

## Architecture of the Future Low-Carbon, Resilient, Electrical Power System

### Future Architecture of the Network (FAN) – Te Whatunga Hiko

#### Workstream 3 –Summer Project

**Project title:** Data-Driven Control of Power Electronic Converters

**Relevant Workstream(s):** WS 3

This project is focussed on Workstream 3 (WS3).

To enable proliferation of DC grids within AC grids by addressing technologies and control mechanisms for different forms of power electronic converters.

#### **Project Description**

One of the main issues in designing control mechanisms for power electronic converters is that the converter must operate in a wide range of conditions, e.g. different grid strengths, load, etc. One potential method to address this is data-driven control, where the converter uses data it collects to adapt to the conditions by re-calculating its control gains automatically.

The student will build on the work of two previous data-driven control summer projects in 2023/2024 and design a data-driven controller for other converter topologies (e.g. DC-DC dual-active-bridge converters). If time permits, comparisons between different approaches will be performed along with investigation of the coordination of multiple data-driven power converters in a power system.

#### **Specific requirements:**

- BE(Hons) - Electrical and Electronic Engineering (EEE) student- Third (second Pro) or Fourth (Third Pro) year.
- Good knowledge of power systems and power electronics
- Experience with programming languages, e.g. MATLAB
- Familiarity with power system simulation tools e.g. Simulink Electrical, PSCAD/EMTDC
- Excellent academic track record
- High proficiency in written and spoken English
- Enthusiastic applicants (any nationality) that want to make a positive impact in the world and can work in a collaborative environment.

**Potential Supervisor(s)** –Jeremy Watson, Tek Lie

**Based in:** University of Canterbury