Solar System Performance Estimate

The estimated average daily output of your solar system may vary depending on following items:

- Roof condition
- orientation of the panels when deviated from true north
- pitch of roof
- **System Performance**

During daylight hours, your system will be generating electricity at varying levels depending on the local environment. The more sunlight falling on the solar array the more electricity is generated; therefore, variables like cloud cover, seasonal solar angle variations, shading or soiling of the solar array, will have an effect.

Note that you need not change your energy usage lifestyle to correspond with your solar system. Your energy consumption will be supplied by both solar and the grid.

The table below shows expected system performance using a 1kW nominal PV array facing True North at a tilt angle equal to the Latitude with no shading. NOTE: A detailed monthly production estimate for your system is included separately.

Location	Beth Month kWh per day	Worst Month kWh per day	Annal Average kWh per day
Brisbane	4.61	3.34	4.04
Canberra	5.32	2.76	4.22
Darwin	5.11	3.54	4.47
Hobart	4.6	2.14	3.54
Sydney	4.83	2.82	3.94
Melbourne	4.59	2.22	3.58
Adelaide	5.72	2.51	4.25
Alice Springs	5.19	4.21	4.81
Perth	5.4	2.93	4.4
Cairn	4.44	3.18	3.86

System performance has been determined in accordance with AS/NZS 5033. An average system efficiency has been used – includes PV array, wiring and inverter losses

4. **Factors Affecting Performance**

1. Standard Test Conditions (STC) PV arrays are rated under standardized conditions, such as specified illumination (1000 W/m2), an air mass of 1.5 standard reference, and specified temperature of 25 "C, these standard test conditions (STC) allow for a uniform measuring of performance between various manufacturers of PV panels. Due to varying factors such as those listed below, performance will vary from manufacturer specified standard test conditions.

2. Temperature and reduced output PV array temperature affects the output of the entire system. As the temperature on the array surface heats rises, the energy output will decrease.

3. Angle of the sun the angle of the sun in relation to the PV array surface (orientation) will affect the PV array output. The array energy output will vary depending on the time of day and time of year as the sun's angle in relation to the array changes. Incident sunlight decreases when the sun is near the horizons due to the greater atmospheric air that it must penetrate. This reduces both the light intensity that strikes the array's surface and spectrum of the light.

4. Partial shade shading of only a single module of the array will reduce the output of the entire system. Such shading can be caused by something as simple as the shadow of a mains power cable or tree branch on part of the array's surface. This condition, in effect, acts like a weak battery in a flashlight, reducing the total output, even though the other batteries are good. However, the output loss is not proportionate to shading. Inverters are designed to maximize energy production in all of the above situations using its MPPT algorithm.

5. Other environmental conditions solar irradiance, wind and cloudy conditions can all affect the performance of a solar power system. Solar irradiance is continually varying throughout the day with a peak level generally around noon or early afternoon. A higher irradiance level will result in higher solar generation. Solar irradiance is also affected by cloud cover, which will substantially reduce the level of solar generation. High wind speeds can enhance performance by reducing the core temperature of the PV panel.

6. Other factors that contribute to system losses are:

- **Dust or dirt on the array**
- **Fog or smog**
- **Inverter efficiency**