



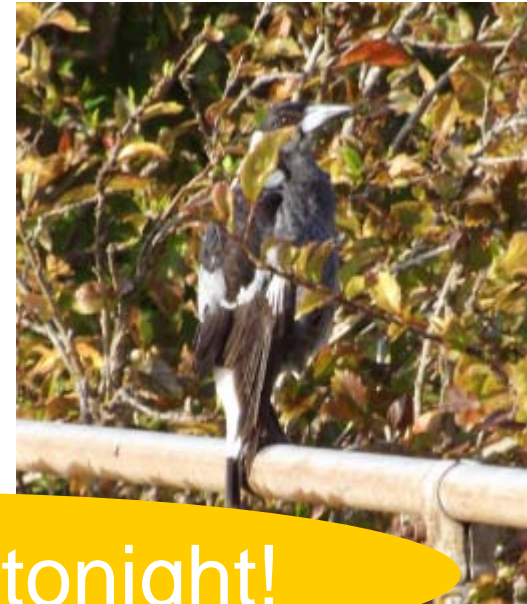
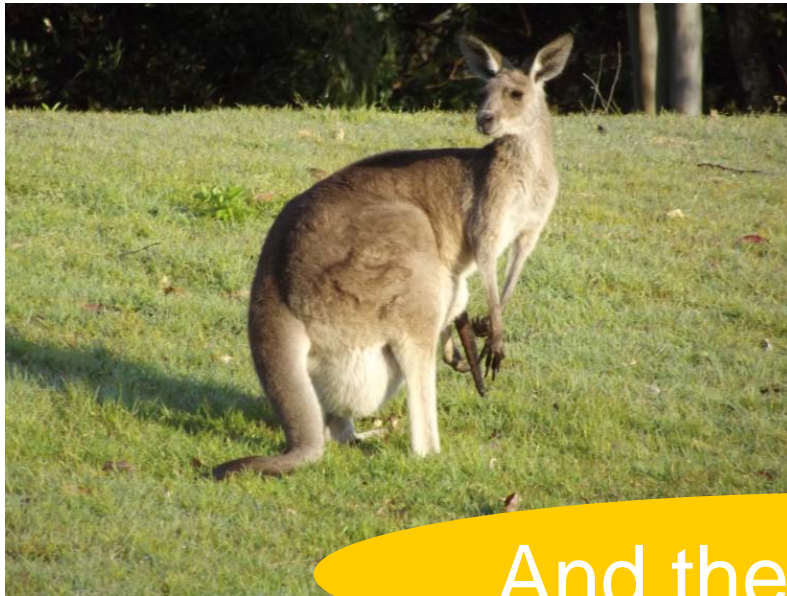
# Some personal thoughts on the OCC2 Conference

## Focus on ASU & CPU

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2<sup>nd</sup> IEA GHG Oxyfuel Combustion Conference, Yeppoon, Australia, 15 September 2011

# My “big 5” in Yeppoon



And the croc tonight!



- Cryogenics development → significant efficiency improvement
  - ✓ -20% vs previous best
  - ✓ 160-170 kWh/t
  - ✓ Various cycles
- Large Capacity commercially available
  - ✓ 3000 → 5000 → 7000-10000 tpd O<sub>2</sub> per unit
- Flexibility:
  - ✓ Load change: 5%/min
  - ✓ Efficient turndown
  - ✓ Energy storage (power price variability)

- Integration (Thermal) can significantly improve efficiency and economics:
  - ✓ confirmed 6 to 8% efficiency loss puts Oxy ahead of PCC
- The century old Cryogenics adapted very well to the specific requirements of Oxyfuel and brings its wealth of experience
- O<sub>2</sub> production will further improve
  - ✓ Cryogenics: cycles, machines, heat exchangers, distillation...
  - ✓ New routes: membranes,...?
- Upstream R&D is still needed
- Industrial Gas Companies commitment pursued

- Feedback from actual operation → It works!
  - ✓ Total Lacq
  - ✓ Vattenfall Schwarze Pumpe
  - ✓ Soon from Callide & Ciuden
  
- Corrosion can be the major issue
  - Impurity management is the solution
  
- It is flexible in purity: « - Which CO<sub>2</sub> purity? »,  
« - You choose »
  
- It can achieve very high capture rate

- Variety of technical options for impurities management with further testing and validation:
  - ✓ Sour compressor, cold deNOx, SOX/NOX removal by activated carbon, NO2 reburning...
- Still a great potential of improvement primarily on Capex
- Important input from Universities / Research activity

- Many large scale demos reach a decision crossroad
- We heard that Oxycombustion is:
  - ✓ Easy to operate
  - ✓ Cost competitive vs PCC (actual projects, reference plants, cost study)
  - ✓ Building up on well known cryogenics for gas production/purification
  - ✓ The « non chemical » capture route
- Even if not the « natural » capture choice for most utilities, Oxycombustion can be the most attractive one
- Since 2 years, more interaction between e.g. boiler suppliers, IG companies and utilities (projects, reference plant & integration studies)
  - ✓ Clearer economics
  - ✓ Better assessment of integration solutions
  - ✓ This opens a new round of optimization

- I have seen a community of passionate people with strong interest to get Oxyfuel demonstrated
- But...
  - ✓ The capture part is not the issue
  - ✓ How can we participate to building up confidence in Oxyfuel and CCS?
- Let's remain optimistic







**So what about the OCC2 Group picture in Yeppoon?**

