SO, WHAT MIGHT A GOOD SOLAR SET UP COST YOU:

These prices include GST and are as at Feb 10. Prices are subject to change and labour and consumables prices are estimates only and may vary depending upon the layout of your mobile home.

These scenarios are based on an existing and effective battery bank of 100-200 Amp hrs, conservative power consumption (25Amp Hrs/daily) and winter sun hours. If you have an electric fridge or high power needs, additional solar panels are recommended and/or extra recharging capacity (larger battery charger, alternator charging, or generator)

LONG WEEKENDER SET-UP (incl GST)

2.5 days away before battery is down to 50% (7+days in summer)

85W Solar Panel	$525.00
15Amp 3-stage Regulator	$214.00
Installation & Consumables	$450.00
	$1189 Estimate

REGULAR CAMPER SET-UP (incl GST)

5-7 days before battery is down to 50%., then, recharge for 24hrs and head back out again. (indefinite camping time in summer)

135W Solar Panel	$830.00
15Amp 3-stage Regulator	$214.00
12Amp Battery Charger	$350.00
Installation & Consumables	$650.00
	$2044 Estimate

YEAR ROUND FREEDOM CAMPER (incl GST)

8+ days before battery is down to 50%, then,, recharge overnight and head back out again (indefinite camping time in summer)

1x 135W & 1x85W Solar Panels	$1355.00
30Amp 3-stageRegulator	$295.00
25Amp 3-stage Battery Charger	$305.00
Installation & Consumables	$850.00
	$2805 Estimate

If your batteries require replacement :

AGM 12V100Amp Hr Battery	$359 each

WHAT ELSE MAY YOU LIKE TO CONSIDER:

Alternator recharging set-up	$500-$750
Honda Inverter/Generator	P.O.A.
Battery Monitor (TM2020) & shunt	$430.00
Fresh, grey & waste tank monitors	$305.00/set of 3

SEE US FOR:

- Specialist, custom-designed solar power systems
- Battery charging systems
- Electrical and wiring to mobile 'house' systems
- Parts supply, full installation, DIY
- Problem solving & troubleshooting
- New systems and upgrades to existing systems
- Alternator charging systems
- Parts warranties and 5 Year installation guarantees
- Reducing power consumption
- Energy audits and smart planning
- Accessories: fridges, TVs, SAT dishes, gauges

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www.absolutepowerltd.co.nz

We Guarantee:

To listen to what you want. To keep you informed about progress and budget. To pay attention to detail. To supply high quality equipment and service. To deliver a custom system which works well and meets your needs over the long term.

Steve & Veronica H.P

Solar Power

BY

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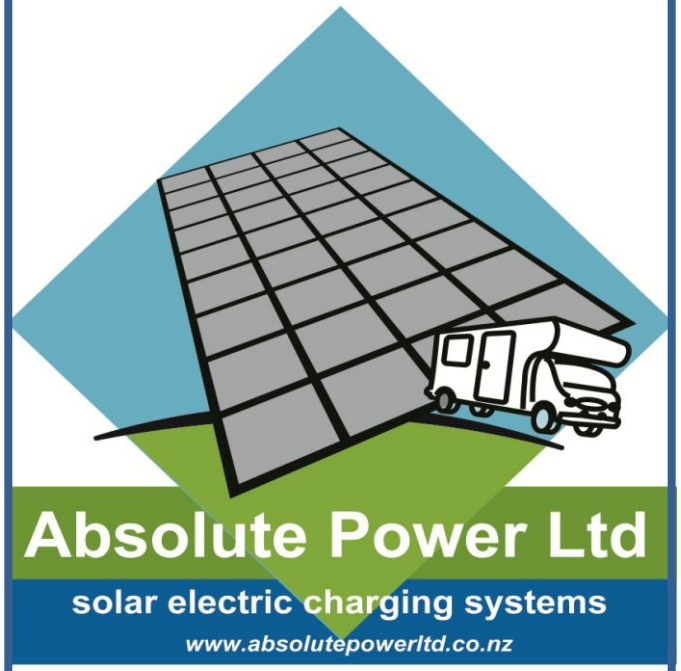

CONTACT US FOR SOLAR and more:

Battery Monitors	*D/Cycle Batteries*
Wiring & Electrics	*Energy Audits*
Alternator Charging	*Tank Gauges*
Inverters/converters	*LED lighting*
Petrol Generators	*Electric Fridges*
TVs, free-view boxes & Satellite Dishes	

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THE COMPONENTS OF A SOLAR POWER SYSTEM

SUNLIGHT
SOLAR PANEL/S (POWER INPUT)
SOLAR REGULATOR or CONTROLLER
BATTERY (POWER STORAGE)
APPLIANCES (POWER DRAIN)
RECHARGING

SUNLIGHT

When sun shines on a solar panel, the light is converted into electricity. Sunlight for solar power purposes is measured in sun hours. A sun hour is a cumulative total rather than a specific length of time. The duration of a sun hour is affected by our latitude, the weather, the season, etc.

On an overcast day in summer a solar panel can accumulate 1 sun hr even if the sun never breaks through. OR, on a very sunny day in the deep south a panel may accumulate only 2 sun hrs over a full day because the sun's rays are weak at that latitude.

In NZ (based on North of North Island figures) we average 3-4hrs sun hrs per day over the year, that's around 4.5sun hrs/day in spring/summer and 1-1.5 sun hrs/day in autumn/winter.

SOLAR PANELS

A solar panels' size is measured in Watts. The higher the Watts, the greater the panels capacity to gather power per sun hour.

EG. An 85W panel can collect 4 - 5 Amps per sun hour
A 125W panel can collect 7 - 8 Amps per sun hour

A Solar panels' performance is reduced by heat, shade or partial shade, rain, clouds, leaves and general grime. Peak performance comes from a clean panel in full sunlight.

SOLAR REGULATOR

Electricity from the solar panel is transferred through cables to a solar regulator and then on to the battery for storage. A good quality 3-stage regulator allows the battery to fully charge. Lesser regulators which operate at one set voltage only allow the battery to reach approx 75% full. When the battery is as full as the regulator can make it, it reduces the power so the battery isn't overcharged.

The size of the regulator is dictated by the total wattage of the solar panel/s. The more panels, the larger the regulator needs to be.

A 15 Amp Regulator can comfortably run a single 130W panel but it's too small for 2x130W panels.

Solar regulators can come with or without a meter. Meters show how much power is coming in, going out and what the battery voltage is – this indicates the battery's level of charge. This information allows for basic monitoring of the system performance and power consumption. Separate battery monitors with more complex functions can be used if a greater level of control of the system is required.

BATTERY

The storage capacity of a battery is measured in Amp Hours. Often 'house' batteries are set-up in a 'bank', a number of batteries working together .

The 'engine or start' battery is quite separate from the 'house' battery and is expected to do quite a different job. 'House' batteries are deep cycle batteries. They perform best when they have relatively small amounts of power drained continuously and are recharged regularly. They work well with solar panels because the panels allow for very regular recharging.

To get the best life from 'house' batteries it's recommended they're not regularly drained of more than 50% of their available power.

A battery bank totalling 100Amp Hrs should not regularly be drained more than 50Amp Hrs before fully recharging.

In our opinion the most suitable 'house' batteries for mobile homes are AGM, sealed batteries. These require no messy maintenance or exposure to acids & chemicals, can be used in any position so its easier to fit them into a small space and they don't create any gases so they're safe to store inside under normal charging.

APPLIANCES

Transfer of electricity is never 100% efficient. All along the way from production to output there's electricity wasted. When making calculations allow for 20% power loss across the system.

Your appliances consume the power stored in your battery bank.

In simple terms, if you ran a 2Amp light for 20 hours it would use 40Amp/hrs of power.

Other examples of power use include:

- *Halogen light : 1Amps per hr of use(or 1 Amp/hr)*
- *Water pump : 5Amps per hr (running time 20 min/day)*
- *Electric fridge : 4 –6Amps per hr (running time 10-12hrs/day)*
- *TV & Decoder : 2-6Amps per hr (.7Amps/hr in standby mode)*

Depending upon the mobile home set-up, daily power consumption can range from 15 – 70Amps/day (or more).

If you drain more power than your solar panels collect you'll be operating in a deficit and your batteries will eventually need recharging or they'll go flat. The larger the deficit the more quickly your batteries will be emptied.

Eg. Joe has a 100Amp Hr battery and a 125W solar panel. With 3.5 sun hours per day he's adding 25Amp Hrs to his battery but he's draining 40Amp Hrs daily to run his various appliances. With a 15 Amp hr deficit daily it'll be 3 days before his battery gets down to 50% and needs to be fully recharged.

RECHARGING

Aside from power input from solar panels, batteries can be recharged by:

- Battery charger (with an AC power source)
- Alternator charging
- A generator (and a battery charger)

A battery charger is the simplest and most common form of recharging and the more Amps the charger is, the faster it will recharge the batteries. But, the charger size should be relative to the battery bank – It's best to stick with a charger that's' amp rating is 8-10% of the Amp Hr rating of the battery bank.

A 3-stage battery charger is best because it operates at the range of voltages which a battery needs to become fully charged. A single-stage charger runs at a single set voltage level so can only charge a battery to say 70-80% of capacity.

Alternator charging (via the engine) is a good option if you move on a regular basis but the vehicle usually needs to be modified for the system to work effectively. Standard alternator charging will allow the battery to charge to around 70% of capacity.

A generator's 12V outlet is not suitable for recharging 'house' batteries and needs to be used in conjunction with a 3-stage battery charger to be efficient and effective.