

Renewable-Energy Cooperatives

Cases from Denmark, Germany, Poland & Turkey



INFORSE-EUROPE
International Network for Sustainable Energy

TRAYA
CEVRE
STRATA, CEVRE, BERKEGİ



Renewable-Energy Cooperatives Cases from Denmark, Germany, Poland & Turkey

Publisher: Published by INFORSE-Europe (Denmark) with contribution from WECF (Germany), Troya Environment Association (Turkey) and Social Ecological Institute (Poland).

Date: July 2022., 59 pages.

Editors: *Danish cases:* INFORSE-Europe: Judit Szoleczky, Bettina Wolgast, Henning Bo Madsen, Gunnar Boye Olesen.

German cases: WECF: Marcela Norena

Polish cases: SIE: Elzbieta Priwiezienczew

Turkish cases: Troya Çevre: Melis Yılmaz, Oral Kaya

Project

The publication is made in the framework of the project “The Power of Community Energy”, which is financially supported by the Erasmus Plus Programme of the European Union. Read more:

https://www.inforse.org/europe/POWER_CE.htm

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CONTACT INFORMATION

INFORSE-Europe

Klosterport 4 building F
DK-8000, Aarhus C,
Denmark

www.inforse.org/europe

WECF Germany e.V.

Sankt Jakobsplatz 10 D
80331 Munich, Germany

www.wecf.eu

Troya Çevre (Troya Environment Association)

Yali Caddesi 59/7
Çanakkale, Turkey

www.troyacevre.org

SIE-Spółeczny Instytut Ekologiczny (Social Ecologi- cal Institute)

Ul. Czeladnicza 17/1,
04-743 Warsaw, Poland

www.sie.org.pl

Online: www.inforse.org/europe/pdfs/Pub_Renewable_Energy_Cooperatives_Cases_from_Denmark_Germany_Poland_Turkey_2022.pdf



Photo: Project team and project seminar participants in front of a solar PV test station at the INFORSE member, Nordisk Folkecenter for Renewable energy in Denmark. Photos on the frontpage are from the Cases in the Publication.



INFORSE-EUROPE
International Network for Sustainable Energy

**TROYA
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TROYA ÇEVRE DERNEĞİ



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Introduction

This Publication is a result of an NGO cooperation project supported by Erasmus+ and aims to provide insights about the work, scope and experiences of energy cooperatives in the partner countries. The publication includes 22 renewable-energy cooperatives, 8 in Denmark, 8 in Germany, 3 in Poland, and 3 in Turkey. The cases are including technologies from solar heating, solar power, wind, and biomass for heating and heat pumps.

The size of cooperatives varies from small with a couple of members to very big ones like Middelgrunden wind cooperative in Denmark with almost 8.000 members.

The collection of the cases is a result of literature research, websites and interviews with people representing the existing cooperatives. Denmark and Germany have a large number of energy communities, and, after an initial mapping, we selected some representative examples that show the diversity and great scope of these kind of initiatives. In Poland and Turkey, the cooperatives are still struggling with the legislation, and most cooperatives are in starting phase. Most information is only available in national languages. We translated all to English, and we are proud presenting a hard-to-find information. We hope that the readers find inspirations from many of the cases to establish a renewable energy cooperative.

In the publication we tried to include information on the cooperatives, so people can be inspired and learn more on the installations and how it was organized. The information includes on each cooperatives: name, place, date of establishment, cost of investment, amount of subsidies, pay-back period, expected lifetime, method of organization, who takes care of the operation and maintenance, whether they received help from different kind of actors, benefits and lessons learned.

We believe that this information is valuable to citizens who consider organizing themselves into Renewable-Energy Cooperatives. To inspire people broadly, we also collected different examples on how the cooperatives benefit both the individual households and the communities, and which motives are the driving forces to start these cooperatives. We hope that this publication will make the process of creating energy cooperative more transparent and easier and that the many benefits will become evident.

The project gave the partners the opportunity to visit each other's countries and see some of the renewable energy installations and cooperatives. We learned about legislative, regulatory and technical challenges during these trips and conferences. We visited Denmark, Poland and Turkey. Unfortunately, a visit to Germany was not possible due to Covid-19 pandemic. Nevertheless, the online webinars organized by WECF allowed an open exchange. We managed to postpone the end of the Project, and all in all, we managed to exchange plenty of valuable experiences and learned a lot. We also got to know each other, developed friendships beyond borders, and made foundation of possible new cooperation.

This publication and the Guideline on how to establish cooperatives contribute with the newest knowledge to inspire people to establish more community driven energy projects and positive changes in legislation.

As Part of the Project, we published 5 newsletters, which also can give insight of the knowledge we shared during the project. Read more on the websites of the partners and at INFORSE's website: https://www.inforse.org/europe/POWER_CE.htm



Photo: Project team and project seminar participants visiting community owned solar thermal heating system providing hot water to the community in Denmark.

The collection of the cases has been done by Partner organizations, which we introduce in this section. The text has been partly shared in the Projects' newsletter, but it gives a good overview in this introduction.

Welcome by the Partners



Denmark – INFORSE-Europe

International Network For Sustainable Energy-Europe (INFORSE-Europe) is a network of independent non-profit non-governmental organizations. It was founded in 1994 after INFORSE, a global network, was formed at the Earth Summit in Rio in 1992. The aim is to work for sustainable energy solutions to protect the environment, and to reduce poverty. INFORSE-Europe has participated on several UN Sustainability and Climate Conferences, where lobby together with other global and national NGOs. INFORSE-Europe cooperates with European NGOs on EU Ecodesign, Coolproducts, community power, lifestyle, and EU Sustainable Energy Weeks. INFORSE-Europe joined Vision Statement on Community Power in 2019 together

with 11 other networks and organisations including REScoop.eu, FoE Europe, ICLEI, and EREF.

INFORSE-Europe has 85 members from 35 European countries. INFORSE-Europe and its Danish members have a long experience in citizen engagement in renewable energy and energy efficiency, and also have a keen interest in further developing the local engagement in citizens' energy. The Danish members have held a key role in the energy transformation in Denmark and promotion of community energy. In Denmark citizen's engagement in energy have been an important driver for introduction of renewable energy from windpower cooperatives for local district heating and for individual solar PV installations.

INFORSE-Europe is a member of the European Community Power Coalition, and CAN-Europe. INFORSE-Europe and its members are the catalyst for community energy projects, with experience in supporting the development of sustainable energy in local communities. Denmark has several good examples on how to conduct an energy transformation in a short time, including with help from the country's citizens. It is thanks to people's environmental awareness and determination,

commitment and joint action that Denmark will soon become a country independent of fossil fuels in electricity and heating. One example is the municipality of Ringkøbing, which will become energy self-sufficient this year. It is possible thanks to many wind turbines including three at Hvide Sande Nordhavn – its owner is the local community, and the turbines provide about 45,000 MWh of electricity per year. Today, Denmark has over 250 wind farms, 110 solar farms, over 300 local heating networks belonging to energy cooperatives, and more than 20 eco-communities (Eco-villages), many of which have their own heating systems.

From INFORSE-Europe, participants in the project have been: Judit Szoleczky, Gunnar Boye Olesen, Bettina Wolgast, Henning Bo Madsen, Kirsten Andersen, Jane Kruse, and Tonny Brink



Photo: Project team and project seminar participants visiting community owned windmills at Hvide Sande in Denmark.



Poland – SIE & Polish Green Network

The Social Ecological Institute has been coordinator of “The Power of Community Energy” Project. The organization has 30 years of expertise in inspiring and supporting grassroots socio-public partnerships working for sustainable development. SIE is the co-founders and member of the Polish Green Network, a nationwide network of environmental organizations from the largest Polish cities.

The goal of Polish Green Network is to develop in harmony with nature, with civic support for sustainable development, by creating mechanisms for social control over the spending of public funds, increasing consumer impact on product quality and global corporation policy, as well as supporting the sustainable development of countries of the Global South and civil society in Eastern Europe. One of the projects implemented by Polish Green Network is the Climate Program. The organizations associated in the network initiated the “More than energy” movement – a broad social coalition that works to develop community energy. The coalition connects local governments, institutions, NGOs and private individuals convinced that Poland needs to improve energy efficiency and the development of distributed energy based on renewable sources. The creation of the “More than energy” movement is a response to the public support enjoyed by solutions related to energy efficiency and renewable energy sources. Opinion polls show that over 88 percent of Poles would like an increase of investment in renewable energy. By participating in the “More than energy” movement, anyone interested in energy cooperatives can join activities aimed at convincing politicians to create solutions that support its development. The movement is already supported by over 150,000 people in Poland.

From SEI & Polish Green Network, participants in the project have been: Elzbieta Priwieziencew (project coordinator), Jolanta Zientek-Varga, Ewa Ligeza-Sieniarska, Zuzana Sasiak, Jan Ruszkowski



Photo: Project team visiting SEI in Poland



Germany – WECF

Women Engage for Common Future is a non-governmental organization founded in 1994 after the Earth Summit in Rio de Janeiro in 1992. WECF Germany is part of the international WECF network that consists of over 150 women's and civil society organizations implementing projects in 50 countries with dedication to a gender just and healthy planet for all. The German team has extensive experience in management, consulting and policy support, working towards transformative gender equality in interconnection with climate justice, sustainable energy, less toxic waste, safe water & sanitation for all.

WECF participates in the negotiations of the UN-FCCC, the Kyoto Protocol, UNEP GC and CSD. It is a co-founder and member of the Women and Gender Constituency, closely cooperates with CAN-Europe and EEB (European Environment Office), CAN EECCA (Eastern Europe, Caucasus and Central Asia) as well as with national and local NGOs and communities.

WECF ensures that the voices of women and marginalized groups are heard at the policy table and combines this with local actions, such as needs assessments and trainings for renewable energy as well as piloting the construction and local management of decentralized technical solutions, e.g. PV, biogas and briquettes in Uganda and Ethiopia. In Eastern Europe, WECF have worked together with local partners to develop solar thermal, insulation technologies and photovoltaic concepts with a focus on rural women. Energy communities and energy cooperatives are a feasible instrument for production and consumption of renewable energy in rural regions. In Georgia, WECF established 5 energy cooperatives to locally distribute solar water heaters. In those cooperatives, 40% of the members are female. In WECF projects, great importance is attached to maintaining gender parities – the goal is to achieve gender balance in decision making positions and in management; to strengthen the role of women, increase their knowledge and skills in managing and influencing decisions related to climate and environmental protection.

From WECF, participants have been in the project were: Katharina Habersbrunner (project coordinator) Marcela Noreña, Johannes Baumann, Annemarie Mohr, Marilys Louvet, and Gina Cortes.



Turkey – TROYA

The TROYA Environmental Association was established in 2009 primarily to strengthen local communities in climate protection activities. The organization is based in Çanak-kale, situated at the Western coast of Turkey. TROYA has been organizing international conferences on energy cooperatives for four years, with guests and experts from all over Europe. Up to date, around 1,000 people from 24 countries have participated in them and attended 56 expert lectures.

Most importantly, half of the participants were women. In May 2017, eight people, members of TROYA, founded the first energy cooperative in Turkey and is managed by three women. This pioneering action paved the way for further cooperatives – in two years ten cooperatives were established in different regions of Turkey. The TROYA team has developed a handbook on energy cooperatives. It explains in eleven points how to set up an energy cooperative; what are the environmental and climate benefits of energy transformation; what profit members of the cooperative can count on by producing electricity and selling surpluses of generated energy. The association also advises groups of citizens and municipalities interested in establishing a cooperative; organizes workshops throughout Turkey, to which it also invites representatives of local and central administration, including representatives of ministries. TROYA also works with scientific institutes, e.g., Bilgi University. Every support voice counts, because the climate requires fast and specific action. Time is running out.

From TROYA participants in the project have been: Oral Kaya (project coordinator), Nadide Su Dağlı, Melis Yılmaz, Çağrı Kiray, and Derya Nazan Ünverir.



Photo: Project team visiting Troya in Turkey.

District Heating Plant Nordby-Mårup (Fjernvarmeværk Nordby-Mårup), Denmark



| | |
|--|---|
| Name (English) | District heating plant Nordby-Mårup |
| Country | Denmark |
| Energy source (wind/solar/biomass/biogas/heatpump) | Solar, wood chips, straw |
| Energy output (El/heat/Co-gen) | Heat |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Nordby |
| Zip Code | 8305 |
| Address | Østermarken 2 |
| Website 1 | https://gronvarme.samsoe.dk |
| Contact Person (s) | Chairman Michael Kristensen |
| Email 1 | gronvarme@samsoe.dk |
| DATABASES | |
| RESCOOP | NO |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | YES |
| Description Summary | <p>In 1998, a small group of local citizens started a feasibility study of a new district heating system based on wood chips and solar collectors. A heating cooperative was formed, the proposal was adopted, the plants were constructed, and from November 2001, they provided heat to 178 consumers.</p> <p>In 2019, the district heating company became part of a larger non-profit heating company owned by the municipality, but the heat supply is still local.</p> |
| Size (e.g. # households) | 2500 m2 solar heat collectors, a 900 kW boiler, and a heat storage tank |
| Energy production (per year) | 1.034.000 kWh/y 20% from solar, 80% from wood chips |

| | |
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| Date of installation | 2001-2002 |
| Organisation time period | 1998-2001 |
| Installation time period | 2001-2002 |
| Expected lifetime | 30 years for the boiler plant, and 60 years for the piping |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | The inhabitants had already a share of the power supply co-operative NRGi when the local working group started the pre-study. The group investigated if there was support for the new technology, and when they found enough support, the project was started, and the inhabitants could sign contracts to connect their houses to district heating. |
| COOP citizen members (nr) | 185 consumers |
| Subsidy/Grant (EU, fund, municipal) | The Danish Energy Agency granted 1,2 Mio Euro (9 Mio DKK) for the project. |
| Loan (bank/crowd/municipal) | A loan was obtained to pay for most of the investments costs, the loan was made with a municipal guarantee as collateral. The guarantee made it possible to get a low-interest loan. |
| Benefits/motives (income/climate/savings/env.) | 1) The main argument is the improved environmental considerations, replacing fossil fuel (oil) import with local resources (the wood chips are made on the island) 2) A more efficient operation than individual heat supply 3) A reduction in the heating bill, replacing oil or electric heating with district heating |
| Additional benefits (awards/ecotourism/education facility) | A reduction in the cost of transportation of fuel to the island, which is quite expensive |
| Organisation methods | Co-operative |
| Help from others | The electric supply co-operative NRGi implemented the project after a working group in 1998 started the pre-study. The energy island Samsø project helped the working group |
| Operation/Maintenance (who) | Grøn Varme Samsø (since 2019) |
| Cost of investment | 2.757.947 Euros |
| Amount of subsidies/grant | 1,2 mio Euros |
| Economy (Pay back period) | 23 years |
| Running costs per year | 163.459 Euros including fuel, pay-back of loan |
| Consumption of wood chips/yr | 350 t |
| Sources | |
| | https://docplayer.dk/2256618-Projektsammendrag-nordby-maarup-samsoe-danmark.html |
| | https://energiakademiet.dk/wp-content/uploads/2018/08/1997_forste_energiplan_for_samso.pdf |

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|-----------------|---|
| | https://energiakademiet.dk/omstilling/samsoe-1-0-selvforsynende-med-vedvarende-energi/ |
| | https://gronvarme.samsoe.dk/kontakt https://www.samsoe.dk/borger/energi-og-klima/energi-oen |
| | https://www.danskfjernvarme.dk/aktuelt/nyheder/arkiv/2019/191211-samsø-hjemtager-to-fjernvarmeværker |
| <i>Pictures</i> | https://arkiv.energiakademiet.dk/en/presse/nggallery/72-dpi/afa-web-erik-paasch/page/2 Source: Erik Paasch Jensen og Energiakademiet (Energy Academy) |

Egebjerg local heating plant (Egebjerg Nærværme), Denmark

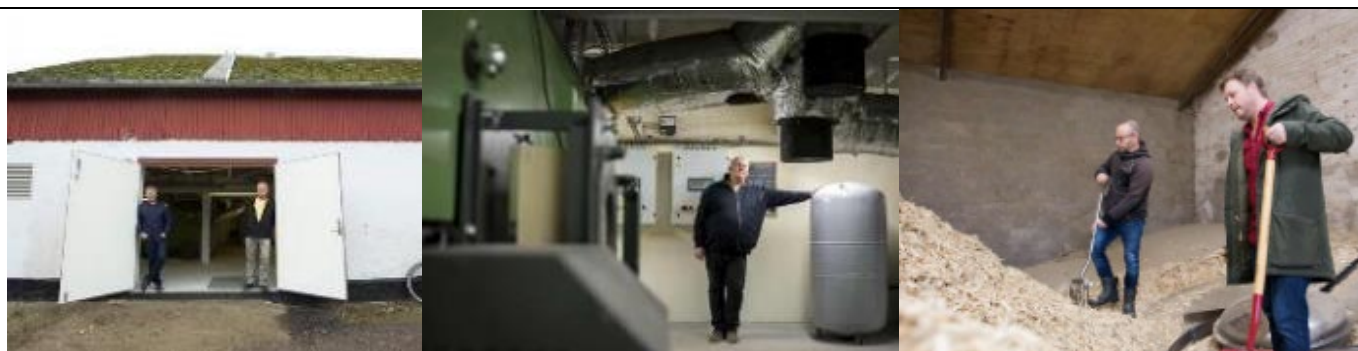


| | |
|--|--|
| Name (English) | Egebjerg local heating plant |
| Country | Denmark |
| Energy source (wind/solar/biomass/biogas/heatpump) | Locally produced wood chips |
| Energy output (El/heat/Cogen) | Renewable heat |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Egebjerg |
| Zip Code | 4500 Nykjøbing Sj |
| Adress | Egebjerg Hovedgade 23 |
| Website 1 | www.egebjergonline.com/naervarme |
| Website 2 | https://www.odsherredforsyning.dk |
| Contact Person (s) | Morten Hylleberg (former chair person) |
| Email 1 | mortenhylleberg72@gmail.com |
| Email 2 | After the take over: info@odsherredforsyning.dk |
| Phone | 70120049 |
| DATABASES | |
| RESCOOP | NO |

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| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | YES |
| Description Summary | The villagers of Egebjerg have together established a small district heating system based on woodchips. In the end of 2021, it was decided that a takeover should take place by the local municipality non-profit utilities. Now the heating system is part of the municipal non-profit district heat supply company. |
| Size (e.g. # households) | 72 houses which is around 100 average households (consumption of 15 MWh/y). It correspond to half of the village. |
| Energy production (per year) | 1500 MWh/y |
| CO2 savings (t/yr) | No specific details, but 60 oil-fired boiler were replaced |
| Organisation time period | 2017-2018 |
| Installation time period | Spring 2018 - August 2018 |
| Expected lifetime | The heating plant: 30 years. The boilers: 15 years. The heating network: 40-50 (by far the most expensive investment). The heat exchanger in the houses: 10-15 years |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | Former limited liability company with local participation through buying shares |
| COOP citizen members (nr) | 67 members |
| COOP members, other (type, nr) | Among the 72 shareholders, there were several other members: The local school, the local nursing home, the village hall, an organization, and a minor factory. So there are 5 bigger consumers and the rest are smaller consumers, such as detached houses. |
| Subsidy/Grant (EU, fund, municipal) | From a non-profit organization/partnership consisting of regions, municipalities, companies and universities (Gate 21) |
| Loan (bank/crowd/municipal) | A municipal guarantee as collateral for costs of construction at 1.594.332 Euros. This enables to use of low-interest loans. 7.313 Euros were raised by the consumers of Egebjerg |
| Benefits/motives (income/climate/savings/env.) | <ol style="list-style-type: none"> 1) Climate and environmental benefits 2) Energy and cost savings (cheaper heat and no need for maintenance of the oil-fired boilers in the houses) 3) Having the municipal guarantee as collateral, makes it possible for every citizens to participate regardless of financial conditions. Furthermore, it sends a message, that the Municipality believes in the project and supports it 4) The project creates a much greater cohesion, solidarity and general teamwork in the village, also in other areas than the heating and energy 5) The wood chips supply is from local forests |

| | |
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| | 6) No need for having a big oil-fired boiler in the house which takes up a lot of room and can be quite noisy |
| Additional benefits (awards/eco-tourism/education facility) | Fjernvarmens Information fonds grant (District heating information Fund) |
| Barriers (changing regulation etc) | 1) A general opposition to change. This is the most crucial part, since if there is not enough locals who wants to join the heating plant, it is not economical possible to start it. 2) (Fake) stories about expensive heat 3) Not many locals wanted to participate in the running of the heating plant/did not have the time. |
| Organisation methods | The project started as a limited liability company. Before the take-over 8 volunteers used to run the heating plant. Every 8th week they functioned as a watchman and was responsible for the running for that week. Furthermore, there was a board and annual general meetings. It was at the AGM in 2021 it was decided to let the municipal Odsherred Forsyning take over the running of the heating plant. |
| Help from others | Odsherred Municipality. University of Southern Denmark Nykøbing sj. District heating plant |
| Lessons learned | The people in the village need to have a great amount of trust in the leaders of the project (the neighbors in the case) because they do not know exactly what they are going to get (especially regarding the financial costs). However, they do know, what they already have, which is more comfortable to stay with for many people |
| Operation/Maintenance (who) | Until 2022 it was the citizens from Egebjerg |
| Cost of investment | 1.477.498 Euros |
| Amount of subsidies/grant | 7.313 Euros was granted by Gate 21, a non-profit partnership among regions, companies and universities on Sjælland |
| Amount of shareholders | 72 shareholders |
| Economy (Pay back period) | The loan from the municipality are paid back within 30 years |
| Running costs per year | 142.155 Euro (2021), also including fuel costs and loan payback |
| Sources | |
| | https://www.tv2east.dk/gron-omstilling/gron-omstilling-egebjerg-naervarme |
| | Interview with Morten Hylleberg |
| Pictures | https://www.energy-supply.dk/article/view/827893/odsherred_forsyning_overtager_naervarmevaerk_og_gar_straks_efter_flere_forbrugere https://www.energy-supply.dk/article/view/629090/bg_bio-varme_leverer_naervarme_til_olielandsby |

Føns Local Heating Plant (Føns Nærværme), Denmark



| | |
|---|--|
| Name (English) | Føns Local Heating Plant |
| Country | Denmark |
| Energy source (wind/solar/biomass/bio-gas/heatpump) | Wood chips |
| Energy output (El/heat/Co-gen) | Heat |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Føns |
| Zip Code | 5580 |
| Address | Ronæsbrovej 5C. 5580 Nørre Aaby |
| Website 1 | https://foens-naerværme.dk |
| Website 2 | klimalaboratoriet.middelfart.dk/Føns%20Nærværme |
| Contact Person (s) | Ole Back |
| Email 1 | foens-naerværme@outlook.dk |
| Email 2 | ole_back@hotmail.com |
| Phone | +45 5117 4317 (Ole Back) |
| DATABASES | |
| RESCOOP | NO |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | YES |
| Description Summary (3-5 lines) | The village Føns joined together to start their own district heating based on wood chips on a voluntary basis. The district heating replaced oil furnaces in 49 households and on top of that strengthened the community |
| Size (e.g. # households) | 49 |
| Energy production | 400 KW (nominal capacity of boilers, not including heat pumps) |
| CO2 savings (t/yr) | 280 t/y |

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| Date of installation | The construction started in the spring 2015 and the opening was the 1th of October 2015 |
| Organisation time period | 2012-2015 |
| Installation time period | 22 months |
| Expected lifetime | The boilers: 15 years The heating network: 25-30 years |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | Fully financed and owned by the community through a limited liability company |
| COOP citizen members (nr) | 49 households. The area of supply covers 79 possible households. |
| COOP members, other (type, nr) | The village hall |
| Loan (bank/crowd/municipal) | A municipal guarantee as collateral for costs of construction was at 1.034.957 Euros. |
| Benefits/motives (income/climate/savings/env.) | <p>1) Climate and environmental benefits. They wanted to reduce the emissions of CO₂</p> <p>2) Direct income from selling energy The collective district heating is cheaper than oil fired boiler, which most of the citizens had before</p> <p>3) Energy and cost saving. In the beginning of the project, the initiators visited all of the households in the village and asked how much oil the oil-fired boiler consumed each year. Then they calculated the maximum costs for the new heating solution for it to compete with the existing solution. This resulted in a minimum of at least 40 households to participate before it was doable. The more joining the local heating district, jo cheaper it will get for everyone.</p> <p>4) Improvement of local economy</p> <p>5) Comfort: There is not the same maintenance or noise as there is with a oil fired boiler</p> |
| Additional benefits (awards/ecotourism/education facility) | The project facilitates possibilities for new energy projects. Føns Nærværme has for several year been interested in installing a heat pump. This project was finally launched in 2021 and in collaboration with the University of Southern Denmark, Middelfart Municipality, EWII, Sprattenborg smithy, and project EMPOWER. During the project 2 heat pumps were connected which together with the existing boiler plant produces heat in the most efficient way regarding the heating network, prices, etc. After the project has ended, it will be possible for Føns Varmeværk to take over the pumps for free. |

| | |
|------------------------------------|--|
| Barriers (changing regulation etc) | One of the main challenges in starting a collective supply was that the projected needed at least 40 households for the project to succeed. The other villages Ballen and Onsbjerg (both on Samsø Island) overcame the challenge of the required high number of connections by charging only a small, symbolic connection fee. Føns as well managed to secure the necessary number of connections in this way by only charging 2500 DKK = 335 Euros for the share. This was possible due to the project was backed by the municipal guarantee as collateral for costs of construction. |
| Organisation methods | Limited liability company. Supervisory board with annual general meetings. Since the organization is a co-operative, the members are only personally liable for their share of 2500 DKK There are 8 volunteers from the village who are responsible for the operation of the plant. Every 8th week, they each have a week of work where they put the wood chips in work and makes sure it is running smoothly. Because of the strong community and due to a self-interest in having this cheaper energy solution, most of the citizens are willing to help if needed. |
| Help from others | PlanEnergi was the project consultant and helped with the feasibility study. For the final application they agreed on a "no-cure-no-pay" agreement and thereby took a small economic risk since they only would get the payment if the project was realized. The equity of the limited liability company of 100.000 DKK provided security so if application was not accepted, they would lose the deposit of the members. |
| Lessons learned | It was questionable if the project was even possible in a small community like Føns, but due to their enthusiasm, persistence, and a lot of voluntary work they made it happen. |
| Operation/Maintenance (who) | Volunteers from the village Føns. Each member of what they call the "operation group" has a shift for a week, where each shift takes about 30 minutes. |
| Cost of investment | In the beginning 42 joined the project, and the costs were at that time 920.078 Euro. Today 49 households are connected, and the extra costs for the households were 26.863 Euros for the additional heating pipes. In 2021, two new heat pumps were installed with an investment of 161.181 Euros |
| Amount of subsidies/grant | The municipal guarantee as collateral for costs of construction was at 1.034.957 Euros |
| Amount of Shares (number, size) | 49 (June 2022) |

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| Amount of shareholders | 49 (2022 June) |
| Economy (Pay back period) | 30 years |
| Running costs /yr | 119.306 Euros (2020), including fuel, pay-back of loan |
| Involvement of the community | 1) Participated in discussions 2) Supported the project 3) Participated in the decision-making |
| Sources | |
| | https://northsearegion.eu/empower-20/news/foens-naervarme-takes-new-steps-towards-even-greener-energy-1/ |
| | https://climatelab.middelfart.dk/Føns%20Local%20Heating%20Plant |
| | https://planenergi.dk/wp-content/uploads/2018/05/11-Føns-Nær-varme.-Rapport.pdf |
| | https://rgo.dk/wp-content/uploads/Publikationer/PDF_Føns_-_Case-beskrivelse_FINAL.pdf |
| <i>Maintenance:</i> | https://foens-naervarme.dk/onewebmedia/Årsrap-port%20%28ekstern%29.pdf |
| <i>Pictures</i> | https://www.danskfjernvarme.dk/aktuelt/nyheder/arkiv/2015/151113fra-mindst-til-stoerst-dansk-fjernvarme-kan-lidt-af-hvert https://fyens.dk/artikel/få-overblik-disse-klimaprojekter-i-mid-delfart-kommune-mangler-hænder https://fyens.dk/artikel/med-i-eu-projekt-føns-nærvarme-ta-ger-nye-skridt-mod-endnu-grønnere-energi |

Hvide Sande District Heating (Hvide Sande Fjernvarme A.m.b.A), Denmark



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|---|---|
| Name (English) | Hvide Sande Community Foundation |
| Country | Denmark |
| Energy source (wind/solar/biomass/bio-gas/heatpump) | Wind turbines, solar heating, heat pump, natural gas |
| Energy output (El/heat/Co-gen) | Heat |
| City | Hvide Sande |
| Zip Code | 6960 |
| Adress | Numitvej 25 |
| Website 1 | https://www.hsfv.dk |
| Email 1 | info@hsfv.dk |
| Phone | +4597311661 |
| DATABASES | |
| RESCOOP | NO |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | YES |
| Description Summary (3-5 lines) | A windpower plant was established by a local community foundation. The windpower plant consists of three large wind turbines on the shore of the North Sea. The majority of the windpower (80%) was owned by the community foundation and the rest by local citizens. The community foundation was formed in 2010 by the local tourism association, local unions, industry and utilities. In 2018, two of the wind turbines were bought by Hvide Sande Fjernvarme A.m.b.A, a heat supply co-operative, and in 2019 the last was bought. Hvide Sande Fjernvarme uses most of the power |

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| | <p>in a large heat pump to produce power in an efficient way.</p> <p>The shoreline where the turbines are installed is owned by the harbor, which profits through the rent from the windturbines.</p> |
| Size (e.g. # households) | Windpower: 3 wind turbines |
| Energy production | Windpower: 9 MW, 3 MW each turbine |
| CO2 savings (t/yr) | 5500 t/yr - 74% reduction |
| Date of installation | 2010 |
| Organisation time period | Limited liability company |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | <p>Different ownership alternatives were analyzed and, once having compared their capability to support the harbor and tourism in Hvide Sande, it was decided to establish a community foundation, similar to a trust fund. The foundation owns 80% of the project, while the other 20% is owned by Hvide Sande Nordhavn Møllelaug I/S , a partnership with local residents, as required under (then) national law.</p> <p>The cost of each share was 309 EUR and they were all sold out in two days. The board is made up of members from within the community, including two representatives from the harbor. Furthermore, members from the tourism association are prohibited from serving on the board in order to maintain independence. The project counted with the support of the entire community and, as a result, many local people were willing to get involved in it – more than 400 people became shareholders.</p> |
| COOP citizen members (No) | 400 |
| COOP members, other (type/No) | Local businesses/associations. |
| Loan (bank/crowd/municipal) | The community foundation was established by the local Tourism Association (Holmsland Klit Turistforening) in collaboration with local industry groups, unions and utilities. The Tourism Association raised the 40,300 EUR requested to start- up a foundation in Denmark. Financing required to cover 100% of the investment related to the 80% owned by the community foundation, which was obtained from two local banks - Jyske Bank (50%) and Ringkjøbing Landbobank (50%) - with the three wind turbines as the only bank guarantee. |
| Benefits/motives (income/climate/savings/env.) | <ol style="list-style-type: none"> 1) Energy and cost savings 2) Improvement of local economy 3) Increase of community resilience 4) The activity in the harbor has incremented significantly due to the increase in ships going there. This has led to creation of many jobs and increased tourism to the town - even more new jobs are |

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| | <p>expected for the future.</p> <p>5) Because the project is community led, it was successful and accepted by the community and able to settle so close to the shore. Private external companies previously failed to realize a project so close to the community due to public dissent.</p> |
| Additional benefits (awards/ecotourism/education facility) | <p>The project received the Wind Prize 2013 given by the Danish Wind Turbine Owners' Association April 2013, for being a good example of a local initiative and cooperation in establishing wind turbines with broad local support.</p> <p>Furthermore it received European Solar Prize in 2013</p> |
| Barriers (changing regulation etc) | <p>For several years, private project developers planned to erect wind turbines in the same location. Because of local protests their project was not realized. In this context, the Trust Fund's objectives and positive impact on the community in Hvide Sande has been crucial for local acceptance. The plan for setting up the turbines met objections from 2 citizens only and the local branch of the Danish Society for Nature Conservation. None of the complaints were fully or partially upheld.</p> |
| Organisation methods | Limited liability company |
| Help from others | The community supported the project. |
| Cost of investment | 12.2 million Euro |
| Amount of shareholders | 80% community foundation, 20% local residents |
| Economy (Pay back period) | <p>With the annual return of 9% to 11%, the Hvide Sande Trust Fund was expected to repay the loans in approximately 6 to 8 years. This is now paid with the sale to the heating company and the fund can use remaining capital for local benefits.</p> |
| Running costs | <p>The port owns the land where the turbines are installed. The annual rent for the three sites of approx. 650.000 Euros is paid to the local harbor, thus creating an annual operating grant to support the development of the port. Furthermore the costs are 8.05 EUR/MWh for operation and maintenance.</p> |
| Sources | |
| | https://www.folkecenter.eu/PDF/Social/01.Community-Power-for-the-World.pdf |
| | https://folkecenter.wordpress.com/hvide-sande/ |
| | https://www.rescoop.eu/uploads/rescoop/downloads/CommunityPower.pdf |
| | https://dbrs.dk/artikel/hvide-sande-fjernvarme-viser-vejen-tæt-på-at-blive-co2-neutral-allerede-i-år |
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Middelgrundens Windmill Association (Middelgrundens Vindmøllelaug I/S), Denmark



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|---|--|
| Name (English) | Middelgrundens Windmill Association |
| Country | Denmark |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Wind |
| Energy output (EI/heat/Cogen) | Electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Copenhagen |
| Zip Code | 1440 |
| Address | Mælkevejen 77 |
| Website 1 | https://www.middelgrunden.dk/middelgrunden-windmill-co-operative/ |
| Website 2 | https://www.middelgrunden.dk |
| Contact Person (s) | Lene Vind |
| Email 1 | laug@middelgrunden.dk |
| Phone | 2117 7170 |
| DATABASES | |
| RESCOOP | YES |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | YES |
| Description Summary (3-5 lines) | Offshore Wind Farm outside the Harbor of Copenhagen consisting of 20 wind turbines. 10 are owned by Copenhagen Energy and the other 10 by the Middelground Cooperative |
| Size (e.g. # households) | 20 wind turbines. 10 are owned by 8110 members, whereas 10 are owned by Copenhagen Energy |

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| Energy production (kWh/yr) | 100 GWh/y which correspond to the electricity consumption of 30000 households in Copenhagen. Each wind turbine has an power of 2 MW and therefore the total is 40 MW |
| CO2 savings (t/yr) | 68000 ton for all of the 20 wind turbines |
| Date of installation | The construction started in 2000 |
| Installation time period | About 12 months |
| Expected lifetime | 20 years estimated in 2000, but new estimation is 30 years more with reconstructions |
| Type of Community (urban/rural) | Urban |
| COOP Ownership type (consumer/share) | Participation through buying shares |
| COOP citizen members (nr) | 7.957 (2020) |
| Subsidy/Grant (EU, fund, municipal) | The Danish parliament granted resources for a preliminary examination, which showed the project was feasible |
| Benefits/motives (income/climate/savings/env.) | 1) Environmental benefits 2) Reduction in energy costs |
| Additional benefits (awards/ecotourism/education facility) | The European Solar price 2000 and Global Energy Award 2000 |
| Organisation methods | Middelgrunden I/S (which owns the 10 wind turbines) is a general partnership. This means that as a stakeholder, one owns 1/40.500 of the partnership per share. Everyone is personally liable for the wind mills. Annual general meeting Supervisory board |
| Help from others | In 1996 the local association Copenhagen Environment and Energy Office took the initiative of forming a working group for placing turbines on the Middelgrunden shoal and a proposal with 27 turbines was presented to the public. At that time the Danish Energy Authority had mapped the Middelgrunden shoal as a potential site for wind development, but it was not given high priority by the civil servants and the power utility. Nevertheless, the Parliament supported the idea and made funding available for further investigations. These developments together with strong public support from 1000 members of the newly established cooperative and cooperation with the local utility cleared the road for the project. |
| Lessons learned | 1. The involvement of potential stakeholders, local citizens, interest groups, politicians etc. Must be ensured throughout the whole process. Especially an early contact avoids problems with acceptance 2. Reservations toward the project were based on the fear of negative impacts. The early dialog helped to mitigate these, e.g. the neighbors were invited to visit a modern |

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| | <p>wind turbine, which convinced them, that there would not be a problem about the noise.</p> <p>3. Relevant concerns and critiques as well as the environmental impact assessment should be taken very seriously, and the project design should be altered if necessary</p> <p>4. A project this size needs a minimum amount of start-up capital or a large amount of voluntary work The great number of members of the co-operative society gave rise to a broad and exhaustive dialog with the critics, which was important since otherwise the critics would have had the chance to control the public opinion. Windpower is highly dependent on both political and public support, and many projects has been shelved due to local critics. Regarding Middelgrunden, a recognized Danish environmental preservation group, Danmarks Naturfredningsforening, was very skeptical at first, but through dialog, the local departments gained insight in the project and its benefits.</p> |
| Operation/Maintenance (who) | Technological supervisor |
| Cost of investment | 48 mio Euro (23 mio euros raised by the 8500 citizens of Copenhagen) |
| Amount of Shares (number, size) | 40500 |
| Amount of shareholders | 7.957 (2020) |
| Economy (Pay back period) | 8 years |
| Cost of Maintenance/yr | 894.154 Euros for maintenance (2020) and 52.982 Euros for administration (2020) |
| Sources | |
| | https://www.hofor.dk/nyhed/statsministeren-besoeger-koebenhavns-groenne-vartegn-havvindmoellerne-paa-middelgrunden/ |
| | https://www.middelgrunden.dk/wp-content/uploads/2021/03/Artikel-Copenhagen-Offshore-7-Middelgrund.pdf |
| | http://vekbh.dk/middelgrundens-vindmøllepark/ |
| | https://www.middelgrunden.dk/wp-content/uploads/2021/03/Arsrapport-2020.pdf |
| | https://www.middelgrunden.dk/wp-content/uploads/2021/01/mg-pjece_72dpi_rgb.pdf |
| Pictures | https://da.wikipedia.org/wiki/Middelgrundens_Vindmøllepark Source: Kim Hansen https://en.wikipedia.org/wiki/Middelgrunden#/media/File:Copenhagen_Windturbines_and_Bridge_to_Malmo_-_panoramio.jpg |

Ærø Wind Cooperative (Ærø Vind), Denmark



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| Name (English) | Ærø Wind |
| Country | Denmark |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Wind |
| Energy output (EI/heat/Cogen) | Electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Southern part of Ærø |
| Zip Code | 5970 |
| Address | At Risemark and Vejsnæs |
| Website 1 | https://www.aeroevind.dk |
| Website 2 | https://www.aeroekommune.dk/borger/energi-natur-miljoe-klima/baeredygtig-energi |
| Facebook | https://www.facebook.com/aeroe |
| Email 1 | vind4@aeroe-emk.dk vind1@aeroe-emk.dk |
| Email 2 | Henrik Steen-Knudsen |
| Phone | +45 20479430 |
| DATABASES | |
| RESCOOP | YES |
| CO2mmunity CASE | YES |
| CO2mmunity PROJECT | YES |
| Description Summary (3-5 lines) | Community-owned wind farm. In 1981 the island's community established the Ærø Energy and Environment Office, which took the role of a local intermediary in the process of developing a community-owned wind farm. The first windmill park was built in 1985 and by 2000 there was 23 small wind turbines on the island. With the help of the Energy and Environment Office, the |

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| | community made plans to replace the 23 small turbines by a smaller number of big turbines. By 2002, three big wind turbines stood on the island. In 2011 3 more was constructed |
| Size (e.g. # households) | 6 windmills |
| Energy production (kWh/yr) | 37.279.063 kWh (2021) |
| Date of installation | 1985 |
| Organisation time period | 1981-1985 |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | Community-owned with local participation through buying shares |
| COOP citizen members (nr) | 650 stakeholders |
| COOP members, other (type, nr) | Ærøfonden. This local fund invests part of its returns to the inhabitants through local community energy projects |
| Loan (bank/crowd/municipal) | Local banks contributed to this inclusive approach by providing bank loans to citizens who were not able to secure the loans with collaterals. Instead, the shares in the wind farm served as sufficient security. |
| Benefits/motives (income/climate/savings/env.) | To cover 100% of the electricity consumption of the Island. The renewable energy development on Ærø started with twelve individuals from different walks of life who all had an interest in technology. All of them had experienced the impacts of the oil crises of the 1970s. Together, they founded a citizen group and gained access to a room in the local school, providing them with a space for regular meetings. Amongst other things, they built their own wooden wind turbines. These early attempts laid the foundation for the community-owned wind farm. |

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| Additional benefits (awards/eco-tourism/education facility) | <p>1. All of the local citizens can participate, if they meet the requirements in the regulations.</p> <p>2. Local ownership meant that a considerable amount of money stayed on the island, which resulted in a boost to the local economy.</p> <p>3. An opportunity to try out some engineering solutions to deal with surplus of power. Some people claim that the original wind power project has paved the way for a number of other renewable energy projects on the island, including the three solar district heating plants and the electric ferry project. These projects are said to have created a local identity around renewables energy, making Ærø one of the three well-known Danish “energy islands” (together with Samsø and Bornholm)</p> <p>4. Be an inspiration to other communities in Denmark to show new different sustainable energy solutions</p> <p>Awards: RESponsible Island Prize 2020</p> |
| Barriers (changing regulation etc) | <p>In 2000, the advocates of the new wind farm were met with some resistance when they publicly communicated the plans for the repowering project. A small but outspoken group of inhabitants with good financial resources resisted the project by initiating a campaign in local media. This campaign included newspaper ads that depicted the new turbines in comparison to local sights such as church towers. This led to concerns that property prices would fall and houses on the island would become unsellable. However, this concern did not materialize. Furthermore, the project encountered some problems during the phase in which the investment was raised. As described above, a considerable sum came from a local fund, as inhabitants on the island were more hesitant to invest than originally anticipated.</p> |
| Organisation methods | <p>The co-operative owns and manages the wind farm. This company is community-owned because only inhabitants from the island had the right to buy shares when the project was initiated. The general assembly of shareholders makes all the important decisions that go beyond daily management</p> |
| Help from others | <p>The local Energy and Environment office</p> |

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| Lessons learned | <p>1) It helps to initiate and implement energy transitions in tight – knit communities where people know each other and work together in other contexts.</p> <p>2) It is very helpful to have a trusted intermediary like the Energy and Environment office, which operates independently from the interests of the municipality or local businesses</p> |
| Operation/Maintenance (who) | Authorized service company |
| Cost of investment | 60 mio. DKK (8,069,382 Euros) in 2002 and 61 mio. DKK (8.196.198 Euros) in 2010 |
| Amount of Shares (number, size) | 29.297 for both wind mill farms |
| Amount of shareholders | 650 local shareholders |
| Economy (Pay back period) | 7,5 year |
| Sources | |
| | https://www.aeroevind.dk/aeroe-vind-4-drift/8-vind-4/57-aeroevind4produktionstal-2021-4 https://www.aeroevind.dk/aeroe-vind-1-drift https://www.euislands.eu/aero-finance |
| <i>Cost of investment:</i> | https://koeberetsordningen.dk/sites/default/files/2019-08/Udbudsmateriale_0.pdf |
| | http://co2mmunity.eu/wp-content/uploads/2019/03/Factsheet-Aerö.pdf |
| <i>Antal af andele Vind 1:</i> | https://docplayer.dk/110163882-Vedtaegter-for-aeroe-vind-1-i-s.html |
| <i>Antal af andele vind 2:</i> | https://koeberetsordningen.dk/sites/default/files/2019-08/Udbudsmateriale_0.pdf |
| <i>Amount of shareholders</i> | https://www.euislands.eu/aero-finance |
| <i>Motivation and benefits</i> | https://koeberetsordningen.dk/sites/default/files/2019-08/Udbudsmateriale_0.pdf |
| <i>Pictures</i> | https://www.aeroevind.dk |

Ærøskøbing District Heating (Marstal Fjernvarme), Denmark

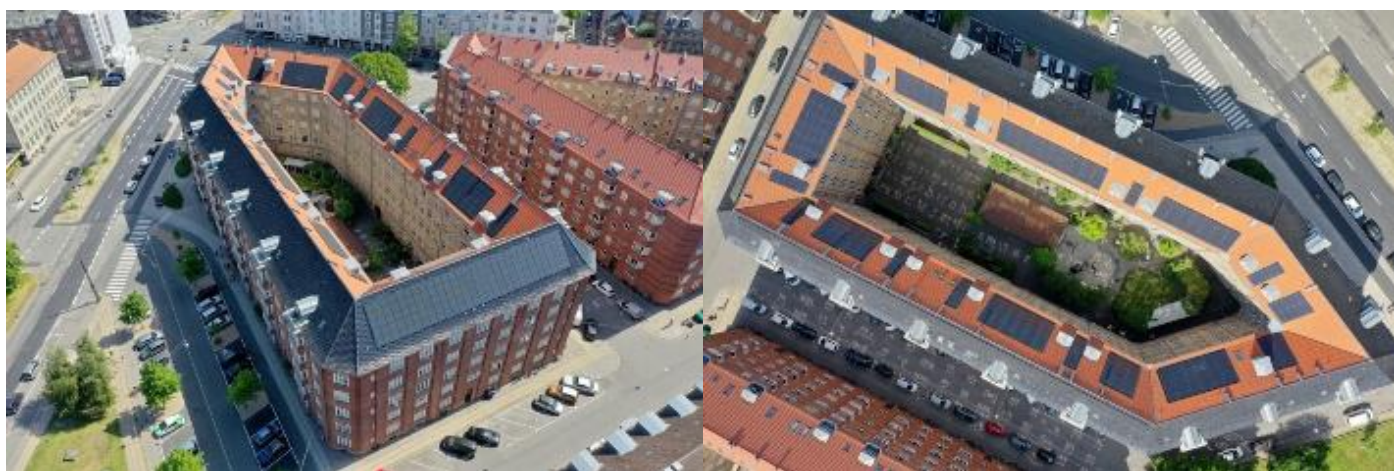


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| Name (English) | Ærøskøbing District Heating A.m.b.A |
| Country | Denmark |
| Energy source (wind/solar/bio-mass/biogas/heat pump) | Solar heat collectors, wood chips, heat pump |
| Energy output (El/heat/Cogen) | Heat |
| Infrastructure (housing/transport/agriculture) | Housing |
| Energy conservation (renovation, storage etc) | There are two pit storage systems where the heat is stored |
| City, Zip Code | Marstal, 5965 |
| Address | Jagtvej 2 |
| Website 1 | www.solarmarstal.dk |
| Contact Person (s) | Lasse Kjærgaard Larsen |
| Email 1 | info@solarmarstal.dk |
| Phone | +45 62531564 |
| DATABASES | |
| RESCOOP | NO |
| CO2mmunity CASE | YES |
| CO2mmunity PROJECT | NO |
| Description Summary (3-5 lines) | <p>Today Marstal Fjernvarme provides heat from 100% renewable energy sources: 50-55% comes directly from the solar heat collectors, 40% from wood chips, 23% from a heat pump. . Solar heat, which is abundant in the summer months, is stored in two pit storage systems: Sunstore2 (10,000 m³) and Sunstore4 (75,000 m³).</p> <p>Two local inhabitants set the project in motion in the 1960s when they went door to door in Marstal to gather support for a citizen-owned local district heating system. When oil prices</p> |

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| | kept rising in the early 1990s, the chair of the board, the manager of Marstal Fjernvarme, and one of EnergiPlans owners initiated the energy transition in Marstal. The first solar heating system was installed at the local swimming pool. After showing promising results, the three men introduced the solar heating system for the local grid and were thus able to provide energy to households at a lower price. |
| Size (e.g. # households) | 1600 consumers. The solar collectors: First 8.000 m ² in 1995-1996, then 18.300 m ² in 2001, and in 2011 they expanded with 15.000 m ² more. Today an area of 33.3602 m ² in total. |
| Energy production (kWh/yr) | 13.100 MWh - More than 50% of the heat consumption of the Island. 36% of the 13.100 m ² comes from the sun. |
| CO2 savings (t/yr) | 5600 t/yr compared to the use of oil |
| Date of installation | 1996 |
| Installation time period | 1 year |
| Expected lifetime | 30 years. But after having the Technical institute of Aarhus University to investigate one of the collectors, it seems like it can continue for a long time since there are no signs of usage |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | Limited liability company / non-profit costumer-owned Marstal Fjernvarme started as a consumer-owned limited liability company with the installation of the initial district heating network in the 1960s. Since then, the company is still owned by the inhabitants of Marstal. Homeowners buy a share in the network when buying a house in Marstal that is connected to the network. Therefore, is is an automatic participation, and to make the sustainable transition even easier for the citizens, there is no connection fee. |
| COOP citizen members (nr) | 1600 |
| COOP members, other (type, nr) | (There is no distinction between citizens and companies in their data) |
| Subsidy/Grant (EU, fund, municipal) | At every development of the project, Marstal Fjernvarme received subsidies. In 1996 they received subsidies of 672.065 Euros out of the total investment at 2.688.260 Euros from the Danish Energy Agency. In 2001 they received 1.814.575 Euros out of the total investment costs at 4.704.455 Euros from the Danish Energy Agency. EU funding at 4.704.455 Euros, were received in 2011 from an EU FP7 collaboration. |
| Loan (bank/crowd/municipal) | The remaining costs (12 million Euro) was raised as a loan with municipal guarantee which allows borrowing money at favorable rates. It is a 30-years loan. |
| Benefits/motives (income/climate/savings/env.) | 1) Environmental benefits 2) Lower energy prices - besides production savings, this |

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| | production does not need transportation of fuel, which is quite expensive for islands |
| Additional benefits (awards/ecotourism/education facility) | Ecotourism: Many visitors come to Ærø to learn about the project. Between two and four thousand people visit Marstal Fjernvarme annually |
| Barriers (changing regulation etc) | Being the first project of its kind in Denmark, the initiators and company lacked substantial external experience to draw on. Changing legislation has been another and probably bigger challenge. In 2017 the Danish government lowered the feed-in tariff for electricity from renewable sources, which resulted in a loss of 268.778 Euros overnight. |
| Organisation methods | The company's board manages the day-to-day business activities. During the annual general assembly, the members of the limited liability company elect the members of the board. The general assembly has the last word in big decisions such as the installation of the solar heating system. |
| Lessons learned | The project was implemented in several steps and each step meant a further expansion of the collector field. Technically, the implementation of the project was unproblematic as several steps were outsourced to contractors. The general assembly had to approve of all the different steps of the development of the project. The different steps contributed to the overall positive attitude towards the project since the success of the first steps helped convince people in the community to trust in later expansion. |
| Operation/Maintenance (who) | Chief Operations Officer Lasse K. Larsen from Marstal Fjernvarme |
| Cost of investment | In 1996: 9,000 m ² solar collectors: 20.000.000 Euro In 2001: 9,000 m ² solar collectors and 10,000 m ³ heat storage (insulated pond with hot water): 4.704.455 Euro. In 2011: 15000 m ² solar collectors and wood chip boiler, Organic Ranking Cycle small CHP plant, heat pump and others: 16.129.560 Euro. |
| Amount of Shares (number, size) | 1600 |
| Amount of shareholders | 1600 |
| Economy (Pay back period) | 30 years |
| Running cost per year | 268.832 Euros including fuel costs, pay-back of loan |
| Sources | |
| <i>Maintenance/yr:</i> | https://www.solarmarstal.dk/media/47518/aarsrapport-2020.pdf |
| <i>Investment:</i> | Interview with Lasse Kjærgaard Larsen |
| <i>Pictures</i> | https://www.solarcity-byplan.dk/marstal |

Øbro 95, PV , Copenhagen, Denmark



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|---|---|
| Name (English) | Øbro 95 |
| Country | Denmark |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Solar PV system |
| Energy output (El/heat/Cogen) | Electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Copenhagen |
| Zip Code | 2100 |
| Address | Østerbrogade 95 |
| Website 1 | www.oebro@95.dk |
| Contact Person (s) | Steen Hartvig Jakobsen |
| Email 1 | info@oebro95.dk |
| Phone | +45 40134484 |
| DATABASES | |
| RESCOOP | NO |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | YES |
| Description Summary (3-5 lines) | The non-profit housing sub-organization Øbro 95 decided in 2011 to integrate plans about new solar cell panels in a bigger comprehensive renovation plan for the building, which houses 81 big family households and 14 youth housings. |
| Size (e.g. # households) | 295 m2 solar panels |
| Energy production (kWh/yr) | 88.751 kWh (2021) |
| CO2 savings (t/yr) | 24 t (2021) |
| Date of installation | 2016 July |

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| Organisation time period | From 2011 to summer of 2016 |
| Installation time period | The mounting took a couple of weeks |
| Expected lifetime | 35-40 years |
| Type of Community (urban/rural) | Urban |
| COOP Ownership type (consumer/share) | Consumer |
| COOP citizen members (nr) | Homeowners of Øbro 95. 81 family households and 14 youth housings |
| COOP members, other (type, nr) | No |
| Subsidy/Grant (EU, fund, municipal) | No |
| Loan (bank/crowd/municipal) | A mortgage loan with fixed rate of 3.293.118, Euros for the whole renovation plan (which included much more than the solar panels) |
| Benefits/motives (income/climate/savings/env.) | 1) Concerns regarding climate 2) Reduction of costs |
| Barriers (changing regulation etc) | <p>The municipality refused to give authorization for the project. First of all, there were some official building restrictions making the constructions illegal. Besides this, the politicians did not believe in the project. It was first after the initiators threatened with legal action, that a proper dialogue with the local authorities started. After being presented with the considerations and benefits the permission was given.</p> <p>In 2013 the legislation for making solar panels at residential' associations was changed, partly due to this case, making it easier to start such a environmental benefitting project and more up to date with the environmental concerns and trends of the Copenhagen citizens.</p> |
| Organisation methods | <p>Øbro 95 is a non-profit housing organisation with internal economic independence, which requires a constant balance between income and expenditures.</p> <p>The leading committee elected by the tenants of Øbro 95, were the ones who initiated the process. This Øbro 95 organisation is part of the larger non-profit housing organization AKB Copenhagen.</p> |
| Help from others | Gaia Solar A/S helped to clarify the different options for construction in the very beginning. |
| Lessons learned | <p>Both support from the politicians and residents are important</p> <p>They recommend other urban solar power projects to incorporate the establishment of a hybrid plant with solar panels</p> |

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| | and a battery storage, if they are about to start some maintenance requiring scaffolds anyway. |
| Operation/Maintenance (who) | An engaged local administration manager Dion Madsen is responsible for the daily monitoring. Furthermore, they have a service contract for the solar panels with a company. Besides this, Øbro has in collaboration with the company Enyday, developed a digital registration and settlement system for the electricity consumption of Øbro 95. |
| Cost of investment | 336.032 Euros |
| Amount of subsidies/grant | No subsidies for the solar panels |
| Amount of Shares (number, size) | 95 |
| Amount of shareholders | 95 |
| Economy (Pay back period) | 30 years due to loan |
| Costs per year | 12.997 Euros each year to pay for the mortgage loan (30 years) and 8.064 Euros for service and other things |
| Sources | |
| <i>Pictures</i> | Foto: Øbro 95 http://www.akb-kbh.dk/om-akb-københavn/artikler/på-østerbro-går-grøn-omstilling-og-betalbare-boliger-hånd-i-hånd |

Heidelberger Energy Cooperative, Germany



| | |
|---|---|
| Name (English) | Heidelberg Energy |
| Country | Germany |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Solar/wind |
| Energy output (El/heat/Cogen) | electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| Energy conservation (renovation, storage etc) | |
| City | Heidelberg |
| Zip Code | 69120 |
| Adress | Im Neuenheimer Feld 561 |
| Website 1 | https://www.heidelberg-energiegenossenschaft.de/ |
| Website 2 | |
| Facebook | https://www.facebook.com/HeidelbergEnergiegenossenschaft |
| Twitter/Other Social Media | https://www.instagram.com/heg_energiegenossenschaft/ |
| Contact Person (s) | Kai Hock |
| Email 1 | info@heidelberg-energiegenossenschaft.de |
| Email 2 | |
| Phone | 06221 326 21 75 |
| DATABASES | |
| RESCOOP | NO |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | NO |
| Other Sources (literature, interview etc) | Interview (local newspaper): https://www.rnz.de/nachrichten/heidelberg_artikel,- |

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| | heidelberger-energie-genossenschaft-von-der-studenten-idee-zum-unternehmen-_arid,546030.html |
| Description Summary | Heidelberg Energy Cooperative (HEG) was founded in 2010 by students. Its goal is to effectively counteract the climate crisis and to offer the young generation a perspective on a future worth living through independent and sustainable energy supply. Currently, HEG operates 7 solar plants |
| Size (e.g. # households) | HEG supplies energy to around 1000 households |
| Energy production (kWh/yr) | Solar: 1.292.582 kWh in 2020 |
| Energy savings (kWh/yr) | No information available |
| CO2 savings (t/yr) | 520 tons of CO2 compared to the German electricity mix |
| Date of installation | First solar system was installed in 2011 |
| Type of Community (urban/rural) | urban |
| COOP Ownership type (consumer/share) | Consumer owned |
| COOP citizen members (nr) | 759 |
| COOP members, other (type, nr) | No information available |
| Subsidy/Grant (EU, fund, municipal) | no |
| Loan (bank/crowd/municipal) | no |
| Benefits/motives (income/climate/savings/env.) | Being an active actor and driver to shape the energy transition |
| Additional benefits (awards/ecotourism/education facility) | Awards: German Solar Award 2014 |
| Barriers | Changing regulations |
| Organisation methods | General Assembly |
| Help from others | consultant company/municipality |
| Lessons learned | NIMBY, regulations/volunteers |
| Cost of investment | 2.500.000 Euros in total |
| Amount of shareholders | 759 |
| Sources | |
| | Interview (local newspaper): https://www.rnz.de/nachrichten/heidelberg_artikel.-heidelberger-energie-genossenschaft-von-der-studenten-idee-zum-unternehmen-_arid,546030.html |
| Pictures | Image credits 1: Heidelberger Energiegenossenschaft/Christopher Holzem; Image credits 2: Heidelberger Energiegenossenschaft |

Schönau Electricity Cooperative (Elektrizitätswerke Schönau eG) Germany



| | |
|---|---|
| Name (English) | Schönau Electricity Cooperative |
| Country | Germany |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Solar |
| Energy output (El/heat/Cogen) | electricity, heat |
| Infrastructure (housing/transport/agriculture) | Housing |
| Energy consevation (renovation, storage etc) | |
| City | Schönau |
| Zip Code | 79677 |
| Adress | Friedrichstraße 53/55 Schönau im Schwarzwald |
| Website 1 | https://www.ews-schoenau.de/ |
| Facebook | https://www.facebook.com/ews.schoenau |
| Twitter/Other Social Media | https://twitter.com/EWS_Schoenau |
| | https://www.youtube.com/user/ewsschoenau |
| Contact Person (s) | |
| Email 1 | genossenschaft@ews-schoenau.de |
| Email 2 | info@ews-schoenau.de |
| Phone | 07673 8885-0 |
| DATABASES | |
| RESCOOP | No |
| CO2mmunity CASE | No |
| CO2mmunity PROJECT | No |

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| Other Sources (literature, interview etc) | Sladek S. (2015) EWS Schöna: Die Schönaer Stromrebelln – Energiewende in Bürgerhand. In: Kopf H., Müller S., Rüede D., Lurtz K., Russo P. (eds) Soziale Innovationen in Deutschland. Springer VS, Wiesbaden. |
| | Dijkstra B.R., Graichen P.R. (2017) Showdown in Schöna: A Contest Case Study. In: Buchholz W., Rübbecke D. (eds) The Theory of Externalities and Public Goods. Springer, Cham |
| | Rave, T. & Albrecht-Saavedra, J. (2015) Die Diffusion von Politikinnovationen: Fallstudie zum „Schönaer Modell“. Working Paper Nr. 3: Energio. |
| Description Summary (3–5 lines) | Today's EWS eG was founded in Schöna in 2009. With its subsidiaries and associated companies, the cooperative is committed to the energy transition and a complete and efficient energy supply based on renewable energies. Civic engagement, co-determination and decentralization are among the cornerstones of its activities. |
| Size (e.g. # households) | 8245 Cooperative members 196.343 electricity clients |
| Energy production (kWh/yr) | Electricity: 42.004.232 kWh: from solar: 6.761.357 kWh from wind: 33.010.142 kWh, from CHP/fuel cells: 2.232.733 Heat generation from biomass: 14.344.395 kWh |
| Energy savings (kWh/yr) | No information available |
| CO2 savings (t/yr) | 363.225 t |
| Date of installation | The first solar system of the cooperative was installed in 2007 |
| Type of Community (urban/rural) | urban and periurban |
| COOP Ownership type (consumer/share) | Consumer owned |
| COOP citizen members (nr) | 8245 |
| COOP members, other (type, nr) | No information available |
| Subsidy/Grant (EU, fund, municipal) | No information available |
| Loan (bank/crowd/municipal) | € 7.123.481,78 |
| Benefits/motives (income/climate/savings/env.) | Civic engagement for sustainable energy supply and climate protection and against nuclear power and fossil fuels. |
| Additional benefits (awards/ecotourism/education facility) | 2016 – Werkstatt N Award 2015 – International Economic Forum, Baden-Baden 2013 – German Environmental Prize 2011 – Goldman Environmental Prize 2010 – Querdenker®-Award (Lateral Thinkers Award) |

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| | 2008 – Utopia Award 2008 – Ashoka Fellow – Social Entrepreneur 2007 – Deutscher Gründerpreis (German Business Founder Award) 2006 – Preis der Arbeit (Employment Prize) 2004 – Bundesverdienstkreuz am Band (Federal Cross of Merit) 2003 – European Solar Prize 1999 – Gutedelpreis (Gutedel Prize) 1999 – Nuclear-Free Future Award 1997 – Henry Ford European Conservation Award 1997 – Förderpreis „Demokratie Leben“ („Living Democracy“ Sponsorship Award) 1996 – Ökomanager des Jahres 1996 (1996 Eco-Manager of the Year) 1994 – Deutscher Energiepreis (German Energy Prize) |
| Barriers | changing regulatory framework |
| Organisation methods | Annual General Meeting Supervisory board |
| Help from others | consultant company/municipality |
| Lessons learned | NIMBY, regulations/volunteers |
| Amount of Shares (number, size) | 404.996 Shares |
| Amount of shareholders | 8245 |
| <i>Pictures</i> | Image credits 1: EWS Schönau Image credits 2: Albert Schmidt |

Citizen Energy Cooperative BENG (Bürgerenergiegenossenschaft BENG eG), Germany



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|---|---|
| Name (English) | Citizen Energy Cooperative BENG |
| Country | Germany |
| Energy source (wind/solar/biomass/bio-gas/heatpump) | Solar |
| Energy output (El/heat/Co-gen) | electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| Energy consevation (renovation, storage etc) | storage |
| City | Munich |
| Zip Code | 81375 |
| Adress | Stiftsbogen 148 |
| Website 1 | https://www.beng-eg.de/ueber-uns/ |
| Facebook | https://www.facebook.com/BuergerenergiegenossenschaftBENG |
| Twitter/Other Social Media | |
| Contact Person (s) | Joachim Bender |
| Email 1 | kontakt@beng-eg.de |
| Email 2 | |
| Phone | (+49) 089-840 29 39 |
| DATABASES | |
| RESCOOP | No |
| CO2mmunity CASE | No |
| CO2mmunity PROJECT | No |
| Other Sources (literature, interview etc) | https://www.energiezukunft.eu/buergerenergie/arbeitssteilung-fuer-die-energiewende/ |

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| | https://www.sueddeutsche.de/muenchen/land-kreismuenchen/landkreis-muenchen-solarenergie-photovoltaik-genossenschaften-1.5554163 |
| Description Summary | Beng was founded in 2011 and has now more than 400 members, who are enthusiastic about a decentralized and sustainable energy economy and actively committed to climate protection. |
| Size (e.g. # households) | 400 members |
| Energy production (kWh/yr) | 1.938.000 kWh in 2020 |
| Energy savings (kWh/yr) | |
| CO2 savings (t/yr) | 1.200 t CO2 |
| Total Installed capacity | Capacity – 2,019 kWp installed |
| Date of installation | The first solar park of the cooperative with 1.1 MWp was installed in 2011 in the Municipality of Aschheim. |
| Expected lifetime | 20 years solar |
| Type of Community (urban/rural) | Urban and periurban |
| COOP Ownership type (consumer/share) | consumer owned |
| COOP citizen members (nr) | 400 |
| COOP members, other (type, nr) | information is not available |
| Subsidy/Grant (EU, fund, municipal) | The projects are normally financed by 2 mechanisms: - participation packages of the members (Shares and subordinated loans) - cooperation with municipalities (such as Aschheim municipality in the 2011 installation) |
| Loan (bank/crowd/municipal) | Information is not available |
| Benefits/motives (income/climate/savings/env.) | 100% locally produced energy supply decentralized and resilient supply structures Climate protection regional value creation (Profits) |
| Additional benefits (awards/ecotourism/education facility) | Tenant electricity projects Co-development of the electricity brand "Bavariastrom" |
| Barriers (changing regulation etc) | Changing regulation (Political framework conditions) Many projects cannot be presented economically, and efficient roof utilization is difficult Tenders, especially for rooftop PV systems Energy transition not a priority for some municipalities and housing associations |

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| Organisation methods | Annual General Assembly Meeting Supervisory board and Management board |
| Lessons learned | Good cooperation with municipalities is key |
| Operation/Maintenance (who) | Information is not available |
| Cost of investment | It depends on the project. Currently, the cooperative has 13 projects. In total the cooperative has investments for about 3.2 million Euro |
| Amount of shareholders | 400 |
| <i>Pictures</i> | Image credits 1 & 2 BENG eG |

Citizen Energy Bremen e.G (Bürger Energie Bremen eG (BEGeno)), Germany



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|---|---|
| Name (English) | Citizen Energy Bremen e.G |
| Country | Germany |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Wind, solar and biogas |
| Energy output (El/heat/Cogen) | Electricity and heat |
| Infrastructure (housing/transport/agriculture) | Housing |
| City, Zip Code | Bremen, 28215 |
| Address | Münchener Str. 146 |
| Website 1 | https://www.begeno.de/ |
| Facebook | https://www.facebook.com/begenoBremen |
| Contact Person (s) | Tobias Jaletzky |
| Email 1 | jaletzky@begeno.de |
| Phone | (+49) 01520 5483326 |
| DATABASES | |
| RESCOOP | No |
| CO2mmunity CASE | No |

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| CO2mmunity PROJECT | No |
| Other Sources (literature, interview etc) | https://www.gruene-sachwerte.de/kooperationen/begeno-buerger-energie-bremen/ |
| | https://www.findorff-gleich-nebenan.de/findorff-gleich-nebenan/magazin/bremen/begeno/ |
| Description Summary | Bürger Energie Bremen eG and its more than 230 members are committed to the energy transition in the hands of citizens in Bremen and the surrounding area and to effective climate protection. Together, they have already invested more than one million Euros in new photovoltaic and wind power plants in the region. |
| Size (e.g. # households) | 230 members and 259 electricity clients |
| Energy production (kWh/yr) | Solar: 217.393 kWh. Wind: 7.817.456 kWh |
| CO2 savings (t/yr) | > 11.788 t (from 2015 until May 2021) |
| Total Installed capacity | Solar: 244,28 KWp (6 PV plants). Wind: 3,05 MW (2 wind turbines) |
| Date of installation | First installed PV plant in 2015 |
| Organisation time period | 1 year |
| Expected lifetime | 30 years |
| Type of Community (urban/rural) | Urban and rural |
| COOP Ownership type (consumer/share) | Consumer owned |
| COOP citizen members (nr) | 231 |
| COOP members, other (type, nr) | Information is not available |
| Benefits/motives (income/climate/savings/env.) | Improvement of the CO2 balance. Added Value for the region Contribution to the expansion of renewable energy in the region. Promotion of diversity and Gender justice in the energy sector |
| Additional benefits (awards/ecotourism/education facility) | Winner of the German solar prize 2016. Education and mentoring. Education and promotion of climate solutions |
| Barriers (changing regulation) | Restricting legal frameworks |
| Organisation methods | Annual General Assembly Meeting Supervisory board and Management board |
| Help from others | Collaboration with other local cooperatives and networks |
| Cost of investment | Solar (until 2020): 296.700€. Wind (until 2020): 5.500.000€ |
| Amount of shareholders | 231 shareholders |
| <i>Pictures</i> | BEGENO (Bürger Energie Bremen eG) |

Citizen Energy Kassel & Söhre eG (Bürger Energie Kassel & Söhre eG), Germany

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|---|--|
| Name (English) | Citizen Energy Kassel & Söhre eG |
| Country | Germany |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Wind, Solar |
| Energy output (EI/heat/Cogen) | Electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Kassel |
| Zip Code | 34117 |
| Address | Wilhelmsstraße 2 |
| Website 1 | http://www.be-kassel.de |
| Contact Person (s) | Rainer Meyfahrt |
| Email 1 | info@be-kassel.de |
| Phone | 0049 561-4503576 |
| DATABASES | |
| RESCOOP | No |
| CO2mmunity CASE | No |
| CO2mmunity PROJECT | No |
| Other Sources (literature, interview etc) | https://www.wildwechsel.de/buerger-energie-kassel-soehre-eg-hofft-auf-windpark-reinhardswald/ |
| Description Summary (3-5 lines) | The cooperative was founded in 2013 in Kassel and it aims to jointly implement projects in the field of renewable energies: In Total the cooperative have invested about 1 million Euro in PV (840 kWp, 46 plants) and participates with a share of 25% as limited partner at a municipal windpark (21 MW) |
| Size (e.g. # households) | 1050 Members |
| Energy production (kWh/yr) | Solar: 800.000 kWh Wind: 29.000.000 kWh |
| CO2 savings (t/yr) | 12516 |
| Total Installed capacity | Solar: 840 kWp Wind: 14,5 MW |
| Date of installation | First installed Windpark in 2013 |
| Expected lifetime | 30 years Solar, 20 years wind |
| Type of Community (urban/rural) | Urban and rural |
| COOP Ownership type (consumer/share) | Consumer owned |

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| COOP citizen members (nr) | 1050 |
| COOP members, other (type, nr) | Information is not available |
| Benefits/motives (income/cli- mate/savings/env.) | <p>Big Advantages to cooperate with municipalities:</p> <ul style="list-style-type: none"> - Extended financial opportunities for municipalities through energy cooperatives - Higher acceptance of energy transition and regional added value (for companies) - Use of synergies (e.g. administrative expertise of municipalities, access to funding programmes) - Use of rooftops and areas of the municipality for the implementation of projects <p>Further Advantages:</p> <ul style="list-style-type: none"> - Improvement of the CO2 balance - Added Value for the region - Contribution to the expansion of renewable energy in the region. |
| Additional benefits (awards/eco- tourism/education facility) | <p>Campaigns like "Windenergy for Climate equality"</p> <p>Coworking with the climate protection council of the city of Kassel.</p> |
| Barriers (changing regulation etc) | restricting legal frameworks |
| Organisation methods | <p>Annual General Assembly Meeting</p> <p>Supervisory board and Management board</p> |
| Help from others | Collaboration with other local cooperatives and networks |
| Cost of investment | Self-funding for 178 kWp Solar / 250.000 € through members |

Energy Community Weissacher Tal eG (Energiegemeinschaft Weissacher Tal EG), Germany



| | |
|---|--|
| Name (English) | Energy community Weissacher Tal eG |
| Country | Germany |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Solar and biogas |
| Energy output (El/heat/Cogen) | Electricity and heat |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Weissach im Tal |
| Zip Code | 71554 |
| Address | Kirchberg 2-4 |
| Website 1 | http://www.energie-wt.de/index.html |
| Facebook | https://www.facebook.com/energiewt |
| Contact Person (s) | Rolf Heller |
| Email 1 | kontakt@energie-wt.de |
| Email 2 | rolf.heller@energie-wt.de |
| Phone | 07191 90 44 920 |
| DATABASES | |
| RESCOOP | No |
| CO2mmunity CASE | No |
| CO2mmunity PROJECT | No |
| Other Sources (literature, interview etc) | https://www.wir-leben-genossenschaft.de/de/energiegemeinschaft-weissacher-tal-eg-mehr-energie-un-abhaengigkeit-durch-sonnenstrom-337.htm |
| Description Summary | The cooperative was founded in 2008 with the aim of actively implementing climate protection and the energy transition. It initiates and promotes renewable energy generation projects at local and regional level. In addition to the construction and operation of PV systems, its business areas include the realisation of tenant electricity models, heat and electricity |

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| | contracting, the sale of 100% renewable electricity and participation in sustainable energy generation plants. The most recent business activity is the construction and operation of charging stations for e-mobility |
| Size (e.g. # households) | 391 members. About 200 electricity customers. Heat for 115 residential units |
| CO2 savings (t/yr) | 450 Tons CO2 through solar systems and 500 Tons CO2 through district heating projects |
| Total Installed capacity | 900 kWp |
| Date of installation | The first installation photovoltaic systems on roofs of buildings in the municipality of Weissach im Tal was in 2008 |
| Type of Community (urban/rural) | Urban and rural |
| COOP Ownership type (consumer/share) | Cooperative shares |
| COOP citizen members (nr) | 391 members |
| COOP members, other (type, nr) | Information is not available |
| Benefits/motives (income/climate/savings/env.) | Climate protection |
| Barriers (changing regulation etc) | A worsened framework conditions for energy cooperatives in recent years the internal structures are characterised by the voluntary work of the stakeholders, which entails personnel risks "Annual General Assembly Meeting. Supervisory board and Management board " |
| Organisation methods | Annual General Assembly Meeting. Supervisory board and Management board |
| Help from others | Green electricity sales in association with Bürgerwerke Heidelberg eG. Cooperation with the private sector. Partnerships with municipal and local authorities |
| Lessons learned | the use of the current facilities is limited in time and that the cooperative need to expand and stabilize the business activities in order to survive in the long term. The expansion of know-how and processes is needed for the cooperative to develop more in the direction of a business enterprise. Due to objections from air traffic control, the cooperative had to postpone its activities in the field of wind |
| Cost of investment | 1.2 million Euro between 2019 and 2020 |
| Amount of Shares (number, size) | The cooperative has shares by 1033000 Euro |
| Amount of shareholders | 391 |
| <i>Pictures</i> | Weissacher Tal eG |

BEG-58, Germany

| | |
|--|--|
| Name (English) | BEG-58 |
| Country | Germany |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Solar |
| Energy output (El/heat/Cogen) | Electricity |
| Infrastructure (housing/transport/agriculture) | housing |
| City | Wetter (Ruhr) |
| Zip Code | 58300 |
| Adress | Gustav-Vorsteher-Str. 20 |
| Website 1 | https://www.beg-58.de/ |
| Contact Person (s) | Peter Modrei |
| Email 1 | info@beg-58.de |
| Email 2 | peter.modrei@beg-58.de |
| Phone | 02335 5279 |
| DATABASES | |
| RESCOOP | No |
| CO2mmunity CASE | No |
| CO2mmunity PROJECT | No |
| Other Sources (literature, interview etc) | https://www.gls.de/privatkunden/wo-wirkt-mein-geld/erneuerbare-energien/beg-58/ |
| Description Summary (3-5 lines) | BEG-58 was founded by environmentally conscious citizens who freely support sustainable, regional and decentralised power generation plants. The cooperative wants to make an active contribution to climate protection. |
| Size (e.g. # households) | 514 members |
| Energy production (kWh/yr) | 3,9 MWh |
| CO2 savings (t/yr) | 3858 t CO2 in 2021 |
| Total Installed capacity | 132 Solar plants with 4,3 MWp |
| Type of Community (urban/rural) | Urban and Rural |
| COOP Ownership type (consumer/share) | Cooperative shares |
| COOP citizen members (nr) | 514 |
| COOP members, other (type, nr) | The information is not available |
| Loan (bank/crowd/municipal) | The plants are mainly financed through members loans |
| Benefits/motives (income/climate/savings/env.) | Climate protection Income |
| Aditonal benefits (awards/ecotourism/education facility) | Participation in the Common Good Economy Regional Group discussing issues of education, policy, and digital |

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| | sustainability. Gender advisory board to promote inclusion and gender justice |
| Barriers (changing regulation etc) | Affected economic viability of the projects due to sharp drop in feed-in tariffs since 2018 |
| Organisation methods | Annual General Assembly Meeting. Supervisory board and Management board |
| Lessons learned | Plants with no more than a maximum of 1,500 Kwp are to be created (responding to regulation restrictions and economic viability). The growing number and the increasing age of solar installations require increasingly more effort in the operation of the existing systems |
| Cost of investment | Total investments by EUR 5,3 million. |
| Amount of Shares (number, size) | Shares by EUR 1.518.000 |
| Amount of shareholders | 514 |

UrStrom, Mainz, Germany



| | |
|---|---|
| Name (English) | UrStrom |
| Country | Germany |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Solar |
| Energy output (EI/heat/Cogen) | Electricity and heat |
| Infrastructure (housing/transport/agriculture) | housing / mobility |
| City, Zip Code | 55120 Mainz |
| Adress | An der Plantage 16 |
| Website 1 | https://www.youtube.com/channel/UCe6K-DqStlZPpe-koIXhxIRQ |
| Website 2 | https://www.linkedin.com/company/urstrom-b%C3%BCrgere-nergiegenossenschaft-mainz-eg/?originalSubdomain=de |
| Facebook | https://www.facebook.com/UrStromMZ/ |
| Twitter/Other Social Media | |
| Twitter/Other Social Media | https://twitter.com/urstrom |
| Contact Person (s) | Christoph Würzburger |
| Email 1 | Info@urstrom.de |
| Email 2 | christoph.wuerzburger@urstrom.de |
| Phone | 06131 62 999 47 |
| DATABASES | |
| RESCOOP | Yes |
| CO2mmunity CASE | No |
| CO2mmunity PROJECT | No |
| Other Sources (literature, interview etc) | https://www.energieatlas.rlp.de/earp/praxisbeispiele/projektsteckbriefe/projekt-steckbriefe/anzeigen/buergerbeteiligung/9 |

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| Description Summary (3-5 lines) | The cooperative builds and operate photovoltaic systems and produce clean solar electricity. In the Bürgerwerke eG network, we offer private and commercial customers nationwide 100% green electricity and biogas from Germany. In addition, it operates car sharing with electric cars at several stations in Mainz, Budenheim and at the University of Applied Sciences Bingen. As a community with over 430 members, UrStrom informs the public about the opportunities of citizen energy and lobby politicians. |
| Size (e.g. # households) | 450 members |
| Energy production (kWh/yr) | on average 1.030.000 kWh |
| CO2 savings (t/yr) | 721 t CO2 |
| Total Installed capacity | 1.133 kWp |
| Date of installation | The first PV system of the cooperative was installed in 2011 |
| Organisation time period | 1 year |
| Type of Community (urban/rural) | Urban and rural |
| COOP Ownership type (consumer/share) | Cooperative shares |
| COOP citizen members (nr) | 450 |
| COOP members, other (type, nr) | Information is not available |
| Subsidy/Grant (EU, fund, municipal) | The projects are normally financed by 2 mechanisms: 1) participation packages of the members (Shares and subordinated loans) and 2) External loans. |
| Benefits/motives (income/climate/savings/env.) | Income. Contribution to a local-based energy transition. |
| Additional benefits (awards/ecotourism/education facility) | Networking with national and international community energy actors. Car Sharing services. Own brand "UrstromPur" for electricity sales since 2014. |
| Barriers | restricting legal frameworks |
| Organisation methods | Annual General Assembly Meeting Supervisory board and Management board |
| Help from others | Collaboration with Municipalities and public institutions Cooperation partner in the 100% clima Protection Master Plan of the city of Mainz. |
| Lessons learned | Cooperation with local companies and authorities is key. UrStrom eG prefers to realise projects in such a way that as much of the electricity generated as possible can be used directly on site. Visibility and Public relations are key to the cooperative growth. |
| <i>Pictures</i> | UrStrom eG/S. Dinges |
| | |

Troya Renewable Energy Cooperative, Turkey



| | |
|---|---|
| Name (English) | Troya Renewable Energy Cooperative |
| Country | Turkey |
| Energy source (wind/solar/biomass/bio-gas/heatpump) | Solar PV system |
| Energy output (EI/heat/Cogen) | Electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Çanakkale |
| Zip Code | 17100 |
| Adress | Kemalpaşa Mah. Yalı Cad. 59 / 7 Merkez / Çanakkale |
| Website 1 | www.yenkoop.com |
| Contact Person (s) | Oral Kaya |
| Email 1 | info@yenkoop.com |
| Phone | |
| DATABASES | |
| RESCOOP | YES |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | NO |
| Description Summary (3-5 lines) | Troya Renewable Cooperative was founded in 2017 by women entrepreneurs. The cooperative, which has 26 members, also advocates in the field of renewable energy as a social cooperative and supports other RE cooperatives. It brings together the |

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| | cooperatives in Turkey by organizing an international conference every year. |
| Energy production (kWh/yr) | 240 kWh (2021) |
| Date of installation | 2018 July |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | Consumer |
| COOP citizen members (nr) | 26 |
| COOP members, other (type, nr) | No |
| Subsidy/Grant (EU, fund, municipal) | No |
| Benefits/motives (income/climate/savings/env.) | 1) Concerns regarding climate 2) Reduction of costs |
| Barriers (changing regulation etc) | Constantly changing legal regulations in Turkey. loan interest rates towards renewable energy investments are high and cooperatives are rendered unable to access credit |
| Help from others | No |
| Lessons learned | Both support from the politicians and residents are important |
| Cost of investment | 336.032 Euros |
| Amount of subsidies/grant | No subsidies for the solar panels |

Altinoluk Renewable Energy Producing Cooperative, Turkey



| | |
|---|---|
| Name (English) | Altinoluk Renewable Energy Producing Cooperative |
| Country | Turkey |
| Energy source (wind/solar/bio-mass/biogas/heatpump) | Solar PV system -600kW |
| Energy output (EI/heat/Cogen) | Electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Çorum |
| Zip Code | 19000 |
| Adress | Ulukavak Mah. Köprübaşı 27.Sk. No:17 Merkez ÇORUM |
| Contact Person (s) | Ahmet Aktaş |
| Email 1 | Aktaslar19@hotmail.com |
| Phone | 90 506 509 50 47 |
| DATABASES | |
| RESCOOP | NO |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | NO |
| Description Summary (3-5 lines) | The cooperative was established in Çorum Center with 10 partners. The year 2018 was spent with spreading the cooperative to the base and preparatory activities. With the implementation of the project submitted to ARDSI in 2019, it started production as a cooperative established by Turkey's first Residential Subscribers in April. Currently, we are working with universities on education and project preparation. It also became the first facility in Turkey to harvest rain for the second time in the world and to carry out agricultural activities with this water. |
| Energy production (kWh/yr) | 1.090.790 kW (2021) |

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| Date of installation | 2018 April |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | Consumer |
| COOP citizen members (nr) | 95 |
| COOP members, other (type, nr) | No |
| Subsidy/Grant (EU, fund, municipal) | No |
| Benefits/motives (income/climate/savings/env.) | 1) Civil initiatives for clean energy 2) Reduction of costs |
| Barriers (changing regulation etc) | Changing legal regulations in Turkey. |
| Help from others | No |
| Lessons learned | The realization of Green Energy by civil initiative is important step for a green world. |
| Income: | \$145,000 gross earnings |
| Amount of subsidies/grant | Agriculture and rural development support agency %55 financial support |

Çorum Renewable Energy Producing Cooperative, Turkey

| | |
|--|--|
| Name (English) | Çorum Renewable Energy Producing Cooperative |
| Country | Turkey |
| Energy source (wind/solar/biomass/biogas/heatpump) | Solar PV system -500kW |
| Energy output (El/heat/Cogen) | Electricity |
| Infrastructure (housing/transport/agriculture) | Housing |
| City | Çorum |
| Zip Code | 19000 |
| Adress | Yeniyol mah. Sel sokak no:31/7 çorum |
| Contact Person (s) | Seyfettin Zengin |
| Email l | corumenerji@hotmail.com |
| Phone | 90 532 4781761 |
| DATABASES | |
| RESCOOP | NO |
| CO2mmunity CASE | NO |
| CO2mmunity PROJECT | NO |

| | |
|--|--|
| Description Summary (3-5 lines) | The cooperative was established in Çorum Center with 10 partners. The year 2018 was spent with spreading the co-operative to the base and preparatory activities. With the implementation of the project submitted to ARDSI in 2019, it started production as a cooperative established by Turkey's first Residential Subscribers in April. Currently, we are working with universities on education and project preparation. It also became the first facility in Turkey to harvest rain for the second time in the world and to carry out agricultural activities with this water. |
| Energy production (kW) | 845 kW (2021) |
| Date of installation | 2017 |
| Type of Community (urban/rural) | Rural |
| COOP Ownership type (consumer/share) | Consumer |
| COOP citizen members (nr) | 53 |
| COOP members, other (type, nr) | No |
| Subsidy/Grant (EU, fund, municipal) | No |
| Benefits/motives (income/climate/savings/env.) | 1) Receiving profit share from production. 2) Reduction of costs |
| Barriers (changing regulation etc) | Changing legal regulations in Turkey. |
| Help from others | No |
| Lessons learned | Renewable energy cooperatives as an investment tool should be the new trend for our world. |
| Income: | 1.000.000 TL gross earnings |
| Amount of subsidies/grant | Agriculture and rural development support agency %50 financial support |



Cooperative – City of Serock, Poland (near Warsaw, 4500 inhabitant)

Spółdzielnia Energetyczna „Słoneczny Serock” – „Sunny Serock” energy cooperative

Registration – 15 February 2021

An initiative of the local government in Serock.

Photovoltaic installation with a capacity of 0.5 – 0.7 MW.

The photovoltaic installation is planned to be installed on the site of the former landfill in Dębe.

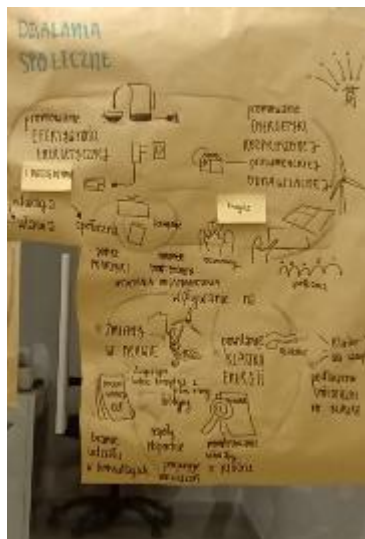
The energy cooperative has an open formula. It is a project that will allow to join anyone willing to meet their own energy needs. The founding group of the cooperative is currently 30 people. The local authorities encourage habitants to contact the office and join this formula that is competitive on the energy market.

All the electricity produced will be consumed by the members of the cooperative. The basic profit will be access to free electricity. Members will contribute to the costs of maintaining the installation, the necessary technical supervision, insurance and tax matters.

Contact: ul. Rynek 21, 05-140 Serock, Poland www.serock.pl

<https://www.serock.pl/4069.2021-rok?tresc=24461>

email: r.karpinski@serock.pl



Cooperative – City of Krakow, Poland (south Poland, 750.000 inhabitant)



Spółdzielnia „Krakowska elektrownia społeczna” (Cooperative – Krakow Social Power Plant)

Registration – January 2020

An investment cooperative. The idea is to finance the installation of PV on roof of a housing association, a kindergarten, school, or enterprises. KSPL pay for the creation of this installation by

investing capital. It can also be a participation – members of the community can co-finance this investment by becoming members of the cooperative. The community can use this electricity to power the common areas in its building.

The “Krakow Social Energy Plant” offer is addressed to those who have the conditions to set up a photovoltaic installation on their building, but cannot or does not want to do so for various reasons – they do not have sufficient funds, such as housing communities and cooperatives or, in the case of entrepreneurs – want to focus only on your business. They have no know-how – they do not know how to choose such a micro-installation, how to evaluate the installers' offers, etc. KSEP propose a fairly simple thing – “Let us invest on your roof without taking any risk, without spending money and we will provide you with you will receive electricity that will be: a) always cheaper than in your current tariff or b) electricity that does not become more expensive with increases, and its cost is only revalued by inflation.”

The aim of the Krakow Social Power Plant is to select the installation so that the recipient uses as much energy as possible, because this will ensure an appropriate rate of return. If, on the other hand, there are surpluses, then the cooperative predicts that it will sell it to the recipient at a lower price and he will sell it to the network, or it will be sold by the cooperative itself.

Everyone can join the cooperative, the basic investment unit, i.e. the share is PLN 2,000 (500 Euro).

The model of the Krakow Social Power Plant assumes obtaining an appropriate return on investment in the PV installation by delivering energy always to the place, i.e. without the need for distribution.

Contact: ul. Chmieleniec 19/48, 30-348 Kraków, Poland.

info@elektrowniaSpoleczna.pl

<https://elektrowniaspoleczna.pl/>

Photo: Why a cooperative?: <https://elektrowniaspoleczna.pl/spoldzielnia/>



Cooperative – City of Raszyn, Poland (near Warsaw, 7000 inhabitants)

Spółdzielnia energetyczna Eisall – Energy Cooperative Eisall

Registration – May 2021

Area of operation: Masovian Voivodeship – 3 communes: Raszyn, Nadarzyn, Michałowice

Current status:

- 3 members
- Annual consumption: ~ 24 MWh
- Annual production: ~ 20 MWh (2 x PV 10 kW)
- Energy storage: TESVOLT TS 48 V – 6 kW / 9.6 kWh
- Ability to work off-grid
- EVC charger: SMA SMA EV CHARGER – 22 kW

The activities of the cooperative listed in the National Court Register include:

electricity generation (the main activity), electricity trading, electricity distribution, electricity transmission, business and management consultancy, engineering activities and related technical consultancy.

The production capacity of Eisall consists of two photovoltaic micro-installations. The power of each of them is 10 kW. They are located in Wypędy in the Raszyn commune.

Eisall offer a comprehensive support in establishing and managing an Energy Cooperative:

- conduct an analysis and recommend the optimal combination of energy sources.
- by selecting the right energy storage, they make it possible to increase energy self-sufficiency and optimize costs.
- provide the participants of the cooperative with energy security and reduction of energy purchase costs while increasing the revenues of its producers.
- together with the trusted partners, provide comprehensive support for the development and construction of renewable energy sources.
- support the structuring and organization of financing

In cooperation with Neo Energy Group and Neo Energy Storage, Eisall provide innovative energy storage solutions for commercial and industrial applications. Eisall is a representative and certified partner of TESVOLT GmbH in Poland.

Contact: Eisall Sp. z o.o. ul. Grzybowska 87, 00-844 Warszawa, Poland.

email: ireneusz.perkowski@eisall.eu. www. <https://eisall.eu/>

References

Publication The Power of Community Energy Analysis of Energy Cooperatives in the Partner Countries. Denmark, Poland, Turkey and Germany, 33 pages, October 2021, published by WECF Germany, with contribution from Troya Cevre, INFORSE-Europe, Social Ecological Institute, Available in English, Polish and Turkish.

- **Online from WECF in English:** <https://www.wecf.org/de/the-power-of-community-energy-analysis-of-energy-cooperatives/>. Direct link to the PDF is <https://www.wecf.org/de/wp-content/uploads/2018/10/The-Power-of-Community-Energy-Analysis-of-Partner-countries.pdf>

- **Online in Polish from the website of SIĘ:** <https://sie.org.pl/aktualnosci/sila-energii-obywatelskiej/>. Direct link to the PDF is https://sie.org.pl/wp-content/uploads/2022/02/POWER_Analiza-Kooperatyw-Energetycznych.pdf

- **Online in Turkish** from the website of Troya Cevre: <https://www.troyacevre.org/power-of-community-energy-kitabi-miz-yayinlandi/>

- **Online from: INFORSE in English** https://www.inforse.org/europe/POWER_CE.htm

Download: www.inforse.org/europe/pdfs/Pub_Power_of_Community_Energy_Analysis_ENG_10_2021_s.pdf

Energize Co2mmunity Project, Interreg Project, in the period of 01.10.2020 – 30.09.2021. The Project developed 8 country specific handbooks, and made a database of renewable energy cooperatives, so called RENCOPs. The database is not online any more but 11 cases can be downloaded as Factsheets (2 in Germany, 2 in Denmark, 2 in Estonia, 2 in Finland, 1 in Sweden, 1 in Poland, and 1 in Lithuania).

Read more: <https://co2mmunity.eu/> <https://co2mmunity.eu/outputs/download-area>

REScoop.eu is a European federation of citizen energy cooperatives. The website has an interactive map, where you can find energy community projects in Europe. You can find the name of the community, name of the city, where it is based in each country. There are no description, contact or website. But, when the community is member of RESCOOP, there is a website. From the 699 community energy projects, the map finds 47 in Denmark, 85 in Germany, 1 in Turkey, and no in Poland. Read more: <https://www.rescoop.eu/> <https://www.rescoop.eu/network/map>

The Polish "More than energy" movement is a broad social coalition working for the development of civic energy. It brings together local governments, institutions, non-governmental organizations and private individuals, convinced that Poland needs improvement in energy efficiency and the development of distributed energy based on renewable sources (RES). The emergence of the "More than energy" movement is a response to the huge public support enjoyed by solutions related to energy efficiency and renewable energy sources. Public opinion polls show that over 88 percent of Polish women and men would like to increase their investment in renewable energy. Thanks to participation in the "More than energy" movement, everyone interested in civic energy can join the activities aimed at convincing politicians to create solutions supporting its development. 158 organizations and institutions belong to the "More than energy" movement Read more: <https://wiecejnizenergia.pl>

Renewable-Energy Cooperatives Cases from Denmark, Germany, Poland & Turkey

59 pp, July 2022. Publication of collections of fact sheets on energy cooperatives from Denmark (8), Germany (8), Poland (3), Turkey (3). Published by INFORSE-Europe (Denmark) with contribution from WECF (Germany), Troya Environment Association (Turkey) and Social Ecological Institute (Poland). Editors: INFORSE-Europe: Judit Szoleczky, Bettina Wolgast, Henning Bo Madsen, Gunnar Boye Olesen; WECF: Marcela Norena; SIE: Elzbieta Priwieziencew; Troya Çevre: Melis Yilmaz, Oral Kaya. The publication is made in the framework of the project "The Power of Community Energy", which was financially supported by the Erasmus Plus Programme of the European Union.

Online: www.inforse.org/europe/pdfs/Pub_Renewable_Energy_Cooperatives_Cases_from_Denmark_Germany_Poland_Turkey_2022.pdf Read more on The Project: https://www.inforse.org/europe/POWER_CE.htm