Battery Storage:

Choice Magazine:

https://www.choice.com.au/home-improvement/energy-saving/solar/articles/home-battery-storage
https://www.choice.com.au/home-improvement/energy-saving/solar/articles/solar-battery-trial#Key_results_from_the_trial
https://www.cleanenergyreviews.info/blog/home-solar-battery-systems

ABC Review with Great Graphic of Solar Installations

https://www.abc.net.au/news/science/2018-08-16/does-it-make-sense-to-buy-solar-batteries-or-should-i-wait/10119900

Battery Economics:

Simple to use:

https://www.solarquotes.com.au/solar-calculator/

More complicated:

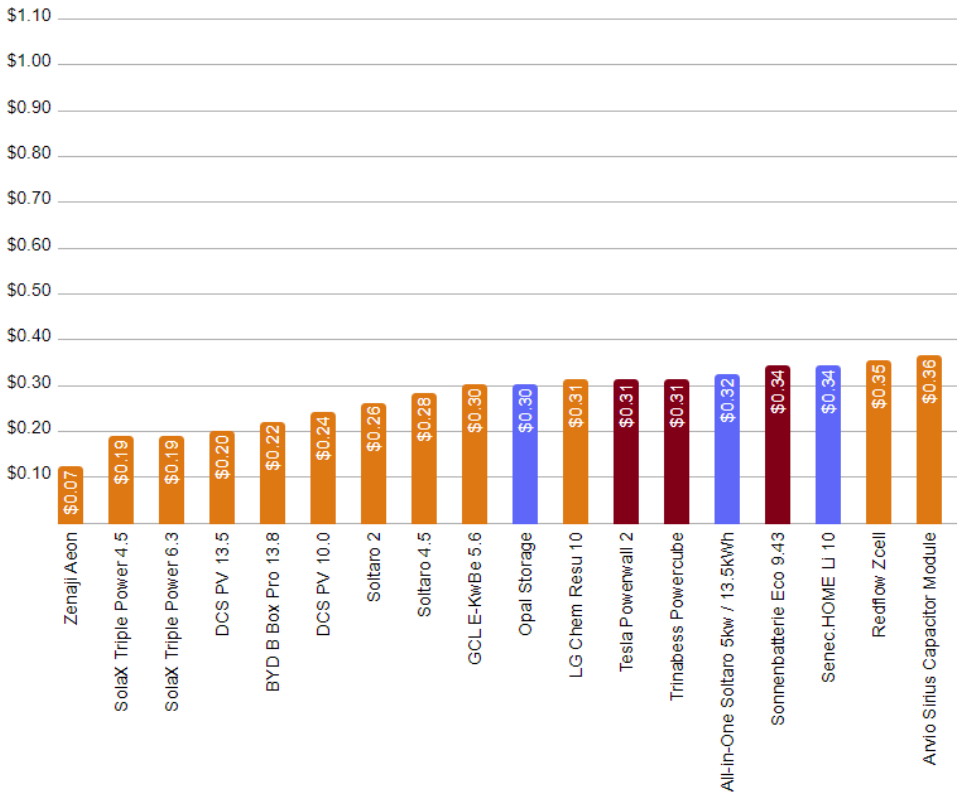
https://www.solarchoice.net.au/blog/solar-pv-battery-storage-sizing-payback-calculator#fullcalc

Battery Comparison Chart:

https://www.cleanenergyreviews.info/hybrid-solar-battery-energy-storage-system-review
https://www.solarchoice.net.au/blog/is-home-solar-battery-storage-worth-it-april-2019-update/

Zenaji – Lithium Titanate Battery – 20 year warranty:

https://zenaji.com/



Solar Panels:

https://www.cleanenergyreviews.info/blog/best-solar-panels-review

Best Solar Panel Manufacturers

Here is our short list of the **best quality** and **most reliable** panel manufacturers on the Australian market based on company history, quality, real world performance, service, and feedback from solar industry professionals. This list is

generally applicable to most regions with established solar industries including Europe and Asia, however in Japan, **Panasonic** has a strong position, and in North America, **SunPower** would take the top spot.

1. **LG**
2. **SunPower**
3. **REC**
4. **Winaico**
5. **Q Cells**

Best Value Solar Panel Manufacturers

Based on feedback from solar professionals, below is our list of the best 'value' solar panel manufacturers. With a long history in research and development, Trina Solar, Jinko, SunTech and Canadian Solar are some of the oldest and best known manufacturers, while LONGi Solar has more recently become the worlds largest solar panel manufacturer by volume.

- **Trina Solar**
- **Jinko Solar**
- **Canadian Solar**
- **LONGi Solar**
- **SunTech**

Solar Panel Efficiency:

https://www.abc.net.au/news/science/2016-08-20/solar-energy-and-panels-explained/7763474

Chart of Panel Types and Efficiences:

https://www.nrel.gov/pv/assets/pdfs/champion-module-efficiencies.20191104.pdf

https://www.nrel.gov/pv/assets/pdfs/best-research-cell-efficiencies.20200218.pdf

Inverters:

https://www.cleanenergyreviews.info/blog/best-grid-connect-solar-inverters-sma-fronius-solaredge-abb

Best Solar Inverters 2020

1. **Fronius** - Primo and Galvo
2. **SolarEdge** - SE and HD wave
3. **SMA** - Sunny boy
4. **Sungrow** - SG-KLT
5. **ABB** - UNO

Best Commercial Inverters (3 Phase)

1. **Fronius** - Symo and Eco
2. **SMA** - Sunny Tripower & Core 1
3. **SolarEdge** - SE 3-phase
4. **Sungrow** - SG-KTL range
5. **ABB** (FIMER) - Trio, PRO and PVS

Smart Home Controls

Several modern solar inverters have inbuilt 'demand' or energy management controls. These can automatically switch on appliances when there is excess solar energy, rather than sending it to the grid for little return. Additionally, companies such as Solar Analytics & Carbon track make clever monitoring devices which can be added to any existing system to enable remote monitoring of both solar and energy consumption.

Hot water diverters:

There are several add-on devices available to automatically heat hot water using excess solar energy which is in effect using hot water as energy storage. Fronius have an add-on system called the ohmpilot, and SolarEdge also have a diverter, plus there are several well known retrofit systems from Catch Power, Powerdiverter, and Paladin.

Hot water systems store energy but unlike batteries which use chemical reactions so store energy, hot water systems simply store energy as heat. If you have electric hot water then by adding a timer or solar power diverter you can reduce energy costs by up to 30% by using excess solar energy to heat your water during the day.

Off-Grid Solar Systems:

https://www.cleanenergyreviews.info/blog/best-off-grid-solar-system

Choosing the best off-grid solar system is not easy as off-grid systems are many times more complicated than grid connected solar systems. In this article we will highlight some of the many considerations which must be taken into account and discuss the various off-grid system types available. We also explain why a good quality 'inverter/charger' is vital to building a reliable off-grid system. Finally we will dive into the different brands available and determine which systems are best suited to different applications.

Many people believe an off-grid system can be easily put together (which may be true in the case of a small caravan or cabin) but in reality these systems need to be carefully designed by an experienced solar installer or system designer.

Solar and battery storage systems must be installed by an experienced licensed electrical professional. Modern off-grid solar systems are typically high voltage and can generate and store huge amounts of energy which can result in damage, fire or serious injury if the installation does not meet all relevant regulations, standards & guidelines.

Community Energy:

http://www.energeticcommunities.org.au/

Community Owned Renewable Energy Queensland

Energetic Communities Association Inc. is a key driver of **Community Owned Renewable Energy (CORE)** development throughout Queensland. We support communities to establish Community Owned Renewable Energy on the roofs of community buildings, businesses, local government and not for profits, and undertake supportive policy development and support at the State level.

How It Works

CORE is where the community raises funds to finance a renewable energy installation, whether it's solar, wind, biodiesel or any other renewable energy resource. You can read more in our **CORE Briefer (PDF)** and **Growing Queensland Community Energy (PDF)** (written with the **Community Power Agency**) to see what's needed in Queensland.

In our model (above), ***Energetic Communities*** will establish a Special Purpose Vehicle (SPV), such as a co-operative, a trust, or a Pty. Ltd. company with democratic principles embedded, comprising of members of the community (Community Investors). As you (Site Owner/Host Site) repay the installation through cheaper electricity bills, the community investors get a return on investment. Under some models of CORE, the site owner/host site is 'gifted' the installation after 10 years.

For Community Groups, Not for Profits, Local Government and Business

Community Owned Renewable Energy is an opportunity for building owners to purchase cheaper low carbon electricity, offer a broader benefit to the community and be seen to engage positively with the community. Other groups around Australia building similar models include local governments, schools, churches and sports clubs

For the Community

If you neither have the capital or the roof to put on solar, community owned renewable energy allows you to change this, as it provides renters, apartment owners, community groups, businesses and those on a low income with the ability to contribute, own and benefit from renewable energy when they can't afford or are unable to install their own.

We are currently looking at finding suitable sites and establishing a co-operative organisation to build a CORE development.

Electric Vehicles:

http://myelectriccar.com.au/faq/

The average price for electricity per kiloWatt hour (kWh) in Australia is about $0.25 and it takes approximately 18 kWh to travel 100kms, so it will cost approximately $4.50 in electricity charges to travel 100kms.

In comparison, the average petrol car in Australia uses 11.1 litres of fuel to travel 100kms (Aus. Bureau of Statistics). That's a cost of $16.65 to travel 100kms at $1.50 per litre. Even a very efficient diesel vehicle (5 litres per 100kms) will cost $7.50.

Average Kilometers Driven

The average Australia passenger car is driven around 14,000 kilometers a year, which comes to an average of about 38 kilometers a day. So if you get 5 kilometers of range for every kilowatt-hour of charge you attempt to stuff into your car, you will use almost 8 kilowatt-hours a day.

Solar Panel Capacity Required

Most Australian households can expect to get around 4 kilowatt-hours of electricity per day for each kilowatt of north facing solar panels they have and around 3.4 for east or west-facing panels. So it would take 2 kilowatts of north facing solar panels to match the electricity consumption of the car.

Charging Options

Production electric cars typically come with two charging options – slow and fast. The slow charge option is the most commonly used as you will no doubt plug in at work or at home. This takes a standard 240 volt AC, 15 amp supply and the vehicle's on board charger charges the battery. The rate of charge will depend on the on-board charger – 2.5 kW to 7 kW is typical. So at 2.5 kW, a Nissan Leaf will be fully charged overnight. The fast charge option involves a publicly accessible 'fast charger' or 'supercharger' which provides power directly to the battery. Fast chargers may put out anywhere from 25 kW to 135 kW and can charge a depleted battery in under 30 minutes. Expect to see more of these around the country, typically located in towns so you can enjoy a coffee break.

https://www.caradvice.com.au/743306/how-long-does-it-take-to-charge-an-electric-vehicle-how-does-an-ev-charge-plus-our-ev-glossary/

https://www.qld.gov.au/transport/projects/electricvehicles/about/compare

https://www.ergon.com.au/network/smarter-energy/electric-vehicles/charging-your-electric-vehicle

https://help.gumtree.com.au/AU/articles/en_US/KB_Article/Electric-Cars-Buying-Guide-AU?vgroup1=PKB&c=PKB%3ABasics&vcategory2=Selling_and_Buying_Guides&s=a002I00000dd2CeQAI

https://evadoption.com/ev-charging-stations-statistics/

VIDEOS:

https://www.youtube.com/watch?time_continue=133&v=vIfABRh-H5M&feature=emb_logo

https://www.youtube.com/watch?time_continue=1&v=kk7ZTn9g7bY&feature=emb_logo