

Power Consumption of Electrical Appliances

To get an accurate measure of the power requirements of an off-grid system or to estimate how much power a particular appliance will use, we need to know how much power in watts they use, then estimate the amount of time that the appliance is used for. The figures used are for typical energy consumption of the appliances used in your house. They can be also used as a reference to evaluate your current usage and for the purchase of new equipment. New appliances have a star rating label on them for comparing products against each other which will also indicate the average energy use for a year. Please use the figures in the table as a guide when you are unable to find the watts used on the nameplate or manual of your appliance. Care has been taken in the accuracy, but if you can use the data from the exact appliance that is used, all the better.

There are some time considerations for different appliance types such as;

Refrigerators

To estimate the number of hours that a refrigerator actually operates at its maximum wattage, divide the total time the refrigerator is plugged in by three. Refrigerators, although turned "on" all the time, actually cycle on and off as needed to maintain interior temperatures.

Refrigerated Air Conditioners

Like fridges, these also cycle in and out, or ramp up and down in the case of inverter drives, as required to maintain the temperature of the room. There are other factors like ambient temperature and the insulation properties of the building that will affect the run time. For the purpose of the off-grid AC Load calculator, we would need to use at least 60% or more because you are likely to use it when it really hot and cold.

Pumping Water

Not many sites use a header tank for water pressure anymore due to the capital cost and Occupational Health and Safety concerns. A well set up pressure pump will run when we turn a tap on and shut down as soon as the tap is turned off. To estimate the time of use of a pressure pump we just need to estimate how long each day we have water running from a tap.

For pumping water to fill storage, such as from a bore into a tank we need to consider the total amount of water used each day and divide by the flow rate being drawn from the source.

Septic and Wastewater

Some systems require no power and have a septic tank that will need to have the solids (poo) cleaned out and the water goes into a gravel drain. Others will have a small motor to aerate and break down solids (60W) then have a pump to empty tank onto a garden or lawn 400W for about 1 hour per day depending on water use.

Summer / Winter Seasons

The seasonal changes also bring some changes to both our energy use and the energy production of the solar system. Some things to consider are

- We might need more water in summer than in winter.
- How we are going to heat and cool our home
- How we heat our hot water
- The extra daylight hours affect the use of lighting
- The extra daylight hours affect on solar system energy production

Appliance	Average Watts	Appliance	Average Watts
Refrige Air Con small	1000	Freezer 300L	150
Refrige Air Con med	2350	Freezer 450L	230
Refrige Air Con Large	3300	Dishwasher	2400
Refrige Air Con Ducted	5000	Electric Frypan	800
Evap Air Con Portable	150	Hair Dryer	1000
Evap Air Con Ducted	1000	Hot Plate small	1000
Bio septic System	80	Hot Plate large	2000
Bio Septic Pump	400	Oven Small	1800
Clothes Dryer	2400	Oven Large	2400
Coffee Machine	1450	Iron	600
Computer & Monitor	450	Range Hood	140
Laptop	50	Lights as per specs (LED)	15
Deep Fryer	1800	Microwave	1300
Pressure Pump 1hp	750	Kettle	1800
Pressure Pump 1.5hp	1150	Radio	60
Exhaust Fan	60	Stereo	100
Ceiling Fan	100	Sewing Machine	75
Fridge 500L	260	Toaster	600
Fridge 600L	400	Vacuum Cleaner	1100
LCD TV	200	Plasma TV	330
Washing Machine	900	Washing machine with element	2400
Slow Cooker	150	VCR DVD	100
Welder	2400	Power Tools	600
Electric Hot Water Small	1800	Electric Heater	2000
Pool Pump	1150	Saltwater Chlorinator	300