighted that technical knowledge on legal and accounting issues is required for decision making and project management. Each community energy project initiative must adopt an individual approach to finding the best solutions for administrative and technical methods.

A series of research studies were commissioned by the Co2mmunity Riga team, which allowed us to elaborate a national roadmap for community energy projects intended to contribute to reaching the national decarbonisation targets in this decade, and to respond to the barriers encountered in policy and practice. Moreover, the evolution of distributed generation, efficiency measures, and sustainable heating systems require a changing landscape of governance and cooperation. We have done this in cooperation with the national energy policy maker – the Ministry of Economics, which is responsible for the implementation and monitoring of the National Energy and Climate Plan 2030. Among the numerous support measures listed in the NEKP 2030, community aspects have been given an important priority.

Lithuania

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

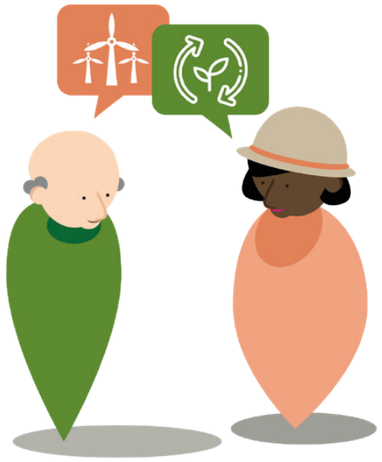
Collective electricity production in solar power plants is not sufficiently developed in Lithuania, however, very favourable conditions have been created for natural and legal persons to become prosumers. Prosumer initiatives (mainly solar energy) are widely developing in Lithuania - from natural persons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

In January 2020, there were 5031 prosumers connected to the grid, and their total installed power was 49,7 MW[19] (all types of RE). 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 potential 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 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.

19 *http://enmin.lrv.lt/uploads/enmin/documents/files/gaminan%C4%8Di%C5%B3%20vartotoj%C5%B3%20prijungimo%20statistika%202020-05-15.pdf*

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 behaviour 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).

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.

Poland

Poland is at the beginning of its energy sector transformation. The share of RE in gross final energy consumption was 11.3% in 2018. Today, more than 80% of energy comes from fossil fuels; mainly coal. Energy production is industrial, concentrated in the hands of state-owned energy utilities.

The interest in RE sources in Poland over the last decade has been steadily growing.

The spatial distribution of RE capacity in Poland shows a significant disparity between the north and south of the country. The largest share of energy produced from renewable energy sources was recorded in the provinces of western and northern 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) is characterised by a much smaller share of renewable energy sources (less than 230 MW in Voivodship). The largest share of renewable energy sources in Zachodniopomorskie, Pomorskie and Wielkopolskie Voivodships is mainly due to the capacity of installed wind power (total capacity in Voivodships is over 750 MW).[20]

20 https://www.cire.pl/gal,118,961,0,0,0,0,0,instalacje-oze-w-polsce.html#galeria

From 2008 to 2015, wind energy was developing intensively. However, these were investments carried out mainly by large energy groups, in which the share of individual citizens was limited to leasing real estate for the location of the power plant. The development of this technology was stopped in 2015 by the new legal regulations blocking the location of wind turbines in the close vicinity of residential buildings and areas of high natural value. In recent years, the most popular RE is Solar PhotoVoltaic (PV) micro installations, with a doubling of sales compared to the previous 12 months, and 2019 sales reaching record levels. The number of PV micro installations connected to the grid at the end of 2018 was 55,105, with a capacity of 380 MW.[21] This increase is mainly due to individual investments and the result of national financial support programmes.

In Poland, development of RE investments is regulated by several legal acts, with the most important being the Renewable Energy Sources Act, dated 20 February 2015. This act defines the rules for electricity generation from renewable energy sources and agriculture. The act also defines terms such as: renewable energy prosumer, micro installation, small installation, energy cluster and energy cooperative.

The community energy sector is based on prosumers and distributed energy and is developed according to three dominant formulas: individual initiatives focused on independent residential and/or farm buildings, energy clusters, and housing cooperatives. A good example is the installation of 750 kW PVs on the roofs of 35 buildings belonging to the "Wrocław-Południe" housing cooperative. The electricity produced supplies the common parts of the buildings: lighting of the staircases and outdoor area, and operation of lifts. The benefits resulting from the implementation of the investment are financial savings of PLN 330 thousand (72k€) per year, but also a reduction in CO2 emissions of 614 t per year.

Due to the current stage of energy transformation in Poland, where community energy and its benefits are not common, it was decided to adopt an expert-driven RENCOP model. It is an open group that has been operating since September 2018, bringing together experts from various fields. Members of the Polish RENCOP are coordinators and members of initiatives, experts in the field of distributed energy, representatives of enterprises providing services for clusters, lawyers, financial institutions, and the RES Council of the Lewiatan Confederation.

For Polish RENCOP, the following goals and tasks were adopted:

- Developing CE in the national energy system
- Co-creating conditions for the development of CE
- Increasing the number of new initiatives and CE projects
- Developing real and effective models and guidelines for CE
- Initiating and maintaining expert support of legislative and regulatory processes
- Promoting experience and good practices developed by RENCOP experts.
- Cooperating and exchanging knowledge and experience between practitioners.

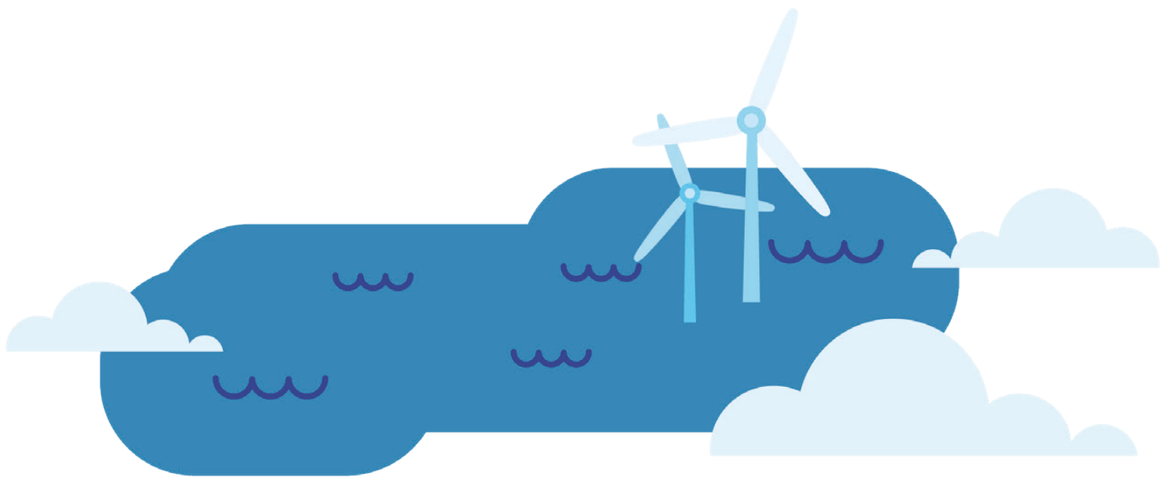
21 *Dyląg A., Kassenberg A., Szymalski W., 2019. Energetyka obywatelska w Polsce – analiza stanu i rekomendacje do rozwoju, Warsaw.*

SWEDEN and the Southeast RENCOP

Sweden has the highest share of RE in its energy consumption in the EU (54.6% in 2018). Most of this comes from bio and hydro power, but wind power is also rapidly increasing. A large majority of the production capacity is however owned by large utilities, municipalities, or the state. The share of CE is not known. Sweden has had a support system for RE "Green certificates" since 2003, which all sizes and types of RE can use. The system will however close soon, as RE is often profitable on its own merits. There is also a dedicated solar-PV support that has given such systems a push in popularity. The interest in starting energy cooperatives has varied over time, with a peak around 2008, when many co-owned wind turbines were built. Today, you can see an increasing interest in solar-PV for housing associations and other types of business models. Lower costs for both solar and wind power technology are a driver, while low electricity prices are a hindrance to investment. Also, the fact that most electricity and heat in Sweden is low carbon produced is a barrier for some investments and public engagement.

The Southeast Sweden RENCOP did focus on housing associations as a target group and to inspire them to install solar-PV. Activities were held, with open meetings throughout the Southeast Sweden region (Kronoberg, Kalmar and Blekinge). More than 200 individual persons visited the open meetings. Experience shows in particular that 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 exercised when inviting providers of PV panels and services, as the RENCOP organiser should retain its credibility as an honest broker for the interests of the citizens.

The network of energy advisers at the municipalities in Southeast Sweden was tied to the RENCOP and formed the basis of the RENCOP experts. These advisers are active in most of the municipalities in the southeast and were aware early on of new initiatives. They can give guidance first hand and follow up after the open meetings. Other experts involved were suppliers, energy companies and the county administrative board.



Transnational aspects

Transforming Europe's energy system does not stop at borders. Looking at the Baltic Sea countries, there are different conditions in the countries because of different political histories and economic and social development. Due to this, the background role and implementation of CE projects must be considered differently. Among political, financial, legal, and economic aspects, specific cultural reasons and know-how play a decisive role.

Specifically, for RE the conditions differ a lot over the BSR. Rivers with high flow and vertical drops give good potential for hydropower, many hours of sun make solar-PV more suitable, and so on. Having many private forest owners makes CE based on bioenergy easier.

Looking on the Baltic Sea countries, there is a clear dichotomy into "frontrunners" and "followers" concerning the promotion and acceptance of community energy:

In "frontrunner" countries - Denmark, Germany, Sweden, and Finland - political regulations are generally defined, legal frameworks exist, and community energy projects are more or less a significant part of energy politics. The projects are financed in different ways and models (subsidies, grants, local funds, shareholders etc.), technological solutions exist and will be improved constantly, and community-owned projects are popular because of the historical culture of collective ownership. These countries have a history of many successful CE projects formed as cooperatives or other ownership models.

In "follower" countries like Poland, Lithuania, Latvia and Estonia, the countries are actually at the beginning of the transformation of the energy sector. Political and legislative frameworks are under development, sometimes there is no clear defined position of community energy projects on a national political level, the countries have no previous experience and a short history of private property, financial inequality is common and sometimes a lack of technological know-how and financial support (funding, support programs etc.) prevails. Examples of CE projects are few in these countries and good examples must be searched for in frontrunner countries.

Community energy projects are playing a key role in the successful European energy systems for the future. The Clean energy for all Europeans Package (CEP) clearly recognised community energy as an important driver for the energy transition in the EU. A substantial step in achieving this target should be the support of countries having unfavourable conditions in successfully realising community energy projects. Therefore, steady, reliable, and forward-looking framework conditions must be established by European and national European directives, as well as stimulating instruments.

On a national, regional and local level, close cross-border cooperation in the community energy sector (e.g. in form of transnational agreements with clear goals and fields of activity) and/or cross-border cooperation platforms as instruments for increasing know-how transfer (i.e. solving technological or economic questions) will help balancing the differences (needs/skills) between partner countries.

Local and regional stakeholders sometimes have limited possibilities to develop suitable solutions because often it depends on national political will, legislation frameworks and instruments. But in close exchange with partners and using experiences and competences of others, they can develop, initiate, and promote ideas, models, and projects to create social will and an acceptance of community energy projects.

RENCOPs and CE projects - beyond the BSR region

Practical experience of RENCOPs and research on existing and initiated CE projects from Co2mmunity projects are focused on the BSR. However, the outputs can, with small modifications, be applied in other parts of Europe *(see the list of outputs in Chapter 4)*.

The RENCOP models and Participatory Mobilisation Process, as described in chapter 2 of this document, form general tools for promoting, catalysing and enhancing CE that must always be adapted to the local context. This is valid regardless of whether you are within the BSR region or not.

Transnational or regional collaboration between RENCOPs can be established. The Co2mmunity project has initiated this process by creating transnational "tandems'' between project partners and other organisations. These will continue to cooperate and exchange experiences after the project ends.

Informal *Meta-RENCOP* - an alliance formed by regional RENCOPs, or a so-called "RENCOP of RENCOPs," is explained in the Figure 17 below.

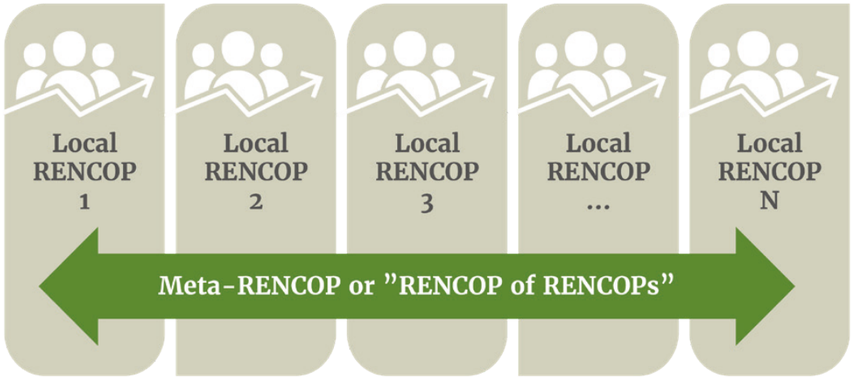


Figure 17. Cooperation between RENCOPs.

Potential for RE varies from region to region, depending on conditions for wind, solar, hydro, or bioenergy, and the geological sources. This will give different substance focus for the specific RENCOP.

Also, funding and policies are different from country to country, but are expected to be more harmonised when the Energy for all directives come into force and are integrated in all EU member states' legislation. The examples of existing CE projects from the BSR that have been researched and described can also be used as inspiration outside BSR.

Examples of existing CE projects in BSR

The Co2mmunity partners have researched/investigated several existing CE projects. In doing so, they did not only look for the best working examples, but also failures and problems. All of the case studies finished to date are presented on the Co2mmunity website here, and four of these you will find in a summarised version below. The examples are chosen to show the variation of how a CE project can look. Type of RE source technology, organisation, size and many other parameters can vary.

Ærø, Denmark – Pioneers of community energy

The Danish island of Ærø lies in the Southern Funen Archipelago, some 150 km southwest of the capital Copenhagen, and is home to some 6,300 inhabitants. Ærø has been a hub for wind energy pioneers for many decades and nowadays the island is one of three Danish energy islands. Locally-owned wind turbines produce around 40 GWh of electricity every year, providing roughly 130% of the island's electricity consumption. This success has its roots in an initiative of 12 locals who took interest in wind power development in the 1970s. Their initiative has led to a number of renewable energy projects all over the island and the establishment of the Ærø Energy and Environment Office, an independent organisation that supports energy projects with know-how and organises learning activities around energy use and production.

The wind farm on Ærø has a special ownership structure. The owner is a shareholder company that is open only to local inhabitants. The local shareholders take all the important decisions relating to the wind farm. The investment cost for three turbines on

the farm was DKK 60 million in 2002. The first two are owned by local inhabitants and the third one is mostly owned by local businesses and a local community fund. Local actors ensured an inclusive bidding process by first selling shares to those islanders who could not or did not want to invest a large sum. The local bank provided loans to inhabitants without the need for additional collateral. The favourable wind conditions on Ærø made the project a financial success. In the first year the return on investment was a formidable 18.75%.

The case of the wind farm on Ærø shows us that communities can achieve great things when they decide to develop local potential for renewable energy themselves instead of selling land or leasing the rights to large commercial developers.

Wind turbines on Ærø. Photo: Jess Heinemann (Ærø Kommune)

Kalmar, Sweden – Local power suppliers as initiators of community energy

The coastal town of Kalmar is in the southeast of Sweden and has roughly 40,000 inhabitants. The location is ideal for both solar and wind energy production. Kalmar is home to one of Sweden's largest solar parks, located on the grounds of Kalmar Airport. The park has an average output of 2.3 GWh electricity per year. A second, smaller solar park, with an estimated output of 0.6 GWh per year is also part of the project. Kalmar Energi, the local energy company, initiated the project. The municipality of Kalmar owns a majority share of Kalmar Energi.

Even though the project is not a grassroots initiative, it is an interesting example of community energy development. The key to achieving this community character is the innovative ownership structure developed by Kalmar Energi. The company supplies customers all over Sweden with electricity. Individual households that are customers of Kalmar Energi can buy shares in the project. However, the maximum amount households can invest is tied to their consumption. Customers can buy shares that correspond to a maximum of 80% of their electricity consumption of the previous year. This way, the project is kept open to households who cannot or do not want to invest large sums. Businesses and organisations based in Kalmar can also invest in the solar project, but the 80% maximum rule also applies to them. Together, the two solar parks cost roughly SEK 40 million and a single share costs SEK 1,100. Many customers reported that they bought shares because it was the easiest way for them to become prosumers who consume their own energy.

Nöbble Gård solar farm. Photo Kalmar Energi.

The case of Kalmar Energi shows that community energy projects do not necessarily have to be grassroots initiatives. This approach opens the potential for publicly-owned energy companies to use their expertise in the service of community energy development.

A second important lesson is that community energy projects do not have to be based in only one place. Instead, shared interests can bring together a community, even though its members live in different places.

Szczecin, Poland – Community solar against all odds

The Polish city of Szczecin is in the northwest of the country, right at the border with Germany. The city is home to roughly 400,000 inhabitants. It is also home to the Pszczelna Solar Housing Community, the first community in Szczecin to install a photovoltaic system. The system supplies the common electricity consumption for a multi-family building. This includes electricity for the underground garage, lighting in the common areas (such as the staircases), electricity for the elevator, lighting for the outside areas, and energy for the heating and air conditioning system. The panels have a combined capacity of 24 kW. Excess energy is fed into the national grid. The inhabitants of the building own the solar PV system.

The project had to face several barriers. Firstly, Polish law does not permit inhabitants to use the excess electricity for their own consumption. Secondly, there is only limited funding to support such projects available in Poland. Thirdly, the favoured position of big incumbent energy suppliers leads to a situation in which people do not have a high level of trust in decentralised solutions like community-owned solar PV. Nevertheless, the community managed to find creative solutions and managed to tap into new public funding streams to make the project a success.

The case of the Pszczelna Solar Housing Community project shows that community energy projects can succeed even if the regulatory framework is not supportive of such projects. This, however, requires dedication and persistence by the community.

Pszczelna Solar Housing. Photo: Krzysztof Stasiewicz

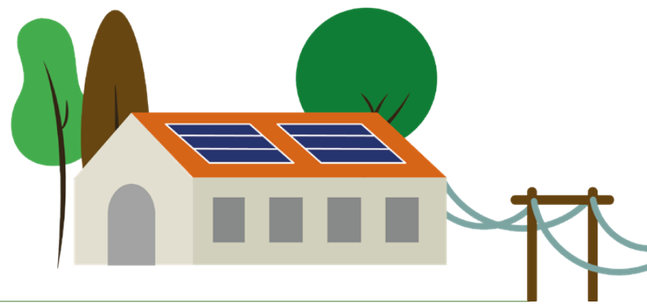
Alpua, Finland – Development in the name of the community

The village of Alpua is in the Finnish province of Ostrobothnia. It is home to some 450 people. Like other villages in the region, the population of Alpua has been declining in recent decades, which culminated in the closure of the local school in 2011. As a response, the villagers founded a village development association and purchased the school building. To supply the building with heat, the association purchased a combined heat and power plant, which uses wood chips. The plant has a capacity of 100 kW of thermal power and 40 kW of electricity. Around 100 inhabitants from the village joined the association and paid the membership fee of 20 euros. The power plant was financed by two funding streams. 60% of the money came from an EU fund for rural development (LEADER programme). The remaining 40% came from a loan with a tenure of 15 years. In summer, the heat energy is used to dry the wood chips. Excess electricity is fed into the grid. Through the Farmivita (farmer power) scheme, the villagers can buy the electricity from their power plant for use at home.

Three individuals from the local community were the driving force of the project. They brought a range of beneficial skills to the project, from knowledge about energy systems to accounting. The idea of the project is not to generate profits but rather to support an active village life and generate benefits for the local population. Consequently, the project sources wood chips for the power plant from local suppliers. Apart from the use of the building as a local community centre, the project produced several further benefits for the village. Firstly, the project created two direct jobs; secondly, the local daycare was able to stay in the village, which enabled young families to remain; thirdly, the local sourcing of the wood chips increased job security in the area. All of this led to a strengthening of the common identity of the villagers, and Alpua village was named Finland's village of the year twice.

The case of the Alpua village underlines the importance of determination and the willingness to take brave decisions if a project is to be successful.

Wood chips – fuel for the small-scale CHP. Photo: Thermopolis OY



The way forward, a roadmap to more CE

Goal

More CE

Community energy can and must play an important role in transforming Europe's energy system in a sustainable and climate-friendly direction. *Half of all citizens in Europe could produce their own electricity or heat by 2050.*[22] This chapter describes a roadmap to make this happen.

If half of the citizens in the EU are prosumers and municipalities, schools, hospitals, SMEs and other organisations take part in the energy transition, we will take a great leap towards a climate-neutral continent in 2050, as outlined in the Green Deal Vision.

Where to start?

In the co2mmunity project, much has been said, commented on and documented about the importance of paying attention to local context. Culture eats strategy for breakfast, as many failed approaches demonstrate. On the other hand, projects have been identified and built upon successful platforms and factors. Therefore, it is relevant for RENCOP coordinators and citizens to pay attention to success-factors and use them for drivers in the development of RENCOPs.

To keep it simple, and for illustration purposes, a roadmap may be an "Organic Carousel" where you commence at an "opportunistic" platform. These can be technical options, organisational/personal settings, financial and economic conditions, or social and cultural settings.

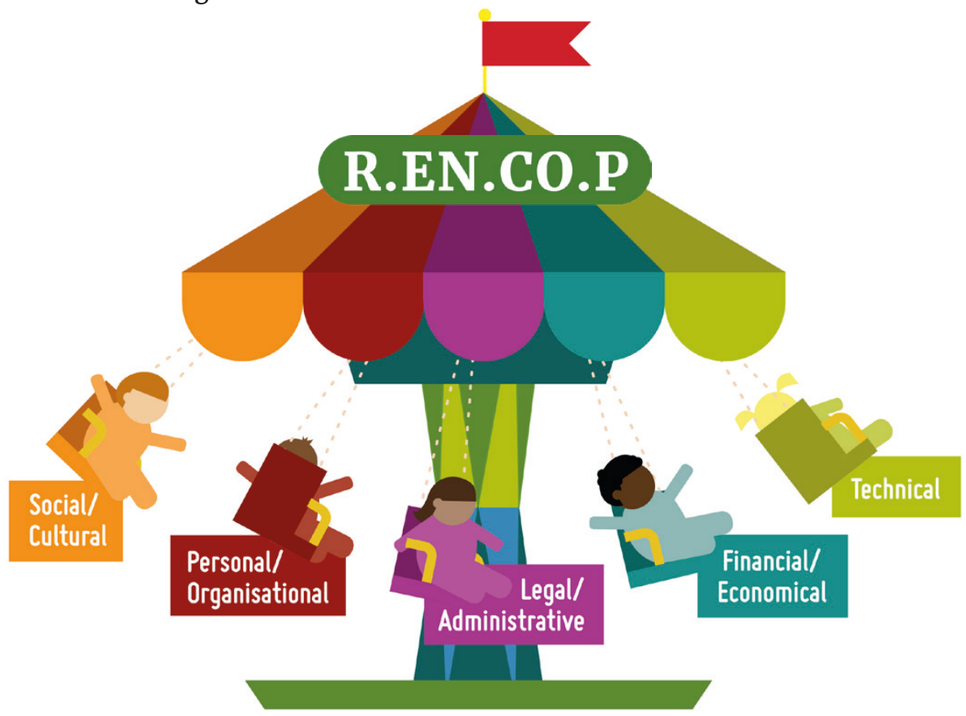


Figure 18: The "organic RENCOP carousel" (Co2mmunity).

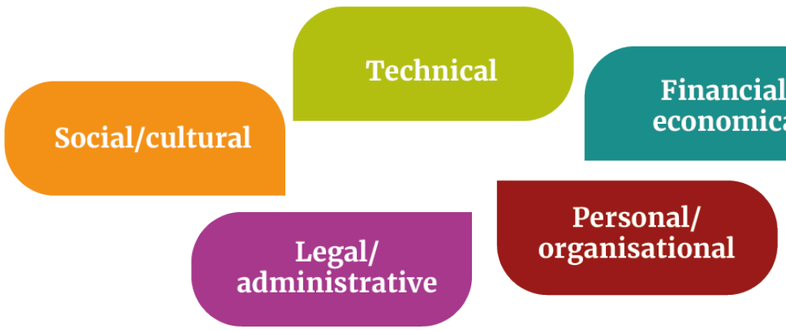
22 *The potential of energy citizens in the European Union, CE Delft 2016*

In this sense, the roadmap does not point at one place to "start the RENCOP journey," and then proceed in a linear process. But we do suggest thoughts about local context, and then to proceed from an easy platform to a more advanced one whilst "success breed success".

Milestones

This *Roadmap for municipalities and regional actors on how to increase Community Energy using the RENCOP model* does not have traditional milestones placed on a timeline. The actions needed to reach the goal of CE for half of EU citizens are hard to place in a timeline – they all must happen as soon as possible! This section however describes drivers, barriers, and recommendations on how to reach the goal. Remember that when working with communities you need a plan, but:

Many things must come into place to enable the energy transition. From the local perspective, each RENCOP and CE project has its own challenges to overcome. From a wider perspective, policy and regulations are important to support local initiatives. To make the reading of the coming section easier, colour codes are used to categorise the recommendations.



Drivers

Drivers for CE shall be highlighted and supported. These are the most important drivers identified by Co2mmunity:

- **Measurable and tangible benefits of CE projects** for local economic development and environment.
- The possibility to **reduce energy costs.**
- **Feed-in tariffs, grants and loan schemes and tax incentives** – makes CE projects economically more feasible.
- **Environmentalism** and the desire to set the "right example".
- Desire for **greater energy independence.**
- **Decreasing** cost for setting up RE projects as a general tendency

Barriers

Knowing possible barriers creates an understanding of why progress is not happening. They are difficult to reduce, but awareness of their existence is a good start. These barriers have been identified by Co2mmunity project:

1. **Lack of stable policy framework for CE and RE investments.** The citizens in many CE projects make investment decisions with a long-term perspective in mind. Therefore, it is essential that all investors can operate within a stable policy framework.
2. **Lack of long-term and low-interest investment funding schemes.** A major barrier is the lack of good financing mechanisms through which community groups can easily raise the needed capital to invest in RE and energy efficiency projects.
3. **Existing regulatory barriers.** In some BSR countries, current metering regulation stops many residents of the housing associations to consume electricity from solar PV in their apartments. Another example is legal restrictions on the location of wind turbines that affect the development of CE projects in certain BSR countries
4. **Competition between community energy projects and large energy companies.** In many countries, large energy companies have interests in conventional energy assets. In some countries, the utilities have been reluctant in opening local district heating networks to energy prosumers.
5. **Lack of understanding of the benefits of community energy projects** in the form of renewable energy acceptance, socio-economic development in rural areas, increased social cohesion, and energy literacy.
6. **Lack of expert knowledge about CE.** New competencesare needed for energy advisors and experts to explain the possibilities and benefits of RE projects to citizens. It is crucial that citizens have access to technical information and guidance.
7. **Lacking the right conditions for support organisations to operate.** A lot of CE projects can be made possible with the support of an intermediary organisation. People often have more trust in these actors since they are not technology providers or authorities. Government funding is often needed to establish these kinds of actors.
8. **Cultural barriers and a sceptical mindset about collective action** stops the popularisation of CE initiatives. This is particularly the case in the Baltic States due to their historical experience. Among the cultural barriers in some BSR countries we can indicate, inter alia, a reluctance of citizens to deal with the administration and a fear of bureaucracy, a reluctance to enter into long-term commitments (loans), as well as a centuries-old culture of using fossil fuels for energy.
9. **Low awareness about CE**, its opportunities and benefits among regular citizens and citizen associations. This is also connected to the lack or insufficient knowledge about the economy in society.
10. **Too rigid and complicated legal procedures**, lots of bureaucracy, administrative regulations, and long timeframes.
11. **Fossil competition** – the current energy system is built for using fossil fuels and people's minds are set for using this system. The cost for C02 emissions is still low, meaning the financial incentives are often against renewables and CE.

Recommendations

The recommendations in this chapter are taken from the Co2mmunity documents; White paper and Policy Recommendations.

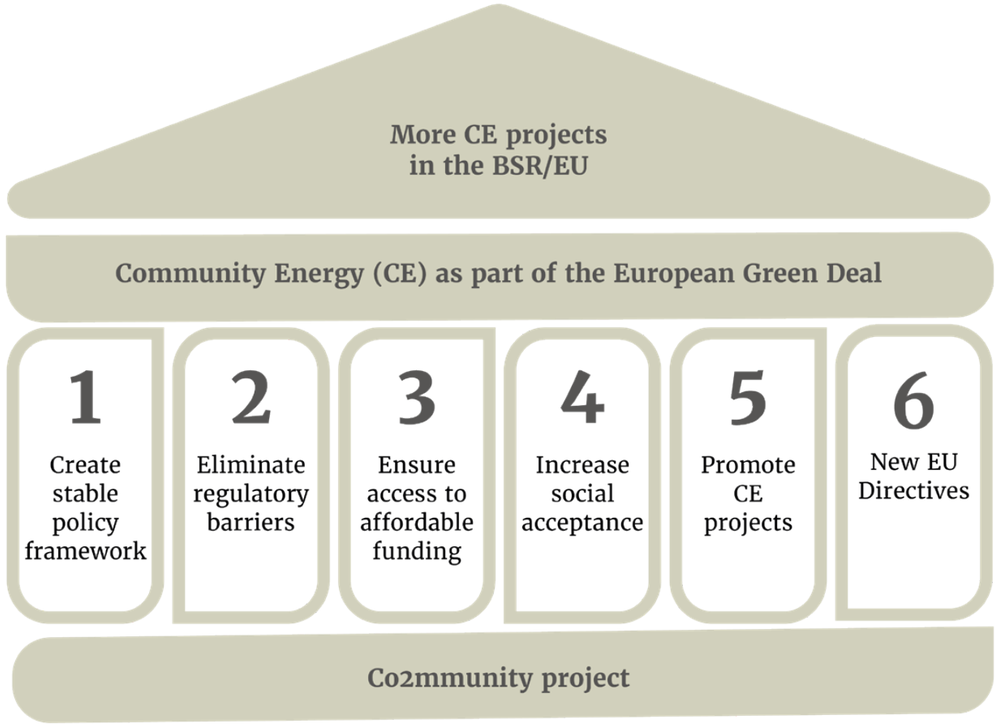


Figure 19: Recommendations leading to the goal.

1 — *Create a stable policy framework for CE projects*

Energy policy and other relevant policies (such as taxation) should be kept stable to provide a long-term outlook for investors. Necessary changes should be phased in over time.

A supporting the policy framework is an indispensable prerequisite for the development and facilitation of CE. Key policy instruments for RE in the BSR differ from country to country, depending on the state policies. Some of these recommendations may already be introduced in some countries. In the heat and electricity sector, supportive feed-in tariffs for bio and renewable energy, tax reductions for renewable energy or pollution taxation and financial instruments are the main instruments used in the policy frameworks.

All those instruments should also be available for CE initiatives. With the supportive EU directives *RED* and *EMD*, and due to the obligation to adapt those EU directives to the legislation of the member states by June 2021, hopefully the barriers for CE in countries' legislation will be reduced. RED requires member states to put in place enabling frameworks that support citizens and communities investing in renewables.

Policy recommendation 1: allocate sufficient human and financial resources to implement the requirements of the amended directives and integrate them into national and regional law in the best possible way, taking into account the national circumstances. The directives provide more general guidance, such as the obligation not to hinder small producers (including energy communities) from entering the energy market and to ensure equal treatment for all. National legislation should provide targeted measures and tools in sufficient detail to enforce these obligations.

Policy recommendation 2: Initiate on a national level a critical debate about the requirements on the national, regional, and local grids of a decentralised energy system.

Policy recommendation 3: Analyse and define the role of municipalities as a tool to develop and implement CE projects, and at the municipal level, promote collaboration between cities and community energy projects by:

- including community ownership targets in long-term climate and energy strategies
- steering new neighbourhood developments towards community energy
- creating a dedicated body to support citizens' projects (e.g. one-stop-shops or information hubs)

Policy recommendation 4: introducing the following changes in the tax regulation to enhance and enable CE development:

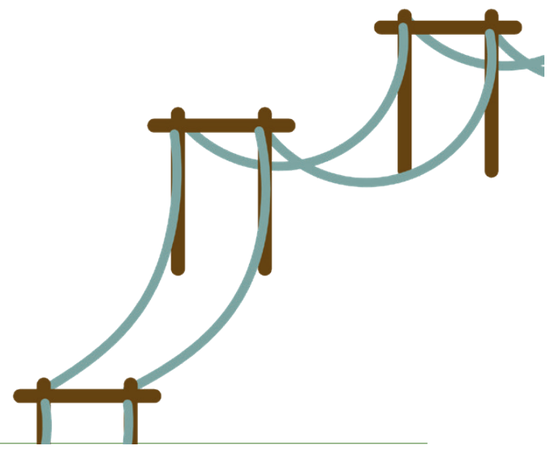
- Link carbon emissions directly to taxes and tariffs at realistic carbon prices. The income from taxes and tariffs should be divided according to the principles in the model of "Carbon Fee and dividend"[23]
- Introduce a tax reduction for co-owned energy production, RE tax reduction, VAT tax reduction (for a certain period, first 3 to 5 years)
- Remove tax for self-produced electricity consumed within own property (today there is a limit in amount - micro production)

Policy recommendation 5: Introduce or strengthen regulations enabling the development of prosumer potential for entities that do not have access to sufficient space to build their own RES source (like residents of multi-apartment buildings/housing estates with insufficient roof surface), such as metering regulations allowing residents of multi-apartment buildings to benefit from the solar PV self-consumption in their apartments.

Policy recommendation 6: Changes in the grid regulation:

- Make it possible to share electricity between adjacent properties for all.
- Grid fee reduction.
- Remove the requirement to be a net-consumer on yearly basis for micro producers.

Policy recommendation 7: Create national guidance on safety regulations for solar-PV targeting emergency services.



23 *https://citizensclimatelobby.org/basics-carbon-fee-dividend/*

Policy recommendation 8: Separate tendering for CE projects.

Policy recommendation 9: Keep legal procedures as simple as possible. In some countries, the complexity of the procedures complicates the implementation of the CE projects. Current frameworkare not inviting citizens to participate.

Policy recommendation 10: Certain shares of new local RE projects could be reserved for local ownership.

2 — *Eliminate regulatory barriers*

Authorities need to remove regulatory barriers, such as the levying of electricity taxes and grid fees on the self-consumption of solar power within an apartment building. Permitting and grid connection procedures can also be streamlined, including setting targets or limits for process lengths, and establishing a one-stop-shop for permitting projects.

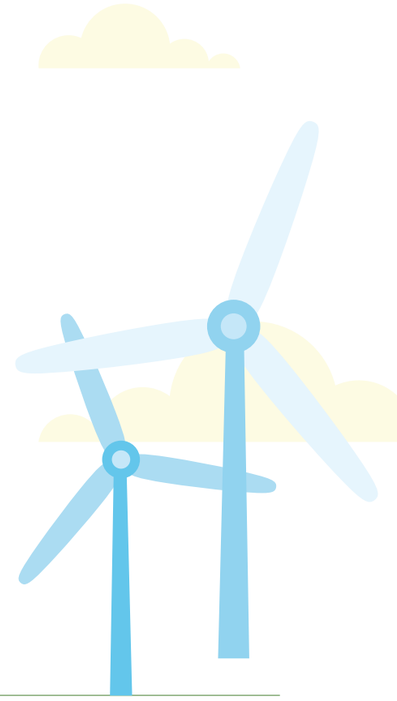
3 — *Establish funding opportunities for CE projects*

Dedicated schemes could be set up to provide early-stage funding for feasibility studies and technical expert services, for example. CE projects should be guaranteed access to affordable financing, including loan guarantees, risk-sharing tools or low-interest loans. One option is a fund guaranteed by the state, with proceeds feeding back to finance new projects.

Funding is an important and often problematic issue in all countries. The Co2mmunity project has clearly found the need for more solid financial support. Implementing the CE project requires financial resources right from the planning and setup phase, and local communities usually do not have spare finances. In some countries, different investment grants are in place, mainly for enterprises, municipalities, or farmers, but not for communities or cooperatives. Bank loans generally have a high interest rate and do not encourage or motivate communities to carry out CE projects. Developing sustainable, long-term, and stable financial instruments and financing schemes is a key issue for the further development of community energy.

Policy recommendation 1: Provide early-stage funding. National or regional governments should introduce dedicated finance support schemes for energy communities to help them during the planning and project setup phases. Early-stage funding is essential for conducting feasibility studies and accessing specialist consultancy services that can transform an idea into an easy-to-implement project plan.

Policy recommendation 2: Provide long-term and low-interest investment funding schemes. According to long-term experience from forerunner countries, CE-dedicated financing schemes are crucial.



4 — *Participation and acceptance*

CE leaders have better chances to succeed in local RE projects if they involve the local people in their initiatives. Therefore, engaging early on with the local community is a way to reduce opposition and increase transparency and trust towards an initiative or technology.

Collective decision making and sharing of benefits are also important success factors. Local acceptance improves when benefits are shared with the members of the local community.

The study also revealed that CE has numerous benefits, which include energy cost reductions, financial gains from the energy sales and renting of land, creation of jobs in the construction and maintenance of RE infrastructures, and tax income for municipalities.

Despite the benefits provided by CE projects, they continue to face many challenges. Policy, regulatory, cultural, and financial barriers continue to hinder the diffusion of CE initiatives. A cultural change is also needed in the mindset of policymakers. CE is an expression of a different set of values and needs. The same policies employed to promote commercial projects might not work for RE projects set up by local communities. Moreover, policymakers need to realise that without the participation of citizens in the energy transition - for example through RE investments - climate change mitigation goals may not be achieved due to local resistance to RE projects.

5 — *Promote community energy*

The development of community energy requires widespread support and awareness at various decision-making levels, as well as in society. The promotion of CE is especially crucial on the eastern coast of the Baltic Sea where the awareness is relatively low. Awareness of society and institutions about the essence, opportunities and benefits of CE is a prerequisite for the development of community energy. This applies to society in general, to ordinary citizens as well as to municipalities and state institutions.

Policy recommendation 1: Systematically disseminate knowledge and integrate community energy into relevant documents; cooperation with intermediate bodies (like energy agencies etc); attendance at information seminars, fostering RENCOPs.

Policy recommendation 2: Involve citizen society representatives (citizen associations, relevant NGOs etc) in the energy policy-making process. Currently the process is participated in and focused more on the big energy industry and their interests.

Policy recommendation 3: Strengthen the role of citizens: Increase the knowledge for citizens in how to get involved with CE projects, for example by disseminating the guidelines on how to do it.

Policy recommendation 4: Inform across society to raise general awareness about decentralised energy systems and CE opportunities and benefits

Establish advice and technical support services for CE projects

Independent and professional advice about organising CE as a legal body and technical advice for CE initiatives is needed.

Policy recommendation 1: Establish national/regional/municipal level info points or one-stop-shops for CE to gather information about legislation and juridically-correct ways to establish and operate CE organisations – simple, understandable information on how to create a CE organisation.

Policy recommendation 2: Establish promotional training and independent high-quality technical information about RE technology suitable for CE. Create a pool of CE technical advisors to supply CE initiators with independent technical information suitable for CE projects

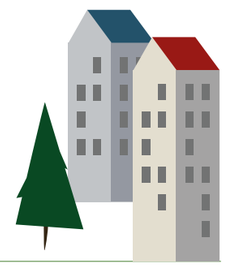
Policy recommendation 3: 1 RENCOP manager should be employed per approximately 20,000 inhabitants in a suitable organisation (depending on the system: in the existing energy agency, respective department in the municipality etc.)

Policy recommendation 4: Enable special pilots: “sandbox cases” – special pilot projects for testing and experimenting. This allows testing and analysing of how an incentive measure works or the effect of the ‘removal of an obstacle.

6 — *Implementing the directives*

The Renewable and Electrical directives shall be incorporated in EU member states’ legislation before the end of 2021. Since the directives highlight CE as a core component in the energy transition, it is important that this is reflected in national regulations. CE must build on the principles of being open, voluntary, and autonomous. The purpose shall be broader than economic, and address socioeconomic needs rather than generate profit. This topic has been studied in more detail in the REScoop PLUS project. From the PLUS project’s main recommendations when implementing the directives into national legislation, the following parts are highlighted by Co2mmunity:

- It is important to define REC and CEC according to the directives’ intentions to enable RE investments
- Prioritise the reduction and simplification of administrative procedures.
- Policies and incentives shall be developed to mitigate energy poverty and support low income households in order to be included in energy communities.
- Frameworks shall be developed to value other energy services from CECs and RECs, such as flexibility to reduce DSO grid investments.
- The DSOs shall be transparent in their grid development plans and include the potential of CECs and RECs in a cost-efficient way.



Good policy examples from BSR countries

Learning from others is a way to avoid mistakes, and save money and time to get inspiration. There are more examples than these chosen from the Co2mmunity White paper output.

Case 1 - CO2 tax system in Sweden. The Swedish CO2 tax was first introduced in 1991. This has mainly made biofuels from forestry competitive compared to fossil oil, coal and gas. It has resulted in a situation today where almost all heat plants are fuelled with biofuels. The tax has been adjusted over the years and is now approximately 10€cents/kg CO2, which is the highest in the world. Not all CO2 emissions are taxed; exceptions are given for biofuels such as forest waste and biogas from food waste. A recent change in the system puts full tax on CO2 emissions from waste incineration.

Case 2 – in Finland, legislative changes are underway to make it easier for residents to utilise solar electricity produced and consumed on the property. Currently, the discussion around CE revolves around two aspects: energy self-consumption in apartment buildings and the enabling of virtual energy communities via aggregators. Energy self-consumption in apartment buildings is currently limited to the energy needs of the common parts of the buildings (e.g. staircase, elevators, laundry rooms, etc.). Under the current regulation, apartment owners who want to utilise solar PV production for their own use need to feed their electricity into the grid and pay transfer fees and taxes, which reduces the economic viability of solar energy communities. Moreover, prosumers need to pay VAT on the generated production. The regulatory changes currently being discussed will remove fees and allow grid operators to offer (at a small fee) a net metering system to automatically balance the amount of energy produced and bought from the grid. Moreover, the tax authority recently ruled that the self-consumption of solar electricity within the property of housing companies should be exempt from VAT. The implementation of the new regulatory framework is expected to take place in 2021-22.

Case 3 – Poland. The energy accounting system. Renewable energy prosumers and energy cooperatives have the possibility of net metering the electricity fed into the power distribution network against the amount of electricity taken from this network for consumption for their own needs.

In the case of a renewable energy prosumer producing electricity in a micro-installation (<50kW installed power) the following apply:

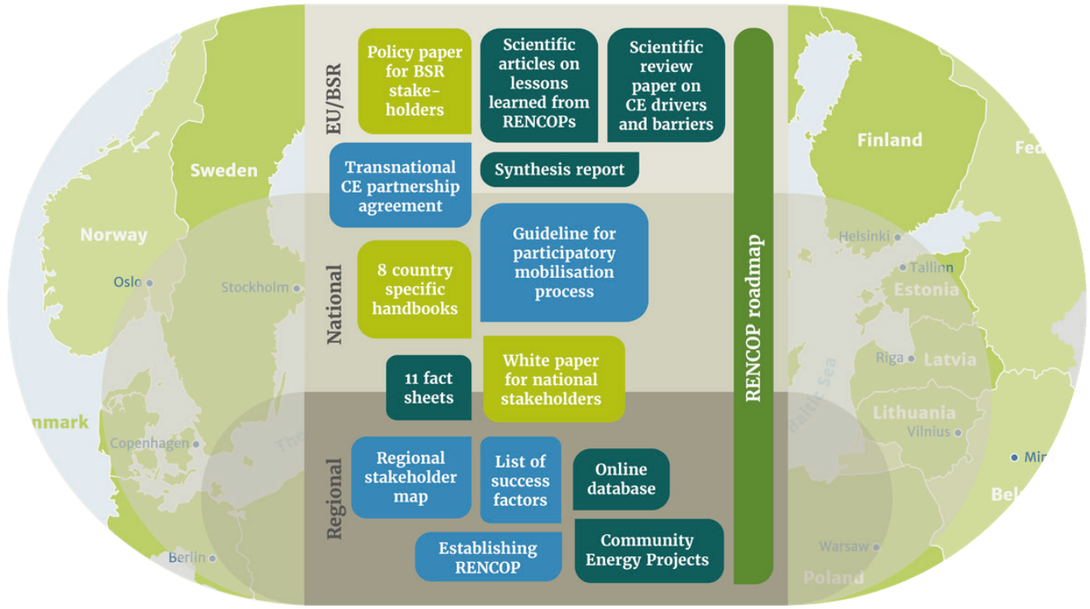
1. For a total installed power < 10 kW, 80% of the electricity fed into the power distribution network can be taken back for free.
2. For a total installed electrical capacity between 10 and 50 kW, 70% of the electricity fed into the power distribution network can be taken back for free.
3. For an energy cooperative the corresponding ratio is 60%

Additionally, the prosumer and the energy cooperative do not pay certain charges related to energy billing and distribution.

Municipality owned CHP plant. Photo: Växjö Energi AB

Appendix - Summary of project outputs

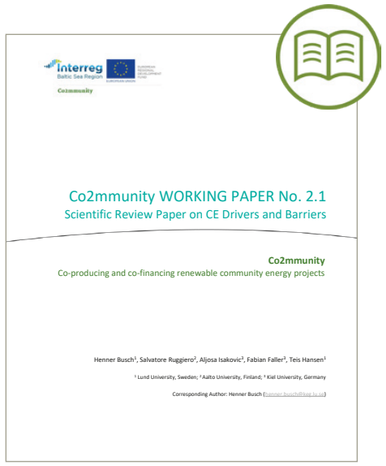
Several interesting reports and data have been developed from the project and are available on the project's website: http://co2mmunity.eu/outputs/download-area



Documents can be read and downloaded from:
http://co2mmunity.eu/outputs/download-area

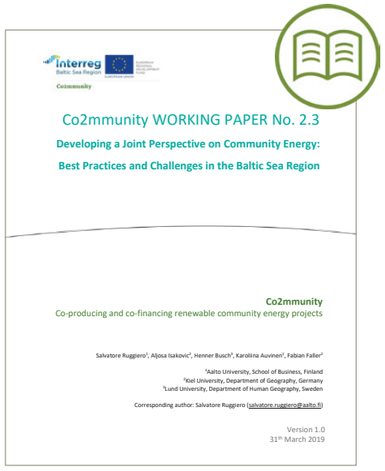
Scientific review paper on CE Drivers and Barriers (O2.1)

This working paper summarises the literature review conducted under work package (WP)2.1 in the Co2mmunity project. The main aim of the report is to inform the project partners (PP) about the latest research in the field of community energy. Special focus is on identifying drivers and barriers for community energy (CE) projects and shedding light on the specific conditions in the Baltic Sea Region, where the Co2mmunity project is located.



Best practice and challenges in the Baltic Sea Region (O2.3)

The aim of this working paper was to study CE in the Baltic Sea Region (BSR) and to thus identify the main drivers, barriers, benefits, and best practices in CE development. To this end, 11 CE case studies were conducted in 7 countries. The results show that in Denmark, Finland, Germany, and Sweden, sociocultural factors and the political economy structure of these countries are more conducive to CE development than in Estonia, Latvia, Lithuania, and Poland. In particular, Germany and Denmark have had the most favourable contextual conditions and policies.



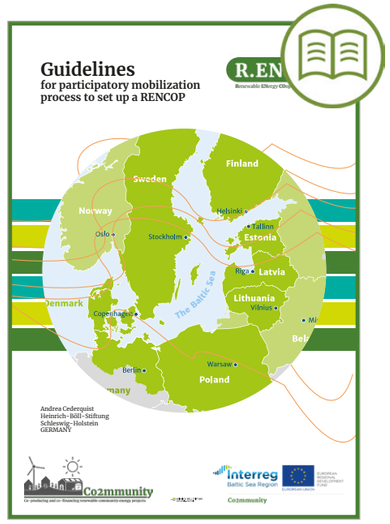
Involving stakeholders in all regions (O3.1)

For this work package, a set of documents has been produced. The aim of the documents is to assist in the setup and running of the RENCOPs. The documents are:

- Guidelines for Establishing and Managing a RENCOP
- Map and Analysis of Stakeholders of Regional RENCOPs (working paper) and Stakeholder Mapping Tool (Excel sheet)
- Success Factors

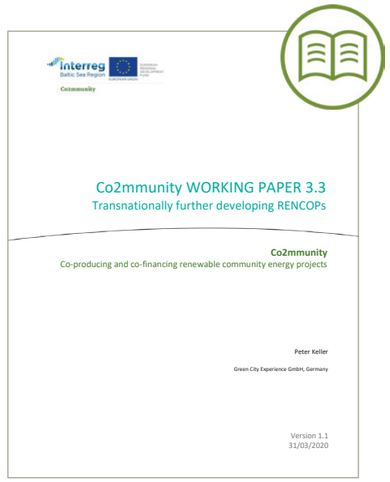
Guidelines for a participatory mobilisation process to set up a RENCOP (O3.2)

These guidelines are a description of key steps that we suggest a person/organisation or institutions should take to develop a strategy for building a mobilisation process to initiate and establish a RENCOP. Although it will be context specific, it is thought that following these guidelines will help the reader to develop a conscious strategy. In practice, the result of these guidelines will be an internal document containing information to help structure a discussion on your RENCOP, out of which external communication material can be developed.



Working paper on transnationality (O3.3)

The main aim of the report is to give an overview about the work on transnationally further developing RENCOPs, with the goal to carve out tandem systems between frontrunners and followers, forming transnational CE partner agreements. Special focus is on having a look at the specific challenges and conditions in the partner regions (SWOT analysis) as a base to identify suitable partners for community energy (CE) projects and develop suitable tandems.

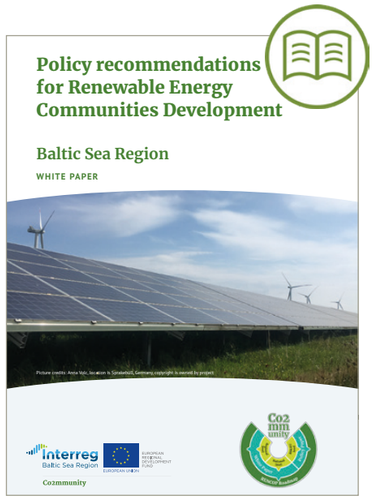


Handbooks (O4.1)

Specific CE handbooks for each partner region written in respective languages have been developed based on a common structure. Specifics and good examples for each region are described, together with a methodology for setting up a RENCOP and mistakes to avoid in the work doing so.

White paper for public stakeholders (O4.2)

This document contains policy recommendations for mainly national level policy makers in the Baltic Sea Region (BSR), to stimulate, support and promote community energy projects (CE). The document focuses on the existing policy framework for community energy and lists the main barriers and drivers that are currently affecting the development of community energy in the BSR. The final chapter provides policy recommendations to alleviate existing barriers and to make the policy framework more favourable to community energy projects.



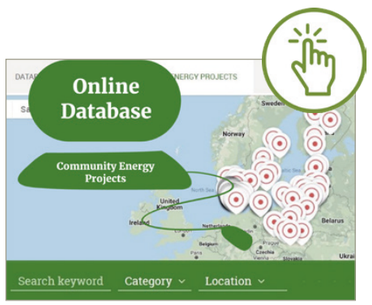
Policy paper with recommendations (O4.3)

Community energy – people coming together to build clean energy projects – can strengthen communities and enable the energy transition. However, many barriers continue to hold the development back. A set of policy recommendations at different levels can accelerate progress – and unleash the potential of community energy in the Baltic Sea Region.

The target groups are national and transnational decision makers responsible for energy issues in the BSR, such as the Council of the Baltic Sea, the Baltic Sea Region Energy Cooperation intergovernmental network (BASREC), and the Baltic Development Forum, as well as national political decision makers. The recommendations are collected through a consultation process with relevant BSR actors.

Database with examples of CE projects in the BSR (O2.2)

An online tool to find CE projects wherever you live around the Baltic Sea has been developed by Co2mmunity. It describes projects and CE actors around the BSR, and helps to initiate and facilitate new CE projects in identifying the right people with the right competences. All types of renewable energy sources are represented and various types of organisational setups are described.



Community energy cases (O2.3)

The Co2mmunity partners have investigated several existing community energy projects. In doing so, they did not only look for the best working examples, but also for failures and problems. The examples are described in detail, and printable fact sheets can be downloaded.

Ærø, Denmark Community-owned wind farm on the island of Ærø.
Marstal/Ærø, Denmark Marstal Fjernvarme – a solar district heating plant on the island of Ærø.
Tallin, Estonia A housing association makes renovates for energy efficiency with a solar PV.
Värska, Estonia Kagu commercial association pioneers community solar in the Seto region
Alpua, Finland Pioneers in energy community through the installation of a CHP plant.
Helsinki, Finland A housing company tests a new community solar farm with a special IT service.
Sprakebüll, Germany A pioneering energy community in North Frisia.
Wiemersdorf, Germany A successful community wind project: The Wiemersdorf Wind Farm.
Smalininkai, Lithuania Unsuccessful community wind project in Lithuania
Szczecin, Poland A pioneer in community solar: The Pszczelna Street housing community
Kalmar, Sweden Törneby Solpark & Nöbble Solpark – solar PV from a local source in Kalmar.


Ærø


Marstal/Ærø


Tallin


Värska


Alpua


Helsinki


Sprakebüll


Wiemersdorf

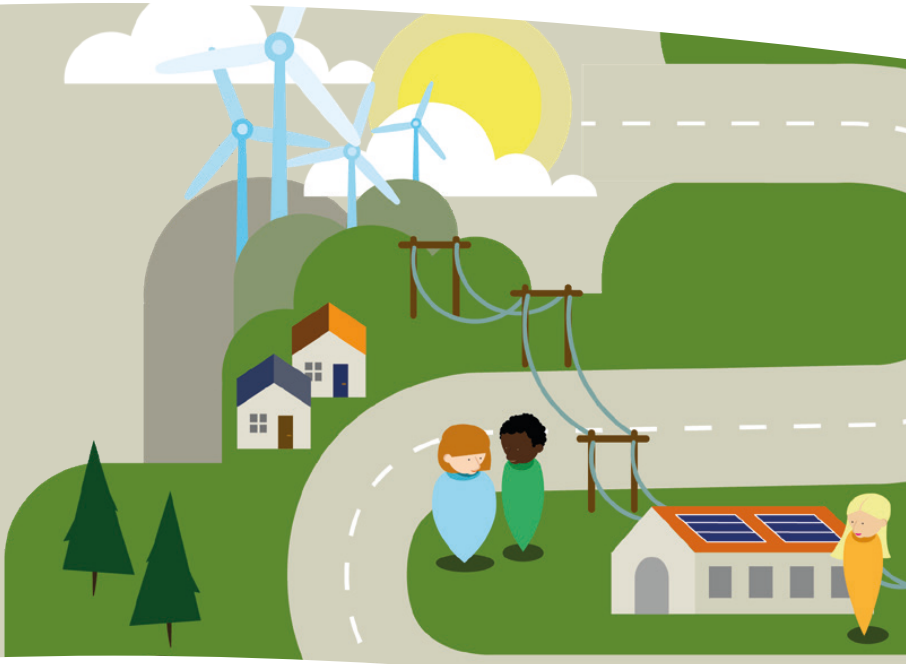

Smalininkai


Szczecin


Kalmar

Co2mmunity

Co-producing and co-financing renewable community energy projects



Co2mmunity Roadmap 3.4

http://co2mmunity.eu/

Publisher Co2mmunity Project, 2020

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GREEN CITY EXPERIENCE

energikontor sydost

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