

Energy Storage for Commercial Renewable Integration - South Australia (ESCRI-SA)

Welcome and Introduction

A presentation for the ESCRI-SA Knowledge Sharing Reference Group, Meeting 1 – 6 February, 2018

In partnership with:



Advisian
WorleyParsons Group

This activity received funding from ARENA as part of ARENA's Advancing Renewables Programme

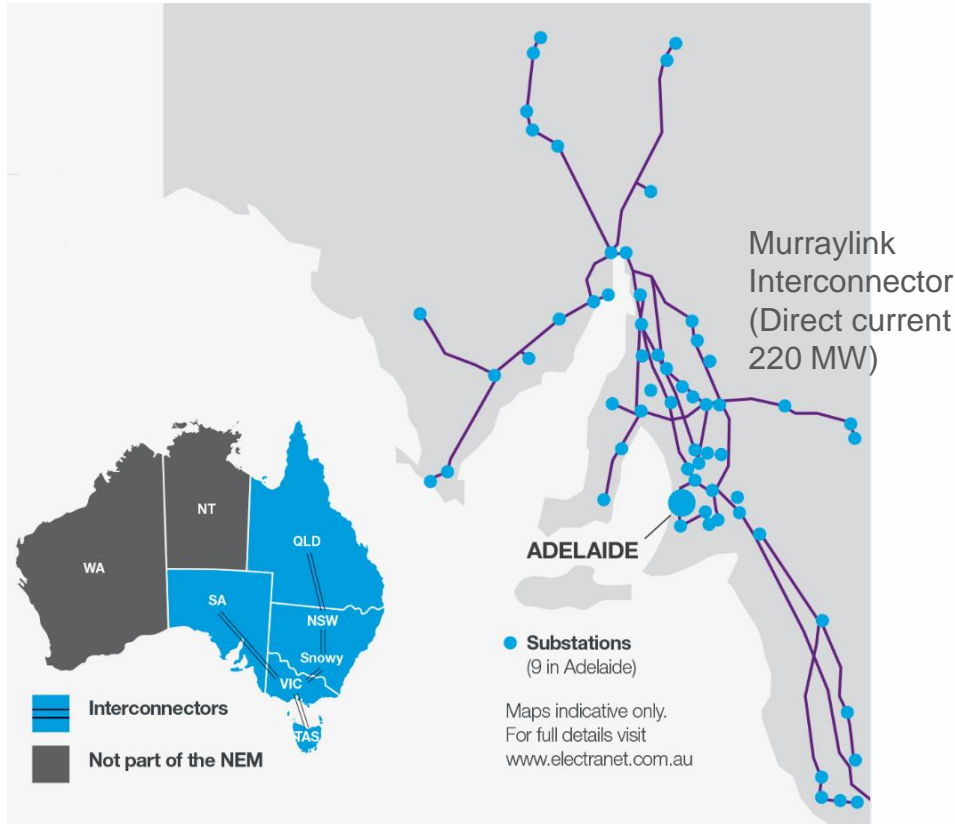
Presentation outline

- > About ElectraNet
- > South Australian power system context

About ElectraNet

About ElectraNet

Owner and operator of South Australia's transmission network



Heywood Interconnector (currently 600 MW)

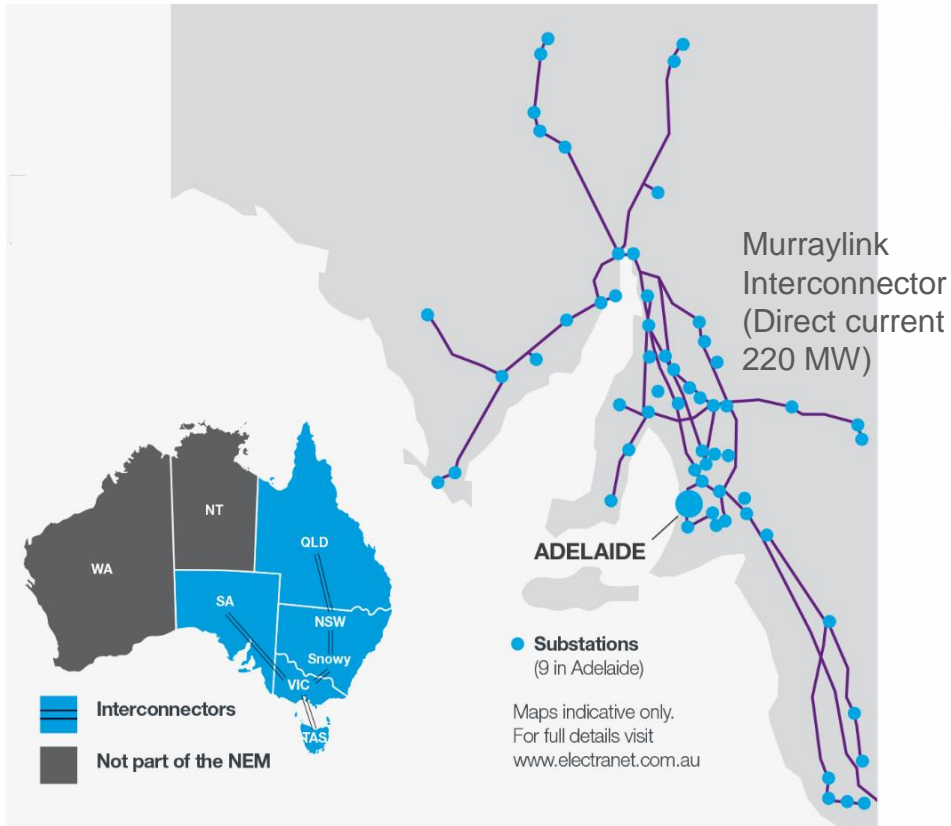
NEM – National Electricity Market
AEMO – Australian Energy Market Operator

- > Connecting customers and moving power over long distances
- > Private company with 3 major shareholders (State Grid Corporation of China, YTL Power and Hastings Funds Management)
- > Total regulated assets of \$2.5 billion
- > Network covers area of over 200,000 square kilometers
- > 91 high voltage substations
- > 5,600 circuit km of high voltage transmission lines and cables
- > 13,700 transmission towers

South Australian power system context

South Australian system overview

South Australia (SA) is at the forefront of energy transformation



Heywood Interconnector (currently 600 MW)

NEM – National Electricity Market

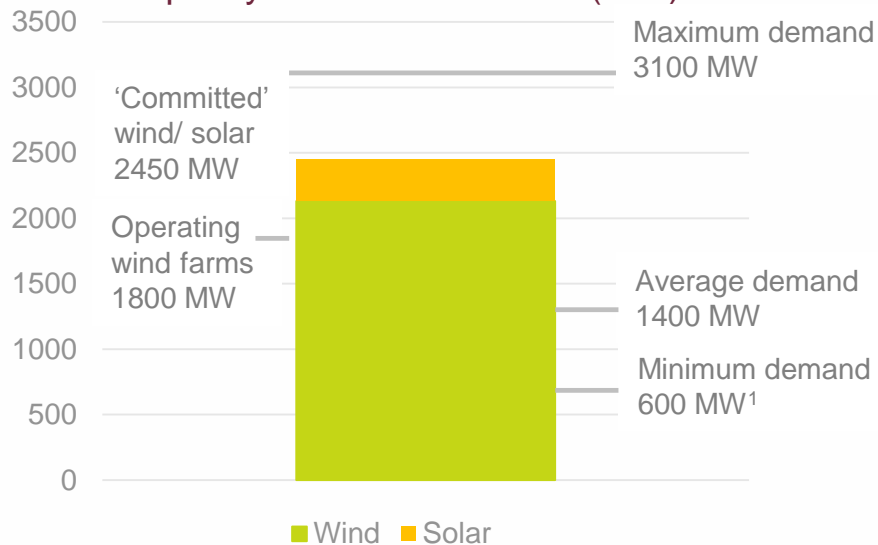
AEMO – Australian Energy Market Operator

- > Abundant high quality renewable energy resources with leading wind and solar penetration levels compared to demand
- > Last coal fired power station closed 2016
- > Reliance on gas generation and impact of higher gas prices
- > Recent SA separation and load shedding events have led to heightened concerns about power system security
- > New measures have been introduced by AEMO and the SA Government to manage power system security
- > Ongoing policy drivers to lower carbon emissions, new technology and customer choice are driving energy transformation

SA renewable energy integration

New challenges are emerging from the combination of high levels of intermittent generation and a relatively isolated and weakly interconnected system

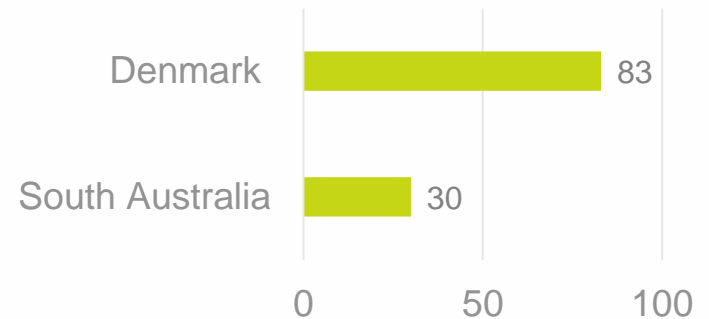
Grid connected intermittent generation capacity relative to demand (MW)



Current wind generation capacity is...

- About 130% of average demand
- > 300% of minimum demand

Interconnector import capacity relative to peak demand (%)



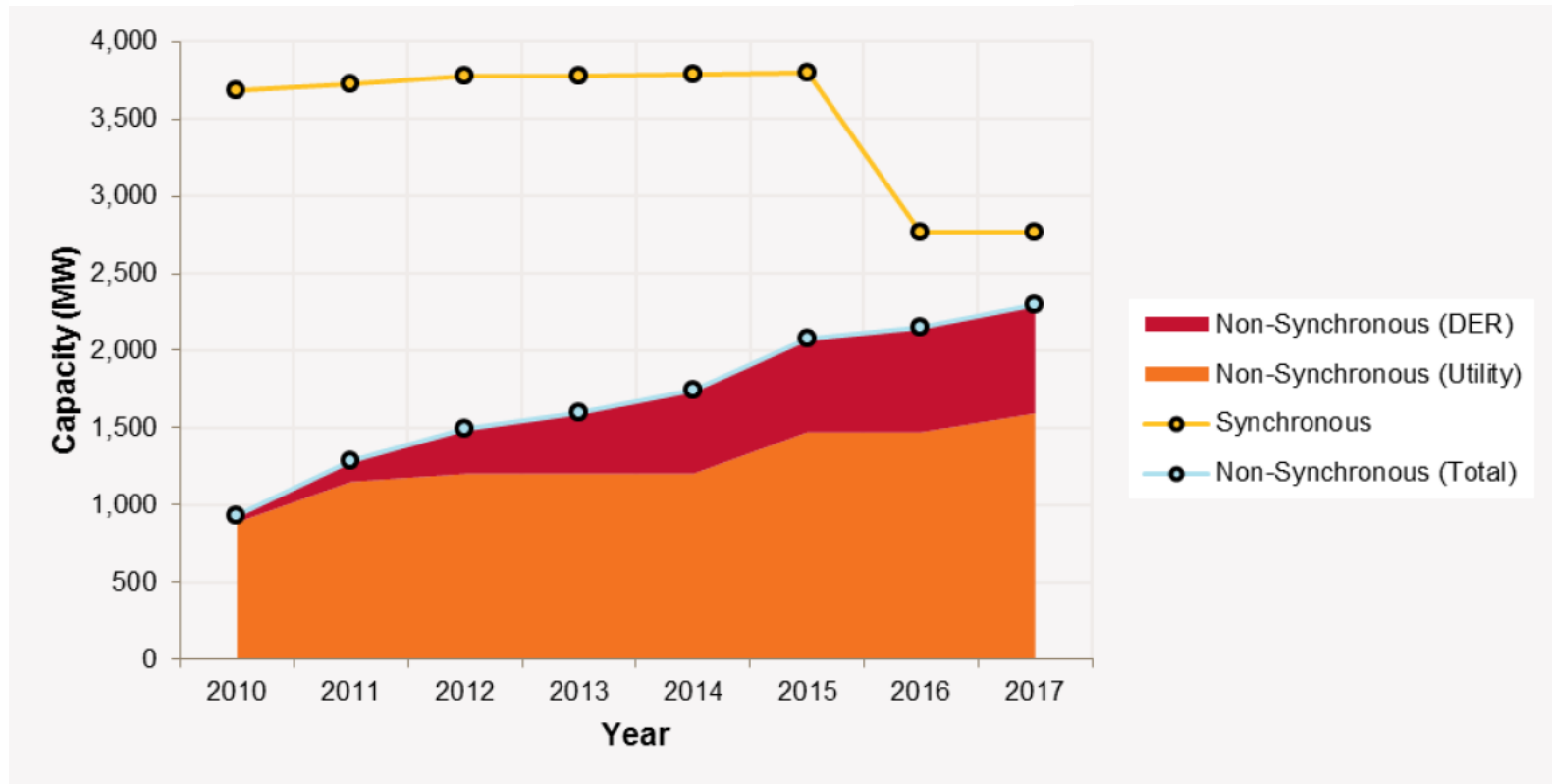
International experience shows that stronger interconnection is needed to support increasingly high levels of intermittent generation and to support energy transformation

1. Growing distributed solar PV (current capacity about 700 MW) is decreasing minimum demand

SA renewable energy integration

Increasing non-synchronous and decreasing synchronous generation

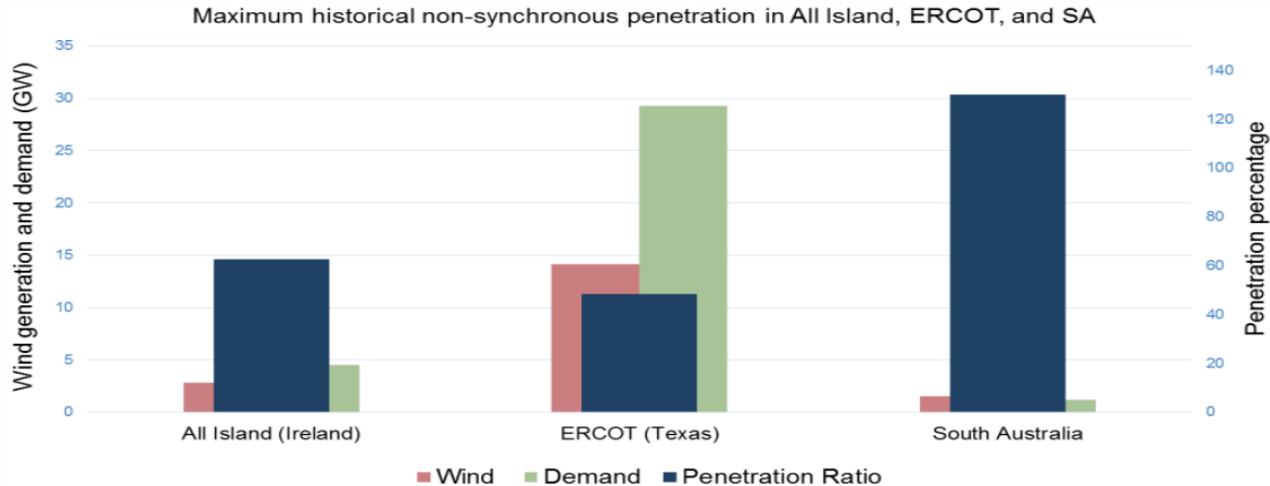
SA generation capacity per year



Source: Recommended Technical Standards For Generator Licensing In South Australia, Advice to ESCOSA, AEMO, March 2017

SA renewable energy integration

- > The challenges seen in SA in relation to minimum levels of synchronous generation are a first in any large scale power system in the world...



Source: AEMO, South Australian System Strength Assessment, September 2017

- > SA is unique compared with other major systems with high levels of wind:
 - Denmark** – has many interconnections with neighbouring countries
 - Ireland** – restricts non-synchronous generation to 55% penetration levels
 - Germany** – has many interconnections with neighbouring countries
 - Texas** – has low levels of wind relative to system demand

Role for energy storage

- > As existing synchronous generators operate less or are retired, new system security ancillary services are required to maintain stability of the power system
- > Grid scale battery storage can help provide...
 - Power system security (resilient to disturbances)
 - Energy security (to supply customer demand)
- > Neoen/ Telsa 100 MW 129 MWh battery has been operating in the market since late 2017
- > ESCRI 30 MW battery is next major battery project in SA
- > Others have recently been announced paired with renewables projects



ElectraNet Pty Limited

PO Box 7096, Hutt Street Post Office
Adelaide, South Australia 5000

P+61 8 8404 7966 or 1800 243 853 (Toll Free)

F+61 8 8404 7956 **W** electranet.com.au

ABN41 094 482 416 **ACN**094 482 416

Thank you

Rainer Korte

ElectraNet
52-55 East Terrace
Adelaide, SA, 5000

In partnership with:



ARENA
Australian Government
Australian Renewable
Energy Agency



Advisian
WorleyParsons Group

This activity received funding from ARENA as part of ARENA's Advancing Renewables Programme