

Cultures of Community Energy

International case studies

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Contents

Summary	2
Community energy leaders: Denmark and Germany	2
Community energy in the UK	3
Lessons from elsewhere	3
Discussion	4
Introduction	5
Background	5
Defining culture	5
Defining community energy	6
Method	6
Community energy leaders: Denmark and Germany	8
Middlegrunden Wind Farm, Denmark	10
Hvide Sande Wind Farm, Denmark	15
Bioenergy Village Jühnde, Germany	21
Community energy in the UK	28
Wiltshire Wildlife Community Energy, England	30
Brixton Energy, England	35
Cwm Arian Renewable Energy (CARE), Wales	41
Horshader Community Wind Turbine, Scotland	47
Lessons from elsewhere: Belgium, South Korea, Chile and Brazil	52
Ecopower, Belgium	54
Buan County community energy, South Korea	60
Energycoop Aysén, Chile	65
CRELUZ, Brazil	69
Discussion	74
Institutional and political cultures	74
Cultures of Social Enterprise	77
Local Cultures	79
Acknowledgements	83

Summary

Community energy generation and supply, characterised by local ownership, participation and benefit sharing, is growing in the UK. As of 2013, there were over 500 such projects. This project for the British Academy provides an international comparison of community energy projects, across England, Scotland, Wales and six other countries. It focuses on the cultural factors influencing community energy.

Three aspects of culture are considered:

- **National institutional and political cultures**, including the assumptions and norms governing regulatory structures, which are often implicit rather than explicit in government statements and policies.
- **Cultures of social enterprise**: Social enterprises are businesses trading for social or environmental purposes. The study examines the extent to which social enterprises (as distinct from the commercial or public sector) are recognised and valued within the economy and society of a region.
- **Local cultures**, referring to the cultural milieu within which community energy groups sit – such as the degree of trust and social cohesion; the influence of religious or social motivations, and so on.

Community energy leaders: Denmark and Germany

Three case studies from Denmark and Germany are profiled, as these countries are acknowledged leaders in community-scale energy generation and infrastructure – longstanding in Denmark’s case, and more recently for Germany.

- **Middlegrunden Wind Farm** is a very large-scale offshore project in Copenhagen harbour, half-owned by the municipality and half by a local co-operative with over 10,000 members. The project received widespread support at the planning stage in the 1990s. It was greatly helped by Denmark’s institutional support for both renewable energy and community scale projects, as well as the lead role played by local government.
- **Hvide Sande Wind Farm**, on a beach next to the small port town of Hvide Sande, is owned by the local community foundation, with profits from the turbines financing local regeneration. The project was established as a response to what was seen as the increasing commercialisation of the wind industry in Denmark.
- **Bioenergy Village Jühnde** is a project in a small village in Germany, supplying heat and power to local residents using biogas and woodchip, so the village produces more energy than it consumes. The facility is owned by residents, with three-quarters of the village population as members of the co-operative. The project was helped by a stable policy framework at the national level, and support from local government, as well as a partnership with the University of Göttingen.

Community energy in the UK

Compared with Denmark and Germany, the UK has had a less stable environment for community energy. The centralised nature of UK energy markets and policy made community energy a rarity until the advent of Feed-in Tariffs (FiTs) in 2010, which led to rapid growth in community projects, and the 2014 introduction of a Community Energy Strategy. Recent policy changes, including reductions to FiTs, have slowed this growth.

- **Wiltshire Wildlife Community Energy** owns two ground-mounted solar farms. The project was developed by the local Wildlife Trust, and benefited from the support and experience of other local projects. One of the projects is a joint initiative with a commercial developer, which has increased the scale of operation but led to some cultural challenges, integrating commercial and community approaches.
- **Brixton Energy** is a co-operative owning three rooftop solar schemes in south London. The project leaders put a big stress on community engagement, with local people being offered a stake in the project, and an apprenticeship scheme for young people in the area. The project is supported by Lambeth Council, an important factor in its success.
- **Cwm Arian Renewable Energy (CARE)** is a co-operative based in West Wales, inspired by a strong local spirit of collective action, including a number of local co-operatives. CARE has so far proposed two wind energy projects, but has not succeeded in securing planning approval. There is opposition to the scheme locally, as well as a strong network of support. They have also been affected by successive changes to the Feed-in Tariff regime.
- **Horshader Community Wind Turbine** is a single turbine on the Isle of Lewis in Scotland, owned by a Community Trust. The project was supported by Community Energy Scotland, and was in part grant-funded. The spirit of community self-determination in the Highlands and Islands was a strong motivator for the scheme.

Lessons from elsewhere

Lastly, four very different community energy projects from elsewhere in the world are reviewed.

- **Ecopower**, operating across the Flanders region of Belgium, is a thriving co-operative with 50,000 members, which generates and supplies electricity directly to its members. It owns wind turbines, solar PV and a combined heat and power plant. The co-operative or mutual model is relatively commonplace in Belgium, which helps individual projects to gain acceptance. Ecopower now plays a key role in promoting co-operative energy across the EU.
- **Buan County community energy**, South Korea is a small scheme generating power from solar PV, solar thermal and geothermal heating. The project came about despite a very centralised energy system in South Korea, dominated by support for nuclear power. In fact, the project was inspired by resistance to nuclear energy, as well as the ethics of shared religious beliefs.
- **Energy Co-op Aysén**, Chile is a new community group in Patagonia, formed in 2014. The group want to demonstrate alternatives to large-scale hydroelectric power. They have plans for community development and ownership of wood-fuelled heating systems. Like South Korea, Chile has a centralised energy system dominated by large players, making community approaches challenging.
- **CRELUZ**, Brazil is a co-operative social enterprise which owns six small hydroelectric plants in the Rio Grande Sol region. Like Ecopower, CRELUZ generates electricity and supplies it to local residents. Its primary aim is to provide to electricity for rural dwellers. It has strong social goals, including free or discounted electricity for families living in poverty.

Discussion

Looking across the eleven case studies, some clear patterns emerge, within each of the distinct areas of culture considered in this report.

Institutional and political cultures

All the local projects are heavily influenced by policies and norms established at the national level. Denmark and Germany have the most developed and stable institutional support, and this is reflected in the scale and ambition of individual projects. In South Korea and Chile, by contrast, markets are centralised and dominated by a few large players, making community approaches much more difficult. The role played by national and government in the UK is mixed, with a centralised and relatively inflexible national structure tempered with more recent support structures for community energy, which in turn have been eroded in recent months. The Cwm Arian project in particular demonstrates the hazards of volatile support and policy frameworks. Across the case studies, the necessity of Feed-in Tariffs or equivalent simple, stable financial revenues for community energy is clear. In summary, community energy benefits from a simple, long-term strategy at national level; a preparedness to embrace innovation; responsibility and autonomy at local level; and policies which encourage plurality.

Cultures of social enterprise

In countries or regions with stronger traditions of social enterprise, it is understandably easier to develop community energy projects. Denmark, Germany and Belgium all have this culture. It is less well developed in the UK, though in rural Scotland, community buy-outs of land and widespread use of community trusts have paved the way for community ownership of energy. Across the case studies, there are contrasting approaches to the question of how 'commercial' community energy projects should be. Some, particularly larger, schemes like Ecopower and Middlegrunden, operate along similar lines to commercial players, albeit with strong social goals and reinvestment back into the community. Others, like Buan and Horshader, are more community-focussed and do not aim to 'compete' in a commercial sense. There are correspondingly different attitudes toward finance, with larger projects using share capital together with commercial debt – which is probably necessary if community energy is to play a significant role within national energy systems.

Local cultures

Across the case studies, local circumstances exerted a strong influence over the type of project developed. A striking finding was that a large number of projects emerged out of protests against something else – nuclear energy, in the case of Buan and Ecopower; and commercial renewables projects, in the case of Horshader and Hvide Sande. In these and other examples, community energy was seen as a positive alternative to a perceived negative threat. In the UK, the Brixton and Wiltshire schemes have benefited from the divestment campaign which asks investors to stop funding fossil fuels and put their money into alternatives.

More generally, many of the projects are motivated by particular environmental or social considerations – energy security and climate change in the case of Ecopower; air pollution and deforestation for Aysén; biodiversity for Wiltshire; and so on. Social motivations include access to electricity (CRELUZ); social equity (Brixton) and community empowerment (Cwm Arian). It is also clear, looking across the case studies, that the difference between urban and rural communities leads to different opportunities. Small rural communities like Horshader and Jühnde benefit from pre-existing strong cultural ties, whereas in other areas, like Brixton and Middlegrunden, there is a greater need to invest time and resources in community engagement, building a 'community of interest' around a project. Lastly, the projects varied in their approach to collaboration, but many benefited from support from local government or, in some cases, commercial renewables developers. The role of influential individuals and peer networks also played a key part in the success of many of the projects.

Introduction

Background

Community energy solutions are a fast growing part of the UK's energy system. Since the introduction of Feed-in Tariffs in 2010, there has been a steep rise in the number of community-led and -owned renewable energy projects, although social enterprise approaches to energy efficiency have been slower to take off. Research by Peter Capener for DECC identified around 550-600 active community energy organisations in August 2013.¹

Although much research has focussed on the technical, regulatory and organisational aspects of community energy, there is a gap in the understanding of the cultural dynamics and drivers involved. This research looks beyond the statistics to investigate in detail the cultural dynamics which underpin community energy across different international contexts.

Defining culture

Culture is a notoriously broad and contested concept. A recent definition demonstrates the breadth of the term:

“Culture is a fuzzy set of basic assumptions and values, orientations to life, beliefs, policies, procedures and behavioural conventions that are shared by a group of people, and that influence (but do not determine) each member's behaviour and his/her interpretations of the 'meaning' of other people's behaviour”²

Following this, any given community energy project will be influenced by, and will itself influence, layers of cultural conditions which may support or inhibit its development. These range from national institutional and political cultures, which are important in determining regulatory structures, through to local cultural characteristics, such as shared social norms, ethical and social commitments which may help to bind groups and allow them to pursue common aims.

Given the breadth and difficulty of the concept, we propose using a working definition of culture as a heuristic for analysis, comprising three interlinked aspects that previous research has suggested are relevant to the development, dynamics and outcomes of community energy.

National institutional and political cultures

This refers to the assumptions and norms governing the design and operation of regulatory structures, which are often implicit rather than explicit in government statements and policies, but which are influential in the success or otherwise of community energy projects. This includes regional and local political cultures, and the extent to which there is a culture of local decision-making and self-determination. For example, the UK has a strongly free-market, centralised energy regulation culture, which influences the landscape within which community energy operates.³

Cultures of social enterprise

Social enterprises are businesses trading for social or environmental purposes.⁴ As such, they can be distinguished from charities and philanthropic organisations, on the one hand; and businesses operating for private profit, on the other. We examine the extent to which social enterprises (as distinct from commercial enterprise or the public sector) are recognised and valued actors within the economy and society of a region or country, and are accustomed

¹ Capener, P. (2014) Community Renewable Electricity Generation: Potential Sector Growth to 2020. London: DECC.

² Spencer-Oatey, H. (2008) Culturally Speaking. Culture, Communication and Politeness Theory. 2nd edition. London: Continuum. Pp.3.

³ Willis, R. and Eyre, N. (2011) Demanding Less: Why we need a new politics of energy. London: Green Alliance.

⁴ http://www.socialenterprise.org.uk/uploads/editor/files/Publications/Social_Enterprise_Explained.pdf

to working together to deliver tangible outcomes, such as services or asset ownership. For example, some regions and countries, such as Denmark and Belgium, have a relatively strong social enterprise culture, and social enterprises such as co-operatives play a significant role in land ownership or provision of health or education services.⁵ Differing cultures of social enterprise also affect the extent to which community groups expect or aspire to develop financially sustainable social enterprises, rather than using voluntary support or charitable grants.⁶

Local cultures

The cultural milieu within which community energy groups sit (for example, the degree of interpersonal trust, social capital and cohesion in a local area⁷) help shape the dynamics of community energy projects. This includes differing conceptions of 'local'⁸, as well as the micro-culture of particular community energy groups. Particular groups may, for example, be motivated by a shared faith, ethical or moral commitments to sustainability or social justice, a desire to demonstrate an alternative business model, or contribute to social or economic regeneration.⁹ The community's own collective confidence in their ability to act may influence their level of ambition on community energy projects.

These three aspects of culture are, of course, connected and overlapping, and each will have contested elements and meanings. However, we use the three aspects as a heuristic device by which to structure our analysis of the case studies.

Defining community energy

Following the literature, we recognise that 'community energy' cannot be taken as a given in our research, but is an ambiguous and flexible concept that is interpreted differently across contexts and sectors¹⁰. Community energy encompasses a broad range of activities and structures, for example undertaking heat or power generation as well as demand reduction activities, led by citizen volunteers or local authorities, at the meso scale, and involving communities of locality and communities of interest to varying degrees.¹¹ Alongside this variability is a consistent emphasis upon two normative dimensions that typically distinguish community energy from other forms of energy projects: high levels of participation in a project, including in decision-making; and a high degree of local benefit sharing.¹²

Method

The project began with an assessment of existing evidence, from the academic and policy literature. Based on this, eleven case studies were selected, from three broad groups:

- **Community energy leaders:** Two projects from Denmark and one from Germany, as these countries have a high uptake of community energy, and supportive regulatory frameworks – longstanding in the case of Denmark, and more recent in Germany's case.
- **The UK:** Reflecting the British Academy's wish to examine the challenges and opportunities facing the UK in particular, we selected four case studies from the UK: two from England, and one each from Scotland and Wales.
- **Wild cards:** In order to learn from very different cultural and institutional settings, we selected five 'wild card' case studies from other countries, with projects from Belgium, South Korea, Brazil and Chile.

⁵ See for example the case of Germany, discussed in Julian, C. (2014) *Creating Local Energy Economies: Lessons from Germany*. London: ResPublica.

⁶ Hargreaves, T., Longhurst, N., and Seyfang, G. (2013) 'Up, down, round and round: connecting regimes and practices in innovation for sustainability'. *Environment and Planning A*, 45, pp.402-420.

⁷ Walker, G., Devine-Wright, P., Hunter, S., High, H. and Evans, B. (2010) 'Trust and community: exploring the meanings, contexts and dynamics of community renewable energy.' *Energy Policy*, 38(6), pp.2655-2663

⁸ Devine-Wright, P. and Wiersma, B. (2013) 'Opening up the 'local' to analysis: Exploring the spatiality of UK decentralised urban energy initiatives.' *Local Environment*, 18, pp.1099-1116.

⁹ Jeong, Y., Simcock, N. and Walker, G. (2012) 'Making Power Differently: Exploring the motives and meanings of community renewable energy developments in cases from the UK and South Korea.' In A. Davies (Ed.) *Enterprising Communities: Grassroots Sustainability Innovations*. Bingley, Emerald, pp. 105-121.

¹⁰ Walker, G.P. and Shove, E. (2007) 'Ambivalence, sustainability and the governance of sociotechnical transitions.' *Journal of Environmental Policy and Planning*, 9(3-4), pp.213-225.

¹¹ Walker, G. and Cass, N. (2007) 'Carbon reduction, "the public" and renewable energy: engaging with sociotechnical configurations.' *Area*, 39(4), pp.458-469.







¹² Walker, G.P. and Devine-Wright, P. (2008) 'Community renewable energy: what should it mean?' *Energy Policy*, 36 (2), pp.497-500.

The eleven case studies include a range of size/technology of project; groups with varying motivations and socioeconomic backgrounds; and some projects which have been undertaken jointly by a community group and another actor (e.g. local authority / private developer).

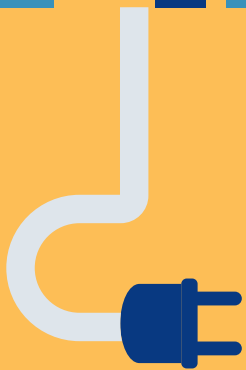
Each case study was researched individually, with desk research complemented by one or more interviews with people involved in the project or closely connected to it.

The project team then drew out common themes from across the case studies, to inform the discussion.

Box 1: The eleven case studies

	Rural / urban	Size / technology	Partnership with others?	Other factors
Denmark and Germany				
Middlegrundten, Denmark 	Urban	Large-scale wind	Joint with commercial developers	Offshore, near Copenhagen. One of the first projects
Hvide Sande, Denmark 	Small town in rural area	Large-scale wind	Linked to local business organisation	Linked to town district heating plant
Bioenergy Village Jühnde, Germany 	Rural	Biomass and other technologies – small scale but whole village	Partnership with local university	
UK				
Wiltshire Wildlife, England 	Rural	Solar PV, medium-large scale	Partnership with commercial developer	
Brixton Energy, England 	Urban	Solar PV, small scale in several locations	Worked closely with local authority	Strong social element including apprenticeships etc
Cwm Arian Renewable Energy (CARE), Wales 	Small town	Medium, wind	Community-led	Not yet built due to a series of difficulties
Horshader Community Wind Turbine, Scotland 	Rural	Small, wind	Community-led with support from Community Energy Scotland	
Wild cards				
Ecopower, Belgium 	Operates across the Flanders region	Range of technologies	Co-operative but very large in scale	Generates and supplies electricity to households
Buan County, South Korea 	Rural	Solar PV	Community-led	
Energy Coop Aysén, Chile 	Predominantly urban	Not yet operational	Community-led	Early stage; mainly focussed on networking & feasibility
Creluz, Brazil 	Rural	Hydro - small-scale but large network	Community-led	

Community energy leaders: Denmark and Germany



In Denmark, wind energy is seen as a green and clean alternative fuel.



Our first set of case studies comes from Denmark and Germany, acknowledged leaders in community-scale energy generation and infrastructure.

Denmark has a long history of strong policy support for wind energy, ever since the 1970s when the country responded to the oil crisis by pioneering wind power as part of a drive toward energy security, and ever since wind has provided a relatively high percentage of Danish energy consumption.¹³ This strong policy support can be thought of as reflective of wider cultural attitudes in Denmark, in which renewable energy and the idea of ‘being green’ carry positive meanings and associations.¹⁴ Several polls have suggested that wind energy has been viewed more positively than other nations.¹⁵ Alongside the response to the oil crisis in the 1980s, citizen support for wind energy also has its roots in a history of protest against nuclear energy in the 1980s¹⁶ with wind energy seen as a green and clean alternative fuel. Denmark still has no nuclear power facilities, with a 1985 law prohibiting the production of any nuclear energy.¹⁷ The widespread use of district heating in Denmark, encouraged through legislation, has also resulted in a more decentralised energy system, with much heat and power generation owned by municipalities and communities.¹⁸

In Germany, like Denmark, there is strong and stable support for renewable energy, though it is more recent. An official ‘energiewende’, or energy transition, was introduced in 2010, though its roots go back to the 1980s. The transition consists of ambitious targets for renewable energy, energy efficiency and greenhouse gas reductions, together with support through Feed-in Tariffs (in place since 2000) and other policies, and a phase-out of nuclear power. As of 2012, renewables made up 12.4% of Germany’s gross final energy consumption, and the overall aim is to meet 80% of its energy demand from renewables by 2050. There is also strong policy and widespread public support for community ownership of renewable energy generation, with approximately half of the installed capacity under some form of community ownership as of 2012.¹⁹

The following case studies, two from Denmark and one from Germany, have clearly benefited from this relative stability at national level. This is analysed further in the Discussion section.

80%

of Germany’s energy
to come from renewables
by 2050



¹³ Oteman, M., Wiering, M. and Helderma, J.K. (2014) ‘The institutional space of community initiatives for renewable energy: a comparative case study of the Netherlands, Germany and Denmark’. *Energy, Sustainability and Society*, 4(11).

¹⁴ Ibid.

¹⁵ Sovacool and Tambo (2016) argue that this has been changing over recent years. See: Sovacool, B.K. and Tambo, T. (2016) ‘Comparing consumer perceptions of energy security, policy, and low-carbon technology: Insights from Denmark.’ *Energy Research & Social Science*, 11, pp.79-91.

¹⁶ Toke, D., Breukers, S., and Wolsink, M. (2008) ‘Wind power deployment outcomes: How can we account for the differences?’ *Renewable and Sustainable Energy Reviews*, 12 (4), 1129-1147

¹⁷ Oteman et al., (2014) ‘The institutional space of community initiatives for renewable energy’

¹⁸ http://www.ens.dk/sites/ens.dk/files/dokumenter/publikationer/downloads/energy_policy_in_denmark_-_web.pdf

¹⁹ Roberts, J., Bodman, F. and Rybski, R.

Middlegrunden Wind Farm

Middelgrunden Wind Turbine Co-operative is an offshore wind farm located 3km from Copenhagen harbour. Operational since 2001, the project comprises 20 turbines of 2MW each providing 40 megawatts of electricity – equivalent to 3 per cent of the capital's electricity needs.²⁰



CR Hans Chr. Soerensen

Key points

- **20 2MW turbines**, located **3km offshore** from Copenhagen harbour
- **50% owned by Copenhagen Energy** (the local utility company, itself owned by Copenhagen municipality), and **50% by a local co-operative with over 10,000 members**
- The **decentralisation of energy targets** and flexible planning arrangements in Denmark encouraged the innovative joint venture between a local utility and co-operative
- **Co-operative energy projects** have a long history in Denmark and are powerful cultural symbols, helping the project to gain public support after other private-developer owned offshore wind projects had met local opposition
- **Open and transparent public engagement**, along with the involvement of the local municipality, helped the project to gain trust and support from a very diverse local public
- The project was deliberately **designed to visually 'fit'** into the history and landscape of Copenhagen's harbour

50%

owned by a local co-operative with over **10,000 members**

50%

owned by **Copenhagen Energy** (the local utility company, itself owned by Copenhagen municipality)

About the project

The Middelgrunden co-operative was established in October 1996. A group of wind turbine enthusiasts got together to create a new co-operative following the success of Lynetten – a previous offshore project near to Copenhagen.²¹ They combined with the Copenhagen Environment and Energy Office, who had noted that the location of Middelgrunden had been identified as a potential site for wind power in the Danish Action Plan for Offshore Wind.²² Together, these groups established the wind turbine co-operative and a partnership with the local utility, Copenhagen Energy. 50% of the project is owned by this local utility (which itself is part of Copenhagen municipality), whilst the other 50% is owned co-operatively by members²³ Initially, membership was limited only to those living within the municipal area, and by 2003 over 10,000 residents had joined the co-operative,²⁴ but legislative changes since then mean that anyone in the country is now eligible for ownership.²⁵

Middelgrunden provides an interesting case study, because it is the largest community-owned wind project in the world, demonstrating how citizens can participate in and take ownership over large, complex projects.²⁶ The project also received widespread public support during planning, in contrast to many wind energy schemes where only critics of a project write to the local council whilst supporters remain silent.²⁷ This is all the more interesting given that the project is located very close to the shore, and other offshore projects in Denmark owned by private-developers met substantial local resistance.²⁸ Its structure of ownership – a combination of civic participation through a co-operative, and strategic direction from the local government via its publicly owned energy company – is rare and may prove to be an interesting model for elsewhere.²⁹

Institutional & political culture

Denmark's longstanding support for both renewable energy and decentralised solutions has been an important factor in the success of Middlegrunden. One project leader told us that he agreed that "in general" there was support for wind energy amongst Danish people and that this had been somewhat helpful both for inspiring and generating support for Middelgrunden – although he was quick to qualify that such support also depended on the ownership of the project and the process through which it was developed.

Political support for wind energy development did provide a setting within which resources were available to pursue the project. In the 1990s Environment & Energy Offices (EEO) were created and funded, by national government money, throughout Denmark to provide information and advice on sustainability and energy saving. The original inspiration for Middelgrunden came from the Copenhagen EEO (CEEEO), who formed a working group to investigate the project in 1996.³⁰ Throughout the development of the project, the office of CEEEO continued to represent the co-operative-half of the ownership, leading on everyday project management from their office in Copenhagen and also aiding in public engagement and contact. The expertise and contacts of the CEEEO, along with the presence of a dedicated office space, helped to 'professionalise' the project and guide it through the complexities of feasibility and planning.³¹ Furthermore, the project was also aided by a government grant during the pre-planning stages of development, which helped to fund the detailed and sometimes complex feasibility studies.³²

²⁰ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy.

²¹ <http://www.middelgrunden.dk/middelgrunden?q=en/node/35>

²² Soerensen, H.C., Hansen, L.K., Hammarlund, K., and Larsen, J.H. (2001) 'Experience with and strategies for public involvement in offshore wind projects.' Brussels: Offshore Wind Energy EWEA Conference.

²³ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy.

²⁴ Larsen, J.H., Soerensen, H.C., Christiansen, E., Naef, S. and Vølund, P. (2005) 'Experiences from Middelgrunden 40 MW Offshore Wind Farm.' Copenhagen Offshore Wind Conference.

²⁵ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy.

²⁶ Bolinger, M. (2001) Community Wind Power Ownership

²⁷ Haggett, C. (2008) 'Over the Sea and Far Away? A Consideration of the Planning, Politics and Public Perception of Offshore Wind Farms.' *Journal of Environmental Policy & Planning*, 10(3), 289-306

²⁸ Soerensen et al. (2001) 'Experience with and strategies for public involvement in offshore wind projects.'

²⁹ <http://www.unrisd.org/thinkpiece-cumbers>

³⁰ Department of Trade & Industry (DTI) (2004) Co-operative energy: lessons from Denmark and Sweden. London: DTI.

³¹ Personal correspondence. In 2002 funding for the EEOs was drawn and the centres were closed.

³² Personal correspondence.

Denmark's longstanding support for both renewable energy and decentralised solutions has been an important factor in the success of Middlegrunden

The presence of a Feed-in Tariff aided the financial viability of the project, which helped to encourage investors in the scheme that helped fund its initial capital costs.³³ Denmark was one of the first countries to bring in a FiT, in line with its support for renewable energy development but also because of a desire for collectively and co-operatively run projects.³⁴

A further factor is that Denmark has a planning framework and culture that provides the space and support for community-led initiatives to develop. Within an ambitious national framework of renewable energy targets, the government adopts a fairly decentralised form of governance, with local municipalities given the responsibility, financial means, and the independence determine how national targets will actually be met.³⁵ This responsibility and flexibility to innovate provides fertile ground for communities to design and develop projects, in collaboration with local municipalities, who are likely to support them as this aids them in meeting their energy targets.³⁶ At the time of Middelgrunden's development, most offshore wind projects in Denmark were not owned co-operatively but by utility companies, but it was a 'political priority' to encourage the formation of co-operatively-owned offshore wind farms.³⁷ Middelgrunden's ownership structure is certainly reflective of the flexible and proactive role that local municipalities play in reaching energy targets, as well as the political drive for co-operatively-owned offshore projects. Someone involved in setting up the project told us that there was a "tradition" for this to happen in Copenhagen (prior to Middelgrunden, the Lynetten wind project had been installed in 1996 using a similar ownership structure, and since then two further projects have followed in 2007 and 2013), driven by the incentives for local municipalities to get public support:

"We have the tradition in Copenhagen to start up as a JV with the local utility. The utility is owned by the local municipality, this happened for the first time in 1995 with the Lynetten wind farm. The reason for them [the utility] to join in is that a coop is more likely to get support from the public – a utility even owned by the public don't have that backing."

This joint arrangement also allowed both parties to work together using their complementary skills, helping to deliver a complex and potentially controversial project. The local utility had the knowledge and resources to deal with the technical and construction aspects of the work, whilst the co-operative, assisted by CEEO, focussed on public engagement and contact with the news media – over 50,000 people were contacted in the early stages of project development.³⁸

Cultures of social enterprise

Co-operatives and collective associations are rooted in Danish culture and have been used extensively in the country for many years.³⁹ This tradition began with the farming community in the mid-19th century,⁴⁰ when farmers worked together to improve their lands and products, and has since extended to many areas of life, including the energy sector. In terms of heating, small-scale district heating schemes are familiar throughout the country.⁴¹ There has also long been co-operative ownership of wind energy projects, beginning only with local ownership in the 1970s and 80s, before this was opened up to encourage a wider number of investors in the 1990s.⁴² The Danish Wind Turbine Ownership Association (which represents co-operatively-owned wind projects) has also been a powerful lobbying force. In short, collective ownership of wind energy has long been typical in Denmark, breeding both public familiarity and support.⁴³ Past surveys have shown that one-third of Danish people were directly engaged in wind schemes or were familiar with other people engaged in such schemes, much higher than in the UK at the time.⁴⁴ More recently, Oteman et al.⁴⁵ have suggested that there is a large

³³ Bolinger, M. (2001) Community Wind Power Ownership Schemes and their Relevance to the United States.

³⁴ Ibid.

³⁷ Larsen et al. (2005) 'Experiences from Middelgrunden 40 MW Offshore Wind Farm.'

³⁸ DTI (2004) Co-operative energy: lessons from Denmark and Sweden.

³⁹ Bolinger, M. (2001) Community Wind Power Ownership Schemes and their Relevance to the United States; Sovacool, B. and Tambo, T. (2016) 'Comparing consumer perceptions of energy security, policy, and low-carbon technology: Insights from Denmark'.

⁴⁰ DTI (2004) Co-operative energy: lessons from Denmark and Sweden.

⁴¹ Sovacool, B. and Tambo, T. (2016) 'Comparing consumer perceptions of energy security, policy, and low-carbon technology: Insights from Denmark'.

⁴² <http://www.communitypower.eu/en/denmark.html>

⁴³ DTI (2004) Co-operative energy: lessons from Denmark and Sweden.

⁴⁴ Devine-Wright, P. (2005) 'Beyond NIMBYism: towards an Integrated Framework for Understanding Public Perceptions of Wind Energy.' *Wind Energy*, 8, pp.125-139.

⁴⁵ Oteman et al., (2014) 'The institutional space of community initiatives for renewable energy'

Co-operatives and collective associations are rooted in Danish culture and have been used extensively in the country for many years

and positive public consensus around the possibility of community-ownership of wind energy in Denmark, and that such developments carry positive cultural associations. There is also a strong tradition of public participation in the planning of renewable energy schemes, again dating back to the early developments of the 1980s.⁴⁶

By the late 1990s, around the time that Middelgrunden was being developed, there were over 2,000 locally owned wind turbines,⁴⁷ with more than 150,000 Danish families members of wind turbine co-operatives in the early 2000s.⁴⁸ One Middelgrunden project leader agreed that the widespread nature of co-operatively-owned energy schemes helped provide the awareness and inspiration for the scheme, before highlighting the deep history of co-operative endeavours in Denmark:

“Yes, certainly [it provided the inspiration for the scheme]. The use of the coop model is a more than 149 years tradition in Denmark, coming from agriculture activities in order to establish local companies of the benefit to all local people.”

Previous studies have also suggested that the widespread nature of co-operatively-owned energy has fed down into public awareness and cultural beliefs. One Danish author has argued that “almost all people in Denmark are familiar with the coop model [of energy ownership]”⁴⁹. Likewise, one representative survey showing that more than one-third of Danish people were either directly engaged in wind schemes or personally knew someone engaged in such a scheme.⁵⁰ Devine-Wright contrasted this with relatively low levels of awareness in South Wales at the time of the concept of local involvement and ownership in the UK.

Local culture

Middelgrunden wind farm is set close to the city of Copenhagen, the largest city in Denmark. Cities such of these are characterised by a multiplicity of actors and interests, and lack the ‘thick’ interpersonal and institutional trust that can occur in small rural localities where ‘everyone knows everyone’. Local trust and support for the Middelgrunden wind project could therefore not be taken for granted, but instead had to be built and encouraged.

The involvement of the local municipality – which owns Copenhagen Energy, the utility company that owns 50% of the project – helped in this regard, providing democratic accountability and legitimacy to the project. One project leader told us that the involvement of the municipality meant that “we could provide the public real figures” about the scheme. Larsen et al. also argue that “The locally based commitment, along with cooperation between the co-operative, the local utilities, and the municipality of Copenhagen, constituted a significant precondition for the development of the project. This cooperation has provided credibility to the project in relation to politicians and the public.”⁵¹

Also important was that a very transparent and open process was used to build trust.⁵² The project was subject of a long and intensive implementation and engagement phase, using financial support from the Government to fund intensive information provision (leaflets, news articles, television coverage) and also open events such as public hearings which invited a broad spectrum of local participation and included detailed visualisations of the wind farm.⁵³

The involvement of the local municipality provided democratic accountability and legitimacy to the project

⁴⁶ Maegaard, P. (2013) Wind Energy requires broad local acceptance. Hvide Sande: 100% Community-owned Wind Turbines. Denmark: Nordic Folkecenter for Renewable Energy.

⁴⁷ Oteman et al., (2014) ‘The institutional space of community initiatives for renewable energy’

⁴⁸ Copenhagen Environment and Energy Office (CEEO) (2003) The Middelgrunden Offshore Wind Farm. Copenhagen., CEEO.

⁴⁹ Personal correspondence.

⁵⁰ Devine-Wright (2005) ‘Beyond NIMBYism: towards an Integrated Framework for Understanding Public Perceptions of Wind Energy.’

⁵¹ Larsen et al. (2005) ‘Experiences from Middelgrunden 40 MW Offshore Wind Farm.’

⁵² Haggett, C. (2008) ‘Over the Sea and Far Away? A Consideration of the Planning, Politics and Public Perception of Offshore Wind Farms.’

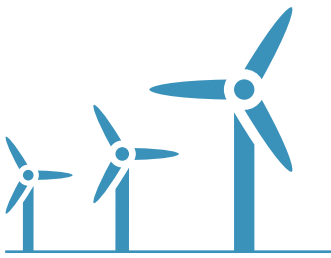
⁵³ Ibid.

The opinions of local people were accommodated and responded to, directly shaping the project – as explained further below, the original proposed layout of the turbines was altered to accommodate public opinion. One project leader told us that this engagement phase was fundamental to achieving widespread local trust and acceptance of the scheme:

“More important [to public acceptance was] the approach of a co-op: open information at all time; strong public engagement during the project period inviting to information meetings, and an open house at the building site.”

Soerenson and Hansen⁵⁴ draw similar conclusions, saying, “For the Middelgrunden Wind Farm outside Copenhagen, it is very probable that the project could not have been carried out without involvement of the local public in this way.”

As noted, as a result of local input, the layout of the wind farm was altered. The initial proposal was for 27 turbines in a rectangular shape of 3 rows of 9 turbines. This was eventually changed to 20 turbines that were placed in a single sweeping curve, with the size of the turbines slightly increasing so the same amount of electricity could be generated.⁵⁵ This shape itself was designed to ‘fit’ into the city’s history and place identity – it was constructed on the lines of the historical defences of the city, and was presented as such to the local people, with the graceful design helping the wind farm to become a tourist attraction in Copenhagen.⁵⁶ In 2003, the newspaper International Herald Tribune described how the turbines fit within the Copenhagen landscape and act as a powerful national symbol, reflecting the country’s cultural identity as environmentally conscious:



20

turbines were placed in a single sweeping curve to ‘fit’ into the city’s history and place identity

“Looking out to sea from this city’s picturesque harbour, a wall of 70-meter windmills dominates the horizon with rotors silently spinning in the glinting sunshine as sailboats and fishing trawlers glide past. For most Danes, these towering turbines are anything but an eyesore, and anything but a threat to the environment. In fact, they are featured on postcards and proclaimed attractions by tour guides on ferry boats. They are the pride of the local Greenpeace office, which even owns shares in the project. Here, the windmills are seen as a graceful gateway to a historic harbour and a proud symbol for an environmentally conscious country that has put itself at the cutting edge of one of Europe’s fastest growing energy sectors: wind power.”

⁵⁴ Soerenson, H.C. and Hansen, L. (2002) Social Acceptance, Environmental Impact and Politics. Draft report for Concerted Action on Offshore Wind Energy in Europe project

⁵⁵ Henderson, A.R., Morgan, C., Smith, B., Sørensen, H.C., Barthelmie, R.J. and Boesmans, B. (2003) ‘Offshore Wind Energy in Europe—A Review of the State-of-the-Art.’ *Wind Energy*, 6, 35-52.

⁵⁶ Ibid.

Hvide Sande Wind Farm

Hvide Sande is a small port village of around 3,000 people, situated on the east coast of Denmark on the small strip of land between the North Sea and Ringkøbing Fjord. The area is a popular tourist region, home to Denmark's 5th largest port.



Photo: Comrade Foot

Key points

- **Three 3MW wind turbines** installed on a beach next to the small port town of Hvide Sande
- Led and owned the **Hvide Sande Community foundation**, a local community trust
- The project aimed to **resist the recent trend** in Denmark toward private-developer led wind farms
- In its **ownership structure and distribution of profits**, it also aims to be different to the co-operative ownership model that has long dominated Denmark's community energy sector
- The project gained wide acceptance among the local population because of its **unique model of community-ownership**, with previous proposals for similar-sized but privately owned schemes having faced significant local dissent.

About the project

In January 2012, three 3MW wind turbines went into operation, installed on Hvide Sande's beach very close to the village. Since that time, these turbines have been exceeding expectations by generating power as efficiently as offshore wind farms.⁵⁷

The project has been led by Hvide Sande Community Foundation (HSCF)⁵⁸, a charitable organisation that was established in 2010 for the purpose of developing the project.⁵⁹ HSCF owns 80% of the project, with the other 20% owned by 400 local co-operative investors, as required by Danish law.⁶⁰ The project cost EUR 12.2million, the vast majority of which came from a loan from two local banks. With an annual return of 9%-11%, the loans are expected to be repaid in 7-10 years, leaving the foundation with approximately €1.2 million per year to spend on local development.⁶¹

The electricity generated is sold into Denmark's national grid. Any excess profits following the repayment of bank loans are invested in the local area on collective projects, decided on a by a democratically elected board of local residents, that aim to redevelop and modernise the harbour area.⁶² This investment of profits into the collective good, rather than private interests, led to widespread local support for the scheme and resulted in the project winning the 2013 European Solar prize.⁶³

Hvide Sande is an example of a project that is different to the typical model of 'community' ownership that is prevalent in Denmark. It emerged in a context of resistance against other wind developments, and demonstrates how this 'resistance spirit' can foster alternative forms of community ownership, illustrates how community-led projects can offer an inspiring and positive alternative to private-developer schemes.

20%

of the project is owned
by **400 local co-operative
investors**

€12.2m

project cost, the vast majority
of which came from a loan
from two local banks



Photo: Johan Wessman

⁵⁷ <http://www.communitypower.eu/en/9-join-community-power/963-denmark-inspiring-story.html>

⁵⁸ HSCF is made up of various local organisations including Hornsland Dunes Tourism Association, local unions, industry and utilities.

⁵⁹ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy.

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² Ibid.

⁶³ <http://www.eurosolar.de/en/index.php/solar-prizes-mainmenu-24/european-solar-prizes-2013-main-menu-352>

Institutional & political culture

Like the Middlegrunden project, Hvide Sande has benefited from Denmark's longstanding support for wind energy, and community-led approaches. We interviewed one Danish citizen with a thorough knowledge of the Hvide Sande development. Like our interviewee in the Middelgrunden case study, she agreed that whilst there was a very general acknowledgement of wind energy as a 'good' and viable renewable energy technology across Denmark, acceptance of specific projects was much more qualified, and depended on the specific ownership structure that was used.⁶⁴ Originally, wind energy developments in Denmark were owned by groups of local citizens (see section on 'Social Enterprise Cultures' below), and policy explicitly encouraged this ownership structure. However, since the early 2000s in particular policy support for such citizen-led developments has dwindled somewhat, with discourses relating to cost-efficiency and economies of scale gaining salience and leading to a favouring of large-scale projects developed by market parties.⁶⁵

Reflecting this change in policy culture, the Feed-in Tariffs for wind energy were dropped by the government in the early 2000s and replaced by a market-based renewable portfolio standard that favoured larger projects.⁶⁶

These changes led to a shift in the dominant form of ownership structure in Denmark, with increasing numbers of private-developer led projects, but also an increasing number of protest groups against wind energy. Our interviewee at Hvide Sande also recounted this story:

"If we look at wind energy development over the last 30 years, in the beginning all the wind installations were based on shares in the local area. But in 1992 the planning system in Denmark it changed, and said you can only put windmills here, here and here. And this encouraged private investors, because they could go to a farmer and say 'in your field you have space for 4 windmills. We are interested in buying the land so that we can set up windmills.' And the farmer gets so much money that he sells the rights to the investors, and then the investor owns the windmills and sets it up themselves. And then this starts in our country a negative attitude to the windmills. They said "we live here in the rural areas, we are very positive toward wind energy, but we also want to have money out of it. We want to develop our local area."

The interviewee then recounted how, in order to mitigate this increasing opposition, the Danish government enacted a law to ensure at least 20% of a project has to be owned locally, by those living within 4.5km of the development.⁶⁷ This law is reflected in Hvide Sande's ownership structure, with 80% of the project owned by HCSF and the remaining 20% owned by local stakeholders. But our interviewee argued that this was not nearly sufficient, and local opposition remained:

"And then the government said 'OK, we have understood what you have said, and 20% of the ownership will go to people that live 4.5km from the windmills. And the rest, 80% goes to the investors'. And the protests still were there. People said 'no, no, no, we are not interested, this 20% is nothing, and it is only to a few private people, and it doesn't give development in our local area.' So with 20% there are still more than 150 groups that are against windmills."

⁶⁴ Sovacool, B. and Tambo, T. (2016) 'Comparing consumer perceptions of energy security, policy, and low-carbon technology: Insights from Denmark'.

⁶⁵ Oteman et al., (2014) 'The institutional space of community initiatives for renewable energy'

⁶⁶ Bolinger, M. (2001) Community Wind Power Ownership Schemes and their Relevance to the United States.

⁶⁷ Haggett, C. and Aitken, M. (2015) 'Grassroots Energy Innovations: the Role of Community Ownership and Investment'. Current Sustainable Renewable Energy Report , DOI 10.1007/s40518-015-0035-8

Indeed, the Hvide Sande area has experience of resisting corporate developments – in 2006, prior to the establishment of the community wind project private developers proposing a similar project in terms of technology, scale and location faced significant resistance from local people who “resolutely fought against foreign investors”. This dissent meant that the scheme was unable to gain planning permission, and the collective spirit of resistance in the area eventually formulated the community-owned project that received widespread local support:

“[In 2006] there were investors that came to Hvide Sande and said that they want to buy the rights to build windmills. And all Hvide Sande people protested, and said that they didn’t want it. So the project went away and wasn’t set up, and then 4 years later local people said ‘we’ll set windmills up and make it as a trust fund.’ All people supported, there was no protests at all. So it means that when we change the ownership and give money to the fund, and use the money to develop the local area, then people are positive.”

Therefore, the various recent policy trends in Denmark toward private-investor and corporate wind energy ownership did inadvertently encourage the development of the Hvide Sande community scheme, by encouraging a ‘resistance spirit’. The project deliberately aims to contradict the dominant trend of private ownership.⁶⁸

One important area of policy tradition that our interviewee did feel aided the development of the Hvide Sande project was Denmark’s decentralised planning system, in which local municipalities are given significant responsibility and independence to determine how national renewables targets are met.⁶⁹ As was the case with the Middelgrunden project, this flexibility and local democratic accountability provides fertile ground for communities to develop projects, and the local municipality has an incentive to support them as a way of meeting their energy targets and also responding to the concerns of their constituents.⁷⁰ For example, our interviewee claimed that projects like Hvide Sande would happen “more and more” and the local municipalities would support their development because “people that are sitting in the local parliament, they want to be re-elected! So it means that they cannot go against their people, and say that ‘never mind, you have to live with these [private] windmills.’ They cannot do it, when you have 150 groups that protest.”

Finally, Hvide Sande benefits from the presence of a Feed-in Tariff brought back in 2009 after the expansion of wind energy production dramatically slowed⁷¹, which makes the project financially viable.

Cultures of social enterprise

As stated above, forms of social enterprise, including co-operatives, are widely used in Denmark. The Hvide Sande community already owned a local heat and power plant and district heating system, which paved the way for the wind turbines. District heating schemes are familiar throughout the country⁷² and supported by legislation. Our interviewee involved with the Hvide Sande project told us that “65% of all households have district heating. It is the highest in the world. It is very, very popular.” Indeed, the Hvide Sande community also has its own district heating system. Like Middelgrunden, Hvide Sande benefited from a history of community ownership of wind, too.

65%

of the **Hvide Sande households** have access to a district heating system owned by the community

⁶⁸ Maegaard (2013) Wind Energy requires broad local acceptance. Hvide Sande: 100% Community-owned Wind Turbines.

⁶⁹ Oteman et al., (2014) ‘The institutional space of community initiatives for renewable energy’

⁷⁰ Ibid.

⁷¹ <http://www.iea.org/policiesandmeasures/renewableenergy/?country=Denmark>

⁷² Sovacool, B. and Tambo, T. (2016) ‘Comparing consumer perceptions of energy security, policy, and low-carbon technology: Insights from Denmark’.

80%

of the **profit** from the windmill goes into the trust fund

However, as noted above, over the last twenty years the growth of co-operatively-owned renewable energy has slowed relative to the development of private initiatives. Hvide Sande aims to resist this trend. The project also aims to be deliberately different from many other 'community' energy developments in Denmark. Specifically, for the most part it does not adopt the co-operative model of ownership, in which individuals buy shares in the development and then receive a return on their investment. Only 20% of the project is owned in this way, and our interviewee told us that this only occurred because the Danish law dictated it. Rather, the project operates a 'community trust' model of ownership, in which 80% of the profits are returned not to individual investors but to collective projects within the local area. This was seen as being a 'truer' definition of what 'community-ownership' meant:

"There's a lot of focus about community ownership now, but what we think is that many places have misunderstood what 'community ownership' means ... it is a rule in Denmark that 20% must go to investors who live 4.5km around the windmill, these people have the chance to buy shares in the windmill. But when they buy shares, it is private money and it goes to your own pocket ... When we talk about development in rural areas, in the local areas where we set-up the windmills, then it has to be money that can be used in the local area. And it is only money that can be put down into a trust fund, or what we could call a development fund or renewable energy fund. It means that 80% of the profit from the windmill goes into the trust fund."

Maegaard⁷³ makes a similar argument, claiming that the Hvide Sande model of ownership restores the 'true spirit' of Danish wind power when it began in the 1980s. He points out that many people currently involved in Denmark's wind energy opposition groups actually organised and pioneered the initial wind projects of 80s. He sees this as a wider trend of social entrepreneurship:

"In Scandinavia, ownership that satisfies the common good is the dominant form of ownership for the supply of water, district heating, public transport and similar part of the public sector. However, until now, windmill ownership primarily has been through private investors and so-called 'guilds' that are co-operatives where people invest in order to make a profit that lands in their own pockets. Therefore, the Danish version of windmill co-operatives does not belong to the common good category, while the Hvide Sande windmill project is to the benefit of all of the citizens."

In many ways, therefore, we can see that the Hvide Sande development is 'counter-cultural' to the dominant patterns of Danish wind energy development, both in terms of its increasing number of private-developer initiatives and also to the typical model of community-ownership. The collective 'resistance spirit' to these developments, and a desire to give a positive example of something different, drove it forward. However, it can also be argued that, as Maegaard suggests above, that the Hvide Sande ownership model is actually closer to the wider Danish principles of welfare and the common good.

⁷³ Maegaard (2013) Wind Energy requires broad local acceptance. Hvide Sande: 100% Community-owned Wind Turbines.

Local culture

The collective spirit and support for the Hvide Sande project, and its particular ownership approach, was further strengthened by the nature of the local community. A rural community that is relatively economically marginal, it is dependent on its harbour for jobs and income, but the harbour was in need of modernisation. The motivation to implement a wind energy project in a different way with distinctly ‘collective’ forms of outcomes was therefore driven by a broader desire for redevelopment:

“In Hvide Sande, in year 2010, there was a little group of people who got together and said ‘we want to develop our harbour, our local interests, and if we set up a windmill and make a trust fund, then with the profit from the windmills we can develop the local area.’”

**DKK
4.8m**

Benefit to the harbour
from annual rent

As with other case studies we examine in this report, the nature of the local community therefore also shaped the type of project that was pursued and developed and the particular outcomes that it generated. In the Hvide Sande case, the profits of the turbine are spent on collective projects that meet specific needs of the community and decided on by a board of local residents.⁷⁴ Much of the expected return will be invested in the modernisation and development of the local harbour, which is of great importance to the region⁷⁵ – HSCF’s stated aim is to ‘support the development of Hvide Sande harbour and the tourism in Ringkøbing/Skjern Municipality by production of renewable energy.’ The harbour itself benefits from an annual rent of from an annual rent of DKK 4.8 million, paid for 30 years by HSCF in return for allowing the turbines to be sited on harbour land.⁷⁶ Other measures adopted include energy efficiency in public buildings, local business initiatives, and initial steps toward public e-mobility.

⁷⁴ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy.

⁷⁵ <http://www.communitypower.eu/en/9-join-community-power/963-denmark-inspiring-story.html>

⁷⁶ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy.

Bioenergy Village Jühnde

Jühnde is a small village in the southern part of Lower Saxony, Germany, with a population of around 750 inhabitants. In 2005, the village opened a local bioenergy plant to supply heat and power to local residents, making Jühnde the first bioenergy village in Germany.⁷⁷



Photo: Axel Hindemith

Key points

- Jühnde is a small village in Lower Saxony, Germany, with a population of **around 750 inhabitants**.
- In 2005, a bioenergy plant running on biogas and woodchip opened to supply heat and power to the village. The plant is **owned by local residents via a cooperative**, providing low-cost energy to its members.
- The **University of Göttingen played a key role** in initiating the project and providing support throughout its development. Political support also proved vital, with the village Mayor particularly important in motivating local participation.
- **Co-operatives are relatively widespread in Germany**, and village residents had an awareness of this business model and shared belief in its value.
- **Interpersonal trust** and **social cohesion** between residents in the village was strong, helping them to work together to develop the project.

⁷⁷ Brohmann, B., Fritsche, U., and Hünecke, K. (2006) Case 6: Bioenergy Village Jühnde. Working paper for Create Acceptance project. Available at: http://www.esteem-tool.eu/fileadmin/esteem-tool/docs/CASE_6_def.pdf

About the project

The system contains a 700kW CHP generator that runs on biogas to produce electricity that is supplied to the public grid. A 550kW woodchip boiler is used in the winter to supply heating which circulates around the local district network.⁷⁸ During summer time, the excess heat of the CHP-plant is used for drying of wood-chips or log-wood for the heating boiler to use in wintertime. The original aim of the project was for the village to be self-sufficient in terms of energy consumption, and the plants now produce 70% of the villages heating demand and double its electricity demand.

The bioenergy facility is owned locally and collectively by the people of Jühnde. Residents are able to buy shares in the co-operative company that owns the facility – at present, nearly 75% of Jühnde's inhabitants are members of this company.⁷⁹ Once they've bought shares and become a member, they are then able to purchase heating and electricity from the company – importantly, this means that the consumers of energy are also the producers of that energy. The system cost 5.2M Euro, of which 0.5M came from the investing citizens, 1.3M from a grant, and the remaining 3.4M from a bank loan.

70%

of the **village's heating** demand is produced by the plant

The original idea for the project was proposed in 2000 by researchers at the nearby University of Göttingen, who were looking for rural villages to take part in a competition, the winner of which would host a new bioenergy plant that could demonstrate an alternative to fossil fuels. Having received information and met with university researchers, a group of local residents were sold on the idea of making the village energy self-sufficient. They began to campaign and organised local support for the project, eventually winning the competition and working alongside the university in making the original vision a reality. Eventually, after nearly 4 years of preparation, construction work and briefings, the Bioenergy Village Jühnde was completed.

The development has resulted in a 60% reduction in the villages CO₂ emissions because of a switch away from oil heating, and members are now provided with a comfortable, reliable and relatively cheap source of local energy. Villagers also believe that the development has contributed to the community spirit of the village. The majority of crops for the plants are harvested locally, with a small shortfall of 25% purchased from regions around the village.⁸⁰ As a result of these achievements, the project was awarded the EuroSolar Prize in December 2005.⁸¹ The project is also catalysing other projects in the neighbouring region, and the Jühnde itself is investigating further sustainability initiatives, including electric cars and wind power.

Institutional and political culture

The Jühnde project is a small part of a rapid expansion of renewables across Germany, including forms of community ownership, has been encouraged by a stable regulatory framework. In particular, a Feed-in Tariff was introduced in 2000 as part of the country's Renewable Energy Act and covers both large and community-based developments. A key principle of the Renewable Energy Act is investment security⁸² - access to the grid is guaranteed, so that every kWh produced from renewable energy sources has to be purchased, and the FiT means that the price is stable and guaranteed for around 20 years.⁸³ The resident of Jühnde that we spoke to explained the importance of the FiT to the bioenergy project, noting that it provided financial security and its long-term and stable nature allowed the community to plan ahead and develop new ideas for when the tariff eventually finished:

⁷⁸ <http://www.4biomass.eu/en/best-practice/project-bioenergy-village-juehnde>

⁷⁹ Ibid.

⁸⁰ <http://www.regbieplus.eu/265.0.html>

⁸¹ <http://www.4biomass.eu/en/best-practice/project-bioenergy-village-juehnde>

⁸² Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy

⁸³ Although there have been regular decreases in the rate of the FiT for new projects, in order to encourage innovation cost-efficiency, these have been at a steady rather than sudden rate.

“We have the renewable energy act, and we can get money for 20 years which is fixed. So now we are ten years in, and we are looking at the next ten years. So we are now doing the next step so that invest money to optimise our plant and make it fit for the future, so we guess that in ten years there will be no renewable energy act so we have to think about solutions about what we will do in the future. And that’s a great discussion in Germany more widely, and what will happen to biogas projects in the future when the Renewable Energy Act has gone. So we are trying to now implement new concepts by having more focus on the heat, and installing techniques for flexible production with this plant. So we think that this is a great chance. We also have some visions that in the future we drive all electric cars in this village. Because we have 70% of the heat should use, we can sell it to them, but we are producing double the electricity that people are using in the village. So we are thinking in the future when people have electrical cars, people can buy electricity from the co-operative. And so we can develop a local market, and is a way of getting money to run the plant later on.”

As Germany is a federal republic, it operates a fairly decentralised energy planning system

The project also received support from regional and local government at various levels. As Germany is a federal republic, it operates a fairly decentralised energy planning system. Throughout the country, state governments are empowered to influence their energy mix through control over planning rules and the provision of local energy supply, including the prioritisation of renewables.⁸⁴ There has also been a strong push for local municipalities to become energy self-sufficient, and many have typically been engaged in the supply, production and distribution of energy through public or municipal utilities. The principle of ‘Daseinsvorsorge’ (‘services for the public’) also obliges municipalities to provide all households with access to basic services such as electricity.⁸⁵ In the case of Jühnde, the municipal government were supportive of the scheme and were particularly helpful in encouraging the national government and banks to provide the project with the necessary funding.⁸⁶ Particularly important, however, was the role played by the Mayor of the town, who played a supportive and networking role throughout the project and was crucial in initiating local resident involvement during the early stages of the scheme. Following the initial approach from the University to the village, he was instrumental in organising and promoting an initial town meeting to hear more about the proposals, as described by a local resident:

“He said: ‘Come on guys from the university, let’s have an assembly of the people and you can present it to them, and then we can take a look to see if the people still like it and they are motivated to do it.’ So this was the first step in this process.”

Following this meeting, the Mayor and the university then organised for local residents to visit a woodchip heating plant that would be similar to one installed at Jühnde, so that they could get an idea of the nature of the development. Then a further village meeting was held, which proved decisive in encouraging the village to enter the University’s competition and pursue the scheme:

“The Mayor came to this meeting and he talked about the trip and this was very interesting for everyone. So in the end we discussed a lot of these things, and then decided that evening to create an initiative.”

⁸⁴ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy

⁸⁵ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy.

⁸⁶ Personal correspondence with local resident.

A distinct and clearly vital aspect in the success of the Jühnde project was the institutional support provided by researchers at the nearby University of Göttingen. As well as providing the initial idea for the bioenergy development, they also had the resources to engage with local residents and ‘sell’ them the idea in the early stages of the project. Throughout the project development, these researchers provided further networking and support for the village, using their scientific expertise to focus particularly on the feasibility and technical side of the development and thus leaving the local residents to concentrate on raising local support, gaining bank finance, and deciding on the best solution in terms of ownership structure and specific technology. One local resident we spoke to described the help provided by the University, noting that it was important that they were a trustworthy and impartial organisation that was not driven only by profit-making:

“It helped very much [that it was a University], because the university wasn’t interested in making money. They tried to convince with other arguments. So there the people trusted them, and that was very good for the beginning to have independent arguments that people can think about it, and ask them questions and so on. So this was very helpful to have the university at this time. And also for the methods – they helped us with moderation, they wrote some papers and information and so on, they helped us with this type of work. So they were part of the process at the beginning, and later on when the project began to be more and more specific, the university concentrated on their scientific work and we decided what was the best solution for us, we spoke with the bank and so on. So the more responsibility we took the more we cared about this topic and the scientists got a little bit backgrounded.”

Cultures of social enterprise

In German culture many people share beliefs around the value of small-to-medium sized enterprises and distributed patterns of business ownership, and these make up an important part of the German economy. Compared to America, there is less support and desire for large corporations and the associated patterns of concentrated ownership.⁸⁷ Although this is not social enterprise in the strict sense, it may help create a more supportive environment for social enterprises like co-operatives, as they tend to be smaller and more local in nature. The use of co-operatives as a form of social enterprise is also expanding throughout the country, and can be set up to pursue a variety of activities including housing, farming, and construction.⁸⁸ This expansion has also taken place in the ownership renewable energy projects, with co-operatives increasingly popular as a vehicle for community investment and ownership – in 2006 there were only two co-operatives in the energy sector, but by 2011 this had risen to 111.⁸⁹

111

co-operatives in the energy sector in 2011 (only 2 in 2006)



⁸⁷ Morris, C. (2013) German Energy Freedom: Moving beyond energy dependence to energy democracy. Washington, D.C.: Heinrich Böll Stiftung

⁸⁸ Roberts et al. (2014) Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy.

⁸⁹ Ibid.

The bioenergy facility at Jühnde is owned by a co-operative of local residents. This was actually the first co-operative in the village. Nonetheless, the fact that co-operative endeavours were widespread in Germany, and indeed were present in the neighbouring village, meant that many residents were aware and supportive of the business model. This eased the path of the development and helped encourage local support and involvement that was required for the scheme to be successful. It was also one reason why the co-operative model of ownership was specifically chosen:

“In Jühnde we were the first co-operative. But the people here in Germany in the rural areas, they know the construction of co-operatives. So for example the bank in the next village is a co-operative, or examples where farmers bring their products from the fields to co-operatives that buy it and sell it to the market. So they knew that this was a very fine and excellent type of company. We discussed a lot of other options, we discussed a lot what was best, asked people for their vote, and the most voted for the co-operative.”

The Jühnde development is interesting because those residents who own shares in the bioenergy co-operative are also the ones who purchase their heat and electricity from the plant. The fact that residents are both producers and consumers – or as one resident we spoke to put it, ‘prosumers’ – encourages them to make balanced decisions on the correct price that the business should sell its energy:

“The co-operative has to strike a balance sometimes. On the one hand the co-operative has to earn money, on the other hand the consumer wants small prices for the heat. So that’s a very good discussion and it’s important that people are involved in the production as well because they have to decide in the interests of the co-operative as well.”

Since its successful development, Jühnde has worked to exchange its experiences with others interested in developing their own ‘bioenergy village’. A guide book for other interested communities has been created, and the village has joined a European network of self-sustaining communities.⁹⁰

Local culture

Jühnde is a small and relatively close-knit community, with a high degree of interpersonal trust between residents fuelled by lots of local associations and social clubs. As one local resident told us:

“We have 750 inhabitants. We’re about 15km away from the university town, so here it’s a very rural area, very nice place, a lot of nature around us. And we have had in earlier times a school and kindergarten, and clubs for playing tennis and these sorts of things, so the people are very organised in this kind of way. So everybody mostly knew the other when we were developing the Jühnde [project].”

⁹⁰ Ibid.

For the village to win the University's competition and for the bioenergy plant to be funded and constructed, a lot of work had to be done to gain the support of the majority of residents, with the university asking for figures of public support:

“The university was running a competition between the different villages, and they gave us a questionnaire and would like to see the figures of how many people are interested, how motivated they are to be involved and so on.”

However, in the early stages, it was difficult to convince some inhabitants of the merits of a bioenergy plant. To overcome this challenge, it was helpful that the community was close-knit and trusting, making it easier to canvas residents and encourage their participation and support. A core group of around 20 people worked to engage other locals and also established other steering groups that could focus on specific aspects:

“We established teams which care about different topics, one team care about what kind of company we should establish, another one was biomass, another was biogas plants and so on. So we had around 8 teams by the inhabitants, and they spent their time doing this, and core group had the task to integrate these teams and consolidate the results.”

After some time, the majority of local people became supportive of the projects and what it could offer the village in terms of energy independence and self-sufficiency. The organisation and widespread support of the Jühnde's residents were major reasons it won the University's competition:

“It was very clear to me that if we want to win the competition we need to put together a proper proposal and force a public response. So we took around a questionnaire and tried to get the people to fill it out, so that we can get an ideal picture of what people who like. So we got a very high rate of return of 60%, and this was very impressive for the university team, and this was one argument later to take Jühnde – we are very well organised.”

Since the bioenergy plant has been installed and running some argue that it has further enhanced the social cohesion of Jühnde, particularly in terms of providing a conversation topic when meeting new residents of the village.

A final factor to consider is that Jühnde is a relatively remote rural village, and this geographic isolation also meant that its residents were, for many years, dependent on sometimes unreliable deliveries of oil for their heating systems, which had gradually increased in price. This history and geography shaped the goals and outcomes that Jühnde residents wanted from the bioenergy plant. Rather than, for example, a community fund that could be reinvested in local services, or delivering a financial return to the co-operative's investors, there is a shared belief amongst residents that keeping energy prices low should be the principal goal. It was the prospect of relatively low-cost heating that convinced many local residents to support the scheme:

“We could not convince [people] by the earning money argument, they were more interested in not paying more on energy bills”

This goal also means that the co-operative only generates a very small profit:

“The main goal of the co-operative is to get low price heating. So the heat price is not so high that the co-operative earns a lot. It's the other way around, we have cheap heat prices and small returns to the members for their investment. For example, last year we could pay round about 2 ½ % on the money that they invested. So it's nice that the people have benefits from the co-operative as well.”

Geographic isolation meant residents were dependent on unreliable deliveries of oil for their heating systems



Community energy in the UK

The centralised nature of UK energy markets and policy made community energy a rarity until the advent of Feed-in Tariffs (FiTs) in 2010, which led to rapid growth in community projects.



Compared with Denmark and Germany, the UK has had a less stable environment for community energy.

The centralised nature of UK energy markets and policy made community energy a rarity until the advent of Feed-in Tariffs (FiTs) in 2010, which led to rapid growth in community projects, and the 2014 introduction of a Community Energy Strategy. Recent policy changes, including reductions to FiTs, have slowed this growth.

There are important differences in the cultures of community energy between England, Scotland and Wales. In England, community energy primarily uses a co-operative legal form, funded through share offers. In Scotland, however, schemes are developed using a community trust model, building on the tradition of such institutions in Scotland, particularly the Highlands and Islands.



Wiltshire Wildlife Community Energy

Wiltshire Wildlife Community Energy (WWCE) is an independent Community Benefit Society⁹¹ set up in 2012 by Wiltshire Wildlife Trust (WWT) to develop, finance and operate community owned renewable energy projects⁹² – the first and only community energy company in the country to be created by a Wildlife Trust⁹³, although other wildlife trusts are now also attempting to develop solar arrays on their land⁹⁴.



Key points

- Two ground-mounted solar PV farms of **1MW** and **9.1MW**
- Led and owned by **Wiltshire Wildlife Community Energy**
- A culture of **landscape protection** and perceived antipathy toward wind turbines in local area led the group to **develop solar energy**
- A **strong social enterprise culture** underpins the case study development, but this also brought significant challenges
- Local community support has been focussed around the community of interest offered by membership of Wiltshire Wildlife Trust, as much as the geographical communities around the projects
- The group was able to draw on expertise and experiences of other organisations because of a burgeoning **niche ‘culture’ of community energy in the south-west**
- Changes in government policy around Feed-in Tariffs affected the financial viability of the larger project, but **support for community energy** also created some of the opportunities that would have otherwise not been available

⁹¹ A Community Benefit Society (also known as a ‘BenCom’) is a type of co-operative that is run for the benefit of the local community as well as its members. This type of ownership enables democratic control based on the one member one-vote principle, but also legally ensures that a portion of any profits from the enterprise are re-invested in the local area.

⁹² <http://www.wiltshirewildlife.org/green-living/About-Wiltshire-Wildlife-Community-Energy.htm>

⁹³ <http://wwce.org/news/>

⁹⁴ For example, Lancashire Wildlife Trust: <http://www.lancswt.org.uk/news/2016/02/01/youngsters-feel-solar-power>

About the project

WWT was motivated to set up WWCE because of their commitment to protect wildlife habitats and biodiversity – climate change poses a real threat to the natural world, and developing community energy projects offered a tangible way of responding.⁹⁵ The provision of community benefits is also central to the WWCE's vision. The level of community contributions generated over the life of these community projects are expected to be around 20 times greater than would be offered by a commercial developer. WWCE itself is a social enterprise, set up with the aim of developing as a financially sustainable community business and to date has not received any grant aid.

WWCE has so far pursued two ground-mounted solar energy projects as well as a number of small roof-mounted schemes. The first is the Chelworth scheme, a 1MW ground-mounted solar PV array near the village of Crickdale, near Swindon. Construction began in spring 2014 and was installed and running by June that same year. The project was funded solely from the selling of shares in WWCE through a community share offer, enabling people to invest anywhere between £500-£100,000 and giving them community ownership of the project.

A second, much larger solar array called Braydon Manor is currently being developed, with construction beginning in September 2015.⁹⁶ Originally planned to be a 5MW scheme, this was expanded to 9.1MW, following changes in government regulations (see below). This makes Braydon Manor the first successful community-owned split-site renewables development. It was named best renewable energy scheme in the Southwest at the RegenSW 2015 Green Energy Awards.⁹⁷

Both projects offer substantial community and environmental benefits. After payment to members, 80% of the remaining money is allocated to local projects through WWCE's community benefit fund, with 20% going directly to Wiltshire Wildlife Trust.⁹⁸ The Chelworth scheme has also established wildflower meadows underneath the solar panels, becoming an exemplar of how solar arrays can enhance biodiversity.⁹⁹ To date WWCE has paid 7% interest to its members, and in 2015 has allocated £25,000 for distribution back into local communities via its community benefit fund.

The Chelworth scheme was funded solely by a community share offer

Institutional & Political Cultures

The Feed-in Tariff has been crucial in making both projects financially viable. For the Braydon Manor scheme, changes to the FiT during project development led to some difficulties and delays in project development, since this changed the basic financial projections and potentially the viability of the scheme. In this regard, it was fortunate that WWCE were able to draw on the expertise and experience of other organisations, who helped to guide them through this complexity (see below). Reducing the FiT has always been part of the subsidy mechanism. This has helped to drive down the capital costs of projects. However, recently there has been a hardening of a dominant policy culture around cost reduction and minimal state interference. For example, defending the most recent FiT reductions, a DECC spokesperson stated:

“Government support has driven down the cost of renewable energy significantly, enabling renewables to compete with other technologies and helping the industry stand on its own two feet. Our priority is now to move towards a low-carbon economy whilst ensuring subsidies are used where they are needed most, to provide the best value for money for hardworking bill payers.”¹⁰⁰

⁹⁵ <http://wwce.org/news/>

⁹⁶ <http://wwce.org/installations/braydon-manor-solar-array/>

⁹⁷ http://www.thisiswiltshire.co.uk/news/14112475.Solar_farm_named_best_in_the_region/

⁹⁸ <http://wwce.org/about-us/community-fund/>

⁹⁹ <http://wwce.org/installations/wwce-projects/>

¹⁰⁰ <http://www.theguardian.com/environment/2015/oct/07/onshore-wind-farms-cheapest-form-of-uk-electricity-reportshows>

Split site ownership offers significant opportunities to community groups but can add complexity to projects

The coalition government did establish a climate of support for community energy, as evidenced by the UK's first ever community energy strategy. However, the new Conservative administration, elected in May 2015, at this time seems less keen to support the sector.

One of the major developments that came out of the community energy strategy was a piece of government legislation that came into effect in April 2015. This legislation made it possible “for an organisation to work with another company and build more than one renewable energy project on a single site”.¹⁰¹ One project can be split into two separate sites of up to 5MW and still receive FiT income as long as one site is owned by a community group (previously, projects could be a maximum of 5MW to be eligible for the FiT.) This meant that the Braydon Manor scheme could be expanded from 5MW to 9.1MW, with 4.1MW owned by a private company. This helped improve the financial viability of the site, despite declining FiTs, as the initial overhead costs could be split – resulting in a £400,000 saving for WWCE. The amount of renewable power being produced is now 4.1MW greater than it would have been. However, these various policy changes did add to the complexity of developing the project, and in this regard WWCE were fortunate in being able to draw on the expertise of Mongoose Energy, a West-of-England based social enterprise (discussed further below).

This approach to split site ownership offers significant opportunities to community groups, enabling them to buy into projects where they would never be able to raise the funds to purchase the whole scheme. However, it also raises significant challenges in terms of partnership development, with potential tensions between commercial and community cultures.

Alongside these national policy aspects, WWCE's solar projects – particularly the Braydon Manor scheme – were also aided by a supportive and enthusiastic local authority at nearby Swindon, who takes a very proactive approach toward encouraging renewable energy development.¹⁰² In January 2010 the council established Public Power Solutions (PPS), a wholly owned subsidiary focussed on encouraging the uptake of green energy solutions in the local area. PPS actively searches for and identifies suitable sites for solar energy. It then completes the necessary work and receives planning consent for the development, before selling the site (and the proposal) on to public and community-groups. Having done this with the Braydon Manor site, they sold the site to WWCE. It was this supportive and proactive approach that led to the development of the site, providing the idea to WWCE but also making the development much easier as planning permission had been granted and much of the feasibility work already conducted. The project leader at WWCE we spoke to said: [PPS] totally planted the seed for us. It wouldn't have happened without them ... we just bought the whole scheme and developed it.”

Cultures of social enterprise

There is less of a culture of social enterprise in the UK compared to Denmark and Germany. Community energy projects have been operating since the 1980s and 1990s, but the advent of the Feed-in Tariff in 2010 led to a financially sustainable business model that could drive the growth of the sector. Prior to that community energy schemes relied on grant funding. This growth was particularly strong in England where there hasn't been the history of grant funding for community energy with over 200 community energy enterprises set up over the last few years.¹⁰³

Alongside this general valuing of ‘community-based’ activity, there are also many social enterprises in the southwest of England that are involved in developing and diffusing self-financing and sustaining community energy projects¹⁰⁴, alongside several associated support and intermediary organisations. Those we spoke to who were involved with WWCE all mentioned the several examples of such organisations, and there was a perception that

The Feed-in Tariff in 2010 led to a financially sustainable business model for community energy

¹⁰¹ <http://wwce.org/news/>

¹⁰² (personal correspondence, consultant at Public Power Solutions)

¹⁰³ Based on searches of the FCA mutual database - <https://mutuals.fsa.gov.uk/Search.aspx>

¹⁰⁴ http://communityshares.org.uk/sites/default/files/resources/community_shares_-_inside_the_market_report_-_june_2015.pdf

the southwest of the UK, particularly the cities of Bristol, Bath and Swindon, was home to a burgeoning 'energy' around community renewables. The consultant for PPS we spoke to indicated that this was an important part of the area's identity, stating: "The south-west has always led the rest of the country in terms of renewable energy". The presence of these various community-energy organisations and enterprises provided fertile ground for WWCE to network and draw on the expertise and experience of others, as discussed below.

Local culture

There are a number of interesting aspects of local culture that shaped the development of the WWCE schemes. Perhaps most interesting is attitudes toward renewable energy. One project leader argued that there are high levels of antipathy toward wind in the local area. Wiltshire County Council, for example, has produced what some see as an 'anti-wind strategy', suggesting that turbines could not be within 3km of homes, and dramatically reducing the number of potential sites. She linked such attitudes to a culture of landscape protection and conservation – a desire to protect the 'rural idyll' – which was, she argued, underpinned by conservative values that were widespread in the area. She stated that this was the primary reason why there is a great deal more solar happening than wind (although this is also related to natural resources, with relatively high levels of solar irradiation but relatively slow wind speeds). This local antipathy for wind directly influenced the decision to choose solar as the technology of choice – the rationale behind solar "was that it was more acceptable locally than wind would have been." Originally, the group had considered putting a wind turbine into the corner of the original solar site, but a neighbour had also tried to put up a small turbine and there was a great deal of opposition to this. The Trustees at WWT didn't want to create problems and stir up difficulties, as the WWT relies on local volunteers and having good connections with the local council. The perception that people in the local rural area would be opposed to renewable energy also provided part of the rationale for adopting a community-ownership approach. It was felt that keeping benefits local, and enabling people to benefit from the project, would reduce local objections.

A further local factor is the high degree of trust in WWT as an organisation. It is a successful and well-established group, with several hundred members and many projects, and is well known throughout the county. This means that the organisation is trusted within the local area, something which it was felt certainly helped with local acceptance and encouraging local people to invest in both schemes.

70%

of WWCE's membership
are **WWT's members**



Wiltshire Wildlife Community Energy October 2015

The project was helped greatly by a burgeoning culture of renewable energy in the Southwest of England

As a member organisation, WWT already had existing ties and relations of trust with a large number of people. Again, this proved useful – for example, it was able to write to all its members encouraging them to invest, so although the geographical communities of place were important, at the core of WWCE's success has been its ability to build a community of interest based around built WWT's members, who represent 70% of WWCE's membership. The community of interest foundation for WWCE's membership, with large numbers of investors, does have other impacts though. For example, the weaker bonds between people mean that there is less buzz within the community of WWT members about the project than you would find within a primarily geographic community. For some people, participation in the project may also be limited to financial investment and perhaps taking part in members' voting at WWCE's AGM, with perhaps less involvement in terms of volunteering for the organisation.

A related local factor is WWT's set of beliefs and values, which influenced the type of project that was pursued. As noted, an initial concern for environmental protection and the natural world motivated the desire to generate renewable energy. But community ownership was pursued not only because it was felt it would lead to greater local acceptance, but because it fitted with the ethos and ideals of the Trust – a community-based organisation that exists for the common-good, not-for-profit. This particular culture and ethos also impacted upon how both solar sites are now managed and used now that they are up-and-running – shaping, therefore, the outcomes of the project. For example, this ethos is the reason that WWCE set up its own ecological management plan. The land beneath the Chelworth solar farm is managed as a wildflower meadow that encourages biodiversity, and the site is also home to the endangered Great Crested Newt and a pond was dug during the installation to further encourage their numbers. Braydon Manor will be managed in a similar way. PPS shares WWCE's ethos of good ecological management, and established this as part of the Braydon Manor scheme from the outset when the project was still in its early planning stages.

The ethos of the WWT is also prevalent in other aspects of the project outcomes, particularly the types of schemes that are funded through the community-benefit fund. To be eligible, some of the criteria for projects supported through the community fund include wildlife conservation, carbon reduction, and a reduction in fuel poverty.

The project was also helped greatly by a burgeoning culture of renewable energy in the southwest of England. In particular, a partnership between WWT and Bath & West Community Energy was central in helping to set up WWCE and in developing the Chelworth solar project. Whilst WWCE was aware of the possibility of developing its own community energy project, Bath & West Community Energy provided invaluable expertise on all the practicalities of actually bringing such awareness into fruition – and on a financially sustainable basis that did not require grant aid. As the project leader we spoke to explained, “It was Bath & West Community Energy's guidance and advice that enabled WWCE to be set up”.

For the Braydon Manor project, support and commercial expertise was provided by another local social enterprise, Mongoose Energy.¹⁰⁵ This group proved very helpful in terms of guiding WWCE through all the aforementioned changes in government policy (see above). However even with Mongoose Energy's support, the delivery of the split ownership project at Braydon Manor resulted in tensions between 'commercial' and 'community' ideals and ways of working. Not only was there a strong commercial drive and forensic due diligence from the senior debt provider Triodos, but there was also a commercial third party who purchased the additional 4.1MW at the site and who were operating on a different set of expectations and timescales. Nonetheless, with Mongoose Energy's help, these differences were overcome and enabled the Braydon Manor scheme to generate much more renewable power than originally anticipated.

The presence of a niche culture and network around community energy in the southwest area was vital for the development of WWCE's project, allowing the sharing and dissemination of knowledge and skills. WWCE had the social and political capital that enabled it to tap into these networks.

¹⁰⁵ Mongoose Energy was set up by BWCE to take on and roll out its project development support services to community energy enterprises nationwide

Brixton Energy

Brixton Energy, based in the district of Brixton in South London, is a voluntary group of individuals who are enthusiastic about community-owned, renewable energy initiatives.



Key points

- Three rooftop solar schemes in Brixton, London
- Led, owned and funded by **Brixton Energy**, a co-operative social enterprise
- The first solar project in particular drew on policy enthusiasm and **support for local energy projects**
- **Changes to Feed-in Tariffs** will restrict the feasibility of future schemes
- The group was inspired by the burgeoning **niche culture of community energy** elsewhere in the UK
- The nature of the local community meant that many residents were initially sceptical of the project. This meant that a very **proactive and participatory process of local engagement was necessary**, as well as shaping the project outcomes

About the project

Since 2012, the group has led the establishment of three community solar energy projects in the area, generating renewable energy and bringing financial revenues into the local neighbourhoods where they are sited.¹⁰⁶ Each project is a registered cooperative that is wholly owned by its shareholders, who were able to buy shares from £250 to be part of the collective ownership. The sale of these shares helped to finance the installation of each solar scheme.

Brixton Solar 1 was completed in March 2012, installing several hundred square metres of solar panels on the roof of Elmore House at Brixton's Loughborough Estate, giving a total generating capacity of 37kW. This project attracted 103 investors, almost half of whom came from within the Brixton area, raising £60,000 in three weeks. Brixton Solar 2 follows in October 2013, located on the five housing blocks of Styles Gardens at Loughborough Estate. Finally, Brixton Solar 3 is a 50kW scheme that was recently installed on four buildings within the Roupell Park Estate.

103

investors attracted to the project, almost half of whom came from within the Brixton area, raising **£60,000** in three weeks

From all these projects, electricity generated is first sold to users within the buildings, and the excess is sold on to the National Grid. To date, the two projects have generated over 50,000kWh of energy.¹⁰⁷ Alongside energy generation, as with many other community energy projects the Brixton schemes provide financial revenues to the local community. Investors in each scheme receive interest of around 3% their investment, whilst 20% of the profits are returned to the Community Energy Efficiency Fund and spent on a variety of local initiatives focused on energy-saving in the local area.¹⁰⁸

Institutional and political culture

Those we spoke to involved with the scheme emphasised the importance of the FiT for making the project financially viable, and had been “absolutely key” in enabling the scheme to live up to its community ethos by allowing the creation of the project's community fund. But beyond only financial viability, both project leaders noted that the FiTs were important because of the signals they sent out – they symbolised that the government was taking community energy projects seriously, and genuinely considered these an important part of the UK's energy mix: “Clear direction from the national government, to say we want community-owned renewable energy, is helpful.”

The various changes and reductions in the FiT, particularly the latest one announced in 2015 because of its severity, were criticised partly because they sent out precisely the wrong signals and affected investor confidence:

“Most of our clients are local authorities, and they are literally now getting nervous again and there's a whole risk averse culture. They had plans in 2010 – 2011 and they retracted them, and they've only just started now getting back to accepting solar, so it's taken them a long time to respond!”

¹⁰⁶ <https://brixtonenergy.co.uk>

¹⁰⁷ <http://www.repowering.org.uk>

¹⁰⁸ <https://brixtonenergy.co.uk>

Funding from the Brixton Low Carbon Zone paid for one of the original project leaders to work as a project officer at Lambeth Council

More practically, it was noted that the latest FiT changes would restrict the viable locations for solar to those buildings where 100% of the energy generated could be sold 'on-site' rather than going back into the National Grid, as this would be the only way for the project to recoup its costs.

The Brixton projects also took advantage of a series of other funding resources that were available. Brixton Solar 1, in particular, was able to take advantage of policy support for local energy initiatives in London via the Low Carbon Zones initiatives that was launched in 2010. Funding from the Brixton Low Carbon Zone paid for one of the original project leaders to work as a project officer at Lambeth Council. Using the time made available by this funding, she was able to act as a facilitator during the Brixton Solar 1's early stages, setting up meetings, writing up minutes, and generally driving the project forward. The policy enthusiasm for community energy around this time also meant money was available from DECC's local energy assessment fund, which was instrumental in taking the project through to its later stages: "DECC's local energy assessment fund [...] really took us from being a volunteer led group to being able to allocate a project manager and going on to develop the share offer and market it and install the system." Such funding was particularly valuable given that proactive and prolonged engagement with the local community was vital for ensuring local support and consent (see section on 'Local Culture' below).

Following the end of Brixton Low Carbon Zone funding, Lambeth Council agreed to continue to provide some support for Brixton Solar 2 and 3 because of the proven success of the first project.

Cultures of social enterprise

The Brixton solar schemes emerged from a local context in which there was already a degree of collective action (although voluntary) happening around sustainability, with a series of different groups with similar goals and visions. Brixton Solar 1 was an amalgamation and continuation of these groups:

"Brixton Energy is a community group that came together from different parts of other community groups; from Community Draftbusters, from Transition Town Brixton, and then also local residents. All these people wanted something different" (Project Leader B).

A second project leader described the benefits of being able to draw on this pre-existing community action:

"I think we were really fortunate, because Transition Brixton had quite a good momentum in Brixton itself... So really strong community activists who we were able to bring together."

It was also noted that the development of the second and third solar schemes, including in terms of gaining local acceptance and trust, became easier as successive projects built trust through a history of success. As one project leader put it: “The success of one makes the next work.”

The Brixton Energy projects learnt from the community energy projects that were happening elsewhere in the UK. This was noted as providing both inspiration and the understanding of the possibility of undertaking a collectively owned and run renewable energy scheme, as these two quotes from a project leader demonstrate:

“We saw that there was quite a lot happening outside of London around community share offers, co-operatives, and there was this movement and momentum happening around wind and you know crowd source funding, all of that. So Lambeth Council – myself and a few others- got together with the Transition group and said ‘let’s kick this group back into action!’ and make it a building energy group.”

“Obviously we were inspired by what others were doing – you know, Brighton, and other community groups. So I think there was just a kind of general energy that was building up where we were inspiring each other, community groups across the country were inspiring each other to do stuff, and it was kind of like ‘They’ve gone ahead with it, we can do it too!’ you know that kind of thing.”

As the above quote suggests, there was a sense that some energy around the community energy sector – something of a niche movement and culture was emerging that allowed groups to begin to learn from one another.¹⁰⁹ The Brixton project was especially able to draw on the knowledge of these other groups because it had residents with the social capital and professional expertise that were able to tap into, and build upon, what they learnt from projects elsewhere. One project leader explained that within the Brixton area and neighbouring localities, there was a body of people who were already engaged with low carbon initiatives, either personally or professionally, and so could use these existing experiences to turn the inspiration from other community energy projects into practical action.

The adoption of a co-operative ownership structure for Brixton Solar did not appear to be something that was given a great deal of reflection – it just seemed the obvious thing to do. One project leader we spoke to found it difficult to imagine other forms of ownership structure. A charitable trust form of ownership was mooted, but her own experience suggested that they were often dependent on following the money in terms of the available grant funding, whilst the co-operative model fitted into the project leaders’ underpinning ethos of community empowerment:

“So I think while we have social objectives, we did want to have a body that was financially viable in the long term, and wasn’t solely dependent on grant funds, but kind of brought a mix... You know grant funding always comes to an end, which is another thing about charities, you’re relying on grant funding and trust funds, and you have to shape your objectives to those particular pots of money. I work on a lot of grant funded projects and I always feel that there needs to be some legacy, some continuity.”

The Brixton solar schemes emerged from a local context in which there was already a degree of (voluntary) collective action

¹⁰⁹ Seyfang, G., Park, J. and Smith, A. (2013) ‘A thousand flowers blooming? An examination of community energy in the UK.’ *Energy Policy*, 61, 977-989

Local culture

The local culture and context of the Brixton area shaped the project in a number of ways. Most obviously, the area lacked the strong social ties and networks that can characterise some rural neighbourhoods where community energy projects are undertaken.¹¹⁰ Reflecting the arguments of Haggett et al.¹¹¹ in relation to community energy in Scotland, the co-operative model of ownership seemed effective in this heterogeneous setting because it allowed a community of interest to be fostered through a tangible buy-in.

“I agree [that coops work well in urban areas]. Because a lot of our investors wouldn’t know each other directly, and the members, all these like-minded people, have come together to become members in this co-operative.”

The site is in a relatively socio-economically deprived area and a portion of the profits is placed into a Community Energy Efficiency Fund

Some parts of the Brixton area, including the housing estates that each solar initiative has been sited on, are also relatively deprived in socio-economic terms. These residents were not part of the steering group that initiated Brixton Solar 1, who as noted tended to come from professional backgrounds and already had a particular interest in sustainability issues. Project leaders suggested that this was an important contextual factor in shaping the development and engagement process of each Brixton Solar scheme. Although there was a strong desire to include all elements of the community into the project, in the early stages of proposing the idea there was some initial distrust and resistance:

“It’s not been as easy as you’ve got everyone on board and everyone’s signed up to it right from the start. We went through the initial bits where we were initially proposing the idea, talking to people and door-knocking, and all of that. And there was an element of “what’s all this about”, you know challenging, and “why should we do this?”; “it’s our rooves” .”

Many local residents were also sceptical of the potential for solar energy in the UK, or were not familiar with the technology. Overcoming this initial scepticism and ensuring the consent and participation of many local residents required a very open, hands-on and proactive form of consultation and engagement on the part of the project leaders. Pre-existing community groups, such as the Loughborough Junction Action Group and the Tenant Residents Association, were used as trusted gatekeepers. Doors were knocked on, and during such discussions, resident views were listened to and taken into consideration, and the aims of the project and the framing of its message were altered to account for local goals and aspirations. The language used was became less about climate change and carbon reduction, moving instead on local development, jobs and improving the prospects for young people. To facilitate an understanding of and trust in solar power, a series of interactive solar-panel making workshops were held, which provided hands on experience and allowed people to see the technology working. The overall philosophy driving the public engagement strategy was defined by Project Leader A: “community engagement starts with asking people what they want, not telling people what they need.” As a result of these strategies, another project leader noted that over time relationships began to be built on the different estates, with the culture and atmosphere gradually changing to one of greater trust:

¹¹⁰ Walker et al. (2010) ‘Trust and community: Exploring the meanings, contexts and dynamics of community renewable energy.’

¹¹¹ Haggett, C., Creamer, E., Harnmeijer, J., Parsons, M. and Bomberg, E. (2013) Community energy in Scotland: the social factors for success. Edinburgh: University of Edinburgh.

“We’ve now got a few key contacts within the estates who we can call and have a chat with. We know who to talk to and how to get things going. Definitely there is that trust element that has built up over the years. And we’ve got a good relationship with the residents and the community groups. So yeah it has taken a couple of years.”

In this regard, it is important to remember that Brixton Solar 1 in particular was supported financially by Lambeth Council and DECC, which enabled significant amounts of time to be put into planning and running local engagement.

As well as influencing the process of project development, the context and culture of the local community also influenced the types of outcomes that were aimed for from the project. For all three of the Brixton Solar schemes, a portion of the profits from the solar panels is placed into a Community Energy Efficiency Fund, which is used to improve the housing stock on some of the poorest estates in Brixton and “thereby taking meaningful steps to alleviate fuel poverty for some of the poorest residents”¹¹². Project leader B told us that the Brixton schemes have focused on training and improving the skills of young people via programs such as internships, in an attempt to address poverty in the area:

“During our energy schemes we’ve worked with residents and young people, some of whom are going to university, some of whom have just finished at school to help them go through an internship programme and develop a wider range of skills. So we’ve had quite a strong impact on some of these young people and it’s been great to see that progression. So community energy has had a role to play to address some of these community and poverty related issues. We’ve got a very strong agenda on jobs and skills really.”

¹¹² Repowering website

Cwm Arian Renewable Energy (CARE),

Cwm Arian Renewable Energy (CARE) is a renewable energy co-operative based in the Cardigan area of West Wales that has been pursuing community wind energy schemes since 2010.



Photo: Cris Tomos

Key points

- Renewable energy co-operative with plans for **wind energy**
- Strongly rooted in the **local community** and inspired by other local co-operatives
- Developed through a **Community Action Plan**
- Has brought **two separate projects** to planning but neither has been successful
- The future of the scheme is in doubt because of **changes to Feed-in Tariffs**

About the project

The story of CARE and its proposed projects began around 2003, with the proposed closure of the area's school. Local people did not agree with this measure, and came together to oppose the scheme. Although their protests were ultimately unsuccessful, the seeds of collective action had been planted. Around the same time, a Community Action Plan was developed that enabled local residents to come together and discuss their visions for future community development, and at these events renewable energy was suggested as a possibility for the area. People began to work together more often in the following years, and CARE was eventually established in 2010 with the intention of implementing a wind energy project that would provide an income for community development through selling electricity to the national grid.

2

wind energy projects which were turned down for planning permission

Thus far, CARE has proposed two separate wind energy projects. The first consisted of two 1.2MW wind turbines, while the second, later proposal consisted of a single 500kW turbine. The idea was that money for the construction of each project would be raised through a combination of bank loans and a co-operative share offer, initially restricted to those living local to the developments but then extended to the rest of Wales. For local people unable to afford the minimum £250 investment there will be an option to join via the local credit union. Profits from the electricity generated would first be distributed to members, and then the remainder would help fund collective projects in the local community.

However, both of these proposed projects have been turned down for planning permission by the local council, in 2013 and 2015 respectively. The second, smaller 500kW proposal was developed in response to criticisms of the first project. The CARE project is thus an interesting case of the difficulties community energy projects can face and the cultural barriers to their development.

Institutional and political culture

Institutional support, in the form of advice and grants, was crucial for the development of both of the CARE wind turbine proposals. As noted above, the early seeds of the projects were planted during the development of a Community Action Plan that took place in 2004-05, were funded by PLANED (Pembrokeshire Local Action Network for Enterprise and Development). These structured but informal events enabled local residents to come together and deliberate about their future visions for the community. The possibility of hosting a renewable energy project in the area first emerged from these discussions, and this proved important in enabling the group to continue to source grant funding in the future:

“We all got together, we had two workshops and teased out what we were proud of and what we wanted to achieve. Those action plan documents have, I think, been really crucial in ensuring that we've been able to draw down more grants. It's evidence based... to show what people actually want.”

Over several years, various other sources of funding for community action helped CARE to further develop the initial idea for a wind energy development. Crucially, such support covered the feasibility studies and community engagement that were required in order to build up to a full planning application – such activities can often be difficult to undertake and find funding for. £7,000 was received from the Pembrokeshire National Park Authority for an initial feasibility study, and £18,000 came from the Welsh Assembly Government's Ynni'r Fro (Valley Energy) programme, which used EU Structural Funds to provide support

Institutional advice and grants as well as Feed-in Tariffs were crucial for the development and financial viability of both proposals

and funding for community energy schemes across Wales. Ynni'r Fro also provided advice through the assistance of one of its Technical Development Officers, which CARE noted was extremely helpful: “He really helped us so much at the beginning and has slowly let us go off independently.”¹¹³. Then, in 2010, £400,000 was received from the Department of Energy and Climate Change (DECC) through the Low Carbon Communities Challenge (LCCC), which proved hugely beneficial in enabling the group to employ staff for the first time that could conduct more detailed feasibility studies. However, following the change of government in 2010, political priorities altered and the LCCC program was cancelled. CARE were given 6 months to spend all of their funding. This altered the group’s timescales significantly and they had to rush some aspects of the work, and it proved impossible to spend all the funding in this timeframe. In the end, only around a quarter of the money was spent, and so CARE could not achieve all that it hoped.

In the UK decisions on the planning approval of renewable energy projects are taken by elected councillors in Local Authorities

The introduction of Feed-in Tariffs (FiTs) were also important in making both proposed projects financially viable, enabling a secure rate of return on electricity sold and ensuring significant funds would be available for local projects. Recent changes to the FiTs have meant that some of these plans would no longer be viable, and if CARE were to continue pursuing wind or other renewable energy schemes in the future it would have to change aspects of its business model. One project leader noted, for example, that without FiTs the group could not afford to fund the construction of a wind project solely through bank loans, and so would have to rely on significant grants. He also noted that rather than purchasing new turbines the group would probably be forced to buy second-hand models, as this would be cheaper. His overall impression was that UK government policy was no longer as supportive of community energy schemes:

“We’re also aware with the FiTs probably going ... the whole community energy Enterprise Investment Scheme on community shares are losing the tax incentives now, the scheme is being scrapped for community energy projects. So it’s all seemingly piling up against us from a UK government point of view, they seem to want to scrap all the benefits to community groups.”

Clearly, various sources of funding and support for community energy were extremely helpful in enabling CARE to develop its plans. However, a more difficult aspect of the UK’s political culture and landscape relates to the nature of the planning system. In the UK decisions on the planning approval of renewable energy projects are taken by elected councillors in Local Authorities. The CARE project leaders felt that giving this level of power and discretion at the local level hampered the development of their project and other renewable energy schemes, as national level support and strategy would not necessarily be operationalised at a local level:

“We’re getting support for our community energy initiative is being supported by the Welsh government – an initiative called Valley Power, Ynni’r Fro. It’s supported a number of community projects to develop plans, and the stark reality is local government planning has not suitably adjusted to what national government wants. There is a lack of unity and vision.”

¹¹³ Willis, R. and Willis, J. (2012) Co-operative Renewable Energy in the UK: A Guide to the Growing Sector. Manchester: Co-operatives UK.

Thus, although the Welsh Assembly Government was supportive of community and renewable energy, both of the CARE proposals were denied planning permission at a local level. Meanwhile, other similar sized or larger projects in neighbouring areas had been granted planning permission, and there was some frustration at the inconsistency in these decisions. This was further exacerbated, CARE's leaders argued, by the lack of legislation that would enable the assembly government to encourage Local Authorities to comply with national need: "But even though [the Welsh government] was well-meaning in supporting projects to develop, there wasn't then that guidance to local authority planning to actually support or give weight to community benefit." The project leader we spoke to felt that it would be better for either all planning decisions on renewable energy projects to be taken at a national level – what he termed "a more neutral setting" – or alternatively new legislation should be issued that would force Local Authorities to give greater weight to community benefits when taking planning decisions locally.

Cultures of social enterprise

A shared resistance spirit over the closure of a local school in 2003 led the communities to work together on a number of projects

Over the past decade, the neighbouring villages of Hermon, Y Glog and Llanfyrnach have worked together on a number of community projects. This experience was vital in helping the CARE projects to begin. The seeds of this recent phase of community activity began in relatively unhappy circumstances, with the proposal in 2003 for the closure of the area's local primary school. Local residents worked together to resist this decision, which they saw as an injustice and a move that would be damaging to their community. Although they ultimately failed to save the school, residents saw an opportunity to buy the school building and use it for other community purposes. Raising money through a co-operative share offer, they converted the site into a community centre, containing offices, meeting rooms and a café, and built to high-standards of energy efficiency and using solar PV, solar thermal and air-source heat pump technologies. The shared resistance spirit that the school closure fostered was noted by the project leader we spoke to as directly important for the development of the CARE wind projects. The group's success in ultimately converting the school into a community facility fostered a belief that if they did work together, common goals could be achieved:

"The idea for community ownership [of wind energy] came because we'd gone through community-ownership of the school, so we had a bit of social enterprise ambition ... so there's this desire, I don't know where it's coming from, but because we were in the middle of the fight for the school, and people just had some kind of strength to think that we could pool our money and do things."

Indeed, since that time a continuing motivation for pursuing community energy has been resistance against political decisions at a national level. The tightening of council budgets, as part of the UK government's wider austerity measures, has meant that local services have been threatened in recent years. The wind energy schemes were seen as a way of providing an income that could be used to protect community facilities:

"We're totally bemused why [you would turn the project down], in a time of austerity, Pembrokeshire County Council come out and say they have to cut their budget by next April... I know there are issues of NIMBYism, and people don't want to live directly under them, obviously, but there are sites and we believe this site would've yielded £200k a year net profit to invest – you know, if the library's under threat, if the swimming pool is under threat, we could've used that element to safeguard our public services."

Since the resistance to the primary school closure, the local community has worked together on a number of projects, including organising a Celtic Blue Rock Festival and buying a portion of land for affordable housing. The aforementioned Community Action Plan process was also noted by the project leader we spoke to as important in bringing the community together. These activities further strengthened local beliefs in the value of collective action, and on a more practical level the experience provided the community with a set of skills around fundraising and conducting co-operative share offers. When asked to explain why they had chosen a specifically co-operative ownership structure for the CARE project, the project leader explained that these past experiences were a major factor: “Because of our past experiences, with that community land trust endeavour, and then in 2006 the old school building purchase was important.”

Local culture

Close-knit community with relatively thick social ties between residents which had both positive and negative impacts on the project

The area where the CARE projects have been proposed is a small and close-knit community, with relatively thick social ties between residents. The project leader we spoke to suggested that this had shaped the development of the CARE projects in both positive and negative ways. On the one hand, the close-knit nature of the area helped make it easier for the lead project team to engage with the wider community. For example, they were able to personally invite people along to open public meetings about each proposed project, including those who were known to be especially concerned about CARE’s proposals. Links with other community groups and networks – including a gardening club, Young Farmers group, Brownies, Guides, a marquee committee and a welfare committee – were also tapped into and used to disseminate information about the scheme and get resident feedback on the plans.¹¹⁴ Issues relating to the lease of land for both projects were also more straightforward as the prospective site is owned by a core member of the original Cwm Arian group, who also hosts the Blue Rock Festival.¹¹⁵

However, whilst those in the local community who supported the CARE wind projects were able to draw on this experience and shared values of working together, so too were those locals who were opposed to the scheme. The project leader we spoke to argued that, in the local area at least, most residents were supportive but there was a strong nucleus of “I would say 10 people who are adamantly against it.” These residents, he argued, were able to draw on wider networks of support from outside the community to support their case – from friends, groups and organisations who shared similar perspectives on the need to protect the landscape value of Wales, including the Campaign for the Protection of Rural Wales:

“I think when our planning application went in this time, we had 125 letters of support and those for refusal had 80 letters, but the majority of those refusing was outside the area, you know far outside. You know friends and relatives of those ten people, and the Campaign for the Protection of Rural Wales and people like that are adamant against turbines.”

Toke et al¹¹⁶ argue that there is a ‘culture of landscape protection’ across the UK, with the ‘untouched’ essence of the countryside considered by some to be part of the national identity, with long battles fought against the industrialisation of the countryside since the time of the romantic poets. These beliefs are reflected by the presence of strong groups and networks, including the Campaign for the Protection of Rural Wales which now opposes wind energy as a matter of strategy. Toke et al further argue that the presence of these networks is a key reason why wind energy projects can face difficulty in receiving planning permission in England and Wales.¹¹⁷ Those opposing the CARE schemes were able to tap into this network and set of beliefs to support their case.

¹¹⁴ Willis and Willis (2012) Co-operative Renewable Energy in the UK: A Guide to the Growing Sector.

¹¹⁵ Willis and Willis (2012) Co-operative Renewable Energy in the UK: A Guide to the Growing Sector.

¹¹⁶ Toke et al. (2008) ‘Wind power deployment outcomes: How can we account for the differences?’

¹¹⁷ Ibid.

The project leader we spoke to felt that the close-knit nature of the community may have made it more difficult for the wind projects to receive planning permission. They felt that, in such a small and close-knit community, members of the Local Authority and planning officers can have social ties with certain groups or individuals, therefore making planning decisions less objective and unbiased. For example:

“We’re totally bemused why [you would turn the project down], in a time of austerity, Pembrokeshire County Council come out and say they have to cut their budget by next April... I know there are issues of NIMBYism, and people don’t want to live directly under them, obviously, but there are sites and we believe this site would’ve yielded £200k a year net profit to invest – you know, if the library’s under threat, if the swimming pool is under threat, we could’ve used that element to safeguard our public services.”

Assumptions are often made that community involvement in a renewable energy project will make the project more likely to succeed in the planning process. However, the experience of CARE shows that the reality can be more haphazard. Some projects which did not provide the same level of community benefits as the CARE scheme received planning consent whilst CARE’s plans were twice rejected.



Photo: Cris Tomos

Horshader Community Wind Turbine

Horshader is a small community in the north-west of the Isle of Lewis, comprising the three villages of South Shawbost, Dalbeag and Dalmore. A consultation exercise in 2012 found there were 70 occupied houses and 159 residents within this area, with only a slight fluctuation since this time.¹¹⁸



Key points

- A **single 900kW wind turbine** based in the community of Horshader on the Isle of Lewis, Scotland
- Led and owned by the **Horshader Community Development Trust**
- **Local cultural beliefs**, prevalent across the Highlands & Islands region of Scotland, in the value of **working together** and **community self-determination** were important factors for inspiring and generating local support for the scheme
- This sense of community and working together also shaped the ownership structure and outcomes of the project, which are focussed on **community development** rather than personal profit
- The project drew on the advice and support of the organisation **Community Energy Scotland**, who were able to highlight successful projects elsewhere
- A trusting and **close-knit local community** meant that public engagement happened easily and in an informal and participatory manner

¹¹⁸ Personal correspondence

About the project

The story of the Horshader community energy development begins in 2004, when private developers approached the community with a view of building a wind farm in the local area, but offering only a small financial return to the community. Local people did not want or support such a development, and this resistance acted as a catalyst, motivating them to begin the long road toward their own wind energy project that would solely be for the benefit of the community.¹¹⁹

Horshader Community Development Trust (HCDT) was thus established in December 2004, a community-owned, not-for-profit organisation with the aim of supporting local development and regeneration. The group has a board of eight volunteer directors, and the Trust, with support from the Big Lottery Fund, has employed a Development Officer for an initial period of three years (CES document). HCDT began the process of investigating the potential for a wind energy development, including the establishment of Risort Power Generation Ltd as its trading arm in March 2010.

In 2012, the group's hard work came to fruition with the construction and operation of a single 900kW wind turbine. The turbine is owned by Risort Power Generation Ltd, and it is hoped that through selling electricity to the National Grid the turbine will bring in £100,000 net income that Risort will gift aid to HCDT, providing the community with a sustainable and continuous revenue to spend on local development.¹²⁰ The group plan to use the income for initiatives such as tackling fuel poverty, community transport projects, a local shop, the development of an old museum building, and a children's play park.¹²¹

Horshader was the first community in the Western Isles to have erected a community-owned turbine, but over the last few years other communities have followed suit. It provides an excellent example of how the collectivist culture and community spirit of the Highlands & Islands region can provide conducive for the development of community energy projects.

Institutional and political culture

As with many other case studies we have examined, the presence of a Feed-in Tariff was vital in making the Horshader project financially viable and secure, with the attractive financial returns a big original motivator. Potential changes to the FiT in 2012 did result in the group having to change plans, and they took the decision to rush the later stages of the project development, ultimately resulting in considerable additional costs for the group.¹²²

Alongside FiTs, the Scottish Government has also used its devolved powers to makes available various other sources of funding for community-owned renewable energy projects.¹²³ The Horshader project benefitted particularly from the Community and Renewable Energy Scheme (CARES). CARES provides grants and loans for various stages of developing a community renewable energy project, including pre-construction phases for which it can be otherwise difficult to gain funding.¹²⁴ HCDT received grant funding for the feasibility study, and furthermore the stage prior to construction but after planning permission, which enabled them to afford to conduct necessary site checks on things, such as peat levels in the soil, and archaeology.¹²⁵

900kw

single wind turbine creating
£100,000 net income
through selling electricity
to the National Grid

The Scottish
Government has
used its devolved
powers to provide
funding for
community-owned
renewable energy
projects

¹¹⁹ Project website

¹²⁰ Personal correspondence; CES document

¹²¹ Community Energy Scotland (2013) 'Horshader Community Development'. Available at: http://www.communityenergyscotland.org.uk/userfiles/file/case_studies/Horshader_Rev_Gen_Case_Study.pdf

¹²² CES document

¹²³ Simcock, N. (2013) Imposition or 'the will of the people'? Procedural justice in the implementation of community wind energy projects. PhD Thesis, Lancaster University.

¹²⁴ <http://www.gov.scot/Topics/Business-Industry/Energy/Energy-sources/19185/Communities/CRES>

¹²⁵ personal correspondence with Community Energy Scotland

Cultures of Social Enterprise

There are a number of characteristics of the culture and way of life of the Highlands & Islands region of Scotland that are conducive for the development of community-owned and led energy projects. Perhaps most strikingly, and similar to several other case studies we have examined in this research, within the region collective, community-based activity is relatively frequent, and such activity is generally valued and considered a 'good thing'. A representative of Community Energy Scotland suggested that this was one of the reasons why community energy projects happened in the region:

“There’s probably a few factors that all seem to combine and work. In the Highlands and Islands there’s always been a strong community angle to anything that happens here ... Community life I guess changes all the time, and with computers and more social networking it is changing again now, but there’s always been a reliance here on local collaboration.”

She attributed this shared belief in the value of working together was partly the result of the area’s relative isolation from private and public sector investment. Rather than being reliant on the slim chance of such investment, people had long worked together in order to support their local area:

“I think one of the main reasons [why there’s a strong community angle in the Highlands & Islands] is that rural areas don’t have the same services that may be present in an urban area, so groups are relying on having to provide these services themselves. Community groups are constantly reviewing local services and will say ‘Well, we don’t have a shop, so we’ll create a community shop or we don’t have the same activities for young people so we’ll build a community leisure centre.’ Communities here are filling the gaps where large commercial enterprises don’t see sufficient profits to invest. The islands are very fortunate to have empowered communities which just say ‘well, we can do it ourselves.’”

Community based activity is frequent in the region and generally viewed as a ‘good thing’

Other scholars have noted a desire for self-reliance amongst Highland & Island communities. Although its historic roots are very deep, a significant event was the Highland Clearances of the 19th century, during which families in the area were evicted from their homes and lands.¹²⁶ Since then, it is argued, a deep-seated distrust for large capital and big business has existed, and a community purchase of Assynt in 1992 re-awoke a desire across the Hebrides for communities to control their own destiny through collective activity.¹²⁷ Meanwhile, community energy projects are argued to represent a further manifestation of this narrative of collective self-reliance, and hence are both popular and widely supported in the region.¹²⁸ This is evident in the Horshader project, which emerged from an initial resistance toward a wind project proposed by a private-developer and is portrayed on the HCDT website as unfair and exploitative:

“HCDT was formed in December 2004 after private developers had approached the community with a view to erecting turbines on community land, and were offering only a small financial return to the community. The community did not agree with this approach, and came together to form a group which would take forward a similar project solely for the benefit of the community.” (project website)

¹²⁶ Hunter, J. (1976) *The Making of the Crofting Community*. Birlinn, Limited

¹²⁷ Brown, K. M. (2007) ‘Understanding the materialities and moralities of property: reworking collective claims to land’. *Transactions of the Institute of British Geographers*, 32, 4, pp. 507-522

¹²⁸ MacKenzie, A. F. D. (2006) ‘S Leinn Fhein am Fearann’ (The land is ours): re-claiming land, re-creating community, North Harris, Outer Hebrides, Scotland.’ *Environment and Planning D: Society and Space*, 24 577 - 598

In contrast, a community-led development offered a positive alternative, ensuring the community had control over both the development of the scheme and its profits, ensuring the benefits stayed within the local area for the common-good. As one project leader told us:

“The community led approach was simply due to the fact that the community wanted to take ownership and ensure that all the proceeds remained in the community and were invested in the community for community benefit.”

One Community Energy Scotland representative also told us that she felt this shared belief in the value of working together for community benefit was a major reason why the project was owned and operated via a Development Trust. This form of ownership predominates in community energy projects in the Highlands & Islands region, whilst forms of co-operative (in which investors buy shares to help fund the project, and then receive return on this investment) predominate in England. The priority for the Horshader scheme was to ensure collective and community-based benefits, rather than private gains for individual shareholders, and the Development Trust model provided a means of achieving this:

“It does go back to just how used to working together people within a community are. A community group is designed in such a way that they will always look at how they can benefit the whole community and ways of making things as equal as possible rather than focusing on ways of providing individual gain. I guess it goes back to the need for collective working to get things done, people in rural areas depend on each other. It’s been the way of life in the islands for centuries, maybe because there isn’t the same income levels, facilities or the same provision of services. Predominantly people are more geared towards ways in which the whole wider community can gain.”

The particular nature of the Horshader project, in terms of the types of outcomes it seeks to achieve, were thus shaped by deeply held cultural beliefs in working together for the common good of the local community.

There is a culture of collective self-reliance amongst Highland & Island communities

Alongside this general support for collective activity and community self-reliance, a more specific cultural factor shaping the Horshader scheme is that community energy projects have become more popular in the Highlands & Islands region, with several communities having undertaken such schemes.¹²⁹ In short, it can be argued that community energy is less of a minority niche in the Scottish Islands compared to elsewhere in the UK. As the number of successful projects grows, island communities are able to learn from one another – raising awareness that such schemes are possible, the benefits they can bring, and the broader ethical arguments that underpin them.¹³⁰ Aiding this further is the existence of the support and networking organisation Community Energy Scotland, which provides advice and support to community groups hoping to develop renewable energy schemes.¹³¹ These factors were crucial in enabling the development of the Horshader scheme. A representative from CES acted as a networker, allowing the groups to learn from the projects that had taken place elsewhere in the Highlands & Islands: “He would just go and talk about how other people have done it elsewhere, and share the support network that they can rely on throughout.” The HCDDT’s development manager noted that local people initially knew very little about wind energy or how to go about developing a community project, and noted that CES provided vital help in this regard: “the group received support from a number of agencies such as Community Energy Scotland, who assisted them greatly through all the development.”

¹²⁹ Mackenzie (2006) “S Leinn Fhein am Fearann” (The land is ours): re-claiming land, re-creating community, North Harris, Outer Hebrides, Scotland.; Warren, C. R. and McFadyen, M. (2010) ‘Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland’. *Land Use Policy*, 27, 2, pp. 204-213

¹³⁰ Simcock (2013) Imposition or ‘the will of the people’? Procedural justice in the implementation of community wind energy projects.

¹³¹ This began as a government subsidiary, and still works closely with the Scottish Government under a national remit.

Local culture

In line with other Scottish Island communities,¹³² the local culture on Horshader is one where levels of trust and social capital between residents are relatively high, and there is a general sense of community and shared identity. As one project leader told us: “It is a typical Lewis community where folk are generally close knit, where everyone is known to each other. [It is a] generally supportive and caring community.” The area has only a very small population (159 people), and like other Highland communities many people have a strong sense of belonging due to family roots: “the unique social structure of our community, where a strong sense of belonging arises from having roots and family, often having a home for life.” HCDDT itself is also a locally-trusted organisation, led by local residents and having undertaken many successful projects since its inception in 2004: “[HCDDT] have an excellent track record and the Trust has delivered on many projects since [their inception]”. This community spirit and high level of interpersonal trust were noted as aiding the development and design of the Horshader project, enabling residents to work together toward a common goal. For example:

“And it’s more of a geographical sense to the communities as well, so it’s easier to define them in that sense, whereas if you’re in a larger area you need to find the communities within that ... So that helps because these small pockets where everybody knows each other, and everybody knows what the needs of that area are.”

It can also be argued that the ownership model of the project – a Development Trust – was pursued partly because of this strong community identity, because, as Haggett et al¹³³ argue, allowing investment from outside the community (see, for example, the Wiltshire case study) via share offers is unlikely to be popular.

As well as helping to build local support, the close-knit nature of the Horshader community both encouraged and enabled a very hands-on and informal level of engagement with the local community during project development. Community consultation was integrated into the project from an early stage, and it was relatively straightforward for project leaders to personally visit every local household¹³⁴, whilst a community open day was well attended. One project leader described that the close-knit nature of the community meant engagement with HCDDT could be very informal and relaxed “[The community] are regularly consulted and kept involved. We operate an open door policy and the community are able to pop in and out of the office on a daily basis.”

A Development Trust ownership model was pursued partly because of strong community identity

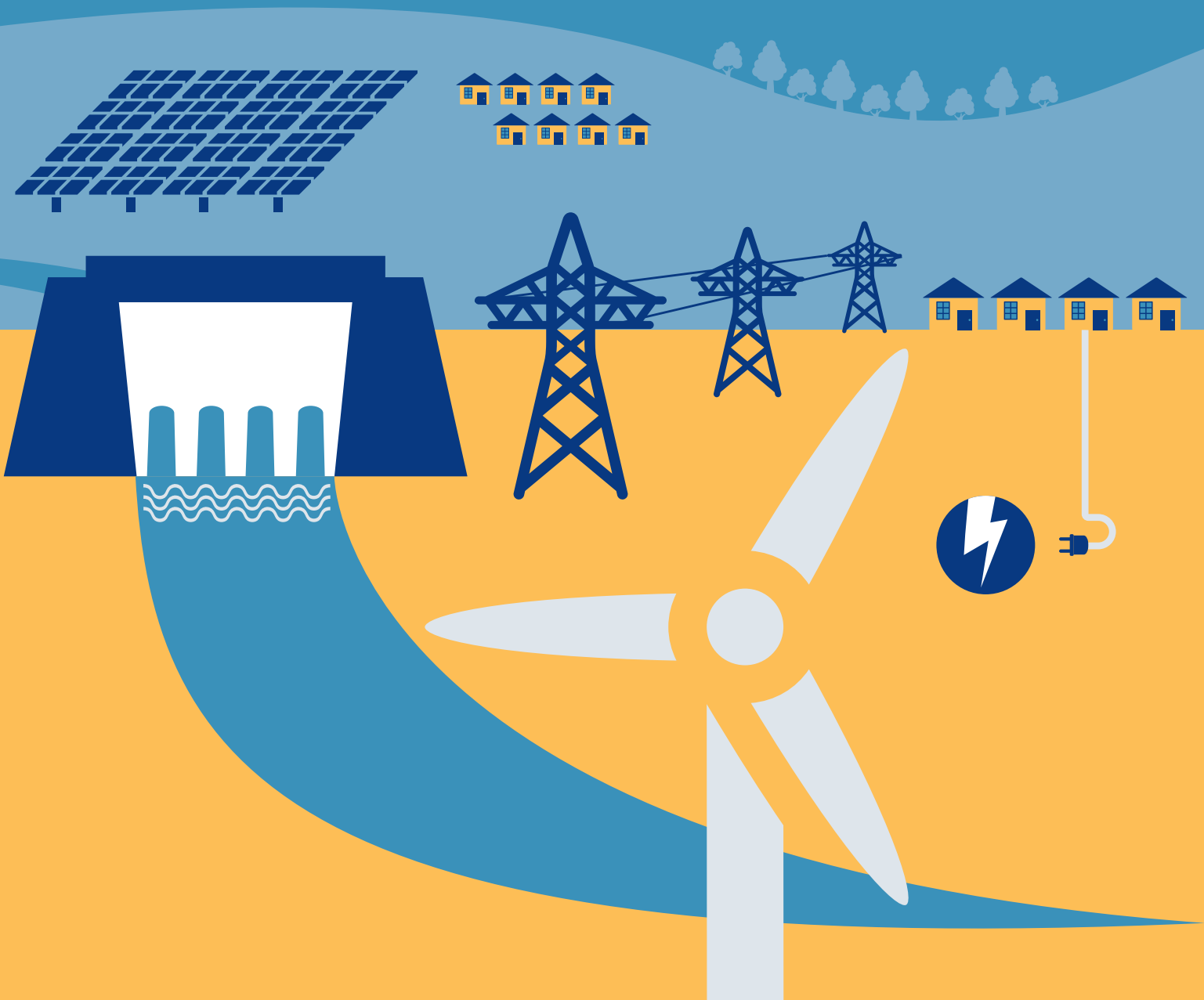
¹³² Murphy, J. (2011) ‘From place to exile.’ *Transactions of the Institute of British Geographers*, 36 (4), 473-478.

¹³³ Haggett et al. (2013) *Community energy in Scotland: the social factors for success*.

¹³⁴ The Brixton case study is an interesting comparison in this regard. Those leading the Brixton case had to invest significant time cultivating local ‘gatekeepers’ who could provide a way in to engaging with local people.

Lessons from elsewhere: Belgium, South Korea, Chile and Brazil

Each project has developed under
very different cultural conditions



Lastly, we review four very different community energy projects from elsewhere in the world. Ecopower, in Belgium, is a large and thriving co-operative, which both generates and supplies electricity to customers.

Buan Citizen Power Generation, in South Korea, was motivated by shared religious beliefs; Energy Coop Aysén, in Chile, emerged from protests against major new hydro-electric projects; and CRELUZ in Brazil aims to bring electricity to remote rural areas. Each of these projects has developed under very different cultural conditions, and different institutional structures at the national level.



Ecopower, Belgium

Founded in 1991, Ecopower is a large co-operative based in the Flanders region of Belgium



Key points

- A co-operative with **50,000 members** and **40,000 customers**
- Generates energy from **hydro, solar and wind**, and supplies electricity directly to its members
- Belgium has a **strong social enterprise sector**, with co-operatives and mutual active in health and social care, insurance and credit, for example
- Ecopower is different to many community energy schemes as it both **owns** and **operates multiple renewable energy projects**, but also operates as a **electricity supply company**.

About the project

Although Ecopower owns renewable energy installations, it is distinct from many typical community energy schemes because it is an energy supplier co-operative – rather than having individual share offers and owners for individual projects, all installations are owned by the single Ecopower co-operative. Ecopower generates its own electricity and sells on to its members – around half of the electricity that Ecopower distributes is from its own installations, with the rest renewable electricity bought from elsewhere.

The Ecopower group began by promoting small hydro schemes, but following the liberalisation of the energy market in 2003 became a supplier co-operative and began promoting and developing other forms of renewable energy. It now owns projects in nearly every community within the Flanders region, including 20 wind turbines (which produce the bulk of its energy), around 320 solar PV installations on schools and the homes of its members, and a cogeneration plant running on rapeseed oil which is used to heat a city municipality building. In 2014 it opened a wood pellet factory, using local wood to supply an alternative source of heating to Ecopower members that don't have access to natural gas.

When Ecopower first began as an energy supplier, it only had ten customers, but this had expanded to around 1,000 after only 6 months of operation. It now distributes electricity to around 50,000 households – around 1.5% of the households in Flanders – selling at slightly below average retail prices in order to attract new customers. Members of the co-operative buy shares costing 250 Euros, and are entitled to cheaper electricity, a dividend of not more than 6% per year, and a vote in the decision-making process. No individual member can own more than 50 shares. As is traditional for all co-operatives, every member gets one vote regardless of how many shares they own.¹³⁵

Ecopower is a rarity as it both generates renewable electricity and sells it on the retail market. It has successfully expanded its business whilst still operating on ethical and community-based principles, demonstrating the potential for community energy to expand to new avenues and forms business. It is now keen to work with other community energy schemes, and so was instrumental in setting up the REScoop.eu project that links renewable energy co-operatives from across the EU.

20

wind turbines in the Flanders region

320

solar PV installations on schools and the homes of the co-operative members

Institutional & Political Cultures

Belgium has few indigenous fossil energy resources. During 1960s and 70s, it was widely accepted that nuclear energy was 'the energy source of the future'¹³⁶, and the country pursued this strategy aggressively. However, it has recently begun phasing out nuclear power, making the country dependent on imports but also encouraging policy support for renewable generation. Although there is no Feed-in Tariff scheme in Belgium, renewable energy is promoted through trade in 'green certificates'. Each Belgian region also has slightly different support structures; in Flanders, where Ecopower is based, there is a quota system, premium prices and a net-metering scheme.¹³⁷ The support mechanisms are vital in ensuring the financial viability of Ecopower, allowing it to sell electricity at a slightly cheaper price than competitors.¹³⁸

¹³⁵ <http://www.ecopower.be/index.php/english>

¹³⁶ Vansintjan, D. (2015) The energy transition to energy democracy. Belgium: REScoop 20-20-20.

¹³⁷ <http://www.res-legal.eu/search-by-country/belgium/summary/c/belgium/s/res-e/sum/108/pid/107/>

¹³⁸ (personal correspondence with project leader).

However, the project leader we spoke to did complain about the support mechanisms in place, suggesting that these had become overcomplicated and not specifically targeted at community or co-operative-based energy projects:

6%

cap on returns for members allows financial surplus to be reinvested in further schemes

“We have a support mechanism, not only for community energy projects but for big investors as well. So we don’t have a specialist mechanism that favours community energy, and that’s what we want. We often give the example of Scotland, where there’s a community energy target. This was the example we gave to the Flemish government, but it hasn’t worked so far! We have a support mechanism where for everyone MWh of electricity you make you get 1 green certificate.”

Perhaps the key policy change that enabled the expansion of Ecopower, from solely a producer of electricity to a supplier business that sold electricity directly to its members, was the liberalisation of the electricity and gas markets in the late 1990s and early 2000s, as part of a wider European Union movement. The idea grew that this would lead to greater competition and lower prices for consumers.¹³⁹ This provided an opportunity for new supplies to enter the market. In Belgium, the energy supply was controlled by a few private companies along with a small amount of public supply. As part of the liberalisation drive, the Ecopower project were actively encouraged by political actors to expand into a supplier of electricity to consumers:

“At the beginning of the liberalisation of the electricity and gas market in Flanders in 2003 our general assembly decided to become a supplier of electricity. And we were one of the first suppliers, and it was not hard to get permits because people from the advisor of the Ministry came to our meeting and practically begged us to do it. So we did and he was one of the first to have the electricity. So it was easy at the beginning, we didn’t need bank cautions and so on ... because the market was liberalised, and to succeed they needed new suppliers. So if everyone stayed with the same private monopolists who had about 90% of production and about 80% of supply then the strategy wouldn’t work.”

The liberalisation of the energy market in the last decades allowed Ecopower to become a local electricity supplier

Also important are the particular rules and laws around co-operatives. First, the interest Ecopower can return to its members is capped at 6%. However, Ecopower do not see this as a limiting factor, instead argues that it “creates possibilities” by allowing enough financial surplus to reinvest in further renewable energy schemes.¹⁴⁰ Second, the project leader we spoke to explained that in Belgium “co-operatives have open capital – the equity is open”. This meant that “We can always accept new members with money, without going through official channels” and had encouraged the widespread development of both ‘technical’ co-operatives but also other forms of mutual endeavour – “It’s an easy way to organise yourself with partners because of the open capital, so people can come in and other people can leave with the money they’ve put into it.”

¹³⁹ Vansintjan (2015) The energy transition to energy democracy.

¹⁴⁰ <http://www.ecopower.be/index.php/english>

Cultures of social enterprise

Social enterprises have traditionally played a relatively strong role in Belgian culture, and a broad consensus exists around the concept and value of a social economy. The co-operative movement has long been present in certain sectors, including in agriculture, credit and insurance, and the pharmaceutical industry.¹⁴¹ Mutual societies have been heavily involved in the health service since the end of the Second World War, and still form a key part of the national health insurance scheme (equivalent to the UK's National Health Service, though with a very different organisational structure). In total, over 300,000 people are employed in the Belgian social economy.¹⁴²

Coops and mutuals and associations gradually began to be more accepted from the 1990s¹⁴³, and since that time energy co-operatives have begun to emerge in the country. Ecopower was one of the first energy co-operatives, although talking to one the project leaders it was clear that awareness of co-operatives and mutual endeavour came from observing their emergence in other sectors:

“In Belgium, let's say that now we have a revival of co-operatives ... Yeah I would say the last ten or twenty years. We were one of the early ones. Some were the result of the election of 68. We've seen some co-operatives popping up in the late 70s and early 80s, like a repair shop for cars, a print shop and that sort of thing, or a cheese factory. Now there is a real wave of them. Now in Flanders there are about 8 energy co-operatives.”

Although the value of working together existed within those leading the project, for the decision to use a specifically co-operative legal ownership structure personal networks played an important role – the group had close ties with an accountant who had a strong knowledge of the legal side:

“The people involved said that we want to do this together, we don't want to get rich, we want to help the community, and then our accountant, he was a member of the Green Party as well, he said that the co-operative society is the best thing that you can do.”

300,000

people are employed in the Belgian social economy.



Bottom-up approaches can prevent local resistance to projects

Local culture

As noted, Ecopower works across the Flanders region of Belgium. Despite the company's co-operative structure and ethical motives, individual wind projects can encounter local resistance and opposition, particularly if the project is considered to be imposed from outside the community. The project leader we spoke to argued that the key to avoiding such resistance was to develop the project in an open and transparent way – Ecopower thus works hard to engage with local residents that may be impacted by the scheme and to encourage them to become members of the co-operative. The “ideal scenario”, we were told by our interviewee, was for each project to be developed completely from the bottom-up via an Ecopower-organised sustainable energy action plan in a local municipality. As part of these plans, local people “weigh things up and look at all possibilities” before deciding which renewable energy option they would like to pursue. This process takes several years, but when this had occurred “then you see in these municipalities there are no objections.” However, driven by a need to remain economically sustainable, Ecopower is also contracted by agencies to develop pre-designed projects. These schemes tend to generate stronger resistance, but Ecopower works to engage opposing residents by pointing out that if they join the co-operative they will share in the benefits of the scheme:

“But if our projects is the result of a tender of an agency, of one or another authority, and this agency says ‘we want to put up 4 wind turbines’, then you confront the inhabitants with a plan that is fixed – then in those cases we face action committees against our projects ... And we see that an action committee is often a coalition of people with different reasonings. For instance, some might say ‘we have all the trouble, the noise, the shadow flicker and so on, and all the profit goes somewhere else.’ You can counter this by saying ‘no, if you put all the money on the table here locally, it's your wind turbine’. These people, then they turn.”

Ecopower also engages residents and encourages wider membership by building partnerships with solar PV installers and farming organisations. People who are having solar PV fitted on their home or farm are encouraged to join the company by these organisations.

The inception of Ecopower, and its focus on renewable energy and co-operative ownership, was also a response to the perceived questionable safety and efficacy of the nuclear sector. The project came about following the Chernobyl accident. Ecopower was designed to be a positive, practical alternative to nuclear power and fossil fuel forms of energy generation. As Vansintjan writes: “The nuclear disaster in Chernobyl (Ukraine) served as a wakeup call for many citizens and caused them to act. This new wave of citizen initiatives sometimes led to the creation of REScoops, like Ecopower (1991, Belgium) and EWS (1991, Germany)”.¹⁴⁴ The project leader we spoke to explained “Well if there is a need, and the authorities don't attend to this need or reply to this need, then people have a tendency to join hands and solve it for themselves. That's how a co-operative starts” – in the case of Ecopower, the need was finding an environmentally friendly and socially just model of energy generation as an alternative to nuclear energy.

¹⁴⁴ Vansintjan (2015) *The energy transition to energy democracy*.

The company was established with a commitment to engage people in renewable energy issues

As some of the above quotes indicate, our interviewee argued that there had been a recent upsurge in co-operatives, including energy co-operatives, in Belgium and other parts of Europe, particularly over the last ten years. He suggested that the reason for this cultural shift was again a response to a perceived crisis – in this case, a convergence of crises, where problems with nuclear energy and fossil fuels combined with an economic crash and the energy security implications of rising geopolitical tensions with Russia:¹⁴⁵

“There is a convergence of crises... this all brings up the idea of ‘there’s a problem, and we can solve it by turning to renewables and energy efficiency.’ And that’s what people do. So they have done it after the first oil crisis, we saw the first energy co-operatives then, people making windmills in their backyard or shed, we’ve seen after Chernobyl, our co-operative was created after Chernobyl, as were others. And then after Fukushima, there was a new wave of energy co-operatives. But we’ve seen this in the past as well, in the first and Second World War, in Germany alone there was 6,000 energy co-operatives. Nazism didn’t do very well to them, or communism either, so only 50 of them survived, but you see that what was a problem after the first world war there was an economic crisis, the financial investors were not interested in rural or mountainous areas because there were not enough people to make it profitable – so people got together and did it themselves. They wanted electricity and they did it themselves.”

A further local factor that has shaped the development of Ecopower is the shared vision and ethos of the highly motivated citizens that lead the scheme, which has been vital in shaping both how the company distributes profits and its particular ownership structure, and also how it engages with citizens of Flanders. The company was established with a commitment to engage people in renewable energy issues, as investors, in order to increase people’s awareness and decrease energy consumption.¹⁴⁶ It also aims to ensure distributive justice by sharing the benefits of the common resource across a wide group of local people – the co-operative form of ownership was felt to match this vision:

“Wind, solar, hydro, biomass and geothermal energy are natural resources. They in fact belong to no one and are in principle available to all. They are common goods. From the perspective of social justice, more attention therefore must be paid to the way in which decentralised renewable energy sources are managed ... This is especially true for wind energy, an energy source that extends over a larger area, but ultimately is exploited on a small site. The benefit of this exploitation should extend to the widest possible group of people. Thus, the exploitation of wind energy should not simply be privatised, but also allocated on the basis of socio-economic criteria.”

¹⁴⁵ Vansintjan (2015) The energy transition to energy democracy.

¹⁴⁶ <http://www.ecopower.be/index.php/english>

¹⁴⁷ Vansintjan (2015) The energy transition to energy democracy.

Buan County community energy

Buan County is located on the southwestern coast of South Korean peninsula. Covering about 493 square kilometres, it has a population of about 60,000 people.



Key points

- **Solar PV** (roof-mounted, 36kW total) + **geothermal** and solar heating systems
- Led and owned by Buan Citizen Power Generation, a local NGO set up in 2006
- The project occurred within a **national policy culture that favoured nuclear energy** and was not particularly conducive for community-based renewable energy
- Protests against nuclear energy raised awareness of the **potential for renewable energy** in the Buan region, and built a shared counter-culture and resistance spirit between residents. The Buan solar projects built on this spirit, and were pursued in order to pursue and put into practice what mainstream energy policy and dominant cultural norms neglect.
- **Interpersonal trust** between residents and with the project leaders was also crucial, developed by the shared experiences of nuclear protest but also the ethics of shared religious and spiritual beliefs.

About the project

Around 35% of the population is engaged in agriculture and fishing, a relatively large proportion for South Korea, where most of the economy is based on industry and services. For some time, its population has been shrinking and ageing, similar to many other rural areas in South Korea.

In January 2005, a local NGO called Buan Citizen Power Generation (BCPG) was launched with the aim of promoting and developing renewable energy projects in Buan. They moved quickly, installing 3kW of roof-mounted solar PV panels in three places¹⁴⁸ within the County by October 2005. Since then, the project has expanded to 36kW of solar PV and also a solar and thermal heating system in the village of Deunyong.

Led by a small but committed group of local activists, around 10 local people provided 75% of the funds for the initial solar PV project, with the remaining 25% coming from government subsidies. Electricity from these projects is sold to the Korea Electric Power Corporation (KEPCO) at a fixed price under the Feed-in Tariff scheme, with the money generated distributed annually to project investors and any remaining profits put toward further solar PV and community heating projects. The project also has a strong element of demand reduction, providing energy efficient lighting and technologies to households and ultimately aiming to reduce energy consumption by 30% in some villages.¹⁴⁹

Buan is very interesting because, as shall be shown, it is in many ways distinct from the dominant national and political culture around energy generation in South Korea, which has historically favoured large-scale, nuclear generation. What very much mattered in making the Buan case a success, and in driving the type of project it sought to be, was a local culture of trust and 'resistance citizenship'.¹⁵⁰

Institutional and political culture

There is a notable lack of renewable energy (RE) development in South Korea. As of 2009, 98.5% of energy generation came from fossil fuels and nuclear energy, with high amounts of coal and crude oil imported. Community-led forms of energy generation are also minimal; with ownership of energy generation is dominated by KEPCO, a state-owned company. Jeong suggests that the development of renewable energy in country has been constrained by a focus on pursuing centralised big technology solutions – particularly nuclear – arguing that national energy policy “is not based on a vision of a more decentralized energy system, but rather on maintaining the conventional point of view, that is, upholding and sustaining a centralized energy supply system.”¹⁵¹ The dominant national policy goals of economic growth and energy security (the country has a lack of domestic fossil fuel resources, creating a vulnerability to international oil prices) have provided the primary rationales for this move,¹⁵² although it has also been justified with reference to CO₂ emissions reduction.¹⁵³

Some policies to support RE and community energy did begin to emerge in 2002, however, when a government subsidy plan and a Feed-in Tariff (FiT) scheme to encourage small and medium-sized RE developers.¹⁵⁴ This FiT did prove valuable to the Buan County community energy project discussed here, helping to make the project financially viable. In 2008 government also adopted a low-carbon green-growth strategy, a plan which also included a projected growth in RE. Although RE development did begin to increase, the government announced that a Renewable Portfolio Standard (RPS) would substitute the FiT from 2012 due to the financial burden involved. This change means that RE will be pursued through large-scale developers who can make a competitive bid for regional generation companies, effectively excluding small-scale developers who cannot compete with large companies.¹⁵⁵

10

local people funded 75%
of the initial solar PV project

98.5%

of energy generation
came from fossil fuels
and nuclear energy

¹⁴⁸ On the roofs of the Won Buddhism Sanctuary, the Majugmul building in Deunyong village, and the Catholic Sanctuary.

¹⁴⁹ <http://green-korea.tistory.com/83>; http://www.business-standard.com/article/opinion/a-new-wave-for-koreanenergy-104020601022_1.html

¹⁵⁰ Barry, J. (2006) 'Resistance is fertile: From environmental to sustainability citizenship.' In: A. Dobson and D. Bell (Eds.) *Environmental Citizenship*. Cambridge, MA: The MIT Press, pp.21-48.

¹⁵¹ Jeong, Y. (2012) *Placing renewable energy development: an analysis of the spatialities of renewable energy projects in South Korea and Japan*. PhD Thesis, Lancaster University, P74-5

¹⁵² Ibid

¹⁵³ Valentine, S. V. and Sovacool, B. K. (2010) 'The socio-political economy of nuclear power development in Japan and South Korea.' *Energy Policy*, 38, 7971-7979.

¹⁵⁴ Ibid

¹⁵⁵ Yoon, S. (2009) 'Issues in Green Growth'

The project benefitted from a Feed-in Tariff which was substituted in 2012 by a support scheme in favour of larger projects

A number of political-cultural factors have contributed to this pursuit of nuclear energy, and the relative marginalisation of RE and community-led forms of generation. First, there is a strong tradition of state involvement in energy policy and economic decision-making. The country was a military dictatorship from 1961 to 1987, and although fully democratised today, bureaucrats and military personnel remain influential in the government.¹⁵⁶ Technocratic forms of decision-making are also valued, underpinned by national pride in advanced science and engineering and a faith in bureaucracy.¹⁵⁷ Valentine and Sovacool argue that nuclear power was endorsed partly because it enabled state authority to be extended throughout the industrial economy, 'in the same way that earlier large-scale rural electrification projects had forced the farming population to depend on the state for essential services'.¹⁵⁸

Second, a high-level of importance has been placed on economic modernisation and industrialisation. Nuclear power was attached to these visions, and was considered a signal to the rest of the world that South Korea was becoming a developed nation.¹⁵⁹ Energy-intensive industry such as shipbuilding still plays an important role in the South Korean economy, increasing the perceived requirement for a substantial and reliable energy supply. Finally, there are dominant visions of military autonomy and strength as being extremely important, partly because of ongoing tensions with North Korea. Nuclear power again aligned with these ideologies, signalling that the country was moving from militarily weak to strong nation.¹⁶⁰

Social enterprise culture

As described above, the dominant culture in South Korea has not been conducive to renewable energy development, or social enterprise models in the energy sector, despite use of the social enterprise model in other sectors of the economy. During the phase of South Korea's rapid economic development, official, national-scale 'co-operatives' were established in areas including agriculture, forestry and credit provision. However, Lee and Kim¹⁶¹ argue that these should more properly be seen as part of the state; it is only in more recent years that a more community-based model of social enterprise has emerged in the so-called 'new social economy', in fields including family support, farming, regional development and energy, though energy remains a minority sector.

The 2006 Social Enterprise Act provides a legal definition of social enterprise, and various measures to promote the model. However, this has not been used extensively in the energy sector, due to the centralised model of energy. This is changing slowly – in 2012, for example, a Sustainable Energy Action Plan for Seoul was launched, incorporating proposals for social enterprise-led energy schemes.

Social enterprise for energy projects is slow to develop due to the centralised model of energy generation



¹⁵⁶ Lee, B.-H. and Ahn, H.-H. (2006) 'Electricity industry restructuring revisited: the case of Korea,' *Energy Policy*, 34, 1115-1126.

¹⁵⁷ Valentine and Sovacool (2010) 'The socio-political economy of nuclear power development in Japan and South Korea.'

¹⁵⁸ Valentine and Sovacool (2010) 'The socio-political economy of nuclear power development in Japan and South Korea,' pp.7975

¹⁵⁹ *Ibid*

¹⁶⁰ *Ibid*

¹⁶¹ Eun Ae Lee and Young-Sik Kim (2013) *Social Economy and Public Policy Development: A South Korean Case* http://www.reliess.org/centredoc/upload/SocialEconomy_KoreanCaseStudy_FinalRevision_201309_.pdf

Local culture

In general, there have historically been low levels of civic activism in South Korea, including in relation to energy issues.¹⁶² The extent of opposition to nuclear power has been limited, constrained by the country's strong, bureaucracy-centred, political system.

However, in the late 1980s and 1990s a moderately influential anti-nuclear movement did begin to emerge,¹⁶³ and it is in this niche, counter-cultural movement that the Buan community RE project has its roots. Jeong¹⁶⁴ argues that the project was “directly connected” to a particular anti-nuclear movement that emerged in the locality in 2003-4. Around this time, the county governor had attempted to have a nuclear waste disposal facilities sited in the Buan area against the wishes of local people, a decision which led to a strong local backlash and many opposition demonstrations. One resident of Buan, interviewed in Jeong's study, argues that this movement against nuclear energy was significant in enabling the region's residents think about energy issues, in a way that they felt was quite different to the dominant cultural attitudes in much of South Korea:

“...In other places, people do not worry about energy issues... Buan people are not thoughtless about energy issues. Most people in Korea do not participate in the process of energy production and so they do not think of energy [issues]. Energy means only electricity charges and oil prices to them. [Energy] production, consumption, conflicts and energy tax systems are not of interest [to them]. However, because Buan people have already faced [the issues] during the opposition movement to the nuclear waste disposal site... in general, Buan people have an awareness [of those issues], which seems to have an important meaning.” (Representative of local NGO, quoted in Jeong (2012).

Resistance was transformed into a sense of active responsibility for doing things differently

Over time, the movement against nuclear energy helped generate a collective bond between protestors and a shared spirit of resistance against dominant models of energy production and ownership.¹⁶⁵ In 2005 the protest movement led to a local referendum being held in Buan on whether the waste disposal facility should be constructed, with 91.3% of local people rejecting the facility.¹⁶⁶ This success was a key moment, heightening the morale of local people and beginning the seeds of motivation for the BCPG project. Shortly afterward, two local religious leaders and a local activist who had led the anti-nuclear protests became the project leaders for BCPG. They regarded a community-owned renewable energy project as a way of keeping the collective resistance spirit inherited from the anti-nuclear movement alive, and to turn it in a more proactive direction by instigating and leading a deliberately different form of energy production – one that was both renewable and environmentally benign, and concentrated power and outcomes collectively amongst citizens and at a local level different project.¹⁶⁷ Resistance to the dominant model of energy production and ownership was transformed into a sense of active responsibility for doing things differently:

“The resistance was represented not just as opposition specifically to nuclear energy but also a broader sense of opposition to the power of the established energy industries that are closely linked with the national government, and to centralised models of energy generation. The local community-based BCPG approach is then continually set in contrast with this, driven by very different normative and ethical principles.”¹⁶⁸

¹⁶² Ibid.

¹⁶³ Lee, S.H. (1999) 'Environmental movements in South Korea.' In: Lee, Y.S.F., So, A.Y. (eds.) *Asia's Environmental Movements: Comparative Perspectives*. East Gate: New York, pp.90-119.

¹⁶⁴ Jeong (2012) *Placing renewable energy development: an analysis of the spatialities of renewable energy projects in South Korea and Japan*.

¹⁶⁵ Jeong (2012) *Placing renewable energy development: an analysis of the spatialities of renewable energy projects in South Korea and Japan*.

¹⁶⁶ <http://www.businesskorea.co.kr/english/news/politics/6761-nuclear-nimbyism-samcheok-citizens-opposed-construction-local-atomic-power>

¹⁶⁷ Jeong (2012) *Placing renewable energy development: an analysis of the spatialities of renewable energy projects in South Korea and Japan*.

¹⁶⁸ Jeong et al. (2012) 'Making Power Differently: Exploring the motives and meanings of community renewable energy developments in cases from the UK and South Korea.'

A sense of interpersonal trust based on shared values and experiences within the Buan community was crucial

The movement against nuclear energy, and the changing energy attitudes and shared resistance spirit that these produced, were thus crucial in enabling a counter-culture to emerge in Buan, enabling the project to emerge despite a wider national culture that was not particularly favourable to community-led RE.

This desire to do a deliberately different energy project manifested more concretely in the specific design of the project. As noted above, profits from the solar panels' electricity generation are used to further enhance the sustainability of the area. Projects have included the further installation of solar panels, but also reductions in energy consumption and the promotion of energy efficiency.¹⁶⁹ Education activities around renewable energy are also provided to local schools.¹⁷⁰ Such schemes are reflective of the wider project goals and rejection of mainstream discourses of mass-production and consumption of energy.

However, a further factor to consider is that the BCPG project did not emerge completely within the bounds of the Buan locality. During the time of protests against the nuclear site in the area, Buan's anti-nuclear movement had support from other environmental and anti-nuclear NGOs that existed in South Korea. These connections proved fruitful for the later development of community-owned RE, with some of these NGOs providing assistance since they were already experienced in running citizen-funded RE schemes.¹⁷¹ As with the other case studies we examine in this report, the existence of wider culture around community-led energy, however small or niche, was a crucial factor in facilitating learning and thus project development.

An embedded sense of interpersonal trust based on shared values and experiences within the Buan community was crucial in helping the BCPG project to emerge, and to be accepted and supported as properly community in character.¹⁷² This trust had multiple roots. First, Deungyong village, where BCPG has its main office and the main focus of RE projects run by BCPG, is a very close-knit agricultural village with just 44 families.¹⁷³ Villagers are also bonded by a shared religious faith of Catholicism. The village itself is regarded as a special place for Roman Catholic communities in South Korea, being referred to as the 'Catholic community village' because the family of the first Korean Catholic priest fled there to escape persecution. Second, the leaders of the BCPG project are very much trusted both by those living within Deungyong and Buan County more widely. Two of the project leaders are also local religious leaders, and are felt to be 'righteous' and 'honourable' characters.¹⁷⁴ One of the BCPG leaders has a strong connection with Deungyong, on account of a shared religious faith and the fact that descendants of his family still live in the village, and most of its residents are Catholic. Finally, this sense of trust was reinforced through Buan's history and residents' shared experiences of collective action against nuclear energy, and the shared resistance spirit that this built.¹⁷⁵

As has been argued in relation to community energy projects in the UK,¹⁷⁶ this interpersonal trust was conducive to the development of the project, encouraging widespread local support and helping it to be developed through an informal and participatory process. As a practical example, when BCPG was launched one resident of Deungyong, a Catholic believer, offered to lend a section of land to BCPG free of charge so that the projects could be carried out there. Indeed, the importance of trust was arguably accentuated in the context of South Korea, with Jeong¹⁷⁷ stating that in this country's culture who a speaker is can matter as much as what they actually say.

¹⁶⁹ <http://green-korea.tistory.com/83>

¹⁷⁰ <http://green-korea.tistory.com/83>

¹⁷¹ Jeong (2012) Placing renewable energy development: an analysis of the spatialities of renewable energy projects in South Korea and Japan.

¹⁷² Jeong et al. (2012) 'Making Power Differently: Exploring the motives and meanings of community renewable energy developments in cases from the UK and South Korea.'

¹⁷³ Jeong (2012) Placing renewable energy development: an analysis of the spatialities of renewable energy projects in South Korea and Japan.

¹⁷⁴ Jeong et al. (2012) 'Making Power Differently: Exploring the motives and meanings of community renewable energy developments in cases from the UK and South Korea.'

¹⁷⁵ Ibid.

¹⁷⁶ Walker et al. (2010) 'Trust and community: Exploring the meanings, contexts and dynamics of community renewable energy.'

¹⁷⁷ Jeong (2012) Placing renewable

Energycoop Aysén

Enercoop Aysén (EA) is a community energy group based in the Aysén region of Northern Patagonia, Chile. It has 98 members across what is a large and sparsely populated region, but the core of the group is based in Coyhaique, the main city of around 50,000 residents.

This case study report was researched and written by Prof. Gordon Walker (Lancaster University) and Dr. Gloria Baigorrotegui (Universidad de Santiago de Chile)



Key points

- The group is at an early stage of development, having been **formed in April 2014**
- Its current focus is on connecting interested people and groups, and lobbying government to provide better **support for community approaches to energy**
- Enercoop Aysén has ambitions to **develop** and **own renewable energy generation projects**
- The project emerged out of protests against large-scale hydro power in the region, as well as a need for more **environmentally** and **socially sustainable solution to the provision of heat**. Access to energy, and air pollution, are both significant issues in the area
- Given its geographical remoteness, Patagonia has a strong tradition of **independence** and **solidarity**
- The very **centralised system of energy generation** and supply makes such initiatives difficult to establish.

About the project

The group is relatively new, formed in April 2014 and is at an early stage of development. Its work so far focuses on connecting together people interested in and committed to the development of small scale renewable and sustainable energy technologies, promoting exchanges across the network, learning from early local technology experiments and lobbying politically for new approaches to local energy policy in the municipality and region. Its members consist of ordinary citizens, some of whom are experimenting with home-based microgeneration, professionals working in various roles within the public and education sectors and small businesses seeking to develop small scale projects (PV, biomass) that can have social, environmental and development benefits for the region. The EA Co-operative has ambitious plans for future development of community owned energy installations, but is proceeding through a step by step process of learning and building confidence and local alliances through what is in Chile a very new process of grassroots energy action with many political, institutional and cultural obstacles to contend with.

The existing energy context that the EA is working within is distinctive, both enormously challenging and having tremendous potential for future transformation. With cold climatic conditions, energy for heat is particularly important and achieved at the moment predominantly through wood burning. Most of the region has a basic electricity supply but the network distances can be very long to dispersed settlements, quality and reliability can be low and the cost of electricity is high, almost double that in Santiago, 1350 kms to the North. There is also some use of propane for cooking and water heating. In Coyhaique the problems of the wood-based heating regime have become particularly acute. Wood is relatively cheap, burnt inefficiently in often basic stoves and the trees are not systematically being replaced as part of a sustainable forest management operation. Whilst there are some more modern building designs and building regulations are now requiring a better standard of insulation, most of the existing housing stock is of poor construction, predominantly thin wood panel walls, corrugated iron roofs and poor sealing around doors and windows meaning that heat is lost very quickly. In both carbon and energy poverty terms this is evidently problematic, but the City also has a serious air pollution problem from wood burning. When combined with a strong temperature inversion preventing dispersion out of the valley basin, serious smogs can be experienced – one day in 2015 Coyhaique had worse air quality than anywhere else in the world. Policy responses are being made. In 2013 the National Ministry of Environment declared Coyhaique as a ‘saturated zone’ in terms of atmospheric pollution (Resolution. N° 46 of 23 May) and an ‘atmospheric decontamination’ pre-plan for the city was approved in February 2015.¹⁷⁸ This all adds up to a complex and problematic local energy situation that the Aysén co-operative is focused on improving through local, participatory processes, and local collective action.

The first larger scale project they and others are focused on is on wood and heat in the form of a modern wood-chip heating system that is being installed in a local school, along with a comprehensive retrofitting to radically improve the thermal performance of the building. This system uses wood chips from a small local business that is gradually developing its knowledge and experience of how to naturally dry wood, chip it into the right size for the boiler and provide the basis for scaling up into the future to a much larger operation. With the support of know-how from a Swiss consultant acting as an intermediary, and investment also from Switzerland and support from local government actors, this is seen by the EA members as crucial to demonstrating the viability and benefits of transforming to a modern wood-based energy system.

Institutional and political culture

Chile’s energy system is very centralised, dominated by big companies that monopolise generation and distribution, and with strong central state involvement in major infrastructure projects, such as the hydroelectric dams proposed in the region.

Coyhaique has substantial air pollution problems partly due to unsustainable and inefficient wood-based heating regime

¹⁷⁸ Resolution n° 66 of the Ministry of Environment

Only very recently have new approaches to energy policy begun to emerge nationally

The institutional culture traditionally has no space for bottom up participation, opening up of decision-making or the making of new opportunities for small-scale entrants into the energy supply system (electricity in particular). In discussions many references are made back to the period of dictatorship under the violent, right wing and aggressively neo-liberal regime of General Pinochet. Even though this regime came to an end in 1999, its legacies are still being lived with, through, for example, embedded market-first principles, concentrations of economic power, land ownership, water rights and other key resources in a small wealthy elite, and a loss of earlier traditions of co-operative forms of association and local business activity.

Only very recently have new approaches to energy policy begun to emerge nationally, which are recognising a role for distributed energy generation, with investments in pilot projects and proposed regulatory changes which will (in theory) enable community energy projects to begin to operate in ways they have been able to in other countries.¹⁷⁹ In October 2014 a net-metering law came into force, enabling small generators to feed into the grid. However this law has been widely criticised, due to there being now Feed-in Tariff incentives for residential or small-scale producers.

Cultures of social enterprise

Although there is some history of third-sector organisations in the economic development sector, there is not a strong tradition of social enterprise in Chile, and few legal or financial incentives for social enterprises.¹⁸⁰ As described above, the country is still emerging from the Pinochet regime which imposed a high degree of centralisation. As in South Korea, the sector is developing rapidly. Recently, there have been reforms of the general law on the legal basis of co-operatives. It is hoped that this will address constraints on the development of a fully-fledged energy co-operative.

Local culture

One of the most striking features of the co-operative is its emergence out of intense protests against plans for major new hydroelectric projects.

In 2005 people in Aysén became aware of plans to build new hydroelectric facilities consisting of 5 large dams in the region and the Patagonia Defense Council (Consejo de Defensa de la Patagonia) immediately began to actively oppose these plans. This mobilisation grew rapidly in the form of the 'Patagonia Without Dams' campaign sustained through until 2014. The protest activity was intense and locally focused, but drew on a coalition of action that extended nationally and internationally.¹⁸¹

Arguments against the major scheme focused not only on the direct destruction of highly valued landscapes and native species, but also the 2,300Km long transmission infrastructure to be built to connect up to the northern grid system and the big mining companies. The projects were therefore seen as primarily in the interests of others, rather than for the benefit of local communities. The opposition was ultimately successful, with the State authorities denying permission for the HEP projects on environmental grounds in 2014.

The Aysén Co-operative emerged directly out of this political history, wanting to promote and have a direct role in enacting an alternative, sustainable and green energy pathway that embodied local decision-making and participation and independence from the Central state.

Having stopped the mega-energy projects, their vision is of a locally determined sustainable energy strategy, including locally owned and run projects, set up for the benefit of the people of Aysén and in a way that is appropriate for and sensitive to the unique landscape, ecology and culture of the area. The president of the EA Co-operative, Pamela Cardenas, particularly highlights the interest in learning and entrepreneurship of its members, and it has been demonstrated that:

The projects emerged out of protests against plans for major new hydroelectric projects

¹⁷⁹ CCE (2015) Comité Consultivo de Energía 2050. Hoja de Ruta 2050. Hacia una energía sustentable e inclusiva para Chile. Santiago Gobierno de Chile. ME Ministerio de Energía (2014) Agenda de Energía. Un desafío País, progreso para todos. Santiago: Ministerio de Energía. Available at: <http://www.minenergia.cl/documentos/estudios/2014/agenda-de-energia-un-desafio-pais.htm>

¹⁸⁰ Nonprofit Enterprise and Social Sustainability Team (NESST) (2006) Parques para Chile: Creating an organisation while simultaneously creating a social enterprise. Available at: <http://www.nesst.org/wpcontent/uploads/2013/07/2007-WDI-NESST-Parques-para-Chile-Case-EN-18.pdf>

¹⁸¹ Schaeffer, C., Smits, M. (2015) 'From matter of facts to places of concern? Energy, environmental movements and place-making in Chile and Thailand.' *Geoforum* 65, 146-157.

“Those who had no idea [about renewable energy] have proven to be able to dive into the swimming pool [a metaphor to highlight the ability to take risks] ... because they believe that Patagonia must be taken care of, as a reserve of life” (Interview 17/11/15 Coyhaique).”

At its origins the EA received the support of the Institute of Political Ecology of Chile and the Private Corporation for Aysén Development (Corporación Privada para el desarrollo de Aysén) that connected it into a network of micro-entrepreneurs in the area. The overall objective of the EA co-operative is to move towards local energy consumption taking advantage of local renewable natural resources, as ‘clean and sustainable as sunlight’. The vision is about improving energy literacy but also moving towards local energy sovereignty.¹⁸² Much of the discourse of the group members is therefore about decentralisation, local democracy and self-determination, alongside commitments to sustainability and enthusiasms for new technology implementation.¹⁸³

As clear from the discussion of political culture above there is a strong sense of a Patagonian and Aysén identity, a local culture which is proudly distinct from the mainstream, in some ways sharing more with Argentinian Patagonia across the border than with the distant ‘centre’ of Santiago. As already explained, this distinctiveness is a strong part of the discourse of the EA Co-operative. Landscape quality and status is also high and strongly valued as such, which means that any future energy development, at any scale, needs to be sensitive to landscape and ecological impacts. Wind and small-scale hydro potential is though very substantial, along with some geothermal and a reasonable solar resource, and most importantly there is potential to transform the existing wood based system into a more sustainable model.

It is also clearly relevant that the region is relatively poor in economic terms, with considerable poverty both within and outside of Coyhaique. The title for a recent international workshop held by the EA Co-operative appropriately included three key words ‘clean, fair and accessible’ (Limpia, Equitativa, Asequible). The area does not therefore have readily available investors in any future co-operative investment scheme, although Coyhaique does have a growing middle class (in Chilean terms) due to its role as a service and public sector centre, and increasingly as a tourist destination. Investment finance for the local energy strategy is therefore a key challenge.

The local culture also has wood and forestry within its historical heritage and identity; for example, one of the standard Coyhaique gifts for tourists to buy is a small model of a pile of wood with an axe resting against it. When the area was first substantially populated only about 120 years ago, the processes of territorialisation by Argentinian and Chilean states in 1880 resulted in the historical wiping out of indigenous people.¹⁸⁴ Wood became an exploitable commercial resource and large areas of local forest were cut and cleared by pioneers. This early form of commercial development has been sustained locally, through the many small family businesses that bring wood into the City on small trucks, a system that operates on the edge of legality (for example approximately 60% of the wood market is supplied by family farmers acting out of the reach of the taxation system in informal micro networks).¹⁸⁵ This wood energy regime is long embedded and therefore hard to shift, but contains the potential for transformation to a locally-based sustainable biomass system which sustains local employment and to some degree routinized cultural practices associated with wood burning for heat. Hence the focus in the wood-chip supply and biomass school boiler project on building on this local culture, seeking to modernise the wood-based heating regime and make it both more productive and sustainable.

The local culture has wood and forestry within its historical heritage and identity

¹⁸² IEP Instituto de Ecología Política (2014) Enercoop Aysén impulsa ambicioso plan de educación ambiental para sus socios. Available at: <http://www.iepe.org/2014/07/enercoop-Aysén-impulsa-ambicioso-plan-de-educacionambiental-para-sus-socios/>

¹⁸³ GORE Gobierno Regional de Aysén (2009) Estrategia Regional de Desarrollo de Aysén. International agreement with ILPES –CEPAL UUNN. Available at: http://www.goreAysén.cl/controls/neochannels/neo_ch112/appinstances/media42/EDR_AYSÉN.pdf Segura, P., Bourlon, F. (2011) ‘Represas en Aysén: traba o trampolín para el desarrollo turístico regional?’ Sociedad hoy 20, 145-157

¹⁸⁴ Aylwin, J. (2005). Pueblos indígenas de Chile. Antecedentes históricos y situación actual. Serie de Documentos N°1. Temuco: Instituto de Estudios Indígenas de la Universidad de la Frontera.; Romero, H. (2014) ‘Environmental conflicts and historical political ecology: a genealogy of the construction of dams in Chilean patagonia.’ PhD thesis, University of Manchester. Available at: <https://www.escholar.manchester.ac.uk/ukac-man-scw:217920>

¹⁸⁵ Sandoval, E. Segura, P. (2015) Tolerancia Cero a la leña: ¿Solución viable para Aysén? El divisadero. Available at: <http://www.eldivisadero.cl/noticia-32728>

CRELUZ

CRELUZ (full name Cooperativa de Energia e Desenvolvimento Rural do Medio Uruguai Ltd) is a member-run co-operative that manages a local section of the electricity grid in the state of Rio Grande do Sol in the South of Brazil. With over 20,000 members, the primary aim of the group is the reliable supply of electricity to all who need it.¹⁸⁶



Key points

- **Six small-hydroelectricity plants** in the Rio Grande Sol region of Brazil
- **Led, owned and funded by CRELUZ**, a local co-operative social enterprise
- Drew on local cultural beliefs in the **value of working together** to get widespread local support and involvement
- An enthusiastic and well-connected **project leader provided inspiration** to the project
- A strong belief in the **importance of helping those in need** means that a proportion of the project's profits are spent on helping those who are poor or disadvantaged

¹⁸⁶ <http://www.ashden.org/winners/CRELUZ10>

About the project

The co-operative was first established in 1996 by a group of local people who wanted to improve the electricity supply in the area. At this time, their primary objective was to increase energy access – to extend the grid to the many homes with the state that had never been connected. The group began buying electricity from the national supplier to sell on to its members.

But over time the issue became not only access to energy, but also a reliable and secure supply. The supply from the national grid was intermittent and variable, restricting employment and development and causing people to leave the region in search of opportunity elsewhere.¹⁸⁷ Brazil's rapid development and increasing national demand for electricity has led to the deterioration of supply to areas at the far end of grid lines, the Rio Grande Sol area.

So in 1999 the members of the CRELUZ co-operative decided to pursue its own solution – generating its own power using mini-hydro plants.¹⁸⁸ The group now owns and operates 6 plants in various rivers in the area, which together generate around 4MW of supply – about 27% of the electricity demanded by 80,000 people. This electricity is then sold on to residents of the area who are members of the co-operative – the members who generate the electricity are also the members who consume the electricity. All except the first hydro plant were funded through the profits generated by the co-operative.¹⁸⁹ Sites for two further hydro schemes have been identified, which CRELUZ hope to develop jointly with other co-operatives. The aim is that eventually all of the member's electricity demand will be supplied by CRELUZ's own power generation – as the CRELUZ president said, “we want to continue doing local power generation, decentralised with low environmental impact, to achieve self-sufficiency.”¹⁹⁰

The more reliable electricity supply enabled by the CRELUZ hydro schemes has improved the quality of life for families in the area, and has improved economic resilience by making possible a greater range of income generating activities and enabling many businesses to operate more efficiently.

The sale of electricity from the hydro plants to its members has meant that CRELUZ had an annual turnover of US\$12.8 million in 2009, and all profits are reinvested in its own capacity or for projects benefiting the local area. This includes measures to improve the local environment, such as reforestation, education programs for schools, and social programs designed to help those on low-income have access to affordable electricity. This all lead to the CRELUZ hydro projects being awarded the Ashden award¹⁹¹ prize in 2010.¹⁹²

Institutional and political culture

One of the main features of Brazilian energy policy over the last 25 years has been a desire for rapid increase in electricity access. In 1990 85% of people had an electricity supply, a number which has recently reached 98.7%.¹⁹³ The quality of life benefits of electricity access have been widely recognised throughout the country, and have been supported through programs such as the Luz para Todos ('Light for All') electrification program.¹⁹⁴ Expansion has also been seen as a necessary part of supporting economic growth.¹⁹⁵

However, the solutions to this have been primarily top-down in nature, and based on the construction of large-scale power plants and particularly the extension of grid infrastructure such as pylons, deemed as more cost effective by electricity distribution companies.¹⁹⁶ Specific support for small-scale, community-owned forms of distributed generation has been somewhat limited and so these have played a relatively small role.¹⁹⁷ Unlike many of the other countries we examine in this report, Brazil does not offer a Feed-in Tariff scheme for community projects. However, despite this lack of direct FiT support, CRELUZ is able to be financially sustainable because it is a supplier co-operative, selling the electricity it generates to its members in the local area rather than the national grid.

6

plants operate in various rivers in the area **generating 4MW of supply**

Brazil does not provide a Feed-in Tariff but CRELUZ is able to sell the electricity it produces to its members

¹⁸⁷ Ashden Awards (2010) 'Ashden Awards Case Study: CreLuz, Brazil: Summary'. Available at: <https://www.ashden.org/files/reports/CRELUZ%20case%20study.pdf>

¹⁸⁸ Ibid.

¹⁸⁹ Ibid.

¹⁹⁰ <http://www.ashden.org/winners/CRELUZ10>

¹⁹¹ The Ashden Awards for Sustainable Energy, which were established in 2001, recognise excellence in sustainable energy solutions in the UK and in the developing world.

¹⁹² <http://www.cleantechinvestor.com/portal/cleantech-awards/5861-led-solar-lantern-supplier-wins-ashden-goldaward.html>

¹⁹³ Slough, T., Urpelainen, J. and Yang, . (2015) 'Light for all? Evaluating Brazil's rural electrification progress, 2000–2010.' *Energy Policy*, 86, 315-327.

¹⁹⁴ Ibid.

¹⁹⁵ Santos, R., Rosa, L., Arouca, M., and Ribeiro, A. (2013) 'The importance of nuclear energy for the expansion of Brazil's electricity grid.' *Energy Policy*, 60, 284-289

¹⁹⁶ Ibid.

¹⁹⁷ Ibid.

For this reason, the company is still able to turn a small profit and remain financially viable, with its members both producers and consumers of electricity.

A further factor is that hydropower electricity generation is very widespread in Brazil. It expanded particularly rapidly between 1975 and 2000,¹⁹⁸ in the run-up to the first CRELUZ hydro development. Whilst the development of hydropower as part of the CRELUZ schemes was partly because of the geography of the area, with several rivers running through, the widespread nature of hydro in Brazil helped develop awareness of the potential for hydro energy development, as well as ensuring the technology was readily available:

“Because there’s a run-of-river scheme, it’s slightly different to the big hydro which is big dams and big turbines. But people understand I think the concept of hydro fairly well and it’s not too difficult to find the technology. They bought standard units, they didn’t make them themselves.”

Cultures of social enterprise

Being a pioneer area, there is a wider belief in the value of working together

The CRELUZ co-operative is notable for its high levels of local participation, with members feeling a very strong sense of ownership toward the organisation.¹⁹⁹ The co-operative has over 20,000 members and 87 full-time staff, and has won prizes for the highest percentage of voting members. More specifically, one Ashden Awards researcher argued that local people were also very supportive of the CRELUZ hydro projects: “It appeared to be working very effectively. People seemed to have bought in to the concept and were very enthusiastic.”²⁰⁰

In his view, this high level of local support and buy-in was encouraged by a wider belief in the value of working together that was shared amongst people in the locality. As well as CRELUZ, the local crystal mine (a major source of economic activity) is also co-operatively-owned:

“Well there seems to be that sense of working as co-operatives in the area. One of the major customers in the area is a crystal mine, and they operate that as a co-operative. So all the mine owners and the miners working co-operatively.”

The Ashden researcher suggested that these shared values had their roots in history – in the activities of the western settlers who first colonised the area. Faced with a new and ‘empty’ landscape (in terms of human infrastructure, at least), these settlers had to work collectively in order to survive:

“I think it’s still a feeling of being a pioneer area. People expanded out of the rest of Brazil into that area. It’s a generation or two ago but the sense of being pioneers. It’s like the western expansion in the States. It’s that sort of feeling that we’ve all moved into this area and we’ve got to work together to make it work.”

Also important was that, by the time of the first proposed hydro developments in 1999, the CRELUZ co-operative had already been successfully running for many years as an electricity supply company, and had undertaken a variety of economic and social projects during this time. There was thus a specific support and trust for the CRELUZ co-operative itself amongst local people, which was further strengthened after the early hydro schemes proved to be successful. One person who had been employed by CRELUZ for 17 years, for example, described the organisation in very positive and supportive terms: “CRELUZ is very well managed and I like working here. They offer a health plan, food, transport and recreation

¹⁹⁸ Geller, H., Schaeffer, R., Szklo, A. and Tolmasquim, M. (2004) ‘Policies for advancing energy efficiency and renewable energy use in Brazil’. *Energy Policy*, 32(12), 1437-1450

¹⁹⁹ Ashden Awards (2010) ‘Ashden Awards Case Study: Creluz, Brazil: Summary’.

²⁰⁰ Personal correspondence

sites. They help students at the University. They care about the development of the workers and offer lectures and other training.”²⁰¹ The success of the CRELUZ schemes has begun to encourage the diffusion of small-scale, co-operatively-owned hydro in the Rio Grande de Sol area. CRELUZ plans to further expand its energy generation through collaboration with four other co-operatives in the area, who have jointly formed a co-operative of co-operatives called COOGERVA. Two potential sites of 24MW and 17MW have been identified, with detailed designs already made for the 17MW plant.²⁰²

Local culture

As with other projects we have examined, the particular details of the CRELUZ hydro schemes have been shaped by aspects of the local culture and context within which the project is situated.

The CRELUZ co-operative is set within a relatively remote part of southern Brazil, far from the economic and cultural urban centres such as Rio de Janeiro. The primary industry in the rural communities is farming, although as noted there is some mining activity also.²⁰³ Although perhaps not the poorest area of Brazil, there is some economic deprivation present in the area. The region itself is at the very end of the national electricity network, and the electricity supply has been very unreliable in the past. This caused out-migration as people sought employment elsewhere. Within this context, profits from the CRELUZ hydro schemes are used to fund a number of social programs aimed at helping residents who are deprived or on low-incomes. These projects are put forward by members of the co-operatives, and are voted on and agreed upon by the whole assembly.²⁰⁴ An Ashden Award researcher told us that within the area there was a strong belief in the importance of helping those in need:

“They were very concerned about those who were poorer and couldn’t afford things, and they were quite keen to help these people out. So as I say, lots of the profits from the new electricity system, which was making a profit once they got the hydro in, is going to what people see as poor. They’re concerned for those within the society that are seen as somewhat disadvantaged.”

600

of the poorest families are provided with free electricity

The particular outcomes of the CRELUZ hydro projects have thus been shaped by this local context and set of cultural beliefs, with the co-operative dedicated to sharing the success the reliable power has provided and putting in place measures to help those on low-incomes.²⁰⁵ This is perhaps best reflected in the way the tariff system for the sold electricity is structured: “members pay an average of US\$0.20 per kWh for electricity, with a sliding scale of tariffs, where larger wealthier users pay more and poorer families are subsidised.” Furthermore, 600 of the poorest families are provided with free electricity under the CRELUZ social program.²⁰⁶

Alongside these socially beneficial outcomes, CRELUZ is notable for its commitment to environmental protection and benefits, and runs several projects in this area that have all been chosen by its members.²⁰⁷ All six of the hydro schemes have been designed with these goals in mind. Each uses run-of-river technology, ensuring that they do not build dams that would displace habitats. The flow of water to the hydro plant is adjustable to prevent the river from running dry or flooding, and a fish ladder is included to ensure that fish can continue to pass up each river safely. An extensive program of reforestation has begun in the areas surrounding each hydro scheme, with all the trees being local Brazilian varieties using seeds from local forests.²⁰⁸ Over 800 young native species have been planted since the hydro schemes began, with over 100 birdboxes.²⁰⁹

²⁰¹ Ashden Awards (2010) ‘Ashden Awards Case Study: CreLUZ, Brazil: Summary’.

²⁰² Ashden Awards (2010) ‘Ashden Awards Case Study: CreLUZ, Brazil: Summary’.

²⁰³ Ibid.

²⁰⁴ Ibid.

²⁰⁵ ‘CRELUZ micro hydro makes the grid reliable’. Available at: <https://vimeo.com/35512662>

²⁰⁶ Other social programs that have been agreed by the CRELUZ members include the connection of any off-grid homes in the area, and the installation of drinking water facilities in over 100 rural communities where families do not have access to clean water in their homes. Furthermore, each of the hydro

generation sites are designed to be educational, providing facilities for schools and university students to learn about power generation. Finally, each of CRELUZ’s 87 full-time staff receive training to improve their technical skills.

²⁰⁷ Other examples of projects include a water cistern that collects and stores rain water for a school and keeps it clean for drinking during the dry season; and tree nurseries planted out by volunteers in de-graded areas and around the generating sites. CRELUZ runs environmental education projects in local schools, and school children are often involved in these reforestation projects. Each canal that diverts water from the river has a trash rack to collect floating debris before the water enters the penstock pipes. Plastic bottles are then collected and recycled, whilst organic debris is used to make compost.

The commitment to sustainability was driven by a need to ‘make amends’ for past environmental damage

The Ashden researcher who had visited the area linked this commitment to sustainability to a deeper set of cultural beliefs in the Rio Grande de Sol area that were the result of the area’s history with settlers – although he stressed that he was not in the area long enough to fully assess the strength of this theory. Specifically, he felt that there was something of a guilt complex amongst the local people due to their ancestors doing some damaging things to the local environment. The area itself was once covered by forests, but large tracts were cleared by the settlers for farming, causing associated environmental problems.²¹⁰ His sense was that the commitment to sustainability was driven by a need to ‘make amends’ for this past environmental damage:

“Again, it is probably linked to the guilt complex. So having got rid of all the forest and being told that was a bad thing, they feel like they ought to be doing something about it. So they’re planting local trees, where there is space to plant them. So they’re trying to reforest, and again it’s sort of tied in with this idea that there’s a guilt complex, and we need to do a little bit of something about it.”

It is also necessary to acknowledge the important role of CRELUZ’s president, Elemar Battisti, in providing a vision and drive to pursue the hydro projects, as well as a practical expertise in how co-operatives can be organised and made to work. Because he is an academic with strong contacts and networks in different parts of the world, Battisti has been able to learn from other energy co-operatives elsewhere, even if they are relatively rare in Brazil – with a small-hydro project in Germany proving particularly inspirational.²¹¹ Battisti also had knowledge of other co-operative projects in Brazil,²¹² a fact the Ashden researcher we spoke to acknowledged:

“I would think that Battisti was involved with other groups that were doing co-operative projects in Brazil. He’s an academic and therefore sharing lots of ideas with other people. And he does a lot of lectures and therefore travels around Brazil lecturing on the subject. So he would certainly have a group of people who were thinking about it and an academic understanding of co-operatives and how to do things. So he would’ve read all the reports from around the world.”

A final cultural factor tying the above points together is the influence of religion on the area. Many people in the CRELUZ community are Catholic, and are very proud of their local church that is covered in crystals donated from one of the local mines. The Ashden researcher we spoke to felt that the moral compass provided by the church gave meaning to the environmental and social programs pursued by the CRELUZ co-operative:

“The Catholic church probably had an influence. People did seem to go to church ... they’re very proud of this church that is covered in crystal. But I think that sort of helps this idea of community and working together. But it’s not the very deep, traditional Catholicism that you find elsewhere in Brazil. There’s a sort of guilt of the past that makes it slightly cautious – ‘we’re not holding onto the old traditions too much because they weren’t very good.’ But that enhances the idea of ‘oh we’re working together to make things happen’ ... I think it [religion] adds a significance that we’ve sort of forgotten about in British life.”

²⁰⁸ Ashden Awards (2010) ‘Ashden Awards Case Study: CreLuz, Brazil: Summary’.

²⁰⁹ <http://www.ashden.org/winners/CRELUZ10>

²¹⁰ Ashden Awards (2010) ‘Ashden Awards Case Study: CreLuz, Brazil: Summary’.

²¹¹ http://www.bbc.co.uk/blogs/portuguese/planeta_clima/2010/07/creluz_uma_ideia_que_fluiu_de.shtml

²¹² <http://www.folhadonordeste.com.br/site/noticia/5361-forum-do-cooperativismo-reune-liderancas>

Discussion

Looking across eleven case studies profiled in this report, some clear patterns emerge. These are discussed below, under the three dimensions of culture that we have considered in this project: institutional and political cultures; cultures of social enterprise; and local cultures.

Institutional and political cultures

Local energy projects can be enabled or constrained by policies and norms established at the national level. This influence can be seen directly – through the way in which projects benefit from particular policy incentives, for example – and through the subtler influence of values or assumptions which help or hinder individual projects.²¹³

Supportive national and local government

Denmark and Germany have the most developed and stable institutional support for community energy generation, and this is reflected in the scale and ambition of individual projects.

In Denmark, for example, support for decentralised and community approaches dates back to the 1980s. Strongly dependent on oil imports, and badly shaken by the oil price crises in the 1970s, Denmark embarked upon a strategy based on developing a strong indigenous renewables industry, local heat networks often owned by the municipality, and local control over planning.²¹⁴ The electricity market was liberalised in the 1990s, but with continued use of fiscal incentives and policy to meet national objectives. In March 2012 a new Energy Agreement set ambitious targets for energy and carbon reduction, with a target of 100% renewable energy by 2050, and specific measures including a ban on use of fossil fuels for space heating in new buildings from 2013. This combination of a long-term, stable energy policy framework, together with considerable local autonomy, has created an enabling environment for local energy schemes, and explains the scale and professionalism of the Middlegrunden and Hvide Sande schemes which we profile in this report. In particular, both projects pointed to the fact that the municipality has responsibility for their share of renewables targets, but also the ability to determine how the targets are met. This creates an incentive for local government to support ambitious projects in their area.

Support from local government is a strong factor in the success of projects. The Jühnde project was helped by the devolved nature of administration in Germany, which encourages local responses. In the UK, Brixton, Wiltshire and Horsham all benefited from local government support, in the form of grants or loans, secondment of staff or use of land or buildings. Such support serves a double function: it is of practical help, but it also provides an important stamp of approval – in cultural terms, it provides trust and credibility.

The role played by national and local government in the UK is mixed. Central government policy making has typically been driven by a culture that favours centralised, large scale energy generation. A drive to support local energy projects, starting with some small-scale funding and support schemes in the 2000s, continuing the introduction of FiTs in 2010 and culminating in the publication, in January 2014, of a Community Energy Strategy, has resulted in a burgeoning community energy sector, with around 550-600 active community energy organisations by August 2013.²¹⁵

²¹³ Toke et al. (2008) 'Wind power deployment outcomes: How can we account for the differences?'

²¹⁴ http://www.ens.dk/sites/ens.dk/files/dokumenter/publikationer/downloads/energy_policy_in_denmark_-_web.pdf

²¹⁵ Capener (2014) Community Renewable Electricity Generation: Potential Sector Growth to 2020.

The Wiltshire scheme profiled in this report is a clear beneficiary of this support. It benefited directly from FiTs, tax incentives and specific measures to support collaboration with the commercial sector, discussed in more detail below. It benefited from support from the local authority at nearby Swindon, who took a proactive role in setting up Public Power Solutions – a fundamental intermediary actor in the development of the second (and significantly larger) solar project. This helped it to pursue ambitious plans for a relatively large scheme at Braydon Manor, in partnership with a commercial player. Looking beyond only the case studies examined in this report, there are other examples of local authorities playing an enabling role, with active involvement in community energy taking place in Plymouth, Oxford and Bath, for example.

However, recent changes to UK policy, including drastic reductions in FiTs, changes to planning policy, and the removal of tax incentives – have affected the viability of similar projects in the future. It is currently unclear whether projects like the Wiltshire case will represent the high water mark of community energy in the UK, or whether further changes will result in the reappearance of a supportive framework.

The role of specific policies and incentives

Projects can also thrive in countries lacking consistent national support. A specific policy such as a Feed-in Tariff (FiT) can provide the foundation for a successful project. FiTs were crucial to the projects in South Korea, Denmark, Germany and the UK. The key feature of FiTs is their predictability, allowing payments for generation to be fixed at the inception of the project, and allowing a simple financial forecast. This feature of FiTs insulates against the vagaries of the wider energy market – particularly essential in more turbulent policy environments like the UK. In the case of the Wiltshire project, a very specific regulatory change which allows a community scheme to be developed alongside a commercial scheme greatly improved the viability of the project.

The rapid UK growth of the community energy sector can be linked to the introduction of the FiT scheme that provided the incentive and the mechanism for community involvement. The Jühnde case study also provides a specific and clear example of how the stable and long-term (20-year) support of the country's FiT provided the financial security to pursue the project with confidence. This consistency has also enabled the energy cooperative to undertake long-term planning to innovate their business model, in preparation for when they are no longer receiving the FiT support.

While such individual incentives can help schemes, the projects profiled here clearly show that it is more difficult and expensive to make progress in the absence of a clear national framework. South Korea, for example, has a strong tradition of centralisation and state involvement in energy generation and supply. The Buan energy project emerged in spite of this, but, perhaps as a consequence of the lack of a supportive cultural and policy landscape across the country more widely, it is very small-scale. In Chile, there is no legal model for energy co-operatives, and no specific policy support, such as a FiT, for local generation. Those supporting local energy have to focus their efforts on advocacy, to try to create better regulatory conditions for future projects.

The Cwm Arian project in Wales has, from the start, been buffeted by changes in national policy. The idea for a community-owned wind turbine emerged in 2004, but has still not come to fruition. The project received a sizeable grant from central Government in 2009, but this was withdrawn following the 2010 election, and they could only use a small proportion of the money originally received. At several points, those leading the project have made financial projections based on predicted FiT income, but twice these have been deemed invalid because of sudden changes in the FiT rates. Finally, whilst they received support from the Welsh Assembly Government, planning permission was rejected at local level. As a result,

eleven years later, their project is not yet complete. The recently announced removal of tax incentives for community energy will hit the project further and may threaten its viability. These rapid changes are in stark contrast to the stability that enabled the development of the Jühnde project, for example.

These examples suggest that without a supportive and stable national framework projects will struggle to establish themselves at anything like a scale that might make a material impact in terms of energy supply.

Liberalisation: help or hindrance?

Our case studies show clearly that it is not the degree of state control or liberalisation of energy markets in itself that affects the fortunes of community energy. The Ecopower co-operative in Belgium in fact emerged out of a liberalisation drive, and specifically, a wish to open up the supply market to new players. In South Korea and Chile, strong state involvement in the energy system leaves little space for community solutions. In Denmark and Germany, there is a high degree of state involvement in setting the strategic direction for energy markets – Germany's Energiewende is a case in point – but structures are designed in way that allows a variety of market actors, commercial, community and municipal, to play a role. This allowed Jühnde, for example, to experiment with a very devolved approach to meeting local energy needs.

Our cross-country comparisons show that it is not the degree of liberalisation, but the type of liberalisation – the culture of energy regulation - that affects outcomes for community energy. A clear, long-term strategy at national level; a preparedness to embrace innovation; responsibility and autonomy at local level; and policies which encourage plurality seem to provide the most fertile territory for local and community approaches. This could be summed up as clarity of outcome, combined with flexibility of approach, to allow for innovation – both in technology, and in business model.

In the UK, a liberalised market has been in operation for some time, but the design of the market has meant that it has been dominated by the major energy suppliers²¹⁶, with market access for new entrants until recently particularly constrained. Whilst there are now increasing numbers of independent suppliers entering the market, the complexity of the energy market together with the financial demands and the administrative burden placed on participants, limits the scope for engagement by smaller scale and community entrants.

The dominance of the major energy suppliers is now being questioned by Ofgem and by government, with the Competition And Markets Authority due to publish its provisional decisions on a major investigation into market competition in the new year²¹⁷. Earlier this year Ofgem also launched work on what they called 'Non Traditional Business Models', which many hope will provide routes to market for community energy projects looking to supply electricity from local projects direct to local people and integrate energy storage into more innovative approaches to local grid balancing and management.

Already community energy projects are engaging in this area with Wiltshire Wildlife Community Energy installing energy storage systems alongside one of their solar arrays and groups like Bath & West Community Energy and Low Carbon Hub engaging with Innovate UK projects around demand/load management and storage²¹⁸.

²¹⁶ Walker and Cass (2007) 'Carbon reduction, "the public" and renewable energy: engaging with socio-technical configurations.'; Willis and Eyre (2011) *Demanding Less: Why we need a new politics of energy*.

²¹⁷ <https://www.gov.uk/cma-cases/energy-market-investigation>

²¹⁸ <http://portfolio.cpl.co.uk/CIBSE/201506/electric-housing/>

Cultures of Social Enterprise

Community energy projects are influenced by wider cultures of social enterprise within different countries or regions. In short, some countries or regions have stronger traditions of social enterprise than others. Social enterprise may stem from different motivations, too – such as a desire for local self-reliance, a mechanism for delivering community aspirations, or as an alternative to nationalised public services.

Social enterprises are businesses trading for social or environmental purposes.²¹⁹ As such, they can be distinguished from charities and philanthropic organisations, on the one hand; and businesses operating for private profit, on the other.

Social enterprise offers communities an approach to engaging with energy that is not grant dependent, but is based on income generation and financially sustainable, community-based business models. This is important because experience from other countries (such as the German, Danish and Belgian examples in this report) shows that a viable business model, based on solid revenue generation, is necessary to scale up community energy. If it relies on grant funding, or support from commercial partners as a ‘corporate social responsibility’ venture, it will remain niche. The capital funding required is just too great. For example, the 3GW of community energy referred to in the UK Community Energy Strategy will require over £4 billion by 2020 to deliver.²²⁰ However, culturally this poses real challenges to a community sector not used to operating on a commercial footing.

Hence the specific focus on social enterprise in this research, highlighting both the value and the potential pitfalls involved.

National and local cultures of social enterprise

The strength of the social enterprise sector in Belgium may be one factor behind the success of Ecopower. Social enterprises play a strong role in Belgian culture, with mutual societies playing a key role in agriculture, credit, insurance and healthcare, for example. This means that people understand what a social enterprise is, and what distinguishes it from a commercial undertaking, or indeed a philanthropic project. If Belgian citizens already receive healthcare from a *mutuel*, then turning to a social enterprise for energy supply makes sense too. Similarly, in Denmark, there is a strong culture of social enterprise in the energy sector. Most electricity distribution companies, for example, are owned by their customers, and the wind industry developed through co-operatively-owned ventures, alongside private and municipal ownership.

In the Scottish Highlands and Islands, the community buy-outs of land, which occurred in Assynt, Eigg and Knoydart, for example, created a supportive environment for community ownership of energy under a community trust model, such as the Horshader example that we review here. There is also a tradition of community-owned shops and other services in remote rural communities where a commercial business may not be viable.

The Creluz project in Brazil similarly benefited from following in the footsteps of a co-operatively-owned crystal mine in the local area. The origins of the Cwm Arian renewable energy project in Wales were in a campaign to save a local school for the community. Though the school closed, the buildings were bought by the community group and used as a community centre. Since then, a Community Land Trust has been established, to provide affordable housing. Local ownership of energy came to be seen as an obvious next step.

In England the social enterprise model has been taken up by many communities that have no grant funding. For example, searches of the FCAs mutual register²²¹ shows that the majority of community benefit societies and cooperative societies that have sprung up in the last few years have been based in England and to a lesser extent Wales. By comparison in Scotland, development trusts and charitable structures have been far more prevalent as a means of delivering community projects.

²¹⁹ http://www.socialenterprise.org.uk/uploads/editor/files/Publications/Social_Enterprise_Explained.pdf

²²⁰ Capener (2014) Community Renewable Electricity Generation: Potential Sector Growth to 2020.

²²¹ <https://mutuals.fsa.gov.uk/>

The social enterprise approach and its application within the energy sector has not always been clearly understood at a regulatory level within the UK, with the Financial Conduct Authority (FCA) for example initially pushing for community enterprises to be philanthropic in nature. In response to careful advocacy, the latest guidance published by the FCA no longer carries this requirement²²².

The role of social enterprise within financing projects

At the core of successful community renewable energy projects is an answer to the question, how do we finance project development and construction at a cost that is manageable and leaves value left in the project to deliver community as well as individual benefit. The case studies illustrate a range of different approaches to this. In Horshader, the capital costs are covered through commercial debt with grant funded project development taken as sweat equity; in Brixton and Wiltshire Wildlife Community Energy project development was carried out either by themselves or by partners for a fee and capital was sourced through equity share offers and in the case of WWCE also through bank debt. In Hvide Sande the projects are charitably owned but have been financed through 80% bank debt and with 20% equity invested by local people, as required by Danish law.

The Horshader approach is dependent on public sector grant and flexibility from commercial lenders. Both of these are in increasingly short supply. The approach adopted by the Scotland Government is still prioritising funds for community energy²²³ in a way that is not seen elsewhere in the UK. English and Welsh governments do have funding programmes of their own²²⁴ though the grant element is less than it has been in Scotland. As a result, community organisations in England and Wales in particular are looking at other options for raising the equity share of projects and as illustrated by Brixton and WWCE are doing so through share offers encouraging local people to invest. These approaches require a legal form that enables such an approach, like community benefit societies or cooperatives. Whilst the legal entities differ and Horshader benefits from project development grants, they are all employing a social enterprise model that requires them to manage income from electricity generation and sales to repay the cost of their capital and to prioritise recycling profits back into their local communities.

Recently, as explored in the Hvide Sande example described above, the Danish government has introduced a new requirement for 20% of all wind energy schemes to be owned by local people, living within 4.5km of the project. This was a reaction to the increasing commercialisation of wind power, despite its community roots. However, the law simply states that local private individuals should own shares, but does not mandate a social enterprise model. Individuals effectively own shares in a commercial enterprise. As the Hvide Sande study shows, this can be problematic, as the scheme is not seen to benefit the local community.²²⁵ Social enterprises maximise profits for the benefit of the community, whereas commercial enterprises maximise profits for the benefit of shareholders. In the UK, the increasing use of crowdfunding approaches has similar challenges: whilst it maximises participation in renewable energy finance, it does not necessarily build returns for the community.

Integrating commercial practice and community expectations

The case studies outlined here range in the degree to which they need to engage with the energy market on a commercial footing. Some, like Ecopower, are fully commercial, with paid staff, operating in a similar manner to a private commercial entity but with the important caveat that they are a co-operative social enterprise, existing to bring about environmental and social benefit. Others, like Horshader and Buan, run primarily through volunteer support. This is in part a function of the scale and complexity of the project or the extent to which communities are trying to develop multiple projects or just managing the performance from one project.

²²² <https://www.fca.org.uk/static/documents/fg15-12.pdf>

²²³ <http://www.localenergyscotland.org/funding-resources/funding/>

²²⁴ <https://www.gov.uk/guidance/urban-community-energy-fund#rural-community-energy-fund>
<http://www.energysavingtrust.org.uk/organisations/ynnir-fro-community-programme>

²²⁵ Oteman et al. (2014) 'The institutional space of community initiatives for renewable energy'

However, given the commercial nature of the energy market, community energy organisations have to consider how to integrate commercial practice in a way that doesn't undermine community expectations around transparency, accountability, control, inclusion and community benefit.²²⁶ In Brixton, for example, paid staff work closely with volunteers, and the focus of the organisation is strongly on social and community outcomes. In the Wiltshire and Horshader examples, partnership with third parties helped to address a knowledge and experience gap that otherwise could have proved problematic.

Developing the community energy model

As the community energy sectors across many countries grapple with a shift towards a subsidy free world and grid parity for many technologies, the need for a solid social enterprise model becomes even more important. Without any subsidies, community energy will have to stand on its own two feet alongside the mainstream energy companies. Competing with commercial entities will require significant capacity building at a community level, and a deeper understanding of local community cultures amongst policy makers.

If this is possible, opportunities illustrated by Ecopower, Jühnde and Creluz for supplying electricity and heat to local people from local projects via a community owned model could be seen in many other countries too. Innovation around local energy supply, energy storage, demand management and local grid balancing represents the next stage of evolution for community energy as it develops beyond renewable energy generation projects.

Local Cultures

Across our case studies, there were clear patterns in the relationship between local culture and the community energy project, with local circumstances exerting a strong influence over the type of project developed.

The case studies reviewed here show a wide range of local cultural influences that can provide strong motivation to take people from inertia to action. Understanding how these issues play out at community level could greatly enhance our ability to increase even further the level of community energy action at a local level.²²⁷

Resistance Spirit

A surprising number of our case studies emerged out of protests against something else. Both the Buan and Ecopower projects were formed out of protests against nuclear power – in the case of Buan, out of opposition to nuclear waste disposal, and for Ecopower, a response to the Chernobyl disaster. The Aysén project emerged out of protests against a large hydropower dam, and Horshader was a reaction to private developers' proposals to a wind farm.

The catalyst for Cwm Arian was a protest against the closure of the local school; whilst the protagonists behind the Hvide Sande project were reacting against what they saw as increasing commercialisation of the energy sector in Denmark – they see their scheme as returning to the original spirit of community energy. This is not just a local phenomenon, either. The Danish wind industry gained its strength from the decision not to invest in nuclear power, with Denmark deliberately choosing a strategy of renewable energy and efficient heat generation.

This is in turn reflected in the UK where the divestment campaign encouraging people to switch investment away from fossil is providing a focus on the alternatives, which many community energy organisations looking to raise finance from local investors like Brixton and WWCE have benefited from.

²²⁶ Seyfang et al. (2013) 'A thousand flowers blooming? An examination of community energy in the UK.'

²²⁷ Walker et al. (2010) 'Trust and community: Exploring the meanings, contexts and dynamics of community renewable energy.'; Haggett et al. (2013) *Community energy in Scotland: the social factors for success*.

More widely community energy action in parts of the UK, like Oxford and Gloucestershire, have sprung up in response to flooding and increased concern about the threats posed by rapid climate change.

These projects are linked by an ambition, in short, to turn a negative into a positive. As well as protesting against what they see as imposed or inappropriate solutions, communities wanted to demonstrate very practical alternatives.

Perspectives on community energy at the local level

At a local level, even community energy projects are not always welcomed. Cwm Arian ran into significant local opposition to what they were trying to do. In Wiltshire the solar projects being developed by WWCE came in part out of a positive response to the prohibitive planning restrictions placed on the development of wind projects by the local authority. Solar was seen as something that most people could get behind.

There are also many views within the sector itself on what community energy projects should involve. The Wiltshire project has been developed around a split site, with the community group owning one site, and a commercial company owning the site next to it, though both projects have been developed together. As a result it involves close partnership with a commercial enterprise, which some see as a necessary way forward in order to scale up the community energy sector; others, however, feel that projects need to stay small-scale and rooted in their communities. Linked to this view is a concern about community projects taking on debt, with some feeling that community energy should be totally funded by community investors so that more of the value stays local. Others see debt as a necessary tool to grow the sector and take it to a scale where it can play a significant role. Trying to raise £4 billion to install 3GW certainly looks far more challenging a target in any meaningful timescale if there is no funding through debt.

Fundraising through community share offers also raises important cultural issues however, that the community energy sector also needs to address. Large-scale projects (like WWCE's projects) will need to raise finance from further afield than just local communities. This may introduce diverging interests between local people and investors from further afield. Many community energy projects look to ensure a significant majority of investors are from the local area or that a proportion of the elected directors are local. However, the need to ensure that communities local to the projects should benefit remains paramount within the community energy model. Greater clarity from community energy proponents around the priorities for benefit would help to introduce greater clarity into the community energy model.

Social and environmental motivations

By definition, social enterprises are established to meet social, environmental or community aims and aspirations; often there are mixed motivations. As the founder of Ecopower explains, his project helps to address 'multiple crises' including energy security and the need to reduce fossil fuel use. The Aysén project in Chile was born out of the need to consider alternatives to traditional burning of wood fuel, given the joint problems of air pollution and declining tree cover.

Sometimes, environmental motivations are influential in the design of the scheme itself. For the Middlegrunden project, the original intention was to build turbines in a grid formation. Following community consultation, the installation was redesigned so that the turbines follow a single flowing curve round the harbour, a design seen as more fitting to the marine environment. Similarly, for Wiltshire Wildlife Trust, solar sites were seen as a way of reclaiming land for hay meadows and supporting greater biodiversity. Indeed one of WWCEs projects has been seen as a good practice case study in BRE best practice guidance around biodiversity for solar PV.²²⁸

²²⁸ <https://www.bre.co.uk/filelibrary/pdf/Brochures/NSC-Biodiversity-Guidance.pdf> pp.8

Other projects had overtly social motivations. Creluz in Brazil was motivated by improving access to energy, and its tariffs are structured to help the poorest. The Brixton project is strongly driven by social aims, shown for example by their efforts to engage local people across the whole community and to provide opportunities for apprenticeships.

Strong social motivations often encourage community enterprises to reduce the interest paid to investors, ensuring a higher proportion of the income goes for wider community benefit. Brixton Energy for example forecasts a return to investors in the region of 3%, whereas WWCE is targeting, and has so far paid, a 7% return. However, again there is a scale issue that needs to be considered. Brixton Energy has shown an ability to raise enough funds with this return to build out smaller roof mounted projects. It is yet to be demonstrated that projects requiring investment in the order of millions can be financed with these lower returns. As the sector matures and its credibility and reliability is more proven, it will seem less of a risk to potential investors, thereby potentially reducing the reward necessary to attract significant investment.

Using and creating local networks

Many of the projects investigated drew upon already-existing social groupings and strong cultural ties. Religious communities, for example, supported Buan in Korea, and the Creluz project in Brazil. Projects in rural areas particularly benefited from existing networks. The Cwm Arian project pulled in support from young farmers, Brownies and Guides; similarly in Wiltshire, community action is seen as normal, with sports clubs, hobby groups and so on providing the social glue which helped to bind community energy projects together. The Brixton project grew out of community action, including the establishment of a Brixton 'transition town' group. In Horsham, the island is home to only 159 people, so the project can rely on simple ties of friendship and neighbourliness. Jühnde is similarly close-knit. Rural projects particularly sometimes make a virtue out of their isolation – with both Creluz and Coihaque driven by a sense of needing to be self-sufficient. Hvide Sande in Denmark is an economically marginal area, and by developing their wind project they found a home-grown source of regeneration funding for their harbour.

By contrast, projects in urban areas generally had to work harder to develop a sense of community. In Brixton, project workers describe having to create a community of interest around their project, and invested time and resources in fostering networks, and, like rural projects, using intermediaries including tenants' associations. The support of the local authority, providing both funding and official support to the project, was critical. Similarly, the Middlegrunden scheme relied on the municipality of Copenhagen to provide accountability and awareness of the scheme amongst citizens.

In one case, with the project in Cwm Arian, the close-knit nature of the community proved a hindrance as well as a help. A well-organised and connected local group opposed the scheme, with the backing of the Campaign to Protect Rural Wales, expressing concern about landscape impacts. The presence of both an anti and pro groups led to tensions in the area.

This is where the tension highlighted in the social enterprise section can play out. A tension between delivering projects quickly, with the underlying commercial imperative to cover costs, and the wider need to value and prioritise the high level of community engagement that can be required. This community engagement can be difficult to fund within a model that depends purely on the project's commercial realities for delivery. However, without it, projects can lose their community roots or indeed not come to even see the light of day.

Support from influential individuals and experienced peers

A striking commonality across many of the case studies is the role of influential individuals. The CRELUZ, Ecopower, Brixton and Cwm Arian projects have been led by particular individuals who in most cases were already involved with community initiatives. For example, for Cwm Arian, the prospective site for the wind turbines is owned by a core member of the group, who is well known locally as he hosts music festivals. In Brixton, the project has benefited from local residents who work on environmental issues, and so can transfer skills to a community project.

As well as the role of individuals, many projects benefit from a culture of peer support, whereby established projects help new schemes to get off the ground. Creluz, for example, has created a 'co-op of co-ops', to spread learning. More informally, Brixton has learned from projects nearby, particularly Brighton Energy Co-op, one of the UK's early adopters. Horsham benefited from the expertise of Community Energy Scotland, which was set up specifically to promote the community energy sector, providing advice, grants and loans. The Wiltshire project was developed in partnership with a well-established group, Bath & West Community Energy, and was also supported by a newly-formed social enterprise, Mongoose Energy, whose aim is to spread community ownership models and collaboration with commercial renewables developers.

Given the challenges of operating within the energy market, the value placed on peer support is not surprising and will be particularly important for communities looking to adopt social enterprise type approaches. This has been recognised in the UK by central government and by organisations such as Co-operatives UK, both of whom have run peer mentoring schemes that have been evaluated and reports published.²²⁹ Academic studies too have shown the value of peer support, networking and sharing learning.²³⁰

²²⁹ <https://www.gov.uk/government/publications/community-energy-peer-mentoring-fund-learning>
<http://www.uk.coop/developing-co-ops/community-energy-peer-mentoring>

²³⁰ Seyfang, G., Hielscher, S., Hargreaves, T., Martiskainen, M. and Smith, A. (2014) 'A grassroots sustainability niche? Reflection on community energy in the UK.' *Environmental Innovation and Societal Transitions*, 13, pp.21-44.; Hagggett et al. (2013) *Community energy in Scotland: the social factors for success*.

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