CAN RENEWABLE ENERGY MEET ‘BASELOAD’ POWER?

19 August 2015

PRESENTED BY: NICOLA FALCON
WHAT IS ‘BASELOAD’ POWER?

• “Base-load” means a generator has a relatively low short-run variable cost
• “Intermittency” means a generator’s output is not readily predictable

• Solar and Wind are both of these

• A more interesting question might be… Can renewable energy provide reliable and secure supply?
DISTINCTION BETWEEN SECURITY AND RELIABILITY

• **Security** is the integrity of the overall power system to cope with unexpected, sudden and credible disturbances.
  o If these can occur without plant damage or significant disruption, the power system is considered secure.

• **Reliability** is the adequacy of installed generation supply to meet demand, particularly peak demand.
  o The NEM uses a probabilistic measure of reliability, or reliability standard which targets 99.998% of all customer demand to be supplied at the wholesale level.
2015 ESROO – WHAT IS NEEDED TO MAINTAIN RELIABLE SUPPLY?

Total 13,085.30 MW in Queensland, 17,348 MW in New South Wales, 5,265.30 MW in South Australia, 12,620 MW in Victoria, 3,044.50 MW in Tasmania, and 51,363.10 MW in NEM.

Existing:
- Queensland: 13,085.30 MW, Confirmed: 100%, Committed: 100%
- New South Wales: 17,348 MW, Confirmed: 100%
- South Australia: 5,265.30 MW, Confirmed: 100%
- Victoria: 12,620 MW, Confirmed: 100%
- Tasmania: 3,044.50 MW, Confirmed: 100%
- NEM: 51,363.10 MW, Confirmed: 61%

Withdrawn (over the last financial year):
- Queensland: 44 MW
- New South Wales: 109 MW
- South Australia: 240 MW
- Victoria: 393 MW
- Tasmania: 1,077.80 MW
- NEM: 2,168.56 MW

Proposed Projects:
- Queensland: 4,430.60 MW
- New South Wales: 7,876.06 MW
- South Australia: 4,243 MW
- Victoria: 4,509.20 MW
- Tasmania: 630.70 MW
- NEM: 21,689.56 MW
CAN RENEWABLE ENERGY PROVIDE RELIABLE SUPPLY?

• Need to manage intermittency
  o Energy storage?
    ➢ How do we predict availability?
  o Increase transmission?
    ➢ To capture potential geographic diversity
  o Improve predictability?

AND/OR

• rethink need for a reliability standard
• consumers will presumably have the option of making price / reliability tradeoffs
  o accepting a lower reliability (being interruptible) in exchange for price relief
  o reliability becomes increasingly market driven
IS THERE REALLY GEOGRAPHIC DIVERSITY?

Wind Generation - NEM

Wind Generation
Policy Makers are faced with a range of issues; Achieving all of these wants is ideal, unfortunately, they are in conflict. Accomplish any two of them impacts the third

High Reliability and Low Price – High Emissions

Low Price and Low Emissions – Low Reliability

High Reliable and Low Emissions – High Price
AND ITS NOT JUST ABOUT RELIABILITY - CAN WE OPERATE THE SYSTEM SECURELY?

The transition to a low carbon future is presenting the energy industry, governments and all Australians with enormous opportunities and challenges.

AEMO’s vision is to provide energy security for all Australians.
• Can AEMO balance supply and demand at all times?

• Can AEMO maintain system frequency within standards?

• Can AEMO manage the rate of change of frequency?