

Smart technologies and data to future-proof UK energy

- Government and Ofgem announce plans for smart technologies to help consumers cut their bills and boost energy efficiency
- unleashing smart technology across the grid could create up to 24,000 UK jobs and boost exports
- plans could also reduce cost of managing the energy system by up to £10 billion a year by 2050

Cutting-edge smart technologies will ensure the lights stay on and energy bills are cut, as demand for electricity intensifies and fossil fuels are phased out in the UK, in new plans laid out by the UK government and Ofgem today (Tuesday 20 July).

Smart and flexible energy systems will be needed if the UK is to meet its world-leading commitments to tackle climate change by 2050. Meeting an increasing demand for electricity, as fossil fuels are phased out, will require a system which ensures the supply of clean energy from renewable sources is guaranteed even when the wind is not blowing or the sun is not shining.

Published jointly by the government and Ofgem today, the Smart Systems and Flexibility Plan and Energy Digitalisation Strategy deliver on the commitments made by the government in the [Energy White Paper](#) and represents a significant step forward on the path to providing flexibility for our energy network.

Unleashing the full potential of smart systems and flexibility in our energy sector could reduce the costs of managing the system by up to £10 billion a year by 2050, as well as generate up to 10,000 jobs for system installers, electricians, data scientists and engineers.

A further 14,000 jobs could also be created by the export potential of these new technologies. For consumers, the benefits range from households being able to trade back their excess energy to reduce bills, through to knowing when the costs of running household appliances like washing machines and dishwashers are at their lowest.

Energy and Climate Change Minister, Anne-Marie Trevelyan, said:

We need to ensure our energy system can cope with the demands of the future. Smart technologies will help us to tackle climate change while making sure that the lights stay on and bills stay low.

The possibilities opened by a smart and flexible system are clear to see. They will not only allow households to take control of

their energy use and save money but will ensure power is available when and where it's needed while creating jobs and investment opportunities long into the future.

Smart technologies and innovations will allow the energy system to cope with increased electricity demand from our homes and workspaces in the future. There is also significant potential to export these technologies abroad and help countries across the world to meet their climate change targets. Estimates suggest this export market could be worth as much as £2.7 billion a year to the UK economy by the middle of the century.

In a further move to help consumers take control of their energy use and reduce bills, the government has today published a call for evidence on the deployment of technologies that allow electric vehicles to export electricity from their batteries back on to the grid or to homes during times of higher demand. A separate call for evidence will look at enabling large-scale and long-duration electricity storage so that availability can be maintained during periods when renewables generate less energy

Energy Minister Lord Callanan said:

From looking at how something as simple as charging your electric car can cut your energy bill to making sure renewable energy can be stored for when it's needed, this plan shows how we are using innovative technologies to meet our commitments on carbon emissions.

Taking advantage of these smart technologies in our homes and businesses will not only help us tackle climate change, but will create thousands of jobs, unleash investment opportunities and cut costs as we build back greener from the pandemic.

In the Smart Systems and Flexibility Plan, the government and Ofgem are driving forward plans for innovative new systems that could allow electricity generated by clean renewable sources to be stored at large scale and over longer periods, so it is ready to meet the challenges of energy system decarbonisation. Such technologies include pumped hydro storage, compressed air energy storage and the conversion of power to hydrogen so it can be used to generate electricity.

In addition, the plan looks at how electricity interconnectors with other countries can help balance the system and decarbonise at least cost.

Jonathan Brearley, chief executive of Ofgem, said:

This plan is essential to hitting the UK's net zero climate goal while keeping energy bills affordable for everyone. It requires a revolution in how and when we use electricity and will allow millions of electric cars, smart appliances and other new green

technologies to digitally connect to the energy system.

As energy regulator, Ofgem will work with government and industry, to help consumers make the changes needed and ensure the transition to net zero is affordable, fair and inclusive for all.

Smart technologies already in development in the UK include:

- heat network projects in Gateshead and Milton Keynes that are supplying residents with affordable, low-carbon heat and electricity by pairing with battery storage to offer excess electricity back to the grid when it is needed
- a trial in the south-east of England that is demonstrating how electric car owners can combine the use of smart meters, a vehicle charger and electricity from renewable sources to save money on their bills so its charge can provide electricity to the grid at periods of peak demand
- new battery technologies being trialled in Oxford, Orkney and Perth in the UK, as well as in Australia, that are helping the transition from fossil fuels to green sources by delivering low-cost, low-carbon energy on demand in a reliable, safe and economic way by revolutionising how the energy is stored within the battery
- a community of 6,500 plus residential customers across the UK where domestic solar energy is being combined with battery technology and using data to forecast energy generation and demand in the wider electricity system to enable customers to trade excess energy to the grid and giving average savings of 70% on bills

The government, Ofgem and Innovate UK are today also publishing the UK's first Energy Digitalisation Strategy. This will examine how energy system data is used so that the full potential of cutting-edge technologies can be realised and consumers can gain maximum benefit from new digital products and services.

Rob Saunders, Challenge Director – Prospering from the Energy Revolution, UK Research and Innovation said:

Easy access to data, and digitalisation of the system will be at the heart of the transformation to net zero energy. Building on the progress made with the 'Modernising Energy Data Access' programme this strategy sets out the next steps towards an energy system that is fit for the future.

With opportunities to join up services more easily for customers, do more with existing infrastructure, and open up new digital business models right across the net zero economy, we envisage development of a thriving cohort of new digital businesses that help the nation decarbonise while serving customers better.

Smart Systems and Flexibility Plan and Energy Digitalisation Strategy

Today we are publishing the following documents:

- Smart Systems and Flexibility Plan
- Energy Digitalisation Strategy

This new Smart Systems and Flexibility Plan updates the previous plan launched in 2017.

We are also publishing a call for evidence on:

- electric vehicles exporting electricity to the grid and to homes.
- enabling large-scale and long-duration electricity storage

Future System Operator consultation and Energy Code Governance Reform consultation

There are also 2 government consultations being published today on proposed reforms to the energy system that will ensure frameworks are in place to drive the UK's decarbonisation plans, while minimising costs to consumers and industry and maintaining resilience in the system.

The Future System Operator consultation is on proposals to create a new energy system operator separate from National Grid plc with roles in both the electricity and gas systems.

The challenges of meeting commitments to tackle climate change are creating the need for new technical roles and responsibilities in electricity and gas systems. New roles include planning and developing future energy networks and increasing competition so decarbonisation can be driven at the lowest cost to consumers and industry, and an impartial, single Future System Operator (FSO) – that covers both gas and electricity sectors – could be well-placed to meet these challenges.

To deliver the roles effectively, a body will be required that is independent of any perceived conflicts of interest within industry and this consultation will ensure it remains accountable to consumers and is resilient to challenges over the short, medium and long terms.

The FSO consultation follows the publication in January 2021 of the [Review of GB Energy System Operation](#) where Ofgem considered the effectiveness of previous system operator reform and whether there was need for further reform.

The government is also launching today, a consultation on proposals to reform the codes that govern gas and electricity markets.

The energy industry codes set out the commercial, operational, and technical rules of the energy system, but in the Energy White Paper, the government stated that they will need to be updated to allow the UK to transition to a

clean energy system and to meet climate change commitments.

This codes consultation will ensure that governance of the energy system is fit for purpose in a low-carbon future and builds on a previous consultation from 2019.