

National Grid ESO launches world-first programme to digitise Great Britain's energy system and advance the transition to net zero



Tuesday 2 November 2021

- The *Virtual Energy System* will be a real-time digital replica of Great Britain's physical energy system, creating a virtual environment to share data, drive innovation and bridge the gap to net zero.
- As COP26 gets underway, National Grid ESO is calling on the energy industry to join its efforts to help realise this vision, through expertise, collaboration, and investment.

02 November 2021, London, United Kingdom: National Grid Electricity System Operator (ESO) has launched a world-first programme to build a digital replica of the entire GB energy landscape, creating a virtual environment to share data, model and predict scenarios that support the decarbonisation of the energy system.

The *Virtual Energy System* will be a digital twin of the existing physical energy system, working in parallel to enable an accessible, unified, real-time view of every part of the GB energy system.

This virtual environment will create the ability to generate insights and new ideas and model solutions to cut real-world carbon emissions, supporting the transition to net zero while delivering long-term value to industry and consumers.

The programme comes at a time when Great Britain's energy system is undergoing its most significant ever transition, and this announcement coincides with the annual COP26 UN climate change conference this year, taking place in Glasgow.

How the Virtual Energy System will work:

1. The development of the Virtual Energy System begins with an open framework, with agreed access, operations and security protocols.
2. Over time, this will be populated by existing and new digital twins – replicas of physical components of the energy system.
3. Each digital twin will contribute to and access real-time data on the status and operation of other elements of the system.
4. This layered data will generate insight, and a virtual environment through which to innovate ideas, with the potential to transform the system and support the transition to net zero.

Fintan Slye, Executive Director of National Grid ESO said; "Great Britain's energy system is made up of multiple component parts which combine and interact to deliver the energy we need.

"Whilst the journey towards a carbon free future has already begun, if the UK is to meet its 2050 net zero target, it's vital the whole energy industry works towards decarbonisation together.

“As we evolve and transition to a greener future, we’ll need to respond to a range of future challenges. And how we innovate and adapt the energy system will require a range of tools, which is where the Virtual Energy System comes in - a shared, digital national asset to help optimise the route to net zero.

“This is an ambitious world-first programme, and we can’t build it alone. We need to come together, as an industry, to help turn this vision into a reality if we are to realise a sustainable energy network for the future.”

National Grid ESO will be launching the Virtual Energy System at an industry event during COP26.

It will then host a free-to-access one-day online conference on 1 December, providing an opportunity for the energy industry and wider stakeholders to find out more about the programme and how to get involved with its design and development. Panellists include Ofgem, BEIS, Energy Digitalisation Taskforce, Energy Systems Catapult and more.

Interested parties can register for the conference [here](#).

An industry consultation will be launched in December, and future industry events will be announced as the programme develops. Visit the [Virtual Energy System](#) webpage.

For more information about the Virtual Energy System and how to be involved, email VirtualES@nationalgrideso.com.

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Notes to editors

About National Grid ESO

National Grid ESO – a legally separate business within the National Grid group – sits at the heart of the electricity system in Great Britain, keeping the lights on around the clock for energy consumers.

It moves electricity around the country’s high-voltage network to balance supply and demand in real-time, using a mix of power sources to make sure electricity is available wherever and whenever it’s needed.

The ESO’s mission is to facilitate the decarbonisation of Great Britain’s energy network and ensure the delivery of reliable, affordable, and green electricity for consumers. It works with stakeholders

across the whole energy industry to plan for future network needs, using insight to make sure it can balance the system today and find opportunities to transform the way it operates it tomorrow.

About the Virtual Energy System, powered by National Grid ESO

The Virtual Energy System is a digital replica of our entire energy landscape, providing a virtual environment to share data, model and predict scenarios that support the decarbonisation of our energy industry while supporting a sustainable energy network for the future.

National Grid ESO is spearheading the industry effort to build a Virtual Energy System, and has started by developing tools that fit within the Virtual Energy System framework based on its own systems. The ESO is developing projects in partnership with Octopus Energy, Google X, Western Power Distribution, and Scottish Power Energy Networks, amongst others.

The launch event at COP 26 will bring together executives from across the energy sector, with presentations from Audrey Zibelman (VP, Google X), Devrim Celal (CEO, KrakenFlex), Laura Sandys (Chair, Energy Digitalisation Taskforce) and others.
