

Domestic / Commercial



## Renewable Energy Technology & Electrical Installation

### Services include:

- Solar Photovoltaic
- Wind Turbines
- Solar Water Heating
- Heat Pumps
- Underfloor Heating
- Electrical Installation

[www.solidrenewables.com](http://www.solidrenewables.com)



## Reliable Service. Genuine Savings.



### Complete Peace of Mind

Solid Renewables uses only fully trained and accredited staff at all stages of the process, to ensure that our customers have complete confidence and peace of mind in the quality of our service and installations.



Thinking about installing renewable energy technology on your property? Looking for a local supplier who will offer you unbiased advice and a high quality installation, taking care to keep you informed every step of the way?

**Contact us today** for a free initial consultation, and discover how you can be earning income from your renewable technology investment, whilst reducing your carbon footprint.

### About Us

Solid Renewables offers a dedicated, personal service using only fully qualified and accredited staff – giving you confidence and peace of mind that all work carried out will be of a high standard and fit for purpose.

We will take the time to listen to your individual requirements and understand the unique challenges of each project, offering bespoke solutions and carefully explaining the potential cost benefits – set against installation costs – to enable you to make informed decisions.

As a small business which is not tied to any individual manufacturer, we can ensure that we can tailor our solutions to offer you maximum value for money every step of the way.

The same quality of service applies to both domestic and commercial installations, and covers the entire process from initial consultation and design, through to installation, commissioning and final handover. We'll be with you every step of the way.

### Why Solid Renewables?

- Small business offering flexible, personal service
- Extensive experience in the Renewable Energy sector
- We ensure that we use local suppliers and manufacturers where possible.
- We only use high quality products whilst remaining competitive.
- Our installation teams are all in-house, trusted, trained and qualified people.
- We are members of the Renewable Energy Consumer Code.
- We offer a complete turnkey service with all our installers, project managers and electricians.
- Bespoke options available
- All our work comes with a warranty and optional operations and maintenance contracts where required, which can include live monitoring of your system to spot problems before you even know they're there.
- Free Periodic Inspection and Testing on your existing electrical installation, for all PV customers

### Our Service

An initial consultation will enable us to fully understand our customers' individual requirements, after which we will be in a position to recommend a bespoke solution to fit in with your property and budget limitations.

You will be provided with a report clearly illustrating projected annual savings and income, set against up-front installation costs – enabling you to be comfortable with the decisions you make.

As with all Solid Renewables projects, we will keep you fully informed all the way through the design, installation, commissioning and handover process; using only fully qualified and accredited staff.

We aim to exceed our customers' demands and requirements and all contractors/staff have sound training to install our systems; every installation is undertaken to the highest standard.

### Finance options available

Solid Renewables have teamed up with a specialist provider for those customers that need financial support for their projects.

Renewable energy finance is an effective way of making the process more manageable for individuals, whilst for commercial customers it can help to secure your business's future whilst simultaneously reducing your company's environmental impact – improving your own finances for many years to come.

#### **Solid Renewables can arrange renewable energy assets finance for:**

- Biomass boilers
- Solar panels
- Wind turbines
- Ground-source heat pumps
- Combined heat and power boilers

# Solar Photovoltaic

Solar panel electricity systems, also known as solar 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.

## The benefits of solar electricity

- **Cut your electricity bills:** sunlight is free, so once you've paid for the initial installation your electricity costs will be reduced.
- **Get paid for the electricity you generate:** the government's Feed-In Tariffs pay you for the electricity you generate for 20 years.
- **Sell electricity back to the grid:** if your system is producing more electricity than you need, or when you can't use it, you can sell the surplus back to the grid.
- **Cut your carbon footprint:** solar electricity is green, renewable energy and doesn't release any harmful carbon dioxide or other pollutants. A typical home solar PV system could save over a tonne of carbon dioxide per year – that's more than 30 tonnes over its lifetime.

## Integrated solar roof tiles and slates

For systems where the user would prefer that the roof retains a 'traditional' look and feel, solar tiles are designed to be used in place of ordinary roof tiles. A system made up of solar tiles will typically cost around twice as much as an equivalent panel system, although you will save the money you would have spent on roof tiles or slates. Solar tile systems are not normally as cost-effective as panel systems, and are usually only considered where panels are not considered appropriate for aesthetic or planning reasons.

## Bespoke Service

- Optional In-Roof Solar tiles system, for better aesthetics
- Choice of full or part roof systems
- Suitable for facades, in addition to roofline
- Can be produced to exact dimensions, with option of triangle or rhomboid shaped panels
- Solid Renewables will size and design a scheme customised to your individual requirements, upon receipt of the basic information, providing a detailed, itemised quotation.



## Likely Costs

The average domestic solar PV system is 4kWp and on average costs between £5,000 and £8,000. Costs have fallen significantly over the last year. **Other factors that affect PV installation costs are:**

- The more electricity the system can generate, the more it costs but the more it could save.
- Larger systems are usually more cost-effective than smaller systems (up to 4kWp).
- PV panels are all around the same price per kWp, but PV tiles cost much more than a typical system made up of panels.
- Panels built into a roof are more expensive than those that sit on top.

## Expected Savings

A 4kWp system can generate around 3,700 kilowatt hours of electricity a year – roughly equivalent to a typical household's electricity needs. It will save nearly two tonnes of carbon dioxide every year.

If your system is eligible for the Feed-In Tariff scheme it could generate savings and income of around £750 a year, for 20 years. You will get paid for both the electricity you generate and use, and what you don't use and export to the grid.

When applying for FITs you will need to show evidence of your property's Energy Performance Certificate and this will affect what tariff you can get.

Visit [solidrenewables.com](http://solidrenewables.com) to use our instant quote calculator, to see the savings you could achieve.

## Ask us about Commercial Installations

### Costs v Savings

#### Estimated Savings on average domestic solar PV systems\*

Initial installation cost:  
**£5,000 - £8,000**

Average savings per year:  
**£750 inc VAT (Approx)**

Est. CO<sub>2</sub> savings per year:  
**1.8 tonnes**

\*Based on 4kWp System  
Estimates correct at time of press, according to latest Ofgen feed-in tariff rates. Subject to change. For latest rates, visit [www.ofgen.gov.uk](http://www.ofgen.gov.uk)





# Solar Photovoltaic *(cont.)*

## Off Grid

### **Solid Renewables off grid energy options for RE systems**

"Off-grid" means that you are not connected to an electricity grid or network. It is very common in rural areas where electricity companies have been unable to connect domestic, commercial, industrial and institutional consumers.

When planning for an off grid renewable energy system, it is vital to assess your specific requirements ... i.e. what appliances - lighting, heating, cooking, refrigeration, pumping etc - you want to power from the installation.

The power requirement of these functions must be determined, as well as their frequency of use (and in some circumstances the likely timing of their use, so that the peak requirement at any one time is known). It is necessary to carefully match the individual parts of the system - batteries, inverters, generators etc.

This process enables us to make the most efficient use of the energy available, and to have energy available at the time(s) it is needed.



## Categorising Energy Needs

When selecting your power system, you need to make several key decisions, with regard to the type of system required.

### **Decision 1:**

**One Central Energy System or Many Isolated Energy Systems/Appliances?**

### **Decision 2:**

**Electricity or non-electric power sources?**

### **Decision 3:**

**How much electric power do you need?**

### **Decision 4:**

**What are your power source options?**

**Hybrid System:** You can combine two or more technologies to make a more versatile system, commonly referred to as a "hybrid" system. For example, solar PV can be combined with a Petrol/Diesel generator set to run all the loads in a small institution. The PV system can run lighting loads, while the generator can be used to run heavier loads (pumps, x-ray, air-conditioning etc.) and to charge batteries when there is not enough sunshine. The same hybrid solution is often adopted for isolated rural wind generator systems.

### **Decision 5:**

**How will your systems be configured?**

What voltage will your equipment operate e.g. (12V DC or 120/240VAC)?

Do you require inverters?

### **Decision 6:**

**What energy system fits within your budget?**

### **Decision 7:**

**What are your organisational goals, capabilities and requirements?**

## Commercial Grid Connected

Our Solar Photovoltaic proposition also extends to large-scale roof mounted systems, ideal for offices, industrial units and public buildings. As with our other PV solutions, Solid Renewables will ensure all products and installations qualify for the relevant Feed-in-Tariff payment schemes to provide a healthy return on investment, as well as a reduction in the cost of electricity bills.

Solid Renewables offer turnkey installation of larger scale roof mounted solar PV, offering systems of 10kW - 250kW as standard and larger on request. The UK Government has chosen to maintain its support for

roof top solar PV while it is trying to discourage large-scale ground mounted equipment. This means it is still an attractive prospect, particularly on projects with high electricity demand during daylight hours.

These systems require DNO approval which will have a longer lead time and can have a charge attached as well, so contact us early to avoid any changes in the Feed in Tariff. Structural and site surveys are usually required, so Solid Renewables would conduct an initial feasibility before a full survey is conducted – but the return on investment can be up to 15% on these systems in the right areas and with an optimised angle.



# Solar Water Heating

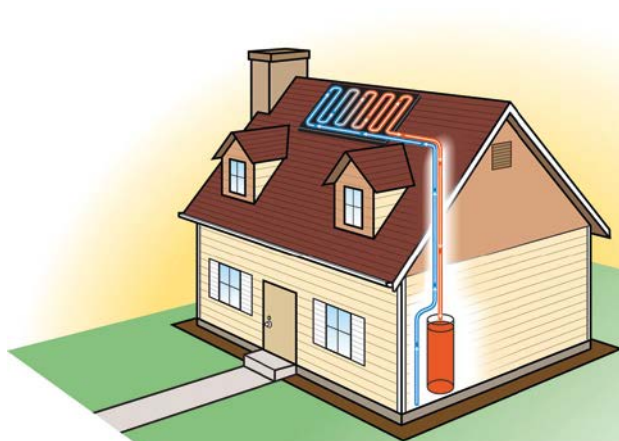
**Heat water for your home using energy from the sun.**

Solar water heating systems use free heat from the sun to warm domestic hot water.

A conventional boiler or immersion heater can be used to make the water hotter, or to provide hot water when solar energy is unavailable.

## The benefits of solar water heating

- **Hot water throughout the year:** the system works all year round, though you'll need to heat the water further with a boiler or immersion heater during the winter months.
- **Cut your bills:** sunlight is free, so once you've paid for the initial installation your hot water costs will be reduced.
- **Cut your carbon footprint:** solar hot water is a green, renewable heating system and can reduce your carbon dioxide emissions.



## How do solar water heating systems work?

Solar water heating systems use solar panels, called collectors, fitted to your roof. These collect heat from the sun and use it to heat up water which is stored in a hot water cylinder. A boiler or immersion heater can be used as a back up to heat the water further to reach the temperature you want.

**There are two types of solar water heating panels:**

- evacuated tubes
- flat plate collectors, which can be fixed on the roof tiles or integrated into the roof.

Larger solar panels can also be arranged to provide some contribution to heating your home as well. However, the amount of heat provided is generally very small and it is not normally considered worth while.



## Costs, savings and earnings

The cost of installing a typical solar water heating system is around £3,000 to £5,000 (including VAT at 5%). Savings are moderate - the system could provide most of your hot water in the summer, but less during colder weather – averaging at approximately 60% of your annual usage.

### Savings

Solar water heating systems can achieve savings on your energy bills. Typical savings from a well-installed and properly used system are £60 per year when replacing gas heating and £70 per year when replacing electric immersion heating; however, savings will vary from user to user.

### Earnings

With MCS certification, you will be able to receive payments for the heat you generate from a solar water heating system through the government's Renewable Heat Incentive, for 7 years.



## Costs v Savings

### Estimated savings with average domestic solar hot water system

Based on a typical average annual water heating consumption for a 3 bedroom house, of 2,159 kwh/year\*

Initial installation cost:

**£3,950 - £5,500** inc VAT

Annual savings on typical electricity bill (based on 14.05p / kwh\*\*):

**£182.00** inc VAT (Approx)

Annual payments recouped via Renewable Heat Incentive (RHI) at 19.51p/kwh\*\*\*:

**£252.70**

Total Est. Annual Savings / Earnings:

**£434.70**

\*Source: Thermal Solar Performance Energy Calculator Provided By MCS Installer.

\*\*Source: Energy Saving Trust, June 2015

\*\*\*Correct as of June 2015. Assumption 60% of Hot Water Consumption is covered by the Solar Thermal Installation and this is Subject To Location, Orientation, and Size of Installation

Ask us about  
Larger / Commercial  
Installations

# Heat Pumps

Solid Renewables offers solutions using air, ground or water source heat pumps. Heat pumps are simple to install, cost effective and offer outstanding energy efficiency. The technology offers a low carbon alternative to traditional boilers in modern buildings.



## The benefits of heat pumps - at a glance

Despite a number of heat pump misconceptions, there are many significant advantages of heat pumps ranging from reduced running costs and excellent efficiency gains to combining with other systems – such as Solar Photovoltaic (Solar PV), Solar Thermal and Underfloor Heating systems to provide even greater benefits.

### Below are just a few heat pump advantages for you to consider:

- Could lower your fuel bills, especially if you are replacing conventional electric heating
- Could provide you with an income through the government's Renewable Heat Incentive (RHI) for 7 years
- Could lower your home's carbon emissions, depending on which fuel you are replacing
- Don't need fuel deliveries
- Can heat your home and provide hot water
- Need little maintenance - they're called 'fit and forget' technology

## Ground Source Heat Pumps

We believe that heating systems using ground source heat pumps to provide all your hot water and heating needs (without requiring expensive, regular maintenance checks and which are safer than traditional, volatile, fossil fueled heating systems) are the future of heating in the UK.

### What are ground source heat pumps?

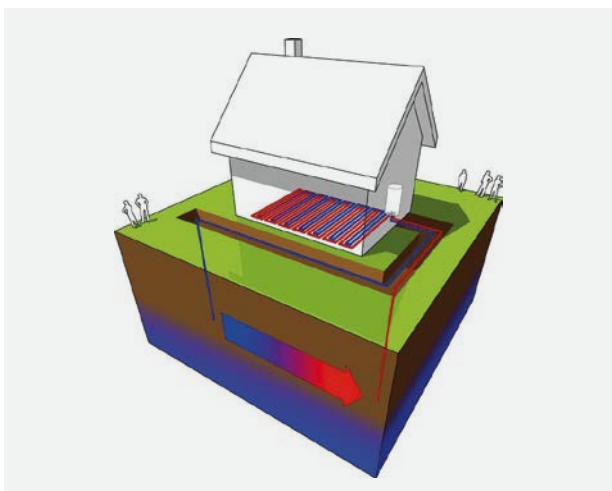
Ground source heat pumps are renewable energy products which use stored solar energy or 'ground source heat' to provide heating and hot water as an alternative to dangerous and expensive fossil fuels.

### How do Ground Source Heat Pumps work?

There are many heat pump misconceptions which can sometimes leave people feeling confused as to how ground source heat pumps work. However, put simply, this type of heating pump moves stored solar energy, sometimes referred to as ground source heat, into the home to provide a total solution for domestic hot water and all heating needs.

### Heat Pump Ground Collector

Different options are available for the installation of the pipework or Ground Loop which collects the stored solar heat used by heat pumps. These include Slinky and Straight Ground Loops, where the pipes are laid in trenches beneath the ground, or alternatively – when space is at a premium – there is the added option of using boreholes.



## Estimated Savings

### Estimated savings with average domestic heat pump system

Based on a typical average EPC report for a 3 bedroom house, of 11,750 kwh/year\*

Initial installation cost:

**Subject to site survey**

#### Ground Source

Annual payments recouped via Renewable Heat Incentive (RHI) at 19.10p/kwh\*\*  
(Assumption Maximum Flow Temperature Provided by the Heat Pump 50 Degrees -3 Star Rating, SPF = 3.4) :

**£1600.00** inc VAT (Approx)

#### Air Source

Annual payments recouped via Renewable Heat Incentive (RHI) at 7.42p/kwh\*\*  
(Assumption Maximum Flow Temperature Provided by the Heat Pump 50 Degrees -3 Star Rating, SPF = 2.7) :

**£560.00** inc VAT (Approx)

\*Source: EPC Report

\*\*Correct as of June 2015

## Air Source Heat Pumps

While ground source heat pumps offer greater efficiencies over air source heat pumps, the ground source solution is not for everyone, often due to space considerations or the required ground works for heat pumps. As a result, many people wrongly believe they are better off retaining their existing heating system. In fact, air source heat pumps can save you hundreds of pounds on your annual running costs, with minimal installation disruption.

### What are Air Source Heat Pumps?

Air source heat pumps are renewable energy products which extract heat from the air to provide a total solution for domestic hot water heat which can be distributed via underfloor heating systems, radiators.

It's worth remembering that to get the most efficiency from your heat pump, it pays to make your home as well insulated as possible. Less well insulated homes may not achieve the highest COP levels. COP levels will also depend on the emitter system (radiators, etc) installed.

# Heat Pumps *(cont.)*

## Exhaust Air Heat Pump (EAHP)

An Exhaust Air Heat Pump (EAHP) extracts heat from the exhaust air of a building and transfers the heat to the supply air, hot tap water and/or hydronic heating system (underfloor heating, radiators). This type of heat pump requires a certain air exchange rate to maintain its output power. Since the inside air is approximately 20-22 degrees Celsius all year round, the maximum output power of the heat pump is not varying with the seasons and outdoor temperature. The exhaust air heat pump can cope with a maximum of 4 KW heat load that correspond to 100 to 120sqm new build in accordance to building regulation.

### How do exhaust air heat pumps work?

Unlike a conventional heat pump, which converts energy from the ambient air, ground or water, exhaust air heat pumps recover the energy from the 'exhaust air', extracted from well-insulated, air-tight

homes, and use it for central heating and domestic hot water. Once the heat pump has extracted the energy it needs from the recovered warm stale air, the used cold air is released outside. Fresh air is then drawn back into the building to provide the property with sufficient ventilation – allowing for healthy buildings and residents and preventing issues like damp and mould.

### The energy contained within the exhaust air is influenced by three distinct factors:

- The natural temperature of the outside air entering the building via the wall vents
- Warmth added by the home's heating system (the exhaust air heat pump)
- Warmth added as a result of human activity and appliances within the home

## Underfloor Heating from Solid Renewables

Underfloor Heating is an ideal partner for heat pumps, combining to provide you with an efficient, low-temperature, cost-effective floor heating system.

Using the benefits of rising heat and lower flow temperatures to radiate heat to the floor surface, Solid Renewables provides an economical heating system working towards a better environment.

At Solid Renewables we provide a complete pipe layout, supply and install service, and using our experience in the field of heat pumps, we are able to combine systems to take advantage of low flow temperatures to maximise heat pump efficiency.

By choosing Solid Renewables as your underfloor heating partner, when installing a heat pump, you can be assured that in the unlikely event of any performance issues, we will work to achieve a fast and efficient solution. This avoids unnecessary

to-ing and fro-ing between organisations and ensures any problems are dealt with efficiently and professionally.

### Underfloor Heating Pipe Layout

The correct design of an underfloor heating system is absolutely vital to ensure your floor heating requirements are realised. At Solid Renewables we can design and specify the correct floor heating system for you.

We will provide you with bespoke CAD design drawings detailing your individual floor heating pipe layout, so any areas of additional heat loss will be identified at an early stage. The drawings are colour coded and encapsulated to suit site conditions.

Solid Renewables can ensure both systems (heat pump & UFH) ideally compliment each other, providing you with the best return on your investment in renewable energy systems.



## Why heat pumps? Your questions answered

### Using Heat Pumps to reduce running costs

One of the advantages of heat pumps is that because they move heat rather than creating it by burning oil or gas, they are much more efficient – with average savings of over 60% for ground source heat pumps and 40% for air source heat pumps. As a result, a heating system using heat pumps will provide a realistic return on investment over a much shorter period of time.

### Combating unstable oil prices

Oil prices are susceptible to large price hikes, particularly during the winter when you need your heating the most. Heat pumps totally remove this problem, providing cost-effective, reliable heating whenever you need it. Heat pumps also remove the dependency on unreliable fuel deliveries which can be further delayed during adverse weather conditions.

### Increased efficiency

The efficiency of heat pumps is beyond question. For every 4kW of heat moved into your house via ground source heat pumps, only 1kW of electricity is consumed. This gives a perceived efficiency of 400%, sometimes stated as a Co-efficient Of Performance (COP) of 4:1. In the case of air source heat pumps, you can expect a COP of 3:1 which, while slightly lower, is still a huge improvement on boilers which have only around 75% to 80% efficiency rates over their lifespan.

### Grant schemes for Heat Pumps

There are a number of renewable energy grants which you may be able to benefit from when installing heat pumps, including the Renewable Heat Incentive (RHI).

### No scheduled maintenance

Heat pumps are extremely reliable with minimal regular maintenance required. Our heat pumps have a planned life span of 25 years with no loss of efficiency, which again demonstrates one of the many advantages of heat pumps – especially when compared to boilers, which can lose up to 2% efficiency for each year of operation and have a usable life span of only around 12 years.

### Warranty

Manufacturers are able to provide 5 to 7 year parts and Solid Renewables provide 2 years labour warranty in all heat pump installations.

### Lower environmental impact

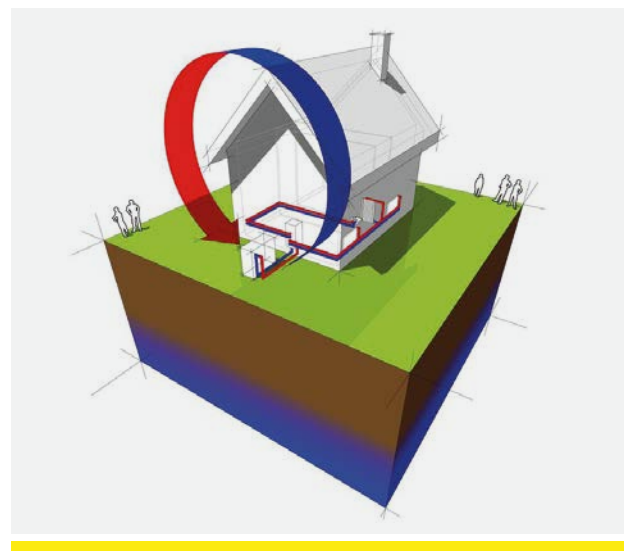
Coupling your heat pump to a green electricity supply such as solar photovoltaic (solar PV) and a battery bank system can provide your heating, hot water and electricity demands, with zero Carbon Dioxide emissions and a fully hybrid installation.

### The safety advantages of Heat Pumps

People often don't consider the dangers that conventional heating systems could pose, particularly as the systems age. Heat pumps can eradicate these issues as they don't use volatile or combustible substances.

### Low risk of accidents

Almost 150 people a year are killed by home explosions and carbon monoxide poisoning linked to faulty boilers. Heat pumps supplied by Solid Renewables are completely free from any contaminants which may cause harm to the environment, and they do not emit any noxious gasses which could harm you or your family.



# Wind Turbines

Wind turbines harness the power of the wind and use it to generate electricity, which can be fed into the national grid and generate a significant income through the UK Feed in Tariffs. Small wind turbines known as “microwind” or “small-wind” turbines can produce electricity to help power the lights and electrical appliances in a typical home.

In the UK only 0.5% of our electricity requirements are currently generated by wind power. Over the next few decades there are going to be significant investments into wind energy, with the continuation of the domestic and commercial Feed in Tariffs and large investment into wind farms.

Wind power varies greatly with wind speed and on an average day can fluctuate dramatically. Individual turbines vary in size and power output from a few hundred watts to two or three megawatts (as a guide, a typical domestic system would be 1 - 6 kilowatts, depending on the location and size of the home).

## Cost & Maintenance

Systems up to 1kW will cost around £1,500 whereas larger systems in the region of 2.5kW to 6kW would cost between £11,000 - £19,000 installed. These costs are inclusive of the turbine, mast, inverters, battery storage (if required) and installation. However, it's important to remember that costs always vary depending on location and the size and type of system.

MCS Certified Wind Turbines can have a life of up to 22.5 years but require service checks every few years to ensure they work efficiently. For battery storage systems, typical battery life is around 6-10 years, depending on the type, so batteries may have to be replaced at some point in the system's life.

The estimated costs are often quickly covered by Feed in Tariffs.

## There are two typical types of domestic wind turbine:

- Mast mounted: these are free standing and are erected in a suitably exposed position, often around 2.5kW to 6kW
- Roof mounted: these are smaller than mast mounted systems and can be installed on the roof of a home where there is a suitable wind resource. Often these are around 1kW to 2kW in size



# Electrical Installations

## Domestic Installation

We are Part P registered and qualified to undertake any alterations or new installation work inside or outside your home. As required, all electrical works undertaken must be certificated. Some electrical works around your home require registration by Law to your local building control office' Solid Renewables can undertake this for you with no extra charge.

### Our services include:

- Full or part Rewire
- Repairs & Maintenance
- External Security Lighting
- New Kitchen Installations
- New Bathroom Installations
- Electric Heating & Under Floor Heating Systems
- Landlord Electrical Safety Checks
- Pre House Sale Electrical Inspections
- Home Automation Systems Including Remote Heating Controls
- Home Networks
- Sky & Telephone Cabling
- Garden lighting & External Offices
- Fault Finding & Repair
- New builds
- Periodic Inspection & Testing



## Experience

The directors and all contractors at Solid Renewables have a wealth of experience of working on renewable energy projects as well as general building services.

We have successfully overseen, managed and commissioned numerous construction projects – including new builds, renovations and refurbishments – to meet a wide variety of customer specifications, in many different environments. His particular areas of interest and expertise is in renewable energy and electrical installations.

All designs are overseen by an experienced Mechanical Engineer with over 10 years industry experience, gained in both the domestic and commercial sectors.

Solid Renewables ONLY hires contractors with a proven track record of delivering successful projects on time and on budget to the highest of standards, with all the required industry-recognised qualifications and accreditations.

## Contact

Our installers cover all of London and the South East, including:

- Hertfordshire • Bedfordshire
- Essex • Buckinghamshire
- Berkshire • Middlesex • Kent
- Surrey • Oxfordshire
- Cambridgeshire

We can also handle overseas installations, subject to exact requirements.

Contact us today for further information, or to arrange your free, no-obligation initial consultation.

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