

CS Energy Clean Tech Forum

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27 April 2009





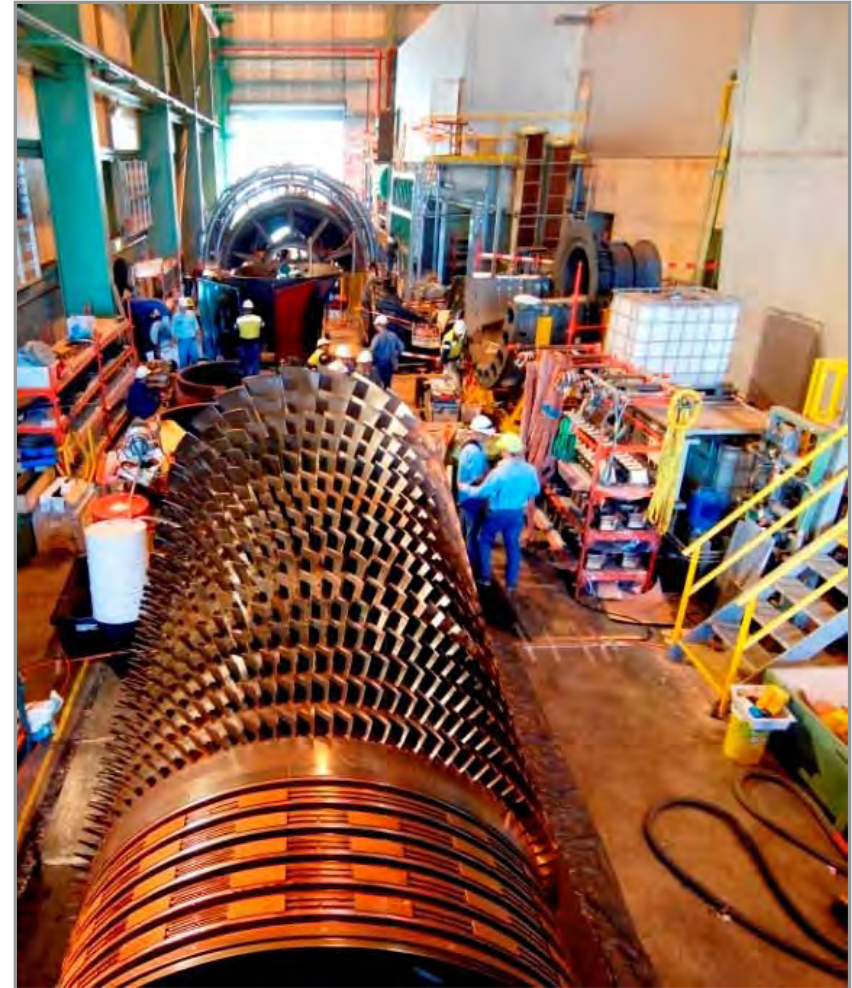
Overview

CS Energy Operates Queensland's largest power station portfolio, capable of generating more than 3000 megawatts of electricity and supplying around 30 percent of Queensland's electricity demand.



CS Energy

- **Employs** more than 600 people across Queensland.
- **Operates** four power stations in Queensland.
- **Uses** coal, natural gas, coal seam methane and landfill gas.
- **Is** Queensland's largest gas consumer.
- **Participates** in the national electricity market.
- **Is** the major electricity generator for the remote regional market in Queensland's North West Minerals province.



CS Energy's operations



Swanbank – Ipswich

Swanbank has a coal fired and gas fired station. Swanbank is also home to the ReOrganic waste –to-energy project.



Approx. 120 staff

B Station: 480MW
coal fired,
supplemented by
landfill gas

E Station: 385 MW
gas fired, combined
cycle

Site Capacity:
865MW

Fuel Supply: Black
coal, natural gas, coal
seam methane, landfill
gas.



Callide - Biloela

Callide Power Station has three coal fired power stations, one of which is operated in a joint venture with an energy company jointly owned by InterGen Ltd and China Huaneng.



Approx. 240 staff

A Station: Callide
Oxyfuel Project,
30MW

B Station: 700MW
coal fired

C Station: 900 MW
coal fired

Fuel: Black Coal



Mica Creek – Mount Isa

Mica Creek Power Station in north west Queensland is a gas fired station, supplying the remote markets of Mount Isa, Cloncurry and surrounding areas



Approx. 100 staff

A Station: 235 MW gas fired, converted from coal fired. 7 units, 3 in a combined cycle block

B Station: 35MW gas fired

C Station: 55MW gas fired, combined cycle



Kogan Creek – Chinchilla

Kogan Creek Power Station is the newest addition to CS Energy's diverse portfolio.



Staff: approx 40

Capacity: 750 MW, single shaft coal fired

Dry cooled resulting in 90% less water consumption

Dedicated mine

Single boiler

Lowest environmental emissions of any similar-sized coal-fired power station in Australia

Fuel: Black Coal





Strategic Objectives

By 2020

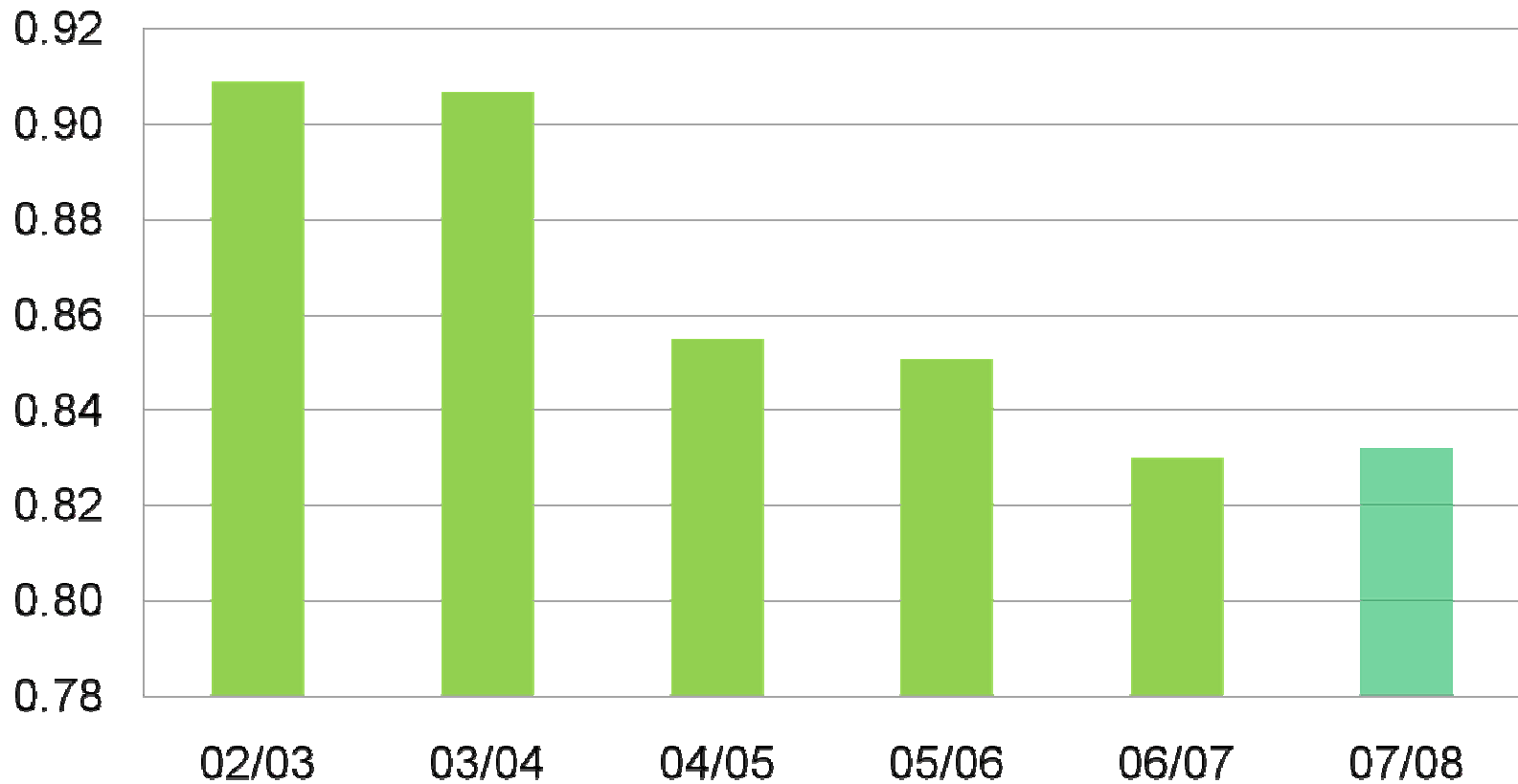
- Generation capacity 4000 MW
- Including 500 MW renewable
- Carbon neutral for internal energy

By 2030

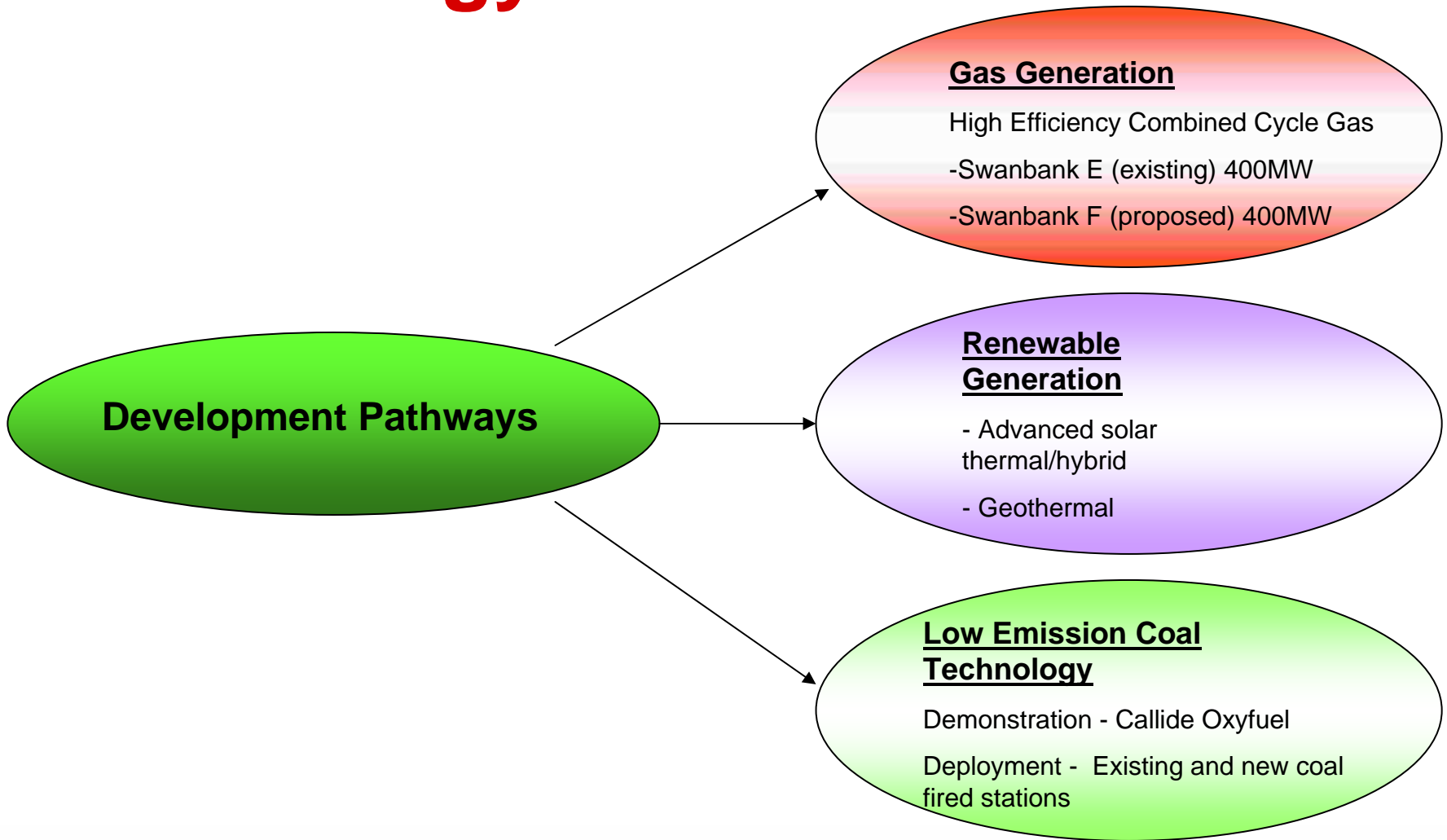
- Carbon intensity below 400kg CO₂/MWhso



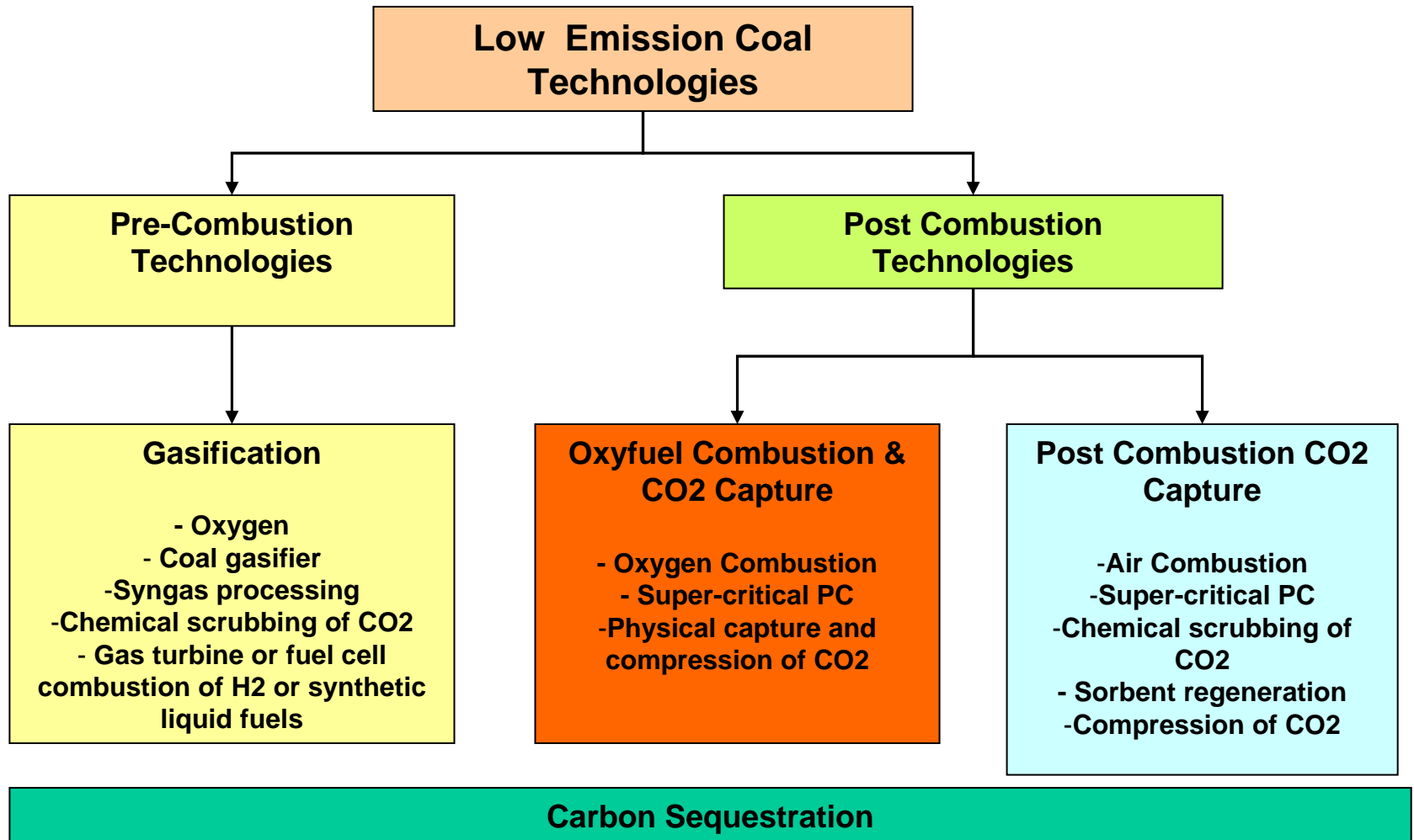
CS Energy Portfolio GI (tCO₂/MWhSO)



CS Energy – Portfolio



Low Emission Coal Technologies



Callide Oxyfuel Project

Location: Callide A, Unit 4, 30MW, coal fired generator

Funding: \$206M

Overall aim:

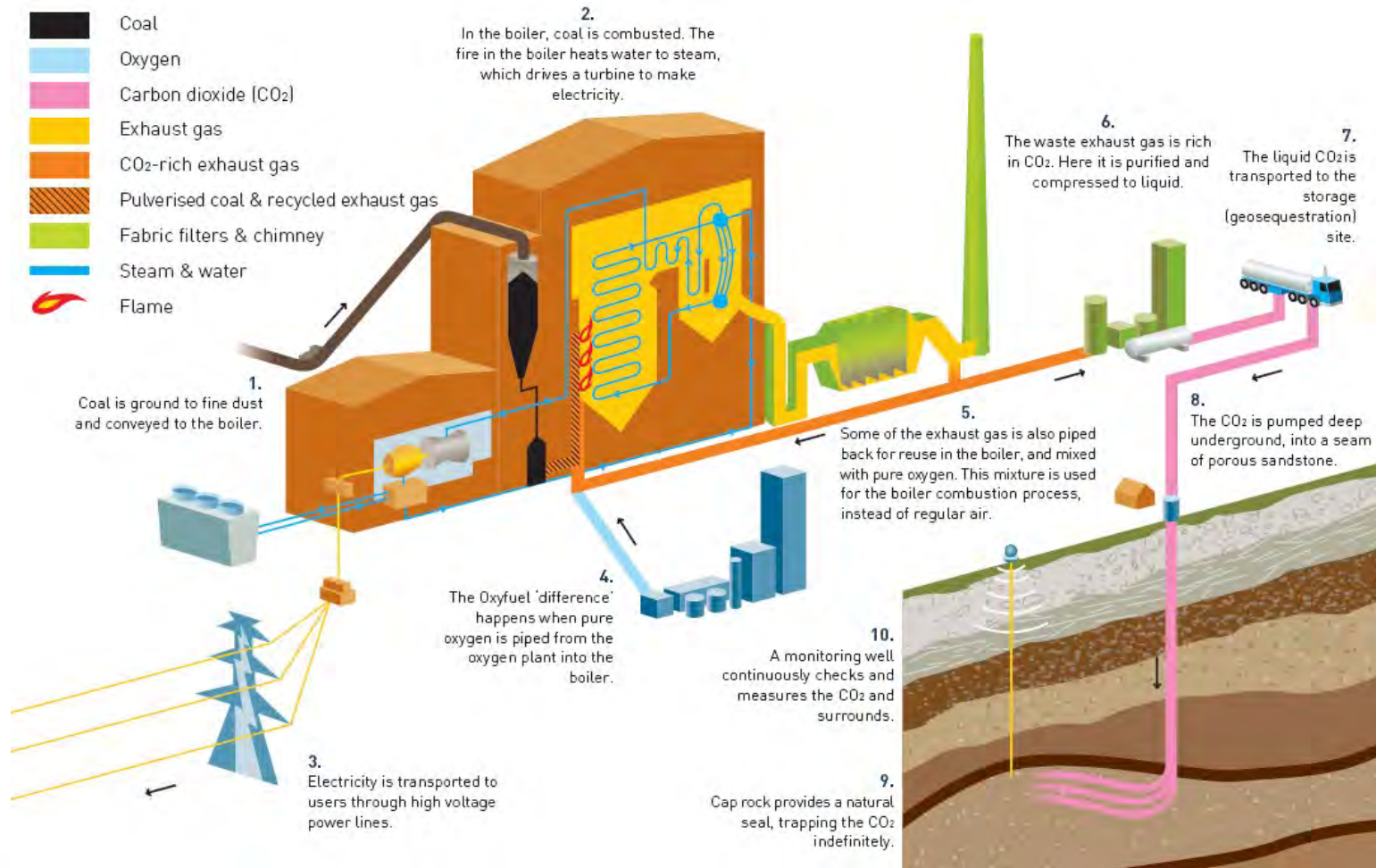
- Overarching objective is to demonstrate a complete oxyfuel process in a retrofit application (oxyfiring, CO₂ capture and CO₂ storage)

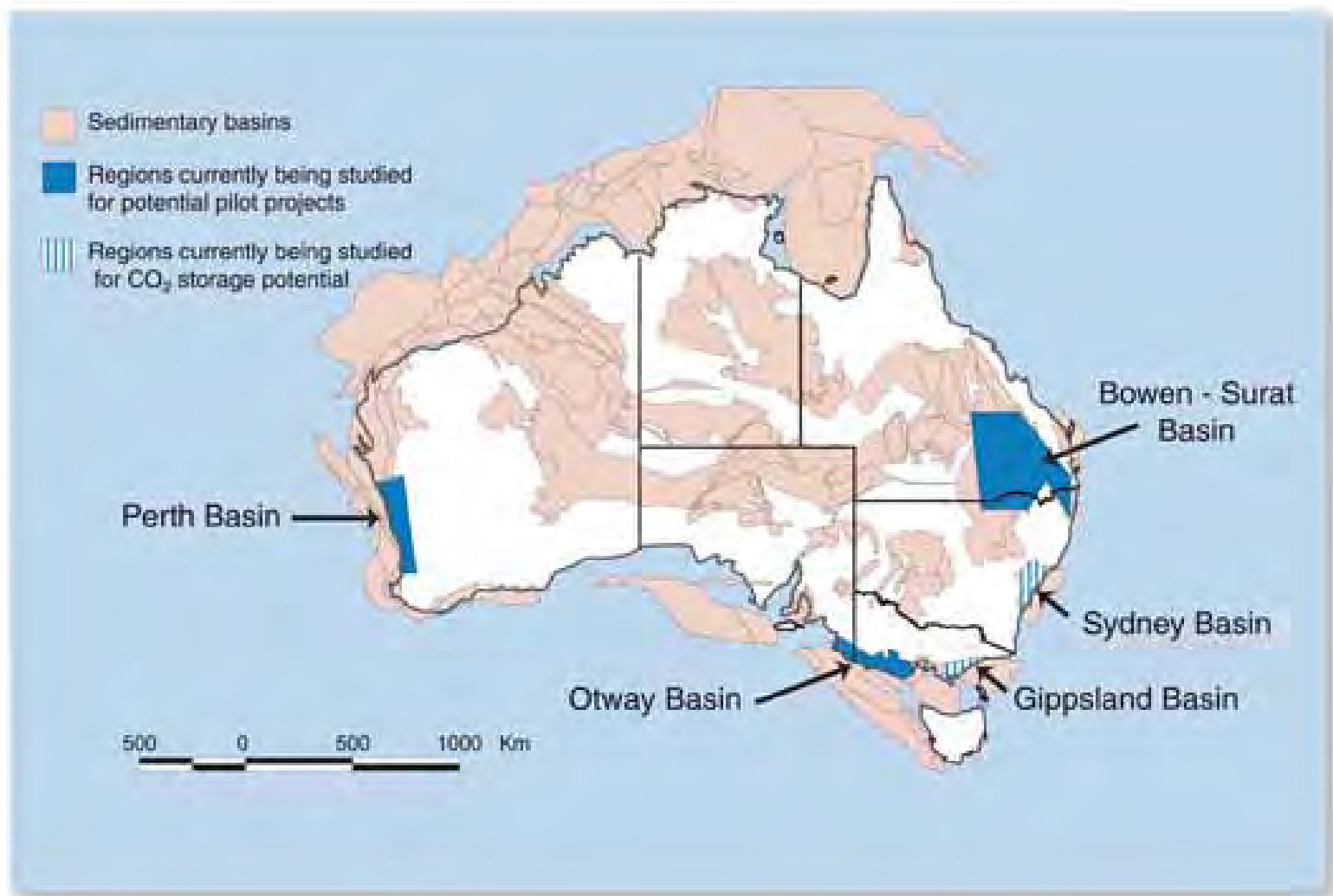
Technical and commercial objectives

- Establish the design and operating requirements for large scale (commercial) retrofit and new-build oxy-fuel plants, including geological storage
- Estimate Capital and Operating Expenditures for the next generation of oxyfuel near zero emission technology plants



Oxyfuel Process





Sedimentary Basins suitable for CO₂ storage

Courtesy CO₂CRC



Callide Oxyfuel Project

Dates	Achievements
Nov 2003	Project Conceived
April 2004	Feasibility Study
Sept 2004	Japan/Australia Feasibility MOU
Mar 2006	Project MOU signed/funding application
Oct 2006	LETDF Funding Agreed
Dec 2006	Pilot testing completed at IHI labs
Mar 2008	JV and Funding Agreements signed
Aug 2008	Plant Contracts awarded
Jan 2009	Plant refurbished and refired on air
Mar 2009	Air firing tests complete



Callide Oxyfuel Project

Dates	Achievements
July 2009	Geosequestration site selected
Oct 2009	Main Plant construction commences
Nov 2010	Commission oxyfiring
April 2011	Commission CO2 capture plant
August 2011	Commence geosequestration
August 2011 +	Monitor oxyfuel
August 2011 +	Monitor CO2 capture
August 2011 +	Monitor Geosequestration
2013 – 2014	Close project



Callide Oxyfuel Project – Participants

Oxyfuel Project Partners



Supporting Collaborators



for more information: www.callideoxyfuel.com



Photos from Recent Plant Refurbishment



