100% Renewable Energy

A feasible option for Australia?

Dr Jenny Riesz

Energy mix in Australia

NSW: 90% of electricity from black coal
Growing pressure to reduce emissions

The electricity sector will be key

Australia’s carbon profile

Source: 2009 emissions from the National Greenhouse Gas Inventory 2011, DCCEE analysis.
Studies indicate 100% renewables is technically feasible and reasonably affordable.

**UNSW**


**AEMO**

Australian Energy Market Operator (April 2013) 100 per cent renewables study – draft modelling outcomes
Renewable technologies

Variable technologies
Diversity is key

45% - 60% wind

14% - 22% Solar thermal

15% - 20% PV

5% Hydro (existing)

6% Biomass

Elliston, B; MacGill, I; Diesendorf, M (2013) Energy Policy, “Least cost 100% renewable electricity scenarios in the Australian NEM”
A new power system paradigm
- Costs are projected to be reasonably affordable

**UNSW**
Average cost: $104 - $173 /MWh

**AEMO**
Average cost: $111 - $133 /MWh

Present average wholesale price: $55 /MWh

2 - 3 times increase in wholesale prices
Components of retail prices

- Wholesale: $110 /MWh (22%)
- Retail: $55 /MWh (15%)
- Distribution: $390 /quarter (42%, 100% renewables)
- Transmission: $300 /quarter (7%)
- Large renewables (RET): 2%
- Small renewables: 3%
- Carbon: 9%

- 100% GreenPower only costs 20-30% more than normal electricity
100% renewables is:

- Technically feasible
- Similar in cost to other power systems in the future
- Much lower risk
  - Exposure to gas/carbon prices
  - Costs of establishing a nuclear industry
  - CCS technology risk
OPPORTUNITIES FOR THE HUNTER
Promote renewable development

All Australians are contributing to the RET

- Mandatory % on all household electricity bills

Regions that host renewables benefit the most

- SA is already experiencing lower and more stable electricity prices (26% wind)
Re-think coal-fired power stations

Liability → Asset

ARENA is particularly interested in hybridisation projects
Solar hybridisation
Biomass co-firing

Vales Point Power Station (Delta)

Clean timber waste is converted to biochar.
Summary

- The world is moving to renewables
- The Hunter has a choice:

Lag behind

- Risk closures, job losses & high electricity prices

Lead the change

- Revitalise industry, create jobs & ensure low electricity prices
Thank you

www.ceem.unsw.edu.au