New Entrant Design for the Australian National Electricity Market

Dr Adelle Howse
John Holland Group

Beyond carbon – emerging markets for ecosystem services conference
Rüschlikon - October 2003
Agenda

• Introduction
• Electricity Demand
• Electricity Supply Options
  – Designing for a competitive market
  – Essential elements
  – Benefits
• Conclusion
Introduction

- John Holland Group is one of Australia’s leading construction companies.
- Australian Economic Outlook is positive
  - Will continue to support strong growth in commercial, industrial and social infrastructure.
  - Electricity supply infrastructure is projected to be a key growth area for construction activity and a number of independent projections indicate that new generation sources are required on or before 2008;
- Development of new electricity supply infrastructure – requires in-depth analysis of the associated risks and opportunities.
Next Decade sees > 45 TWh increase in energy requiring 6000 – 9000 MW of sent-out capacity

Source NEMMCO 2003 SOO
How do we meet Australia’s growing electricity demand?

- Demand side management / Energy Efficiency?
- Renewable generation?
- Cogeneration / distributed generation?
- Larger scale baseload generation?
- **ANSWER:** a combination of all the above – the challenge is to ensure that new supply options systematically reduce the emissions intensity of the National Electricity Market.
- Baseload thermal plant must deliver low net emissions relative to existing benchmarks.
- Redbank plant in NSW was recently rejected for having CO2 emissions intensity > existing average levels
Challenges for New Entrants to the Electricity Market

- Be competitive with existing generators
- Proactively address all identified risks – including management of Greenhouse emissions
- Be attractive to investors.

Can we achieve this?
Key Components & Considerations

- Low marginal cost & reliable fuel source
- High availability & highest possible efficiency from power plant design
- Reduce Greenhouse regulatory risk with a long-term offset program, such as large scale reforestation
  - In parallel, assess potential to contribute to salinity & biodiversity conservation
- Potential to enhance regional economies & communities
- “Hybrid” cooling system to manage water usage
  - potential for “water trading” markets;
  - potential to use recycled water

**RESULT:** Market Competitive, Sustainable & Emissions Management Competent
New Entrant Power Plant Design

• The Power Station Entity sells a new electricity product defined by its Emissions Intensity ("EI"):  
  – “X” Kg/MWh certified CO2-EI Electricity  
  – The attainable value of “X” will be influenced by:  
    • Underlying power station emissions (based on efficiency of the power station and fuel type);  
    • Level of Carbon Offsets secured from Reforestation activities or arrangements;  
    • Market or Regulated drivers that support the demand for this product & hence increase revenue potential.

• Power Station can also trade in water, possibly ‘salinity credits’ and/or other environmental products.
New Entrant Power Plant Design

Essential Components

• Proven technology
  – Best possible efficiency & reliability

• Carbon Offsets from Forestry
  – Land availability, species suited to climate, timber markets, management expertise, accounting systems, term to support long economic life of power plant

• Legislation or Regulations that create a medium-long term defined market for Environmental or Greenhouse products or that rewards low emission generation sources;
Economic Benefits

• Ability to deliver a portfolio of products to customers and retailers of energy.
  – Alternate products diversify revenue.
  – May be able to attract new customers and assist them in attaining goals of sustainable and low emission, yet competitive supply sources of electricity.

• First-mover competitive advantage of securing access to CO2 products before possible generator tax or mandate.
  – 30-40 year project has in-built capability to manage future Climate Change policies;
Social/Environmental Benefits

• Reforestation of salinity affected regions and degraded lands.
• Regional community benefits.
• Supports economic growth with consideration of future generation requirements for jobs & social prosperity.
• Solution allows phasing out of older emissions intense coal-fired plant on a larger scale than could otherwise occur.
Conclusion

• Australia has a growing economy and a growing population base that drives an ever-increasing demand for baseload energy
• Energy Efficiency Initiatives and Renewable Energy Incentives help – but are not enough
• Recent events indicate that Governments will reject projects that do not demonstrate a consideration for reducing greenhouse emissions.
• KEY: seek solutions that incorporate best practice technology, innovative use of co-investment in offsets such as reforestation and an overall “sustainability Orientation
• We are making progress to achieve these goals and remain commercially competitive.