

---

## Breakthrough Irish AI to predict electricity from wind farms

**Irish researchers from [CeADAR](#) have come up with a new AI tool that has been deployed at [SSE Airtricity](#) wind farms to accurately predict how much electricity can be generated by wind.**

The reliability of renewable energy to power Irish homes and businesses has been reinforced by the creation of a system that can accurately predict the amount of renewable energy that can be produced by wind farms.

AI research centre CeADAR, Ireland's national centre for Applied Data Analytics and AI, has deployed an AI tool at 21 SSE-owned wind farms to accurately predict wind energy generation.

Currently it is not possible to accurately predict the amount of energy that will be generated making the new tool the first of its kind in the renewable energy industry.

### **The AI answer is blowing in the wind**

This new AI tool was developed during a partnership project, called FREMI (Forecasting Renewable Energy with Machine Intelligence) between CeADAR and Ireland's largest provider of 100pc green energy, SSE Airtricity.

The €370,000 project took 18 months to complete and was funded by the SEAI National Energy Research Development and Demonstration (RD&D) programme. The tool created by the project will contribute to save energy at national and European level and in turn to create a greener, decarbonised environment.

It is accurate, scalable, reliable, and maintainable, and has already been deployed and is in use by SSE Airtricity at 21 wind farms around Ireland which are owned and operated by its sister company, SSE Renewables.

FREMI will also allow energy traders to comply with new market rules imposed by the Integrated Single Electricity Market (ISEM), the wholesale electricity market for the island of Ireland. As part of ISEM, renewable energy generators must accurately forecast the energy they generate a day in advance of it generating and going to market.

The project was led by Dr. Ricardo Simon Carbajo from CeADAR, and David Noronha, Project director at SSE Airtricity and was supported by SSE's head of Energy Markets David Graham. A range of data scientists were involved in the project including Dr David Haughton, Andres Suarez-Cetrulo and Lauren Burnham-King from CeADAR, and Derek Aherne and Noelle Doody from SSE

Airtricity.

“This is cutting-edge applied research in deep learning with real application in an energy market setting which provides a real tangible impact to the energy sector, contributing to lower costs of energy and the decarbonisation plan. Both SSE Airtricity and CeADAR have a close collaborative relationship and are looking to develop further projects in this area, specifically now due to the importance of the European Green Deal and the fast adoption of renewable energy.”

Renewable energy generators have a large amount of data about the historical operations of their wind farms. This valuable data is combined with forecasts of meteorological conditions to accurately predict wind energy production a day ahead of the energy being generated.

The more accurate the predictions, the less uncertainty in the level of wind energy that will be available to the grid, making this technology more economically competitive and reliable. This in turn helps accelerate the transition to a green energy landscape, by reducing carbon emissions and ultimately reducing the cost of energy.

“FREMI was a collaboration that combined CeADAR's technical expertise with the knowledge of the SSE Group,” said Graham.

“By utilising leading-edge machine learning techniques, tools have been produced that can improve the accuracy of renewable production forecasts. We look forward to future exciting collaborations with CeADAR.”

His colleague David Noronha added: “At SSE Airtricity, we’ve a proud history of collaboration with CeADAR and this latest project is another great example of how energy companies can benefit from applied data and AI. FREMI has helped us to take another big step towards meeting our goal of Net-Zero by 2050 and will also have added benefits for the entire energy chain, including customers.”

By [John Kennedy](mailto:john.kennedy3@boi.com) ([john.kennedy3@boi.com](mailto:john.kennedy3@boi.com))

*Published: 22 February 2021*