Green Ixworth

**Photovoltaic Panels**

**Types of solar panels**

Solar panels are made of a thin layer of semi-conducting material sandwiched between a sheet of glass and a polymer resin. When exposed to daylight, the semi-conducting material becomes 'energised' and this produces electricity.

The four basic types of PV panel are all made of silicon but of differing efficiencies and price. Efficiency measures the proportion of solar energy turned into electricity. Remember also that a 5% increase in efficiency from 15% to 20% is an increase of 33.3% in power.

Monocrystalline: They have the highest purity of silicon making them efficient, with a higher power output than polycrystalline panels. Look dark and uniform. Efficiency up to 20%

Polycrystalline. Look blue and speckled and contain many crystals in each cell. They’re cheaper but less efficient up to 15%.

Hybrid cells combine crystalline cells with thin film cells. They're also known as HIT solar cells. The panels efficiency is up to 20%, but they cost more.

Thin film (or amorphous silicon) cells can be the cheapest but also the least efficient. They're flexible but rarely used for residential projects.

Solar tiles and slates are also available. Aesthetically pleasing as they look like ordinary roof tiles but are twice the price of alternatives.

When deciding which type of solar cells to go for, look at cost-per-watt (£/W) of power output. Divide the total cost of the solar system by the actual power output and ensure the types of panel are the same in any quote.

**Solar panel modules and system**

A solar PV system usually comprises solar panels, an inverter, isolator switches, a PV-generation meter and cables.

The more panels you can fit on your roof, the more expensive the system will be to purchase and install. But the more electricity you will produce.

The electricity produced by the PV panels is direct current (DC). Before it can be used in the home, it has to be converted to safer alternating current (AC) using a box called an inverter. This is often placed in the loft.

It's worth noting that the inverter doesn't have the same lifespan as the panels. If it fails, a replacement inverter could cost around £1,000 depending on the size of the PV capacity.

For safety, isolator switches are also placed before and after the inverter.

If a PV-generation meter is connected inside your home, you can see a real-time display of how much electricity the system is generating. This data is used to calculate your Feed-in Tariff payment, which provides cash in return for generating your own electricity if you are registered for it and produce a surplus. Ensure the installer registers with UKPN for battery use and supply of surplus electricity to them.

You may require an additional meter box next to your existing one to hold some of metering equipment for the panels.

If you are considering a Heat Pump and /or an EV charger then consult the surveyor on the installation so as to minimise repetition of cabling, boxes etc.

**How long does it take to install solar panels?**

If the solar panels are being installed on your roof, you're probably going to need scaffolding.

Once the scaffolding is up, often one or two weeks before installation, the panels could be installed in less than a day. Roofers will attach the fixing brackets on to the rafters of your roof – this is why a proper surveyor should go into your loft to check the integrity of the roof and the rafters. The solar panels will then be clamped on to the fixing brackets. Ask your installer for an estimate of timings including the time between the order and installation, so you're prepared.

If scaffolding is needed, check with the surveyor that there is space for it and that the cost is included in your quote.

**Is my home suitable for solar PV panels?**

Solar PV panels are most efficient on a South facing roof with a pitch (angle to the ground) of between 30 and 45 degrees and no shade of trees or buildings. Do not have a panel installed in a row if shaded as it can reduce the efficiency of the whole row.

Power output will be maximised if facing South but West or East are possible with efficiencies reduced to approx. 78% at a 30 degree tilt. North is not recommended.

How much energy you produce with solar panels – and therefore how much money you could make – will depend on orientation, tilt and the number and type of panels.

The surveyor will need to look at your roof construction to ensure it will take the weight of the panels. If it is not strong enough there are two possible solutions. Strengthen the roof internally or remove the tiles beneath the panels to reduce weight and finish with flashing. This often looks better and avoids the need of netting to prevent birds nesting or roosting beneath the panels, not a good idea as cleaning the panels is an expensive job.

**Do I need planning permission for solar panels?**

If you are not in a Conservation area nor the building listed, the only requirement is that the panels do not come over the edge of your roof in any event a gap of 30-40cms should be left to enable safe maintenance.

See the separate guidance from Green Ixworth prepared with the help of WSC.

**Solar panel maintenance costs**

Solar panels are pretty much maintenance-free and should last for at least 25 years.

However, within 25 years, you’ll need to replace the inverter – which have a life of approx. 10 years and cost £1,000 plus or minus.

Once you’ve had solar panels installed, your installer should give you written details of any maintenance checks you need to carry out occasionally to check your system is working properly.

The installer should also supply full technical details of the system, guarantees and MSC Certification.

Note: When approaching a potential supplier only the surveyor is qualified to determine your requirements and the capabilities of the house and agree the proposed purchase with you. If a salesperson offers a price and then seeks to pressure you with a significant drop of the quote take care. See the Which! Check List, PV installation, available with this guidance.

**Solar Together Suffolk**

Solar Together Suffolk (STS) is established by Suffolk County Council to reduce prices for PVs and Batteries as much as possible. They have two periods a year when you can ask for inclusion in their collective bid for quotations. You complete a form with approximate roof dimensions and its orientation, you will then receive a provisional estimate for the Solar Panels with costs for batteries etc if you want them. If you are broadly happy then a deposit of about £120 is payable if you wish to proceed further, to cover a visit by a surveyor who will seek to establish your needs and what is possible. When agreed, a new quote will be made reflecting the original plus any changes e.g. Batteries, you have agreed. Applications are closed for this year but if you are interested, register your interest for the spring round.

https://www.greensuffolk.org/at-home/solar-together-suffolk/

Those who have used it are generally pleased with installations and price but only you can judge. The contractors they use are local and also operate independently of the STS scheme.

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