Mrs Smith's SOLAR PANELS STORY: A real life example in Merton 2023

Mrs Smith* liked living in her semi-detached. Just like many others in the road of course, and probably several million others in the UK. And she had a good neighbour in Mrs Jones* next door.

Wimbledon Society

Her house had the usual double glazing, and some loft insulation, but she had also installed twelve Solar Panels on the roof five years ago, which made it look a little different.

Her energy supplier had just sent her the annual summary showing how much electricity her house was now using.

With all the talk about the rising cost of energy, she decided to go back through her files, to see how much, if at all, her new Solar Panels had reduced her electricity bills.

Before the Panels had been installed, she could see that her house had used some 5,000 kWh** of electricity in a typical year, costing some 15p per kWh. So her **electricity cost around £750 every year,** for the usual lighting, cooking and so on. There was also an annual standing charge of just over £100.

She could see that the cost of her 12 Solar Panel (3.6kw) system in 2018 had been £4,000 from Merton's group-buy scheme. It was much cheaper than going individually to a local installer.
The whole installation included the Solar Panels, the Inverter, cabling connection to the consumer unit or fuseboard, scaffolding, installing, admin costs, and the installer's profit.

The installation took time of course: there was a day when the scaffolding went up, another couple when the Panels were all fitted and connected up, and yet another day for the scaffolding to be taken down.

The 12 Panels generated some 3,500 kWh of electricity each year, which meant that she only had to pay her electricity supplier for 1,500 kWh. Which meant paying them around £250 a year, rather than £750, **a saving for her of about £500 per year.**

As she had an "old fashioned" meter – not a so-called smart meter - when her Panels were generating electricity during the day, the little wheel in her meter was running backwards. Which meant that she was exporting electricity back to the Grid. She liked that.

So with a set-up cost of £4000, and a saving of around £500 a year, she worked out that the Panels could probably pay for themselves by reduced bills in around 8 or 9 years or so.

And as Solar Panels have a claimed life of at least 20 years, she might be making a 'profit' of around £500 a year from year 9 to year 20, coming to perhaps £ 5,000.***

Which she might consider putting towards the cost of a storage battery,**** or a heat pump perhaps.

But then she realised that today's costs had changed a lot since 2018.
Then she was paying around 15p for each kWh: now the cost was around 27p.*****
So she was now saving not close to £500 every year in bills, but maybe closer to £900.
Which meant that her pay-back period now was not around 8 years, but significantly less.

So, purely for fun, as something to talk to Mrs Jones about, (you remember her? - she was the neighbour) she did the comparable figures for today.

Mrs Jones' electricity bill last year in an identical house, using the same 5,000kWh of electricity each year, came to around £1,350. *(5,000 kWh x 27p)*

A 12 Solar Panel (3.6kw) system would today cost around £5,300 to install, via a similar group-buy scheme. With 3,500 kWh of electricity being generated, as before, at perhaps 27p per kWh, the initial cost of the Panels might be repaid in about 7 or 8 years. *(3,500kWh x 27p = say up to £900 saved each year.)* Meaning that from about year 9 to year 20 she stood to make a 'profit' of around £10,000. *(11 years x £900)* (Or if you prefer, she would need to pay her electricity supplier less by that amount).

When Mrs Jones saw the figures, she felt that there was something here that needed her attention. She picked up the phone.

Notes: * Names have been changed: Remember that individual properties & lifestyles will generate their own **very different figures & costs.**
** A kWh is a kilowatt-hour, an amount of energy: Imagine an old-fashioned single bar electric fire, running for one hour, giving out heat.
*** The "Inverter" (a piece of equipment that is needed to join the panels to the electrical system) is said to have a life of around 10 years, and would cost about £1,000 to replace. **** But that is for another story. ***** Now 27p/kWh (12/23), but this is subject to change. TM PTO

Some background:

Some householders will decide to pay for their new Solar Panels up front, as Mrs Smith did.

But for those who find that difficult, some Councils and Electricity suppliers may in the future consider setting up a loan scheme for householders.
The electricity bill payment might remain roughly the same as before, but around 1/3rd of it would be for the cost of the electricity actually used, with the remainder going towards paying off the loan.
The payback time would of course be much longer than before, as interest on the loan is payable.

Someone asked the other day: What is the payback period for a £5,000 Kitchen refit?
Noting that, if the property is sold, the projected lower electricity bills might influence the property value.

Solar Panels need to face towards the sun, to get the maximum amount of energy, which means ideally facing as close as possible to southeast, south, or southwest.

Some roofs will not be able to accommodate Solar Panels, because of orientation, or complex roof shape, or shading by trees or other buildings, or structural strength, or their historical/architectural sensitivity.

Some house roofs could support more than 12 Panels, to the extent that a (say) 20 Solar Panel array might mean that some householders could be a net electricity exporter over the whole year, (greatly in the summer, but still an importer in the winter when the day length is short).

The design and manufacture of Solar Panels themselves will need to evolve, and be more than just standard 1m x 1.4m rectangles, so that they can fit more easily into a range of roof sizes and shapes. There are already versions that resemble slates, and others that themselves form the roof surface.

When Solar Panels on local roofs start producing electricity, our many local electrical transformer stations may need adaptation to cater for and accept the input, not just from the Grid as now, but also from a significant number of "local rooftop generators".

With the potential for so much local generation of electricity, the annual national generating load requirements via the Grid may be lowered in daylight conditions, and may need to be managed differently.
If fossil fuels are still used for electricity generation nationally, overall UK CO2 levels may then reduce.

The various tariffs now offered to householders by electricity providers may need to factor-in generation.

Just taking the 10,000 or so semi detached houses in Merton: if even half of them installed Solar Panel arrays by 2050, the amount of electricity they would generate could be some 15 million kWh a year.

And that does not take account of the electrical generation potential from the Borough's 3,000 detached properties, the 37,000 terraces and the 35,000 flats.
Not to mention the many roofs of big commercial, educational and social buildings.

Although Mrs Smith's house used some 5,000kWh of electricity each year, the average for the 86,000 dwellings in Merton is lower, at around 3,500 kWh. For London as a whole, the figure is around 3,350kWh.

Particularly in the winter months, shadowing very severely reduces electrical generation in Solar Panels. In London in mid winter, the sun rises in the (roughly) south east. And sets in the southwest, with the sun only reaching some 15 degrees above the horizon at midday, and with daylight for only 7½ hours.

This contrasts with the amount of daylight reaching Solar Panel arrays in mid summer, when the sun rises in the (roughly) north east* and sets in the north west. (* Rises at 50 degrees from north rather than 45 degrees).
And with sun reaching over 60 degrees above the horizon at midday, and with 16 hours of daylight.

Town Planning:
New Local Plan Policies will be needed to limit the height of new developments (similar to the daylighting protection standards for neighbouring sites in Policy DMD2A), so that they do not significantly overshadow the (potential or actual) Solar Panel arrays on neighbouring roofs.

The installation of most Solar Panels on residential property may now be "permitted development", with no need to apply for planning permission, but there are some important limits and conditions – please refer to the Planning Portal website, and/or check with the Council's planning office.

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