



OFF-GRID SYSTEMS



OFF-GRID ALTERNATIVE ENERGY SOLUTIONS FROM ECOGISE

MAKING THE DECISION TO GO OFF-GRID

The process of going off-grid can be quite daunting so ecogise offer a complete service with expert advice, experience and world class products to make it easier for you.

There are a number of reasons why people look at the option of going off-grid, for example:

- Environmental and sustainability reasons
- The desire to be independent
- Costs of \$15,000 and upwards of \$100,000 to get mains power supplied to their house
- High and ever-increasing power prices
- Unstable power supplies in some areas
- The prospect of power cuts.

DOES IT MAKE FINANCIAL SENSE?

The financial viability of going off-grid is greatly influenced by the cost of running mains power to your property's boundary. In our experience, when the mains power supply cost is around \$20,000 or more, an off-grid system is definitely a viable option and should be explored further. If you are unable to get power supplied to your boundary at all then it may be your only option.

WILL IT BE VERY DIFFERENT?

With ever increasing worldwide demand for sustainable energy sources, alternative energy is no longer the fringe technology it used to be. Because of this demand, more and more research and development has been done in this field, and the technology has advanced dramatically. People are now finding that living in an off-grid home is very much the same as being connected to the main grid.

The key thing is to be aware of your energy efficiency and the consumption demands of your household appliances. There is more information on ways to improve your energy efficiency on page 5 of this brochure.

Phone 0800 4 ecogise to talk to us today.

DOING THE MATHS

This is a simple calculation to show the viability of going off-grid, if you have been quoted \$15,000 or upwards to have the power connected to your home.

• Connection of power to your home:.....	\$15,000
• Your projected power costs over the next 10 years, using the national average consumption of 23Kwh p/day (Projected 7.5% increase over the next 10 years)	\$25,000
• Your fixed line charges over the next 10 years (Projected 4% increase over the next 10 years).....	\$ 4,320
TOTAL	\$44,320

Note: Not factored into this equation is the substantial value that having an off-grid power supply and not having to pay a monthly power bill adds to your home's desirability.

MAINTENANCE

Your maintenance requirements will depend on your individual system but in most cases they are very minimal. In general, maintenance requires keeping fuel in the generator topped up, the replacement of oil and filters in the generator, topping up fluid in the batteries and cleaning the surface of the solar panels from time to time.

Most components within the ecogise system have quite long life expectancy and warranties, for example:

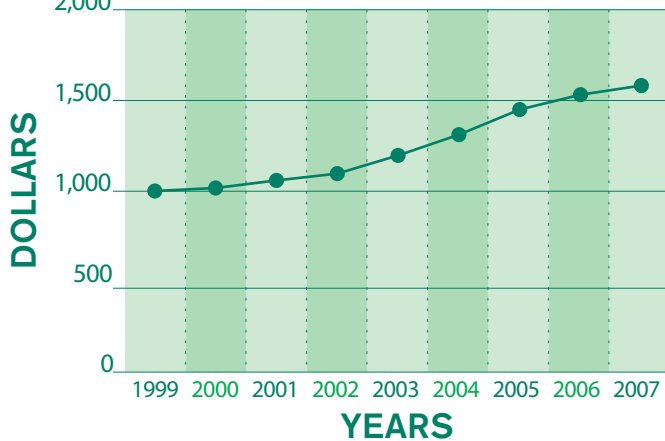
- Solar panels have a 25 year warranty
- Batteries have a 5 year warranty and life expectancy of over 15 years
- Solar water heating has a 10 year warranty and life expectancy of over 20 years
- Most other items have at least 2 year warranties and life expectancies of at least 10 years.

All products used by ecogise are top quality to ensure extended life, ease of use, reliability and ultimately customer satisfaction.

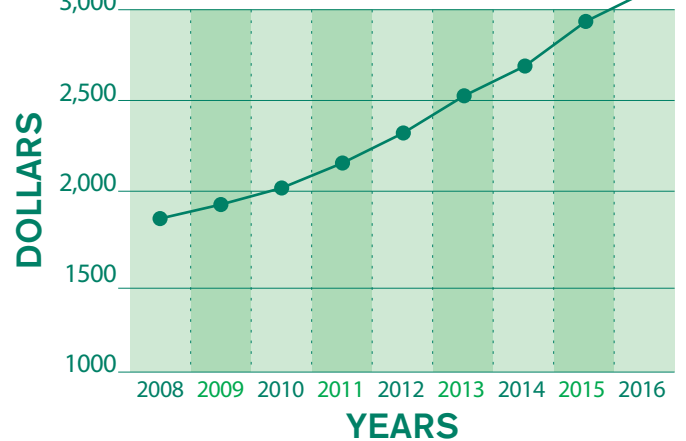




ANNUAL POWER PRICES
(based on the average 23Kwh p/day)



PROJECTED POWER PRICES
(based on the average 23Kwh p/day)



THE PARTS OF AN OFF-GRID SYSTEM EXPLAINED

ENERGY SOURCES

There are a number of methods to generate electricity:

- Photovoltaic (PV) solar panels
- Wind generation
- Micro hydro (from small streams)
- Fuel-driven generators.

Most areas will have sun available but only a few areas will have a stream or enough wind. Micro hydro generation is the most cost effective method, as it generates power 24 hours a day. Having assessed your site we can recommend the best way to go about generating your energy. We will commonly use at least one of the methods listed above in conjunction with a fuel driven generator back-up.

ENERGY BACKUP

The fuel driven generator is wired into the system with an automatic start up so whenever the system requires a top up from the generator it will start up itself. This gives you the reassurance that you will not run out of power and you can go about your lives as though you were connected to the main grid.

ENERGY STORAGE

The energy generated is stored in a battery bank, ready for use whenever it is required. The batteries used are specially designed to be discharged and charged regularly. We also size the battery bank to allow for a number of days without any generation, so we can ensure that you do not run out of power.

CONVERSION

The energy stored in the battery bank is usually 12 or 24V DC and this needs to be converted to 230V AC for use within the home. We install a high quality inverter that produces a pure sine-wave 230V AC that will power all your appliances, without causing damage. This inverter also doubles as a battery charger when the generator is started up. This can be programmed to happen automatically if there is a lack of power or you can start it manually when required.

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ENERGY GENERATION OPTIONS

Photovoltaic Solar Panels

In most cases we will use photovoltaic solar panels to generate the bulk of your energy requirements, unless you have good average wind or a stream available on your property. Photovoltaic solar panels generate electricity (unlike solar water heating panels that heat water travelling through the panel) which is then stored in batteries ready for use.

We supply a number of different brands of solar panels including Suntech, Mitsubishi Evergreen and BP. Each brand is similar in quality, and each has a 25 year warranty, so we would usually look at the best priced panel available at the time.

Wind Generators

In many locations around New Zealand there is not enough average wind flow to warrant installing a wind turbine. However when there is enough wind available, they can be very effective, generating energy day and night.

Most commonly we use the Whisper 900watt wind generator in domestic off-grid situations, but we do have a wide range of other units available depending on your requirements.

Micro Hydro

Generating energy via a small stream is usually the most cost effective method of renewable energy generation. This is because of the fact that it will generate energy 24 hours a day. If you have a stream available, we would need to take measurements from it to judge its suitability and potential energy output.

We custom build our own micro hydro units to a very high quality and use a specialist who has many years experience with small through to very large hydro systems.

Fuel Driven Generators

Generators are usually used to back up the renewable energy generation of your system. The amount of solar, wind or hydro energy available to you will vary at certain times of the year and under different weather conditions. Because of this we need to find a cost effective combination of renewable generation sources and fuel driven generator running time.

ecogise are a GDP (Generator, Diesel, and Pump) agent. We have a fantastic range of quality fuel driven generators available. Most commonly we supply 'Mase Generators' with either Yanmar or Ruggnerini diesel engines, and 'Honda Powered' petrol driven generators.

Batteries

Batteries are used to store the energy generated by your renewable energy sources, ready for use when required. We specify a battery bank with enough storage to last at least a few days without any energy generation, so that we can ensure your energy supply even in extended bad weather. We commonly use

Off-grid alternative energy system diagram



traction cell deep cycle batteries that last for at least 10-15 years and have the ability to be drained down to 20% of capacity. The lead acid cells can be easily maintained.

Inverters

Generated energy that is stored in the batteries is low voltage DC power that needs conversion to 230V AC power for use in your home. This is done with an inverter. It is important to use high quality pure sine-wave inverters that will produce pure power for all appliances without causing damage to them.

We use Outback inverters that are very good quality and double as a battery charger when the fuel-driven generator is running, to quickly boost the batteries in times of extended bad weather or high usage.

Monitoring

Digital monitoring equipment is fitted to ensure that you can monitor your system's performance and capacity at all times, for peace of mind.

Solar Water Heating

In many cases we recommend using solar water heating to heat your water, as using electricity will draw too much energy. Solar water heating can produce the bulk of your hot water requirements and a gas califont can be used to top up (usually only required in winter or times of high usage).

We manufacture our own solar water heating system that is New Zealand Standards approved and has been proven in New Zealand for over 25 years.

THE OFF-GRID SYSTEM DESIGN PROCESS MADE SIMPLE

HOW DO WE GET STARTED?

When designing an off-grid system to meet your requirements, there are a number of things to be taken into account, such as:

- The renewable resources available on your property
- The expected occupancy of your home
- Your year-round energy requirements
- Your ability to live energy-efficiently
- The design of your home
- Your budget
- The location of your property.

HOW DO WE PROCEED?

Contact ecogise and we will supply you with two basic worksheets to fill out. This will enable us to gather some of the required information.

Worksheet 1:

A site assessment form that gives us the details of the property's location, the number of people in the home, the house design and alternative energy sources in the area.

Worksheet 2:

An energy consumption calculator that works out the expected energy usage of your household items such as your fridge, TV, lighting and heating.

Once we have this information we can design and cost a system that meets your current or expected lifestyle requirements. We also ask to see some of your old power bills to get an idea of your present energy consumption and a copy of your building plans. ecogise can work with you to fill in these forms if required.

RECOMMENDATIONS

On most occasions a home connected to the main grid uses electricity to cook, heat the water, boil the jug, run alarm clocks and sometimes power electric heaters. When going off-grid we present a design to change the way these things are done, so that the amount of power required by way of alternative energy generation is kept to a minimum with minimal effect to your lifestyle.

Please contact us for more information.


info@ecogise.co.nz

IMPROVING YOUR ENERGY EFFICIENCY

Examples of ways to improve energy efficiency in everyday situations are listed below;

- Use eco bulbs for lighting. A standard 100 watt bulb is equivalent to a 20 watt eco bulb and therefore you use about a fifth of the power. NOTE: Eco bulbs should be recycled properly and not put into landfills.
- The fridge and freezer are important factors in energy usage as they run 24 hours a day. If you do not already have an energy efficient fridge and freezer this would be the time to invest in one. We can supply a number of different models and brands of fridges and freezers that are very efficient and will work well with an off-grid system.
- For cooking we would recommend using LPG, as an electric stove will draw a huge amount of energy. Most chefs use LPG for cooking and you can boil the jug with it as well. The general rule is that anything that uses electricity to heat will draw too much energy.
- For all other appliances i.e. washing machines, vacuum cleaners etc care should be taken when purchasing to get energy efficient products where possible.
- We would suggest not purchasing a dish-washer as this is an unnecessary consumer of valuable energy. However, if you do want one, buy the most efficient model available. If you can find one that does not heat the water internally, but uses hot water from the water cylinder, this would be preferable.
- For heating the household water we would advise using solar water heating in most situations. We have our own NZ made system that we can incorporate into your off-grid system. This will be topped up with LPG in times of extended bad weather and/or high usage.





An example of an ecogise solar collector, custom designed to fit the curve of this roof.

Your grandchildren will thank you!

As alternative energy solutionists, we combine our passion for the environment with a vast array of practical alternative energy and electrical knowledge to advise, create and install an energy system that will meet your needs, and just as important, match your budget.



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