

## Faculty of Engineering

### Summer Research Program 2024 - 2025

Project Title: A Digital Twin to Prepare Power Grids for Rapid Electrification

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#### Objective

This project will be in collaboration with power industry and aims to create algorithms and tools urgently needed for energy transition. The intended outcome of this project will be an automated tool encompassing energy data ingestion, solar and EV adoption propensity modelling, grid impact analysis, and comparisons of mitigation strategies.

#### Project Details

Australia's energy and transport sectors account for more than 80% of its greenhouse gas emissions. Electrification of gas and transport is key to decarbonising the energy and transport sectors and to a larger extent the whole economy. Transition to electric vehicles (EV) is a key part of Federal and State emissions reduction strategies, with 1.7 million EVs anticipated to be on Australian roads by 2030.

This project aims to build a Digital Twin for power distribution networks that will provide critical insights into the grid constraints, capacity requirements, and cost implications of electrifying transportation and heating through a comprehensive network impacts study. The developed tool will help to understand where and when Distributed Energy Resources (DERs) and EVs are adopted, and what the impact of these changes is on grid the operation of the grid.

The project will involve developing mathematical models, analysing time series energy data and creating a user-interface dashboard.

#### Additional Information

Potential applicants are required to attend an interview. The successful applicant will be working within a group supported by PhD students and Research Fellows.