

Section 9: Facilitating local and community engagement in renewable energy and energy efficiency

This section considers the barriers to greater uptake of small-scale community energy projects and potential options to facilitate community energy, including:

- a clear government position on community energy
- support for community energy pilot projects.

Background

Renewable energy investment in New Zealand has been largely led by established utilities, with little involvement of local and community organisations. However, there is a growing interest in local and community energy projects. This comes from a desire from many New Zealanders to engage locally in the transition to a low emissions economy, a resurgence of interest in contemporary papakāinga on whenua Māori, and a growing interest in regional development and local resilience.

Community energy projects need to be carefully designed to suit market arrangements and New Zealand's emissions profile. This means community energy projects in New Zealand are likely to look different from first generation community energy projects in Europe and North America, for example.

We have defined community energy as any renewable energy activity that is managed in an open and participative way, and has local and collective benefits and outcomes. Community energy includes both communities of place (defined by the places people live, such as a neighbourhood or region), and communities of interest (defined by a shared interest, such as a sports club or national co-operative).

Community energy can involve a wide range of activities, including heat and power generation, demand side management, storage, clean transport and energy efficiency.

Benefits and costs of community energy projects

This section sets out the potential benefits and costs of community energy projects. Many of the benefits are based on overseas experience. We would expect it to take time for New Zealand projects to scale up to the benefits seen offshore.

Economic impacts

Large-scale community projects are likely to procure locally and spend a higher proportion of revenues locally, generating multiplier effects in income and employment. Local and community energy has been used to test novel applications or functional integration of commercially available technology, to drive technological learning and support nascent clean technology industries to scale. These local benefits support a just and inclusive energy transition to a low-emissions economy.

In the longer term, participation of a wide variety of new entrants in the electricity market could increase competition and may lead to lower overall wholesale prices in the electricity market.

However, the potential downside of investment in community energy is the low economies of scale in comparison to larger projects. There is precedent overseas for large community projects delivering energy at lowest cost, but they have largely been joint ventures.

There also can be a tension between people and groups seeking to minimise their energy costs at a local level, versus the need to operate energy markets at a national level for the lowest aggregate cost. For example, persons generating a large proportion of their own power will expect lower power bills, but also will expect energy on demand from national networks at times (which is more efficiently generated at large scale).

Social impacts

Community energy can provide a platform for individuals to engage with complex problems and build positive relationships, contributing to social wellbeing. Projects can build local capacity for consumer-facing pilot projects on a wide range of energy issues, including energy efficiency, smart appliances, and EV uptake and utilisation.

In remote areas on low voltage networks, islands, or locations that have ample low-cost wood fuel supply, community energy can improve energy access and energy affordability, with associated health benefits. Generation methods such as small-scale solar and wind can be combined with batteries to operate independent micro-grids to supply isolated communities with emissions-free electricity.

Community organisations working on the basis of trusted relationships can enhance participation, energy savings outcomes and energy literacy. Projects can also facilitate knowledge and skill development across a range of areas and result in organisations replicating and scaling projects. Community energy also facilitates trust and improved reputation of energy utilities, and support for government climate change and renewable energy policy.

A risk is that inclusive management with input from the wider community can generate trust and local buy-in, but can also slow decision-making and increase development time and cost, in comparison to commercial decision makers. There also is a risk of a lack of capability for ongoing maintenance and operation of energy systems.

Environmental impacts

Internationally, community energy has accelerated investment in clean technology. It can contribute to lowering emissions by providing additional renewable electricity capacity, short-term flexibility and ancillary services, and reducing peak loads, and provide renewable dispatchable alternatives to gas.

However, as discussed above, the likely small scale of community energy projects (in the near term) means they are a less cost-effective means of decarbonising the national energy system, in comparison to utility-scale projects.

Distribution networks and security of supply

Community energy can contribute to local energy supply resilience and network stability. In some cases, a local or distributed generation project may offer an alternative to new transmission or distribution build, thereby reducing the system cost of delivered electricity. In cases where community energy projects are able to use waste heat locally, such as biomass or geothermal based 'combined heat and power', system efficiency increases substantially.

The flipside is potentially unfair distribution of benefits and costs. For example, the burden of whole energy system costs fall disproportionately on consumers who do not have the capacity to engage in

community energy schemes (e.g. they could pay a higher proportion of the fixed costs of network connections).

Case study: Blueskin Energy Network and P2P

Blueskin Energy Network (BEN) is a solar sharing venture started by the Blueskin Resilient Communities Trust (BRCT) in 2017, run in collaboration with P2P (emhTrade), who provide the retail service and trading algorithm. It operates across the Powernet network area in Otago. Since the project has gone online in April 2018, over 60 households have joined the project in order to buy local solar power below retail rates, or sell their solar power above wholesale price at half hourly intervals.

A smart phone app (PowerPal) connects remotely to smart meters enabling monitoring of power usage, provides tips, gift and monetary incentives to use (or not use) power at certain times of the day, allowing users to participate in optimising grid function. The biggest challenge in getting the project up and running has been the lack of start-up funding.

BRCT's longstanding community presence and experience in energy efficiency and wind, as well as its work with the University of Otago on energy innovation, the partnership with emhTrade, and the simplicity of the system have all been key to the project's success to date. BEN is also exploring data sharing and collaboration with PowerNet on network charging rates and battery storage.

Questions

Q9.1 Should New Zealand be encouraging greater development of community energy projects?

Q9.2 What types of community energy project are most relevant in the New Zealand context?

Q9.3 What are the key benefits and downsides/risks of a focus on community energy?

What's the problem?

Electricity market arrangements

There are a number of perceived barriers to community energy from current electricity market arrangements. Many of these issues are discussed in Section 11 of this discussion paper, and relate to more general issues with distributed (not just community) generation. As noted in section 11, many of these issues are subject to current work from the Electricity Authority. **Table 6** below sets out the key issues, and relevant projects.

Table 6: Key issues for community energy projects and related work underway

Issue	Electricity Authority work programme
Ensuring electricity distributors have the necessary incentives, data and know-how to identify and promote distributed energy solutions and engage with community actors.	The EA is currently considering the need for more data to be published about opportunities to provide alternative solutions to network issues as part of the Open Networks programme.
Concerns independent power generators have in some instances faced high risk and poor terms and conditions in securing power purchase contracts/agreements in the market.	The EA has an active project on its work programme to improve hedge markets.
Concerns that current network charges for distributed generation do not accurately reflect the costs incurred by networks. Inconsistent terms and conditions for distributed generation to connect to the network, and the need to recognise the range of (ancillary, capacity, demand response) services it can deliver to the network.	The Open Networks project will overcome barriers to greater uptake of distributed energy resources at both the consumer and network services level. The EA is monitoring and supporting distributors' efforts to make network charges more cost-reflective, consistent with distribution pricing principles the EA released this year.
Difficulties for consumers to grant access to consumption data with (non-retail) third parties, or to be serviced by peer-to-peer and retail service providers simultaneously.	The Additional Consumer Choice of Electricity Services (ACCES) project – decisions are expected in late 2019 on rules to better facilitate third party access to consumption data and enable simultaneous service providers.

Coordination of policy across government

Central and local government agencies can sometimes take different positions on, for example, the costs and benefits of solar energy, or the added value of community energy. This partly reflects the competing priorities of different agencies and work programmes, plus the fact that community energy is a relatively small and emerging part of New Zealand's energy sector.

Small scale of community energy advocates, and lack of networking effects

The community and distributed energy sector is largely comprised of small organisations, who have expressed concern they have insufficient capacity to engage in government consultations and make their voice heard. There is currently a lack of 'sector identity' and a unified voice – plus low networking and knowledge sharing across operational community energy projects. This also means a lack of data and evaluation to identify local impacts and successes to justify community-based approaches, and inform decisions about how to support replication.

At the project level, the small scale of operators often results in a lack of local capacity and resources to identify viable projects and bring them to financial close. Constraints can include:

- a. Land, often due to a reliance on a single site for development.
- b. Seed finance to fund the first high risk project stages, especially for new organisations with small cash reserves.
- c. Capital finance, because of a lack of precedent and legitimacy of projects amongst commercial lenders.
- d. In some cases, a shortage of legal, technical and financial expertise, or having “no idea where to start”.

Resource Management Act barriers

Community energy practitioners have raised concerns around disproportionate and inconsistently applied resource consenting procedures. There is also a perception that the local benefits of community energy are not weighed appropriately alongside the negative impacts of a proposal. Resource Management Act barriers are discussed more generally in Section 7 of this discussion paper.

Questions

Q9.4	Have we accurately identified the barriers to community energy proposals? Are there other barriers to community energy not stated here?
Q9.5	Which barriers do you consider most significant?
Q9.6	Are the barriers noted above in relation to electricity market arrangements adequately covered by the scope of existing work across the Electricity Authority and electricity distributors?

What are the options?

We seek your feedback on a range of options to support future development of community energy proposal.

A clear government position on community energy

Option 9.1	Ensuring a clear and consistent government position on community energy issues, aligned across different policies and work programmes.
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Description

Government could develop a coordinated position on community energy. This would nest into any wider government energy strategy and energy emissions targets, and consider synergies and trade-offs with other programmes. For example, we would not want to invest heavily in a community energy generation project without having first considered more cost-effective energy efficiency measures.

This position could set out strategies and direction for how the sector can overcome key challenges, covering matters such as electricity market arrangements, distribution networks, the ability of local government to invest and facilitate projects, and resource management issues.

Government could also explore whether existing sources of government finance and support for social enterprise, regional development, technology innovation and diffusion are aligned to vet and support credible community energy projects, in a way that recognises the wider co-benefits.

Community energy proposals could also benefit from some of the proposals in Section 8 (investment) of this discussion paper. For example, a power purchase agreement platform could potentially help de-risk small local generation projects.

Government can also play a networking and information sharing role to facilitate learning and inspire replication of community energy proposals, for example by means of an online information hub to help connect community groups and share best practice.¹¹⁰

Finally, government could work to foster a shared ownership culture in the renewable energy industry, for example by producing guidance on principles, business models and community engagement processes for shared ownership.

Analysis

The benefits of an aligned position on community energy depend on the downstream implementation actions. A greater focus on community energy would contribute indirectly to goals for 100 per cent renewable electricity generation and decarbonisation but have minimal impacts at the national scale in the short term. It is likely, however, that community energy proposals – and distributed generation and storage more broadly – will have increasing impacts over time.

Enabling market access and addressing regulatory barriers

Option 9.2

We do not propose any new initiatives in addition to existing work programmes

Description

Improvement to market arrangements for community energy would generate scope for wider uptake and replication of projects and more diverse community energy models.

Section 11 of this discussion paper notes the current work programmes across Transpower, the EA and electricity distributors looking at changes to network charging and connection to the network to better enable distributed small-scale connections. As such, no further proposals are suggested here, though we seek your feedback on the degree to which this work would support development of community energy proposals.

Government support for pilot projects

Option 9.3

Government supports development of a small number of community energy pilot projects

Description

The government could support and resource a number of pilot projects to ‘learn by doing’, set precedents for success, and build an evidence base that supports the case for community energy.

¹¹⁰ [Local Energy Scotland](#) is an example of a one-stop-shop for community energy, where practitioners can go to for information, tenders, funding and networking.

Pilot projects could help reveal barriers to community energy projects, and explore the business models, practices, market design and regulation required for replication and scaling. This will inform any subsequent programmes to assist the development of community energy proposals.

Analysis

The key direct benefits of pilot projects would be:

- direct end user benefits – e.g. lower power bills, warmer homes and associated health impacts
- potential improvement to resilience of energy supply (depending on the location and proposal)
- social capital benefits – new networks, relationships and collaborations fostered around local energy and environmental action.

The key costs of this proposal are the direct costs to government for investment and assistance. The costs are highly scalable, based on the size of the support package. Because these projects are small in scale, there would not be a substantive short-term effect on national-scale energy supply or climate goals. However, they could provide proof of concept for how community-based solutions, and distributed supply solutions in general, might be scaled up in the future.

Summary assessment of options against criteria

Community energy is still nascent in New Zealand, which makes it difficult to assess options against the criteria at this stage (i.e. we would not expect any short-term impacts around greenhouse gas emissions). The benefits of individual projects will fall to a small number of households or community organisations.

The key potential benefits lie more around the potential future scaled-up impact that might follow from pilots. For example, lessons learned about the best means to deploy small scale distributed generation could inform policies around distribution network regulation, or the most cost effective technologies to provide energy and resilience in remote communities.

Pilot and demonstration projects are used internationally by governments (such as the USA, Japan and many European) to catalyse the early adoption of new technologies and social programs. In particular, they have been extensively used to help overcome innovation uncertainties in renewable energy for electricity supply systems.

If we proceed with support for pilot projects, a monitoring and evaluation strategy will be required to assess the impacts, and look at how the national-scale benefits could be scaled up over time.

Questions

Q9.7	What do you see as the pros and cons of a clear government position on community energy, and government support for pilot community energy projects?
Q9.8	Any there any other options you can suggest that would support further development of community energy initiatives?