Solar Battery EPS/Backup explained

When the grid power fails…
Many people already understand that if you have solar installed, if there is a loss of grid power then the solar shuts itself down immediately. This is a safety requirement to protect electricity workers from getting a shock from your solar installation exporting solar back into the grid.

Solar and batteries
If you add a battery to your solar installation then there is still a risk that the workers might get a shock from your solar, so the solar shuts down when the grid power fails, unless…

Solar and EPS/UPS/Backup.
EPS (Emergency Power Supply) is an additional component to a solar/battery installation. Sometimes it's built-in to the inverter, sometimes it's an extra external box, but the way it works is the same, and for the sake of simplicity, whether it's built-in or not, from here on we are going to describe it as 'the inverter'. Built-in or not, you are paying about $500 for the necessary hardware.

First an electrician creates a new circuit on a single phase in your switchboard of your essential loads. The inverter can only deliver 5kW of power on this circuit (Growatt only 3kW) so 20A maximum. That will power quite a lot. Lighting, outlets for fridge, freezer, but not AirCon or an Oven, Pumps etc.

As you can imagine, creating this new circuit takes a considerable amount of time. Wires that used to go to this breaker and that breaker, now have to be moved over to the new backup breaker. Two or three hours of work and perhaps $500 or so labour costs.

This new circuit is then cabled back to the inverter and from that moment on, runs continuously through the inverter. Therein lies another worry. What if the inverter develops a fault and you have to wait a few weeks for a replacement? The circuit permanently runs through the inverter, so now you've got no lights, or fridge etc until the inverter is replaced. Solution. The electrician wires the emergency circuit first to a manual three-way switch so if the inverter fails, you flick the switch across, and the power gets to your circuits from the grid. More time, more cost.

So now you've got your backup, and at 7pm on a hot evening when everyone turns on their Air Con the grid fails. Your circuit draws power from the battery, and you have lights etc until the battery runs out. It might get you through the night. Great.

Next scenario, a cyclone blows through and knocks out power lines in the middle of the day.
Your backup circuit kicks in and draws from the battery. Does the battery keep getting topped by the solar panels? Well, probably not because it will be very cloudy, and the panels will make very little power. Typically, on a stormy day a 6.6kW system will make about 2 or 3 kWh of power for the whole day instead of the usual 30kWh.

So, in our opinion, there are really very few scenarios where spending over $1,000 for a back-up circuit, which is what it typically costs, is a better solution than having a ***generator*** handy.