

Island Ways

Charmaine Watts look at a remote area power system (RAPS) running an off-grid home in the Bay of Islands.

Powering a remote island property from the national grid was simply not a practical option for the owners of this Bay of Islands home, built in 2001.

Nestled amidst bush on the western side of Motukiekie Island, the house provides holiday accommodation for the property owners, and a self-contained apartment. The house is wired in the normal 240volt system.

With no access to the national grid, an alternative power system was installed. It included solar PV panels, a wind turbine and back-up diesel generator to recharge a 48volt bank of batteries.

Energy from the batteries is fed to two separate inverter systems, to provide two, 240volt sub mains to power the house.

But after seven years of operation, the battery bank was performing badly and had generally reached the end of its life. The diesel generator had accumulated high running hours, and the inverter/charger unit had developed problems that required it to be sent away for maintenance. In 2007, Peter Hunt, the property's caretaker, decided to replace all three items.

After much deliberation, investigation and costing, the project turned out to be a joint venture using two companies

to supply the batteries and the diesel generator, and a local contractor in the Northland region.

The batteries that Peter settled on were the Genkit GENERGISER, 2volt 600Ah/10Hr rated.

With the previous batteries being 6volt units, the new ones - in voltage, capacity and size - were a complete change. However, in the many discussions that Peter had with the supplier on these matters, he had the confidence to proceed

with this style of battery. The supplier's technical knowledge and accessibility to answer questions on the system was also very helpful.

The diesel generator, after more research, costing and discussion, resulted in a "Lister Petter", 2 cylinder, 1500rpm 6kva, silent-type Genset, with the supplier arranging transport to the Bay of Islands.

There have been a couple of minor mechanical problems with the Genset since it was installed, but after discussions with the supplier, new components were ordered from the Lister Petter UK factory, and were delivered in a very short time.

The supplier was also helpful with information on inverters, particularly the Outback inverter/charger; on this occasion Peter purchased two FX2348ET 48VDC/230VAC "Outback" inverter/charges, along with "Outback" DC & AC distribution boards, and a Whisper Wind Generator from a local contractor.

Living with a RAPS

Living off-grid in a remote place means some lateral thinking, as Peter explains.

"The isolated location was a challenge - moving heavy equipment was not without its difficulties, like getting our new Genset



About Charmaine

Charmaine Watts is the CEO of the Sustainable Electricity Association of New Zealand (SEANZ), the industry association that represents the interests of all stakeholders of the smaller scale renewable/distributed generation (SSR/DG) industry. For more information on SEANZ and its members, visit www.seanz.org.nz



Peter in the power room.

(weighing 400kg) to the power shed - from our boat to pontoon, then via steep wood walkways and steps using a quad bike and trailer, ropes and pulleys, low loader trolley and winches. Phew! What a relief when it rolled into the power shed - hope I don't have to send it back to the dealer for warranty work!"

The new batteries were another mission, with each weighing 50kg.

"Because of logistics, I took delivery of them from the transport company on the wharf at Opuia. They were beautifully crated, so I uncrated and barrowed those to our boat (24 trips!) then at the island the process had to be reversed - onto pontoon, barrow and trailer to power room. This sort of project makes you sleep very well."

However, Peter reports the effort and investment has been well worth it.

"With the system that we have now, the equipment delivers good, stable 240volt @ 50Hz power to a house that has modern amenities. It now runs totally automatic, with excellent control via the OutBack Inverters to start the generator if battery voltage or electrical load gets to preset levels."

For Peter, it's now just a matter of regular battery maintenance and keeping fuel and oil to the diesel generator, with minor maintenance.

"It is a good feeling on bright sunny days, or when the wind is blowing at a brisk rate, knowing that energy is being harvested from Mother Nature, stored in a reliable battery system, to be used to provide electrical energy to this beautiful island property."



Adjusting the solar array.



Grandson Josh doing a power study.



Peter with the new batteries.

Thank you

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Motokiekie property load requirements

The load parameters and limits were designed to supply electricity for the following appliances and equipment, requiring an average daily load of approximately 8 kW hours:

- Internal lights - 1000watts, using energy efficient bulbs
- External lights - 3600watts
- 1 x fridge/freezer
- 1 x freezer
- 1 x fridge
- 1 x dishwasher
- 2 x microwave
- 2 x washing machine and 1 clothes dryer
- 4 x heated towel rails
- Various household appliances (toaster, clothes iron, vacuum cleaner, electric blanket, portable hairdryers, grillers, etc)
- Telephone/fax system; the house has normal phone outlets and uses the Telecom 027 network, via a Hi Gain aerial, feeding to a CDMA fixed wireless unit
- 1 x effluent treatment plant (includes aeration pump @ 65watts @ 16 hours per day, submersible pump @ 600watts, level probe control)
- Computer and printer; laptop computers & normal printers, internet via Wireless Air Card using an external aerial

Motokiekie property equipment

The upgrade included:

- 24 x 2 volt 600amp/10hour-rated Generisier battery cells
- Lister Petter 6Kvar 2-cylinder 1500rpm diesel generator
- 4 extra solar panels, bringing the total array to 24 BP solar panels @ 120watts x 22volts, connected in groups of four. On an average sunny day, this array will generate 10.5 Kwh into the battery storage system
- 2 x 48volt Outback Controllers
- SouthWest Windpower Whisper 100 Wind Turbine Max, output 900watts @ 28mph wind speed