



SPECIAL EU PROGRAMMES BODY



THEME:

Research and Innovation

FUNDING (ERDF+MATCH):

€6,462,927.87

MATCH FUNDERS:

Department of Business, Enterprise and Innovation, Ireland and the Department for the Economy, Northern Ireland

LEAD PARTNER:

Ulster University

PROJECT PARTNERS

Queens University Belfast; Ulster University; Arbarr; Dundalk Institute of Technology; University of Strathclyde and Sunamp.

Start Date: 01/01/2017

End Date: 31/12/2021



<https://www.ulster.ac.uk/spire2/the-project>



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Project Case Study: SPIRE 2 Researchers Progress (May 2021)

University of Strathclyde Researchers Developing Lifetime Prediction Model of Wind Turbine Blade Erosion

Spire 2 researchers in the University of Strathclyde are developing a tool, designed to represent a lifetime prediction model of wind turbine blade erosion. The inputs for the model contain climate data for the location of the wind turbine including: Impact velocity, internal stresses on the blade, off-shore / on-shore turbine placement, turbine service period, the postcode of the wind turbine and the degree of erosion prior to maintenance. Using these inputs, the algorithm uses experimental data to give an output of mass loss, whether it passes or fails the allowed erosion, the stage of erosion the blade is experiencing and also a future expected mass loss. Ongoing work to develop the model will include the collation of data on criteria like type of wind turbine, wind variety and expected turbine lifetime data for input to the model.

Belfast City Hospital Research

SPIRE 2 researchers have been working with Belfast Health and Social Care Trust to assess the integration of MAN Energy's new Electro-thermal Energy Storage (ETES) system at Belfast City Hospital. SPIRE 2 researcher, Motasem Bani Mustafa, is assessing the impact on the distribution network of adding the new electrical load, and investigating how to increase flexibility by smart management of the ETES. Researchers are also evaluating the mitigating effect of adding a combined battery and PV array to the system, to establish the net effect on the grid. The SPIRE 2 research team will additionally assess the potential for the system to participate in DS3 ancillary services markets, as well providing future flexibility services to the network operator.

Presentation at IEEE PES ISGT Europe 2020

SPIRE 2 QUB PhD Researcher, Ahmed Mohammed, presented his research work on the battery storage for congestion management at the IEEE PES ISGT Europe 2020. His presentation was entitled '*Battery Energy Storage for Congestion Management Considering Distribution Network Congestion*'. The paper proposes an operational planning strategy for battery energy storage systems (BESS) in medium voltage distribution networks. This strategy determines the optimal location and size for BESS, as well as, the discharging and charging schedules. The objective of this methodology is to improve reliability and stability by relieving distribution network congestion, such as voltage violations and lines overloading.