25 OCTOBER 2018

Meeting Status: Public

Purpose of Report: For Decision

ENERGISE ŌTAKI - SOLAR FARM PROPOSAL

PURPOSE OF REPORT

- 1 This report seeks the Council's approval to establish a photovoltaic solar power installation on surplus land at the Ōtaki Wastewater Treatment Plant in partnership with Energise Ōtaki via a lease agreement.
- 2 Council's support for this initiative is required for Energise Ōtaki to secure a financial contribution from an external funder.

DELEGATION

3 Council has authority to consider this matter.

BACKGROUND

The Proposal: A Solar Farm at Ōtaki Waste Water Treatment Plant

- 4 In May 2017, Energise Ōtaki wrote to Council regarding the potential development of a photovoltaic solar power installation (solar farm) at the Ōtaki Wastewater Treatment Plant to support a community investment fund through revenue gained from the solar farm.
- 5 The initiative proposes a solar panel installation, built using external funding, at an agreed location on the Ōtaki Waste Water Treatment Plant site. The solar farm generated power would directly supply the Plant.
- 6 Energise Ōtaki proposes to sell the power to the Council at an agreed rate; or below market price. This would provide Energise Ōtaki with revenue to fund community projects via a community investment fund. Energise Ōtaki have indicated that their first priority would be to assist initiatives to insulate the homes of low income households in Ōtaki, particularly those with children and the elderly. This aligns with Council's outcomes to build resilient communities and improve biodiversity and the environment through sustainable practices.

7 The diagram below illustrates how the proposed solar farm would operate:



- 8 It is important to note that the solar installation would operate in tandem with the grid supply. This means that there is no operational risk or loss of power supply to the Plant.
- 9 The proposed location for the solar power farm is within an existing fenced area within the Ōtaki Wastewater Treatment Plant. This area is not required by the Plant and offers security for the new facility. Access to the proposed lease area would be from Riverbank Road, as shown below:



Image1: The agreed location within the Treatment Plant is shown as a white triangle

Construction plan

- 10 The solar farm would be constructed and involve installation of 496 solar panels generating up to 141 kWh per annum.
- 11 Project management of the solar panel installation would be carried out by Leigh Ramsey from Blended Fuel Solutions/Nufuels Ltd and Iain Jarrett from Astara Technologies Ltd. Both have experience in solar installation projects. For more details on installation please refer to Appendix 2 of this report.

Selling and Buying Power

- 12 The initiative is reliant on Energise Ōtaki's ability to sell solar generated power to Council for the operation of the Ōtaki Wastewater Treatment Plant. There are two sell back options that require further exploration; these are outlined in the Options section of this report (paragraph 28).
- 13 The estimate consumption of power for the Ōtaki Wastewater Treatment Plant, main building is 280,000 kWh per annum with the total costs of around \$50,000 per annum.
- 14 Energise Ōtaki revenue estimations are based on the Ōtaki Wastewater Treatment Plant's supplier pricing with conservative assumptions supplied in the table below:

	Parameters	Indicative Cost	Annual Revenue	Total revenue over 25 years for community investment	ROI	Annual Emissions Reduction
WWTP 496 x 285Wp solar panels	141kWp	Est. \$318,000	\$22,654	\$566,350	5.27%*	24,27 Tonnes

- 15 Based on the load profiles the solar farm would be capable of providing up to 40% (annually) of Ōtaki Wastewater Treatment Plant's base power supply with excess power being exported to the grid.
- 16 Energise Otaki has indicated they will explore the development of battery storage on site in the future as unit costs for batteries fall. The main benefit of batteries will be in levelling the system peak demand from the grid.
- 17 A copy of the Energise Ōtaki Solar Farm Investment Fund proposal is attached at Appendix 1 of this report. Please note that the proposal covers a two staged process however, Energise Ōtaki have indicated that funding (if successful) will allow the full specifications of the farm to be constructed with not staged process required.

External funding for the solar farm

- 18 Energise Ōtaki have advised that they are engaged in funding negotiations with a regional funder. It is expected that Energise Ōtaki will be well positioned to fully finance the installation of the solar farm with this funding. The outcome of the funding negotiations will be known before the end of the year.
- 19 As there is no financial input required of Council for the solar farm, the initiative is cost neutral and has no impacts on rates or additional costs to consider.

District-wide Benefits

- 20 This initiative will reduce the Council's carbon emissions and contribute to its target of an 80% reduction in emissions by 2021/22 (compared to the 2009/10 baseline). It would also add value to Council's CarboNZero programme, which aims to:
 - Improve energy efficiency.
 - Increases the use of renewable energy.
 - Improve the resilience of operations to energy supply disruptions.
 - Aid the development of a low carbon economy.
- 21 The solar farm is forecasted to save between 9.48 tonnes (stage 1) to 24.27 tonnes (stage 2) per annum in carbon emissions. This amounts to approximately 600 tonnes of emissions avoided over the life (25 years) of the asset.

About Energise Ōtaki

- 22 Energise Ōtaki is a community not-for-profit charity organisation that started as a Council supported initiative to support the aspirations outlined in the Greater Ōtaki Vision project. Energise Ōtaki has its origins in community action with a focus on sustainable development to achieve social, environmental and economic outcomes.
- 23 Finding ways to produce new clean energy or reduce the environmental impacts of existing energy use is central to the Energise Ōtaki's vision. Their renewable energy generation projects are centred on local energy production that can be stored and distributed across the local network. Energise Ōtaki has a proven track record of solar installations for community benefit. A selection of their recent projects are summarised below:

Project Name	Description	Outcome
Ōtaki Service Centre Solar Array (2011)	The 16 square metre photovoltaic (PV) array of eight Mitsubishi Electric panels is linked to the electrical system of the building, via a 'grid-tied' Ensolar inverter. Installation supported by Astara Technologies, ESG Green Energy, Enasolar and Mitsubishi Electric and Energise Ōtaki.	Produces 2,600 kilowatt- hours of electricity per year, which is used in the building. Any excess power is fed into the local lines network.
Ōtaki Swimming Pool Thermal Solar Array (2011)	EECA grant and loan went towards a 535 square metre collector on the roof. The panels were redeployed to other projects when the roof was replaced in 2016.	May 2014, the system had recorded 205,000 kWh of energy production – reducing the facilities carbon emissions by 47 tonnes.
Ōtaki College PV Solar Array for Scholarships (2014/15)	Partnership with the Otaki College Foundation Trust to install a 20kWp solar array at the College. A 10.4KW system was installed with funding from Pub Charities and the Ōtaki Community Board.	The Trust supplies power direct to the College, and the revenue is used to fund student scholarships. Between 2015 and 2017, the system has provided \$7,000 in revenue for scholarships.

Project Name	Description	Outcome
Ōtaki Central Technology Park: Wind and Solar (2013)	New Building at the Ōtaki Central Technology Park has four business units with a range of environmentally sustainable technologies and materials.	A solar thermal water heating system is installed.
Ōtaki College Swimming Pool Thermal Solar Array 2017/18 panel redeployment.	Redeployment of the thermal solar panels previously used at the Ōtaki Swimming Pool.	The goal was to extend the season for pool use by keeping the temperature at a useable level.

24 The organisation has also implemented a number of other successful community projects in Ōtaki, for example, the establishment of the Ōtaki Curtain Bank, Ōtaki College Community gardens and the Ōtaki Bike Library.

ISSUES AND OPTIONS

Options

- 25 The Ōtaki Solar Farm concept uses social enterprise principles to address energy poverty and support renewable energy production and education. It will also support Council's goal to reduce its carbon footprint and support its emissions reduction target.
- 26 For these reasons it is recommended that Council support the initiative by granting a lease to Energise Ōtaki for the agreed location for the solar farm at the Ōtaki Wastewater Treatment Plant. The details of the lease would be based on the following broad terms:
 - As the lease area has no commercial value (it is unsuitable for grazing) it is recommended that the rental fee is a nominal charge of a peppercorn rate of \$1.00 per month.
 - The duration of the lease would be for 10 years with a right of renewal for another 10 years.
- 27 Agreement on the lease would be subject to Energise Ōtaki obtaining adequate funding to establish and maintain the photovoltaic solar power installation. For Energise Ōtaki to obtain financial support from an external funder they require a commitment of support from Council. The above option would provide the commitment required for Energise Ōtaki to progress.
- 28 The community investment aspect of the initiative is reliant on Energise Ōtaki selling electricity to Council. There are two purchasing options for Council officers to explore:
 - at a below market rate up to 5% discount. This ensures that Council is benefitting in the way of cost savings for supply, this option acknowledges that the initiative primarily services the Ōtaki community while any cost savings from the sale would benefit the entire district.
 - at market electricity rates no discounted rate. This option will not result in direct cost savings for Council from the sale of power but will enable more funds to be available for the community investment fund (for the Ōtaki community). This option also considers the delivery of clean energy

and reduced carbon emissions sufficient benefit for Council and the wider community.

CONSIDERATIONS

Policy considerations

29 The initiative will have benefits that contribute to Council's Emissions Management and Reduction Plan which feeds into Council's CEMARS accreditation.

Legal considerations

- 30 New lease documentation will be drafted and reviewed by the Council's legal advisor before being presented to Energise Ōtaki for the site at the Ōtaki Waste Water Treatment Plant.
- 31 During the next phase, legal advice will be sought in developing a contract with Energise Ōtaki to outline the terms in selling solar generated power to Council.

Financial considerations

- 32 Grid-connected solar PV systems gain the best return on investment when they can offset 'peak priced' electricity (i.e. during the day). This means that it is reasonable to expect that revenue will be generated to support sustainable energy projects within Ōtaki.
- 33 As there is no financial input required of Council for the solar farm, the initiative is cost neutral.
- 34 Staff have contacted the Council's current electricity supplier to understand any impacts on Council's existing pricing if an alternative power supply to the Ōtaki Wastewater treatment plant was to be established. At the time of writing this report no response has been received.

Tāngata whenua considerations

35 The principles of sustainable environmental practices are consistent with a Māori world view. A presentation about the concept and outcomes has been scheduled for an upcoming Te Whakaminenga o Kāpiti meeting.

Strategic considerations

36 This initiative aligns with Council's outcomes to build resilient communities and improve biodiversity and environment through sustainable practices.

SIGNIFICANCE AND ENGAGEMENT

Significance policy

37 This matter has a low level of significance under Council policy.

Consultation already undertaken

38 The initiative has been proposed to Council by Energise Ōtaki. The initiative has been socialised with a number of elected members.

Engagement planning

39 An engagement plan is not needed to implement this decision.

Publicity

40 If Energise Ōtaki is successful with its funding negotiations, Council and Energise Ōtaki will partner to announce the Community Investment Fund and Council's role in the initiative. It would also be an opportunity to showcase the benefits of sustainable environmental practices.

RECOMMENDATIONS

It is recommended that Council:

- 41 **Agrees** to support Energise Ōtaki by approving the establishment of a photovoltaic solar power installation at the Ōtaki Wastewater Treatment Plant for the purposes of supplying power to Council.
- 42 **Notes** that Energise Ōtaki intend to use the revenue obtained from the sale of power to establish a Community Investment Fund.
- 43 **Notes** that Energise Ōtaki will be able to progress to the next phase of obtaining funding with Council's commitment of support.
- 44 **Authorises** the Chief Executive to enter into a lease for Energise Ōtaki, contingent on Energise Ōtaki obtaining adequate funding to establish the solar farm. The agreement will be at a peppercorn rate with Energise Ōtaki for the duration of a 10 + 10 years lease as outlined in the options section of this report.
- 45 **Directs** staff to further explore options for a contract where the solar power generated will then be sold to Council at or below the market electricity rate.
- 46 **Notes** that regular progress reports on this initiative will be made available to elected members.

Report prepared by	Approved for submission	Approved for submission
Tania Parata	Kevin Black	Sean Mallon
Manager Programme Design and Delivery	Acting Group Manager Strategy and Planning	Group Manager Infrastructure Services

ATTACHMENTS

ATTACHMENT 1: Solar Farm Community Investment Fund (2018)

ATTACHMENT 2: Installation project management

ATTACHMENT 3: Otaki Solar Farm Community Investment Fund: Further Notes



Energise Otaki

Solar Farm Community Investment Fund

2018



Energise Otaki: Helping Ourselves to a Smart Future

The Concept

Energise Otaki intends to establish an on-going Otaki community investment fund using revenue from its proposed solar farm. The fund will support:

- projects which will assist Otaki families, households and address energy poverty and its impact on health and wellbeing
- projects which assist Otaki businesses to reduce their energy costs
- innovative projects which develop the towns and community's structural capacity to produce clean renewable energy
- support education and learning projects which promote sustainable development and thinking, innovation and employment pathways for young people in the wider energy space
- initiatives which address wider environmental and social issues through clean and renewable energy production and energy conservation innovation – e.g. energy from waste
- projects which are fun and communicate wider opportunities and issues around local energy use
- projects which lead to local job creation for people, including young people and people otherwise disadvantaged in the job market.
- initiatives which build and empower community partnerships and capacity building

How it Works

A series of solar farm installations are built using external funding and owned by Energise Otaki to provide/ sell power direct to large energy users in and around Otaki.

All revenue is placed in a separate Community Investment Fund to be disbursed on an annual basis, according to funding criteria. While the systems is owned and managed by Energise Otaki, governance of the fund will be by a community committee (see below).

The project is dependent on finding external funding for the initial build of each solar farm installation. The concept provides any funder of the build with:

- An assurance of an effective annual rate of return on their investment of between 6%-10% for an expected system life of 25 years (depending on site parameters). The ROI variation depends on the extent to which any excess energy is exported (the lower ROI) and future investment in battery storage, which will avoid the need to export any energy.
- A direct environmental good outcome via reduction of green-house gas emissions

- Social and environmental good outcomes through each subsequent project funded from the investment fund
- A potential financial multiplier effect if the Otaki Community Investment Fund is used for projects which generate further revenue, that is in turn, reinvested in the community.

A Proven Model

The funding model is already proven. Energise Otaki, in partnership with Otaki College old students association (XOtaki Foundation Trust) and Otaki College, have already developed a 10Kw installation at the College, to fund scholarships, particularly for families struggling financially to support their children.

The XOtaki Trust owns the solar array and sells the power to the College. They are now, with the support of Energise Otaki, building a Stage 2 (a further 10Kw) which was always planned after Stage 1 was in place.

The Stage 1 array cost \$27,000 to build and has within two years delivered \$7,000 for scholarships.

Governance of the Energise Otaki Community Investment Fund

The proposed governance model is as follows:

- a committee comprising the following:
 - o the Chair of Energise Otaki
 - o an appointee from Energise Otaki
 - a representative of the Kapiti Coast District Council and/or the Otaki Community Board
 - o a representative from Nga Hapu o Otaki
 - o a representative from major funders (if sought by the funder)
- disbursement of funds according to agreed criteria, agreed minimum/ maximum amounts and period of funding
- monitoring of projects and funding use
- report backs to the community via the Otaki Community Board and to major funders/ participants in the project (e.g. organisations/ businesses using power)

Energise Otaki members with relevant skills and experience would work with prospective applicants for funding to develop concepts and practical aspects and, if needed, would provide on-going support for projects.

The Solar Farm Project

The overall project has identified five larger Otaki power users where solar arrays designed to fit their baseload and/or designed with storage capacity can be installed and power supplied directly.

These are:

• Otaki Waste Water Treatment Plant (WWTP)

- Otaki College
- 3 industrial users

Stage 1, to be advanced during 2018, involves installing solar arrays at the Otaki Wastewater Treatment Plant and at Otaki College. Both projects have been supported to proceed to the next project stage by Kapiti Coast District Council (WWTP) and the Otaki College Board of Trustees.

Otaki Wastewater Treatment Plant

Two stages involving installation of solar arrays only have been developed and costed for this site and are summarised below. The location and plan is attached in Appendix 1. These stages provide for a minimum size array and a larger array and allows the project to be advanced in modules, giving flexibility around funding. A variation on the larger array is to install batteries alongside the array itself, allowing the maximum return on all energy generated by. The preferred approach is to build the larger array with batteries as this minimises installation and site preparation costs.

The inclusion of batteries remains to be costed, along with the estimate of revenue and ROI.

Revenue estimates are based on the WWTP current supplier pricing contract. The Kapiti Coast District Council is about to enter into its regular supply price review and this will allow a clearer assessment of revenue. Energise Otaki is confident that the revenue assumptions here are conservative.

	Stage 1	Stage 2	Stage 2 with Batteries
Installation parameters	 57 kWp solar array (200[*] 285 watt solar panels). 	 141 kWp solar array (496 * 285 watt peak solar panels): 	 141 kWp solar array (496 * 285 watt peak solar panels): XX batteries
Energy generated	78, 718 kWh per annum	194,167 kWh per annum	(TBD)
Energy used Energy exported	73, 931 kWh per annum 4,787 kWh per annum	107, 724kWh per annum 86, 444 kWh per annum	TPD
Revenue ROI	\$10, 996 in Year 1 7.13%	\$22,654 in Year 1 5.27%	TBD but > 5.27%
Carbon emissions reduction	9.48 tonnes	24.271 tonnes	Approx. 24.271 tonnes

The table below summaries the two stages, plus potential returns if batteries included in Stage 2.

Current Status

- KCDC letter of intent provided in relation to establishment on site adjacent to WWTP
- KCDC approval in principle to receive power, subject to final pricing agreement
- In discussions with external funder on funding

Otaki College Array

This involves installing an array on the second storey roof of the northern block at Otaki College. The power would be provided to the College with some export over the summer holiday period. At this stage batteries are not included in the scheme but can be added later. These would increase the rate of return on investment.

Revenue estimates are based on a conservative estimate of 20c per kWh. The table below summarises the project

Key Facts	Details
Installation parameters	• 25 kWp solar array
	• (100 * 285 watt solar panels).
Energy generated	Est. 40,620kWh per annum
Energy used	
Energy exported	
Indicative cost	\$69,800
Revenue	
ROI	9.9%
Carbon emissions reduction	4.0 tonnes per annum

Current Status

- Otaki College Board of Trustees approval to proceed granted.
- In principle agreement to provide power on same basis as that for XOtaki Foundation Trust array. Formal agreement to be drawn up.
- Final license to occupy being drawn up
- In discussions with external funder on funding

Appendix 1: Otaki WWTP Site

Location and Installation

The Solar farm will be located at the rear of the land in the red triangular shaped area in the diagram following:



This area has space for around 500 panels. These would be either 1 or two panels high (dependent on ground composition and wind loading), and mounted in rows facing North (refer concept diagram following)



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Otaki Solar Farm Community Investment Fund: Further Notes

Solar Installation Components – 2018 project This consists of:

- Otaki College installation: 25kWp (100 panels)
- Otaki Wastewater Treatment Plant
 - 141 kWp (496 panels) final installation to full capacity
 - 141kWp (496 panels) with batteries (maximises revenue return)

Use of Batteries

The discussion last Tuesday identified that we had included identification of batteries as a future option alongside the panels as the preferred long term installation approach. We noted that technology options and costings had not been advanced to the point that we had confidence in providing a figure. Further review has identified tentative battery costs and we have concluded that at this stage the cost/benefit does not justify investment. We believe that in about 2-3 years batteries when prices have fallen further, they can be installed and will give a higher return.

Our preferred approach at this stage is to install the array at Otaki College and install the 496 panel array at the WWTP. This gives significant income for the Fund.

Set Up and Site Costs

During the discussion we identified that we had not costed site preparation and fencing of the site. We estimate that this would be around \$15,000. In addition, there will be some connection fees with the lines company. We have identified an upper figure of \$5,000

Summary of Costs and Anticipated Revenue

These costings and anticipated revenue have been developed using a robust technical and financial model which takes account of the specifics of location, Otaki sunshine profile, performance life of the panels over the 25 years, operating costs, installation costs and pricing regimes. It uses actual panel unit costs but treats them in a conservative manner at this stage.

	Parameters	Indicative Cost	Annual Revenue	Revenue over 25 Years	ROI	Annual Emissions Reduction
Otaki College	25kWp	Est. \$69,000	\$6,500	\$162,500	9.9%	4.0T
WWTP 1	57kWp	Est. \$130,000	\$10,996	\$274,900	7.13%	9.48T
WWTP 2	141kWp	Est. \$318,000	\$22,654	\$566,350	5.27%*	24,27T
WWTP Site		Est. \$20,000				

* This ROI will rise significantly when batteries are installed (at optimal battery cost).

No project management costs have been included. This would be provided by Energise Otaki which has technical and project management expertise.

Using Project Revenue to Reinvest in Future Solar Installations

This was raised as an option during the discussions. Our preference is to use the revenue from any installation for the proposed Community Investment Fund rather than for reinvestment in further arrays. Energise Otaki has been very successful in developing some very effective projects with very limited funding. We know that the available funds will allow us to advance new and/ or maintain existing projects with a level of certainty. We think this is a more productive use of the fund.

We also think that if some future projects are designed to yield additional \$ returns while delivering immediate social and economic benefit, we continue to effectively to 'grow' the fund. An example of this is the wood coppicing project at the College which required a small initial investment and now presents an opportunity for students to earn money from the energy produced and invest the revenue in a local community project of their choosing.

The model we have developed maximises 'return' to initial funder investment.

Energise Otaki Financial/ Resource Contribution to Project

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Energise Otaki is a voluntary organisation and has no direct financial resources it can invest in the installation. Many of its members have technical, professional and community based skills which are donated to individual projects, and to co-ordination, liaison and on-going strategic development of the overall vision. While we do not keep a detailed record we estimate that between 1.5FTE to 2.0 FTEs are donated annually with an estimated (conservative) value of \$152,500. Note: this does not take full account of value of professional/ technical advice donated if it was to be purchased for projects.

In terms of the Solar Farm Community Investment Fund project we identify the following contributions (again conservative):

Project development, technical review, modelling, meetings, liaison, preparation of documents etc - to date	\$ 8,500
Technical advice and project	\$12,500
management to point of completion –	
On-going administration of fund.	\$3,500
Involves advertising etc.	annually

It is important to note the following. Our approach to the fund will be to both support projects financially and provide other support and expertise (technical and strategic) for ideas and initiatives. That is, it will not be a process of simply dispensing funds to projects but will involve working with people involved to develop ideas, bring people resources to bear, and advance the project over time. There will also be an emphasis on capacity building.

We will follow our current model of wrapping resources around ideas and initiatives. While we cannot fully anticipate the amount of resources applied to any one project we do anticipate that about .5FTE of time annually would match with the level of anticipated revenue dispensed from these first two solar farm projects.

APPENDIX 2

APPENDIX 2: Installation project management

Installation project management will be undertaken by Leigh Ramsey (Blended Fuel Solutions/ Nufuels Ltd) and Iain Jerrett (Astara Technologies Ltd). Leigh is an experienced property developer who has project managed a wide range of property development projects. He will focus on site preparation and fencing but will also retain oversight of the solar panel installation project. Iain Jerrett also has extensive project management experience with a range of technology build projects in New Zealand and overseas, and has had direct involvement in solar installation projects.

The installation itself will be undertaken by a solar installation company with extensive experience in larger design and build projects both in New Zealand and overseas, who is also a SEANZ member. The Sustainable Electricity Association of New Zealand (now rebranded as Sustainable Energy Association of New Zealand) is heavily involved in setting industry standards and has, for example, recently completed the development of protocols with the Ministry of Education for installation on school properties. It has four members sitting on joint Australian New Zealand standards committees for P.V. and storage. Iain Jerrett has been on the SEANZ Board of Directors since 2009.

Contingency and full project costs

Project costs (note total costs have been previously provided) include a contingency (15%) for site preparation. This will be a relatively simple process of site clearing and levelling (to a degree) and fencing. Installation will be undertaken by an independent contractor who will build to the agreed specifications for a fixed price. The contract will be expected to include explicit listing of any requirements/costs/provisions which sit outside normal installation requirements. Usual consenting processes will be followed.

Notes:

Installation will be on a simple frame similar in design to the kind of installation at Paraparaumu Wastewater Treatment Plant. This kind of installation is straight-forward and standard practice. Provision will be made for the inclusion of battery storage in the future. Further protection against any project installation risks (which have been identified through the risk assessment process as low) also lies in the modular approach. The proposed design is for 496 panels but this can be modified down (and up) to accommodate any changes in project costs if necessary. We do not consider that this will be needed.

Financing depreciation of the asset.

The solar panels have an expected life of 20-25 years. Performance will fall from 100% to approximately 80-85% by the end of life and this has been factored into the modelling of the overall project and project revenue.

Provision for depreciation is part of the business/ finance model1 used for this project and replacement costs will be funded over the life of the asset according to normal accounting standards. Final details on the appropriate approach to depreciation will be established in conjunction with a financial accountant once we know whether Kapiti Coast District Council will proceed. Funding of depreciation will be explicitly covered as a requirement with the project funder and the project has allowed for such funding in calculating initial ROI.

It is important to note that it is expected that solar (PV) and battery technology and costs will alter significantly over the period, as greater design and production efficiencies are achieved and the market for the technology grows. This has already been the case over the last five years. Therefore the cost profile for similar outputs is likely to be lower than the projected replacement costs for the current technology. This will be assessed regularly over the life of the current asset.

APPENDIX 3

Otaki Solar Farm Community Investment Fund: Further Notes

Solar Installation Components – 2018 project This consists of:

- Otaki College installation: 25kWp (100 panels)
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Our preferred approach at this stage is to install the array at Otaki College and install the 496 panel array at the WWTP. This gives significant income for the Fund.

Set Up and Site Costs

During the discussion we identified that we had not costed site preparation and fencing of the site. We estimate that this would be around \$15,000. In addition, there will be some connection fees with the lines company. We have identified an upper figure of \$5,000

Summary of Costs and Anticipated Revenue

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No project management costs have been included. This would be provided by Energise Otaki which has technical and project management expertise.

Using Project Revenue to Reinvest in Future Solar Installations

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We also think that if some future projects are designed to yield additional \$ returns while delivering immediate social and economic benefit, we continue to effectively to 'grow' the fund. An example of this is the wood coppicing project at the College which required a small initial investment and now presents an opportunity for students to earn money from the energy produced and invest the revenue in a local community project of their choosing.

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We will follow our current model of wrapping resources around ideas and initiatives. While we cannot fully anticipate the amount of resources applied to any one project we do anticipate that about .5FTE of time annually would match with the level of anticipated revenue dispensed from these first two solar farm projects.