Case Study: Energise Ōtaki https://energise.otaki.net.nz/

Summary

Energise Ōtaki (EO) has built, and operates, two solar generation projects. Both produce revenue that serves as a financial annuity to fund community grants for community driven initiatives for as long as they operate. This case study focuses mainly on the energy project at the treatment plant, but it worth understanding a little more about EO https://energise.otaki.net.nz/. At its heart, Energise Ōtaki (EO) is about enabling bright futures for the community which they do through sustainable energy related initiatives. EO started about ten years before the energy project was started. This was important because it enabled the members to work together on smaller projects first, get to know one another and establish a track record and credibility.

The people, the people, the people

Like most community projects, Energise Ōtaki started with people:

Leigh Ramsey had worked in the alternative fuels sector and through establishing projects in the Pacific Islands had developed technical, innovation and project management skills and was a business member of the Clean Technology Centre in Otaki

Gael Ferguson had been the senior manager responsible for strategic direction, climate action and sustainability on the local Kapiti Coast District Council (KCDC). She brought many existing relationships that would later prove helpful and she had the project management and negotiation skills. Motivated by a desire to contribute and learn, Gael became the project manager.

Ian Jarrett (Astarra Technology) had experience in solar and battery storage and was a business member of the Clean Technology Centre in Otaki. Ian did the initial sizing and scoping and was able to judge merits of the proposals from suppliers.

The community had several contractors, technical experts and community leaders who could provide advice along the way as needed.

Success Factors

Energise Ōtaki describes five factors that were key to their success:

- It was important to have a core team of people who were dedicated, persistent and had the foundational skills to initiate, develop and manage the project. Importantly, they had someone with enough knowledge of power systems to hold their own in discussions with industry players and contractors.

- They had established relationships with key stakeholders such as KCDC who would ultimately purchase the energy and lease them the land. This enabled them to get the first meeting and build on the relationship.
- They had people who could think strategically. Not just about the project, but what the project could mean in the broader context of the community. This was key to securing the financing for the project and the ongoing contribution to the community.
- They were able to figure out who had the requisite skills in the community and were able to enrol them to in contributing to the extent that they could and stay engaged throughout the project.
- They were organized and efficient in the use of resources and people's time. They started as a loose coalition but became a functional organization with clear governance and management roles. They worked as a coherent team.

In combination, these factors gave EO the credibility and gravitas to be taken seriously by outside parties and to be able to execute at a pace that maintained momentum which was most important in dealing with risk adverse stakeholders

The Rau Kūmara project on opening day

Recipe for Success

They knew that they wanted to create a renewable energy project that would generate revenue for community initiatives. Previous projects had been on a smaller scale with less structure and risk and external stakeholder engagement.

The trick was to get three primary elements all lined up at the same time: the funding, the commitment of the land, the off-taker (purchaser of the energy) and the physical plant construction.

Off-taker or purchaser of the power: EO did a broad scan of loads (under its intern program) on the local grid to understand location, size and how they were used and managed. There were consumer loads, retail store loads and industrial loads. Consumer loads where too distributed and retail loads individually were too small but industrial loads were large and managed by a single entity that could be readily negotiated with. EO was looking for a "behind the meter" circumstance to reduce complexity and maximize the value of the energy.

Kapiti Coast District Council (KCDC), is the big game in town both in terms of electricity use and land holdings so it made sense that they might have a stable load that an energy project could serve. In addition, EO had a good current and historical relationships with all levels of council (political and operational). Ultimately, the best KCDC load identified ended up being behind the meter at the Otaki Waste Water Treatment Plant (OWWTP). This was ideal for solar as it predominantly runs electrical pumps for the water treatment.

Generation Technology: EO evaluated several generation technologies but settled relatively quickly on solar versus other technologies. Firstly, it was resource that they had and secondly it was modular so could be built at the right scale. They also decided to do a relatively large installation (over 100kW which at the time of inception was one of the largest in the country) so that they could have significant impact. A key was to model the demand, loads and financial return.

Funding: EO were searching for a single source rather than cobbling together a coalition of funders although the cobbling option was a fallback if necessary. Ultimately, both energy projects were funded with a $407,000 grant from the Wellington Community Trust.

An absolute key to securing this funding was Energise Otaki's development of a model which would return the revenue to the community via community change focused projects. This is what attracted the Community Trust who could see an on-going return to the community on their investment. In effect the financial model was worked out at the outset as a way to contribute to the community and attract funders. Thinking outside the box on this was key.

This focussed, clear decision making and reduction in complexity, enabled EO to work relatively quickly and build credibility with third parties and stakeholders.

Governance

Initially, for Energise Otaki overall, and well before the solar installation conception, the group functioned as an umbrella reference group for ideas. To get the ball rolling for financial activities, Leigh's existing commercial entity served as an umbrella organization. This involved using a spare bank account and having a separate person monitoring it until EO could be established as a legal entity. EO moved to an Incorporated Society Inc. structure which evolved the people in the reference group into the legal entity. This structure lasted several years until EO outgrew this structure and took legal advice that EO move to a trustee (charitable) structure. EO is now a charitable trust governed by a committee of trustees.

The physical project

In October 2020, Energise Ōtaki commissioned a 23kWp solar PV system at Ōtaki College and a 107 kWp system at the Ōtaki Wastewater Treatment Plant. The energy generated is used at the College and to run the Council's wastewater treatment process. Behind the meter energy is billed to both the college and the council and excess export power is sold back to the retailer. Proceeds from these electricity sales are put into the Whakahiko Ōtaki – Energise Ōtaki Fund to support community-initiated energy projects.

The remainder of this case study focuses only on the system at the water treatment plant.

Key features or the system at the Ōtaki Wastewater Treatment Plant

– A ground-mounted solar farm facing north at a 25° angle

– 240 photovoltaic solar panels of 445W each (total of 106.8kWp) with four 3-phase Fronius Symo 80kW inverters.

– A peppercorn lease with KCDC for the land being used for the solar farm. This was a negotiation with council that had to be worked through as the land is owned by district-wide ratepayers. It was determined by council that the land was landlocked, that the OWWTP would not be needing the land for future expansion and it was part of an old landfill not fit for better use.

Contribution to the community

Starting in 2021, the Whakahiko Ōtaki – Energise Ōtaki fund is to be dispersed annually, according to funding criteria, to community energy projects. Governance of this fund is via an Energise Ōtaki sub-committee with representatives from Nga Hapu ō Ōtaki, Wellington Community Trust, Kāpiti Coast District Council and Energise Ōtaki. There is an estimated

minimum $23k annual revenue from the two installations for reinvestment in community-initiated energy projects.

Engaging with funders

Energise Otaki knew that they needed to be able show a return on investment that was relevant to the funder. This meant a financial return, but they also needed to show how the money, that would be generated annually, would be used. Specifically, since their funder was the Wellington Community Trust (WCT) they needed to show that there would be a return to the community in ways that the WCT would ordinarily have funded anyway.

The financial model (how much value would be generated) was as important as the physical model (how the electricity would be generated).

The basic economics are that a $407,000 upfront investment generates $23,000 per year. On a straight-line basis this would pay back in 18 years. Since the project has a life of 20 to 25 years, they can expect to generate about $575,000 over the life of the project for the community. Therefore, WCT can deliver 50% more value by doing this project than by investing directly in the community projects. Of course, there are variables that would make this number go up or down but there is a demonstrable payback. In addition, since the proceeds are distributed to projects decided by the community, WCT can be assured that this is the highest and best use of the funds in the eyes of the community.

In many ways the EO model is ingenious in its simplicity and directness with which it serves the community – that is to build an asset that generates revenue and then use that revenue annuity to fund community led initiatives for the commercial life of the project.

However, to fully commit the funding, WCT needed to see that they had signed contracts with the landowner. This was difficult to do as they could not sign without knowing the funding was assured. This was eventually solved by lining everything up so that it was all agreed and signed at the same time and by making each contingent on the other. This required a degree of trust of the key stakeholders.

Engaging with off-taker (and in this case the land owner)

Since the project was to be built on local council (KCDC) land and KCDC would also be buying the power, EO needed the council to say yes to three key things:

- Yes, that they could lease the land on a peppercorn lease of $1 per year.
- Yes, that they would take the power and that they would pay the same price for the power as they were currently paying from their existing retailer.
- Yes, that they would allow EO to assess and count the export value of energy going through their ICP connection.

First, EO got the operational team to say yes and then they got the elected officials to say yes to the project in concept. Getting the sequence right is important as elected officials rely on the operational team to understand the details and act in the commercial interest of the constituents. The conceptual yes, aligned the operational team to negotiate in good faith.

Since the land is ring fenced (land locked), adjacent to the waste water treatment plant and a former dump site it was of little alternative value so it was relatively non-controversial that EO would be able to lease it for a nominal $1 per year. In addition, the substation is close by. The land was zoned for industrial, so EO needed to change the designation to simplify the consenting process. A resource consent was not required as solar farms are considered a controlled entity in the district.

The negotiation on the power off-take and price was more difficult. The council argued that there should be a discount on the price otherwise why would they switch. EO argued that this was for the benefit of the community which the council also serves. Of course, there are differences in the definition of the community for each and the council can't be seen to be biasing positive or negative toward one segment of the community. Ultimately, the impasse was resolved by allocating the green credits from the solar project to the KCDC as a non-financial deal sweetener. Since the EO project is less than 1 MW they do not need to pay the Electricity Authority (EA) registration fee so could pass that savings on to the KCDC.

Although the chances of electricity costs declining significantly are slim, EO carries some downside risk. If the price that council is paying for electricity from its retailer is reduced then council will pay the reduced rate to Energise Otaki. Since the project was grant funded, they are not servicing any debt so this merely impacts their ability to fund grants.

To enable the electricity to be procured by KCDC, EO and the council had to be with the same retailer (Meridian). Rather than use a formal Power Purchase Agreement (PPA), a contract for the energy sale to KCDC was drafted from scratch by EO and negotiated.

A check meter at the solar site and another at pumping station ensure that there is accurate accounting on a 30-minute basis for what is produced and used. The meters compare the energy generated by the on-site solar to the energy used at the pumping station. This amount of energy is then multiplied by the corresponding time of use rate (there are 3 tiers.) This is tallied and invoiced at the end of each month.

The excess energy is exported through the meter at the pumping plant. Since any export must have come from the solar project this is allocated to Meridian via a direct passthrough from the KCDC electric bill. KCDC has direct access to the spot market through Meridian, the retailer. For each 30-minute period they get the market price multiplied by the kWh exported.

The negotiations and complex workings of this required both parties and the retailer to work in good-faith and EO developed IP for this financial model to be put in place.

Engaging with the lines company

Electra, the local lines company, engaged to enable the project to get connected. As part of the interconnection, EO had to install an import/export meter and run a cable to the switchboard but no upgrade was needed to the substation.

Over time the relationship has strengthened and EO and Electra are looking at more creative approaches for future projects.

Engaging with contractors

Led by Ian Jarrett, EO put together a bid package for the project and ran a contestable RFP process to solicit proposals for the solar array. One of the challenges was that they received a very wide range of bids in terms of quality, detail and price. It is still common for contractors to simply provide a total cost estimate and be opaque or non-committal about the type of equipment they will use, to break out parts and labour and to show where cost reductions might be possible. There might also have been an incorrect assumption that, because EO was a community group, they might lack expertise or savvy and could be taken advantage of. One of the clearest and most detailed proposals came from Infratec who have done extensive work on energy projects in the Pacific Islands. It broke down the costs in several categories with labour rates, cost for civil works, panels etc., Their price was toward higher end however. After further discussion between EO and Infratec, in order to ensure fairness, they settled on doing the project open book with a reasonable margin for Infratec. Infratec did the array design and was the overall project manager and dealt with the interconnection, Electra, access to the grid for export and all the physical construction third parties including the two subcontractors. EO managed any consenting matters of which there were few. Because the land was within a designation EO simply had to provide information that the installation was consistent with the designation. No RMA consent process was required beyond that.

Infratec also set up all the guarantees from the various parties to ensure that the work was done correctly. Hoskins Energy Systems built the array and Pritchard civil did the civil works www.pritchardcivil.co.nz. There were some geotech surprizes as the land was found to have hard rock below the river silts. This increased the cost of the civil works but did not affect the size of the array. The key issue was to ensure that the ground works did not affect the PV supplier guarantee, which ultimately was unaffected. The final plant was 106.8kW – a bit smaller than the original plan. One of the benefits of solar is that it can be scaled up or down depending on the budget and hiccups along the way.

EO decided to go for top quality components like Fronius invertors so that they could be assured that it would work over the long term.

The project went operational in 2021 and is expected to deliver revenue to the community for the next 25 years.

Operations

To deliver the revenue according to forecast, the plant needs to be operated and maintained and the running costs kept in check. This requires a manager, at least part time, to reconcile revenue and ensure the grounds are maintained and the panels kept clean. One of the surprises was the cost of insurance. Few insurers had experience with solar and assessed a premium for it being ground mounted even though it is in a difficult to access, fenced-in location that should present very little increased risk compared to roof mounted. Understanding the ongoing maintenance costs is also import to creating an accurate assessment of the net cash flow that will be delivered from the project.

Future plans

EO plans to expand the system to potentially megawatts size and also incorporate of end-of-life EV batteries to provide stationary power storage all of which are positively welcomed by the stakeholders.