COMMUNITY RENEWABLES INNOVATION LAB

ENERGY TRANSITION PLATFORM POLICY BRIEFING | NOVEMBER 2017

Innovation Labs are the second phase of The Climate Group's **Energy Transition Platform**, a project which connects 11 highly industrialized, carbon-intensive states and regions seeking to transition to a clean energy future. The Energy Transition Platform enables these governments to share experiences and successful initiatives, and helps them overcome barriers and adopt innovative clean energy policies.

Innovation Labs accelerate this work by facilitating workshops, group calls and best practice case studies. The Grantham Institute – Climate Change and the Environment is the knowledge partner for the Innovation Labs, providing research tailored to each government.

This policy briefing outlines key learnings from the Community Renewables Innovation Lab, as well as recommendations for governments on including community renewables schemes as part of their clean energy transition.

Government partners of the Community Renewables Innovation Lab are **Alberta** (Canada), the **Basque Country** (Spain), **Minnesota** (US) and **Wales** (UK).

EXECUTIVE SUMMARY

Community renewables are installations of renewable electricity such as solar panels or wind turbines, which are owned by, or have significant benefits for, residents and local organizations. Such schemes not only help regional governments meet their carbon reduction targets, but they also engage citizens in the wider clean energy transition. Projects are considered as 'community' schemes if residents are highly involved in decision-making, or if there are local benefits such as energy access, job creation, regeneration and education.

Our research highlights the opportunities and challenges of developing community renewable schemes in the partner regions. For schemes owned by community co-operatives, a significant challenge is raising sufficient capital. Without existing financial capacity in the local community, innovative approaches such as crowd funding are needed. While up-front and ongoing investment subsidies are beneficial, such financial support is often time limited and may not be

sustainable long term. Hybrid models of ownership, such as partnerships between commercial developers, community organizations and local authorities, may be the most plausible arrangement.

Capturing wider socio-economic benefits for local communities is also a challenge for commercially-led schemes, but may be more possible with hybrid ownership models. And while regional and national legislation can help – it can also hinder uptake of community renewables. One further challenge across three of the four governments was how to develop a smart grid infrastructure that can integrate large volumes of distributed generation.

The overall aims, needs, challenges and enabling factors of the Community Renewables Innovation Lab are summarized in Figure 1.

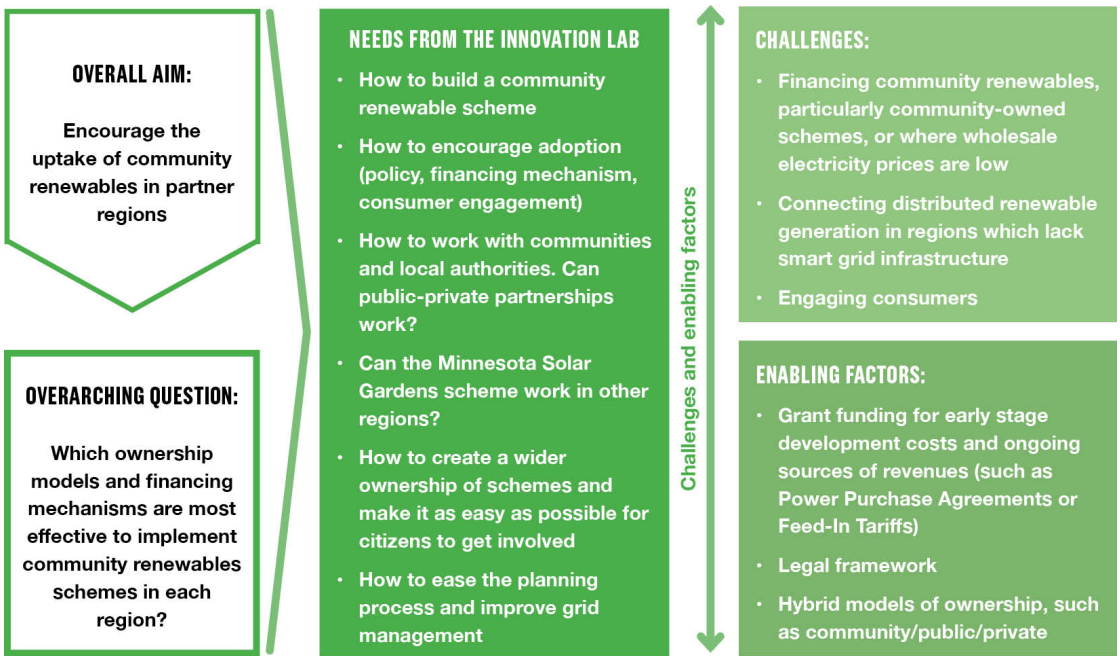


Figure 1 - Overall aim and research questions arising from the Community Renewables Innovation Lab

EVIDENCE FROM THE LITERATURE

As a basis for our Community Renewables Innovation Lab work, we reviewed academic papers and public-sector documents to:

- Identify ownership models which could be considered for community renewable energy schemes in the partner regions.
- Evaluate the relative strengths and weaknesses of each ownership model.

Research shows that in both North America and Europe, projects may be owned completely by a community (such as managed by a co-operative) or developed through hybrid models, involving partnerships with public or private sector organizations. We reviewed the relative strengths and weaknesses of community-owned renewable energy projects versus different hybrid models of ownership (see Table 1).

Raising sufficient capital can be a big challenge for community co-operatives, as enough financial capacity must already exist in the local community. For this reason, there are two alternative models for community co-operatives: community share offers and crowd funding. Community share offers are a popular option in the UK for wholly or part-owned community renewable energy schemes. They can be issued by co-operatives or community benefit societies. Crowd funding involves investment in projects by members of the public. Minimum investment levels may be offered to maximize participation. In the UK, investments can be placed in Individual Savings Accounts (since 2015) to obtain tax-free returns. One example of crowd funding is the Abundance community renewables model[1].

Partnerships between community organizations and the public or private sectors can offer benefits over community renewables projects owned by community co-operatives alone (see Table 1). For example, local governments can partner with community organizations to help de-risk initial investment in projects, share public land or properties for community energy projects, or provide practical planning support. Community organizations can also join in partnership with commercial developers. In such cases, communities could benefit from the skills and investment of private developers who can support larger renewable energy installations with the potential for higher returns on investment.

In the US, 'community shared solar' is a widespread model in which solar generation is used to provide electricity and/or financial benefit to multiple members of a community. Within the shared solar group of models, we particularly focus on 'Solar Gardens' schemes, which Minnesota and Colorado both have. In the Minnesota Solar Gardens scheme, a solar photovoltaic (PV) system is owned by a utility or third party (e.g. commercial developer) that contracts with the utility for solar generation.

[1]See Abundance Investment at: https://www.abundanceinvestment.com/

Table 1: Relative merits of different models for community renewables ownership

Model type	Strengths	Weaknesses
Co-operative (community-owned social enterprises)	- Co-operatives are voluntary and democratic (typically one member = one vote). - Common economic, social and cultural goals can be met.	- Raising sufficient capital can be a significant challenge. - Lack of familiarity with renewable energy and technical skills/ knowledge.
Community/local government hybrid model	- Local authorities can help to de-risk initial investment in projects, provide grants and collaborate on external funding bids. - Local authorities can provide practical planning support and share public land.	- Local authorities vary in terms of their understanding of the benefits of community energy. - Inconsistent application of planning rules and consent across different local authorities.
Community/ commercial developer hybrid model	- Increases community acceptance of larger scale installations, which offer potential for strong returns on investment. - Community organizations benefit from skills and investment of commercial developers.	- Cultural and operational differences between community and commercial organizations. - Communication barriers due to mutual lack of understanding and transparency.
Split ownership	- Supports multiple owners of a community renewables development on a single site, where a community organization owns one part of the development. - Other parts of the renewable energy facility might be owned by commercial developer, utility, independent power producer or investment fund.	- Community organization still needs to raise funds to construct or purchase part of the renewable energy development. - Community organization responsible for operating, monitoring and maintaining their equipment.
Minnesota's developer/utility subscription (Solar Gardens model)	- Community/residents do not need to provide their own location for renewables generation. - Subscribers receive electric bill and/or renewable energy credit, with long-term fixed utility rates.	- Delays to regulatory and interconnection process. - Consumers need more transparency and ability to compare developer terms on prices and contracts.

Alberta, Canada

Targets, market structure and status of community renewables

In Alberta, there is no vertical integration of generation, transmission and distribution, and consumers can choose their retail electricity provider. Generation is deregulated, while transmission/distribution is regulated. There are four major Distribution Facility Owners covering roughly Edmonton, Calgary, the northern half of the province and the southern half of the province. In addition, there are over 30 small Rural Electrification Associations which cover small pockets of land within the four major distribution areas. There have been low electricity prices in Alberta for the last two to three years and, as of November 2017, these were forecast to continue due to an oversupply of electricity.

Alberta is committed to sourcing 30% of its electricity generation from renewables by 2030 under the Climate Leadership Plan[2] and the government is currently defining its strategy to promote community generation in the province. The government is also aiming to phase out coal generation and replace it with natural gas and renewables. Common technologies for distributed generation in Alberta include solar, wind (in southern Alberta) and biomass. Combined heat and power is also permissible under Alberta's Micro-generation Regulation (see below).

Challenges and policy priorities

Although there is interest and support for community renewables from the national government, developers, environmental groups and consumers, community generation projects have not yet taken off in the province. Key barriers include lack of financing, concerns around land use and restrictions to the billing system. Low electricity prices (around 3 cents/kWh) also currently limit the income stream for community generation, leading to a low demand both from commercial parties and social enterprises. Government support is therefore needed to encourage community renewables.

Alberta's Micro-generation Regulation enables customers to offset their electricity use by generating electricity from renewable or alternative energy sources, up to a maximum of 5 MW. A second regulation is underway to define 'Community Generation', with a focus on generation projects that net export to grid. As part of its strategy to develop this new regulation, the government has recently engaged with around 200 stakeholder groups and organizations, including distribution facility owners, electricity retailers, industry associations, incumbent generators, alternative and renewable energy developers, non-governmental organizations, consumer groups, indigenous communities, community co-operatives and municipalities. The responses to the engagement indicate support for using a range of ownership models to

[2] Alberta Climate Leadership Plan, https://www.alberta.ca/climate-leadership-plan.aspx

implement community generation in Alberta. The Alberta government has also engaged with indigenous peoples who are typically located in more rural/remote communities within the province.

Alberta's distribution grid is currently not designed for decentralized electricity generation. Current billing and settlement systems in the region do not allow for virtual net metering, and this is a barrier to implementing a Solar Gardens type model[3]. The Government of Alberta has therefore asked the Alberta Utilities Commission to conduct a broad review into matters of distributed generation in Alberta, including grid readiness, billing systems, rates and tariffs[4].

Basque Country, Spain

Targets, market structure and status of community renewables

The Basque Country has no vertical integration of generation, transmission and distribution, and consumers can choose their electricity supplier. Generation is partially deregulated (except for renewables and cogeneration), while transmission and distribution is regulated. Around 99% of the electricity distribution is owned by Iberdrola Distribución. Distribution is separate from the electricity retail business, for which there are three main suppliers (including Iberdrola) and many small energy suppliers. The Basque Country has 450 MW of wind farms and two combined cycle gas turbines for back up. Combined heat and power is also used, notably by the paper industry.

The Basque Country has targets to increase solar energy production from 25 MW in 2015 to 55MW in 2020 and 300 MW in 2030. While the region has no existing experience with community renewables, the Basque Energy Agency is planning for community solar generation to contribute significantly to meeting these targets. At present, solar PV is the only technology being considered for community generation. Other technologies that may subsequently be used for community generation include biomass and integrating energy storage as part of community-scale solar PV.

Enabling conditions

The Basque Country has implemented an effective public-private partnership between the Basque Energy Agency and Iberdrola Distribución to modernize its electricity grid. This partnership delivered the €60 million *Bidelek Sareak* project which led to the roll-out of smart grids through a large part of the region within five years.

[3] Some shared solar schemes use virtual net metering, which allows a subscriber to own generation that is not located on their property, but be credited for the generation as if it were. The customer therefore pays only for net of use over generation.

[4] http://www.auc.ab.ca/regulatory_documents/Pages/Distributed-generation-review.aspx

Challenges and policy priorities

The feed-in tariff was introduced in 2007 in Spain, and led to a faster than anticipated growth in electricity generation from renewables. In 2013 the Spanish government terminated the feed-in tariff by royal decree, due to a large budget deficit in the electricity system and an excessive cost burden on consumer bills. A further royal decree in 2015 introduced charges for 'self-consumption', i.e. the production and consumption of renewable electricity not supplied to the grid. A recent decision in the supreme tribunal now allows the Basque Country to install community renewables, ruling that previous national legislation constraining the development of renewable energy for self-consumption is not legal.

The Basque Energy Agency is preparing amendments to the Public Administration and Energy Sustainability law to ensure that billing information is provided in the same format by all energy suppliers. For example, although different suppliers currently provide net metering to customers, the period of billing varies between suppliers (such as one month, two months etc.), and this needs to be standardized. The Basque Energy Agency also plans to make net metering mandatory for the gas grid.

The Basque Energy Agency is planning to implement a pilot community solar scheme potentially in the south of the region, involving a partnership between the public and private sectors and a local community, specifically: the Basque Energy Agency, a solar PV developer and technology provider, and community residents. This scheme could set up a PPA to sell solar electricity generated to the Spanish capacity market. The Basque Energy Agency is also planning to develop a stakeholder engagement strategy around community solar pilot projects.

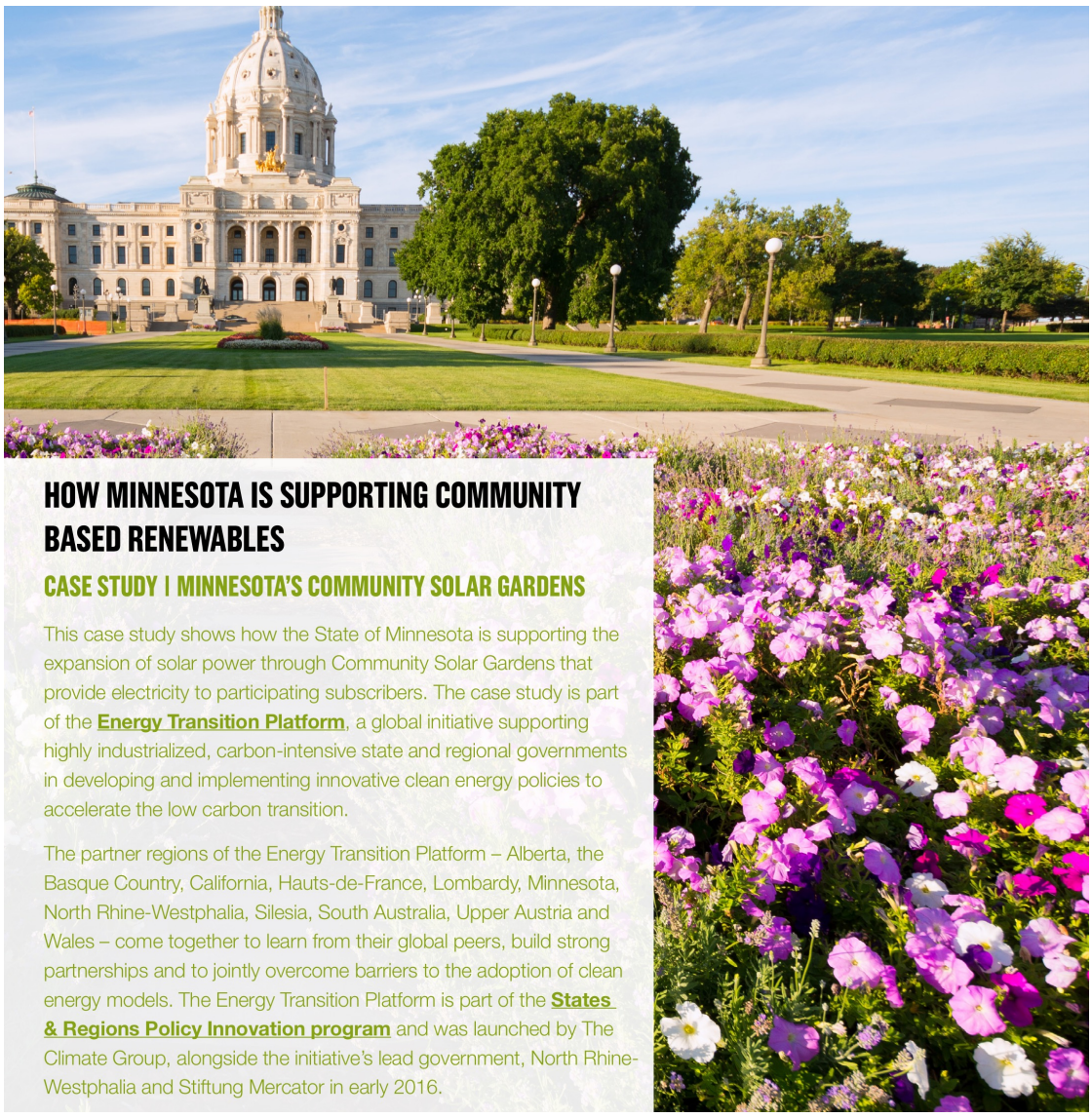
Minnesota, US

Targets, market structure and status of community renewables

In Minnesota, utilities are vertically integrated, which means they have control over generation, transmission and distribution of electricity. Unlike the other regions of Alberta, the Basque Country and Wales, consumers in Minnesota cannot choose their electricity supplier. Utilities are regulated by a state regulatory authority (the Public Utilities Commission). The price of wholesale electricity in Minnesota is around 8 to 12 cents a kilowatt hour (kWh). This is enough to drive profitability for Community Solar Gardens (several megawatts or larger), but not for small rooftop projects (10kW).

In 2013, Minnesota enacted new legislation requiring Investor Owned Utilities to procure 1.5% of retail sales from solar electricity by 2020 and setting a goal of 10% of retail sales from solar by 2030. To achieve this target, as well as to support the state's economy and give citizens the option of purchasing clean energy, several policies incentivizing solar energy were developed. One of the policies enacted in 2013 was Community Solar Gardens, a model where development takes place in locations ideal for solar power generation and the purchase of the power is open to anyone (either as a subscriber or developer).

Most of the subscribers to the Solar Gardens are from the Minneapolis–Saint Paul metropolitan area. Rural co-operatives have also received significant interest in the state of Minnesota. In rural areas, co-operatives own solar equipment themselves and can offer subscriptions. From the 1940s, a Rural Utility Service financing scheme has been available for rural electrification. Rural co-operatives owned by members of the community can raise capital through this mechanism.



HOW MINNESOTA IS SUPPORTING COMMUNITY BASED RENEWABLES

CASE STUDY I MINNESOTA'S COMMUNITY SOLAR GARDENS

This case study shows how the State of Minnesota is supporting the expansion of solar power through Community Solar Gardens that provide electricity to participating subscribers. The case study is part of the **Energy Transition Platform**, a global initiative supporting highly industrialized, carbon-intensive state and regional governments in developing and implementing innovative clean energy policies to accelerate the low carbon transition.

The partner regions of the Energy Transition Platform – Alberta, the Basque Country, California, Hauts-de-France, Lombardy, Minnesota, North Rhine-Westphalia, Silesia, South Australia, Upper Austria and Wales – come together to learn from their global peers, build strong partnerships and to jointly overcome barriers to the adoption of clean energy models. The Energy Transition Platform is part of the **States & Regions Policy Innovation program** and was launched by The Climate Group, alongside the initiative's lead government, North Rhine-Westphalia and Stiftung Mercator in early 2016.

Case study: Community Solar Gardens in Minnesota

In 2013 the largest utility in Minnesota (Xcel Energy) was mandated to develop Community Solar Gardens. The Solar Gardens scheme supports access of residents to small-scale and centrally-located solar PV systems. The process is as follows:

1. A solar developer applies for a solar project with a utility. Once approved and installed, the utility receives the electricity produced.
2. The solar developer signs up subscribers to a share of a Community Solar Garden.
3. Subscribers receive an electric bill credit equal to their portion of Solar Garden's generation. For applications filed after December 31, 2016, the bill credit is calculated according to the 'Value of Solar' methodology (see below).
4. If residents move, the solar garden subscription stays with the original property.

The Minnesota Solar Gardens model was developed specifically to reach businesses and homeowners that either do not have good potential for solar on their building or do not want to make that kind of investment, but are comfortable participating in a larger project with other subscribers. There are already around 20 developers of solar gardens installations. While some are more established developers with experience in Minnesota and elsewhere, other companies started their activities exclusively because of this program and are only doing business in Minnesota so far. To be involved in a project that has been developed as a Community Solar Garden, subscribers need to live in the same or adjacent county. There are also limits per subscriber on the amount of energy from one Garden that can be subscribed to (40% of the overall project) and usage (capped at 120% of annual usage, based on previous year's data). This is to include households and smaller business, making communities the main beneficiaries of the program and preventing projects from having only a couple of subscribers.

Initially, subscribers were credited based on the applicable retail rate – the average residential rate for power in their territory. The government has been working on a calculation of a rate based on the value of solar, a built-up rate that varies from year to year and considers avoided energy costs (transmission and distribution costs with customers switching to solar) and avoided environmental costs. This rate is now used to credit subscribers.

As of July 2017, there were 100 megawatts (MW) of installed solar PV capacity in service under the Solar Gardens scheme, with 215 MW under construction and 700 MW in active application. All 315 MW in service and under construction are fully subscribed. Xcel is required by the regulator to complete 600 MW of installed capacity by 2020.

In terms of economic contribution to the community, the current estimate is that between 500 and 1,000 jobs were created on the installation side, but the government has yet to estimate the impact on the supply chain (although most of the equipment is not manufactured locally). On the environmental side, there is also a need to measure the emissions saved. The fossil fuels that are primarily deferred are coal and gas.

Challenges and policy priorities

Because greater amounts of distributed solar are now being integrated between utilities and developers, there are interconnection issues. The Minnesota Solar Gardens scheme experienced delays during its first few years due to disputes between utilities and solar project developers, requiring mediation from the government. The Department of Commerce hired four independent engineers to evaluate disputes and issue recommendations.

There is also a need for greater transparency for customers: current legislation gives the Minnesota government no specific regulating power over Solar Gardens developers. For customers, it is difficult to compare different offers. The Department of Commerce provides resources and a list of questions that subscribers should ask, to support customers in making informed decisions. At least two online tools have been developed to help customers evaluate the different community solar opportunities in Minnesota and across the US[5].

Wales, UK

Targets, market structure and current status of community renewables

The Welsh Government has set a target of 70% electricity generation from renewable sources by 2030. There are additional targets for one gigawatt (GW) of renewable electricity capacity to be locally owned by 2030, and for all new renewable energy projects to have a degree of local ownership by 2020[6]. The big six energy suppliers in England and Wales are all vertically-integrated, and consumers can choose their electricity supplier, unlike in Minnesota. Transmission and distribution is regulated by Ofgem, the UK Office of Gas and Electricity Markets. The wholesale price of electricity is 13 pence/kWh but this is lower for large energy users (4-4.5 pence/kWh).

Wales has large community hydroelectric projects, such as the Ynni Anafon Energy's 270kW hydro project (installed in 2015), and small to medium scale wind projects, such as Bro Dyfi Community Renewables (575kW of wind electricity in mid-Wales). The feed-in tariff was a significant driver for renewables deployment from 2010 until early 2016, when it was reduced to a very low rate. In this new context, alternative sources of financing (both upfront and ongoing) and means of supporting community renewables are required. Commercial developers built projects in the most favorable sites. In the past seven years, about 11 megawatts (MW) of community-owned renewables capacity have been developed.

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5 See: Clean Energy Resource Teams, 'Community Solar Gardens', https://www.cleanenergyresourceteams.org/solargardens#calc;
and A-Sharp Energy, Solar Match, https://www.mysolarmatch.com/
6 '70% renewable electricity target set by ministers'. http://www.bbc.co.uk/news/uk-wales-politics-41405007

Enabling conditions

Wales has extensive and recent experience of public engagement, including on energy. 'The Energy We Want' campaign was an element of the 'Wales We Want' consultation exercise which informed the development of the Well-being of Future Generations (Wales) Act 2015[7]. The year-long National Conversation took place in 2014 and consulted almost 7,000 people across Wales through their communities and groups[8]. The consultation tested different approaches to engaging citizens, including using social media, postcards and online engagement. Futures Champions were recruited to take the Conversation forward and become advocates for future generations, raising issues affecting their groups and communities. Within the National Conversation, people adapted the 'Wales We Want' to separate conversations meeting their own interests – including 'The Energy We Want'. These adapted conversations have helped to establish common values from which measurable outcomes can be developed for the future. There is now a Future Generations Commissioner whose role is to ensure that public authorities are bound by the Act.

[7] Well-being of Future Generations (Wales) Act 2015. http://gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en

[8] The Wales We Want report: A report on behalf of future generations. http://www.thewaleswewant.co.uk/sites/default/files/The%20Wales%20We%20Want%20Report%20ENG.pdf

Case study: Community Benefit Payment model – Pen y Cymoedd wind project

The rationale behind the community benefit payment model is to encourage wind project developers to provide greater benefits to local communities. Wales has worked with commercial developers willing to voluntarily set up community funding pots, which take a proportion of the wind farms' profit and use it to pay for local social schemes. Often, the community is involved in deciding what projects or organizations receive the funding.

Community benefit payment schemes used to be quite common in the UK, but current capacity and willingness to fund communities vary between commercial developers. Those that consider it necessary to give back to local communities, tend to have better schemes with good governance arrangements in place and stronger links to the communities that host them.

The Pen y Cymoedd wind energy project was developed by energy company Vattenfall and is located within Rhondda Cynon Taf and Neath Port Talbot, on land managed by Natural Resources Wales. The development comprises 76 turbines, has an installed capacity of 230 MW and is expected to generate sufficient power to supply the electricity needs of 188,000 homes per year. The project has a capital value of £300-400 million (US$402-536 million) and pays a community fund of £1.8 million (US$2.4 million) each year from 2017 until at least 2036. The fund was established by Vattenfall to benefit communities hosting the wind farm in the Neath, Afan, Rhondda or Cynon Valleys. The fund is managed by an independent, locally based not-for-profit Community Interest Company (CIC). Through local conversations over several years, residents and communities have defined economic, social, cultural and environmental priorities that they would like the community fund to support.

The community benefits payment model can add a community element to traditional and commercial renewable projects, either on a voluntary or mandatory basis. A few issues remain: a stronger sense of community ownership needs to be incorporated into these schemes and defining long-standing community benefits can be difficult. The Welsh Government also has an interest in obtaining capital value for Wales from such projects (including the development of a supply chain and corresponding skills), rather than focusing only on community benefit payments. Community benefit payments may be less viable without significant support from feed-in tariffs, and in general, these payments alone may not necessarily be transformative.

Challenges and policy priorities

Wales has access to several funding streams to encourage the development of community renewables: the Rural Community Energy Fund (RCEF), regionally specific support, Ynni'r Fro development grant funding, and occasionally additional capital finance beyond planning stage (the Ynni'r Fro program finished in 2015). The EU-funded LEADER program is part of the Wales Rural Development Plan and covers early stage development costs of community energy. The RCEF and LEADER programs are still in operation.

Power purchase agreements (PPAs) could provide an alternative investment model for community renewables following the reduction of the feed-in tariff (FIT). However, the FIT guaranteed income for 15 years, while PPAs are usually set up for a period of two to three years. Therefore, the Welsh Government is looking at whether it can provide 20-year PPAs and raise finance based on these. The PPA would be index-linked. Such long-term PPAs would be hedging against the future price of electricity, but current electricity prices modelling shows that it would prove cost-effective.

To measure the success of a community renewables schemes, the Welsh Government has developed key performance indicators which demonstrate progress on external capital finance, jobs and training opportunities created, income secured for communities and carbon emissions savings. The Welsh Government also takes into account the social indicators that are contained in the Well Being of Future Generations Act[9].

9 Welsh Government. 'How to measure a nation's progress? National indicators for Wales'. http://gov.wales/docs/desh/publications/160316-national-indicators-to-be-laid-before-nafw-en.pdf

LESSONS LEARNT AND RECOMMENDATIONS

The Energy Transition Platform Community Renewables Innovation Lab has supported government partners to explore region-specific policy priorities and challenges, and to identify key enabling factors and common challenges with developing community renewable schemes. This section summarizes some of the overarching findings.

- **Financing**: Community renewables schemes can benefit both from up-front and ongoing investment subsidies, but such support may not be cost-sustainable in the long term and can be time-limited. Grant funding and feed-in tariffs have been successful in growing the community renewables sector in Wales, while a capital financing scheme has supported utilities in setting up community solar in rural parts of Minnesota. The development of community renewables in the Basque Country has been restricted by national laws terminating the feed-in tariff and charging for self-consumption from renewable electricity generation. In the absence of significant subsidies such as feed-in tariffs, a proven option for raising ongoing income for community renewable generation is from power purchase agreements, although the terms of such contracts are frequently too short.

- **Community vs commercially-led approach**: The evidence suggests that it is more difficult for community organizations to develop community renewable installations at scale in comparison to commercial developers who may have greater resources and technical and planning expertise. Hybrid models, such as partnerships between commercial developers, community organizations and local authorities may be the best arrangement for community renewable schemes to secure sufficient capital financing while also bringing benefits to local communities.

- **Co-benefits**: Capturing wider socio-economic benefits for local communities remains a challenge for commercially-led schemes, but may be easier for hybrid models of ownership. The Minnesota Solar Gardens scheme has had a clear positive impact in terms of access to clean energy, citizen participation and a likely beneficial impact on jobs creation within the community. Wales has recent successful experience of community engagement through their National Conversation, 'The Wales We Want', which included a consultation theme on energy. In Alberta and the Basque Country, engaging consumers and gathering support for community renewables is a key priority.

- **Regional specificities**: Region-specific factors may influence which ownership models and financing mechanisms for community renewables are most appropriate, effective or possible in each participating region. The Minnesota Solar Gardens model is not wholly or directly applicable to Alberta, the Basque Country and Wales, since all three regions have

competitive electricity supply markets. Attempting to implement a solar gardens model in these regions would be more complicated on the utility side, particularly when customers change supplier.

- **Legislation**: The evidence also points to the role of legislation in facilitating and constraining the uptake of community renewables. Alberta is currently developing a legislation to define community generation and has consulted widely with stakeholders as part of this process. The Basque Country is now able to consider setting up community renewables following a legal challenge to a national law restricting self-consumption.

- **Smart grids**: Developing a smart grid infrastructure fit for purpose in integrating large volumes of distributed generation remains a key challenge in Alberta, Minnesota and Wales. In all three regions, there are common issues with finding suitable locations for new renewable installations to connect to the grid. Policies are underway in Alberta to move towards a smarter grid and modernize the billing mechanism, while the Basque Country has recently implemented a five-year project to transition to a smart grid throughout the whole region.

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