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COllective action Models for Energy Transition and Social Innovation

FRONTIER CASE STUDIES

Exploring world-wide collective action initiatives at the frontier of social innovation in the energy field

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Abbreviations and Acronyms

CAI	Collective Action Initiative
CBS	Community Benefit Society
CEC	Community Energy Co-op
CO2	Carbon Dioxide
ELENA	European Local ENergy Assistance
ESV	Energy Self-Reliant Village
ET	Energy Transition
FIT	Feed-in Tariff
IEA	International Energy Agency
IOU	Investor-Owned Utility
JSNA	Joint Strategic Needs Assessment
kWh	Kilowatt-hour
LEAF	Local Energy Assessment Fund
MWh	Megawatt-hour
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
PV	Photovoltaic
RE	Renewable Energy
RESS	Renewable Electricity Support Scheme
SME	Small and Medium-sized Enterprises

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INTRODUCTION

Addressing the current environmental and socio-economic challenges globally and within our own communities requires a concerted effort. These trends underscore the need to rethink our global energy systems, especially if we want to remain within a safe 1.5 Celsius temperature increase. This requires a massive uptake of renewable energy. A new IEA pathway[1] highlights that wind and solar power need to quadruple by 2030, requiring a change to our whole energy system. This energy transition impacts how citizens use energy, heat our homes and how industries are shaped. Leaders in government and industry have often overlooked the large, potential power of citizen engagement in the energy transition in Europe and around the world. Empowering citizens to participate in the energy transition not only helps to address the pressing environmental challenges, but also tackles environmental justice issues such as fuel poverty and equal access to renewable energy production, all of which are core tenants of Energy Democracy. Collective Action Initiatives (CAIs) are democratic and participatory organizations, encouraging equity and equality, that reflect the concerns of communities regarding issues related to social justice and the environment. As CAIs operate with values and principles that include social responsibility and caring for one's community, they serve members not solely based on economic benefits, but also in the wider social, cultural and environmental wellbeing.

Through a selection of innovative "frontier" case studies from Europe and around the world, this report aims to raise awareness on experiences of communities that made energy accessible and affordable. This report provides a variety of insights into how CAIs are contributing to the energy transition in different areas of the world and their potential for scaling up. The aim is to inspire CAIs that are either already established or are looking to get started. The more collective action there is for building movements, the more there can be influence on energy policies that can support these initiatives.

This report focuses on exploring innovative "frontier" case studies that represent a particularly innovative contribution to the future of social innovation in the energy transition. Considering social innovation, we are motivated by Hubert and colleagues' definition of social innovation, representing "new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations. In other words, they are innovations that are not only good for society but also enhance society's capacity to act."[1] Even if not yet widely applied (i.e. niche level), the "frontier" cases represent a particularly innovative contribution to the future of social innovation in the energy transition.

Investigating innovative CAIs also means that we consider cases with the highest forward-looking content that are explored in-depth to contribute to the inputs for scenario-building in the COMETS project. This effort has been co-designed among eight COMETS partners involved in Task 5.1, including UNITO, TECNALIA, UB, DTU, VITO, ECOLISE, TREA, and HVL. All partners worked collaboratively to feed a list of around 40 potentially "innovative" cases and, subsequently through a voting exercise using the Delphi method, we narrowed down the list to provide a robust selection of around 20 backgrounds and experiences to learn from. Based on the most recent debate on the potential innovations for CAIs, attention is focused on these 20 cases around the world to be investigated mainly through desktop methodologies and interviews with representatives. The interviews conducted by UNITO provide deeper qualitative knowledge on the nuances faced by CAIs around the world.

The "frontier" cases in this report offer insights into methods and efforts that may have worked successfully or proved futile in the process of community empowerment. In the end, the 20 cases reveal common challenges that many CAIs face in the energy field. In addition to the recent case

[1] International Energy Agency. Net Zero by 2050: A Roadmap for the Global Energy Sector https://www.iea.org/reports/net-zero-by-2050

studies developed in COMETS, both comparative and participatory cases, these “frontier” cases are an added value to the knowledge building that contributes to a more just and inclusive energy system.

RATIONALE

With pressing environmental and energy justice issues motivating citizens to rethink our global energy systems, especially systems that achieve objectives of providing energy access to all, especially low-income communities, and ensuring stable markets while addressing climate change. The toolbox of solutions to a just energy transition must address the nexus of social innovations and economic and technical advancements.

While CAIs develop based on different motivations, they address a common thread: to reconcile economic, social and environmental needs, whether it for the local community or the needs around the world. The measuring of the performance of social innovative CAIs in the energy transition, as envisaged in COMETS, goes beyond measuring the performance of individual CAIs. The goal is to derive robust qualitive estimates for their aggregate contribution to the energy transition which will help to increase the perceived ownership of citizens of the energy transition. This empirical investigation is complemented by qualitative data gathered in selected European countries and around the world looking at case studies at the “frontier” of social innovation.

Frontier case studies aim to highlight dimensions that go beyond the traditional foci of traditional CAI development that often looks at installation capacity of renewable energy sources based on wind, solar, and biomass, as well as energy efficiency implementation. These cases also include potentially innovative ideas for CAI activities, both socially and structurally. This may include implementing low carbon mobility services or opportunities arising from the deployment of crowdfunding and block-chain technologies.

Frontier case studies are meant to be peculiar examples of CAIs that possess unique and innovative features, or unique combinations of some of the features that can be found in other CAIs. In this way, it will be possible to take into account the cases that are more challenging to categorize, and which may possess seeds for future niches to develop. The strength of the COMETS project is supported by the analysis of the frontier case studies and complements the analysis of other established cases.

METHODOLOGY

In line with the dimensions defined in the COMETS Analytical Framework (T2.1. and T6.1) and recalled in the survey design (T.3.1), we selected the most interesting cases from around the world based on the following seven dimensions:

1. **Context of development** (motivations to organize, social movements engaged in, etc.);
2. **Organizational aspects** (decision making and governance, procedures, roles and functions);
3. **Social** (members profile, diversity/social inclusion, gender balance, social networks and community);
4. **Spatial** (rural-urban relationship, geographical coverage);
5. **Evolution** (scaling capacity, trajectories and strategies, diversification of services);
6. **Economic** (innovative business model, funding strategies, blockchain, etc.);
7. **Material** (technologies and energy sources).

Delphi methods for Frontier case selection

The Delphi method is beneficial when the problem at hand can benefit from collective, subjective judgments or decisions and when group dynamics do not allow for effective communication (e.g., time differences or distance).

Phase I: Item Generation

- Survey: Panelists (Task 5.1 partners) were encouraged to share examples of CAIs of interest when referring to the selected seven dimensions of "innovation"
- During Phase I, Panelists used surveys and literature review to generate all potential candidate CAIs associated with dimensions of innovation.
- First, we asked 24 collaborators (Task 5.1 partners) in an e-mailed survey to list all CAIs that, in their experience, presented with some degree of innovation and could represent examples of frontier case studies. The purpose of this question was to help identify potential candidate with ''positive weight''.
- The target number was 40 CAIs to be listed in a database. In the end, 40 examples were inputted for potential interest.

Phase II: Item Reduction

In the phase II, we aimed to have an item reduction guided by the following principles:

- the examples remaining after phase II should demonstrate good face, construct, and discriminant validity as examples of "innovation";
- items should be cover separate domains of "innovation".

To achieve the item reduction, a second survey (survey II.A) was circulated aiming to assess each example generated in Phase I based on the Likert scale (-5 to +5), ranging from (-5) *extremely not innovative* to (+5) *extremely innovative.*

The concept of innovative is subjective by definition and each panelist (Task 5.1 partner) was asked only to range each CAI from (-5 to +5) and eventually add additional comments if necessary.

Mean survey scores for each item (±SD) were calculated and CAIs were ranked from highest to lowest mean score. **The Top 20 Frontier CAIs** were selected for further investigation in this report. The first six ranking Frontier CAIs were considered for an in-depth investigation through interviews. (see Chapter 5 for these in-depth cases)

Voting: a collaborative action among partners:

- At least 1 person from each of the 8 Partner organizations were expected to participate. In the end, we had 14 participants vote on the CAIs.

- Each of the partners reviewed every Frontier CAI on the list by reading each brief description and reviewing which of the 7 dimensions corresponded to each CAI (usually more than one).

  For example, Coop Power in New York. Partners read its brief description on the list and then saw it was aligned with 4 of the 7 dimensions (organizational, social, special, and economic). In the end, this CAI scored the highest with a mean score of 3.9, showing high innovative potential.

- The estimated total time for the entire voting on the list was around 2 hours per partner.

Data analysis

Quantitative data were analyzed using SPSSv26 (IBM, NY, USA). We examined the data distribution of each score by calculating mean and standard deviation of overall scores for each dimension.

- CAIs scoring ≥2 overall were included in the list to be analyzed. (see **appendix B** for details on the list of information to be collected for each Frontier CAI);
- CAIs scoring ≥3 overall were included in the list to be interviewed (see **appendix C** for details on the selected questions presented).

Frontier CAIs identification

Phase I generated 40 candidate criteria, analyzed for 6 items of innovation dimensions.
Using iterative item reduction techniques described in Phase II, we initially reduced these items to 20 potential candidate CAIs. Subsequent item reduction methods resulted in 6 candidate CAIs for interviews and organized into seven domains of innovation (not based on any particular order) 1. Context of Development; 2.Organizational Aspects; 3. Social ;4. Spatial/Geographical; 5. Evolution; 6. Economic/Business Models; 7. Material/Technology.

Table 1: Final list of CAIs to be analyzed/interviewed

CAI name	Location	Delphi results	Delphi Score (mean±SD)	Dimension(s) of innovation #
Co-op Power	MA, USA	Interviewed	3.9±0.8	2,3,4,6
Bristol Energy Community Fund	Bristol, UK	Interviewed	3.3±1,8	2,3
People Power Solar Coop	Oakland, CA	Interviewed	3.0±1.0	2,3,4,6
Nørrekær Enges Vindmølleforeni ng	Denmark	Interviewed	3.0±1.0	3,6
The Coastal Electrification and Women's Development Cooperative (CEWDC)	Bangladesh	Contacted for Interview, not reachable	3.8±1.4	1,2,3,4,6
AiPOWER/	Japan	Contacted for Interview, not reachable	3.7±1.1	1

Fairpla	Münster, Germany	Data collected	3.0±1.3	3,6
Windfang eG	Hamburg, Germany	Data collected	2.9±1.3	2,3
ACOPREV	France	Data collected	2.8±1.1	2,4,7
CoWatt	France	Data collected	2.7±1.0	1,2,3,6
ERE43	France	Data collected	2.6±0.7	2,6,7
Community Power	Co Tipperary, Ireland	Data collected	2.6±1.8	1,2,3,4,5,6
Middelgrunden wind farm	Denmark	Data collected	2.4±1.3	4,7
Cowichan biodiesel Co-op	Duncan, Canada	Data collected	2.3±0.6	1,7
EWS Schönau	Schönau, Germany	Data collected	2.2±0.7	1,3,4,5,6
Hepburn wind	Victoria, Australia	Data collected	2.2±1.5	5
Compile	Križevci, Croatia	Data collected	2.2±1.8	4,6
The Energy Self-Reliant Village Program	Seoul, South Korea	Data collected	2.1±1.9	1,3,4,6

Hackney Energy	Banister House estate, UK	Data collected	2.0±1.5	2,3,6
Conelectricas - Consorcio Nacional de Empresas de Electrificación de Costa Rica R.	Costa Rica	Data not available	3.0±1.6	1,2,3,4

1. Context of Development; 2. Organizational Aspects; 3. Social; 4. Spatial/Geographical; 5. Evolution; 6. Economic/Business Models; 7. Material/Technology.

SELECTED CASES BASED ON THE 7 DIMENSIONS

1. fairPla.net

Location: Münster, Germany
Year of establishment: 2007
Number of members: 760+ members from twelve nations on four continents
Area of activity: Solar, Biogas, Energy Efficiency
MWh/year produced: N/A

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Social	Targeting social justice issues with twin projects in developing countries.
Spatial/Geographical	Based in Germany with projects in several developing countries.
Economic/Business Model	Provider of member-financed international development aid.

Description

fairPla.net is a German cooperative, active internationally, aiming to contribute to climate protection and social justice. Their activities target both reduction of CO2 emissions in industrialized countries and provision of financial and technological support to developing and emerging economies in order to promote climate-friendly development. They consider themselves to be a viable joint venture of people from the global north and the global south.

The cooperative provides the possibility of contributing to investments in renewable energy and energy efficiency projects developed both in developing and developed regions of the world in order to offer a secure, environmentally friendly energy supply, thus creating the basis for sustainable economic development.

The cooperative was founded in 2006 by several energy and development experts from Germany and abroad. Together they contributed to the development of fairPla.net with their competences mostly on a volunteer basis. In spring 2007 another 500 co-founders from four continents joined and by the beginning of 2012 it had grown to almost 800 members from twelve nations on four continents.

fairPla.net is a member of the Climate Alliance Germany, the broad social alliance for climate protection with over 120 member organizations from the fields of environment, religion, development, education, culture, health, youth, consumer protection and trade unions. The member organizations together represent around 25 million people.

Organizational structure

Individuals, companies or organizations become members of fairPla.net by subscribing for one or more shares of € 250 each, plus a one-off flat-rate fee of € 25 and € 12.50 on every third and further share which helps to cover personnel and administrative costs. The membership must be retained for 3 years to guarantee financial sustainability of the cooperative. After this period, it is possible to cancel the membership and have the shares repaid.

The members' shares represent the "share capital" used to make investments in sustainable energy projects in the industrialized north and in developing regions of the south. The general assembly of fairPla.net decided that 10% of the cooperative shares are to be invested as a reserve (liquidity reserve); a maximum of 75% is to be invested in the developed north; that at least 15% is invested in the developing south regions. The rationale behind this choice is to use income from German projects as a guarantee in order to be able to absorb potential losses due to shock and uncertainties in more risky investments in the developing regions, e.g. due to natural disasters, civil wars, etc.

The cooperative shares are invested in long-term energy projects, with paybacks of at least 10 years and expected returns for fairPla.net of about 2% for projects in the developing regions and 4-5% for projects in Germany. The resulting dividend to the members of the cooperative should be 2 - 3% per year. In the first few years, no dividend could be paid out, as fairPla.net first had to offset a loan for start-up financing and start-up losses in the start-up phase - like every company. However, since 2012 it has been possible to discuss the distribution of dividends at the general assembly.

In the respective projects, the money is used as equity by fairPla.net and supplemented by bank loans, additional financial investments and grants in order to create as much benefit as possible for the environment and development.

In addition to the contribution in shares (equity), fairPla.net offers the cooperative members the opportunity to participate directly in solar, energy efficiency or wind power projects at home and abroad. This capital - in addition to the cooperative shares of fairPla.net eG - is raised through so-called "subordinated member loans". As a lender, the members receive annual interest and repayment over the term of their loan, depending on the economic success of the respective projects.

Governance

Members have the right to vote on decisions within the general assemblies and thus influence the development of fairPla.net. The board of directors consists of two people who together fill about 1.5 full-time positions in terms of workload. In the first two years, they were each paid for a half-day position, from 2009-2011 for a quarter position, and they worked on a voluntary basis beyond this. In 2011, the General Assembly decided on a one-time additional bonus payment to the members of the Board of Management. Since 2012, the two board members have been working on externally funded climate protection projects as project managers (one half-day, one quarter position) and their board activities are entirely voluntary. Since 2013, they have been supported by a paid administrator.

Personnel and administration are financed with the cooperative flat rate and with commissions or remuneration from the planning and implementation of projects and, in the long term, from their earnings. The cooperative's shares are not used for personnel or administrative costs; they are all invested except for the reserve.

Projects

fairPla.net works with various partners, both in Germany and abroad[2]. Foreign projects have been and are continuously carried out by competent partner organizations that have the necessary experience on site. fairPla.net is actively involved in the planning phase, while the practical implementation is carried out by the project partner in accordance with the mutual contractual agreements. The foreign projects were each carried out by partner organizations because they have the experience on site. fairPla.net is also involved in the implementation of the project with investments.

The members' capital was used to finance 16 photovoltaic projects in Germany between November 2007 and April 2012, two biomass village power plants in Bihar, India, and a solar project for 1,350 families in the Philippines.

2. Windfang eG FrauenEnergieGemeinschaft

Location: Hamburg and other locations in northwestern Germany
Year of establishment: 1992
Number of members: More than 300 members.[2] Membership has grown over time. In 1995 there were 160 members, in 1998 214 members (400 shares).[3]
Area of activity: seven wind power facilities comprising 10 turbines in total, of which four facilities in the city of Hamburg (Ochsenwerder and Francop) and three North (Hemme) and Southwest (Hüven) of Hamburg.
Windfang also runs three rooftop solar PV facilities, of which a small one on the rooftop of the Bonn Women's Museum, established in 1996. Two larger facilities are located in Beidenfleth (NW of Hamburg) and Saterland (West of Bremen).
MW/year produced:
The seven wind-turbine facilities produced 23,032 MW in 2020. They have produced 181,106 MW in total since production started in 1995.
The three rooftop solar-PV facilities produced 201.3 MW in 2020, of which Saterland accounted for 143.5 MW, and Beidenfleth 56 MW.[4]

Which of 7 dimensions are they aligned with? All seven dimensions

Dimension	Alignment
Context of development	Strong alignment with RE policies in Germany, having installed both onshore wind and later solar facilities in increasingly large sizes. Has received feed-in tariffs under the German Renewable Energy Sources Act that came into force in 2000 and before that under the Electricity Feed-in Act (from 1991). Revenues will fall with the phasing in of a new auction system from 2021. It is unclear if and how Windfang will benefit from this new system.
Organizational aspects	Windfang is a classic cooperative, governed by cooperative decision-making rules and overseen by a regional

[2] List of fairPla.net partners available here: https://www.fairpla.net/index.php?article_id=25&clang=1

	cooperative society. A special feature is that only women can be members.
Social	All members are women, as per the rules of the collective action initiative (CAI). Information on other social aspects is not available online.
Spatial/Geographical	The CAI has RE facilities in both rural and urban areas, but their largest facilities are in urban industrial areas. The CAI covers northwestern Germany.
Evolution	The CAI has expanded their wind power capacity with new and larger turbines and has diversified into large-scale solar PV. Their strategies for future growth or diversification (in light of the new auction-based support system for RE) are not known.
Economic/Business Models	The CAI reads like a classic RE cooperative, where members buying shares in the facilities raise the finance. Members have received more than 4% in return on their investments. In addition, they have also received soft loans for a solar PV facility from a foundation, which has co-invested in the facility.
Material/Technologies	Ten onshore wind turbines (mainly Vestas) and three rooftop solar PV facilities (4.86 kWp facilities using 45 polycrystaline Kyocera modules). The turbines have become larger over time.

Description

History

According to a recent interview with two board members, "we (women) just wanted to have something of our own and show that we can do wind energy and cooperatives ourselves. Our experience from the political groups at the end of the 80s was that men always took on the most interesting positions; we didn't feel like that anymore." [5]

The first 450 kW turbine was built in 1995, in Hemme, Schleswig-Holstein. The second 600 kW V44 turbine (Hüven I) was established in 1997 in Hüven, and in 2000 a V47 was set up in Hüven (Hüven II). The turbines in Ochsenwerder (Hamburg) were built in 1997. Later came more turbines, the latest in 2018.[6] In 2002 the daughter company "Windfang goes solar die erste eG & Co. KG" was founded and a 17,5 kWp solar PV facility was built on the roof-top of a technical school.[7]

Unique attributes

Windfang is an all-women's cooperative. As stated in its statutes, the CAI only allows women to become members. Other legal persons (businesses, etc.) may become members as long as all members/employees/etc. of that legal person are also women.

The wind and solar PV facilities are spread over quite a large area in Northwest Germany, but most are in or near the city of Hamburg. The contact address of the CAI is in the town of Stadtlohn, 330 km southwest of Hamburg.

Ownership structure

Windfang eG is a registered *cooperative* (*genossenschaft*). It is governed by an annual General Assembly (Generalversammlung) of the cooperative members. A Board of Directors consisting of two members runs the daily affairs. A Supervisory Board of seven members controls the board. All

members of these bodies are women. Windfang eG is moreover member of the Weser-Ems Regional Cooperative Society (*genossenschaftsverband*) which controls the business activities or Windfang eG on a regular basis.[8]

Business model

The members are obliged to make a financial contribution upon joining the cooperative. Their financial liability is limited to this contribution. The share cost is €1500 (2015). Members may also participate in the work of the cooperative. Presumably, members buy shares in the different energy facilities. Windfang offers a return on investment of more than 4% to its members.[9]

Renewable energy facilities have received subsidies through feed-in tariffs under the German Renewable Energy Sources Act (the EEG-Föderung) that came into force in 2000, and before that under the Electricity Feed-in Act, which entered into force on 1 January 1991. The EEG is being phased out and replaced by an auction system, which will affect the revenues of Windfang, already from 2021 (see below).[10]

Windfang has received a soft loan for one of its solar PV facilities from the Schwelle foundation, which also owns an interest in the facility.

Qualities that help them to be successful

They see women having a different approach, bringing in so-called female strengths, i.e. cooperation, community ('Gemeinshaft'), and win-win situations, and the ability to network.[11] Members have different skills that they bring to the cooperative. For example, in the supervisory board, there are several engineers who work in different areas (transportation, environment, government) and there is a banker, a teacher and one working with political campaigns. Additionally, many have been active in political movements for years or even decades, also before the CAI started.

Challenges

Government support to renewable energy facilities under the so-called 'EEG-Föderung' is being phased out in 2021. For Windfang, this means that 4000 MW of wind power will be excluded from EEG support in 2021, rendering them largely economically unviable, and another 10,000 MW from 2025. The end of EEG means a general roll-back of renewable energy transition in Germany.[12]

There is a political proposal that operators of renewable energy facilities should pay a fee to municipalities. Windfang does not support this proposal but finds that RE should not be seen as a burden to society and that the AEE (German agency for renewable energy) took initiative for municipal value creation for 10 years. Municipalities already benefit in various ways (tax revenue, employment, profit from own investment). Windfang believes that participation is key to acceptance and it encourages members to participate in and benefit from the success of the CAI.

Another challenge relates to the scarcity of urban space for RE installations. Windfang believes that solar PV should cover the roofs of commercial and industrial buildings, as they are ideal sites for that. Yet regulation is needed to achieve this, e.g., in Bremen PV systems must be installed on all new buildings and roof renovations.

3. ACOPREV (Association Communale de Production des Energies Vertes)
Centrales Villageoises du Val de Quint

Location: Saint Julien en Quint, France
Year of establishment: 2016
Number of members: 88
Area of activity: Solar, Hydro, Hydrogen shared mobility, Storage, Consulting services, Micro-grid services

MWh/year produced: 83

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Organizational Aspects	ACOPREV is two organizations in one: A commercial entity, ACOPREV CV, organized as a simplified joint-stock company (SAS), and an association that has galvanized citizen participation in the creation of ACOPREV.
Spatial/Geographical	Although based in an isolated rural territory with regular electricity transport and distribution issues, they are creating a multi-modal microgrid.
Material/Technology	They intend to put in place a system that synergistically mixes rooftop solar-PV production and hydrogen-based energy storage as a backup power source, and hydrogen-powered mobility through a shared car and a small fleet of bikes.

Description

Created in 2016, the Association Communale de Production des Energies Vertes (ACOPREV) emerged in response to a set of challenges and opportunities present in its territory. Saint Julien en Quint is located in the rural, mountainous department of the Drôme, specifically in the secluded Diois area which is known as a haven for alternative culture and initiatives (also a seasonal tourist destination). In this territory, extreme weather events and geographic isolation create grid problems and the risk of power outages. ACOPREV seeks to reinforce the resilience of the local energy system while contributing to the energy transition. Since the very beginning of this initiative, ACOPREV has been a part of the EU's PEGASUS (*Promoting Effective Generation and Sustainable USes of electricity)* project as a pilot case of a rural micro-grid.

Unique attributes

The primary dimension which ACOPREV innovates is technological. They intend to put in place a system that synergistically mixes rooftop solar-PV production and hydrogen-based energy storage as a backup power source, and hydrogen-powered mobility through a shared car and a small fleet of bikes. Hydrogen would be produced using electricity from the PV modules when their production exceeds their building's consumption. This hydrogen would be used to power spot generators to keep things like refrigerators working in case the grid fails during an extreme weather event, but also to power the shared vehicles that would be available to locals and tourists alike.

Spatially/geographically ACOPREV is taking local energy independence, a common focus of many collective action initiatives, to its next logical step. In an isolated rural territory with regular electricity transport and distribution issues, they are creating a multi-modal microgrid. They hope to expand this model outside of the single town where they are currently based and into the rest of the valley, but not beyond as that would run counter to their vision of locality.

Business model

ACOPREV is also experimenting with a diversified business model, in which it combines revenues from production with services for private households, public authorities, and firms in the domain of installation, tracking, and maintenance of their renewable energy units. In addition, ACOPREV hopes to be one of the main service providers for an eventual rural microgrid in their zone of activity. Over

time, their main revenue source is likely to be services rather than production, with continued funding likely to come from European or French projects and public-private partnerships.

ACOPREV is not one, but two organizations. The commercial entity, ACOPREV CV is organized as a simplified joint-stock company (SAS), which is a very flexible legal form allowing the project a free hand in defining its own governance and operations. The share price is fixed at €100. They have chosen to adopt the 1 person = 1 vote rule common to cooperatives, and the organization is often colloquially referred to as a cooperative. The association, which originally existed to prefigure and organize citizen participation in the creation of ACOPREV, continues to function alongside the commercial entity. This dual function allows people with insufficient revenues to purchase shares in ACOPREV CV and thus participate in governance by joining the association for a nominal fee.

In addition, ACOPREV has decided to join the Centrales Villageoises (CV) network, which is a group of solar photovoltaic cluster-based cooperatives and social businesses mostly within the Auvergne-Rhône-Alpes region. This network was the result of a multi-year experiment carried out by the regional environmental agency, Auvergne-Rhône-Alpes Énergie Environnement (AURA-EE), a semi-public non-profit, from 2011 to 2015. AURA-EE partnered with numerous regional natural parks and sought to create a duplicable model and organizational support structure for citizen solar cooperatives. While requiring participating initiatives to adhere to a set of standards in their quality, governance, and geographic reach, this model has seen a great deal of success with over 50 CV organizations being created or joining the network over the last 8 years.

Qualities that help them to be successful

ACOPREV is well-networked, politically and institutionally. Thanks to the implication of several current and former mayors and their social networks, the organization has had greater access to institutional partners and high-ranking political officials than would have been possible otherwise. For example, they were able to have direct contact with the Minister for the Ecological Transition to lobby for more flexible rules regarding the geographical extent of collective self-consumption projects in rural areas. They have also been helped along by their partnership with AURA-EE on the EU-funded PEGASUS project.

This initiative also benefits from a favorable local cultural context. The *Diois* zone is also known as the *biovallée* (*bio* = organic) and is home to a large number of alternative and innovative initiatives, with a population that is highly engaged in associations and local development projects. The large seasonal tourism industry brings external revenue flows into this otherwise isolated area, meaning that crowdfunded capital is more available than it might otherwise be.

Challenges

Like any new collective action initiative, ACOPREV needs to grow quickly enough to achieve financial and operational stability while the initial wave of volunteer motivation is still carrying them along. They have yet to launch the majority of their planned services, with their current activities mostly limited to production and sale of solar photovoltaic energy (either collective self-consumption or to the grid). These activities are relatively work intensive to put into place and have thin margins, creating a less-than-stable economic base for the rest of the project. Currently, they receive both local public and European support, but this may not be a permanent revenue stream. Developing the service and mobility side of their business model, while challenging, will be key to ACOPREV's success.

4. CoWatt

Location: Pays de Loire (Loire region), France
Year of establishment: June 2016
Number of members: 24 Communities (as of April 2021)

Area of activity: Solar production and selling. 9 solar installations in exploitation. Several in development.
MWh/year produced: 200MWh /year[13]
MWh installed: 640kW[14]; 176kW[15]

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Context of development	The organization was setup by two associations (Alisée and Elise) and partners with five financial partner institutions and nine technical institutions.
Organizational aspects	A regional-scale collaborative project of several departmental-scale non-profits that were already involved in promotion and information services related to the energy transition.
Social	They facilitate and encourage citizen mobilization by providing communities with the tools to seek funds, roofs available and promote the project.
Economic/Business Models	5 main targets that align with their goal of empowering local communities in the production of solar energy.

Description

CoWatt is a citizen cooperative that aims to empower local communities in the production of solar energy, making it accessible to all on a regional scale. The organization was setup by two associations (Alisée and Elise) and partners with five financial partner institutions and nine technical institutions.

CoWatt is a regional-scale collaborative project of several departmental-scale non-profits that were already involved in promotion and information services related to the energy transition. With a few exceptions, the organization does not actually identify and develop solar projects itself. Rather, it serves as a sort of "platform" that local associations or informal citizen groups can use to develop their own projects in their own towns. This allows them to save on some of the fixed organizational costs and gather additional funds, making business plans more viable for these projects. This company is a formal cooperative to which the community members or local associations become members in order to fully own the solar installations and participate in a democratic process (1 person = 1 vote) where a general assembly decides on all strategic aspects of the organization (including dividends).

Since more than 24 energy communities are already part of this cooperative, the governance is one of its innovative aspects as it creates several levels of groups to make communication, discussion, working, monitoring and decision making both effective and democratic. The business model implies the existence of a local community that looks for the local conditions to make a viable solar installation, for local co-investors and creates a local monitoring team for the exploitation of the solar installation. This not only reduces very significant costs of decentralised energy production but, at the same time, empowers the local communities in energy production, consumption, maintenance and awareness. As one of its members said, *a* "thousand roofs would perhaps produce as much as a single huge farm... But a thousand households would care to produce and consume better." Cowatt has the target of installing 1000 solar roofs and engage as many people as possible in local community groups.[16]

The vision of CoWatt is, ”Together, let's produce electricity using renewable energy. With the citizen cooperative CoWatt, installing solar panels on roofs becomes accessible to all!”
The overall target is to Install 1000 citizen solar roofs. “This target of 1000 roofs is reachable after 5 to 10 years, depending on the enthusiasm of the communities.”

Business model

The business model of Cowatt has 5 main targets:

1. Citizens gather in communities in order to invest in citizen renewable energies. They find suitable roofs and mobilize other citizens locally. Then, they join CoWatt by buying shares (100€ each). The solar power plants (3 to 9 kW) are installed on private roofs: a lease is signed between CoWatt and the owner of the roof. The owner of the roof will reduce the annual electricity bill and after 20 years will be the owner of the panels.

2. With the capital provided, the citizen company can carry out the solar photovoltaic installations on sites identified and chosen by the communities.
The installation sites are studied by CoWatt's group of technical experts and if the installation proves to be profitable, the administrative and legal procedures are initiated. To finance the projects, the citizen investment is completed by borrowing from partner banks.

3. CoWatt manages the operation of the installations throughout their lifetime and sells the electricity produced on the network.

4. The profits from the sale of electricity enable CoWatt to operate.

5. The general meeting of shareholders will decide each year on the allocation of the profits generated (remuneration of shareholders, financing of awareness-raising actions, setting aside of reserves, financing of new solar installations, etc.)

Governance

The governance is cooperative with the principle of "One person = one vote" and collegial. This structure also reflects their motto on their website. “We are all co-owners of CoWatt and therefore of all the installations. For the management of CoWatt, the associates (all of us) meet in a General Assembly every year to decide on the major orientations of the cooperative. The associates are also invited to participate in the life of the cooperative within the local communities and within thematic working groups.” [17]

For the regular management of CoWatt, the General Assembly elects a Board of Directors. Its roles include accepting new partners, validating new installations and loans, preparing the annual general meeting, etc. To help CoWatt define these major orientations and innovate, a Scientific and Technical Ethics Committee are set up. Its recommendations are consultative.

To integrate and support the communities and groups, Cowatt has designed mailing lists to discuss issues and working groups that meet periodically to make decisions, shared online storage and working space, social networks for dissemination, clear processes for communication and a detailed kit to explain and support communities in the development of a Cowatt solar community energy project.

CoWatt has two main activities:

- **Facilitate and encourage citizen mobilization** by providing communities with the tools to seek funds, roofs available and promote the project.
- **Ensure the realization, administrative and technical management of the photovoltaic installations** that will remain his property. The collective will rely on local associative, institutional and provider partners.

It is worth mentioning that CoWatt is formally an all-volunteer organization, although they do get staff time dedicated to them by the two departmental non-profits (ALISEE and ELISE) that founded it.

Strengths and challenges

Flexibility, simplicity and mutualization seem to be main pillars of the organization and may constitute its strengths in order to facilitate the engagement of citizens. However, managing communications and fast growth are proving to be challenges for CoWatt.

5. ERE43

Location: Yssingeaux, Haute-Loire, France
Year of establishment: 2001 (creation of the association). 2007 as SCIC (cooperative)
Number of members: does not seem to work by membership.
Area of activity: Solar and biomass
MWh/year produced: There are 18 micro-biomass (last one from 2018), counting 1.92 MW. Most plants are of 100Kw, but range between 60 and 200Kw.
For the rooftop solar, it is standardized at 9kw.

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Organizational aspects	They have 96 associates, which include paid staff, volunteers and representatives of the beneficiaries.
Economic/Business Models	Turnkey and complete services for biomass boilers and solar panels: Installation, maintenance storage. For the wood pellets, the users pay for the heat, and don't worry about any other aspects. The user has a single point of contact for everything.
Material/Technology	Heat production through biomass and renting of rooftops for solar power

Description

In 2001, ERE43 started as an information and sensibilization organization, and conducted advocacy activities with the municipalities. In 2007, after government institutions took over the task of providing information, it became a consultancy to collectivities, individuals, and professionals. In 2008, they started providing turnkey biomass installations (boiler + storage silos) for municipality public buildings under the program 'Modul'R. In 2010 they constructed a warehouse for the treatment, storage and distribution of wood for Modul'R installations. The warehouse also has rooftop solar panels. In 2013 they created a subsidiary called Meteor and in 2016 they launched a solar project.

Ownership structure

Societe cooperative d'interet collectif is registered as a cooperative and a commercial entity for the participation of salaried staff, 'volunteers' and 'beneficiaries'. ERE43 has a capital of €118,900.
Like other cooperatives, they abide by the one person + one vote principle. They have 96 associates, which include paid staff, volunteers and representatives of the beneficiaries.

Business model

Two main business activities:

1. **Heat production through biomass**: the Modul'R program provided a turnkey silo + boiler for collectives, municipalities, and companies. ERE43 states that they are opening the market to shared use of each boiler, which will allow for smaller consumers and potentially households, to participate in the program. The whole process is taken care by ERE43 (through its affiliate Meteor), including maintenances. The user pays to ERE43 for what they consume in heat, with a meter point at the output of the boiler. The fuel is locally sourced chipped or thinning wood. Some wood is sourced from waste wood, for example from forest tending. Other advantages include an infrared camera in the silo that allows to measure the levels of stock and provide on time delivery.[18]

2. **Renting of rooftops for solar power under the project "projet photovoltaique citoyen**". The owner of the rooftop receives a rental fee and needs to be member of the society with at least €3000 of capital. It receives a rental fee of €300 for 20 years. ERE43 provides the financing (including installation and maintenance) of the solar panels. ERE43 then sells the generated electricity to EDF. After 20 years, the owner of the rooftop becomes owner of the installation. All installations are of 9kwc. In 2019 ERE43 decided to put an end to the program. They have no new installations although continue the work with the already installed plants. This is because they have achieved the objectives of the program.[19]

Qualities that help them to be successful

Turnkey and complete services for biomass boilers and solar panels: Installation, maintenance storage. For the wood pellets, the users pay for the heat, and don't worry about any other aspects. The user has a single point of contact for everything.

Use of locally-sourced installations and fuel: the claim of 15 km between wood source and the client, the renting of rooftops is within 10km of the capital of the region. This also provides a revitalization of the area.

Other activities engaged in beyond energy

Information and advocacy on climate change and renewable energy during public meetings and online. They also engage with local institutions, such as municipalities, to make audits and studies about thermic insulations of buildings. They also have a business model that can also be replicated in other projects.

6. Community Power

Location: Co Tipperary, Ireland
Year of establishment: 2000
Number of members: several energy communities across the Ireland (18 according to website)
Area of activity: Renewables, Co Tipperary have Templederry Wind Farm
MWh/year produced: 15 GWh

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Context of Development	Ireland's first community-owned licensed electricity supplier. It took almost 12 years to build their first only wind farm.
Organizational aspects	They catalyse, partially fund and project manage community-owned, renewable energy facilities; They sell electricity to communities and the wider market; They

	provide a meaningful ownership structure for communities and individuals in the renewable energy sector.
Social	Their mission is to actively participate in Ireland's transition to renewable power, developed for people, by the people.
Spatial/Geographical	Working in both urban & rural communities throughout Ireland.
Evolution	It took them almost 12 years to build their first and only wind farm, and it has been operating from the foothills of Slieve Feilim since November 2012.
Economic/Business Modes	Community Power is supported as part of the European Regional Development Fund through Interreg North-West Europe. They provide businesses, large and small, with an ideal opportunity to lead by example in terms of Corporate Social Responsibility.

Description

Community Power is Ireland's first community-owned licensed electricity supplier. They are a partnership of community energy groups working for a sustainable energy future for Ireland. Their mission is to actively participate in Ireland's transition to renewable power, developed for people, by the people. They grew out of Ireland's first community-owned wind farm, Templederry Wind Farm in Co Tipperary, and now are working with Irish communities to develop more renewable energy projects owned by citizens.[20]

It took them almost 12 years to build their first and only wind farm, and it has been operating from the foothills of Slieve Feilim since November 2012. These two turbines are generating about 15 GWh of electricity every year, which is about the amount of electricity used by the town of Nenagh. Now they are buying renewably generated electricity from a handful of small and micro hydro and wind generators across Ireland and selling it to their customers to use in their homes, businesses, farms and community buildings.

Community Power is supported as part of the European Regional Development Fund through Interreg North-West Europe.

As the electricity market moves away from traditional, centralized fossil fuel power stations towards a low carbon energy economy, Community Power is working to promote and develop Local Energy Markets where residents and communities will actively participate in an evolving electricity market of decentralized renewable energy generation, distribution and energy efficiency.

Unique attributes

Community Power is a renewable electricity supplier that looks at the bigger picture, providing innovative solutions for their customers while ensuring service excellence. Their professional service matches their thoughtful approach to environmental stewardship, with an approach that aims to facilitate the concept of ensuring that social, economic, and environmental benefits of community-based energy initiatives stay within the local community.

Their service provision is always undertaken within the context of remaining true to their core values which are: local benefit and building resilience; clean energy; fair prices; democracy and cooperation.

Ownership structure

The Community Power initiative has three components:

1. **They catalyse, partially fund and project manage community-owned, renewable energy facilities, such as solar, wind, hydro and biomass.** They provide communities with optional PPA's (power purchase agreements), so they can sell their excess electricity, thereby improving their revenue stream from their power plants.

2. **They sell electricity to communities and the wider market.** Their contracts have no early termination clause, which means customers are free to leave whenever they wish without penalty. Their community ethos and their service level agreements are the strengths that bind them to their customers – who in most cases are also their owners.

   They provide businesses, large and small, with an ideal opportunity to lead by example in terms of Corporate Social Responsibility. Every euro spent and every kilowatt hour of electricity used – facilitates the development of additional community owned renewable energy generation facilities, in their neighborhood, and around the country.

3. **They provide a meaningful ownership structure for communities and individuals in the renewable energy sector**. This helps to ensure that the surplus revenue generated stays in the communities, thereby buttressing the local circular economy.

They are looking for communities and people who share their vision of community and citizen owned renewable energy in Ireland. Taking part of renewable energy development in Ireland is possible by renewable energy projects. If there is development of a solar farm, ownership of these initiatives will be open to the communities and citizens of Ireland, with priority to those living nearby, to allow all shares in the returns and benefits of renewable energy.

All renewable energy projects are developed as individual legal entities and will be built on co-operative principles based on voluntary and open participation, will be autonomous and will be effectively controlled by shareholders or members that are located nearby.

Qualities that help them to be successful

They have taken part in the first auction of Ireland's Renewable Electricity Support Scheme (RESS) in September 2020 which has proven to be successful. The RESS is the new state funded program which enables communities to become involved in energy generation projects. This scheme will provide support for the sale of solar electricity to the Irish market for the first time. Significant revenue streams can accrue to communities annually via such projects. The state guarantees that successful RESS projects will have their electricity output presold, at fixed prices, for upwards of fifteen years. Therefore, the economic viability of the projects can be validated, de-risked and made bankable even before construction takes place. Communities now have an opportunity to lead in the decarbonization of Irish society and its economy.

Community Power is assisting urban & rural communities throughout Ireland to become involved in the RESS program. The first RESS program (RESS-1) commenced in 2020 when Community Power was successful in assisting Claremorris Energy Coop in Mayo and Dunmore Energy Community in Galway to get through the auction. These two communities will commence building their solar parks in 2021 and transmitting power to the national grid in 2021/2022, with revenue flowing back into the communities.

Community Power is also working with excellent community energy organizations like Energy Community Tipperary Co-operative, Aran Islands Energy Co-operative, Tait House Community Enterprise, Claremorris and Western District Energy Co-operative.[3]

7. The Middelgrunden wind project

Location: Copenhagen, Denmark
Year of establishment: 2000
Number of members: 10,000 local private investors
Area of activity: Offshore wind
MWh/year produced: 99,000 MWh

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Spatial/Geographical	The world's first part-community-owned offshore wind farm, and one of the largest offshore projects in the world at the time of construction.
Material/Technology	Technical performance of the wind turbines. Also, no visual overlap of the turbines, thus avoiding the messy 'criss-cross' of turbines and blades when such projects are normally viewed from various angles.

Description

The Middelgrunden wind project was the world's first part-community-owned offshore wind farm, and one of the largest offshore projects in the world at the time of construction. The original idea of building a high-profile windfarm, visible from Copenhagen, was first shared publicly by a group of experts and wind enthusiasts in 1993. Final construction began in 2000 and the farm came online in 2001 and still remains operational 20 years later.

Unique attributes

The project is unique in various ways, both technically and organizationally. The Danish Energy Authority approved the project in mid-1999, following years of planning, technical assessment and business model design. The final ownership and governance structure saw the municipal Copenhagen Electricity Services and the Middlegrunden Wind Turbine Co-operative create a 50/50 joint venture to finance and own the project. They appointed the SEAS Wind Energy Centre as the project manager and technical adviser.

The semi-circular layout of the 20 x 2MW turbines was intended to ensure an aesthetically pleasing effect. Specifically, this means there is no visual overlap of the turbines, thus avoiding the messy 'criss-cross' of turbines and blades when such projects are normally viewed from various angles. This was a deliberate decision, aimed at helping secure public approval, as the expense of the marginal efficiency loss.

Qualities that help them to be successful

Stakeholder consultation and local buy-in was central to the design, implementation and success of the project, where the developers claimed to have been in contact with up to 100,000 people who

[3] Community Power Ireland. https://communitypower.ie/our-communities/

provided inputs, views and opinions. This was crucial to helping overcome local opposition, which is a well-known barrier to wind project development, but also to actively generate political support for the project, from the ground-up. Indeed, many of the local residents and organizations who were involved in project development - and who had previously no knowledge or particular interest in wind power - ended up being key advocates and lobbyists in favor of the project. For example, successful public petitions were submitted to the City Council to overturn decisions that initially supported the opposition to the siting of the project by the Danish Society for the Conservation of Nature.

In part, it could be argued this was the consequence of the financial incentives offered to residents who were given the opportunity to buy shares in the project. However, the lobbying success depended upon - and tapped into - something larger and ideological about the future role and importance of offshore wind and positioning Denmark as the globally leader in this specific technology (which it now is). Indeed, this was part of the plan and strategy of the project developers who were made up of passionate wind power advocates who understood the need for, and power of, local buy-in and ownership. Both politically and financially.

Ultimately, the Cooperative sold approx. 10,000 shares to local private residents in Copenhagen and demand for shares exceeded supply. These make up 50% of the overall project ownership. From a top-down and political perspective the Mayor of Environment for Copenhagen city council, Bo Kjeldgaard, was instrumental in helping the project developers secure final approval.

Business model

The business model is a 50/50 revenue-sharing agreement between the cooperative and public utility, who signed a long-term power purchase agreement with the local grid operator, supported by a structured feed-in tariff that guaranteed minimum income for each MWh supplied to the grid.

Overall the project is widely regarded to have been a success, in terms of technical performance, the governance structure and business models. The project was also a political success in terms of securing public support for offshore wind and providing an important, and somewhat symbolic, example of how the technology can deliver clean and reliable power without disrupting or risking life or commerce so close to a capital city.

As one of the oldest offshore wind farms in the world, Middelgrunden is also one of the first to require restoration and replacement of hardware. To that end, in late 2020 and after almost 20 years of continuous power generation, the Danish utility company, HOFOR, was issued a contract to conduct work aimed at extending the project's service life, possibly for another 20 years.

8. Cowichan Bio-Diesel Co-op

Location: Vancouver Island, Duncan, Canada
Year of establishment: 2005
Number of members: 200
Area of activity: Biodiesel made from recycled cooking oil.
MWh/year produced: N/A

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Context of Development	The Guiding Principles: Ethically produce and distribute sustainable fuel alternatives; Provide a community source for recycling local supplies of waste vegetable oil; Stimulate local economic activity by producing bio-diesel and supplying it at a reasonable and justifiable price; Ensure a

	stable, high-quality and local fuel supply; Share information about community-based biofuels to the wider community; Provide a strong voice for sustainable fuel production and use.
Material/Technology	Biodiesel from recycled cooking oil.

Description

The Cowichan Biodiesel Co-op is "a community owned and operated non-profit organization dedicated to the local production, use and promotion of biofuels in order to achieve an ethical and environmentally sustainable local economy. The Cowichan Bio-Diesel Co-operative (CB-DC) has been supplying 100% biodiesel made from recycled cooking oil to all its members as a petro-diesel alternative since 2005." [4]

Governance

Cowichan Biodiesel is a cooperatively owned and managed. Members have voting rights in annual and other General Assembly meetings as well as access to other benefits like fuel discounts.

In the past, only members could have access to the biodiesel produced, but in 2019 they opened the offer to the general public.

The main motivation, and practically the only one, for the members to join is that they believe that the use of biofuel is healthy, localized, sustainable and good for the environment. An important communication campaign has been needed though, in order to eliminate the barrier caused by the users concern that the biodiesel might damage their engines.

Ownership structure

The cooperative is composed of individual members as well as corporations and organizations, like Cruise Victoria Services bus lines (CVS), a sightseeing and tour operator. These kinds of members are the ones that have helped the cooperative to scale up. At the time they joined the cooperative and were the only company in North America running a major fleet of buses on biodiesel fuel.

Initially, the waste vegetable oil was collected from local restaurants in the region and then it was processed in the Cowichan Biodiesel Cooperative's processing facility. As CVS started to increase their demand for biodiesel fuel by switching to the use of 100% biodiesel, the Cowichan Biodiesel Cooperative came up with the opportunity of collecting the waste vegetable oil from the 220 cruise ships that dock at Ogden Point in Victoria every year, and that was enough to satisfy the demand.[21]

The Cowichan biodiesel cooperative started small, selling biodiesel made from waste vegetable oil in jugs at a farmer's market in 2005. Since then, they have been scaling up successfully and in 2019 they were proud to announce the opening of the second biodiesel pump in the city of Duncan, BC and are already planning to open a third one.[22]

Qualities that help them to be successful

One of the key elements for this successful evolution is the partnership with Greasecycle and the Cowichan Energy Alternatives Society (CEA). Greasecycle is an employee owned enterprise which is in charge of collecting the oil. They seek for agreements with local schools, universities, malls and restaurants and have a free pickup service. The CEA supports the creation of sustainable local energy projects and also runs a biodiesel production and distribution social enterprise in Duncan,

[4] Cowichan Valley's Local Biodiesel Provider - Home (cowichanbiodiesel.org)

BC. CEA also launched the Vancouver Island Biofuel Network (VIBN), which focuses on encouraging collaboration instead of competition between biofuel companies.

These partnerships support the growth of BC's biofuel industry as a regional component of the larger British Columbia Biofuel Network.[23]

As they described in their online materials:
"The BC Biofuel team has brought together over two dozen organizations, including the Province of B.C., several regional governments, for-profits and non-profits who are working to bring waste cooking oil in British Columbia full circle back to the communities it is used in. The results currently are nearly 500 British Columbians and organizations, who are members of a series of Biofuel Co-operatives, purchasing Biofuel through card lock systems and pumps and who are creating a positive impact on the environment, reducing Greenhouse Gases, reducing pollution, and reducing or eliminating harmful asthma causing exhaust all over B.C." [5]

As a consequence of this, British Columbia is emerging as one of the fastest growing and most advance biofuel communities on the planet. Due to this, Cowichan Energy Alternatives was chosen to host the 2011 International Collective Biofuels Conference.[24]

9. Elektrizitätswerke Schönau – EWS (Electricity Works Schönau)

Location: Schönau, Germany
Year of establishment: 1994
Number of members: Approximately 185,000 electricity users in about 800 grid areas; 11,000 natural and biogas customers.
Area of activity: Mainly solar electricity as well as power being fed in from a large number of small cogeneration units. EWS both produces and distributes electricity and natural biogas.
MWh/year produced: In 2015 they produced **5,892.96 kW**, including 21 cogeneration plants (814.7 kW) and 19 PV systems (5,078.26 kWp)[25]

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Context of Development	Founded through extensive community engagement and mobilization since the Chernobyl nuclear disaster. It took 10 years to obtain license to distribute electricity when the market was dominated with 4 big companies and still not open for competition.
Social	Decentralized generation of production with multiple sourced energy; Strong involvement of the community; Ability to communicate and engage with people in innovative ways. Also focuses on energy justice issues.
Spatial/Geographical	Provides local training and education initiatives and energy projects in developing and emerging countries.

[5] Cowichan Valley's Local Biodiesel Provider - Home (cowichanbiodiesel.org)

Evolution	Evolved from anti-nuclear activism to raise awareness about nuclear and exchanging with other citizens of Schönau on how to cut electricity consumption. They eventually gained the legal right to operate the local grid.
Economic/Business Models	Cooperative members are guaranteed a profitable investment. Also, a significant percentage of EWS's profits is reinvested in small-scale citizen energy projects and in innovation projects.

Description

ElektrizitätsWerke Schönau (EWS), a community-owned energy cooperative, was founded through extensive community engagement and mobilization over many years.

History

Starting around 1986, after the Chernobyl nuclear disaster, a group of local citizens from Schönau, a small town in south Germany, created a group called "Parents for a nuclear-free future". Initially their aim was to raise awareness about nuclear and exchanging with other citizens of Schönau on how to cut electricity consumption.

Over the next 10 years, this local action group raised funds, galvanized action from Schönau's 2,500 citizens, mobilized local momentum and awareness, took the incumbent distribution company to court and won two local referendums. Eventually in 1995, they gained the legal right for EWS to operate the local grid.

With the liberalization of the electricity market in 1998, EWS started to provide electricity nationwide. Since then, the group's vision has grown broader and EWS not only wants to create a fair and just, sustainable energy supply system, free from nuclear power, but it also actively encourages people to take action and advance the participation of individuals and community in the clean energy distribution in Germany and beyond.[26]

Unique attributes

- Decentralized generation of production with multiple sourced energy;
- Strong involvement of the community;
- Ability to communicate and engage with people in innovative ways.

Ownership structure

EWS is a cooperative owned by more than 6000 members with a capital shares of € 37 million.

Business model

EWS business focused on citizen energy. It takes the form of a cooperative subsidizing renewable energy systems but also aims to reduce electricity consumption and support the operation of climate-friendly cogeneration units. It provides its prosumers (customer-producer) with the option of funding the installation of power plants by acquiring shares in the cooperative.[27]

The EWS has devolved a business model where cooperative members are guaranteed a profitable investment. However, the main reason to join is not the financial reward. First, a significant percentage of EWS's profits is reinvested in small-scale citizen energy projects and in innovation projects and, secondly, the shares that a new member can buy are limited to € 1200. This aims to discourage members from being only interested in the money, but to be committed to the wider cause of clean energy and energy justice.[28]

Qualities that help them to be successful

- **Unconventional methods of public engagement**: This includes electricity-savings competitions, awards showcases, and documentary films that can capture the attention of the citizens and contribute to transform behavior.
- **Broadening the narrative:** EWS has emphasized the benefits of the energy transition in terms of community regeneration, green jobs, cost of living, and quality of life, both internally within its membership and externally.
- **An experimental and learning mindset:** This forms part of the culture, whether it is in financing new technologies or supporting other local grassroots community energy initiatives.
- **Persistency to act in a very complex and regulated environment:** It took 10 years to obtain license to distribute electricity when the market was dominated with 4 big companies and still not open for competition.

Challenges

EWS has turned into a large cooperative and it's impossible for its many members to be involved directly—a key characteristic of both the cooperative idea and citizen energy in the first place.

Other activities engaged in beyond energy

- **Political agenda**: including campaigns against nuclear energy and contributing to the current political debate over amendments to existing energy legislation;
- **Actively contributing to the growth of the environmentally driven initiatives network:** by organizing seminars, for example, and attracting people who share common interests and join forces to implement innovative projects.
- **Supporting other initiatives:** This includes a number of local training and education initiatives and energy projects in developing and emerging economies.

10. Croatian Green Energy Cooperative (ZEZ)

Location: Križevci, Croatia
Year of establishment: 2019
Number of members: 40
Area of activity: Solar
MWh/year produced: PV system of 30 kW

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Spatial/Geographical	On the roof of the local public library fully financed by the citizens under the micro-loan business model.
Economic/Business Models	Crowdfunding with 50+ small investors. For the EV charging station, they attained co-financing and installation is in progress.

Description

Croatian Green Energy Cooperative (ZEZ) wanted to encourage Križevic citizens to produce solar energy together with them. They wanted to encourage citizens to invest in projects that have a

positive impact on society and the environment. In order to reduce dependence on energy or energy imports, they aim to continue with the goal of keeping energy in the hands of citizens.

The mission of ZEZ is to assist citizens in the development, investment and use of renewable energy sources. They develop concrete and sustainable solutions that promote the development of local communities in Croatia.

Ownership structure

Organized by ZEZ, the power plant launch event brought together citizen investors and other locals who had the opportunity to find out what are the options for establishing an energy community aimed at creating energy self-sustaining public spaces. The event and the establishment of the energy communities are a part of the Horizon 2020 project, **COMPILE.** The participants expressed their interest in actions on the local level through the new energy communities and to be engaged as co-creators of local policies and projects for community benefit.

The goal of the Križveci pilot site is to establish an energy community that would replicate the success of crowdfunded PV plant on the urban technology development center, a technology park with new actions for further investments in RES, especially PV. An additional goal is to use COMPILE tools to increase self-sufficiency of the technology park and support the operation and management of EnC through blockchain technologies.

After the successful realization of the first solar power plant on the Technology Park through a group investment campaign in which 53 citizen-investors invested in a short period of 10 days, ZEZ launched a new campaign within the project, **Križevci solar roofs**. They encouraged citizens to use their funds, according to the model of micro loans, to finance a solar power plant on the roof of the **City Library "Franjo Markovic"** in Krizevci.

Unique attributes

On the roof of the Public Library Franjo Marković is a 30 kW solar power plant, which was fully financed by the citizens under the micro-loan business model. A total of 40 citizens have decided to support the solar power plant by giving a micro loan to the ZEZ for a period of 10 years, within which their interest will be repaid at 3% per year. The solar power plant started to produce green energy on 4 October 2019. The required amount of HRK 172.000 (ca. €23.000) for the installation of a solar power plant on the roof of the library was collected in a record time of 48 hours. The stakes in the solar power plant were limited to a minimum of HRK 1.000 (ca. €135) and a maximum of HRK 7.500 (ca. €1.000) in order to involve as many citizens as possible.

Photo credit: ZEZ

With the funds from the loans, ZEZ bought a solar power plant and placed it on the roof of the City Library "Franjo Markovic" in Križevci. Based on the contract, the cooperative will receive compensation from the power plant users for a period of 10 years. The fee is fixed and equal to the amount of anticipated savings in electricity consumption, achieved by the operation of the solar power plant. The same fee will be used to repay the interest-bearing loan to all investors.

From October 2020, the COMPILE pilot site in Križevci, led by ZEZ, installed an EV charger connected to the grid. The public charging station model is from the ETREL company that builds the stations to accommodate two vehicles at a time with 2 x 22 kW maximum charging power. This provided by partner ETREL and installed in cooperation with PETROL branch in Croatia.

The installation of the EV charger goes in line with the installation of two solar power plants (on TechPark and public library) and investment into a battery storage system which is planned to arrive

shortly after that. All mentioned activities are aimed to reach the milestone of pilot site Križevci being operational in early 2021.

Business model

Activities: Crowdfunding actions

- PV plant on Technology Park. 30 kW (crowdfunded in 10 days, 50+ small investors)
- Heat pump for heating and cooling the TP
- PV plant on Library. 30 kW set from Aug (crowdfunded in 2 days, 50+ small investors)
- EV charging station – attained co-financing. installation in progress

COMPILE positive results

1. As a result of COMPILE, Križveci EnC took form of an energy cooperative
2. Citizens + Municipality support, planned involvement of local SMEs and NGOs
3. Started in early 2020 and already developing new RES projects and attracting new citizens and investments

Križveci slogan: "As early as tomorrow, it could be another power plant in your city or neighborhood. It can be a power plant in a kindergarten or school where your children go, in a health center or a culture center. By producing your own energy from renewable sources, your electricity bills are reduced and more revenue remains available to invest in other good things your local community needs.*"* [29]

11. Hepburn Wind Cooperative

Location: Daylesford, Victoria (Australia)
Year of establishment: 2007
Number of members: 2000+
Area of activity: Wind and Solar
MWh/year produced: 10,000 MWh.

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Evolution	First community owned wind farm in Australia and now working to make Hepburn emission free by 2030.
Context of development	Originally a wind park development proposal received strong community opposition, much to the disappointment of a small group of Daylesford residents. Later an association was formed to garner local support for the wind park. It did this through a broad range of educational activities, including community forums, personal visits to neighborhoods, informational meetings, etc.

Description:

Hepburn Wind is the owner and operator of Australia's first community-owned wind farm, at Leonards Hill, about 100km north-west of Melbourne. The 4.1 MW wind farm hosts two turbines called Gale and Gusto, who produce enough clean energy for over 2000 homes.[30]

Hepburn Wind is the trading name of Hepburn Community Wind Park Co-operative Ltd, a co-operative registered in Victoria, Australia. Hepburn Wind was established in 2007 by the Hepburn Renewable Energy Association, now known as SHARE.[31]

The wind farm is owned by the local community through Hepburn Wind. The cooperative manages the wind farm, provides financial returns to its members and funds community projects through a community fund.[32]

History

In late 2005, a wind farm developer held a community consultation meeting regarding the proposed Clarkes Hill wind farm. The development proposal received strong community opposition, much to the disappointment of a small group of Daylesford residents. Instead of accepting the community's negativity and rejection, this group decided to pursue the idea further.[33]

Local architect and Daylesford resident, Per Bernard, formed a steering group and began looking for wind developers who might be interested in the community cooperative model. Most were not interested in building such a small wind farm for a group with no industry experience and no money. However, one developer referred Mr. Bernard to niche developer Future Energy, a company focused on development of small to medium-sized renewable energy projects. Future Energy had already identified Leonards Hill, near Daylesford, as a suitable site.[34]

Backed by a local steering committee, Bernard formed an agreement with Future Energy whereby attempting to develop a community-owned wind farm, with Future Energy coordinating project development and advising the community. Bernard's steering committee would build local individual and organisational support. Future Energy agreed to take on much of the early financial risk in exchange for a development fee.[35]

The wind park cooperative was established by the Hepburn Renewable Energy Association, now known as the Sustainable Hepburn Association – Renewing the Earth (SHARE). The association was formed to garner local support for the wind park. It did this through a broad range of educational activities, including community forums, personal visits to neighborhoods, informational meetings, bus tours, festival displays, newsletters and fortnightly street stalls in Daylesford's main street. The amount of energy, goodwill and commitment that went into this exercise is immeasurable.[36]

Ownership structure

Hepburn Wind is a cooperative that is run democratically, whereby each member has a single vote, regardless of the number of shares they own. In Hepburn's case, while members expect to receive dividends from a profitable wind farm, they also want the benefit of producing emissions-free electricity as well ensuring benefits for the entire community.
Hepburn Wind is governed by a board of seven directors, elected by the member shareholders at the annual General Meeting on the basis of the cooperative principle of 'one member, one vote'. All members 18 years and over may be nominated for a directorship in the period prior to the Annual General Meeting.[37]

Unique attributes

a) **Community engagement evolution**
   Hepburn Wind were pioneers in Australia. In their origin, they had to fight against a strong opposition from the community and 11 years later, in 2018 they launched a project to make the Hepburn Shire the first zero-net emission shire in Australia by 2030. The project is Co-developed with the local community and various research, industry and technical stakeholders.[38]

b) Community Fund

They believe that the community Fund is the most generous community fund in the industry (on a per turbine basis), by an order of magnitude. They donate more to the community than they pay in lease fees to the landowner at Leonards Hill.[39]

Business model

Traditionally, most wind farms enter into long term Power Purchase Agreements with a retailer. At the time of developing the project, the board determined that the prices on offer were not reasonable and chose instead to sell the energy at the market price. As such they are exposed to full price and volume risk.[40]

Market prices in the National Electricity Market are set in a form of auction every 30 minutes throughout the day. At times of high demand prices can be well over $1000 per megawatt hour and when demand is low the price can even go negative. Hepburn Wind accesses the energy market through an offtake agreement with Red Energy.[41]

Hepburn Wind's electricity partner is Powershop, who pay for the output of the wind farm at the prevailing National Electricity Market price. Hepburn Wind and Powershop have collaborated to create an electricity retail product.[42]

Profits from the project remain in the community as dividends returned to investors and through the Community Fund. From conception, Hepburn Wind has been determined to ensure that the entire community, beyond the investors, will benefit from the project.

As such, they have committed to establish a Community Fund which will fund projects that contribute to strengthening the environmental, wellbeing, recreational, cultural and educational sustainability of the local area. The project has committed to contribute $15,000 per turbine annually into the fund. With indexing, this will total more than $1m over the next 25 years. They also have a unique arrangement with their retail partner Red Energy which grows their community fund and are actively working to develop other revenue streams to allow them to increase this commitment.[43]

What have helped them to be successful

a) Finding appropriate partners

Managing the development of a major infrastructure project of this nature is a significant challenge for a community group in which much of the work and governance is undertaken by volunteer directors.

In the early stages of the project, the relationship with Future Energy provided essential professional and project management expertise. As the project progressed it became important for the board to be able to draw directly on specialist expertise in areas such as network connection, contract negotiation, project management and the legal issues surrounding fund-raising.

An important lesson for future projects is the need to retain flexibility to bring on appropriate partners at different stages of project development as needs are identified.[44]

b) Governance arrangements

Delivery of the project required more than 30 commercial arrangements to be struck, most of which have long term implications for the project. The project must also comply with a wide range of regulations, permit conditions and technical requirements.

Hepburn Wind's structure means that the ultimate responsibility for the project rests with the board of directors. In addition, Hepburn believes that its status as a community cooperative adds an additional layer of governance in the form of a social contract with the community.

It is not possible, nor desirable, for these responsibilities to be delegated to a third party. At all times, contractors must be ultimately accountable to the board and the board must be ultimately responsible for the entire project.[45]

c) Communications capability

Hepburn Wind is particularly proud of the high level of communication maintained with the community throughout the project, in the form of street stalls, public events, speaking engagements, media releases, newsletters, wind farm tours, and general accessibility via email and telephone.

Maintaining high levels of communication requires significant organizational and financial resources.[46]

d) Administrative capacity

Throughout the project, Hepburn's board members contributed an enormous amount of unpaid time and expertise to the project. While this has been invaluable, the demands of the project have placed an unsustainable load on many directors at various stages of the project. In addition, the fragmented nature of volunteer hours means that a project of this complexity is beyond the capability of a purely volunteer organization.

Hepburn identified the requirement for administrative staff in early 2009 and fortunately was in a position to fund the engagement of their first staff member out of the interest accumulating on the share capital raised.

This enabled the project to move forward much more quickly and professionally. Hepburn would recommend that future projects hire staff much earlier in the project.[47]

e) Fundraising

Raising the required capital from members took longer than anticipated, in part due to the global financial crisis as well as the challenges of a model that did not have a track record in Australia.

The announcement at the end of March 2011 that the share price would rise on 1 July 2011 was an important contributing factor to the success of the final capital raising push for the project. From this experience, Hepburn learned (later in the process) the power of an impending share price increase as a call to action for prospective investors.

Other groups considering similar types of capital raising should give careful consideration to mechanisms that will reward the crucial early investment and ensure momentum throughout the capital raising period and to adequately address the risk-reward balance at different stages of project development.

Capital raising is a specialist skill. While Hepburn Wind was ultimately successful in raising the required funds, they now appreciate the value of specialists. Future projects may want to consider engaging professional capital raising support, especially if this opens up avenues for project underwriting.[48]

f) Community investors

The project has shown that the community is prepared to invest significant capital in local infrastructure, provided that local benefits are created. During the course of the project, they have demonstrated that a new class of investor is emerging, the community investor, who may be characterized as having:

- modest return expectations — prepared to accept a slightly lower rate of financial return than institutional investors, offset by an increased expectation of non-financial returns;
- generally modest sums to invest — notwithstanding that a significant proportion of funds came from self-managed superannuation;
- risk averse;
- no appetite for capital loss;
- high levels of patience;
- a high requirement for communication;
- a high expectation of transparency.[49]

Challenges

Like many cooperatives face in the early development stage, financing and getting a fair price for electricity were some major early hurdles to cross. The difficulty in obtaining grid access and the

costs associated with the connection created more challenges, as well. Additionally, having access to skills and knowledge, along with community support, is another challenge they faced.
As the pioneers in sustainable community energy in their region, Hepburn Wind faced the challenge of improving knowledge and understanding of Renewable Energy Communities.[50]

12. The Energy Self-Reliant Village (ESV)

Location: Seoul, South Korea
Year of establishment: 2012
Number of members: 100 ESVs were part of the program (as of December 2018)
Area of activity: Subsidies for solar and collective energy savings. Information, advocacy and formal administrative support, living labs, 'Energy supermarkets' where micro PV panels and energy efficiency devices are sold.
MWh/year produced: 2.99 million kilowatt-hours (kWh)[6]. Electricity consumption was cut by 15 percent. (data from the end of 2018)

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Context of Development	The Seoul Metropolitan Government (SMG) launched the One Less Nuclear Power Plant initiative in 2012 to reduce electricity consumption and produce more renewable, matching the output of nuclear power plants. The Energy Self-Reliant Village (ESV) is a flagship of this program.
Organizational Aspects	The SMG provides the support for collective action initiatives in the energy field. The program and its participants are embedded in a larger constellation of collective actions. They can access additional support from other Municipal projects, such as financial support in the form of subsidies for mini solar PV installments, FIT for small-scale PV, and low-interest loans for building retrofits.
Social	523 rounds of energy-saving education classes took place at 66 energy self-reliant neighborhoods in 2017. Representatives from 'graduated' ESVs have formed new cooperatives
Spatial/Geographical	Mostly urban space.
Economic/Business Model	The ESV encourages collective action through financial, administrative, and informational support.

[6] Data from 2017 https://www.koreatimes.co.kr/www/nation/2018/12/281_260590.html

Description

History

In 2011, Seoul's electricity consumption was 41,824 GWh, 10.9% of the national total. However, only 2.95% of Seoul's electricity needs were generated in the city. The Seoul Metropolitan Government (SMG) launched the One Less Nuclear Power Plant initiative in 2012 to reduce electricity consumption and produce more renewable, matching the output of nuclear power plants. It is now at its second phase, lasting until 2022.[51]

The Energy Self-Reliant Village (ESV) is a flagship of this program. It encourages collective action through financial, administrative, and informational support. It first focused on energy savings, then energy efficiency measures, and finally on energy production.

In Seoul, communities were dismantled after fast population growth and urbanization. Collective Action initiatives were rarely created before 2012. The Seongdaegol project is considered the birthplace of energy self-sufficiency. Starting in 2010, its success inspired the ESV program.[52]
The program is fast growing: 7 ESVs in 2012, 66 ESVs in 2016, 80 in 2017, and 100 by the end of 2018. The aim was to have 140 ESVs by the end of 2020.

In 2014, including through other programs, the city had committed to reach a 20% self-sufficiency and reduce consumption by 10Mtoe. No figures have been reported beyond 2018.

Unique attributes

The municipal institutionalization of collective actions: This gives support to create communities in an environment where the heterogeneity of the population (economic, social), and lack of interpersonal links, or "shared emotional connection", and no established collective actions make the spontaneous creation of community actions difficult.

The program and its participants are embedded in a larger constellation of actions. For example, Seoul's Community Building Project aims to restore resident-driven activities, such as community cafés or communal child-care, and the ESVs. They can access additional support from other Municipal projects, such as financial support in the form of subsidies for mini solar PV installments, FIT for small-scale PV, and low-interest loans for building retrofits.

Ownership structure

Seoul Metropolitan Government provides the support. Each ESV has its own structure and size.

Business model

The ESV encouraged collective action through financial, administrative, and informational support. There are 4 stages of an ESV program: (1) project preparation, (2) project selection, (3) implementation, and (4) evaluation. Each incipient initiative needs at least 3 local residents. They receive support on how to build their plans and increase the team. After the plan is reviewed, they can receive support through consultants and members of experienced ESVs to make it stronger. They can receive a 3-year subsidy. At the end, they "graduate" but can still receive non-financial support.

In 2018, 73 out of the 100 ESVs were receiving the three-year subsidies, which range from 5 million won (€3,700) to 30 million won (€22,000). The budget for that year was 1.1 billion won (€8 million).[53]

Qualities that help them to be successful

The comprehensive and robust support: subsidies; administration and permits; information and trainings including leadership and organizational skills, advice and consulting, mutual support with other ESVs.
The complementarity with support: this stems from other municipal initiatives on community generation and energy savings and renewable generation.

Additionally, the program is formalized with ordinances, providing a level of trust and guarantees to the communities.

Challenges

Lack of skills: Despite the support, there still remains a lack of skills: technological, legal, financial, political, physical, and organizational.
Additionally, the subsidies are insufficient to ensure financing of new projects.
Limited time: Seoulites have limited free time. In fact, South Korea ranks third among OECD countries in terms of amount of working hours. Leaders and key members might drop-out, change of leadership is identified as causing the dissolution of ESVs.
Space: Seoul has a high density of buildings, with little available spaces for PV panels.
Program requirements: The evaluation criteria require continuous enhancements in the projects to be kept in the program. This constraint discourages some citizens.
Program support: As the program relies on municipal support. Mayor Park (in power since 2014) died in 2020. This program might not be a priority for new Mayor.
The electricity market: As the electricity market is shaped by the central government, this can undermine the effort of Seoul's Municipalities. For example, after a change in the progressive electricity tariffs, it was less interesting economically to engage in savings and self-generation.

Other activities and impacts

523 rounds of energy-saving education classes took place at 66 energy self-reliant neighborhoods in 2017. Representatives from 'graduated' ESVs have formed new cooperatives.[54]
ESV leaders and the Seoul municipality participate to international conferences and exchanges with other cities. Notably, Seoul is part of the C40 a network of megacities committed to addressing climate change. Two of the ESVs have received prizes from the C40 for their success.
Promotion of local economy: This is especially through the creation of Energy Supermarkets where micro PV panels and energy efficiency devices are sold.

An objective of Seoul's goals on self-reliance is to reduce the environmental impact and social tensions in regions where electricity is generated. There is replicability in other countries and metropolitan areas in Asia (e.g., Taiwan, Hong Kong).

13. Hackney Energy/Banister House Solar

Location: London (Borough of Hackney), United Kingdom
Year of establishment: 2014
Number of members: N/A
Area of activity: Solar
MWh/year produced: 82,000 kWh/annually

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Organizational Aspects	UK's largest community energy project on social housing.
Social	An advocacy group that aims to create renewable energy and low-carbon projects that benefit the Hackney community. Repowering mentored 8 local volunteers through the development of the project. 10 local youth also benefitted from a 30-week paid internship learning about everything from renewable energy technologies, energy

	efficiency and climate change to marketing and community engagement.
Economic/Business Models	The project was funded and supported by Hackney Council and was developed by PM Repowering London (a non-profit organization specialized in community-owned renewable energy projects) in collaboration with Hackney Energy which acted as a local facilitator.

Description

Hackney Energy is a local energy and climate change advocacy group that aims to create renewable energy and low-carbon projects that benefit the Hackney community. Their first and main project is Banister House Solar (BHS) a Community Energy Enterprise based in the Borough of Hackney, north-east of London, and the UK's largest community energy project on social housing.

The project was funded and supported by Hackney Council and was developed by PM Repowering London (a non-profit organization specialized in community-owned renewable energy projects) in collaboration with Hackney Energy which acted as a local facilitator. The Banister project follows the successful experiences of Brixton Energy Solar Co-operatives 1, 2 and 3 where Repowering London experimented with specific community engagement procedures within the urban context of Brixton, south London.

History

The Banister House Solar Cooperative was established in November 2014 with 5 estate residents taking on the role as Directors. The project has seen the installation of a 102kWp solar PV array on the 14 blocks of the estate. The system generates up to 82,000 kWh of clean energy annually reducing 680 tons of CO2over the lifetime of the project. To assure the use of the rooftop, the enterprise has signed a 20-year leasing agreement from the LA Hackney Council, the same period of the Government's Feed-in Tariff (FIT), a main source of revenue of the project.

Photo Credit: Hackney Energy/Bainster House Solar Coop

The solar panels power the communal supplies of the buildings, thereby providing Hackney Council with potential savings of £20,000 (€23,450) through the sale of electricity at a discount price over the 20-year life of the project. Repowering mentored 8 local volunteers through the development of the project. 10 local youth also benefitted from a 30-week paid internship learning about everything from renewable energy technologies, energy efficiency and climate change to marketing and community engagement. They also took part in paid work experience alongside professional contractors during the solar installation process.

Governance

BHS was registered as a Community Benefit Society (CBS), an enterprise based primarily for the benefit of the community at large, rather than just for members of the society. The BHS statute includes a democratic system of management and decision-making, where each member has one vote regardless of the number of shares held. 4 of the 5 directors live on the Banister House Estate.

Business Model

The capital funds of £149,500 (€175,000) required to buy and install the solar panels was raised through a community share offer allowing local people the opportunity to invest in their energy future (from 131 individual investors). Each share has had a nominal value of £1 (€1.17), the minimum shareholding was £50 (€58) for Banister House investors, the external investors between £250 (€293) and £42,600 (€50,000) (30% of the total share offer value).

The cooperative earns income from the generation and sale of solar electricity providing investor members an average of 4% return on their investment, after initial capital investment has been paid and a general reserve for new investments has been set aside. It is also estimated £20,000 (€23,400) lifetime savings for Hackney Council on energy bills.

Furthermore, according to the Community Benefit Society guidelines, 20% of the net profit throughout the lifetime of the project is transferred to a Community Benefit Fund, which aims to benefit tenants and residents living in Banister House in a broad sense, including alleviation of energy poverty. In addition, BHS invites the shareholders to allocate even the whole of their annual share interest payment to the Banister House community fund. The Banister House Solar community fund is expected to raise £28,000 (€33,000) over the 20-year lifetime of the project.

The following are the actions implemented to address fuel poverty and increase awareness of energy efficiency: 106 energy surveys have been carried out; 15 home energy audits have been delivered to residents of the Banister House Estate to help increase energy efficiency and reduce energy bills; 3 energy efficiency advice sessions held; 2 “training the trainer” energy efficiency workshops delivered.[7]

[7] Banister House Solar Report**:** https://www.repowering.org.uk/wp-content/uploads/2020/05/Banister1pgReport_2015.pdf

IN-DEPTH INVESTIGATIONS: INTERVIEWS WITH FRONTIER CASES

The following four Frontier cases provide more in-depth knowledge about the development through interviews with a representative from each of their leadership teams. Through these interviews, the COMETS project is able to contribute more understanding to the 'knowledge commons' of shared experiences that collective action initiatives face, as well as unique challenges that might shed light on future mitigation tools and policies to overcome potential obstacles. Appendix C (page 65) provides the list of interview questions for the following in-depth investigation.

1. CO-OP POWER

Location: Incorporated in Massachusetts with projects in other northeastern states, USA
Year of establishment: Incorporated in 2004, but started discussions in 1996
Number of members: 820 families and organizations in Massachusetts, Vermont, Connecticut, New Hampshire, and New York (soon to be 1250 for new NYC members)
Area of activity: Only community solar (had some wind projects in the past)
MWh/year produced: About 4.5 MW of solar under Co-op Power subscriptions. Helped put in 1000+ solar installations on rooftops, solar installation businesses, solar financial business, and a biodiesel plant (to be launched soon).

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Organizational Aspects	A federation (or network) of local energy cooperatives that uses one cooperative structure. This regional network is a *commons* - a shared resource where communities come together to make a difference.
Social	Prioritizes creating ownership of affordable solar energy for people in low income communities. Additionally, they provide job training/workforce development, community education, and community strategic planning. They make decisions by consent instead of by voting or using veto power, so that anyone who opposes a proposal has an opportunity to work with the group to address their concerns.
Spatial/Geographical	Based in Massachusetts with projects in several states in the Northeast, United States. Located in both rural and urban spaces.
Economic/Business Models	Created the **People's Solar Energy Fund** in order to get access and predevelopment money and tax credits to move the projects into the pipeline

Interview with Lynn Benander, President & CEO, Co-op Power (June 18, 2021)

Description

Co-op Power is a federation of local energy cooperatives that uses one cooperative structure. They are incorporated as a consumer-owned energy cooperative in Massachusetts and democratically controlled by its consumer members. Co-op Power members work locally through their energy cooperative to bring energy efficiency and renewable energy resources to their communities.[55]

All the cooperatives in the Co-op Power federation are under the same network umbrella. In order to start an energy cooperative with Co-op Power, a prospective initiative would just need permission from the Board. One does not need to incorporate independently since any new initiative would be part of one shared structure.

Co-op Power is established as a Consumer Cooperative, and is structured around democratic participation in decision-making, joint purchasing, member-to-member installations, community-scale sustainable energy development, member education, and public outreach and policy advocacy.[56]

Organizational Structure

In 2009 Co-op Power Members adopted a regional structure, organizing the cooperative as a decentralized network of Community Energy Co-ops (CECs). These Co-ops in Massachusetts, Vermont, Connecticut, New Hampshire, and New York are self-organizing and set their own agenda based on local energy priorities. They raise capital from their members and invest it in their own local energy projects. They organize their own buying groups, contracting with local vendors to bring them the energy resources they need.[57]

Below is an example of one of their urban projects, the New York City Community Energy Co-op.

According to Lynn, “this regional network is a *commons* - a shared resource where communities come together to make a difference.” Co-op Power, as a decentralized network of local organizations, has CECs each playing the lead role in their regions. Their primary responsibility is to organize and educate people in their region and to facilitate the development of one or more community-owned, community-scale, clean energy businesses.

Governance

Each CEC has one member serve on the Co-op Power board. Additionally, the Co-op Power delegates decisions regarding the activities within a region to the Community Energy Co-op board overseeing that region. Co-op Power also makes decisions by consent instead of by voting or using veto power, so that anyone who opposes a proposal has an opportunity to work with the group to address their concerns.

How did Co-op Power formalize?

Like many CAIs in the energy sector, there were several streams that brought Co-op Power together. In the 1990s, Lynn Benander, President & CEO of Co-op Power, was working at the Cooperative Development Institute, another federation of cooperatives in the Northeast and also a non-profit that helps with the development of new cooperatives. Lynn mentioned that around 1995, at the request of the public service commission in Vermont, which was looking at the impacts of deregulation of the energy industry, they convened a group of people that looked into how to protect the needs of consumers in a deregulating energy industry. This included what role cooperatives could play in the energy market.

This is a great example of how getting several key stakeholders from various backgrounds can collectively engage to effectively address sustainability and justice issues. Lynn’s team secured grant money and brought in consultants with broad input from the national rural electric cooperative movement, as well as municipal utilities, nonprofits, the National Renewable Energy Laboratory, and a group of stakeholders that represented over 2 million people across New England and New York.

They were tasked with exploring how energy cooperatives can move us towards a more sustainable and just energy system in the Northeast. Lynn noted that many talented consultants helped in finding solutions to the question of where communities can have the biggest impact, studying all kinds of technologies, including fuel cells, PV, biofuels, energy efficiency, etc.

In this earlier work in the 1990s, Lynn and colleagues were also looking into where citizen action can "create the most jobs while diminishing the reliance on fossil fuels". In other words, this group was aiming to create a "needed framework for people to transition off fossil fuels and reduce energy use while, at the same time, for communities learn to engage more and be committed to each other no matter what race and class". Lynn and colleagues were looking at stakeholders in a variety of lenses: "as citizens and residents in a political process; as volunteers and workers using life energy to make change; as investors putting money and time in; as consumers who can shape the way markets work and de-commodify the energy world that the communities are in". All in all, Lynn said that they were viewing themselves as whole people in whole communities, addressing sustainability and justice issues.

The shift to prioritize access to solar for all

Several years later, in the early 2000s, the Co-op Power network was being formally established. In these earlier days, some members suggested for Co-op Power to focus mainly on rooftop solar. Lynn remembers the moment that shifted the course for Co-op Power. There was a meeting with stakeholders where there was a general feeling of unrest in the room and someone said, "I thought Co-Op Power would only do things that would benefit *everyone* and not just wealthy communities". Namely, people at this meeting addressed concerns that citizens who are renters (not homeowners) can't participate in rooftop solar, and with high upfront costs, that this technology is being mostly implemented in wealthy communities. From that moment on, Lynn remarked that this created a pivotal shift in the room and for Co-op Power overall, where people started to listen well to each other. They decided to not focus on rooftop solar until they could find a way to do it where *everyone* can participate, especially given the high upfront costs to participate in rooftop solar.

Inspired by ongoing conversations in the early 2000s, Co-op Power prioritized creating ownership of affordable solar energy for people in low income communities. They started investing more in community solar and worked with the State of Massachusetts to provide a solar loan program that would monetize the tax credit, giving 30% off on the loan that was used to pay for the system. Lynn noted that this had a big impact on community solar, as well as for low income families.

Additionally, Co-op Power helped people with energy efficiency through insulation and other efficiency upgrades to their homes and apartments, whether or not they are homeowners or renters. Lynn noted that this helps to ensure all members have access to the products and services Co-op Power is investing in.

The CECs in the Co-op Power regional network have supported the development of 12 enterprises in solar installation, solar finance, energy efficiency, thermal window fabrication, green plumbers and biodiesel manufacturing. They have created more than 400 good, green jobs. The CEC's share business plans, staff, money, ideas and other resources with each other and are as committed to the success of the other CEC's as they are to their own success.[58]

Co-op Power Project case: NEW YORK CITY COMMUNITY ENERGY CO-OP

Background

The New York City Community Energy Co-op (NYC CEC) is a multi-class, multi-race cooperative working for energy justice and a just transition in Manhattan and the boroughs. The NYC CEC is part of the Co-op Power regional network of community energy co-ops. They also partner with other local organizations such as Solar One, UHAB, CUNY, UPROSE, WE ACT, Brooklyn Movement Center and Resonant Energy to be developing affordable solar solutions in New York City.[59]

In fact, NYC CEC was started by a group from SolarOne, a non-profit. Noah Ginsberg, co-program director of SolarOne, talked to one of the colleagues at Co-op Power, as well as with groups looking for community ownership in Brooklyn. Isaac Baker, the Community Solar Program Director at Co-op Power during that time, worked together with Ginsberg on early stage exploration with the communities who said they want local ownership, to decide if joining the Co-op Power federation would be useful. They saw the value and joined, formed a board of directors, and oversaw 2MW or solar projects there.

Organizational structure

Their team consists of the Board Chair, Coordinator, Intern, and the CEC's Board of Directors. They work together with community solar project teams that oversee the development of their solar arrays. They also work with environmental justice organizations to empower people to build ownership and increase access to sustainable energy, especially people of color and low-income communities. The community solar arrays they are building provide a path to community ownership so that members not only have solar discounts on electric bills but have the jobs and the economic and political power that comes from owning the arrays.[60]

Photo Credit: NYC Community Energy Co-op

The NYC CEC is owned by the people, the families, and the organizations that subscribe to the solar arrays and by others who join to access other benefits they are building together. They are working together to create solar arrays, green jobs, and enterprises that "will create a more just and equitable energy future in NYC - where everyone has access to affordable, clean, safe energy and has an equal voice in how our energy economy works." [61]

Business model

The NYC CEC operates on a not-for-profit basis and any excess money collected is given back to Members based on how much they've paid into the Co-op. Owner-Members participate in the consent decisions of the NYC CEC. Together, they elect a board that makes decisions that they delegate to them between Member meetings.[62]

As an energy cooperative, they abide by the 7 international principals of cooperatives. Members who subscribe to the solar arrays receive credits from the solar arrays that are applied to their electric bills then they pay Co-op Power 80% to 85% of the credits they receive, depending on which program they are in, based on the price points on the projects.

In the United States, solar arrays can only deliver credits to people in the same load zone and same utility. The energy cooperative can serve any region and develop projects in all the load zones in that region or just one load zone. All of it is delivered through the existing grid (no new grid construction needed). With the installation of solar arrays, the NYC CEC delivers credits to the grid and then gives ConEdison, the major utility of New York, a list of the CEC's members, who are also ConEdison customers, to deliver those credits. Then Co-op Power sends a bill to the members asking to be paid 80-85% of the credits applied to their bill.

According to Lynn, the large utilities are typically part of the legislative action that requires them to abide by this structure, even if not all utilities are supportive and compliant. Nevertheless, they don't have a choice as it is a regulatory matter.

Member participation

Members of the NYC CEC make decisions about what projects to get involved in, where to invest membership dollars, what community solar arrays to build, what benefits to develop for Members and what benefits to bring to their community.

They start by looking at what is needed in their community and choose the things they can do that will meet the community's needs, the organization's needs, and grow the cooperative. Benefits are created by members pooling their buying power, their investment dollars, their power as workers and volunteers, and their power as voters.

This is just one example of the many projects of Co-op Power.

Access to predevelopment funding

In the United States, for building a solar project, one needs to pay for the design, interconnection agreement with utilities, permits, etc. that needs to be put together before building a solar array. Thus, as no money comes in until after the building process has begun and a loan can be secured. Lynn noted that most communities have to get a developer who is willing to put up the upfront money and then the project belongs to them, since they are the ones who accept the risk with the initial investment. Having the "risk money" to put into a project is very important.

Additionally, people in the U.S. build solar projects through access to tax credits, with a quarter of the project paid for by tax credits. If the tax credit incentive does not exist, then it is much harder for projects to develop or be viable.

To overcome this challenge, Co-op Power created the **People's Solar Energy Fund** in order to "get access and predevelopment money and tax credits to move the projects into the pipeline within a reasonable amount a time." The People Power Solar Cooperative (see page 44) is also an active participant of the People's Solar Energy Fund to create a shared "knowledge commons" across the country.

Other activities of Co-op Power

- Job training/workforce development,
- Community education,
- Community strategic planning (looking at what is most urgent for creating a just and sustainable energy system).

What makes Co-op Power unique?

Lynn noted that Co-op Power does not want to be considered unique because "they aim to create symbiotic relationships with other sister and brother communities that lift each other up as part of a sharing economy." Aligned with that aim, they share all their legal documents, notes, promotional materials to any like-minded community group to help them seed. Additionally, as part of a symbiotic relationship with other initiatives, Lynn said Co-op Power is also learning so much from other groups, as well.

Lynn highlighted that she is proud of the cooperative structure platform that communities can access and start having an impact right away. "Even if it doesn't work 100% right away, communities are still finding their way in the middle of trying to lift the new economy in the old one and trying to help people learn the skills and approaches of cooperation in the midst of a competitive reality", said Lynn. "For some communities, this is an easier lift than for others. Just trying has been the exciting part."

Additionally, Lynn is proud of the idea that low-income communities not only can own things they depend on, such as energy, but have the sovereign right to.

Co-op Power and energy scenario in near future

Lynn described Co-op Power's near future aim as having more financial abundance to have an impact and lower the stress for the people working in the initiatives that are putting the pieces together for scaling up community solar.

Additionally, Co-op Power would like to be able to aggregate, not just within network itself, but with all sister and brother energy cooperatives and municipal utilities across the country. In this way, Lynn said, "there would be more collaboration and providing consumers with options beyond the Investor-Owned Utilities that allow them to build a local energy economy that is connected with other local energy economies in their state, region, country, or around the world. This includes being part of a bigger movement that brings back more sovereign control and benefit over energy."

2. People Power Solar Cooperative

Location: Oakland, California, USA
Year of establishment: 2018
Number of members: 168
Area of activity: community solar
MWh/year produced*: N/A*

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Organizational Aspects	multi-stakeholder cooperative with hundreds of community members
Social	Actively helps their members to build skills, leadership, and people power necessary to overcome the barriers to energy constraints in the communities.
Spatial/Geographical	Urban area
Economic/Business Models	Community owned and financed. Communities can access capital from diverse sources, including crowdsourced investments from community members.

Interview with Crystal Huang, Worker-Owner and Co-founder (6 May 2021)

Background

As with many cooperative movements, the efforts of People Power Solar Cooperative (People Power) are coming from standing on the 'shoulders of giants'. In other words, People Power gives

much credit to the movements and people decades and centuries before them who paved ways and strategies for them to be where they are today. Their mission is inclusive and movement-building, to *"*create a just and inclusive transition to renewable energy by enabling everyone to own and shape our energy future.*"* [63]

The People Power Solar Cooperative was incubated by a 501c3 non-profit in California called the Sustainable Economies Law Center, also based in Oakland. The Law Center has been trying to put energy into the hands of the people through community ownership in California since 2014. They work hard on trying to change laws to allow communities to have solar ownership. According to Crystal Huang, Worker-Owner and Co-founder of People Power, "even in a so-called progressive state like California, passing policies to transition power away from corporate energy establishments and putting it into the hands of the people has proved to be particularly difficult." The Law Center has been trying to figure out best ways to pass such laws that have been approved in states like Massachusetts, New York, Minnesota and Colorado in the United States.

The lawyers at the Sustainable Economies Law Center decided climate change is an urgent issue and there is not much time to wait for laws to change; alternative paths were needed, especially given all the regulatory barriers in California. By passing the **California Worker Cooperative Act** [8] in 2015, the Law Center saw an opportunity to create a model that pools resources among a community of people to build solar energy systems as "a wealth building machine for the community". This law allows individuals to join or purchase shares of a cooperative, which used to be capped at $300 per person, but now increased to $1000 per person. According to Crystal, this law opened up opportunities for people to get together to pull resources in a meaningful way. For example, with only 100 people you can have $100,000 to invest in shared assets like clean energy projects.

A 'Movement' Cooperative

Photo credit: People Power Solar Cooperative

Crystal Huang recalls that the group asked themselves in 2018, "What if we let go of the idea that community-owned energy is about the community owning and consuming energy from a specific energy project? Since most people can't use their utility bills to subscribe to those solar projects in California, People Power is not a cooperative with the primary purpose of letting people consume electricity."

Instead, its purpose is to let people participate actively in shaping the renewable energy economy. It is for that reason they call themselves a 'movement cooperative'. Many of its members won't actively consume energy through the cooperative, but they and their capital will be part of a movement to transform the energy economy. Crystal noted that their model "allows anyone in the community to work with property owners to disconnect ownership of land from the ownership of power". This, in turn, would enable the community to get shared financial benefit on a privately-owned roof, in addition to collectively deciding and putting it into the commons as part of the cooperative. A pilot project was launched in 2019 to show this is feasible.

Since then, People Power has focused on "activating member-owners to see energy more than just the opportunity to decarbonize or have bill savings, but a tool to build community power." [64]

[8] California Worker Cooperative Act: https://www.theselc.org/ca-worker-cooperative-act

As a multi-stakeholder cooperative with hundreds of community members, Crystal emphasized that People Power is “like a grid for the transmission and distribution of another type of power: it is a combined, connected and amplified potential of many people sharing resources, ideas, skills, connections, labor in infinitely creative ways to find ways together to change the conversation, solve the problem, and understand the history of the energy system.” In other words, People Power is not just functioning to build a traditional cooperative business model, which is certainly one part, but the bigger aim is to **build a movement.**

People Power actively helps their members to build skills, leadership, and people power necessary to overcome the barriers to energy constraints in the communities. When people are tired of protesting and complaining, Crystal said, “Join us! Let’s build people power together.”

How their cooperative structure works

As a multi-stakeholder cooperative, they have 4 different classes of member owners:

- **Worker Owners,** the cooperative’s staff, who provide the technical, operational, and organizing support to all other Owners. They create the tools needed to support the member-owners and be the conduit. The asset is the more projects they build with member owners in their communities, the more knowledge gained on how to do it.

- **Subscriber Owners (consumer-owned),** who get electrical power and other benefits or services from the cooperative.

- **General Owners,** who purchase shares of the cooperative and provide support for projects. This was helped by the state law, California Consumer Cooperative Corporation Law, where people can come in and purchase shares and have capital up to $1000 and get a financial benefit.

- **Anchor Owners,** are the community members who provide leadership and spearhead the development of new projects. Everything done is led by them. “They come together to talk about projects, educate others on energy history systems, talk about healing trauma to shift from the consumer mindset and come together as a village to talk about what energy means”, said Crystal. There are different things Anchor Owners can do to drive the direction of the cooperative.

A ‘Commons’ State of Mind

The People Power Solar Cooperative describes their work by reminding people that there are 3 mindsets that citizens are always operating in but don’t always recognize:

- **Market state of mind**: where people buy and sell things like energy. In this framework, if one cannot afford energy, then it gets shut off.

- **Charity state of mind:** where people can get free or cheaper energy. Crystal noted that “This is creating a system of reliance on the strangers who became wealthy from the market state of mind. This still creates a trap in a system of treating energy as a commodity and not recognizing that energy is a human right -- people should never have their energy shut off.” Instead, Crystal asked, “how do we enable everyone to have self-determination?”

- **Commons state of mind**. This is not about have vs. have nots. Crystal noted that “this is about everyone coming with a diverse pool of knowledge and working together to build the future that they want to see collectively.” In other words, the commons state of mind is about “getting together,” instead of just “getting by” or “getting ahead”, said Crystal.

The Commons state of mind is the center of everything People Power operates in because they "activate members of the community to get together and determine the wealth generated form the energy projects they build in the commons." [65] However, this is just one of the models for community solar ownership that People's Power member-owners are implementing to build this cooperative energy movement. It does this despite the fact that California does not have a viable shared solar policy.[66]

Qualities for success

According to Crystal Huang, People Power's activities engage beyond the traditional energy grid of transmission and distribution, but empowering member-owners and anyone in the community to be part of the movement and come together to connect and amplify what they know – to share resources, ideas, skills, and labor -- in a way that is cooperative. "The strength of people coming together is a key quality to the success", said Crystal.

Challenges

- **Knowledge barriers about benefits of cooperatives:** As with many energy cooperatives, it is difficult to persuade people about the benefits of being part of a cooperative, especially when one owns the energy system on someone's roof, in the case of People Power. One does not see it on his or her electricity bill.

- **Evolving from the consumer mindset:** As noted by Crystal Huang, "the new energy paradigm is about shifting our understanding of what energy means because many people have been trained to only see electricity as a bill to pay or something that contributes to pollution in our communities. When things go wrong on the grid by utility mismanagement, such as the fires in California and the grid failure in Texas in early 2021, consumers are left powerless and accountable to pay for the infrastructure failures in California and many states around the U.S. When we are not paying attention, we are giving so much of our power away and not paying attention to the very thing that determines our survival."

  Crystal highlighted a study that was done in the United States that looked at how often Americans think about energy. An *Accenture* statistic showed that consumers spend around 10 minutes annually thinking about their electricity bill.[67] Thus, Crystal said, "when discussing a new energy paradigm when people only take 10 minutes on average per year to think about energy, it becomes extremely limited to build power when we don't take time to understand the very thing that we rely on."

- **The narrative around power that's needed to make a shift.** According to Crystal, this includes **!**the utility power to make sure that citizens don't understand what's going on so we can continue to keep paying them for them to make a profit." The NAACP (National Association for the Advancement of Colored People) in the United States has an environmental and climate justice program that has already repeatedly pointed out that all the climate and health-related indicators tell us that a transition away from fossil fuels is happening way too slowly. They identified the primary cause as the Investor-Owned Utilities (IOUs) domination of the energy sector. According to the NAACP, the only way we can actually address the climate emergency is if we start to address the power dynamic in which energy is rested upon. Crystal highlights that "if we don't act now, we risk further consolidation of power by the for-profit fossil fuel companies, utilities, financiers, and developers that have been extracting wealth and health from our communities for decades."

Energy Democracy

All the issues that People Power is focused on is under the principles of *Energy Democracy*.

When we talk about *Energy Democracy*, Crystal Huang noted, “it is important to recognize that it is a culmination of many movements in the past. For example, in the United States, Energy Democracy is the culmination of the Civil Rights Movement, the Indigenous Rights Movement, Women's Rights Movement, Labor Rights Movement, Environmental Movement-- all combined together is what Energy Democracy is about.” It's about people having power and having the ability to determine their own destiny.

Crystal said that when we are talking about power, “we are actually talking about recognizing what the system is doing to all citizens and how can people work together and start to build something that truly serves everybody and future generations. Therefore, many of the conversations People Power have ends up centering around the discussion of power, and about trauma that the system has created in so many of the communities, a system that created a situation where we are constantly pitted against each other, not just by racial identity, but not being able to trust each other to share.” Crystal stresses the need to find resources that does not require dollar-to-dollar return in order for people to recognize the trauma in the communities and not be against each other in the commons state of mind. Initiatives like People Power addresses that through building energy projects.

What makes People Power Solar Cooperative unique?

The People Power Solar Cooperative is “a laboratory for people who are trying to figure out how to address the liberation of all people around climate justice to build power in energy project development.” Crystal said the diversity of strategy around Energy Democracy is large because it is not just about the energy sector, it is about liberation of the people in the sector that determines our economic system.

Collaboration

People Power is working closely with many similar efforts in the Energy Democracy movement with practitioners like Co-op Power, Cooperative Energy Futures, NAACP, Emerald Cities Collaborative through initiatives like the **Energy Democracy Project.**[9]

Next steps

It is easy to look at energy cooperatives and think that they are all the same. There is obviously the historic Rural Electric Cooperatives in the U.S. established as part of the New Deal in the 1930’s, but there are new types of clean energy cooperatives, like Co-op Power and Cooperative Energy Futures that can rely on community solar laws in their state.

Crystal noted that it is still a struggle in California. Thus, much of the activities at People Power is around education and activation of the member-owners so they can start to shift the narrative in the state, and in many others states that don't have such laws limiting communities to come together and benefit from energy.

Knowledge commons

When people come together to have conversations around *Energy Democracy*, Crystal said it is important to build a suite of resources that people can tap into and build a ‘knowledge commons’ that people can share together and build faster. People Power’s model has been to work with the member-owners in their projects and their own local communities, talking about the political dynamic, power, and community ownership of energy as the solution. Community members can then rely on People Power for technical assistance and together they can start to build a wealth of knowledge to be shared with many other communities down the line.

Youth Resilience Hub

One of the biggest projects People Power is working on is supporting the implementation of a youth-led resilience hub in Richmond, California, a town in the Bay Area that has one of the largest Chevron

[9] The Energy Democracy Project**:** https://energydemocracy.us

oil refineries, among many other refineries, in the state. Asian Pacific Environmental Network and Communities for a Better Environment have organized the communities there, especially young people, to gain deeper understanding of what it means to have a Just Transition from the current fossil fuel economy into a regenerative economy. Thus, Crystal noted, the community learns how to go from an extraction-based economy to a way that actually spreads wealth to the community. This goes beyond just the fuel source, but also looking at governance and the economy. People Power supports the youth-led resilience hub as a technical assistant to provide them with the knowledge needed to make critical decisions in the project development to maximize community benefit, which has become increasingly important in the state of California.

3. Bristol Energy Network

Location: Bristol, United Kingdom
Year of establishment: 2010
Number of members: their projects operate with many citizens in the Bristol municipality.
Area of activity: Solar, Wind
MWh/year produced: N/A

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Organizational Aspects	Two types of members: 1) Voting members consist of community initiatives in Bristol and the surrounding area with an active interest in energy; 2) Non-voting members consist of individuals and organizations interested in the activities of the network.
Social	BEN is focused on getting everybody in the community involved, from engineers to roofers, etc. BEN is also focused on health and wellbeing of its members. They approach health and wellbeing through the lens of community energy, and thereby involving health practitioners in the energy sector. This is bringing increasing recognition to the nexus of community energy and public health.

Interview with David Tudgey, Project Development Manager (22 June 2021)

Background

Bristol Energy Network (BEN) is an umbrella organization for individuals and community groups with an interest in energy in Bristol and the surrounding area. BEN's vision is for a city "where clean, green, affordable energy is delivered to the community by the community." [68]

BEN's work is based on the foundation that, in order to build an energy system that works for *everyone*, everyone must be involved in the building process. In 2008, David Tudgey and friends started thinking more about solar PV electricity and, at that time, "it seemed like participating in sustainability activities was like an exclusive club and language, as if one needed a degree and money to participate", said David. After attending a Transition Town Cities meeting, David left inspired by their collective action efforts of going to neighbors and talking about solutions.

Together with a small group of friends, David focused on starting an organization that acts on climate change while addressing social justice needs, such as poor quality of homes. They did a community asset assessment (social and physical assets) and engaged with people, looking at everybody's skills and "what they can bring to the table". The aim of this community engagement was not to talk about climate change, but how to give people agency and to take action, based on the Transition Towns movement. Through this process, David said they found energy to be one of the most pressing issues, and that there are several communities around Bristol that are focusing on energy.

How a small idea can be a city-wide realization (even with small amounts of money)

BEN began to develop from hosting open quarterly meetings every year. These meetings were open to all, no matter which background people came from. The aim of these preliminary meetings was to bring affordable energy to all. David and colleagues were looking for innovative solutions by having meetings for different energy projects to come together.

BEN was officially set up in 2010 to help community energy initiatives across the city share learning and ideas for a more sustainable energy future. The network was formed in response to a flourishing of grassroots energy activity and the perceived benefits of closer collaboration. BEN became, and continues to be, a connective tissue for different community energy projects around Bristol.

For the first four years, BEN was run by volunteers with support from the Centre for Sustainable Energy (CSE), Bristol City Council's Sustainability team and the University of Bristol, amongst others. During these formative years, people involved through the network supported the launch of Bristol Green Doors (their first event was held in September 2010) and the development and launch of Bristol Energy Cooperative (launched to the public in 2011). In January 2012, as a result of the network's activity, 11 local energy initiatives won Local Energy Assessment Fund (LEAF) awards. The BEN network supported partnering between initiatives, communication between projects and dissemination of learning and results. As a result Bristol had the highest concentration of LEAF activity outside of London. [69]

BEN emphasizes that in to participate in the energy transition, one does not have to be professional. Instead, they encourage people to ask themselves, "what can I do and be part of the solution?"

When feed-in tariffs were available about a decade ago in the United Kingdom, BEN quickly tried to establish a working group to form an energy cooperative. David noted that they fostered relationships instead of competing with other groups. They also needed support at the local policy level, such a property services, finance and legal services. In the first few years, not everyone was onboard, but they now have the needed broad support.

The Bristol Community Strategy for Energy

Part of the formative years was developing a community energy strategy in 2013. This is when BEN hit a turning point. In the spring of 2013, BEN coordinated and led the development of the **Bristol Community Strategy for Energy.**[10] The Strategy sets out aims and steps for community level action on energy and seeks to enable local community groups to work in collaboration with local authorities, the private sector and third sector organizations on sustainable energy issues.[70]

At that time, BEN's members were providing different perspectives on which direction to go: "energy efficiency is the solution", "renewables are the solution", and "addressing energy poverty issues is the solution". David said they developed a community energy strategy, a so-called "Arthur's Round Table", where they gather everyone together to understand and see everybody's perspective, thus, to see everybody's goals and support each other. From this strategy, they created the Community

[10] Bristol Community Strategy for Energy: https://bristolenergynetwork.org/aboutus/community-strategy-for-energy/

Energy Strategy Wheel (Figure 1). Over 50 people and organizations were involved in shaping its content and direction. It was officially launched by the Mayor of Bristol in June 2013.

Fig. 1 The Bristol Community Strategy for Energy

The Community Energy Strategy Wheel shows how different actors and their priorities fit in the wheel. This also includes at the political level. In 2014, BEN was elected as the Energy Action Group and received a green capital award, then offered a contract to promote community energy. The coalition government at that time introduced the Community Energy Strategy Wheel at the national level and the wheel became part of the national policy to support community energy.

The Municipality (Council) of Bristol is a city and a county with around 400,000 inhabitants. The municipality also has one of the largest energy services in the country. In parallel to the community energy sector starting, the council received EU funding, ELENA (European Local ENergy Assistance), to borrow money where they needed to demonstrate the funding works as a multiplier. According to David, this ended up putting the local authority against community energy, so it didn't go as they imagined. Eventually, BEN worked with the local offices, and proved where engagement works and the council (municipality) received the fruits of the projects. "Now there is 3 years of funding between BEN and the council to come up with more innovative projects and to demonstrate unique innovations, which are now nationally recognized", said David.

Governance

The network is registered with Companies House as a Community Interest Company (CIC) (no. 9077917) limited by guarantee with a large membership. The network has two types of members: voting and non-voting members:[71]

- Voting members consist of community initiatives in Bristol and the surrounding area with an active interest in energy;

- Non-voting members consist of individuals and organizations interested in the activities of the network.

Membership is free and is open to non-profit organizations in Bristol and the surrounding area that are running energy related projects or have an active interest in energy issues. Voting members are entitled to attend all meetings and to vote on BEN resolutions at the Annual General Meeting and to vote to appoint new directors. However, open meetings are open to all, individuals and non-member organizations are welcome to join and take part in developing and implementing project ideas.[72]

BEN is member-led, therefore the network's activities are informed by the needs and views of its members, who are consulted via BEN meetings, online surveys and other means. Members commit to sharing information and ideas via BEN meetings, the members email list and monthly newsletter, and work together to achieve the network's vision.[73]

BEN has 9 board members, many of whom are part of member organizations. The board is responsible for the financial management of the organization, as well as staff supervision, and works collectively with the staff to develop and direct the work of the BEN staff, which includes producing a monthly newsletter, organizing meetings and events, project development support, community outreach and member recruitment.[74]

Values

BEN members are guided by the following values:[75]

1. For everyone – actively working to create an energy movement that reflects the diversity of Bristol communities and ensuring everyone has a chance to play a part in designing and carrying out the work;

2. Open and honest – being accountable to those affected by our work by giving them the opportunity to be involved and openly sharing information about our activities;

3. Community-led – communities, rather than private interests, lead the work and benefit from it;

4. Sharing and supporting – working together, sharing learning and supporting each other to achieve shared goals.[76]

Bristol Energy Network as innovators

BEN is recognized as innovators in the community energy sector and commercially and winning national awards. In January 2014, the Sustainability team at Bristol City Council (BCC) provided a £10,000 (€11,700) grant to the network in order to formalize the organization and employ part-time staff. By July 2014 the Network was set up as Community Interest Company and was employing a coordinator and project development officer. Since 2014, the Network has secured project-based funding. In 2015, it ran the Energy Champions project, in partnership with CSE, OVO, Bristol NHS Trust and others, funded by a grant as part of Bristol's year as European Green Capital. In 2016, the Network partnered with BCC to deliver a 'community energy best practice' model with funding via Department of Energy and Climate Change.[77]

Upcoming project

BEN just placed an order for a wind turbine, the largest one in the country. David noted how this is an example of working with the local authorities to get the land permits, even when the national

government is making it harder for onshore wind projects. BEN is also collaborating with institutions, such as universities, to help bring policy changes.

Harnessing the skills of community members is a way BEN has fostered important conversations to happen, focused on empowering people to participate and connecting underserved communities like Lawrence Western (where the onshore wind turbine will be located).

Challenges

According to David, the first and foremost challenge is the knowledge building about community energy at both the policy and community level. The role of community energy is often not properly understood. In May 2021, BEN produced 10 'asks' that they would like to hear being asked of candidates in a recent election. Through the 10 asks, they present their contribution to a smart local energy agenda which they believe should be a strong focus in the near-term elections:[78]

Q1. Community Energy: How can we grow and support our community energy sector to deliver a smart, local (community) energy system?

Q2. Renewable Energy: How can we ensure that more renewable energy is generated, and community owned in Bristol?

Q3. Sustainably Heated Homes and building efficiency: a) How can we encourage take-up of energy efficiency measures in our homes (existing and future) to reduce heat demand? b) How can our homes be supplied with heat from renewable energy sources?

Q4. Green Workforce & Green Recovery: a) How can we employ and train a green workforce to deliver a smart local (community) energy system? b) How can we ensure that the inequalities in our current energy system are addressed?

Q5. NetZero Transport system for all: How do we transition to a NetZero integrated transport system that is affordable and accessible for all?

Q6. Improved focus on Air Quality: How can we ensure that in the future energy system air quality emissions are prioritized alongside reducing carbon emissions?

Q7. Using the planning system to address NetZero: How can we ensure that climate change is addressed in new developments?

Q8. Alleviating fuel poverty: How can we eliminate fuel poverty in Bristol? a) What strategy and action plan should we follow? b) What is our timeline? c) What should be our initial actions over the next two years?

Q9.Engagement in energy issues: How can we increase opportunities to educate Bristol on energy issues, particularly in less affluent communities?

Q10. Reducing Consumption and Waste: How can we reduce consumption and waste across the city?

Current energy and social policies hostile towards community energy

David Tudgey noted that if they can get the conditions right for community energy, then it can thrive. The business models are not working properly at the moment "because the policies do not fit the purpose as they are designed around big institutions and investments", said David. "Policies still do not support a decentralized energy system because the current centralized regime fits them at the moment."

BEN is focused on getting everybody involved, from engineers to roofers, etc. As David stressed, "we can't wait for unicorn technology, especially given the urgency of the climate emergency, we need to use what we have and drive forward."

Community empowerment

David noted that "communities know where the priorities are and they have a sense of the climate emergency and the social injustice of fuel poverty. Thus, supporting the communities to develop solutions is very important." BEN wanted to create something that can be replicated anywhere. Community energy should be part of the roadmap to Net Zero energy and part of the conversation at the upcoming COP26 (2021) because, as David said, "if you empower communities with information and resources, then amazing things can happen."

BEN supports any community that wants to build something around energy and fits within the Community Energy Strategy. There is no profit motivation, instead a motivation by community needs. BEN has expanded significantly in the surrounding areas of Bristol, often in lower income communities that are forgotten by institutions and put into large council estates (public housing). David notes that services often don't reach residents in these areas, so BEN goes into these communities and engages to strategize their plans and host meetings in the communities. David also notes that rather than say that a community doesn't have skills to do x, y and z actions, BEN instead looks at what skills they already have and empower them to do more. "In turn, the communities don't rely on institutions to come in and do it to them, they look at how BEN can support them," said David.

Health and wellbeing

One of the most important aspects that David highlighted about BEN's work is their focus the health and wellbeing of its members. "Once we offer solutions that offer wellbeing, you offer solutions to climate change," said Tudgey. "But if we only focus on air quality, clean vehicles, decarbonization, and focusing on just one issue, then we miss the systems of how things work. We end up with siloed work and distorted outcomes."

David noted that BEN approaches health and wellbeing through the lens of community energy, and thereby involving health practitioners in the energy sector. This is bringing increasing recognition to the nexus of community energy and public health.

BEN has been working with other partners to put together the first ever chapter on Fuel Poverty for the Joint Strategic Needs Assessment (JSNA). The JSNA looks at the current and future health and care needs of local populations to inform and guide the planning and commissioning of health, well-being and social care services within a local authority area.[79]

The published chapter can be online[11] and information about the Joint Strategic Needs Assessment are accessible online.[12]

Key Activities

BEN has over twenty members (groups and individuals) involved in many different energy projects in Bristol, including: [80]

- **Addressing fuel poverty**: Assisting people struggling to pay their fuel bills by advising them on how to deal with debts to energy companies, finding the cheapest energy provider for their needs and accessing grants;

- **Behavioral change**: Advising people and community organizations on how to reduce their energy use, both by changing their behavior (e.g. not boiling more water than needed) and ensuring homes and community buildings are more energy efficient (e.g. improved insulation);

- **Clean energy diffusion:** Supporting the transition from fossil fuels to renewable energy, including raising money for and installing community-owned renewable energy projects (e.g. installing solar panels on community buildings);

- **Knowledge building**: Education, campaigning and lobbying to push for the social and political change needed to create a fair and sustainable energy system.

How members get involved

BEN supports initiatives and organizations working towards a vision of community energy as a solution for community priorities for health and wellbeing but don't have their voices heard. BEN supports its members by:

- Sharing news and information through our newsletter, website and social media;

- Acting as a conduit between members and other organizations;

- Helping members share resources and ideas through regular meetings;

- Building capacity through training, advice and support;

- Community outreach to engage a wider range of people and groups in the network.

Qualities for success

According to David, having a *community energy strategy* which lays out a round table for people to discuss and agree on ground rules for collaboration, provides the ethos of how to support one

[11] Bristol JSNA Chapter Fuel Poverty (2018)
https://www.bristol.gov.uk/documents/20182/34772/Fuel+Poverty+JSNA+Chapter+%282018%29.pdf/46359d3e-74cd-524e-819f-d27c86a692ae

[12] Joint Strategic Needs Assessment (JSNA)
https://www.bristol.gov.uk/policies-plans-strategies/joint-strategic-needs-assessment

another, which helps guide the narrative and building of BEN. “A value added to the organizational strength of BEN is involving everybody and creating working groups for this to happen”, said David

Creating access and helping to amplify people’s voices

BEN is also broadening the conversation beyond just clean energy, but also on social justice issues. They are giving access for people to participate and amplifying the voices of the communities often forgotten in the energy transition. David Tudgey notes that this is where education plays a key role, “especially creating information that is accessible for everyone from an 8-year-old to an 80-year-old.” This highlights the need for designing things that are accessible for all.

4. Nørrekær Enges Vindmølleforening (Nørrekær Enges Wind Turbine cooperative)

Location: Nørrekær Enge in North Jutland, Denmark
Year of establishment: 2016
Number of members: 1000
Area of activity: wind
MWh/year produced: 120 MW - 150 MW expected (not yet in production)

Which of the 7 dimensions are they aligned with?

Dimension	Alignment
Social	Building trust and cooperation in the local area among community members and a large energy company. Mobilized 1,000 community members in the local area to go up against the big “Goliath” energy company and make an agreement with them that is supported by the local municipality.
Economic/Business Models	Cooperation agreement with a large energy compay which gives the citizens in and around Nørrekær Enge the opportunity for a local co-ownership of wind turbines in their community.

Interview with Daniel Leuchtmann, Developer and Advisor to the Nørrekær Enges Vindmølleforening project (3 June 2021)

Background

Nørrekær Enges Vindmølleforening (Wind Turbine Cooperative) is a wind energy cooperative with around 1,000 members and 17 associations in the local area in and around Nørrekær Enge in North Jutland, Denmark. It was founded in August 2016 in response to Vattenfall's application to the municipalities of Aalborg and Vesthimmerland for permission to erect wind turbines in Nørrekær Enge. Vattenfall is a Swedish company and one of Europe’s largest producers and retailers of electricity and heat with main markets in Sweden, Germany, the Netherlands, Denmark, and the UK.[81]

Since its founding, the Nørrekær Enges Vindmølleforening has worked committedly and purposefully to ensure locally anchored co-ownership of the wind turbines in the local meadow lands, with the aim of securing funds for local development with the wind turbines as leverage. After two years of

negotiation, the Nørrekær Enges Vindmølleforening entered into a cooperation agreement with Vattenfall in November 2018, which allows for the purchase of a number of turbines in the park.

With this approach to the project, Nørrekær Enges Vindmølleforening has made a significant contribution to ensuring that there has been a great deal of trust and cooperation in the local area. Nørrekær Enges Vindmølleforening has therefore been met with great political backing from the municipalities of Aalborg and Vesthimmerland. However, like with any "David and Goliath" relationship, where small players are up against large, incumbent players, the challenges can sometimes be beyond expected.

Community response

Photo Credit: Nørrekær Enges Vindmølleforening

Wind turbines were established in the local area around a decade ago. Vattenfall built them and owns all turbines in the area. Daniel Leuchtmann says there is a lot of undisturbed wind in the area, even if it's not close to the seaside. The area doesn't have a real town, it is mostly just small villages.

At the early stages of the turbine implementation, the local people were positive about the project, but wanted to know how the project would benefit them. Daniel noted that the turbines are far away from any of the villagers and farmers. In other words, now that they have a very big industrial player in their area, would there be any jobs for them or anything else that would benefit the local economy?

The challenge

According to Daniel, a conflict arose between the large player and local interests. "Vattenfall was focused on energy production without understanding that there could be other interests at a given site. Years ago, many of the big energy companies just made big coal and oil-fired production facilities and there were hundreds of MW, but nobody cared, and they continued with business as usual. The same company mindset is still the status quo today because when the energy transition started, it certainly didn't start with the big players. It started at the grassroots level, with single turbines dispersed from community to community." That's when collective action among community members comes in.[82]

Regulation: Shifting to benefit the community

There was no direct connection between an energy producer like Vattenfall and Nørrekær Enges Vindmølleforening and a consumer. Daniel described it as "the consumers get their energy from the plug and that's it—they pay for it as they usually do in their monthly bills. This electricity is in no way directly delivered to an area so the benefits to an area has to come from a different source. In Denmark, this is actually quite well regulated. The legislation has changed now, but if you wanted to construct a wind farm, you would have to divest 20% of that to local investors, helping to increase acceptance of this kind of new energy production." [83]

Daniel noted the regulation in Denmark is now distance-based, where a turbine company would have to pay anyone in an area of a circle around the project within 2.5 kilometers, pay a tax-free bonus annually, "but this is a small amount", said Daniel. The majority of the money goes to the local government, the municipality, and they can use it however they want. The project is located in two munipalities—the Aalborg and Vesthimmerlands municipalities, both over 30 km from the site.

Because of this distance, Daniel highlighted the local people's concern that the money is not reaching the local area where the turbines exist around Nørrekær Enge and where the problems (noise, shadows, etc.) may be.

Daniel mentioned that the community cannot bypass Vattenfall because Vattenfall sits on the land lease agreements. One needs to secure land for that and you can't bypass them. For that reason, they had a group of people who said they would like to benefit in a more direct way from this. Daniel noted that the local people don't believe in the 20% divestment, they don't believe that it functions well, and want to have something more concrete. "Then Vattenfall offered 15000 Danish Krones (€2,000) per turbine per year for local development, which is an offer that has been seen in other places, as well." Daniel noted that the offer was not bad as such, but the community said, "no, we want local ownership!"

This was the start of the Nørrekær Enge movement, where the group formed a local cooperative and gathered 1,000 members, corresponding to a large percentage of the local population over 18 years old.

Challenges:

Funding

The question of funding is a crucial one: "how do you actually fund such an initiative/cooperative that is very professionally organized and has a strong relationship with the municipality?" asked Daniel.

One challenge that Daniel highlighted with the Nørrekær Enge cooperative is many people want to support it, but nobody wants to pay a membership fee. If they had taken a membership fee of 1000 Danish Krone (around €134) per year, for example, Daniel said they probably would have received a low membership rate. For the cooperative it was more important to get the masses activated, so they didn't require a fee, but that also means that they faced financial challenges. Daniel noted that "this is especially challenging when there are large players, such as Vattenfall, who have been creating obstacles to community ownership."

Political will

Daniel noted one of the biggest hurdles is th political system because there is an established way of making locally-owned projects ownership of 20% of the project value based on purchase of shares by individuals. The Nørrekær Enge approach is based on the local cooperative owning the shares. "This is new and has been very difficult to sell to the to the national political system". "Several attempts were made but were waved away by the minister of energy because probably he didn't understand the group's approach. Not the utilities, but the system is not prepared for this type of approach," said Daniel.

Ownership structure

The cooperative has a board where all decisions are made. There is an annual congregation, and their financials are audited like any other initiative. Normally for a local initiative of this kind, and there are many in Denmark, one would organize as a group of individuals who want to build this wind farm and finance it commonly. "This would also have been of interest for Nørrekær Enges, but as Vattenfall already had engaged with the landowners, this was not possible," said Daniel.

A new Nørrekær Enge Wind Farm

In March 2016, Vattenfall applied to the municipalities of Aalborg and Vesthimmerland for permission to erect 40 wind turbines in Nørrekær Enge (Project Nørrekær Enge II). At the final political decision in December 2018, the project was reduced to 36 turbines. The work has so far included concluding agreements with the affected landowners, concluding a cooperation agreement with the local Nørrekær Enge cooperative and examining other possibilities for establishing a new wind farm in the area.

In addition, work was done to obtain the necessary regulatory approvals. According to a preliminary project plan from Vattenfall, the construction of the new park has been expected during 2020 and 2021 with anticipated grid connection during December 2021. Daniel noed that “the work with authority approval, choice of turbine type and management of joint activities in Nørrekær Enge Wind Farm is carried out by Vattenfall, which makes the decisions about the park, but keeps the Nørrekær Enge cooperative engaged.”

The new park is expected to include 36 new wind turbines, which together are expected to be approx. 120 MW - 150 MW in total, depending on the turbine type. Up to 13 out of these 36 turbines are labelled to be owned by the Nørrekær Enge cooperative. The rest of the turbines will be owned by Vattenfall. Vattenfall states that they are currently looking at turbines with a nominal power of 3.6 MW to 4.2 MW per. turbine. When Vattenfall selects the turbine type and make, the financial return is sought to be optimized, at the same time as legislation on noise and distance requirements, etc. [84]

The cooperation agreement with Vattenfall

In November 2018, Nørrekær Enges Vindmølleforening entered into a cooperation agreement with Vattenfall which gives them, and thus the citizens in and around Nørrekær Enge, the opportunity for a local co-ownership of the turbines in the meadow.[85]

The main points of the agreement are the following: [86]

- The Nørrekær Enges wind turbine cooperative is offered to buy the share of the 20% that may not be sold to the neighbors. The number of turbines are rounded up;
- Landowners in the meadow have a pre-emptive right to 5 turbines agreed with Vattenfall. To the extent that the landowners do not wish to exercise this right of first refusal, the turbines are offered to Nørrekær Enges wind cooperative;
- Always round up to the nearest number of whole turbines;
- It has been agreed that the turbines offered to Nørrekær Enges will be transferred at cost price (RE price). Vattenfall thus has no profit on the sale of the wind turbine shares;
- The agreement ensures that the pricing of the turbines takes place in full transparency. The Nørrekær Enges cooperative will thus have the opportunity to review all relevant information and contracts entered into by Vattenfall regarding the project;
- The agreement ensures that the turbines offered to the Nørrekær Enges cooperative must have an average production that is the same as for the total number of turbines in the project.

Project halted

According to Daniel, the deadline of construction for the new park expected during 2020 and 2021 has not been met due Vattenfallto changes in energy law, ongoing negotiations, EU- bidding rules and objections from the public to the environmental report.

The wind park has, hence, not been built and there is currently no updated time plan to the project. Another uncertainty is that Vattenfall has recently announced publicly that they are withdrawing from the onshore energy market. All the way through you have the “David and Goliath” issue, which is daunting and unsettling, especially for private citizens to whom it is the first time they engage in community energy.

Relationship building

Although the project has not been established so far, some good has come out of it. Daniel notes that “throughout the process, the group has established some relationships with banks and financial institutes. This is encouraging because there is great will, especially from a local bank, to support this project. On the other hand, every financial institution is obliged to require securities, but how

does one get securities from a group that owns zero assets at the moment? This is another hurdle to cross."

There is no supporting governmental funds that could fund this, or at least provide the security for the financing of such a project. Daniel highlighted that the Nørrekær Enges cooperative has some excellent financial advisors, so they are surrounded by helpful and skillful people. "However, they can't engage in tough negotiations with the financing institutes until there's a specific project which can be negotiated. Ideally, they would have some government funds that could provide the security to such a project," said Daniel.

Until 2017, there were subsidies, or a type of Feed-in tariff, of 10 Danish Krone cents per KWh which was almost 50% of the energy price on top, so that was a good incentive. Daniel said this scheme no longer exists. Now it's all based on market prices and Purchasing Power Agreements (PPAs). "The securing of energy sales is, hence a very important part of the job of the Nørrekær Enges cooperative. This includes meetings with energy traders, who expressed willingness to support the project. Should this project become reality sometime in the near future, they have everything in place for it to become a reality," said Daniel.

Innovative potential

The Nørrekær Enges cooperative has managed to mobilize 1,000 members in the local area and has been able to go up against the big "Goliath" energy company and make an agreement with them that is supported by the local municipality.

Daniel highlighted that "the aim is to operate these turbines and generate benefits for the local communities, but the timeline is difficult at this point." Having ownership of the turbines is the vision that drives the group. The turbines will not be owned by a specific person or company, but by the citizens through the member-owned cooperative, generating consistent income year after year for the benefit of the local community.

DISCUSSION

As a complimentary addition to the other case studies investigated in the COMETS project, this report intends to be used as a contributor to the 'knowledge commons' for existing and/or potential collective action initiatives (CAIs) in the energy field. Although we started with a standardized set of indicators to feed information to this report, naturally, as all CAIs have unique attributes and nuanced approaches, some of the structure throughout this report may not be synchronized with every Frontier CAI.

Nevertheless, it is imperative for all citizens who want to contribute to the energy transition be able to do access valuable insights and lessons learned in order to scale up efforts for building movements around the world. By providing the lessons learned from the almost 20 innovative Frontier CAIs, the aim is to support communities that are striving to build an inclusive and just environment and sharing in the narrative that challenges the incumbent systems.

The barriers to successful development of community energy projects vary across Europe and around the world. However, some of the most common issues relate to grid access, hindering regulatory laws, access to supportive finance schemes, and overwhelming permitting processes. There are simple policies that national governments can put in place to remove these barriers and allow community energy to flourish.

The cases here show that access to renewable energy is not always accessible to all. This restriction is not only due to of its economic costs, but also due to lack of finance and political support, including supportive policies. Regarding the economic challenge, the cases here show that renewable energy is not always affordable to low-income communities. Empowering low-income communities with access and ownership of energy requires rethinking and restructuring energy investments.

Some of the common key takeaways learned from the variety of Frontier cases showcased in this report include:

- **Social justice approach**: we cannot just focus on policy and technology that cut carbon emissions but must put the communities most impacted by the extractive fossil fuel economy at the forefront of the energy transition.
- **Don't give up:** the process to getting to where a successful CAI can take time. EWS in Germany took 10 years to obtain license to distribute electricity when the market was dominated with 4 big companies and still not open for competition. Also, Community Power in Ireland took almost 12 years to build their first, and only wind farm.
- **The power of networks:** Collaborating in a broader network in one's region, country or internationally can provide valuable information and support.
- **Education and training**: many of the projects provide an added value to the communities they serve by having education and training for members.
- **the David and Goliath issue**: Many small players (community members, citizen groups, etc.) are burdened with going up against the large, "Goliath" energy players (incumbent utilities, energy companies, etc.)

An important lesson for future projects is the need to retain flexibility to bring on appropriate partners at different stages of project development as needs are further identified.

From all of the cases highlighted in this report, a common theme is that these communities are building more than just energy projects. Instead, they are shifting the culture in the narrative around energy, recognizing that some of the deepest issues pertaining to scaling up community energy is the obstructing economic structures in various municipalities, states and countries.

CAIs are enabling citizens, especially in low income communities, to be able to afford modern renewable energy by organizing, networking, and owning the renewable sources themselves. If we

focus on a just transition where everyone could actually have a fair share and to thrive in the future, we really are talking about an alternative energy paradigm where business models target socio-economic and environmental issues for increasing community wellbeing.

CONCLUSION

Collective Action Initiatives (CAIs) are increasingly being formed in many parts of the world, from the United States and France, to South Korea and Australia. No matter how their business models may vary, they all are attempting to provide access to renewable energy to their communities. Many of them are also addressing serious social issues, such as access and ownership of renewables by low income communities. This report demonstrates that the promotion of CAIs and the lessons learned from innovative Frontier cases around the world can give powerful insights to overcoming key barriers that are hindering low-income communities' access to clean energy sources, thereby taking ownership of their communities.

Like the case of People Power in California, United States, many of these Frontier cases are not just building an energy project, they are building power with community members, networks, off grid projects, and are building economic and political power to change the system.

The Frontier cases highlight that oftentimes the renewable energy industry has been continuing the same mistakes of the fossil fuel industry, which is extraction from the communities for profiting only a small number of people. The cases here show that for an aggregate scaling up of community energy, equity in the way that centers on the communities that have been excluded, is imperative. By limiting equity in the energy transition, this ends up slowing down communities' ability to transform and create the needed collective power to mitigate ongoing social justice issues and the further destruction of the environment.

APPENDIXES

APPENDIX A:
Socially innovative case that launched but got liquidated.

Name of initiative: kids&energie eG[13]

Location: Bremen, Germany
Year of establishment: 2015
Number of members: N/A
Area of activity: Solar plants, Electricity production, Electricity & Gas Supplier
MWh/year produced: N/A

Description
The 'kids&energie eG' has the legal form of a cooperative and has officially been founded in Bremen (Germany) on 27 February 2015. The cooperative was then liquidated on 29 November.2018 but has been restarted again since March 2021 according to the trade register. Yet, the website is not online anymore and the contact person does not respond to inquiries regarding the cooperative. Therefore, this description has been created based on snapshots from 2018 that were taken when the website was still online. The snapshots were found in the internet archive 'Wayback Machine'.

The 'kids&energie eG' was the first cooperative in Germany that accepted children and teenagers as full members. Adults were accepted only as investing members. Parents represented their children in the general assembly. Communication between and with the children was explicitly desired and took place via a children's and youth assembly. This assembly brought suggestions and wishes to the board, which was obliged to take them into account as far as possible. This balance between youth and parental rights should protect children from being overwhelmed when learning to assert their rights democratically.

The aim of the cooperative was to support children/young people educationally and financially. It was the first cooperative to use the costs of electricity and heating, which are necessary for everyone, for the environmental education of children. At the same time, the funds were going to be used for free workshops in schools, excursions into nature, children's university, handicraft courses, children's magazine, etc. This was made possible by a solidarity contribution (under 1 Ct/kWh), which is included in the tariffs of 'kids-Baumgas' (gas tariff 'kids-tree gas') and 'kids-Ökostrom' (green electricity). "Kids-Baumgas" means that €10 per new customer was invested in renaturation measures (reforestation, moors, and orchards) and children/young people could actively participate in this. "kids-Ökostrom" was promised to be 100% from renewable energies. Both tariffs were promoted as being CO2 neutral and nationwide low-priced, coming from a municipal energy supplier that pooled 194 municipalities. In order to buy these tariffs, it was not necessary to be a member of the cooperative.

Despite selling energy, the cooperative did not see itself as an energy supplier because the main promotional purpose was: "Children should learn democracy through full membership, contribute to the energy transition with their creative ideas, understand the necessity of resource-saving living and learn that ecology and economy are not opposites. Operating plants for decentralized, regenerative energy production. The amounts invested by parents, grandparents or other investors were planned to be available to the children as a financial cushion when they come of age."

The cooperative offered two options for getting involved financially: regular monthly contributions or one-off amounts. Monthly payments had to be at least €15, but €25 were recommended. This was promoted to be especially suitable for the financial provision of grandchildren and godchildren.

[13] http://web.archive.org/web/20180812024039/https://www.kids-energie.de/.

Amount changes or additional payment was possible at any time, as well as interruption or termination was possible without notice.

The one-off amount could be a multiple of shares that were worth €100 each. It was recommended to invest at least €500. Interest was paid on shares with a value of €300 or more. Additionally, the cooperative promised a yearly dividend of at least 3-5% and claimed that it was completely self-financed from equity without the influence of third parties.

By the time when the snapshots were taken, the website listed one PV plant in Bremen with 99,96 kWp which was financed by the cooperative. The project looks like it was still open for more financing and listed a module price of €323,77 (VAT-free). The annual yield was stated to be €26 to €30. Another project on the website was a light rent. The cooperative rented LED-lights to interested tenants. They promoted the project to offer attractive cost savings for the tenant (supermarkets, associations, small and medium-sized enterprises) and a rapid amortization. The advantages mentioned were a low investment risk and attractive returns. Those two were the only projects that were listed on the website but it said that more projects would appear there soon after.

As the cooperative specifically targeted children and had a focus on education, the website has some sections where topics are explained in a way that is suitable for them. For example, there was an explanation of what a cooperative is and a section called 'magazine' where different stories about the mascot of the cooperative, a ladybird, were planned to be published. Furthermore, the website had an extensive FAQ section.

Why the cooperative has been liquidated can only be speculated. Either it was too much of an effort for the founders to keep the cooperative running or they did not manage to sell enough shares to keep the cooperative profitable. Unfortunately, no data or articles could be found about the liquidation in desktop research. The person who is the new managing director since March 2021 did also not react to interview inquiries and no information regarding the continuation of the cooperative could be found on the internet.

Useful information was also found in an article about the cooperative from the central association of German consumer cooperatives that was published in 2015.[14]

APPENDIX B:

Outline for Frontier CAIs investigation

The following list of indicators were to be used as a guide in the partners' investigation of Frontier CAIs. This information was then used to feed our final report.

Background Info

- Name of initiative:
- Location (*City, Country*):
- Year of establishment:
- Number of members:
- Area of activity (*Solar, Wind, Hydro, Trade, Production, Distribution, etc.*):

[14] https://genossenschaftsgruendung.de/2015/10/09/kidsenergie-eg-erste-kindergenossenschaft/

- MW/year produced (*if available*):
- Which of 7 dimensions are they aligned with? (*organizational, social, technological, etc.*)

Description (500-1000 words):*

- History (*how they got started*)
- Unique attributes
- Ownership structure (*cooperative? Solar community? Co-ownership? purchasing group? prosumer? etc*)
- Business model
- Qualities that help them to be successful.
- Challenges they face.
- Other activities engaged in beyond energy?

** Doesn't have to address all specific areas, but try to cover as many as possible.*

APPENDIX C:
Interview questions for in-depth investigation

Background Info

- Name of initiative
- Location (*City, Country*)
- Year of establishment:
- Number of members
- Area of activity (*Solar, Wind, Hydro, Trade, Production, Distribution, etc*.)
- MW/year produced (*if available*)

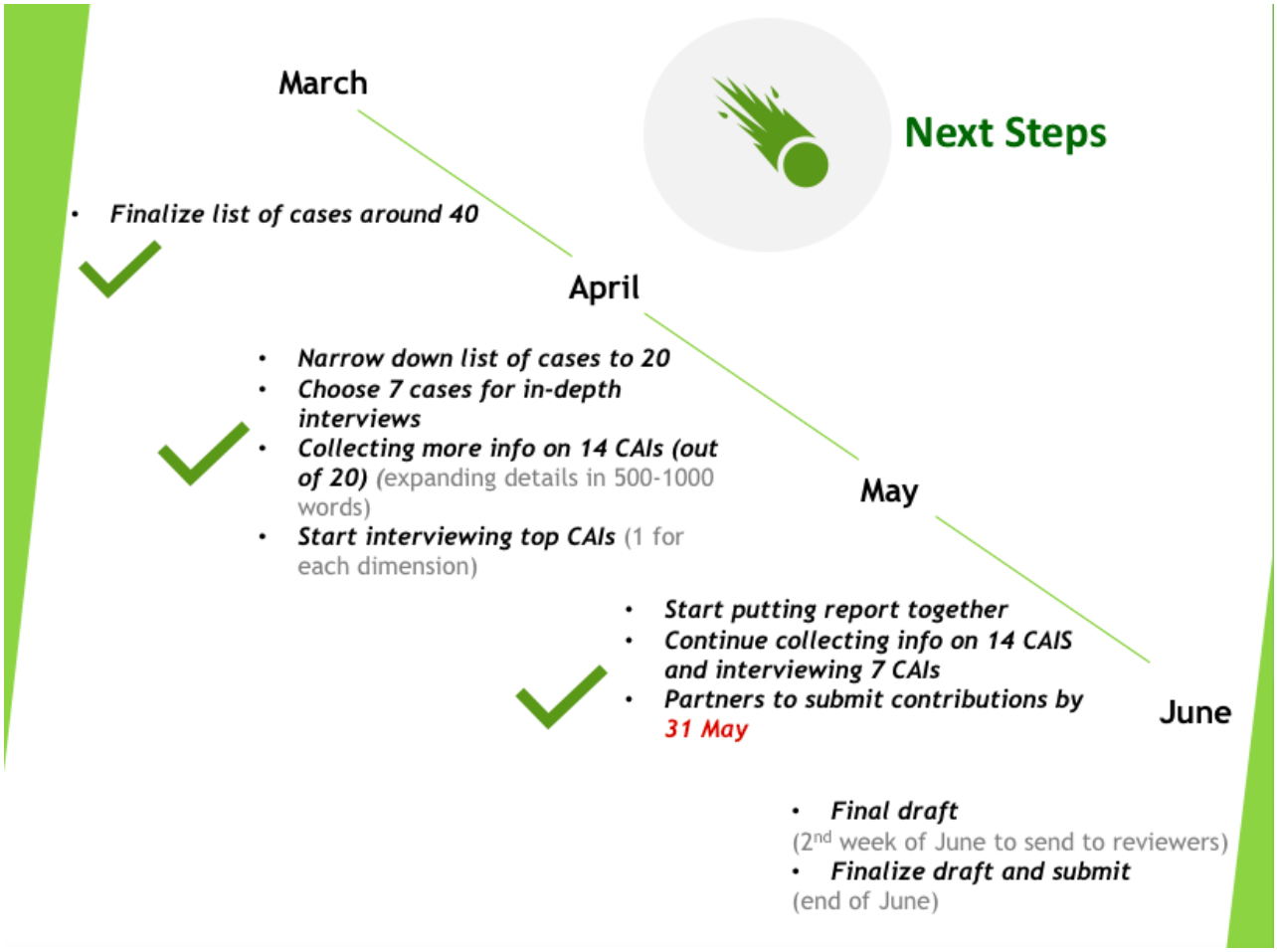
In-depth description

- History (*how it all got started*)
- Ownership structure (*cooperative? Solar community? Co-ownership? purchasing group? prosumer? etc*) and how does it work?
- Business model
- Qualities that help to be successful?

- Challenges faced?
- Other activities engaged in beyond energy?
- What makes your collective action initiative unique?
- What are you particularly proud of?
- How do you see your initiative and the energy scenario in 5 years?

APPENDIX D:

Task 5.1 timeline (March-June 2021):



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