**PhD Project Proposal**

School of Electronics, Electrical Engineering and Computer Science

& ECIT Global Research Institute

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| **Proposed Project Title: Operation of Low-Inertia Power Systems** |
| **Principal Supervisor: Dr. Robert Best Second Supervisor: Dr. David Laverty** |
| **Project Description:** With high penetrations of non-synchronous infeed, for example wind generation and DC interconnection, the all-island power system in Ireland is one of the most dynamic in the world and its study offers a unique platform for analysis and research.One consequence is the reduction of power system inertia, which has conventionally been relied upon to stabilise frequency. To maximise the amount of renewable energy, techniques must be developed to ensure that the power system can operate effectively with high non-synchronous infeed.This project investigates methods of co-ordinating the provision of system services from technologies such as variable speed wind generation, HVDC and battery storage, with the response of conventional generation.Objectives:* Determine the effect of non-synchronous in-feed on power system dynamic performance.
* Analyse system-wide Phasor Measurement Unit (PMU) data captured from the all-island power system.
* Through a combination of simulation and laboratory demonstration, develop control algorithms and propose operational strategies for power systems with low inertia.
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