

ALTERNATIVE POWER

SYSTEM EXAMPLES

The system examples on the following pages are indicative system examples only.

Generally, an alternative power system is designed specifically to suit the requirements of every individual client. These system examples will give you an idea of what loads and appliances are able to be run with which equipment.

The systems have been calculated using winter sunshine hours for the North Island of New Zealand, and 3 days storage for the batteries.

Systems 5 and 6 incorporate a small Wind Turbine to augment the solar panels. A good wind site with clear air flow (no turbulence) and a minimum average annual wind speed of at least 9 miles per hour (4.0 meters per second) is necessary.

Pages 10 and 11 show three schematic examples of solar power systems.

Independent Power stocks a wide range of products, and we can offer many different solutions for your Alternative Power System.

We have a nationwide Dealer network who offer on-site visits and evaluations, and quotations for systems to suit each individual site.

Please contact us for further assistance or for details of your nearest Dealer.

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SYSTEM EXAMPLE 1

SMALL SOLAR DC ONLY

Load / Appliance	Qty	Watts	Hours/Day	Watthours/Day
DC Lights 11watt	2	11	5	120
DC Lights 7 watt	2	7	1	14
DC Radio / DVD player	1	18	3	54
			Total	188

Main System Components:

1 x 80 watt Solar Module

1 x 10amp Regulator

1 x 80ahr Battery

Also required for a complete system:

Mounting for solar panel, Cabling, Fuses/Circuit breakers etc

SYSTEM EXAMPLE 2

SMALL SOLAR DC ONLY

Load / Appliance	Qty	Watts	Hours/Day	Watthours/Day
DC Lights 11 watt	2	11	5	120
DC Lights 7 watt	2	7	1	14
DC Radio / DVD player	1	18	3	54
DC Television	1	36	3	108
DC Water Pump	1	50	0.5	25
			Total	321

Main System Components:

2 x 80 watt Solar Modules

1 x 15 amp Regulator

2 x 80ahr Batteries

Also required for a complete system:

Mounting for solar panels, cabling, fusing/circuit breakers, battery link etc

SYSTEM EXAMPLE 3

SMALL SOLAR DC/AC

Load / Appliance	Qty	Watts	Hours/Day	Watthours/Day
DC Lights 11 watt	2	11	5	120
DC Lights 7 watt	2	7	1	14
DC Radio / DVD player	1	18	3	54
DC Television	1	36	3	108
DC Water Pump	1	50	0.5	25
Vacuum Cleaner	1	600	0.2	120
Washing Machine	1	700	0.2	140
* Total includes inefficiency for DC to AC Inverter			Total*	645

Main System Components:

4 x 80 watt Solar Modules
1 x 30 amp Regulator
1 x Battery Monitor c/w 100amp shunt
2 x 200ahrs Batteries = 400ahrs@12VDC
1 x 1300watt 12VDC Inverter/Charger
1 x System Display and Controller

Also required for a complete system:

Mounting for solar panels, grounding/lightning protection, fuses/circuit breakers. Battery links, inverter to battery cables etc.

Recommend a back up Inverter Generator to provide power should there be insufficient sunshine, or if larger loads need to be used

SYSTEM EXAMPLE 4

MID SIZE SOLAR DC/AC

Load / Appliance	Qty	Watts	Hours/Day	Watthours/Day
DC Lights 11 watt	2	11	5	120
DC Lights 7 watt	2	7	1	14
DC Radio / DVD player	1	18	3	54
DC Television	1	36	3	108
DC Water Pump	1	50	0.5	25
Vacuum Cleaner	1	600	0.2	120
Washing Machine	1	700	0.2	140
Microwave	1	1200	0.2	240
Refrigerator Gram KS360	1			620
* Total includes inefficiency for DC to AC Inverter			Total*	1218

Main System Components: 24 VDC system

- 4 x 180watt 24VDC Solar Modules
- 1 x 60amp MPPT Solar Controller
- 1 x Battery Monitor c/w 100amp shunt
- 4 x 245ahrs Batteries = 490ahrs@24VDC
- 1 x 2000watt 24VDC Inverter/Charger
- 1 x System Display and Controller

Also required for a complete system:

Mounting for solar panels, grounding/lightning protection, fuses/circuit breakers. Battery links, inverter to battery cables etc.

Recommend a back up Inverter Generator to provide power should there be insufficient sunshine, or if larger loads need to be used

SYSTEM EXAMPLE 5

MID SIZE SOLAR/WIND DC/AC

Load / Appliance	Qty	Watts	Hours/Day	Watthours/Day
Solagen DC Lights 11-SS-12	2	11	5	120
Solagen DC Lights 7-DL-12	2	7	1	14
DC Radio / DVD player	1	18	3	54
DC Television	1	36	3	108
DC Water Pump	1	50	0.5	25
Vacuum Cleaner	1	600	0.2	120
Washing Machine	1	700	0.2	140
Microwave	1	1200	0.2	240
Refrigerator Gram KS360 354Lt	1			620
* Total includes inefficiency for DC to AC Inverter			Total*	1218

Main System Components: 24 VDC system

- 1 x Air Breeze 24VDC Regulated Wind Turbine
- 1 x 180 watt Solar Module
- 1 x 15amp 12/24VDC Solar Regulator
- 1 x Battery Monitor c/w 500amp shunt
- 4 x 245ahrs Batteries = 490ahrs@24VDC
- 1 x 2000watt 24VDC Inverter/Charger
- 1 x System Display and Controller

Also required for a complete system:

Mounting for solar panels, grounding/lightning protection, fuses/circuit breakers. Battery links, inverter to battery cables etc.

Recommend a back up Inverter Generator to provide power should there be insufficient sunshine, or if larger loads need to be used

A wind site having an average wind speed of 10mph (4.4m/s) is required for this system

SYSTEM EXAMPLE 6

MID SIZE SOLAR/WIND DC/AC

Load / Appliance	Qty	Watts	Hours/Day	Watthours/Day
Fluorescent Lights	4	20	4	320
Fluorescent Lights	2	11	2	44
Stereo	1	20	3	60
Television	1	50	3	150
Water Pump	1	375	0.5	188
Vacuum Cleaner	1	600	0.2	120
Washing Machine	1	700	0.2	140
Microwave	1	1200	0.2	240
Gram Refrigerator/Freezer KF310-01 178/133Lt	1			948
* Total includes inefficiency for DC to AC Inverter			Total*	2210

Main System Components: 24 VDC system

- 1 x Air Breeze 24VDC Regulated Wind Turbine
- 2 x 180 watt Solar Modules
- 1 x 15amp Solar Regulator
- 1 x Battery Monitor c/w 500amp shunt
- 12 x 2 volts cells = 692ahrs @24VDC
- 1 x 2000watt 24VDC Inverter/Charger
- 1 x System Display and Controller

Also required for a complete system:

Mounting for solar panels, grounding/lightning protection, fuses/circuit breakers. Battery links, inverter to battery cables etc.

Recommend a back up Inverter Generator to provide power should there be insufficient sunshine, or if larger loads need to be used

A wind site having an average wind speed of 112.5mph (5.4m/s) is required for this system

SYSTEM EXAMPLE 7

LARGE SOLAR AC

Load / Appliance	Qty	Watts	Hours/Day	Watthours/Day
Fluorescent Lights	4	20	4	320
Fluorescent Lights	2	11	2	44
Stereo	1	20	3	60
Television	1	50	3	150
Water Pump	1	375	0.5	188
Vacuum Cleaner	1	600	0.2	120
Washing Machine	1	700	0.2	140
Microwave	1	1200	0.2	240
Gram Refrigerator/Freezer KF350-01 238/111Lt	1			972
Iron	1	1200	0.3	360
Toaster	1	1000	0.2	200
* Total includes inefficiency for DC to AC Inverter			Total*	3036

Main System Components: 24 VDC system

- 7 x 180watt 24VDC Solar Modules
- 1 x 60amp MPPT Solar Controller
- 1 x Battery Monitor c/w 500amp shunt
- 12 x 2 volts cells = 692ahrs@24VDC
- 1 x 3000watt 24VDC Inverter/Charger
- 1 x System Display and Controller

Also required for a complete system:

Mounting for solar panels, grounding/lightning protection, fuses/circuit breakers. Battery links, inverter to battery cables etc.

Recommend a back up Inverter Generator to provide power should there be insufficient sunshine, or if larger loads need to be used

SYSTEM EXAMPLE 8

LARGE SOLAR AC

Load / Appliance	Qty	Watts	Hours/Day	Watthours/Day
Fluorescent Lights	4	20	4	320
Fluorescent Lights	2	11	2	44
Stereo	1	20	3	60
Television	1	75	3	225
Water Pump	1	375	0.5	188
Vacuum Cleaner	1	1000	0.2	200
Washing Machine	1	700	0.2	140
Microwave	1	1200	0.2	240
Gram Refrigerator/Freezer KF350-01 238/111Lt	1			972
Elcold Chest Freezer EL21XLE 227Lt	1			748
Iron	1	1200	0.3	360
Toaster	1	1000	0.2	200
Electric Kettle	1	1500	0.2	300
Clothes Dryer	1	2000	0.2	400
Power Tools	1	1200	0.1	120
* Total includes inefficiency for DC to AC Inverter			Total*	4900

Main System Components: 24 VDC system

- 11 x 180 watt 24VDC Solar Modules
- 1 x 80amp MPPT Solar Controller
- 1 x Battery Monitor c/w 500amp shunt
- 12 x 2 volts cells = 1150ahrs @24VDC
- 2 x 2000watt 24VDC Inverter/Chargers
- 1 x System Display and Controller
 - 1 x FW500DC
 - 1 x FW500AC
 - 1 x HUB 4
 - 1 x FW-MP

Also required for a complete system:

Mounting for solar panels, grounding/lightning protection, fuses/circuit breakers. Battery links, inverter to battery cables etc.

Recommend a back up Inverter Generator to provide power should there be insufficient sunshine, or if larger loads need to be used



