

The ultimate
solar + battery guide



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The smartest home energy upgrade

Why electricity and energy matter

Electricity costs have become one of the defining pressures on household budgets across Scotland. Whether you run a heat pump, charge an electric car, or simply want to keep the lights on without watching the meter, the price of electricity shapes daily life in ways that feel increasingly hard to ignore.

Solar photovoltaic (PV) panels change that picture. Fitted to your roof, they turn daylight into electricity you generate yourself, use yourself, and pay far less for. The technology is more reliable and more affordable than it has ever been, and solar has quietly become one of the most practical, high-return upgrades available to Scottish homeowners today.



A photograph of a house with a dark tiled roof covered in solar panels. The scene is set at sunset, with a bright orange and yellow sky and silhouettes of birds flying in the distance. A yellow rectangular box is overlaid on the upper part of the image, containing text. In the foreground, there are green conical evergreen trees.

Solar installations in
Scotland have grown by
over **200%** since 2016

Scotland is moving away from gas. Boilers are being phased out, the grid is getting cleaner, and homeowners are thinking carefully about where their energy comes from. Solar gives you a degree of energy independence that most people have never experienced before. With generous Scottish Government support available, getting started is more accessible than you might expect.



How does solar PV work?

Solar panels do not need blazing sunshine. They work on daylight, the diffuse light that fills a Scottish day even when the sky is grey. That is an important point, and one that consistently surprises homeowners who have assumed solar is a technology built for sunnier climates.

The process is elegant. Each panel is made up of photovoltaic cells: layers of semiconductor material, usually silicon, that react to light. When photons strike the cells, they knock electrons loose and create a flow of electricity. That electricity is direct current (DC), the same kind a battery produces.



Your home runs on alternating current (AC), the type that comes from your wall sockets. An inverter, typically installed in the loft or utility room, converts the DC electricity from your panels into AC your home can use. Think of it as a translator: the panels speak one language, your kettle and washing machine speak another, and the inverter bridges the two.

Any surplus electricity your panels generate is exported to the grid automatically. With battery storage, it gets held back for later use.

Output depends on system size, roof orientation, and the time of year. Scottish summers can be genuinely impressive: long days and reasonable solar radiation mean a well-sized system can cover a significant proportion of your annual electricity needs, even at this latitude.



Solar panels work even on cloudy Scottish days, generating electricity all year round



What does a solar system include?

A solar PV system is more than a row of panels on a roof. Several components work together to turn daylight into usable electricity and make sure your home gets the full benefit.

Solar Panels: Typically monocrystalline silicon, these are the cells on your roof that convert daylight into DC electricity, performing well even in lower-light Scottish conditions.

Inverter: Converts DC electricity from your panels into AC electricity for your home; a hybrid inverter also connects to a battery, making it the smarter choice if storage is on your radar.

Generation Meter: Records how much electricity your system produces, a requirement for export tariff schemes and a useful tool for tracking performance over time.

Consumer Unit Connection: Your system connects directly to your home's fuse board so solar electricity flows straight into your circuits, with all grid notification handled by your installer.



A well-designed system is more than just panels on a roof. Every component plays a role in how well your home performs





Battery Storage and Diverters

Generating your own electricity is a strong start. Making the most of every unit you generate is where the real returns come from. Solar panels produce the most electricity in the middle of the day, often when a home is at its quietest. Without a way to store or redirect that surplus, much of it flows to the grid for a fraction of what it would cost to buy back later.

Battery storage and solar diverters are two practical ways to change that.

Battery Storage

A home battery stores the surplus your panels generate during the day so you can draw on it in the evening, overnight, or on days when generation is lower. This is the most effective way to increase self-consumption: the proportion of your own solar electricity that you actually use rather than export.

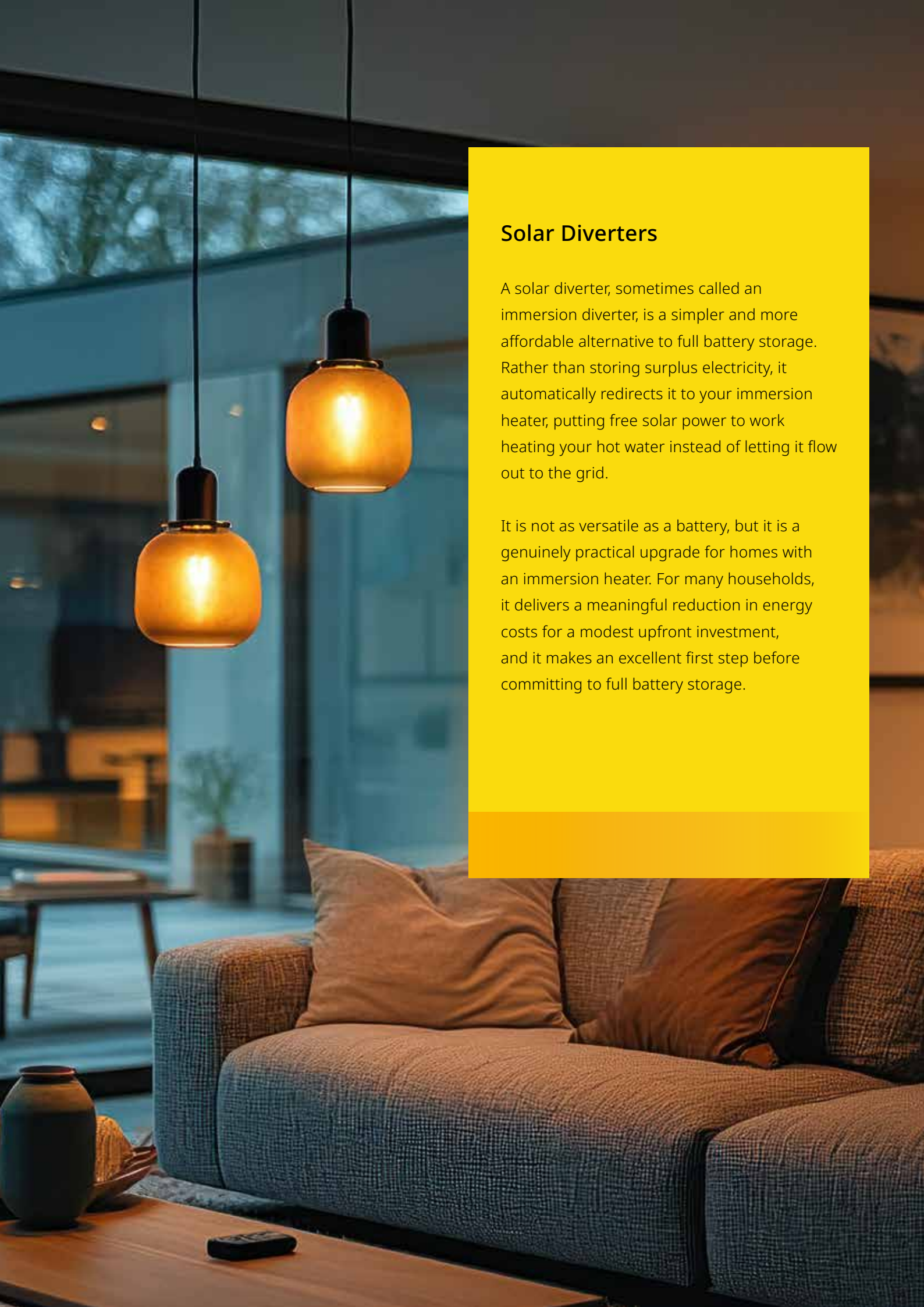
Modern home batteries are compact, safe, and increasingly affordable. They can also be paired with off-peak electricity tariffs such as Octopus Go, which allow you to charge your battery from the grid at a cheaper overnight rate, a useful backstop during the shorter days of a Scottish winter.



Homeowners with battery storage can use up to

70 - 80%

of the electricity their panels generate,



Solar Diverter

A solar diverter, sometimes called an immersion diverter, is a simpler and more affordable alternative to full battery storage. Rather than storing surplus electricity, it automatically redirects it to your immersion heater, putting free solar power to work heating your hot water instead of letting it flow out to the grid.

It is not as versatile as a battery, but it is a genuinely practical upgrade for homes with an immersion heater. For many households, it delivers a meaningful reduction in energy costs for a modest upfront investment, and it makes an excellent first step before committing to full battery storage.



Keep the lights on, even when the grid goes off

Smart gateways and backup systems help your home ride out power cuts and make the most of every unit your panels produce. They sit between your solar, battery, and the grid, quietly keeping everything running smoothly in the background.



Smart gateways: the brains of your system

A smart gateway is the control centre that coordinates how your solar panels, battery, and the grid work together. It decides where your electricity goes, prioritising your home's needs and helping you get maximum value from every kilowatt-hour you generate.

With the right gateway, your system can automatically charge your battery at the cheapest times, power your home from stored solar when prices are higher, and prepare for periods of bad weather or higher demand.

Backup power for essential circuits

Some solar and battery systems can be set up to keep key parts of your home running during a power cut. Instead of the whole house going dark, your battery can automatically take over and keep selected "essential circuits" powered. These might include your fridge and freezer, Wi-Fi router, lighting in key rooms, and a few sockets for charging devices or working from home. When the grid supply returns, the system switches back just as smoothly as it switched over.



Designing for backup from the start is simpler and more cost-effective than adding it later, so tell your surveyor if backup power matters to you.

Who benefits most

- Homes in rural or exposed locations where power cuts are more common
- Households where people work from home and need reliable power
- Homes with medical or critical equipment that must keep running
- Anyone who wants extra peace of mind from their solar and battery system



Your solar panels feed power into a hybrid inverter and battery. A smart gateway monitors the grid and your home's electricity use, automatically switching essential circuits to battery power if there is a power cut.



Ready to explore backup power?

If you are interested in adding backup power to your solar and battery system, talk to Renewable Heat during your survey and we will design a setup that fits your home, your budget, and the level of resilience you want.

Three levels of control

1. Solar + battery

Use your own electricity day and night, cutting your bills and reducing dependence on the grid.

2. Solar + battery + smart gateway

Add smarter control so your system can react to energy prices, weather, and demand, helping you get more value from your solar investment.

3. Solar + battery + backup circuits

Keep critical circuits powered during a power cut, combining long-term savings with extra resilience for your home



The benefits of going solar

Energy in Scotland is changing faster than at any point in a generation. Prices have risen, the grid is decarbonising, and the technology to generate your own electricity is now genuinely within reach for most homeowners. Solar PV sits at the centre of that shift.

A well-designed system does more than cut your bills. It reduces your carbon footprint, improves your property's value, and gives you a degree of control over your energy costs that simply was not available to homeowners a decade ago.

So what makes solar such a smart investment?

Here are the key benefits for your wallet, your home, and the planet.

Lower Electricity Bills: Every unit your panels generate and you use directly is a unit you do not buy from the grid. With electricity prices remaining high, that saving compounds steadily across the life of your system.

Income From the Smart Export Guarantee: The Smart Export Guarantee (SEG) requires energy suppliers to pay you for surplus electricity you export. Rates typically range from 4p to 15p per unit, so your system earns something even when you are not home.

A Smaller Carbon Footprint: Solar electricity is clean electricity. Every unit generated at home is a unit that does not come from the grid, reducing your household's emissions as Scotland works towards its net zero targets.

Added Value to Your Home: Solar panels typically improve your Energy Performance Certificate (EPC) rating, which matters for both running costs and resale value. A home with solar and a strong EPC stands out in the market.

Low Maintenance and Long Life: Once installed, solar panels need very little attention. Rain handles most of the cleaning, and a periodic professional check is all most systems need across a 25-year-plus lifespan.

Energy Independence: Generating your own electricity reduces your dependence on the grid and the uncertainty that comes with every energy price announcement.



Solar panels installed today come with 25-year performance guarantees. Most systems are still generating strong output well beyond that.

Solar panels can cut a typical household's electricity bills by

£400 - £700

a year, depending on system size and usage habits





Is solar right for your home?

Solar PV is a genuinely versatile technology, and the range of homes it suits is wider than most people expect. Terraced houses, stone-built semis, rural farmhouses, and modern new builds across Scotland are all generating their own electricity right now. The key factors are your roof, your electricity use, and your appetite for reducing bills and carbon over the long term.

Thanks to advances in panel efficiency and system design, even properties that would once have been considered marginal are now worth assessing properly.

Home Suitability Checklist

Working through the following checklist will give you a clear sense of how well-suited your home is.

- **Your heating bills are high**
If you spend more than £900–£1,000 a year on electricity, solar is likely to deliver a meaningful return. The more electricity you use, and the more you use during daylight hours, the stronger the financial case.
- **Your roof faces south, south-east, or south-west.** A south-facing roof at a pitch of around 30–40 degrees captures the most solar energy across the year. East or west-facing roofs are also viable, typically generating 15–20% less than an ideal south-facing installation. Do not assume that anything other than due south is unsuitable.
- **Your roof is in reasonable condition.** Solar panels are typically installed for 25 years or more. If your roof is due a replacement in the next few years, it is worth addressing that before installation to avoid removing and remounting panels later.

Even north-facing roofs may benefit from solar. Our surveyors will assess your specific situation and give honest guidance



- **You have limited shading.** Trees, chimneys and neighbouring buildings can reduce panel output, especially during peak generation hours. Where shading is unavoidable, micro-inverters or power optimisers can help each panel perform independently and minimise losses.
- **You are home during the day.** Use more of the electricity your panels generate in real time, improving self-consumption and increasing savings. Homes with daytime use, electric vehicles, heat pumps or other regular loads often see the strongest returns.
- **You are planning a renovation or new build.** If you are already undertaking significant building work, adding solar at the same time is almost always more cost-effective than returning to it later.



Suitable for more homes than you might think

Solar PV works on daylight, not direct sunshine, which means Scottish weather is far less of a barrier than most homeowners assume. Even on overcast days, your panels are generating.

If your roof faces south, that is ideal. But east and west-facing roofs are also viable, typically generating only 15–20% less than a south-facing equivalent. Many Scottish homes with split or complex roof lines can accommodate panels on more than one aspect.

And if shading is a concern, modern micro-inverters and power optimisers allow each panel to work independently, significantly reducing any impact. A good installer will assess your roof properly and give you an honest picture of what your system can realistically deliver.



Solar Installation Costs and Savings

Installing solar PV is an investment in your home, your energy bills, and your future. For most Scottish homes, a typical 4kWp system costs between £6,000 and £9,000 installed, depending on your roof, your property type, and whether battery storage is included. With 0% VAT on installation and long-term bill savings, many homeowners find the numbers more accessible than they first expect.



What affects the upfront cost?

Every solar installation is tailored to the home it serves, so costs vary. Key factors include:

- System size (number of panels and total kWp)
- Roof type, access, and any additional roofing work required
- Whether you include battery storage now or add it later
- The complexity of the electrical connection and cable runs

Your surveyor will design a solar system around your home, then provide a clear, fixed-price quotation that covers equipment, installation, and certification. You will see how much the system costs, how much you can expect to save each year, and how long the payback period is likely to be before you decide to go ahead.



What is included in a standard installation?

Solar panels and mounting system

Inverter and generation meter

Full electrical connection to your consumer unit

DNO notification and MCS certification

System commissioning, handover, and monitoring setup



What size system do you need?

A 4kWp system, four kilowatts of peak capacity which typically means 10–12 panels, is a common starting point for a three-bedroom Scottish home. Larger households, homes with heat pumps, or properties with higher consumption may benefit from a larger system.

What is the payback period?

The payback period for a well-specified solar installation currently sits at around 7–12 years, depending on system size, usage, and whether battery storage is included. Panels carry 25-year performance warranties and typically last considerably longer, which makes the long-term economics compelling.

How much does it cost to upgrade your heating too?

Understanding the savings from solar requires being clear about one thing: the biggest benefit does not come from what you earn by exporting electricity to the grid. It comes from the electricity you generate and use directly, because every unit you use from your panels is a unit you do not have to buy.

Scenario	Est. Annual Electricity Cost
Average Scottish home (no solar)	£1,100 – £1,400
With 4kWp solar (no battery)	£700 – £950
With 4kWp solar + battery storage	£450 – £650
With solar + battery + heat pump tariff	£350 – £550

Note: figures based on average consumption and 2025 unit rates.



HomeEnergyScotland.org

☎ 0808 808 2282

Support and Incentives

Scotland remains one of the best-supported places in the UK to invest in renewable energy. Between interest-free loans, grant support when you combine technologies, export tariffs, and 0% VAT on installation, there is a strong framework to help you upgrade your home.

Home Energy Scotland

Solar PV Only (Loan)

If you are installing solar panels on their own, the current Home Energy Scotland scheme offers an interest-free loan to help cover your installation costs, rather than a grant, so you can spread the cost over time with no interest while your electricity savings start from day one.

Solar + Heat Pump (Loan + Grant)

If you are considering solar alongside a heat pump, the support available is more generous. Eligible homeowners can typically access a grant and interest-free loan towards the heat pump itself, with an additional interest-free loan available to help fund the solar PV and any battery storage. Because funding levels and criteria change over time, Renewable Heat will always check the latest position and explain what you may be able to access before you decide.

Renewable System	Grant	Loan
Heat Pump (<i>rural uplift</i>)	£7,500 (£9,000)	£7,500
Solar PV	No	Available
Battery Storage	No	Available

Smart Export Guarantee (SEG)

Your solar panels will often generate more electricity than your home can use, particularly on bright summer days. The Smart Export Guarantee (SEG) means you are paid for each unit of surplus electricity you export to the grid, rather than letting it disappear for free.

All licensed energy suppliers with more than 150,000 customers are legally required to offer an SEG tariff, and Scottish homeowners are fully eligible to take advantage. Rates currently range from around 4p to 12p per unit depending on your supplier and tariff type, and you are free to choose whichever offer suits you best. Over the course of a year, SEG income adds a steady layer of return on top of your bill savings.

You will need a smart meter to access most SEG tariffs. Your installer can advise on this during the handover process.



VAT Relief

Solar panels, battery storage, and all associated installation equipment currently attract 0% VAT across Scotland and the rest of Great Britain. That represents a saving of 20% compared to the standard rate, and it is applied automatically through your installer with no additional application required.

This relief is confirmed until March 2027. After that, VAT is expected to rise, so for many homeowners this is a practical reason to move sooner rather than later if they are already considering solar.



A Phased Approach

One of the most common misconceptions about solar is that you have to do everything at once. You do not. Many homeowners start with panels and an inverter, begin saving on bills immediately, and then add battery storage or a heat pump when it suits their budget and circumstances.

At Renewable Heat, we design every system with future upgrades in mind from day one. That means when you are ready to add a battery or move to a heat pump, the work is straightforward rather than disruptive, and the costs are predictable. Your first step does not have to be your last.





Installation and what to expect

At Renewable Heat, we have been designing and installing renewable energy systems in Scottish homes for over 20 years. In that time, we have learned that a great installation starts long before anyone gets on a roof. It starts with understanding your home.

1. Home Energy Assessment

Every Renewable Heat installation begins with a thorough assessment of your home. Using 3D scanning technology, satellite weather data, and your energy usage patterns, we build a precise picture of your property so that your system is designed specifically for your home, not a generic template.

2. Bespoke system design

Armed with your home's data, we design a solar system built around your specific roof, your consumption habits, and your goals. We specify the number and layout of panels, the right inverter type, the position of all electrical components, and whether battery storage or a solar diverter should be included from the start. Every detail is considered, including shading analysis and seasonal generation variation, so your system performs as well in February as it does in June.



3. Your Detailed Quote and Consultation

We provide a clear, written quotation that covers all equipment, labour, electrical work, scaffolding, DNO notification, generation meter, and MCS certification. A member of our team then contacts you personally to walk through the quote, answer your questions, and discuss any grant or funding options available to you. There are no surprises and no pressure.

4. Installation Day

For most homes, the physical installation takes one to two days. Our experienced roofers and qualified electricians work methodically: mounting the panel frames and laying the panels on day one, followed by inverter installation and electrical connection to your consumer unit. Your home remains fully habitable throughout, and the team works tidily with minimal disruption to your routine.

5. Commissioning, Monitoring, and Aftercare

Once the system is live, we commission and test everything, walk you through real-time monitoring via your inverter app, and hand over all warranty documentation and your MCS certificate.

What about disruption?

Virtually all of the work takes place outside on your roof or in the loft. You do not need to vacate your home, and the only period when your electrical supply needs to be briefly isolated is typically less than an hour. We plan and communicate every step in advance so you know exactly what to expect and when.

Most projects take around 2 to 4 weeks from initial assessment to completed installation, depending on survey availability, system type, grant applications and installer lead times.

Our relationship does not end at installation: we provide ongoing support, and we are trusted by manufacturers to service and care for their customers' systems across Scotland.





A smarter home energy system

Solar panels are a powerful upgrade in their own right. But the homes that see the greatest transformation are those where solar is designed as part of something bigger: a joined-up energy system where every component works in harmony with the others.

At Renewable Heat, we call this Triple Play: solar PV, battery storage, and a heat pump working together to create a home that generates its own energy, stores it intelligently, and uses it as efficiently as possible. For homeowners, it represents the most significant step change in comfort, cost, and carbon that a single investment can deliver.



Solar and Heat Pumps: the most powerful pairing

A heat pump heats your home by moving warmth from the air or ground rather than burning fuel to create it. It runs on electricity, which makes it the natural partner for solar panels. When the two work together, a significant proportion of your heating is powered by electricity you have generated yourself, at near-zero cost.

This combination delivers the most dramatic long-term reduction in both energy bills and carbon emissions available to Scottish homeowners today. It is also the route to the most generous financial support: combined grant funding of up to £10,000



Together, solar PV, battery storage and a heat pump could save a typical home up to

£1,300* a year

**Source: MCS Foundation*



through Home Energy Scotland, plus an optional interest-free loan to cover any remaining costs, making it one of the most financially accessible home upgrades available anywhere in the UK.



Solar and EV Charging

If you drive an electric vehicle, or are planning to, a solar system opens up the possibility of fuelling it at near-zero cost. A smart EV charger connected to your solar system automatically prioritises surplus generation, so your car charges from your panels rather than the grid whenever the electricity is available. For many households, this alone adds significantly to the overall return on a solar installation.

The Whole-System Difference

At Renewable Heat, we have always taken a whole-home view. When we design a solar installation, we consider how it will interact with your heating, your hot water system, your tariff options, and any future upgrades you have in mind. The result is a system where every component is chosen and configured to work with the others, delivering performance that no individual product could achieve alone.



Solar and Battery Storage

Solar panels generate the most electricity when your home often needs it least. Battery storage solves that mismatch, capturing surplus generation during the day and releasing it in the evening or overnight. In Scottish conditions, where winter days are short and generation and demand rarely peak together, a well-specified battery can raise your self-consumption from around 30–40% to 70–80%.

Smart Controls and Tariffs

The final piece of the puzzle is how you manage the electricity that flows through your home. Smart meters, real-time energy monitoring apps, and time-of-use tariffs such as Octopus Agile allow you

to shift energy use to the cheapest or greenest moments of the day. Combined with solar and battery storage, a well-chosen tariff lets you top up your battery from the grid at low overnight rates in winter, ensuring your home is always drawing on the cheapest electricity available.



Choosing the right solar installer

The quality of your solar installation depends enormously on the company you choose. These are panels that should still be performing well in 2050, and this is not a decision to make on price alone.

The most important accreditation to look for is MCS certification. MCS (Microgeneration Certification Scheme) is the industry-standard quality mark for small-scale renewable energy installations in the UK. An MCS-certified installer meets rigorous standards for training, equipment, and installation practice, and MCS certification is a requirement for accessing most grant and export tariff schemes. Do not accept a quote from an installer who cannot demonstrate current MCS certification.

Questions to ask before you say yes

- **Are you MCS-certified?**
Only MCS-certified installers meet recognised quality standards and can help you access government grant funding.
- **Can you provide a shading and roof assessment?**
A responsible installer will not quote without visiting your property. Any quote produced without a site survey should be treated with caution.
- **What system size do you recommend, and why?**
Your installer should explain their recommendations in terms of your household's consumption, your roof's characteristics, and your goals, not simply offer the largest system that fits.
- **What is included in your quote?**
Make sure the quote covers all labour, materials, electrical work, scaffolding, grid notification, generation meter, and any applicable VAT. Surprises at invoice stage are a bad sign.
- **How will the system be monitored?**
Most modern inverters include remote monitoring via an app. Your installer should set this up and show you how to use it.



Why Aftercare Matters

A solar installation is a 25-year commitment, and the quality of support you receive after the panels are fitted matters as much as the quality of the installation itself. A reputable installer monitors system performance, responds promptly when attention is needed, and remains a reliable point of contact as your energy needs evolve.

Over time, you may want to add battery storage, upgrade your inverter, or integrate a heat pump. The right installer grows with you, providing continuity of knowledge and care rather than a one-off transaction. At Renewable Heat, we are trusted by manufacturers to service and maintain their customers' systems across Scotland, a relationship built on consistent, high-quality aftercare that we are proud to extend to every homeowner we work with.



Why Choose Renewable Heat?

At Renewable Heat, we have over 20 years' experience designing, installing and maintaining home energy systems across Scotland. As an **MCS-accredited installer**, we work to recognised industry standards, giving you confidence that your system is designed and installed properly.

We supply and install solar PV, battery storage and heat pumps, creating joined-up energy systems that can grow with your home and family. Whether you are installing solar for the first time or planning a whole-home energy upgrade, our experience means we can design a practical, efficient solution that reduces your electricity bills, lowers your carbon emissions, and supports your future energy needs.



What does good service look like?

A reputable solar installer does not disappear after the scaffolding comes down. Good service begins before a single panel is fitted and continues for the life of your system.

Before installation, you should receive a written quotation that is clear and itemised, with no vague line items or verbal promises. Your quote should be accompanied by a system design showing the number and layout of panels, the equipment specified, the estimated annual generation, and projected savings. Where shading is a consideration, you should receive a shading assessment that addresses it directly.



Choosing the right installer

During installation, your team should work tidily, communicate clearly, and leave your home in the condition they found it. Any disruption to your electrical supply should be planned and clearly communicated in advance.

After installation, a good installer walks you through the system, shows you how to read your generation data, and makes sure you know what to expect across

different seasons. You should receive all your warranty documentation, your MCS certificate, and a clear point of contact for any questions that arise later.

At Renewable Heat, we can also help you navigate the Home Energy Scotland grant and loan application process, from checking your eligibility to completing the paperwork. It is one less thing to manage, and it means your funding arrives as smoothly as possible.

Your next steps

You now understand how solar PV works, what a well-designed system looks like, whether your home is likely to be suitable, what the realistic costs and savings are, and what financial support is available to you as a Scottish homeowner.

The next step is a straightforward, no-pressure conversation about your home and what solar could offer you specifically.

Every home is different, so **we offer a free, no-obligation 15-minute consultation with one of our renewable experts**. It's a chance to ask questions, get honest guidance, understand your eligibility for funding and find out what installation could involve for your home.



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Book your 15 minute no obligation call.

Solar PV, battery storage, heat pump and underfloor heating specialists

Discover how we can reduce your energy bills and carbon footprint with a fully electric home.