

Centre for Railway Engineering (Est. 1995)
Centre for Hydrogen and Renewable Energy (2022)

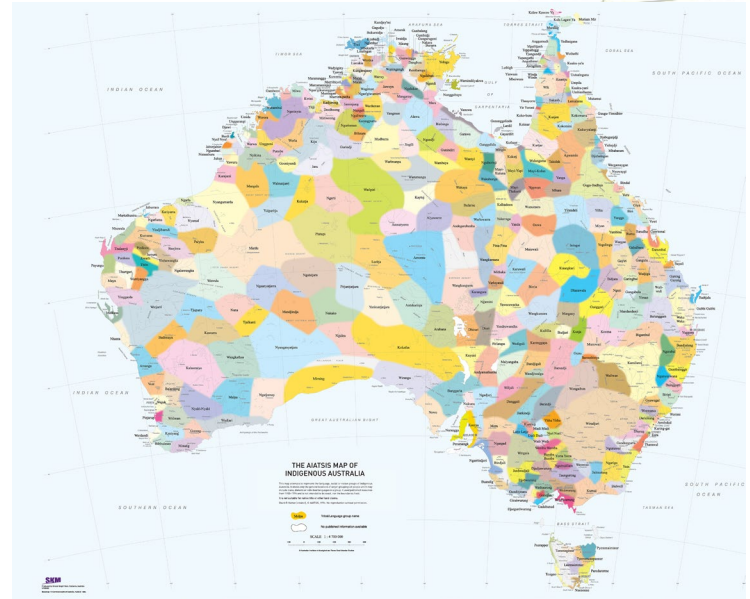
CQUiversity

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Acknowledgement of Country

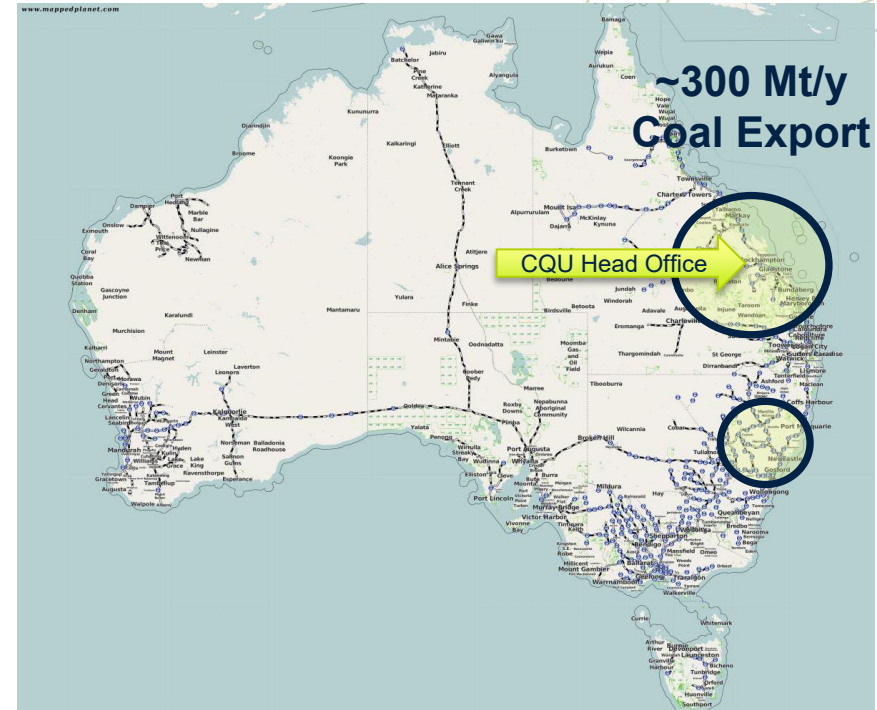
We respectfully acknowledge the Traditional Custodians of the many lands in Australia on which we work and learn. We pay respect to the First Nations peoples and their Elders, past, present and future for they hold the memories, the traditions, the cultures and hopes of Aboriginal and Torres Strait Islander peoples.



Introduction – Local Context – Energy Transition

CARBON INTENSIVE

- 50 of Australia's Largest carbon emitters
- 3 Coal power stations
- Coal mining
- Liquefied Natural Gas Exports
- Aluminium, Chemicals, Agriculture



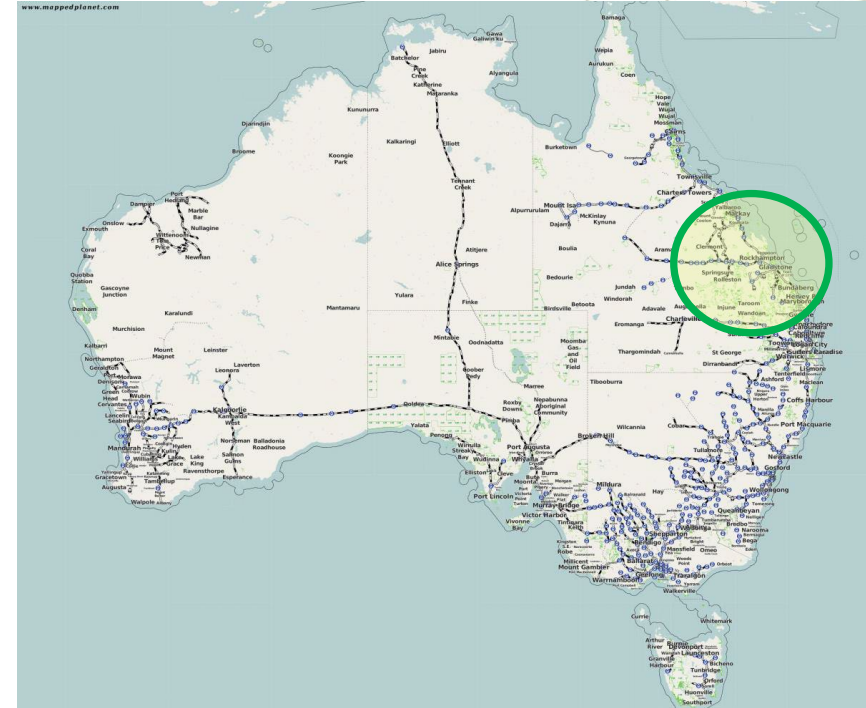
Introduction – Energy Transition Projects

Gladstone

- 9 GigaWatt - Solar & Hydrogen
- Manufacturing Hydrogen Electrolysers
- Hydro and Wind Power Stations
- Solar Farms and Rooftop Solar
- Green Chemicals

Strong Government Support

- Qld Energy and Jobs Plan
- CQ-H2 Consortia



Approach to Research

- These are “Industry Focused Centre’s” for problem solving and Applied Research.
- Research spans from “Theoretical” to “Industry ready” First-of-a-Kind solutions and Consulting.
- International Engagement via
 - Shared interests and Joint Publishing in High Quality Journals
 - Co-tutelle Research Student Programs
 - Focus on a select number of countries where needs and interest match
 - Benchmarking research in peak International Conferences and Associations
 - IHHA, IAVSD, WCRR etc



What we look like in 2024 - Hydrogen and Renewables

- Green Hydrogen production
- Green Chemicals
- Freight Mobility



Reach – Where we have worked

Research Projects

In 4 of the 6 Australian States

New Zealand

India

China

Joint Publications

Europe

Canada

South Africa

China

Engineering Consulting

Australian States

New Zealand

India

USA

Mongolia

Cameroon

Canada

New Product Rollouts

Australian States

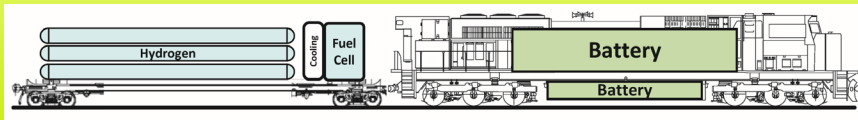
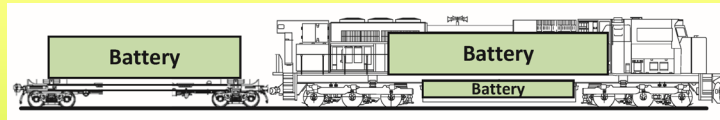
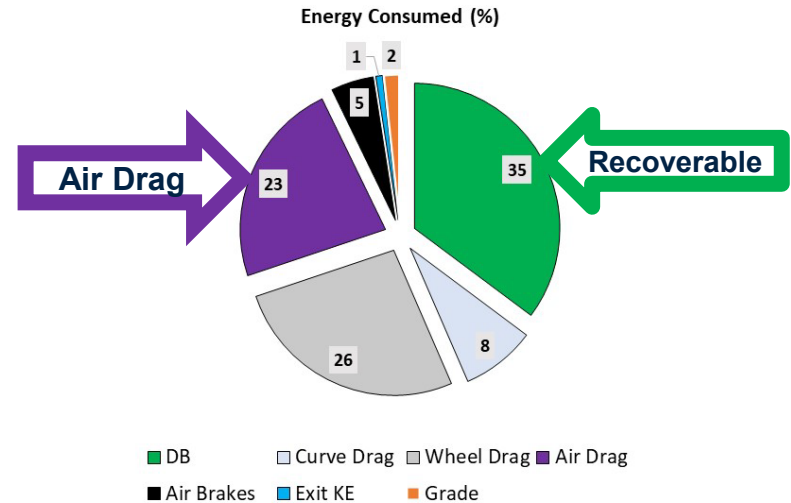
New Zealand



Example Projects in Energy Transitions - RAIL

- Energy Solutions for Large Railway Freight Operations
 - Simulation of Energy usage, recovery and storage
 - De-Risking Industry of Transition Solutions

- Similar Applications in Road



Research Opportunities Going Forward

- Energy Analysis
- Reducing Energy Consumption
- Biofuel Projects
- Battery and Hydrogen Conversions
- Storage and Charging/Refueling Systems
- Safety System Developments in each new Application
- Green Chemicals
- Ammonia applications
- New Mobility Decarbonisation Technologies

Current Projects

- ☆
- ☆
- ☆
- ☆
- ☆
- ☆



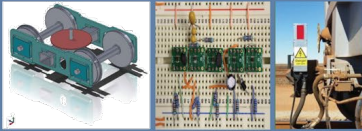
Smart Condition Monitoring



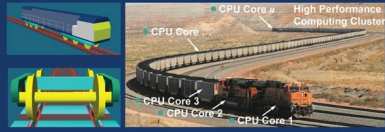
Automation and Optimal Energy Drive Assistance System



Virtual Prototyping Product Design Smart Devices



Simulation Parallel Computing Digital Twins



Field and Laboratory Testing



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Thanks

Comments, questions & discussions

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