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Notes on Solar Batteries for domestic use

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Feed in Rates - FIT for energy to the grid



In Australia domestic energy in the form of electricity has stayed reasonably constant at ~ \$0.32 per KWh since 2020 after a rapid rise from 1980 onwards. Feed in rates for households sending energy onto the network have fallen to \$0.033 flat minimum rate per KWh in Victoria, other states energy retailer benchmark rates can be higher to \$0.069 . The reduced feed in rate and current retailer rates to homeowners suggests self usage of self generated power is an obvious path to minimum energy cost. With consumption saving \$0.33 (Victoria) for each KWh versus export of that same energy receiving only 10 - 20 % being the feed in tariff, many solar panel owners now see the financial advantage of battery energy storage. Recent government mandates reinforce this self

usage approach.

Grid customer's inverters now assist in grid management!

The large uptake of roof solar produced energy that until recently had only the power grid as a destination for excess energy. This has created grid instability. Energy grid managers have sought decentralised techniques to mitigate the problem at the 'distributed energy resource' interface - the home or business inverter. Several initiatives were recently added as mandatory for inverter grid connection.

Provision 1: VolVar is an attempt to manage rising or falling grid voltages using a mechanism built into the solar panel inverter to keep the grid AC voltage stable. The inverter provides or absorbs 'reactive power' which has the effect of reversing over/under voltage and is now a feature of compliant modern inverters. This has several implications for the domestic home energy generation; VolVar might lower the real power to be delivered to a battery or house load during good sun periods and might incorrectly become active depending upon the grid point to inverter cable length.

Provision 2: VolWatt is similarly built into the inverter and forces reduced output power to the grid where the solar energy is in excess of requirement. Simply stated it curtails the owner's offset energy back to the grid when judged to be in excess of thr grid's general load need.

Provision 3: VPP capable The Australian Federal battery offer stipulates the battery must be 'VPP' capable. This unpopular arrangement called VPP (Virtual Power Plant) is where a 3rd party such as a power retailer can control the domestic homeowners inverter/battery remotely to take charge of energy or stop accepting that energy to the grid. Various complaints have been associated with this concept. Of note is that although stated as a battery purchase rebate, to be VPP capable as required for the federal battery rebate, the owners inverter probably will require replacement. Most Inverters more than 2-3 years old will not have VPP ability.

Where to now?

An inexpensive and elegant alternative is to make your property dual On and Off grid. 'Off grid' for most circuits; lights, GPO (general purpose outlets) for fridge, fans, washers, computers, modems and the like. Optionally retain high current devices such as stove/cooktop, electric hot water as permanently 'On grid'. Self generated solar energy together with that stored in the battery will be used in the home by default. Should immediate extra energy be needed, the fallback is to switch both to the 'On Grid' mode. Solar energy produced is not limited by grid curtailment policies and the self usage maximises home energy savings.

To implement dual On and Off grid energy supplies have an authorised electrician install a line transfer switch in the electricity switchboard that selects the grid or the alternate energy source being the solar inverter output. Have the wiring separated to that which is permanently On grid and that which you require Off grid and connected to the transfer switch. Note that there



purposefully is no allowance for the inverter to become 'grid tied'. If an automatic transfer switch is installed, loss of battery power will automatically switch to the grid. Once sufficient battery recharge occurs, manually switch and return to the zero cost off grid mode.

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Cost savings using this dual arrangement are (i) energy is maximised from the solar panels with no grid determined energy curtailment (ii) All of your battery stored energy is available when solar is not eg. nighttime (iii) no new inverter cost (providing the current inverter is standard 48volt hybrid) (iv) no inflated cost, VPP enabled battery is required. Lastly consider purchase the SunSaverBatteries 15.5KWh battery unit and save \$4,000 - \$10,000