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LIFE AS WE DON'T YET KNOW IT: BUILDING A SMART MODEL FOR SUSTAINABLE ENERGY PRODUCTION

OVERVIEW

The government's new plans to implement a Smart Export Guarantee for solar panel owners from 1st January 2020 could represent a significant step towards creating a cleaner, greener future.

This new initiative will replace the export tariff linked to the previous Feed-In Tariff which was scrapped in April, and enables homeowners with rooftop solar panels to lower their bills by using more of their own energy.

But how will it differ to the previous tariff? What kind of energy models could the government adopt to help the UK meet its climate change agenda, and how might they be affected by Brexit? What do homeowners and housebuilders need to be aware of? And how big of a step could this really be towards changing the way we generate and use energy?

Paul Hutchens, leading green energy advocate and CEO of solar panel installation specialists Eco2Solar, tackles these questions and explores what the 'new norm' could look like for homeowners 10, 20 and 30 years from now.



Source: [The Solar Guide](#)

THE CASE FOR SMARTER ENERGY MODELS

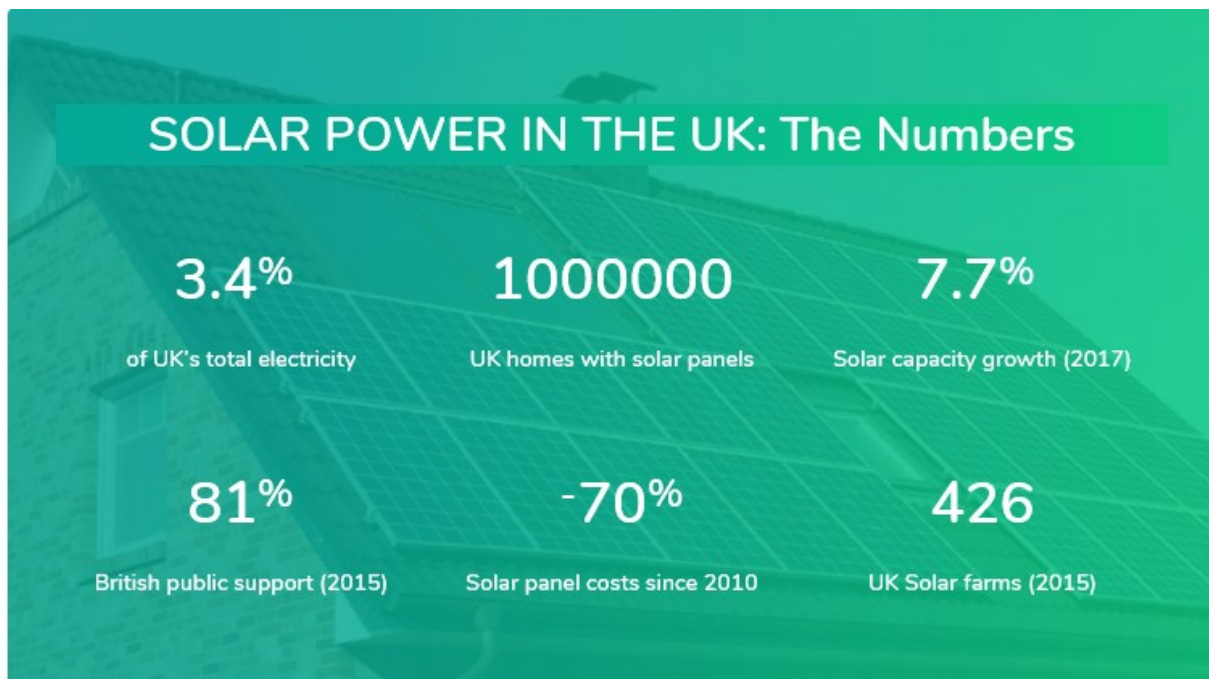
At 7.45pm on a Tuesday evening, it's more than likely that that you, along with many other UK householders, have come home from work, cooked supper, put your phone or device on charge, perhaps taken a bath or shower, and are now perched on your sofa watching TV with a cup of tea. Or maybe something stronger, depending on how your day went.

Your energy provider knows this. It's the same pattern they've observed in households across the country for decades. Since the system was designed 60 years ago, our predictable behaviour has remained relatively similar; at 7.30pm, when the nation tuned in for its nightly fix of Coronation Street, extra energy would be produced in vast power stations and be pushed down through sub-stations via increasingly small cables, and into your TV socket.

Now, however, that pattern is changing. Our use of electricity is becoming much less predictable; we have a lot more devices but they're more energy efficient. Our homes are better insulated. And, most significantly, we have more households producing their own energy through solar panels; a trend that began with the introduction of the UK government's Feed-In Tariff in 2010.

Creating a market for renewable energy

The original [Feed-In Tariff](#) – which ended in April 2019 - was always destined to be a temporary measure. Its premise was to incentivise and stimulate use of solar technology which, at the time, wasn't economically viable for most householders. Through the Feed-In Tariff, homeowners would be paid a set rate for each unit of electricity generated, use as much electricity as they could and export the remainder; for which they would be paid via the Export element of the Feed-In Tariff.



Source: [The Switch](#)

Today, however, solar technologies are more affordable than ever, and under the new [Smart Export Guarantee](#), the government's proposed mechanism beginning on 1st January 2020, homeowners who install solar after that date can still generate free electricity, but instead of being paid a flat rate of, for example, 5p for every kilowatt of surplus power they export, they'll be paid a variable amount depending on the value of that energy at the time.

Energy is still more valuable to communities at 6pm when people come home from work than it is at 3am when most of us are sleeping - so rates will depend on these usage models, as well as the energy provider themselves and the package they're offering to homeowners. This will create a thriving market for surplus energy sellers, as they'll know when it's most advantageous to produce, store, use and sell energy, and be able to seek out the most competitive export packages from energy companies.

The [National Grid](#) and the [District Network Operators](#) have yet to develop models around how this market could work. There will invariably be opportunities for homeowners with solar panels and a battery to sell energy at the most advantageous rates, but we may also see the emergence of more complex models where the homeowner effectively leases the panels until they're paid off, or the energy company installs and owns the panels and sells the energy produced from them to the home or building occupier.

Predicting future usage models

It's similar to the model we see with phones; people will rarely spend £1,000 on the latest iPhone, but they'll happily spend £30 a month leasing it. Just as the way we currently use data, where we can easily buy, store and move data around, the energy market could - and should - adopt the same model, where we're able to buy unlimited energy on a particular rate. This model could be successful, providing the energy companies ensure that energy is used and moved around in the most efficient way.



Since solar energy is generated during the day, when people are generally out of the house, it will also be crucial to develop a mechanism to capture and leverage that energy; whether it's for our own use or for export. Therefore, as the Smart Export Tariff becomes more embedded, we'll begin to see a greater emergence of supportive technologies like [lithium batteries](#) that allow us to store energy and sell it at the most advantageous times of day.

But one of the most important technologies - which, like batteries, exists at the moment but is yet to be adopted on a widespread scale - is smart apps and programmes that can connect real-time weather predictions to excess solar energy and immediate consumer needs. In other words, technology that knows you're generating excess solar energy at midday because the sun's shining, and then harnesses that energy to do tasks you'd normally do when you come home from work, like put the washing machine on.



Source: [Which?](#)

And if you don't have any daytime need for energy, that technology stores it as surplus for you to use later, or sell to someone down the street at that moment in time, because perhaps they work from home and most of their energy usage is during the day. We'll also see more technologies that allow us to sell energy to a specific buyer at a certain location, such as our next door neighbour or nearby schools, shops and services.

Solar will then become more of a lifestyle factor, where we as consumers get used to different ways of generating, storing and exporting energy. As renewable energies become more embedded in our lifestyles, so too will electric vehicles, battery storage and technologies that are capable of moving energy around as and when it's needed.

When we explore these possibilities, it becomes clear that the Smart Export Tariff could represent an important step towards creating a full-blown marketplace for energy that moves us much closer to the government's targets of where we need to be with sustainability. But how does that fit into the global climate change agenda? And how far are we currently away from becoming a carbon-zero world?

Clean energy at local level

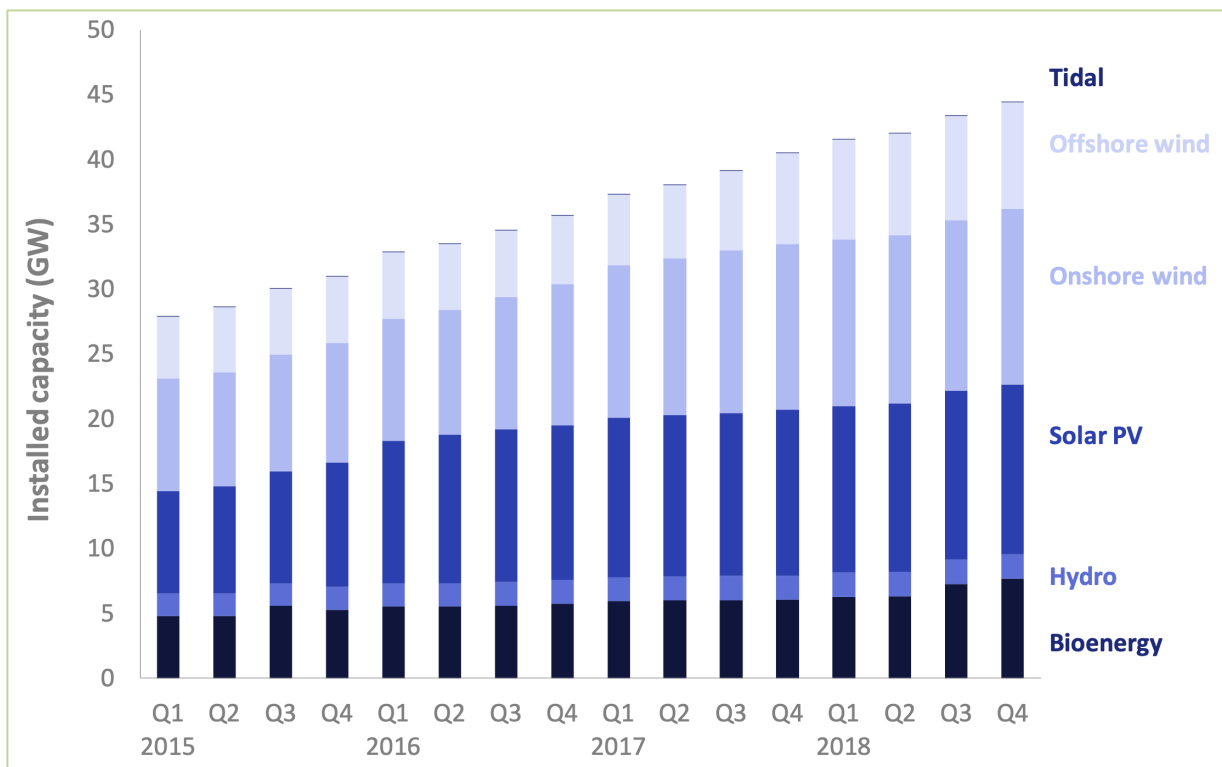
To explore that question, we first need to understand the difference between energy and power; two elements that are frequently and easily confused. Energy is what we use over a period of time, generally measured and

billed in kilowatt hours (kWh). Power, however, is measured in watts or Kilowatts, and is the amount that's delivered to you at that point to fulfil whatever you're doing, whether it's taking a shower or charging your phone.

This may seem like a fairly trivial point, but it's actually a significant one because we traditionally think in terms of generating and using energy, when we also need to focus on how we're going to deliver it as power.

Take a typical UK household that currently uses around 4,000 kilowatt hours of energy every year - then consider the energy future we're moving towards of more vehicles powered by electricity rather than fossil fuels, and more electric heating rather than gas. In a few short years, that same household could be using 10 times as much.

On a larger scale, developers building a new housing estate, university or school in a town or village not only need to be able to generate 10 times as much energy at any given time, but also consider how to deliver it into and out of the area. To achieve that, towns and villages would need to upgrade their infrastructure, cables and sub-stations, which could cost millions; even billions, on a national scale.



Source: [Solar Magazine / UK Energy Trends](#)

That's why we need to consider how to deliver power, as well as generating it – which invariably leads to one clear conclusion; we need more solar. Solar energy is by far the most convenient and cost-effective form of renewable energy which can be easily added onto most buildings to generate power locally.

Combined with battery storage and smart technologies, it offers us a clear model for a sustainable future where clean power is both generated and delivered locally.

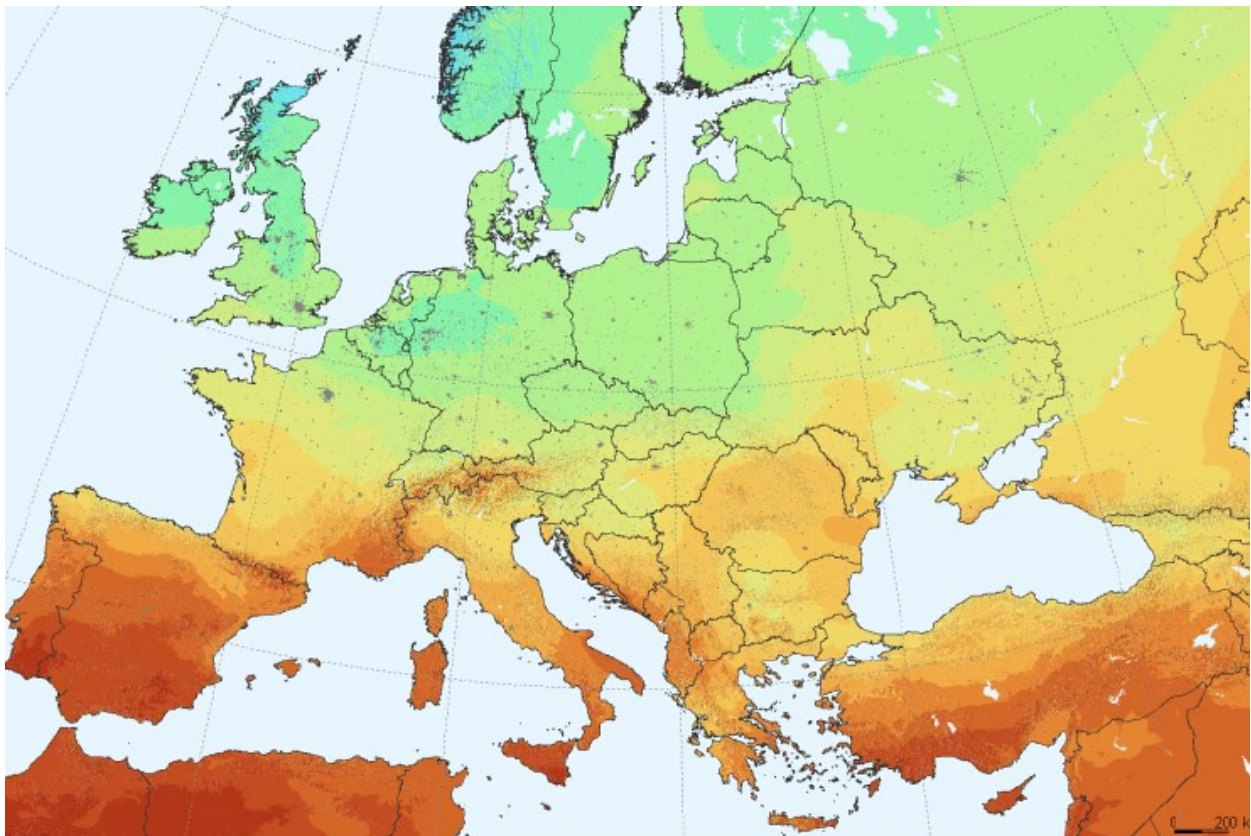
Leading the world in energy targets

Vast, polluting power stations which rely on coal and other fossil fuels are already becoming redundant on a number of different levels. Governments around the world – albeit not yet America’s, sadly – are divesting from coal-powered plants and investing instead in renewable energies. In the UK, that’s going to form an essential part of meeting our climate change agenda, now and into the future.

So how will that impact on the way we live? For a start, from 2025, homeowners will no longer be able to install gas-fired heating – so depending on what else arrives between now and then, it’s likely that only electric heating will be a viable option.

From 2030, the government has set a target to halve the amount of energy each new house uses. From 2040, we’ll no longer be able to sell petrol and diesel cars in the UK.

Most significantly, from 2050, our goal as a country is to reach a [Net Zero target](#), meaning that none of our energy must come from fossil fuels. When the UK government announced this target as part of their [Climate Emergency declaration](#) in May 2019, they were the first government to have ever done so.



Solar Potential in European Countries | Source: [ResearchGate](#)

Brexit may of course affect that goal, depending on what the government choose to do; and if we break away from the EU and regulate our own energy market, we could end up with different standards for climate change.

But whoever is in power, the onus will be on the government to legislate and regulate in a sensible and progressive manner; and if we do make strides towards our Net Zero target, we'll be leading the world in sustainable energy production.

That goal, coupled with the groundswell of public opinion led by [David Attenborough](#), [Extinction Rebellion](#) and even youth-level campaigners like [Greta Thunberg](#), is already beginning to create a paradigm shift in previously outdated approaches like the overuse of fossil fuels and plastics.

Building for tomorrow's homeowners

This culture shift towards a cleaner, greener future is impacting on every sector at every level, but housebuilders in particular will have a significant role to play in reshaping what a sustainable home might look like by 2050. As well as preparing for the regulations coming into play from 2025 onwards, housebuilders are more future-focused than ever – and they need to be.

The people looking to buy a new home in 2025, 2030 and 2040 are going to be from Greta Thunberg's generation; a generation who want to know their home is sustainable. They're the ones who will be more likely to seek out a new home that's carbon zero, that's more cost-effective to run in the long-term - as opposed to prioritising the number of bedrooms and its proximity to a low-cost supermarket.



Source: [Current News](#)

So what could this future home actually look like? In the 1950s and 60s, our imaginations had us flying cars by now – but in reality, the home of 2050 will probably look much more similar to our current homes. The difference will be that technology will evolve, as the internet, the mobile revolution and artificial intelligence have done, that will mean our future homes will be heavily automated and highly sustainable.

With continued population growth, we'll inevitably see more [megacities](#) like London, Tokyo and Shanghai developing all over the world, and that's likely to result in the continued growth of the [tiny house movement](#) towards more compact, sustainable micro-homes – especially in towns and cities.



Source: [PV Magazine USA](#)

With that trend comes widespread use of technologies like electric trams and autonomous vehicles, which in itself could then change the whole concept of how we live and work. The lack of land, rising house prices and growing commutes to work could perpetuate the idea of our vehicles becoming our homes. An RV-sized electric vehicle equipped with all the comforts of a bricks-and-mortar house, that can be programmed to autonomously pick you up from your office and drive you to the countryside for the evening? That, I'd like to see.

A collective responsibility

These trends may not happen in my lifetime, or yours; but what is likely to happen is that more of us – individuals, businesses, schools and hospitals – will gradually move towards generating the energy we need ourselves, and selling any surplus to our neighbours. No dirty power stations, no endless cables; just clean, green, locally produced energy, directly from the sun. Use it, store it, sell it; that's the hierarchy we'll be aiming for.

So while we wait for energy providers to build competitive models, for the government to legislate and regulate the market, and for housebuilders to construct the kind of homes that move us towards our Net Zero target, what can we do ourselves, right now?

We can explore that future for ourselves. We can make sure we're recycling all our materials. We can avoid or re-use plastics. We can explore greener modes of transport, whether it's a hybrid or electric car, or cycling to work. And we, as individuals, can switch to solar and begin to make real strides towards producing our own energy and building a cleaner, greener tomorrow.

For more information, advice and opinion around renewable energy, visit <https://eco2solar.co.uk/>