

# Power System Sizing Form

Name: .....

Address: .....

..... Email: .....

Postcode: ..... Phone: ..... Fax: .....

## Lighting

I plan to use :  12/24V Lights  240V Lights  Both  Not Sure

# of Lights / Comments	Location	Watts	Hours Usage per Day
.....	Family Room	.....	.....
.....	Dining Room	.....	.....
.....	Kitchen	.....	.....
.....	Bedroom 1	.....	.....
.....	Bedroom 2	.....	.....
.....	Bedroom 3	.....	.....
.....	Bedroom 4	.....	.....
.....	Bathroom	.....	.....
.....	Hall	.....	.....
.....	Laundry	.....	.....
.....	Toilet	.....	.....
.....	Outside	.....	.....
.....	Garage	.....	.....
.....	Shed	.....	.....
.....	Other	.....	.....

## Appliances

Volts (eg 12 or 240)	Appliance	Watts / Amps	Hours Usage per Day
.....	Fridge: make:      model:      Size:      Litres	.....	.....
.....	Freezer: make:      model:      Size:      Litres	.....	.....
.....	Microwave	.....	.....
.....	Food Mixer	.....	.....
.....	Television	.....	.....
.....	VCR / DVD	.....	.....
.....	Stereo	.....	.....
.....	Radio	.....	.....
.....	Computer:      Desktop      Laptop	.....	.....
.....	Printer:      Laser      Ink	.....	.....
.....	Washing Machine:      Loads per week=	.....	.....
.....	Vacuum Cleaner	.....	.....
.....	Iron	.....	.....
.....	Power Tools	.....	.....
.....	Ceiling Fan	.....	.....
.....	Domestic Pump*	.....	.....
.....	Transfer Pump*	.....	.....

Please attach extra sheets for further lights and appliance if required



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# Stand Alone Power Supply

## ENERGY SOURCES

You may have a combination of power and energy sources to meet your requirements. The various sources may include sun, wind, water, or a generator using diesel, petrol or gas as a fuel.

With a battery based power system you can use any combination of energy sources to charge the battery bank.

To help us advise you on the most cost effective power system to meet your needs please indicate in the next column which combination of energy sources we should consider for your power system.

### What system options are available?

There are three broad types of systems available:

**Stand Alone:** These fall into two categories -

- 1) systems which are entirely reliant on non-mains powered energy supply, and
- 2) non-mains powered systems which are installed in the same premises as mains power **BUT** do not interact with the mains power in any way.

**Grid Feed:** With a grid feed inverter you can send the power from PV solar panels direct to the grid. Your incoming power would be coming directly from the grid. A grid feed system does not incorporate a battery bank and therefore does not give you any continuity of power in the event that the grid fails.

**Grid Interactive:** With a grid interactive setup all the power is directed through and monitored by the inverter(s) which will allow you to sell power to the grid when you have a surplus of power, buy power from the grid when you don't produce enough power to meet your own needs and charge the battery bank from the grid if and when required (automatically). A grid interactive system will allow you to continue having power even when your neighbourhood is having a power blackout.

### Location of Power System

It is important for us to know the location of your site.

**So please assist us by:**

- a. Providing **longitude and latitude** of the location.
- b. OR providing the **name of a town or locality** that can be found in an atlas. If it is a very small town then provide the name of a nearby larger town.
- c. OR clearly **mark an X on a map** of the country or state.

## SOME DETAILS TO ASSIST US:

Please give the longitude and latitude of the location of the proposed power system.

Longitude: .....

Latitude: .....

Nearest Large Town: .....

### AC/Grid/Mains power.

Is grid power connected at your site? (Tick a box)

Yes  No

Is available but not presently connected

Will be available approx. \_\_\_\_\_(month/year)

Are you considering a renewable power system which is:

Stand-alone

Grid Interactive  Grid Feed

**(refer to left column for definitions; please contact us if you need further information)**

**Solar.** Please fill in page 4 of this form.

**Wind.** If you feel that your site may be suitable for a wind turbine, tick this box

**Hydro.** If you feel that your site may be suitable for a hydro (water) turbine, tick this box

**Generator (Petrol/Diesel/Gas).** A generator may be used as an emergency backup or to augment a power supply. Please indicate size (kVA) if you already own one.

Size: ..... kVA

If you intend to purchase a generator, tick this box.

### Is there any existing solar equipment already installed?

Quantity = ..... Solar Panels of .....Watts each

Battery Bank of ..... Volts, ..... Amphours

Regulator Brand ..... of ..... Max. Charge

Sine Wave Inverter (not modified sine) of ..... Volts

DC ..... Watts continuous and ..... Watts Surge

**Motor Home.** How many days do you wish to be able to operate your electrical power system without charging the battery with the engine, generator or grid connection.

..... Days

# Power System Sizing

Dear Friend,

Thank you for your inquiry. In order for us to design an appropriate power system for you, we ask that you fill in the Power System Sizing Form. If we are to also install the system then we ask you to also fill in a Roof Description Form (available from our Web Site).

## Load Profile

In filling out the form you will need to consider the following points:

- **LIGHTS:** You need to provide an **daily average**, not a minimum or maximum. In our report we will take into account the fact that the lights will be used for longer in the winter and shorter in the summer.
- **SPACE COOLING:** For all space cooling requirements please provide **daily maximum** use. It will be assumed that in the cooler winter months these appliances will get little or no use.
- **WATER PUMPING:** Generally the reverse of lighting. Water consumption usually increases with higher temperatures, and to a much lesser extent, the length of daylight. You need to provide your pumping requirements, measured as hours/day (if applicable).
- Please provide **FRIDGE/FREEZER size in litres**.
- With all **OTHER APPLIANCES** it will be assumed that there are no seasonal variations in their usage. Please provide **daily average** use.

**NOTE: You may wish to consider using a petrol or diesel generator to operate some loads directly (eg washing machine, vacuum cleaner, iron, power tools, and transfer pump). Please indicate if this is the case.**

\* For pumping demand profile refer to our pumping questionnaire.

## What This Service Provides

The results that we will post back to you may advise you to consider more appropriate appliances to reduce the cost of the system. We will also recommend:

- **Solar (PV) Panels.** The type and number of solar panels that will meet all your requirements. We will also provide the optimum array tilt angle for your location and load profile.
- **Battery Storage.** The battery voltage (eg 12V, 24V, 48V etc) and the battery capacity.
- **Backup Costs.** The expected generator run time on a month by month basis and the expected yearly fuel bill.

## Recommendations

**Cooking & Heating.** It is recommended you use gas and/or firewood for cooking and heating. To produce this amount of heat using electricity is costly and inefficient.

**Hot Water.** Hot water can be obtained by using a solar hot water system. It is possible to combine a wood stove or gas heater and a solar collector.

**Refrigeration.** Power consumption for refrigeration is relative to ambient temperature and it pays to find the coolest possible location to place the fridge or freezer. Note that for every degree cooler that the fridge is run at there is a 5% increase in power consumption.

Because of the number of variables, including the usage patterns of the fridge (opening, loading, unloading etc) it is almost impossible to get an accurate assessment of the power usage of a fridge or freezer.

It is generally not recommended to run a 240 volt fridge and/or freezer from a battery bank (via an inverter) due to the high power consumption. We generally recommend either to use a 12V or 24V DC compressor motor fridge and/or freezer or to use LP gas fridge/freezer. The use of a LP gas fridge/freezer will reduce the capital outlay for the power system, but a 220L gas fridge will use four 45kg gas bottles per year.

**Space Cooling.** Refrigerative air conditioning on a stand-alone power system is prohibitively expensive. Evaporative air conditioning is much less expensive but does not work so well in a humid climate. Ceiling fans, extractors and oscillating fans are recommended.

## Accuracy of Results

This assessment takes into account power transmission and battery storage efficiency as well as local climatic and insolation data. The results of this service depend upon the accuracy of the information you provide.

**Note: The results of the assessment will allow for seasonal variations in usage and power consumption as required by Australian Standard (AS) 4509.2 - 2002.**

# Roof Description for Solar Installation

roof slope is north facing. If its not north facing:  
..... degrees ..... (East or West) from north

The roof slopes at ..... degrees from the horizontal.

I want the solar panels mounted at:  best tilt as you determine  flush on the roof

Roof construction:  tile  corrugated zincalum or colourbond  other

if other, roof material is: .....

Roof dimensions: ..... metres long, ..... metres wide

Height of eaves above the ground: ..... metres

roof is shaded for approximately ..... hours each day between 7am and 5pm in summer.  
 roof is shaded for approximately ..... hours each day between 7.30am and 4.30pm in winter.

roof is shaded in the mornings and evenings  roof is shaded in the middle of the day.

I think that my house roof may not be suitable. Please describe other options (eg shed, garage or ground mounted):  
.....

Located ..... metres from the house

I have attached photos of my preferred roof site. (If you cannot include a photo then please make a sketch below)

I would like to locate my batteries .....

I would like to locate my inverter .....



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