

Building Resilience

Community energy business models
for a world post FIT



Plymouth Energy Community

Reckoning with batteries
in Plymouth



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Regen passionately believes that sustainable energy has a vital role at the heart of a successful economy and thriving local communities. Our mission is to transform the way we generate, supply, and use energy. Energy is the beating heart of our communities, an unseen web that binds us together. Radical change in such a critical system is not going to be easy. Regen has a clear goal - accelerating the transition to a decarbonised, decentralised and democratic energy system. We are independent, mission led, and not-for-profit.



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10:10 Climate Action is a registered charity that exists to help people take action on climate change. Whether we're installing solar panels on schools and community buildings, cooking up a vegan feast, celebrating the power of onshore wind, or lighting up our favourite places with LEDs, we're positive, inclusive and dedicated to cutting carbon.

Charity no: 1157 363



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Community Energy England (CEE) is a not for profit organisation that represents and supports those committed to the community energy movement. CEE was established by the sector to provide a voice for community energy and to help create the conditions within which it can flourish. This is done by increasing the profile of community energy, sharing good practice and by advocating for supportive policies at national and local levels.

The Building Resilience project was made possible with the support of the **Friends Provident Foundation**



friendsprovidentfoundation.org

Friends Provident Foundation is an independent charity that makes grants and uses its endowment towards a fair, resilient and sustainable economic system that serves society. We connect, fund, invest and share learning to shape an economy that works for all.



ww.nweurope.eu/projects/project-search/climate-active-neighbourhoods-can/

The Climate Active Neighbourhoods (CAN) project, supported by European Regional Development Funding provided through the Interreg Europe Programme, aims to reduce carbon emissions in deprived neighbourhoods across North West Europe. It supported this initiative as part of a suite of work scoping viable financing schemes that empower bottom-up initiatives to improve energy standards and reduce GHG emission.

Summary

Plymouth Energy Community have 30 PV installs on schools and public buildings across Plymouth. Right now PEC sells electricity to the site and exports the rest to the grid. But what if they could maximise the amount of electricity each site used? They'd make more money and the site would use more cheap clean solar.

There had been a lot of buzz around battery technology, so in early 2017 Alistair MacPherson and the team from PEC started looking into whether it could work in Plymouth. Batteries will increase the amount of solar electricity a site can use, but the investment only makes sense if the cost of buying and servicing them can be paid back within the project lifetime.

To see whether their sites would be suitable, they needed to compare the PV generation profile with each site's demand profile. Then they were able to work out how much of the electricity that the site currently exports they could be storing and using later, and what the financial benefits would be.

That turned out to be a challenge in itself - collecting the energy consumption data from sites was tricky, but vital to get accurate financial models. They found that if a particular site didn't have half-hourly metering, they would need to install a smart meter, pay for a metering collection service and gather data for at least a year.

After all that fact-finding, it turned out none of PEC's sites were suitable for batteries in today's financial conditions. But, through this project with Regen SW, the team have developed a tool to quickly assess whether a site might be suitable for storage from a financial perspective.

The tool will give community energy groups a provisional yay or nay, at which point groups can decide whether to dive into more investigation, including detailed, and paid for, metering.

With battery costs falling and electricity prices rising, it won't be long before storage will begin to play an important role. And that's a role that will only grow once the feed-in tariff is phased out.

Key lessons from the project

1. Collecting good energy consumption data is key to understanding a site's demand profile and creating robust financial models. This may require a year of paid for metering collection services. Community energy groups can use PEC's Ready Reckoner tool to make a high-level assessment before investing in metering.
2. Storage doesn't look viable for most community energy installations - yet.

Cover image: The Plymouth Energy Community Team.
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Prospecting for batteries

Interview with Alistair MacPherson

Millie Darling interviewed Alistair MacPherson from PEC to find out how their storage investigation project went, and what other practitioners can learn from their work.

Who are you and how did you first get involved in community energy?

I've been involved in PEC since it was founded by the local authority in 2013. We set it up because we wanted to enable the community to take control of their energy future. So far we have worked on renewable energy generation projects and energy efficiency programmes to help tackle fuel poverty.

“In a nutshell what the Ready Reckoner tool is trying to do is provide community organisations like ourselves with a quick assessment of the situation where a battery storage could assist a solar installation.”

What was your motivation for doing this project?

We already have about 6MW of solar photovoltaic installations, and wanted to review our business model in light of upcoming subsidy changes. There has been lots of excitement about the potential for battery storage over the last few years, so we really wanted to test whether going down this route would be financially beneficial for us, and share our findings with other community energy groups.



What did you find out?

Through our investigations we discovered that most community energy projects would not suit installing storage at the moment. But if the price of batteries continues to fall and the cost of electricity continues to rise then we could be in a different situation by the end of 2018. If I were to imagine an ideal site for battery storage in the future, it would be a site with a great roof for installing solar PV (no structural issues, south-facing, big), significant onsite consumption that is understood in great detail, and a good amount of space indoors to accommodate batteries.

Could you explain the tool you've created?

From this investigation we have created a Ready Reckoner tool. It can be used to do a high-level viability assessment to see whether a site has the potential for battery storage. We hope that this tool will be useful for other community energy groups in helping them explore whether storage technologies could work for their projects.

The tool takes basic, readily available site data and applies some assumptions about costs and finance to create a high-

“We're on that journey where our energy infrastructure needs to be a lot more flexible and it'll be storage that brings that flexibility. Communities will continue to play a role in that exploration of how the storage and battery market develops - rightly so.”

level illustration of what revenues and savings batteries could generate if they were installed with the solar PV. The tool identifies how economically viable a particular combination of generation, demand and storage may be.

What barriers did you come across?

A major barrier was the lack of data for the site's demand profile, and how difficult this data was to get hold of. We would urge other groups to start collecting demand profile data early if they think they have sites with the potential for battery storage.

What do you hope happens next?

I am excited about batteries becoming part of the community energy sector in the future, and the potential for this technology to enable groups to continue to operate in a difficult policy environment. I hope community energy groups will use our Ready Reckoner tool and that the sector can continue to innovate together. In Plymouth we will continue using this tool and hope to make use of battery technology in the future.

Pupils at Montpellier primary school, Plymouth



Tool guide

The ready reckoner is available on [the Community Energy England Hub](#).

PEC worked with Regen SW to create a Ready Reckoner tool that community energy groups can use to assess whether their solar sites would be suitable for battery installations. PEC used data from their school solar PV installations to establish a typical demand profile. Schools have consistent patterns of use that fall into two profiles: a day of 'typical use' (a normal school day) and a day of 'not in use' (weekends and school holidays). The generation model divides the year into four seasons, reporting a typical daily profile for each one. The tool takes basic available data about the site, applies assumptions about costs and finance, and then develops a high level illustration of what revenues/savings a battery installed alongside the solar PV installation could generate.

The Ready Reckoner tool can currently only assess secondary schools, although it has the functionality to incorporate demand profiles for other types of building

(leisure centres, primary schools, and retail).

Steps to using the tool

1. Gather basic data about solar PV generation and energy consumption on site and input this into the Ready Reckoner tool.
2. Check whether the inputted data passes this initial test and creates a model that looks potentially viable.
3. If the model looks viable, collect more energy generation and consumption data (at shorter intervals over a longer period of time) to carry out a more detailed analysis. If the model doesn't appear viable, try using the model for other sites, or again for the same sites in the future once the

Right: Ernesettle community solar farm



