Former DeepMind expert's AI tool could help boost National Grid ESO's solar forecasts

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- **Britain's grid operator joins forces with energy data innovator Open Climate Fix**
- **Innovation project could help control room 'nowcast' solar power generation**
- **Potential for significant savings in balancing costs and carbon emissions**

National Grid Electricity System Operator (ESO) has teamed up with Open Climate Fix (OCF) – a non-profit start-up co-founded by former DeepMind researcher Jack Kelly – to use AI to improve the way the grid forecasts solar generation.

The new innovation project will see the ESO – which balances Britain's electricity system second by second to keep the lights on – work with Kelly and his team to develop a first-of-its-kind solar 'nowcasting' service for its national control room.

Nowcasting involves a machine learning model forecasting the near future – in minutes and hours rather than days – and has historically found use in predicting rainfall.

OCF's pioneering work applies a similar approach to predicting where sunlight will fall, by training a machine learning model to read satellite images and understand how and where clouds are moving in relation to solar arrays below.

Changes in solar generation are difficult for grid operators to anticipate owing not only to uncertainty in forecasts, but also uncertainty around the location of many solar panels – most of which are connected to regional networks.

While work is underway to map Britain's solar panels, previously there's been no way to anticipate short term swings in solar generation caused by cloud cover.

To cover that uncertainty – and make sure any dip or rise in solar generation doesn't nudge the electricity system out of balance – the ESO keeps reserve power, often flexible gas plants, in readiness to respond to unexpected changes in supply or demand.

The increased certainty in solar forecasts that OCF's nowcasting service could bring to the ESO's control room could mean fewer carbon-emitting generators held in reserve, and more efficient balancing actions – meaning better value for consumers.

It would mark a significant step in the ESO's ambition to be able to operate a zero carbon electricity system by 2025.

Carolina Tortora, head of innovation strategy and digital transformation at National Grid ESO, said:

> "Accurate forecasts for weather-dependent generation like solar and wind are vital for us in operating a low carbon electricity system. The more confidence we have in

our forecasts, the less we'll have to cover for uncertainty by keeping traditional, more controllable fossil fuel plants ticking over.

We're increasingly using machine-learning to boost our control room's forecasts, and this latest nowcasting project with Open Climate Fix – whose work could have real impact for grid operators around the world – will bring another significant step forward in our capability and on our path to a zero carbon grid."

Jack Kelly, co-founder of Open Climate Fix, said:

"We're over the moon to be collaborating with one of the world's most innovative system operators – National Grid ESO. We plan to adapt the amazing work done by the global machine learning community to solar electricity forecasting. All our work will be open-source, so others will be free to use the technology to help reduce emissions globally as rapidly as possible."

In April OCF won part of a €10m fund from Google.org as part of its Impact Challenge on Climate programme – an initiative that backs bold ideas that use technology to accelerate Europe's progress toward a greener future.

Machine learning developments in the ESO's control room have already resulted in a 33% improvement in the accuracy of solar forecasts in recent years.

Last week saw the launch of another ESO innovation project using machine learning to help forecast the required levels of back-up power on the grid more efficiently.

ENDS

Notes to editors

Images of National Grid ESO's control room available here.

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