



A passion for clean energy

Community Renewable Energy

Greater Charlestown Sustainable Neighbourhood Group
Saving Energy Costs

Saturday 31 May 2025



CLEANaS

CLEAN ENERGY
ASSOCIATION OF
NEWCASTLE AND
SURROUNDS

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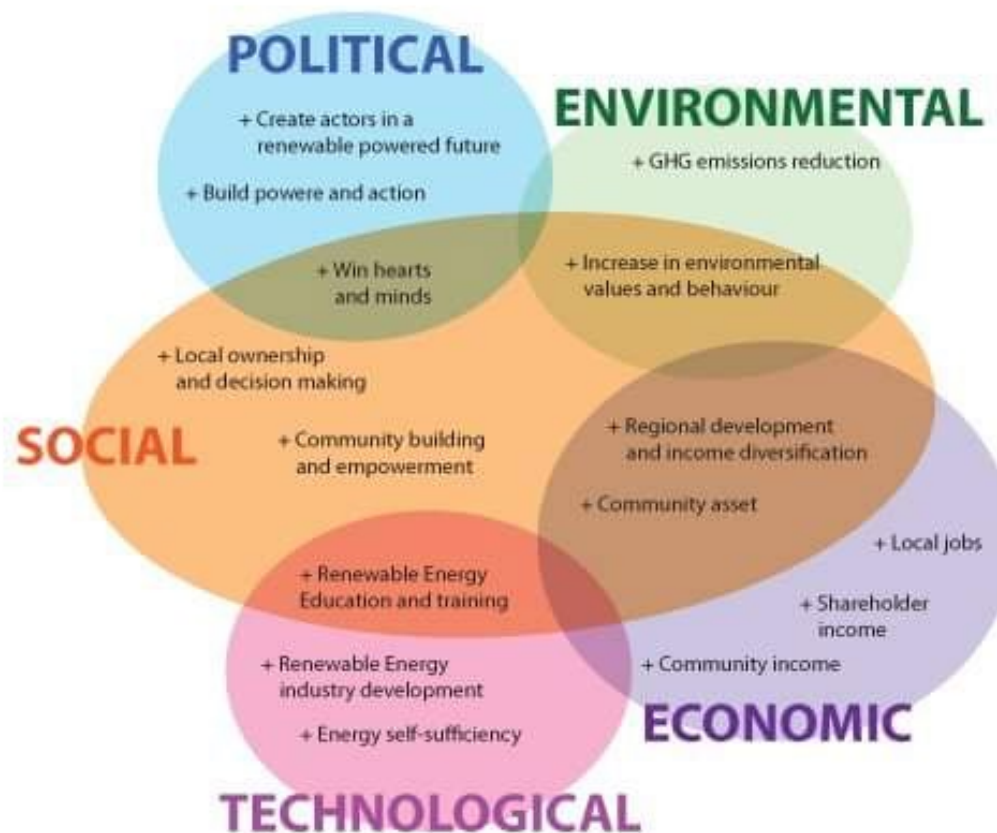


Clean Energy Association for Newcastle and Surrounds

- not-for-profit association
- creating community-focussed viable clean energy projects
- providing education, resources and project services
- partnering with other community and business groups

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What is Community Energy?



The benefits of community renewable energy projects
From the "Home Energy Handbook", 2012

Community Energy is an approach to renewable energy development that involves the community in initiating, developing, operating, owning and/or benefiting from a renewable energy project.

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Solar Batteries

- Why get a Battery?
- Battery Alternatives
- Battery Sizing
- AC vs DC
- Battery Rebates
- Virtual Power Plant (VPP)
- Which Brand?
- What's it cost?
- Vehicle to Grid (V2G)
- Further info / help



Why get a Battery?

- Cutting Power Bills
- Utilise more of Solar PV
- Energy Independence
- Backup power during blackouts
- Environment (greater use of renewable energy)



Battery Alternatives

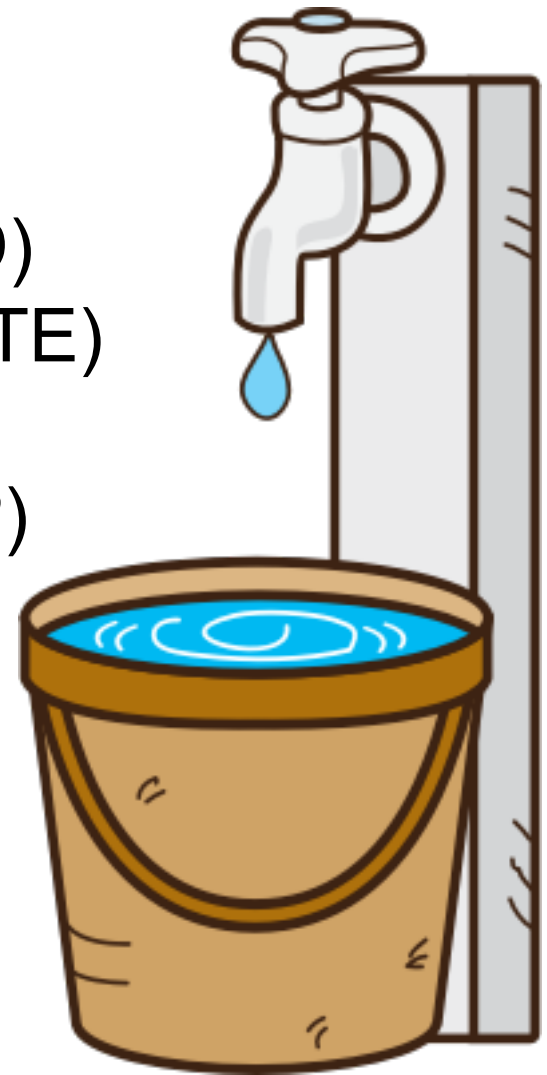
(/ additional to)

- Load shift to daytime
- Energy efficiency
- More rooftop solar PV
- Solar Diverter
- Switch electricity provider for Green Power
- Solar Gardens
- Vehicle to Grid (V2G)



Battery Jargon

- kW vs kWh
- Depth of Discharge (DoD)
- Round Trip Efficiency (RTE)
- Backup Power
- Virtual Power Plant (VPP)
- Vehicle to Grid (V2G)



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Backup Power

- Blackout Protection
- What gets powered during Blackout
- For whole house backup consider larger inverter (limiting factor)
- Single Phase vs 3 Phase



Battery Sizing

- Rule of thumb 60-80% daily use
- Look at average daily usage (kWh)
- Seasonal changes
- Tariffs and demand charges
- Goal of battery use:
 - All of use when sun not shining
 - For evening peaks
 - Evening peaks and overnight
 - Emergency power
- Future use



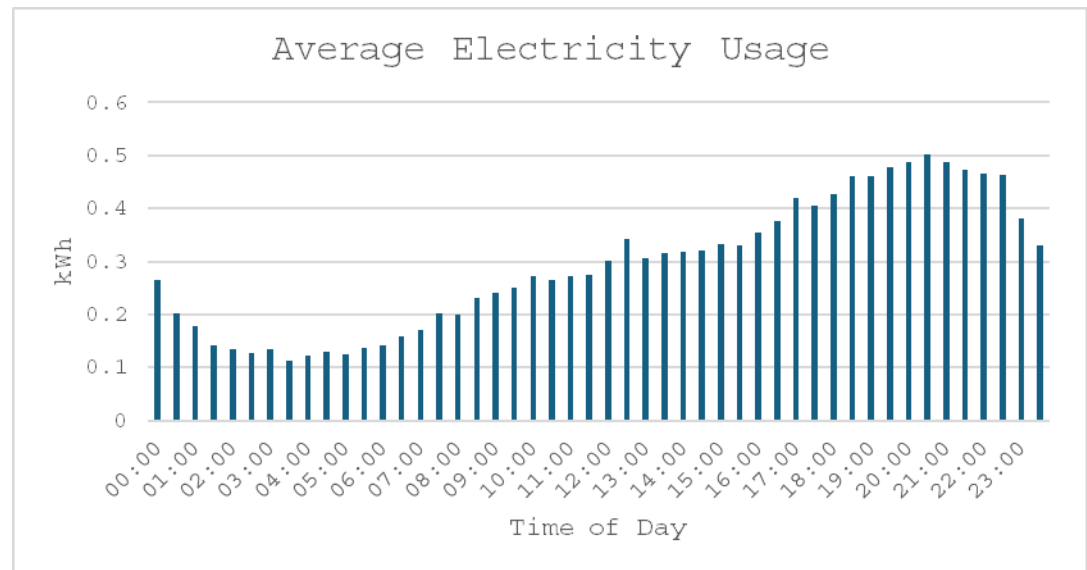
Battery Sizing

- Avoid smaller batteries (e.g. 5 kWh)
- Go higher than current needs:
 - Healthier battery
 - Account for reduced capacity over time
 - Future needs
- Solar size also matters



Battery Sizing Example (rough)

- Current Daily Usage 23 kWh
 - 8.7 kWh (38%) Daytime
 - 10.3 kWh (45%) Peak Evening
 - 4kWh (17%) Overnight



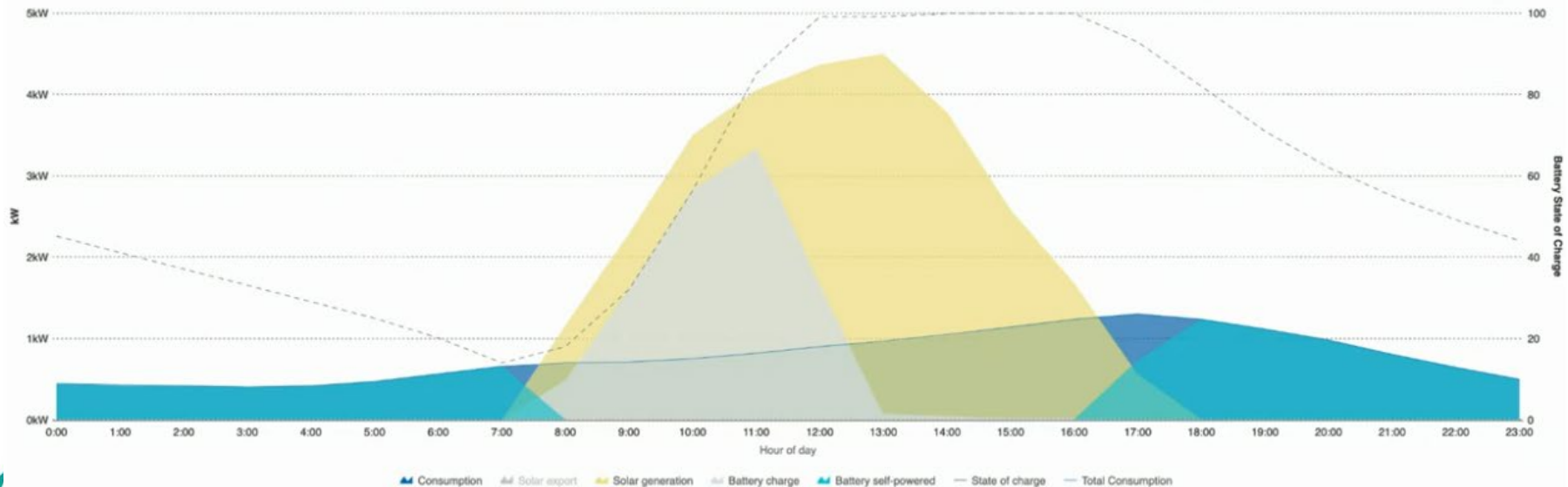
Typical Day Scenario – Work from home

Work from home 20kWh/day usage,
6.6kW existing PV, 10kWh battery



Typical April day

Payback: 12y 3mo Powered by renewables: 93% June Autonomy: 11hrs



ToU tariff Peak 40c, Shoulder 30c, O/P 23c, FiT 6c

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Typical Day Scenario – Work from home

Different battery options



Typical Sept sunny day

Battery usable	Payback period	Powered by Renewables	Hours of Autonomy July	Battery utilisation	Battery kWh: Load kWh	PV Self-consumption
5.2 kWh	14y 1m	75%	5.6hrs	98%	26%	52%
10.4 kWh	12y 3m	93%	11.2hrs	85%	52%	64%
15.6 kWh	13y 9m	96%	16.8hrs	60%	78%	66%
20.8 kWh	15y 5m	97%	22.3hrs	46%	104%	67%

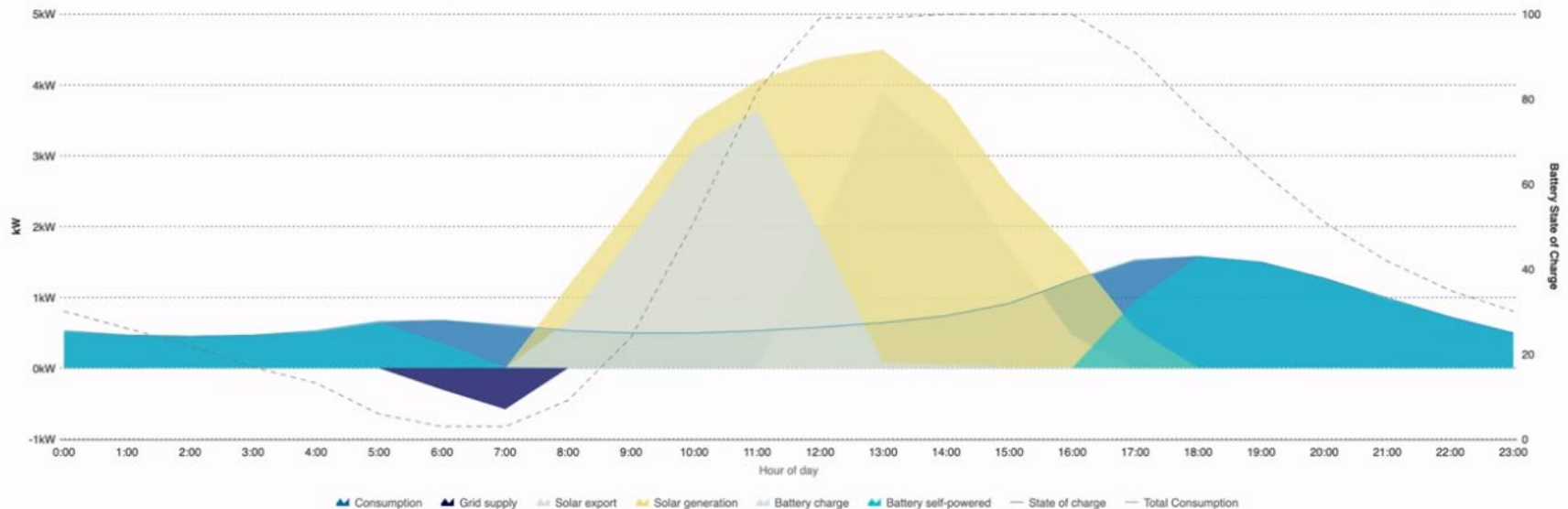
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Typical Day Scenario – Away during day

Away during day, 20kWh/day usage,
6.6kW existing PV, 10kWh battery



Typical April day



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Typical Day Scenario – Comparison

Change load profile
– low day, high night



Load Profile	Battery usable	Payback period	Powered by Renewables	Battery utilisation	Battery kWh: Load kWh	PV kWh/day : load kWh/day	PV Self-consumption
High daytime use	10.4kWh	12y 3m	93%	85%	52%	145%	64%
High evening use	10.4kWh	10y 9m	88%	94%	52%	145%	61%

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Typical Day Scenario – Increased Load

Larger load
– 40kWh b/c home electrification



Battery usable	Payback period	Powered by Renewables	Hours of Autonomy July	Battery utilisation	Battery kWh: Load kWh	PV gen kWh : load kWh	PV Self-consumption
5.2kWh	13y 7m	46%	2.8	96%	0.13	72%	64%
10.4kWh	10y 3m	57%	5.6	88%	0.26	72%	78%
15.6kWh	10y 2m	64%	8.4	78%	0.39	72%	88%
20.8kWh	10y 9m	69%	11.2	67%	0.52	72%	95%

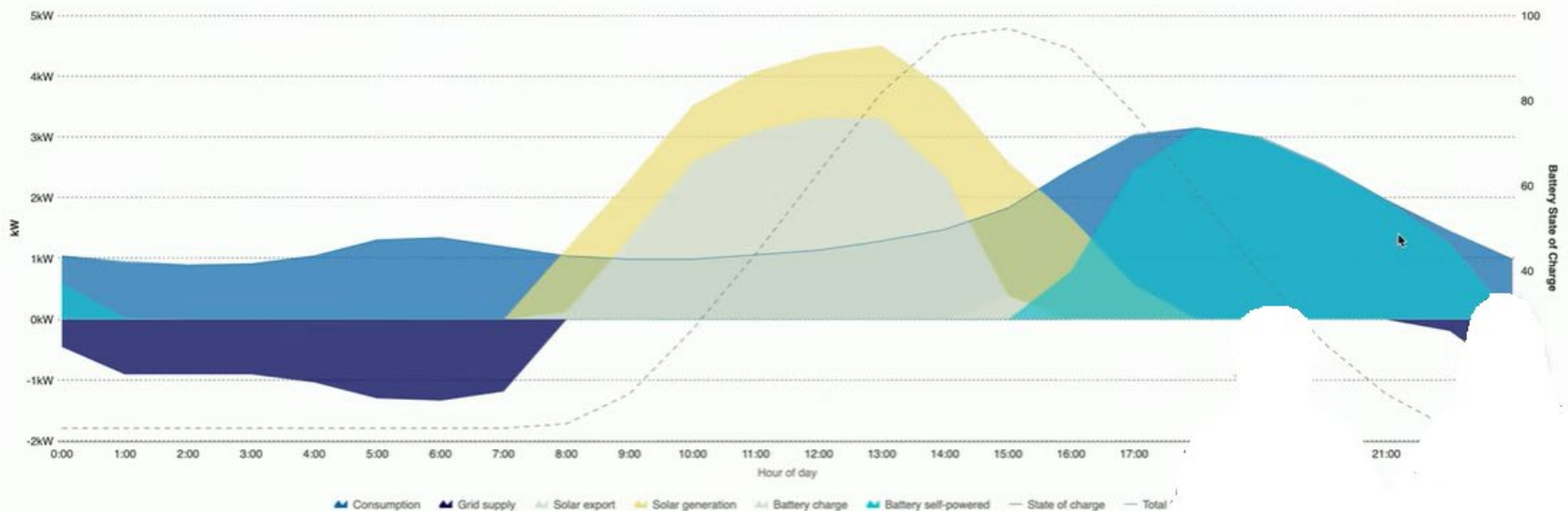
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Increased Load – Insufficient Solar

40kWh load, 15kWh
battery, 6.6kW PV



Typical April day



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Increased Load – Double your solar

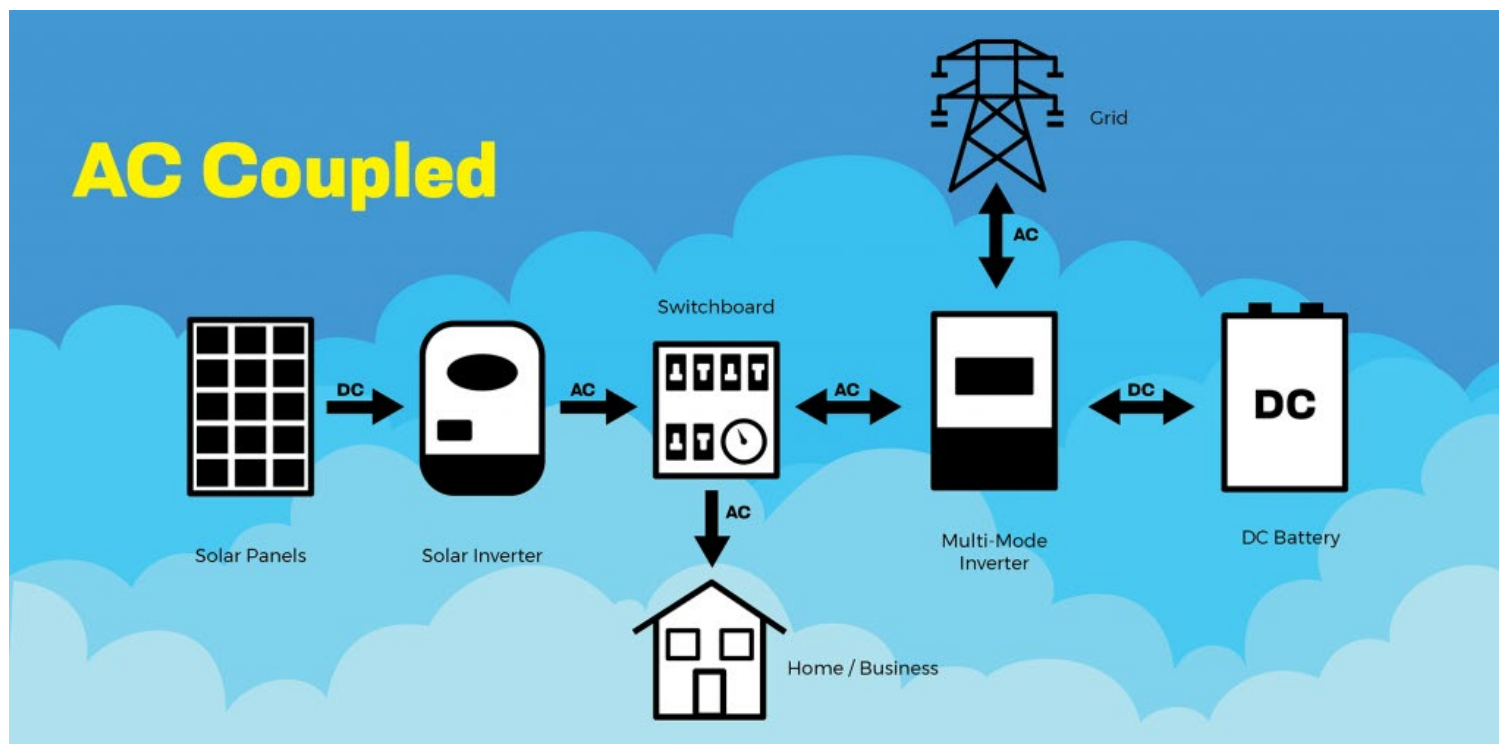
Double the PV (15kWh battery)



PV	Battery usable	Payback period	Powered by Renewables	Battery utilisation	Battery kWh : Load kWh	PV gen kWh : load kWh	PV Self-consumption
6.6kW old	15.6kWh	10y 2m	64%	78%	0.39	72%	88%
6.6kW old + 6.6kW new	15.6kWh	6y 1m	76%	98%	0.39	145%	54%

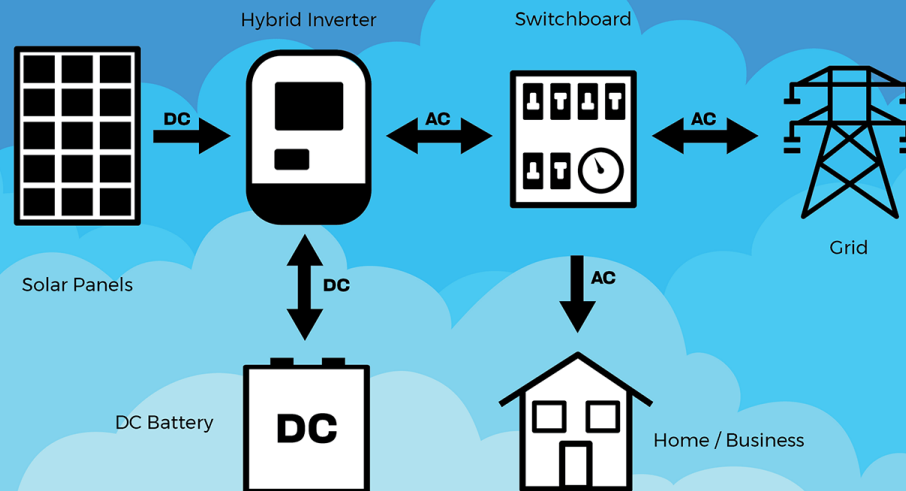
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AC vs DC Coupling



AC vs DC Coupling

DC Coupled Hybrid



Hybrid Inverters



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Battery Rebates – Federal Cheaper Home Batteries Program

- From 1 July 2025
- Approx. 30% Upfront discount
- Rebate value: \$320–\$370 per kWh
- Delivered through Small-scale Renewable Energy Scheme
- Stacks with state-based schemes
- Decreases each year until 2030

E.g. 15kWh battery \$5,580 -> \$2,820



Cheaper Home Batteries Program - Eligibility

- Available for households, businesses, and community facilities
- 5 kWh – 100 kWh
- Discount applied up to 50 kWh capacity
- Must be paired with existing / new solar PV
- Solar Accreditation Australia accredited installers
- Clean Energy Council approved battery and inverter
- Electric vehicles are not eligible
- Only once per residence/premises
- VPP capable
- Grid connected / Off grid
- Meets Australian Standards
- Not means-tested

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NSW Household energy saving upgrades

– Battery Discount

a.k.a. NSW Solar Battery Rebate

- Discount from accredited installers
- Discount amount is related to usable capacity battery (kWh) and your location
- Typically, between \$1,600 to \$2,400 off the upfront installation costs



NSW Battery Discount - Eligibility

- Resident/Business owner in NSW
- 2 kWh – 28 kWh
- Solar already installed
- No existing battery / additions
- Grid connected
- Installer accredited under Accredited Certificate Provider
- Clean Energy Council approved battery
- Meets Peak Demand Reduction Scheme requirements including supports third-party control (i.e. for VPP)
- Min 10-year product warranty and guarantee 70% usable capacity after 10 years
- Meets Australian Standards



Virtual Power Plant (VPP)

- Network of distributed solar power and battery systems
- Coordinated by a central operator
- Operator decides when to discharge battery to the grid in response to grid demand (high spot prices)
- Various incentives: Up front and/or ongoing bill credits, rate discounts, high feed in tariffs during peak times, discount on a battery installation



NSW Household energy saving upgrades

– Sign your battery up to a Virtual Power Plant

- Discount from accredited supplier
- \$250 to \$400 incentive, claimable twice over six years
- Discount amount is related to usable capacity battery (kWh)
- Incentive may be passed on in full, in instalments, as a discount on a battery installation – or in the case of your VPP operator being your electricity retailer, off your bill



Sign your battery up to a Virtual Power Plant - Eligibility

- Available for new and existing batteries
- 2 kWh – 28 kWh
- Solar and battery installed
- Must have 6 years remaining on battery warranty
- Sign up to VPP with accredited supplier
- Supplier accredited under Peak Demand Reduction Scheme
- Grid Connected



Payback Periods – including rebates

Battery Booster



Incentive	Battery usable	Payback period	Powered by Renewables	Battery utilisation	Battery capacity : Load kWh
PDRS BESS 1	15.6 kWh	9y 9m	93%	93%	0.52
	20.9 kWh	10y 6m	99%	77.50%	0.7
PDRS BESS 1 + Battery Booster	15.6 kWh	6y 2m	93%	93%	0.52
	20.9 kWh	6y 2m	98%	77.50%	0.7
PDRS BESS 1&2 + Battery Booster + VPP earnings \$400p.a.	20.9	4y 7m	98%	?	0.7

A decorative graphic in the bottom left corner consisting of three overlapping curved shapes in teal, yellow, and orange.

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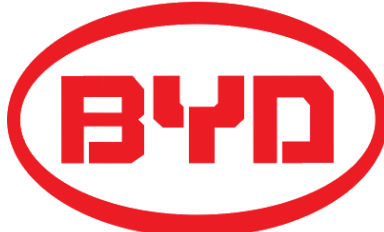
Which Brand?

- Sungrow
- Sigenenergy
- Tesla Powerwall 3
- Tesla Powerwall 2
- BYD
- SolarEdge
- Enphase Energy
- FranklinWH
- Alpha-ESS
- Sonnen

SUNGROW
Clean power for all

 **SIGENERGY**


TESLA


BYD

solar**edge**

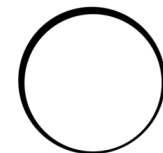
FRANKLIN
WHOLE HOME



ENPHASE.



Alpha-ESS



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What's it cost?

Average Solar Battery System Costs (Fully Installed) – May 2025

Battery Size	Battery Only Price*	Battery + Inverter/Charger**
3kWh	\$4,140	\$4,950
8kWh	\$9,040	\$10,240
13kWh	\$13,650	\$15,080
18kWh	\$17,820	\$19,260

**Includes the installation of the battery only. You must already have a hybrid/battery ready system*

***Includes an additional inverter to manage the battery bank for a DC-coupled battery system*



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What's it cost?

Solar Battery Costs: May 2025

Here are typical **installed** prices for popular solar batteries in Australia. They include the federal battery rebate, but not state and territory rebates that can lower prices further in NSW, NT, and WA:

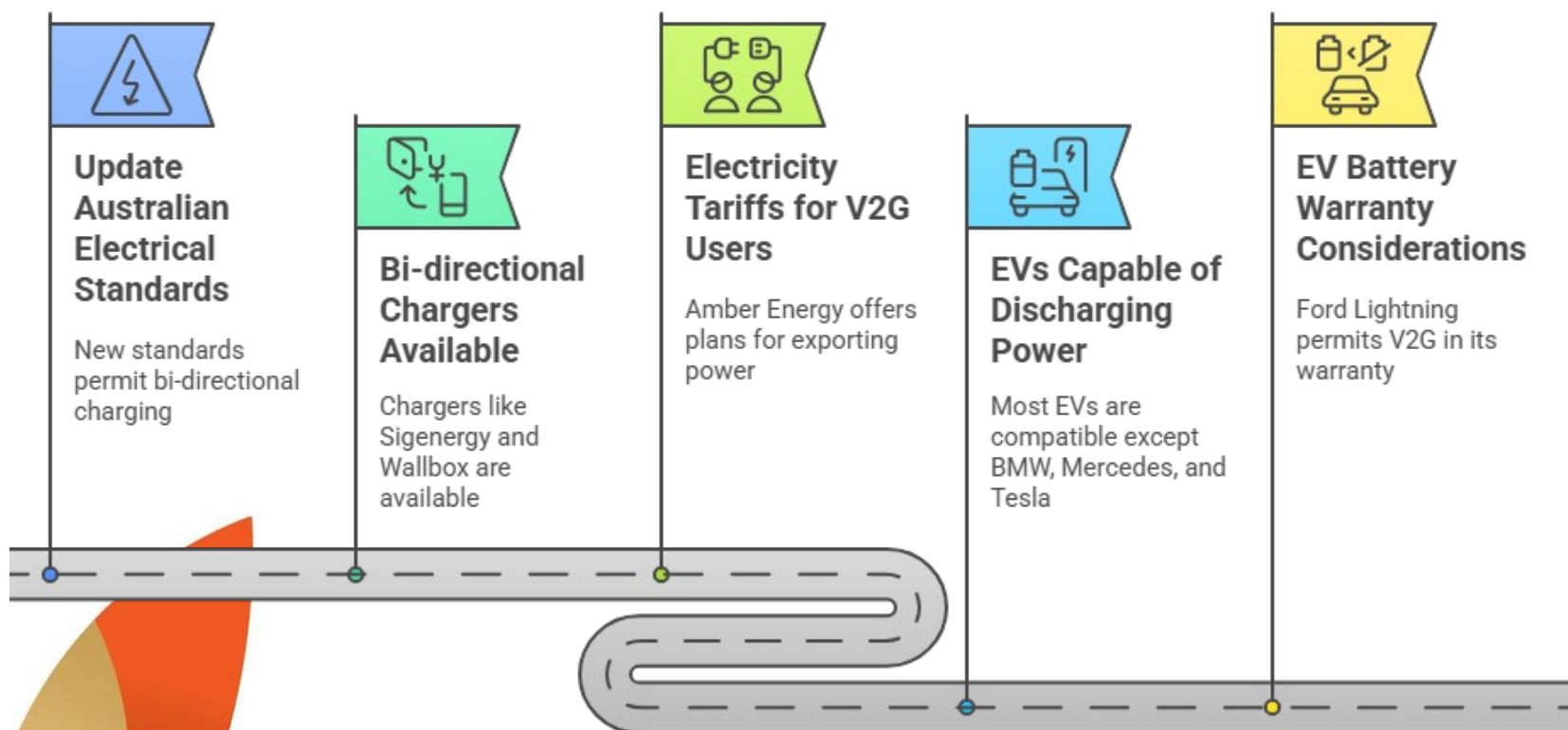
Battery System	Capacity	Approx. Installed Cost [February 2025]	Cost per kWh	Warranty
BYD*	13.8 kWh	\$7,400	\$540	10yrs, 60%
Tesla Powerwall 2	13.5 kWh	\$11,000	\$810	10yrs, 70%
Sungrow*	12.8 kWh	\$7,000	\$550	10yrs, 60%
SolarEdge*	9.7 kWh	\$10,200	\$1,050	10yrs, 70%
Enphase	5 kWh	\$8,700	\$1,740	15yrs, 60%
Sigenergy	7.8 kWh	\$6,200	\$790	10yrs, 70%

* not including hybrid inverter cost. Reliable hybrid inverters start at \$2,200. But if your battery is installed with solar the battery and solar panels will share the hybrid inverter, saving the cost of a separate solar inverter.

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Vehicle to Grid (V2G)

Implementing Bi-directional Charging in Australia



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Further information / help

- Solarquotes



- Solar Choice



- renew

renew.

- <https://www.solarchoice.net.au/learn/solar-rebates/government-battery-rebate/calculator/>
- <https://www.solarchoice.net.au/learn/calculators/residential-solar-battery-system-size-calculator/>
- <https://renew.org.au/resources/sunulator/>

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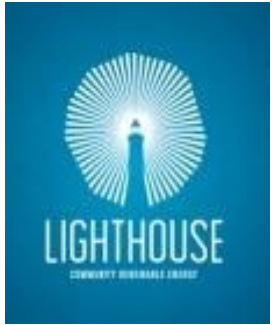
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CLEANA S - Get More Involved

CLEANA S projects will require the combined efforts of individuals in the community, business and clean energy partners.

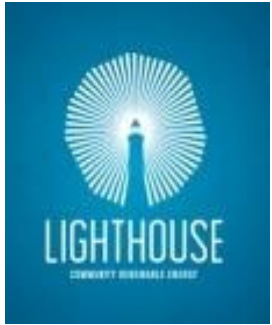


LEADING TO A CLEANER,
BRIGHTER FUTURE



"The most ecological economical kilowatt is the one that isn't consumed" José Vicente Barcia Ecooo (Madrid, Spain)

Questions



Thank You

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<https://www.cleanas.org.au/news/saving-energy-costs-solar-battery-systems>

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