

THE RENEWABLE ENERGY SPECIALISTS

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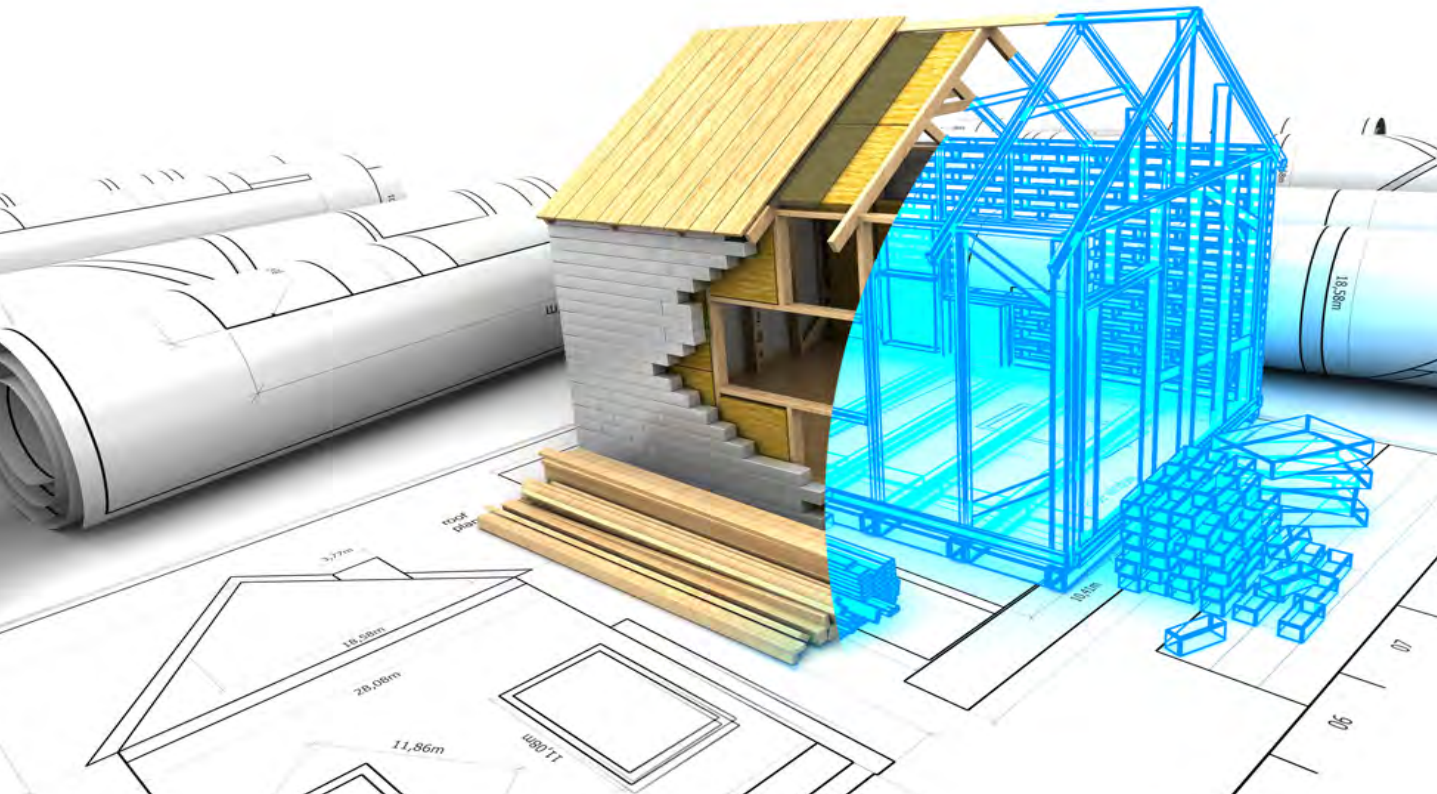


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Self-Build and Homeowners

**SUSTAINABLE
LIVING, GREEN
HOMES AND
SAVING MONEY**



THE RENEWABLE ENERGY SPECIALISTS



ABOUT OPC ENERGY LTD

At OPC we will provide a full Design, Supply, Installation and Commission service, our aim is to provide a solution that satisfies the clients expectations regarding the quality of product and service and which also meets the budget! Our expertise spans the full range of renewable technologies and also some of the traditional heating solutions as listed below.

- **Air Source Heat Pumps (ASHP)**
- **Ground Source Heat Pumps (GSHP)**
- **Solar Photovoltaics (PV)**
- **Battery Storage Systems (BSS)**
- **Infra Red Heaters or Electric Heaters**

Our commitment to our customers is to provide the right solution for any given project, we work with a number of manufacturers and we will always find the most suitable technology and installation so that it meets or exceeds the expectations that you will have. OPC have worked closely with Homeowners, Architects, Developers and Housing Associations, this has provided us with the required experience, practical knowledge and the technical expertise to deliver a project whether it is a single heat pump for a domestic dwelling, a district heating system for a block of flats or even a Solar PV Farm. We are fully accredited and compliant with all industry standards which ensures that all of our solutions meet the required design criteria so that our customers can feel confident in the product and services that we are providing.



We are proud to be MCS Certified:
Giving you confidence in home-grown energy



THE RENEWABLE ENERGY SPECIALISTS



TECHNOLOGY OVERVIEW



Ground Source Heat Pumps (GSHP)

Using the stored solar energy in the ground, GSHP's are an extremely efficient and effective way to provide all of the heating and hot water all year round.



Air Source Heat Pumps (ASHP)

A very efficient, alternative source of energy for your heating and hot water requirements. The heat pump extracts renewable heat from the air outside.



Under Floor Heating (UFH)

UFH is an alternative heating distribution system to radiators. Or, it can be used in addition to radiators, for example radiators upstairs and UFH downstairs. UFH works extremely well with the lower flow temperatures you get with a heat pump.



Solar Photovoltaic (PV)

Capture the sun's energy using photovoltaic cells, the cells convert the sunlight into electricity that can be used around your home.



Battery Storage (BSS)

OPC can provide you with a battery storage system to work with your solar PV. Saving you money and providing back-up power when needed.



GROUND SOURCE HEAT PUMPS

HOW A HEAT PUMP WORKS

In principle, a heat pump works like a refrigerator, only in reverse. A heat pump receives its energy from a heat source, this could be from the ground, the air or from water. The heat pump captures this low grade heat energy, works it through the refrigeration cycle and then releases the heat at a much higher temperature on the heating side.

Touch control PicoEnergy Touch panel AP420



Using PicoEnergy's sophisticated touchscreen controller OPC are able to set up the system to exactly how you would like it to be.



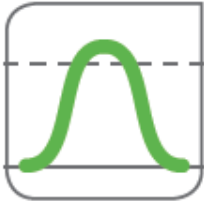
A Ground Source Heat Pump uses the solar energy stored in the ground. This solar energy is available at any time. Day or night, summer or winter and it is unlimited as it constantly renews itself. Due to the relatively constant ground temperature, the earth is a particularly good heat accumulator. Starting at a depth of approx. 1m only very little temperature fluctuations occur, no matter how cold it is outside. We use either a straight collector which is a large straight pipe system that is laid about 1m below ground, a 'Slinky' which is a coiled pipe system also 1m below ground or a geothermal probe, via deep drilling into the ground. The boreholes are typically 50m to 200m deep, borehole drilling is a more expensive solution but is suitable where there isn't much land available.



GROUND SOURCE HEAT PUMPS



FEATURES & ADVANTAGES



INTELLIGENT POWER CONTROL

The PicoEnergy Power Inverter is a true innovation in the field of heat pump technology. The principle is very simple: The inverter adjusts the energy used to the actual needs of your home. The efficiency is thereby improved by approximately 20% and the life span of the compressor is prolonged due to significantly less switch-on/off cycles.



NEW INJECTION TECHNOLOGY

The Pico Heat pumps contain the latest in injection technology from years of designing next generation heat pumps.



SMART GRID

PicoEnergy heat pumps are already "Smart Grid Ready". Although Smart Grid is not yet available in the UK you can be assured that when it does come your heat pump will be ready to work with this function.



INTERNET INSIDE

All PicoEnergy heat pumps are equipped with the technology of "Internet Inside". This allows you as a customer or OPC as your installer to control your heat pump from your mobile phone, tablet or remotely.



GROUND SOURCE HEAT PUMPS



FEATURES & ADVANTAGES



SYSTEM INTEGRATION

The integration of a photovoltaic system or house management system are possible thanks to the intelligent controls of the heat pump. OPC will ensure that your photovoltaic system is integrated to give you the maximum benefit from the electricity produced by your array before the electricity is exported to the grid.



SYSTEM DESIGN

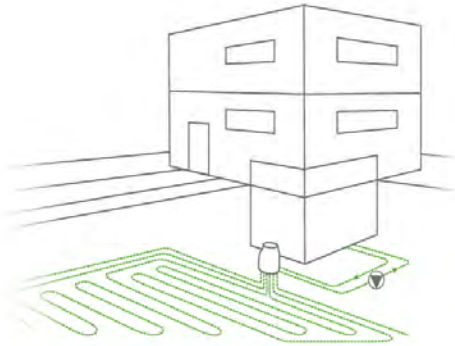
Even the best heat pumps are only as good as the system design, here at OPC we have the expertise to design your system so that you get the maximum benefits and efficiency from it.



GROUND SOURCE HEAT PUMPS

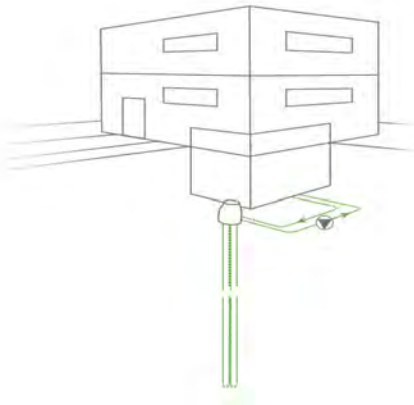


ENERGY SOURCE - GROUND COLLECTOR



The ground within your property is a free and inexhaustible source of energy. Thanks to sun, rain and geothermal energy, your garden is always recharged and the stored energy is available year-round, free of charge. Straight or slinky pipe are installed as a horizontal pipe system in the ground, which is laid in a similar way as an UFH system in snakes at a depth of approx. 1m. The required collector area depends on the heat demand of the building and the thermal conductivity of the soil. For an average single-family new building, it is about one and a half times the heated living space.

ENERGY SOURCE - DEEP DRILLING GEOTHERMAL PROBE



In the case of geothermal probes, a non toxic anti-freeze (glycol) circulates round the 32-40mm HDPE pipes in a closed circuit to collect the heat. A geothermal probe requires only a small area of land from your garden. From a depth of 1 meter, the temperature of the soil is almost constant all year round, and is therefore unaffected by seasonal fluctuations, the geothermal probe is very effective especially in winter at low temperatures. The necessary length of the probe required is dependent upon the size of your home.



GROUND SOURCE HEAT PUMPS



ADVANTAGES

- Intelligent power control
- The most innovative and efficient heat pump on the UK market.



UrbanECO

GROUND SOURCE HEAT PUMP
2-6 kW

*control technology
Inverter technology
Latest overheating control
PV Self-consumption optimization
Advanced "Smart Grid" functionality
External systems can be integrated LAN interface in each heat pump Easy to use touch screen technology*

The PICO Energy UrbanECO is a 2 - 6kW Inverter driven GSHP, this heat pump is ideally suited to smaller properties. OPC have specified and installed over 450 of these heat pumps in district heating systems for tower blocks. It is also suitable for small domestic dwellings with a heat load of up to 5kW.



Performance Data*

Operating point	Comp. speed	Heating capacity	Cooling capacity	Rated Input	COP
W10/W35	72%	5,9	4,9	1,0	6,01
W10/W35	100%	8,6	7,0	1,6	5,36
W10/W55	100%	7,7	5,3	2,4	3,24
W10/W35	Minimal	3,7	3,0	0,7	5,19
W10/W55	Minimal	2,8	1,9	0,9	3,01

Climate: warmer	35°C	SCOP	6,69
		η_s	257
	55°C	SCOP	4,31
		η_s	178
Climate: average	35°C	SCOP	7,32
		η_s	290
	55°C	SCOP	5,13
		η_s	198
Climate: colder	35°C	SCOP	6,61
		η_s	291
	55°C	SCOP	4,66
		η_s	198



AIR SOURCE HEAT PUMPS



ECOAir Compact
AIR SOURCE HEAT PUMPS
2-17 kW

AIR SOURCE HEAT PUMPS

Air source heat pumps obtain the energy for heating your home and hot water from the ambient air outside.

OPC will design, install and set up your EcoAir heat pump to ensure maximum efficiency and low running costs.

The PicoEnergy ECOAir Compact is a 2-17kW ASHP, the EcoAir is one of the worlds quietest and most efficient ASHP's. **NEW REFRIGERANT R452B** - Aside from the improved performance estimated at 5-6%, the most important feature of refrigerant R452B is that it is 67% lower on the the GWP scale (Global Warming Potential) than most other heat pumps on the market.

Performance Data*

Operating point	Comp. speed	heating capacity	Cooling capacity	Rated Input	COP
A10/W35	33%	5,1	4,2	0,9	5,65
A7/W35	33%	4,8	3,9	0,9	5,18
A2/W35	52%	6,6	5,1	1,4	4,56
A2/W35	100%	11,8	8,7	3,1	3,84
A-7/W35	88%	8,0	5,5	2,5	3,24
A-7/W52	100%	9,0	5,3	3,7	2,45
A20/W55	Minimal	6,0	4,4	1,6	3,76

Climate: warmer	35°C	SCOP	5,26
		η_s	208
	55°C	SCOP	4,28
		η_s	168
Climate: average	35°C	SCOP	4,95
		η_s	195
	55°C	SCOP	3,82
		η_s	150
Climate: colder	35°C	SCOP	3,98
		η_s	156
	55°C	SCOP	3,49
		η_s	137



AIR SOURCE HEAT PUMPS

(Three Phase)



HOW TO SIMPLY AND EFFICIENTLY CONNECT WITH YOUR HEATPUMP

Due to "Internet Inside" Maintenance and error Diagnosis can be carried out quickly and easily remotely. Travel costs and time are eliminated when the system is set up for this function.

You can also control your heating system from anywhere in the world: Whether by smartphone, tablet or voice control allowing you to operate your heat pump remotely should you need to.

Performance Data*

Operating point	Comp. speed	Heating capacity	Cooling capacity	Rated Input	COP
A10/W35	33%	12,3	9,9	2,4	5,08
A7/W35	33%	11,9	9,3	2,5	4,70
A2/W35	67%	15,1	11,7	3,3	4,52
A2/W35	100%	18,7	13,9	4,8	3,93
A-7/W35	100%	14,6	10,1	4,5	3,24
A-7/W52	100%	13,3	7,4	5,9	2,26
A20/W55	Minimal	9,1	6,5	2,6	3,50

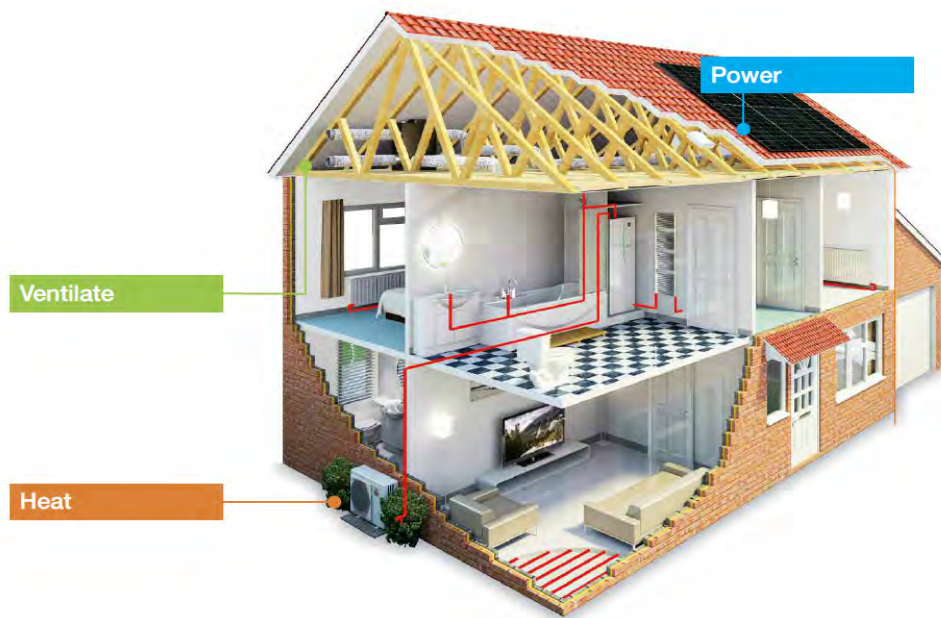
Climate: warmer	35°C	SCOP	-
		η_s	-
	55°C	SCOP	-
		η_s	-
Climate: average	35°C	SCOP	4,93
		η_s	190,7
	55°C	SCOP	3,84
		η_s	149,7
Climate: colder	35°C	SCOP	-
		η_s	-
	55°C	SCOP	-
		η_s	-



AIR SOURCE HEAT PUMPS



Why Air Source Heat Pumps are an ideal alternative to traditional heating: Recognised as a renewable technology by both UK and EU Governments, heat pumps provide an effective, energy efficient alternative to traditional heating systems. Modern ASHP's use advanced technology to heat homes and provide hot water using energy absorbed from the outdoor air. As perhaps the single most important renewable solution, heat pumps are an established, proven technology, supported by Government incentives, economically viable and flexible in their application for domestic heating.



ASHP's are suitable for both new and existing homes.

For space heaters such as heat pumps energy efficiency labels came into force in 2015, they will run from G (the lowest) to A+++ , with new classes being added in the future. The ultimate aim of energy labelling is that the lowest scoring products will eventually become obsolete.



OPC can provide ASHP's with an energy label between A++ to A+++



Renewable Heat Incentive

The Renewable Heat Incentive (RHI) is a UK Government scheme set up to encourage uptake of renewable heat technologies amongst householders, communities and businesses through financial incentives. It is the first of its kind in the world and the UK Government expects the RHI to contribute towards the 2020 ambition of 12% of heating coming from renewable sources.

What could I earn using RHI?

RHI cash payments are made quarterly over seven years. The amount you receive will depend on a number of factors - including the technology you install, the latest tariffs available for each technology and - in some cases - metering. You can estimate how much money you could earn through RHI using the Department for Business, Energy and Industrial Strategy's RHI payment calculator.

What technologies can I claim RHI support for?

- Ground to water heat pumps
- Air to water heat pumps
- Solar thermal panels (flat plate or evacuated tube only) providing hot water for your home
- Biomass (wood fuelled) boilers
- Biomass pellet stoves with integrated boilers providing space heating

Who can apply for RHI?

- Owner-occupiers, self-builders, private landlords and registered providers of Social Housing who have installed an eligible technology can apply for RHI support (provided they meet eligibility criteria).
- Single domestic dwellings are covered.
- RHI support is not available to new build properties (other than self-build projects).
- You must apply within one year of the commissioning date of your system.

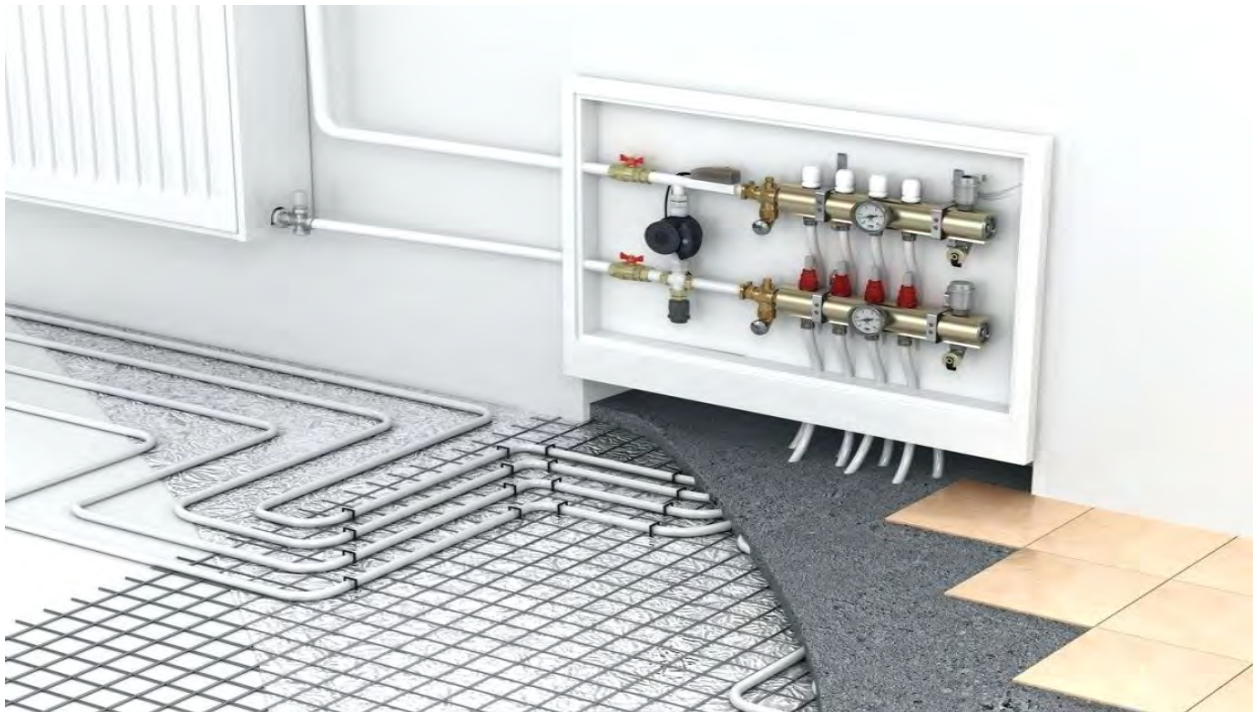


UNDERFLOOR HEATING

NEW BUILD AND RETROFIT



Wet underfloor systems are an increasingly popular method of primary heating and a great alternative to radiators. It makes the most sense to incorporate the underfloor heating at the new-build stage – it is quicker and cheaper to install at this stage, as well as offering the best heat output. However, for a variety of reasons, many homes are built without underfloor heating – this could be due to cost, specification or even awareness of the benefits over traditional radiator systems. Many UFH systems are considered once a home is already built. Traditionally underfloor heating has only been installed at the new-build stage, but with the introduction of a range of retrofit solutions, it is now possible to install UFH into existing houses.



With a water-based underfloor heating system, a series of pipes connected to your heat pump circulate warm water throughout the floor to heat the space, similar to radiators. The pipes will be connected to your heat source using a manifold (essentially a central system allowing all the pipes to work together) The bigger the system, the more pipes it will have and the more complex the manifold will be. The system will also be fitted to a thermostat (or thermostats, if you're having more than one zone) so that you can regulate the temperature throughout your home.



UNDERFLOOR HEATING



TYPES OF UNDERFLOOR HEATING



Screeded systems are the most popular and effective type of underfloor heating. Pipes are clipped or stapled onto an insulation layer, then the screed is laid on top. The warm pipes effectively heat up the whole slab, giving even and consistent heat output.

Suspended Systems are used for joisted or battened floors, we offer a range of plated solutions to suit each application. The aluminium plate either spans the joist or is fixed from underneath and supports the pipes as well as spreading heat for an even heat output.



Floating floor systems consist of UFH pipes laid directly into pre-grooved and foiled insulation boards, which can be laid directly onto the floor surface below.

Low Profile systems are ever-increasing in popularity as more people see the benefits of underfloor heating and want to add it to their property. These systems can be laid onto solid floor surfaces to provide an even heat output with minimal floor build-up.



SOLAR PHOTOVOLTAIC



Solar panel electricity systems, also known as **Photovoltaics (PV)**, capture the sun's energy using photovoltaic cells. These cells don't need direct sunlight to work – they can still generate some electricity on a cloudy day. The cells convert the sunlight into electricity, which can be used to run household appliances and lighting.



A natural sustainable source of energy, using the natural power of the sun you can harness this free and abundant energy to generate your own electricity.

How do solar panels (PV) cells work? PV cells are made from layers of semi-conducting material, usually silicon. When light shines on the cell it creates an electric field across the layers. The stronger the sunshine, the more electricity is produced. Groups of cells are mounted together in panels or modules that can either be mounted on your roof or on the ground. The power of a PV cell is measured in kilowatts peak (kWp). That's the rate at which it generates energy at peak performance in full direct sunlight during the summer.



BATTERY STORAGE SYSTEMS



US2000 series is an ideal solution for residential storage

OPC supply Pylontech battery storage solutions, pylontech have been manufacturing batteries for residential and commercial applications for the last 11 years, they are multiple generation batteries with excellent life cycles, quality and reliability..



Solar panel battery storage - battery storage for your solar panels will help reduce your electricity costs further. And if you find that you generate more energy than you can use and **store**, you can still sell the surplus back to the grid.

A battery storage system is a great addition to your solar installation, helping you make the most of the power you produce. You can monitor, optimise and precisely manage how you use the electricity generated by your PV system.



The batteries come in 2.4kW units and you can link up to 6 batteries (14.4kW) in a single cabinet. They are simple to stack with minimal installation time and cost.



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No obligation advice & estimates

Should you have a project and are considering introducing one or more renewable technologies that we offer at OPC, upon receipt of plans we can provide an initial no obligation design and estimate which will help you with an understanding as to what to expect as a financial outlay and financial return.

OPC pride ourselves on being able to provide factual information to our customers so that they are able to make an informed decision on any investment that they make, especially with regards to those technologies that are subsidised through government incentive programme's. We would encourage as much information on the project to be made available so that we can deal with the response quickly and accurately.

We look forward to offering you sound advice and helping you deliver your project

