



Community Power in operation

7 March 2024 Chris Wenban – NEV Power

Narara Ecovillage (NEV) & NEV Power Pty Ltd

- Intergenerational residential community on the Central Coast
- 150+ homes and is to be phased in 3 stages
- Currently over 55 of the residences are occupied
- All house designs must meet a minimum NatHERS 7 stars rating
- Mandatory to have at least 4kW on solar on each house
- NEV Power Pty Ltd is a full owned subsidiary of the Narara Ecovillage Cooperative

NEV Power Pty Ltd

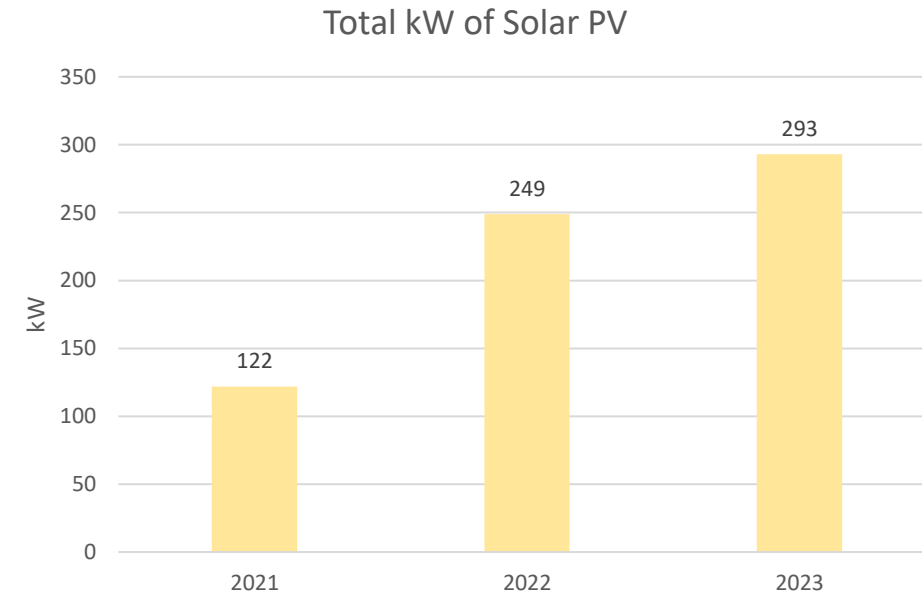
- The village has its own behind the meter power network
- NEV Power is an R2 exempt embedded network under AER regulations
- We have a high voltage connection to the Ausgrid network with our own tap change transformer
- Installed grid controllers to ensure that the NEV Power Smart Grid can coordinate with the Ausgrid network in the case of power outages, surges or equipment failure.
- All houses in the village are required to have at least 4kW solar power. Many have much more. Overall the village now has more than 350 kW of installed solar power.
- Commissioned a Hitachi ABB 437kWh community battery
- Installed a back up generator to provide the ultimate safety net



Amount of PV in the village

PV is of course increasing over time and will continue with Stage 2

As of	Solar Panels in the Village (approx.)	Total
January 2021	92 kW plus 30kW admin	122kW
January 2022	133 kW plus clusters 86 kW plus admin 30 kW	249kW
January 2023	177 kW plus clusters 86 kW plus admin 30 kW	293kW



Solar Generation on a Perfect Summer's Day



2022-23 Import and Export with Sunshine Hours

Daily solar exposure data for Gosford AWS (061425)



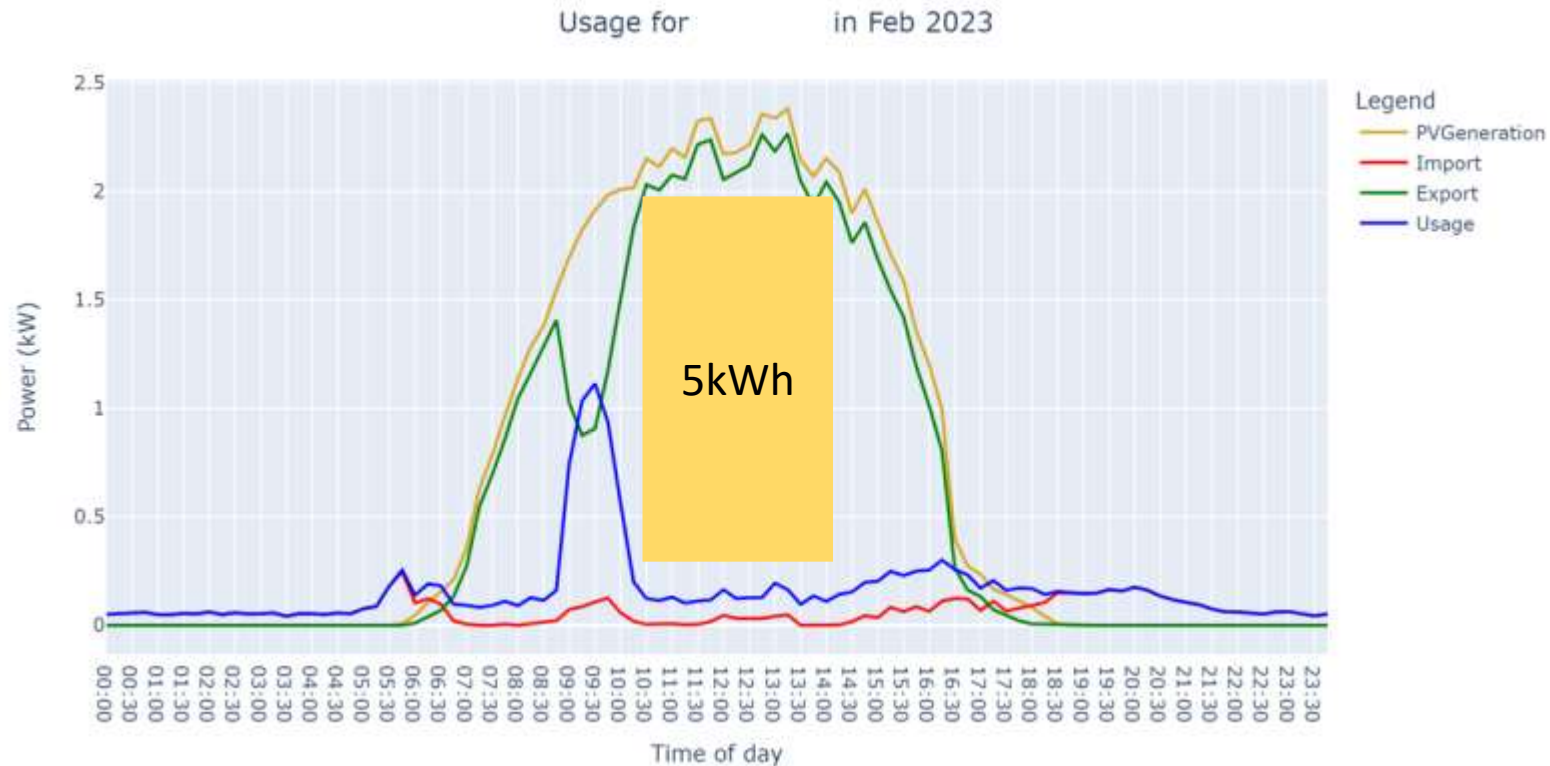
- Export to the grid (bar below the line)
- Import from the grid (bar above the line)
- Hours of sunshine
- We will be able to compare over time as we get more data

New Year

Individual NEV Households

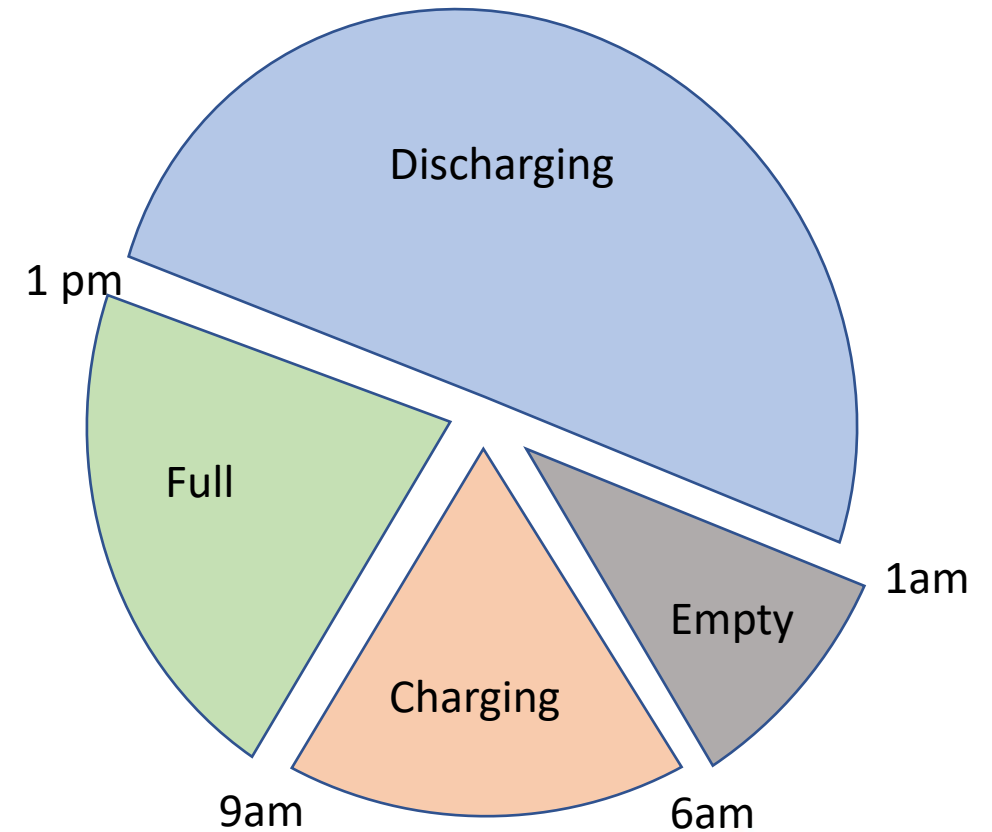
Each household needs to contribute to the battery storage each day, in addition to their own use.

- In general, solar generation is far higher than usage
- Some of this spare 'capacity' is required to fill the battery each day
- Around 5kWh each day from each house is needed with 50 houses to fill the community battery



Community battery – the first 12 months

- The battery was full 22% of the time.
- The battery was charging 17% of the time. On a typical day the battery recharged in 2-3 hours
- The battery was discharging 49% of the time
- So overall the battery helped our network be energy **self sufficient 88% of the time.**
- The remaining 12% of the time NEV power was partly reliant on power from the grid
- There were **only 90 days** during the year where the battery was **not fully recharged** by the end of the day



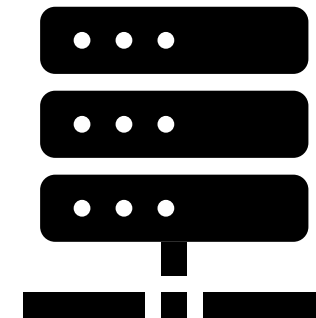
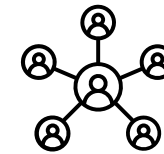
Smartgrid

- Capturing data every 5 minutes from each meter
- Using the data
 - Released an API interface
 - Producing reporting for individual houses
- Having reliable data to move to Time of Use billing
- Modelling various options but the preferred option seems to be a daytime and night time split
 - Low cost daytime because we normally have too much power
 - High cost night time because that's when we use the limited battery storage
- Set-up customer billing using a 3rd party billing platform
- Provide customers with usage reporting



Ceta meter

RAK &
LoraWAN



NEV Power
server

Managing Demand for Power

There are many ways we can manage the demand for power and we can also use our Slack channel to alert village residents to urgent issues

- Village Households
 - Dishwashers, Washing Machines & Dryers
 - EV Charging
- Community Facilities
 - Pump water during the day
 - Recharge batteries for grass cutters

Managing Energy Use


We have a 'Bot' that tells us what is happening with our power




NEV Power Bot APP 7:05 PM

NEV Power stats for 24hrs to 8pm tonight:

 highest level of **consumption** was at 18:07 with **30kW**

 highest level of **generation** was at 11:59 with **161kW**

 total **import** was **182kWh** (avg 7.6kW)

 total **export** was **810kWh** (avg 33.7kW)

-> This is a net **export** of **628kWh** (equivalent to the usage of **38** local households, or **515kg** of CO₂)

Narara Ecovillage in Action

How to visit Narara Ecovillage

Coalition for Community Energy – Narara Ecovillage - Friday 8 March 2024

- Monthly Village Open Days (see Facebook page & Website)
 - Saturday 30 March 2024
 - Sunday 28 April 2024
 - Saturday 25 May 2024
 - Sunday 30 June 2024