

BATTERY COMPARISONS FOR STRATA

1 Three Popular Brands of Batteries

The **Tesla** Powerwall lithium battery system has made a big impact in the solar world and pushed home energy storage into the mainstream. The first generation Powerwall was released back in 2015, followed by the Powerwall 2 in 2016. The latest iteration in the Tesla home battery series is the new Powerwall+, which is essentially the Powerwall 2 battery system with an integrated solar inverter making it a complete all-in-one solar energy storage system.

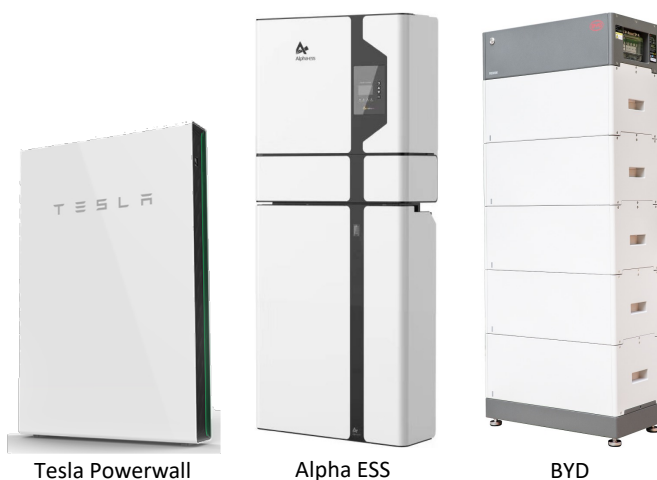
Alpha ESS is a Chinese battery manufacturer established in 2012. After first establishing an office in Australia in 2015, it has since established a manufacturing facility in Adelaide in 2018. It has signed an agreement with the South Australian government to make more than 8,000 of their SMILE 5 home batteries in Adelaide each year. The eligibility of the AlphaESS battery to participate in the state government scheme suggests the company has a good reputation and that the battery can be considered reliable.

BYD is the largest Chinese manufacturer of rechargeable lithium batteries and has dominated the Chinese electric vehicle and energy storage market for some time. The company first started as a battery manufacturer before entering the automotive market in 2003 and is now a multi-billion dollar company with over 220,000 employees and a vast global distribution network. BYD has now released its third generation of energy storage batteries which are modular and scaleable. The performance of this new model has been reported to be very good. This is backed by the accelerated testing currently being undertaken at the ITP renewables battery test centre in Canberra Australia.

2 Fire Safety of Batteries

The best location to install batteries is outside the building in a ventilated area away from direct sunlight. Batteries should not be positioned under an apartment and should be more than one metre from any walkway or easement.

There are two main types of battery chemistries used in the market, Lithium Nickel Manganese Cobalt Oxide (NMC) and Lithium Iron Phosphate (LFP). LFP batteries are more stable than NMC because of the additional of aluminium. LFP batteries can also stand high voltage use for extended periods of time. This translates to high thermal stability, reducing the risk of electrical shorting and possibly fires. As a result, LFP batteries are safer to use in an apartment building in comparison with NMC batteries.



	Tesla Powerwall 2	Alpha ESS Smile 5	BYD-HVM-13.8
Price	\$17,500	\$12,700	\$15,000
Usable Capacity	13.5 kWh	13.34 kWh	13.8 kWh
Warranty	10 year product, 10 year performance (70% of original capacity)	5 year product, 10 year performance (80% of original capacity)	10 year product, 10 year performance (60% of original capacity)
Battery Chemistry	Lithium Nickel Manganese Cobalt Oxide (NMC)	Lithium Iron Phosphate (LFP)	Lithium Iron Phosphate (LFP)
Dimension (H x W x D)	1150 x 753 x 147 mm	812 x 610 x 236 mm	1411 x 585 x 298 mm
Peak Discharge Rate	7 kW	5 kW	Depends on inverter
Backup/Off Grid Capability	Yes	Yes	Yes
Manufacturing	U.S.	South Australia	China
Ingress Protection Rating*	IP67	IP65	IP55

*Ingress protection is a measure of how water resistant the battery. An IP rating of 65 and above is suitable for use in an outdoor area without a cover.