

Solar panels - an overview

Eco Whittlesford

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Economic & environmental case - typical house

	Cost /kWh	Cost/year	Cost saving compared to grid	CO ₂ impact per household
Grid	30p	£1,080		760kgCO ₂ /year
Solar: 100% home use	15p	£520	+£560	Saves 740kgCO₂/year Equivalent to 10% of total average emissions per household/year
Solar: 75% home use 25% export	21p	£744	+£336	
Solar: 50% home use 50% export	27p	£970	+£110	

The average cost for a typical 4kW household installation is £6-8,000. Numbers presented above assume a £6,000 installation funded by a 20-year loan at 5% interest rate. System lifetime is 20 years, and one inverter replacement is costed during that time.

In all scenarios a c. £200/year standing charge needs to be paid to the electricity supplier

Smart export guarantee (SEG)

Range of prices for the Smart Export Guarantee

Octopus - 15p/kWh

c. £135-270/year depending on export amount

E.ON - 5.5p/kWh

c. £50-100/year depending on export amount

	Supplier	Tariff Name	Tariff Type	Tariff Length	Tariff Rate (p/kWh)	Payment Cycle	Includes Battery Storage	Must be on supplier import tariff
1	Octopus Energy	Outgoing Fixed	Fixed	12-month fixed term	15p	Monthly	Yes	Yes
2	Tesla	Tesla Energy Plan ¹	Fixed	Unknown	12.0p	Unknown	Yes (must be Tesla Powerwall)	Yes (Octopus Energy)
3	Tesla	Tesla Energy Plan ²	Fixed	Unknown	10.0p	Unknown	Yes (must be Tesla Powerwall)	Yes (Octopus Energy)
4	British Gas	Export & Earn Flex	Currently Fixed	No fixed end date	6.4p	3 months	Yes	No
5	Bulb Energy	Export Payments	Fixed	No fixed end date	5.57p	3 months	Yes	Yes
6	E.ON Energy	Next Export Exclusive	Fixed	12-month	5.5p	Unknown	Unknown	Yes

Taken from:

<https://solarenergyuk.org/resource/smart-export-guarantee/>

Medium/large business

- ▶ Economies of scale
- ▶ 20kW system = £30,000
- ▶ 140m² roof space
- ▶ £1,000/year electricity cost savings
- ▶ £2,000/year income from Smart Export Guarantee
- ▶ Therefore c. 10 year payback period

Cost and size estimates from:

<https://www.renewableenergyhub.co.uk/main/solar-panels/commercial-and-business-solar-panels-return-on-investment>

Solar battery systems

- ▶ Batteries can store the solar energy for later use
- ▶ Typically installed in a loft or garage, along with the inverter needed for the solar panels

Pros	Cons
Reduced reliance on grid electricity with uncertain costs	Cost - a typical household sized battery (8 kWh) is £4,500 and payback period >20 years
Improved CO ₂ savings	Batteries expected lifetime c. 10 years
Independent power source during power cuts	Batteries use rare earth metals and as yet cannot be recycled

Other thoughts - practical and ethical

- ▶ “Pigeon protection” - chicken wire around the panel edges is frequently sold as an add-on, and may not be needed. Find out if any near neighbours have issues with birds nesting under their panels.
- ▶ Solar hot water boosters are another add on - these can divert excess electricity into an immersion heater. Houses without mains gas, and those who wish to use as much energy produced on site may find this useful. It is less useful in a system with an EV to charge or a solar battery.
- ▶ Find a trusted installer and ensure you get the MCS installation certificate - you will need this to access payments for electricity exports.
- ▶ The manufactures of half of the world’s polysilicon are based in the Xinjiang region and implicated in forced labour of the Uyghur population. Please consider making ethical purchases.