



**BetterVolt**  
solar + batteries

# 6 Key Considerations For Buying A Battery

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Energy independence and lower bills

[bettervolt.com.au](http://bettervolt.com.au)

## Company Profile



In the heart of Dorrigo, BetterVolt has emerged as a leading force in solar innovation, driven by a team of seasoned experts with over 40 years of collective experience.

We specialise in designing and installing cutting-edge solar systems tailored to the unique needs of homes and businesses across the region.

### **Our Mission: Empowering Your Energy Independence**

Led by Geoff Tosio, a renewable energy veteran with a deep understanding of solar and battery technology, BetterVolt is committed to providing superior design, installation, and service. We recognize that choosing the right solar solution is a significant decision, which is why we take a personalized approach to every project.

### **Beyond Solar Panels: A Comprehensive Approach**

BetterVolt goes beyond solar panels. We provide high-efficiency solar panels optimized for our climate, durable batteries, and user-friendly monitoring software to help you save on energy bills. Our extensive product range caters to the diverse needs of residential and commercial clients.

### **Your Energy Independence Begins Here**

Contact BetterVolt today to embark on your journey towards energy independence. Let our experienced team guide you through the process of harnessing the power of the sun, reducing your environmental impact, and taking control of your energy future.

**BetterVolt: Better design. Better installation. Better service.**

**Geoff Tosio**

# Key considerations when buying a Solar & Battery solution

Solar systems with batteries have become increasingly popular over recent years and are expected to become even more so going forward. We predict that a solar/battery combo will be a standard accessory to a residential home in years to come.

Several key factors that should be considered when researching and purchasing a solar and battery system or adding a battery as a retrofit to an existing solar system.

**Here are the 6 key considerations to be aware of before embarking on this journey.**



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## The best reasons to buy a battery

Good quality batteries that are safe and installed by professionals are not cheap, and in a typical context can take 10 years to pay for themselves.

However the right choice of battery and supplier can offer extra benefits:

### ☰ Blackout protection

If you have regular blackouts, or feel there is a risk of blackouts, then installing a battery to power essential appliances from both solar and/or battery energy is a smart design decision

For example, if you reside in a bushfire-prone zone or remote area which experiences storm damage on a regular basis then a solar + battery system could run water pumps, charge phone, internet or other essential loads

### ☰ Self-sufficiency

Many people want to get a battery to increase their personal autonomy and reliance on expensive carbon based fuels.

When there is a lack of solar and wind power the grid is being monopolised by gas cartels who game the system for their own financial gain, and at the expense of every Australian.

### ☰ Maximising energy efficiency

If you are in the process of building and designing your house and are planning to utilise energy-efficiency principles then a solar and battery combination is a must-have.

When designing the building envelope please ensure that the orientation of the roof allows for maximum winter sun to strike thermal mass areas, but don't forget to also allow for a large number of solar panels to angle towards the North or at least the NE & NW as this will allow you to create energy when the days are short and the sun is at it's lowest point.

When outlining your design with the architect or builder ensure that you provide large unbroken areas with few ridges and gables, and strategically place any breathers, chimneys or vents to reduce shadows over those areas.

Because of the average households energy consumption profile we also suggest some western facing panels (20-30% of the array) to capture afternoon sun in summer, especially for air conditioning and cooking.

### ☰ The benefits of new technology.

“Electrify Everything” is the new phrase, it's clean, smart and the responsible choice for our future generations.

Some people install batteries because they love the technology and are early adopters or thought leaders.

Many now recognise that a significant solar system with a battery, plus an electric vehicle, electric heating and cooling, induction cooking and a smart electric hot water system are essential items to insulate your home budget from international inflationary pressures, ie; Fossil Fuel price hikes.





### ☰ Increased earnings for smart batteries

Your return on investment (ROI) period can drop significantly if you include smart energy trading software - the evolution of renewables is now a solar + battery system connected to a Virtual Power Plant (VPP). This means your system automatically utilises intelligent algorithms to trade energy back into the grid when wholesale market pricing is high, lowering the cost for everyone and taking away profits from greedy fossil fuel based energy providers, ie: Gas peaking plants.

Using these energy wholesale markets 'Peak Price Events' which occur infrequently may earn enough to reduce the ROI of the battery down to half = 5 years!

However beware that many VPP's are operated by large energy retailers where they keep a majority of your profits, but some smaller providers now provide you with 100% of the traded value!



## 2

# What is the financial reality?

A low quality residential solar system will have an ROI of 3-5 years.

A low quality residential solar system + battery combination will have an ROI of 7-10 years .

However both of these systems have a high chance of not realising those statistics, because the brand of product or the company providing it will not be there to support you over the term.

A high quality residential solar system installed by a local reputable company will have a return on investment (ROI) of 4-7 years.

A high quality residential solar + battery system installed by a local reputable company will have a return on investment (ROI) of 9-12 years.

However this same high quality solar + battery system integrated with a virtual power plant (VPP) could drop that ROI to 5-7 years

The reason for having a range of years on the ROI is because different households utilise more or less of the solar production, exporting the balance of that energy back to the grid.

Feed In Tariffs are dropping because there is more and more of this excess solar energy reaching the grid in the middle of the day, sometimes reducing the demand to negative pricing on the wholesale market - meaning it costs your retailer for you to send that energy into the grid. These 'oversupply' issues will increase over the coming years - making batteries the most important part of financial savings for every household.





Here is one specific sample using top-of-the-range equipment \*:



**Item**



**Size**



**Est Purchase & Installation Costs**



**Est Annual Benefit**

Item	Size	Est Purchase & Installation Costs	Est Annual Benefit
Solar System	13.2kWh	\$12,500	\$2,200
Battery	13kWh	\$15,000	\$1,100
EV Charging	20,000km travel per year	\$2,200	\$2,100 (50% solar charging / 50% off peak night charging)
<b>Total</b>		<b>\$29,700</b>	<b>\$5,400</b>
ROI with an electric vehicle			5.5 years
Adding smart VPP integration			4.4 years

\*This is a rough calculation only, as prices vary depending on installed brands and local energy prices

\*\*Assumes owner uses 75% of EV electricity consumed via home solar, the rest is paid for.



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## Don't buy cheap & ask for referrals

A home battery is a complex piece of equipment, and high quality batteries command a decent price point.

You will get what you pay for so buying cheap introduces several risks to your home and wallet.

Home Storage Batteries are mostly Lithium Ion chemistry, but there are different Lithium Ion cell chemistries. Some of these have highly volatile components with low thermal runaway temperatures (fire risks) and a few of these are well known supposed 'premium brands', for legal reasons we will not name these.

Lithium Nickel Manganese Cobalt Oxide (NMC) are well known for being light and useful in electric vehicles, but they constitute a higher risk of fire.

Lithium Iron Phosphate (LiFePO<sub>4</sub> or LiFe) is a much more stable chemistry and weighs 30% more, however for stationary applications this is acceptable. So for a much safer home storage solution we only use these types of cells.

Remember that a battery is not a set-and-forget purchase and needs to be supported with a quality monitoring system and back-up service by the installer (and support from the manufacturer if required). So when deciding on a battery ask around for a local company with a good track record and high quality brands.





## 4

### **Will batteries prices be coming down soon?**

The short answer is 'No, not with the current market conditions'

Batteries have slightly reduced in price over the past 4 years.

The battery manufacturing industry continues to be in high demand due to home battery systems, consumer electronics, electric vehicles, and grid scale battery installations.

Most of these batteries have a vital role to play in the future of our worlds electrical grid.

Solar panels and inverters have reduced in pricing over the past decade as production increased, the theory was that costs reduced by 20% when production was doubled.

But this has yet to be true for home batteries even through production has increased dramatically, and despite new Lithium mines being opened in record numbers demand has still outstripped supply.

It is anticipated that the supply issues will be with us for years to come, and therefore home storage battery prices are not predicted to change in the near future.

With over 3.4 million solar systems on the roofs of Australia and only 140,000 home batteries installed there will continue to be a high demand for these products.

## How do batteries work?

Solar panels produce DC power, and typically this is by creating strings of panels which combine into voltages of between 200-500V up on your roof.

This DC voltage is then sent down a cable and converted into 230V alternating current (AC) power for use in your household, this is done by an inverter (one direction).

Batteries import and export energy using DC voltage.

A hybrid or bi-directional inverter allows for voltage to be converted both ways.

Traditional off grid systems utilise 48V DC batteries because it has been the industry standard over many decades, and is safe enough for a lot of DIY constructions.





However converting energy across large voltage gaps results in approximately 15-25% losses.

Modern hybrid inverters are now in the market with high voltage (200-400V) battery architecture to avoid these losses.

The Fronius Gen 24 hybrid inverter and BYD HVM battery combinations have won multiple international awards for round trip cycle efficiency, sometimes as high as 95.5% (only a 4.5% loss).

An efficient inverter and battery combination runs at high voltage and low current for the same amount of energy, and low current means less loss because less heat is generated.

Fronius inverters have active cooling fans, this extends their lifespan and is the trademark of an efficient system.



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### What is a battery warranty?

All batteries degrade, mostly as a function of how hard they are discharged and how often they are discharged / recharged (cycled).

A battery warranties will explain how much capacity will remain at the end of their 10 year warranted lifespan. A high quality LiFePO4 battery will have at least 60% warranted capacity at the end of a 10 year warranty period, but very few clients ever cycle their battery to 0% every day (especially if they have a battery reserve kept in case of blackouts), so most batteries will live past 15 years and have less capacity loss.



Batteries also have a “throughput warranty” measured in MWhrs.

1 kWhr of battery capacity cycled 70% each day for 1 year, over 10 years = 2550 kWhrs or 2.55 MWhrs.

A high quality battery will have at least 3 MWhrs of throughput warranty per kWhr of capacity.





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BetterVolt follows all the important guidance given in this guide.

# Contact us for free advice or an obligation free quote.

 0422 544 555

 [bettervolt.com.au](http://bettervolt.com.au)

 1 Ash St, Dorrigo, NSW, 2453

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