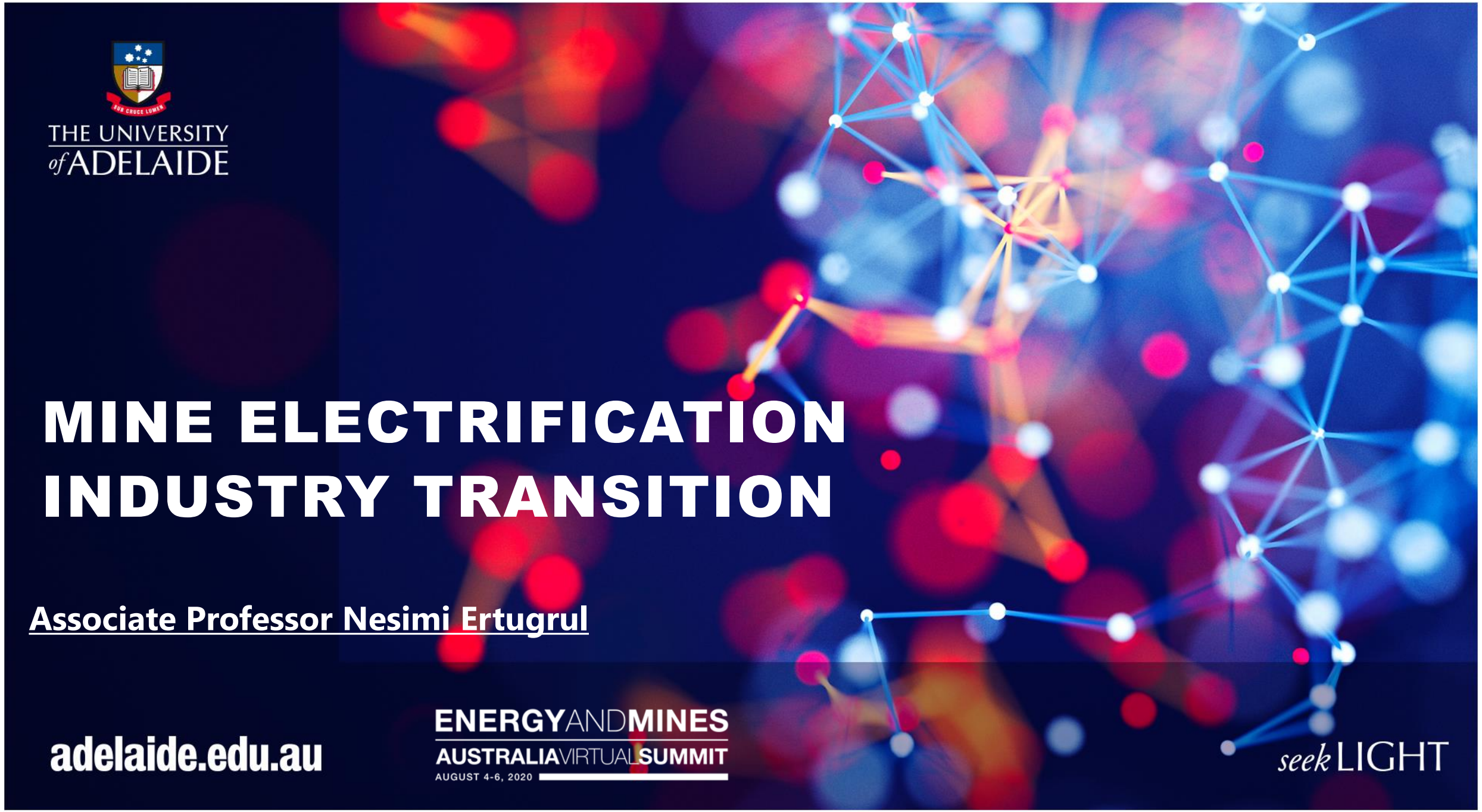
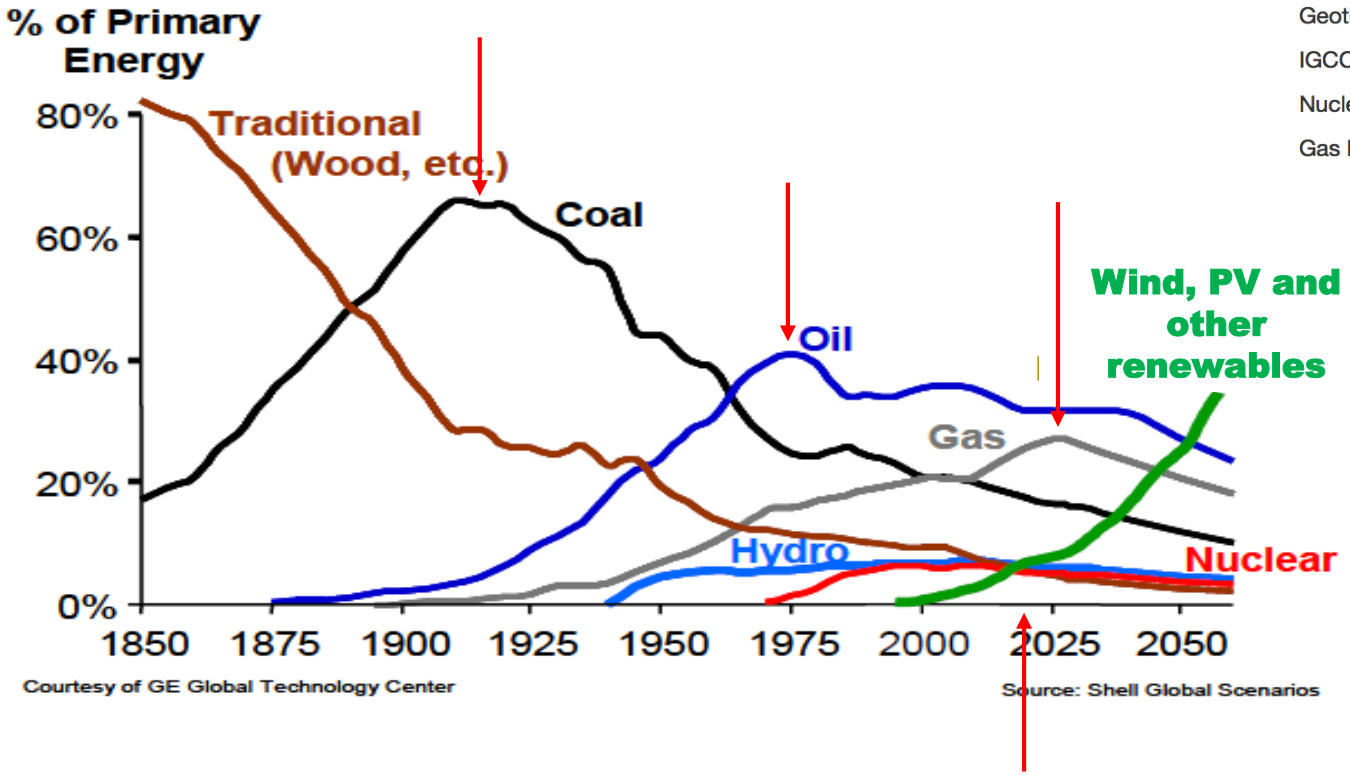
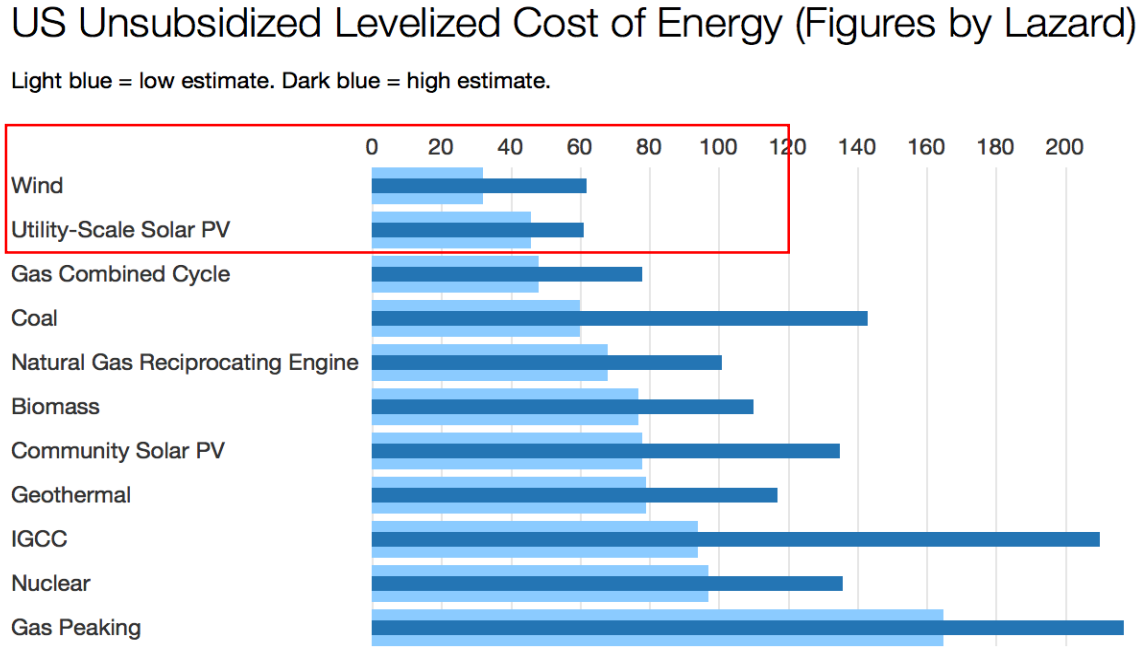
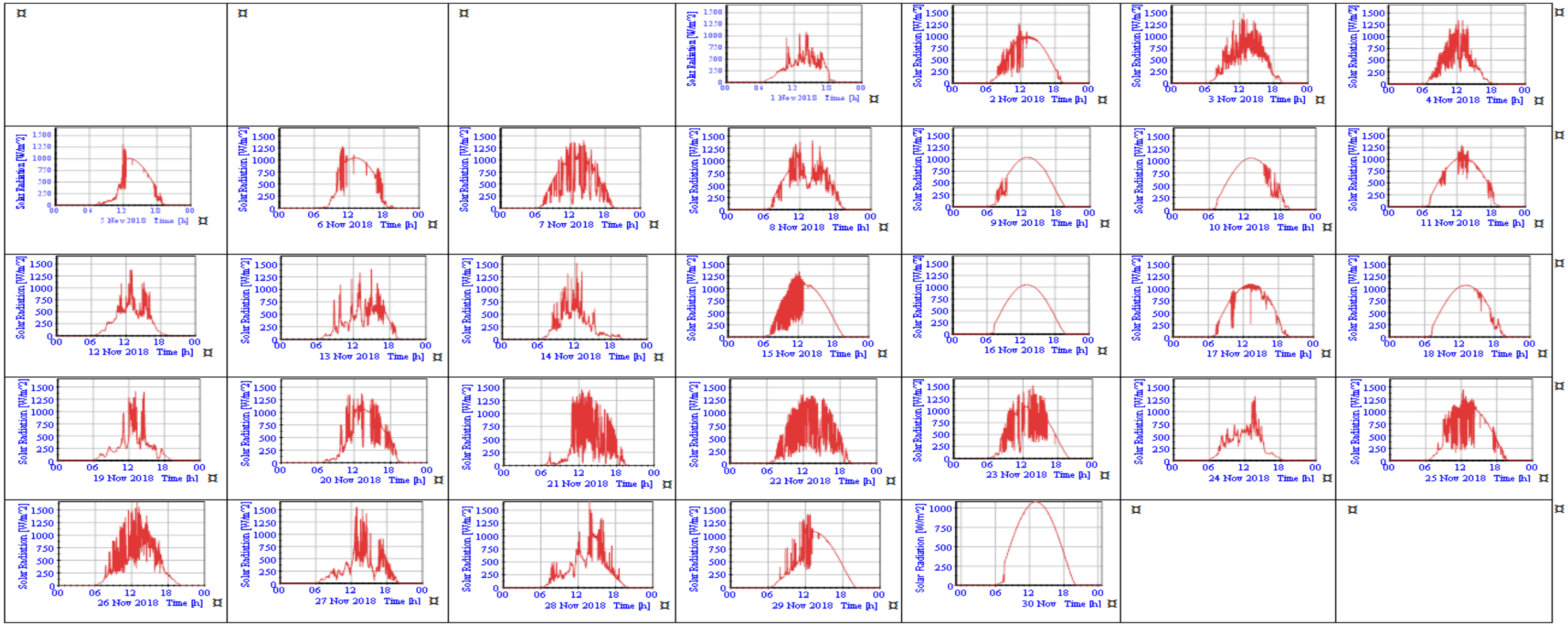

THE UNIVERSITY of ADELAIDE
MINE ELECTRIFICATION INDUSTRY TRANSITION
Associate Professor Nesimi Ertugrul
adelaide.edu.au
ENERGY AND MINES AUSTRALIA VIRTUAL SUMMIT
AUGUST 4-6, 2020
seek LIGHT

The writing on the wall





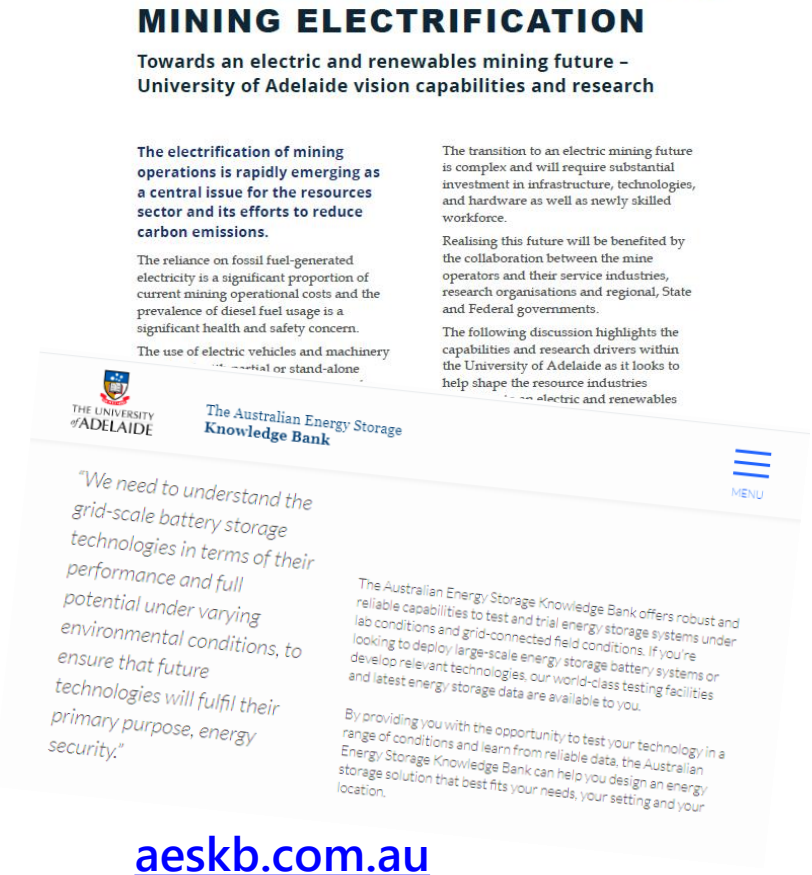
Monthly Solar Irradiance on a Site



The electrified mine

University of Adelaide is positioned as a thought leader in this space and is available for partnerships

- Recently released “Mine Electrification Report” (available on request and in our virtual booth)
- Proven capability and expertise in:
  - Renewable Energy
  - Microgrids
  - Electric Vehicles
  - Power System Operations
  - Automation and robotics
- **How we can help industry**
- Deploy microgrid test systems to support mine specific studies,
- Work with both end users and system suppliers/operators to safely and efficiently design and deploy electrified mining systems



aeskb.com.au

How we can help industry make the transition

Program A

Detailed understanding of the energy needs of a mine site - towards more renewable integration

- evaluate consumption patterns
- identify mine specific features
- assess the impacts of the transformation

Procedures and guidelines for energy management towards more-electric more-renewable mining

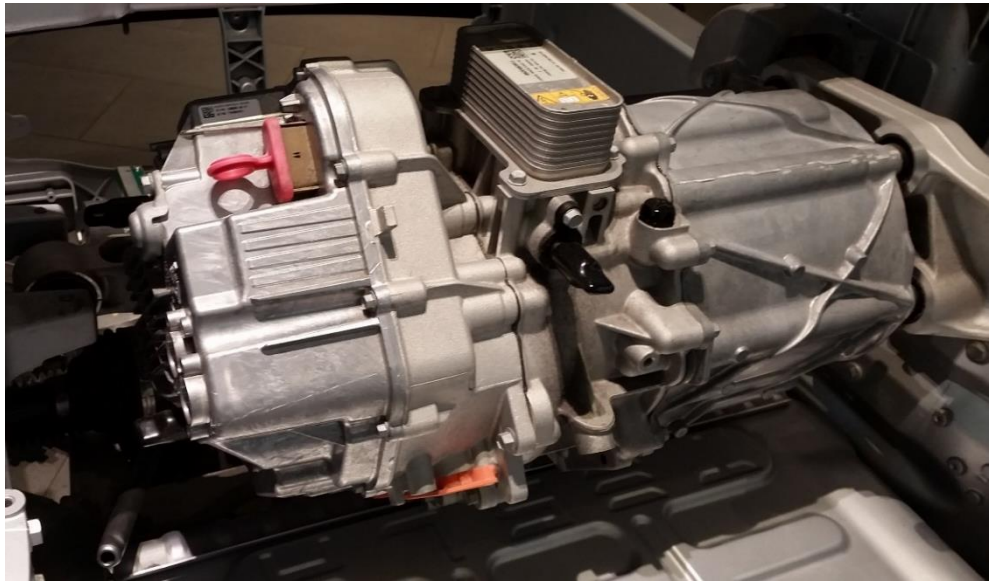
How we can help industry make the transition

Program B

Optimal design of charging and discharging infrastructure

- understand the existing fleet operation
- data collection and analysis
- considering 2nd life of batteries in stationary mining applications
- considering renewable sources in mining-towns as well as vehicle-to-grid operation

Tools, options and guidelines to design and operate infrastructure



How we can help industry make the transition

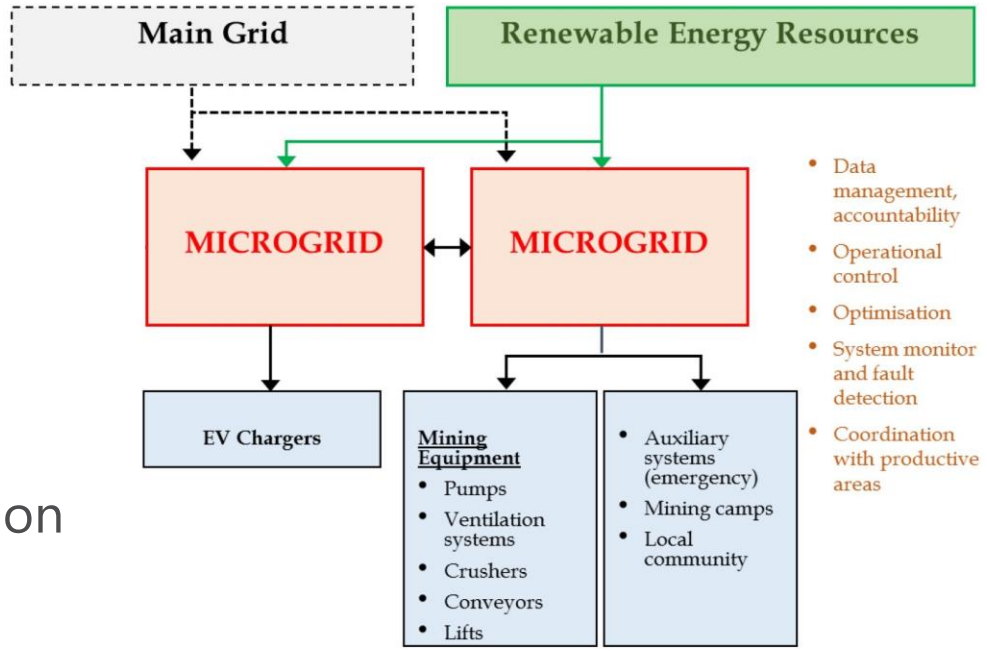
Program C

Design the backbone infrastructure for safe and continuous EV fleet operation

Integrate renewable/non-renewable energy in electricity network with sensors and communication

- designing modular and scalable solutions for 24/7 operation
- assessing multiple microgrid co-operation
- designing sensor/communication IoT network for EV monitoring and control

Tools, guidelines and designs for the infrastructure for EV fleet operation



How we can help industry make the transition Program D

A microgrid/battery storage pilot study using the AESKB test system

Support EV fleet infrastructure using renewable resources and battery storage by

- design battery-supported EV fleet and infrastructure
- deploy AESKB microgrid/battery platform

Understanding capability of microgrid/ battery storage and future EV systems

Flexible Microgrid Test System: 270kW/270kWh

Battery energy storage system with multiple inputs

PV, wind, diesel, fuel cell and others

Proven technology: deployed for 12 months into the National Grid with full functionality and monitored operation

Available for commercial deployment for investigating specific needs of a mine site

- Renewables integration, EV charging, peak lopping, islanding, stability, starting current for large machinery & others

Hardware

(a)

(b)

(c)

a) AC switchboard, (b) Automated circuit breaker, (c) Bi-directional Inverter.

How we can help industry make the transition Program D

Training the workforce needed for the electrified mine

- General and bespoke training seminars
- organising specialised courses using local and international resources
- Courses ready to go

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