

Callide
The logo for the Callide Oxyfuel Project. It features the word "Callide" in a blue sans-serif font above the word "Oxyfuel Project". The "O" in "Oxyfuel" is a stylized blue circle with a white question mark inside.

Callide Oxyfuel Project

Callide Oxyfuel Project Update

Australia-Japan Coal Workshop

10 March 2011

Melbourne

Nobuhiro Misawa
J-POWER

Presentation Outline

- **Positioning of this project**
- **Collaboration between Japan and Australia - Government and industry**
- **Callide oxyfuel project update**
 - **Stage 1 – Callide A CO₂ capture status**
 - **Stage 2 – Geological storage status**

Project Overview

Callide A Power Station

4 x 30 MWe

Steam 136 t/h at 4.1MPa, 465°C

Commissioned: 1965 – 69

Refurbished 1997/98

Placed in storage in 2002

Scope:

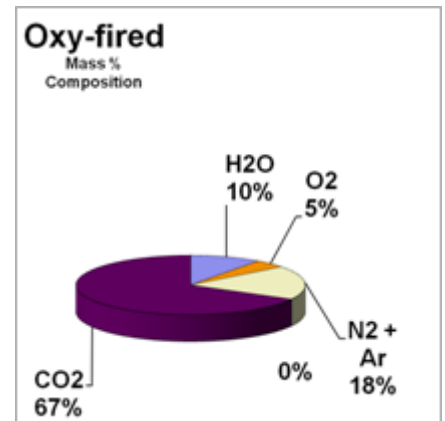
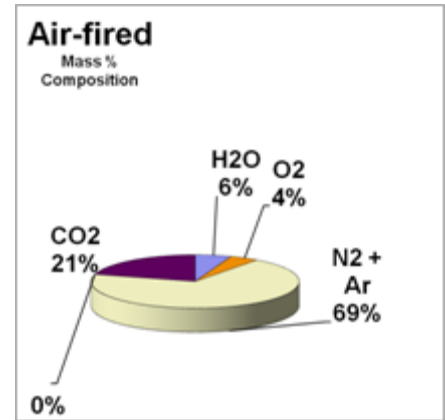
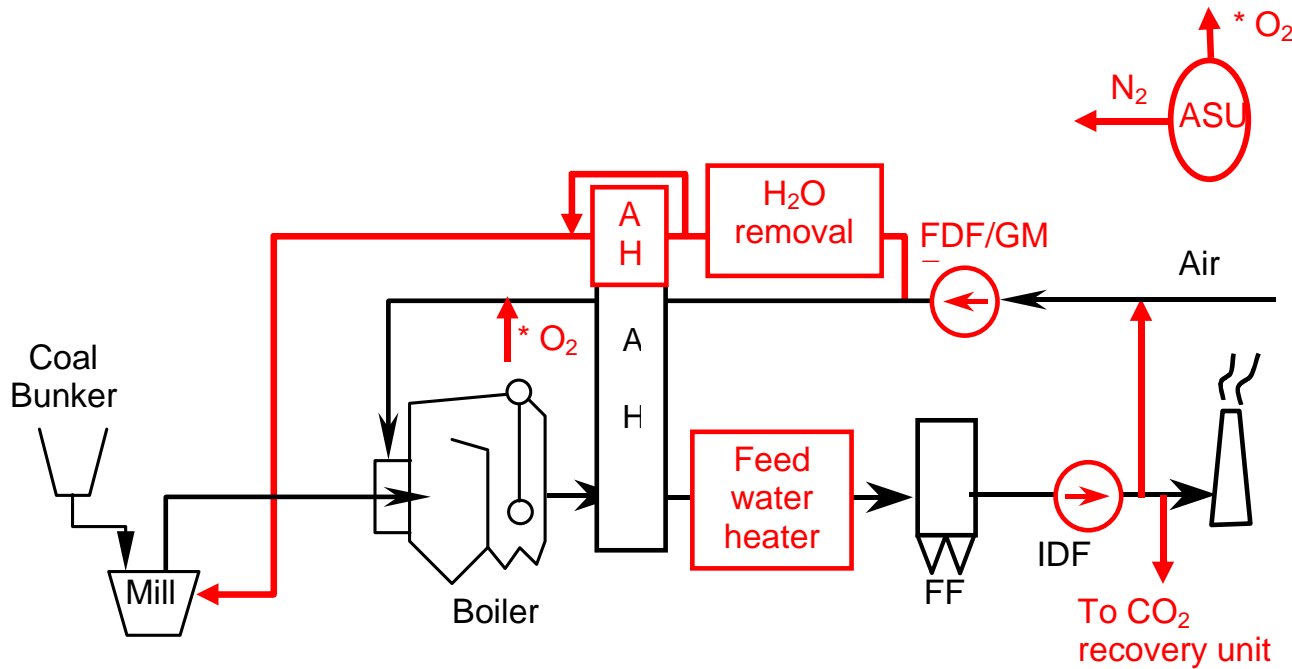
- No.4 Boiler refurbishment
- 2 x 330 TPD ASU
- Oxyfuel combustion Retrofit
- 70 TPD liquid CO₂ recovery
- Trucking to CO₂ reservoir
- Injection and monitoring



21 January 2011

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Modification of Callide-A Power Plant

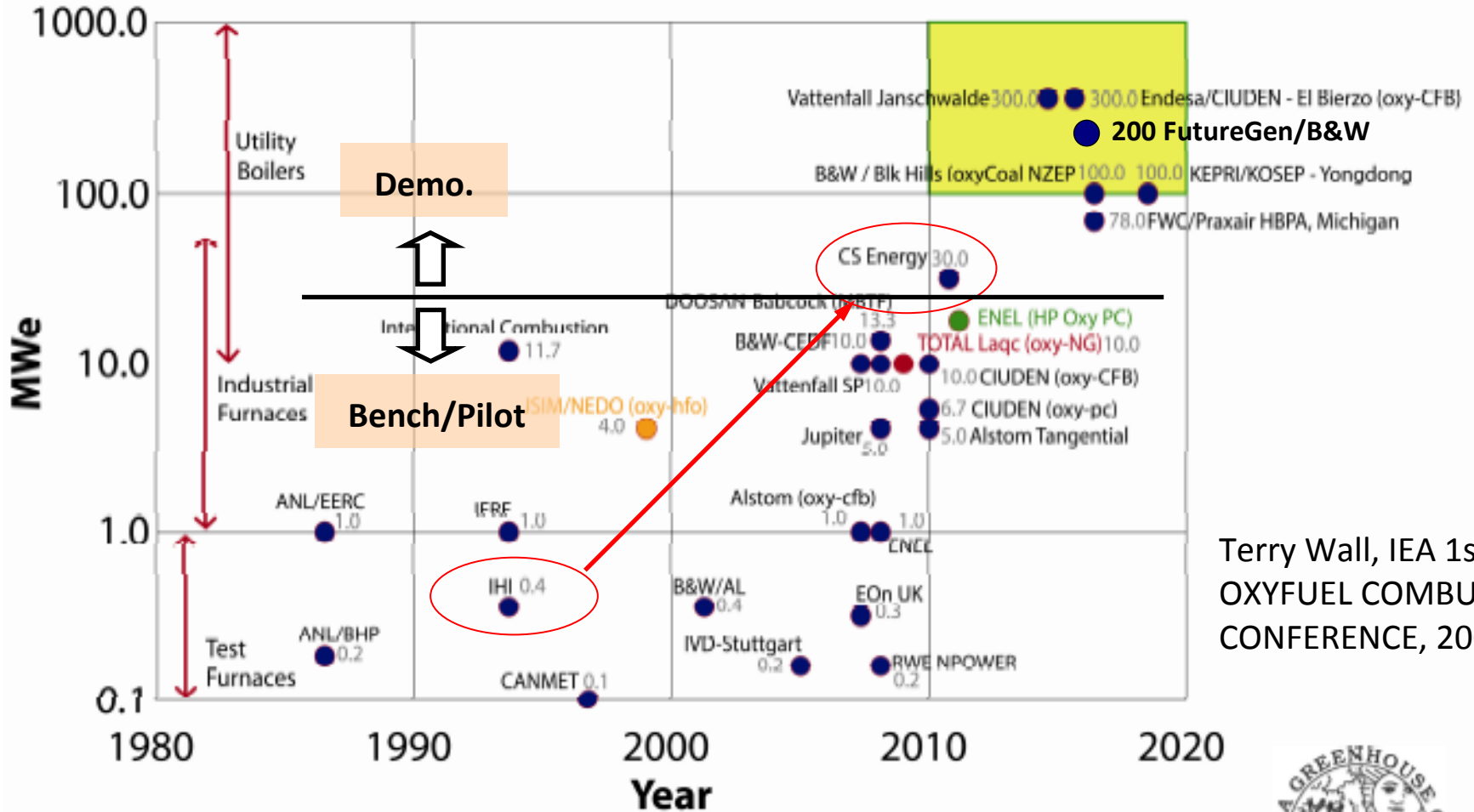


Main features of Oxyfuel Technology

- ✓ High CO₂ concentration in flue gas results in decreasing energy consumption of CO₂ recovery
- ✓ Reduced amount of air pollutants, NO_x, SO_x and particulates
- ✓ Multi introduction options, brand new power plant, boiler replacement and retrofit of existing boiler

Oxy-Fuel Combustion Boiler Projects

(1 MWe = 3 MWt = 10 MMBtu/hr)



Terry Wall, IEA 1st OXYFUEL COMBUSTION CONFERENCE, 2009



- Callide Oxyfuel Project is driving the transition from pilot phase to demonstration phase of oxyfuel technology
- This “early moving” project will demonstrate CCS integrated system toward large/commercial scale demonstration projects

Project Structure

Japanese Government:
Funding Support

JCOAL:
CCT/CO₂ geological storage experience

Japan

- IHI:**
- Oxyfuel pilot plant experience
 - Boiler retrofit

J-POWER:

- O&M and CCT R&D experience

- Mitsui:**
- Worldwide Project development experience

Air Liquide:
ASU and CO₂ Processing experience

**Oxyfuel
Joint Venture**

Australian Government:
Funding Support

Queensland Government:
Funding Support

Global CCS Institute:
Funding Support

Australia

- CS Energy:**
- Power plant, O&M experience
 - Project Management

Australian Coal Association:

- CCT/CCS knowledge

Schlumberger:

- CO₂ geological storage experience

Xstrata Coal:

- CCT/CCS knowledge

Site works



Boiler - before



Oxygen plant



Oxyfuel construction work



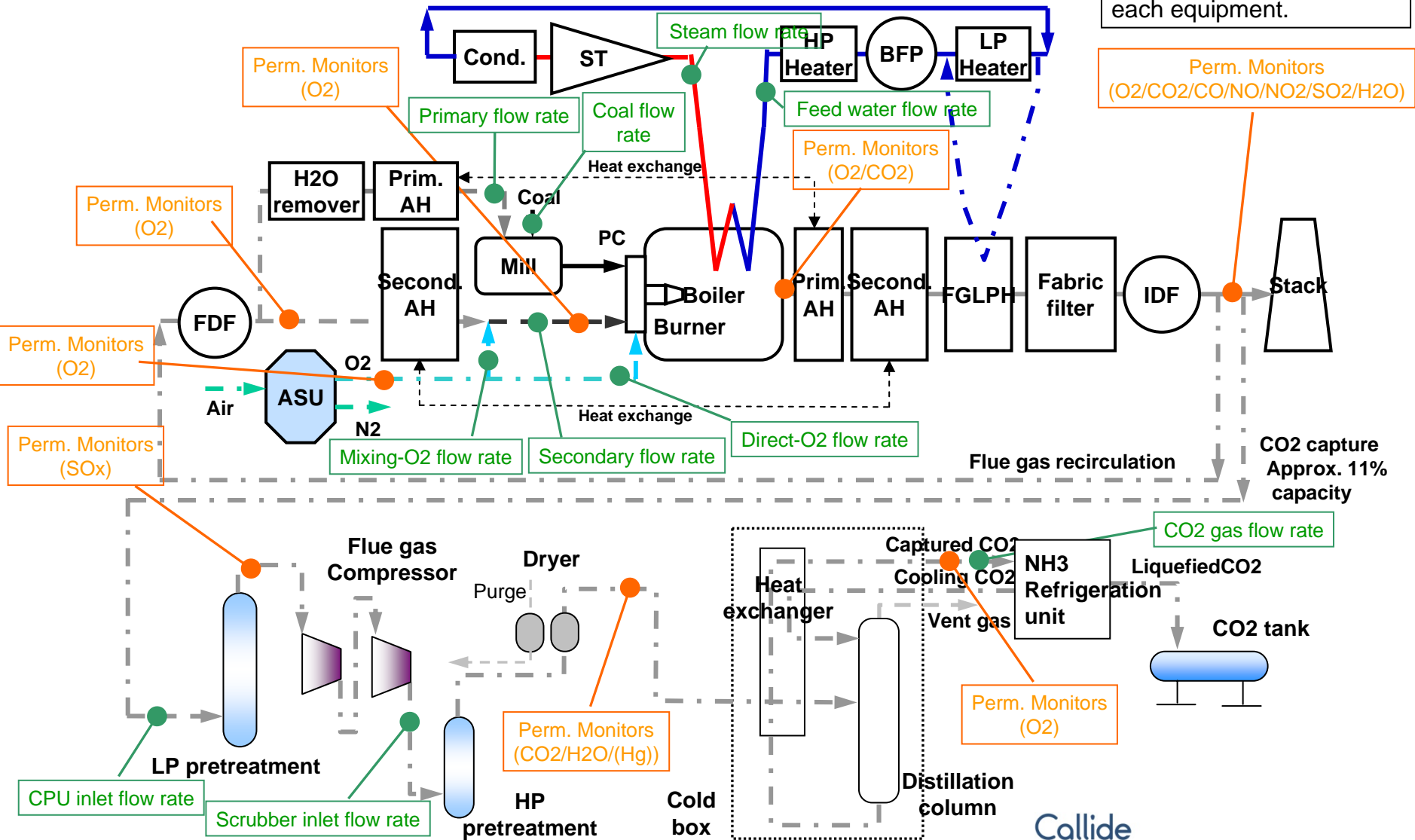
CO2 plant

COP key demonstration items – CO₂ capture

- Oxyfuel & CO₂ capture operation
- Safety
- Operation flexibility
- Durability
- Plant efficiency
- CO₂ capture rate & CO₂ purity
- Cost data
- Air ingress
- Process control and optimisation

Gas & O₂ process flow and measurement points

*There are multi ports for sampling at inlet & outlet of each equipment.



Gas contents, fly ash and trace elements are monitored or sampled, in order to check the mass balance and the performance of each equipment.

CO₂ storage

Objectives:

Level 1 – To demonstrate CO₂ storage and monitoring as part of **an integrated carbon capture and storage project**

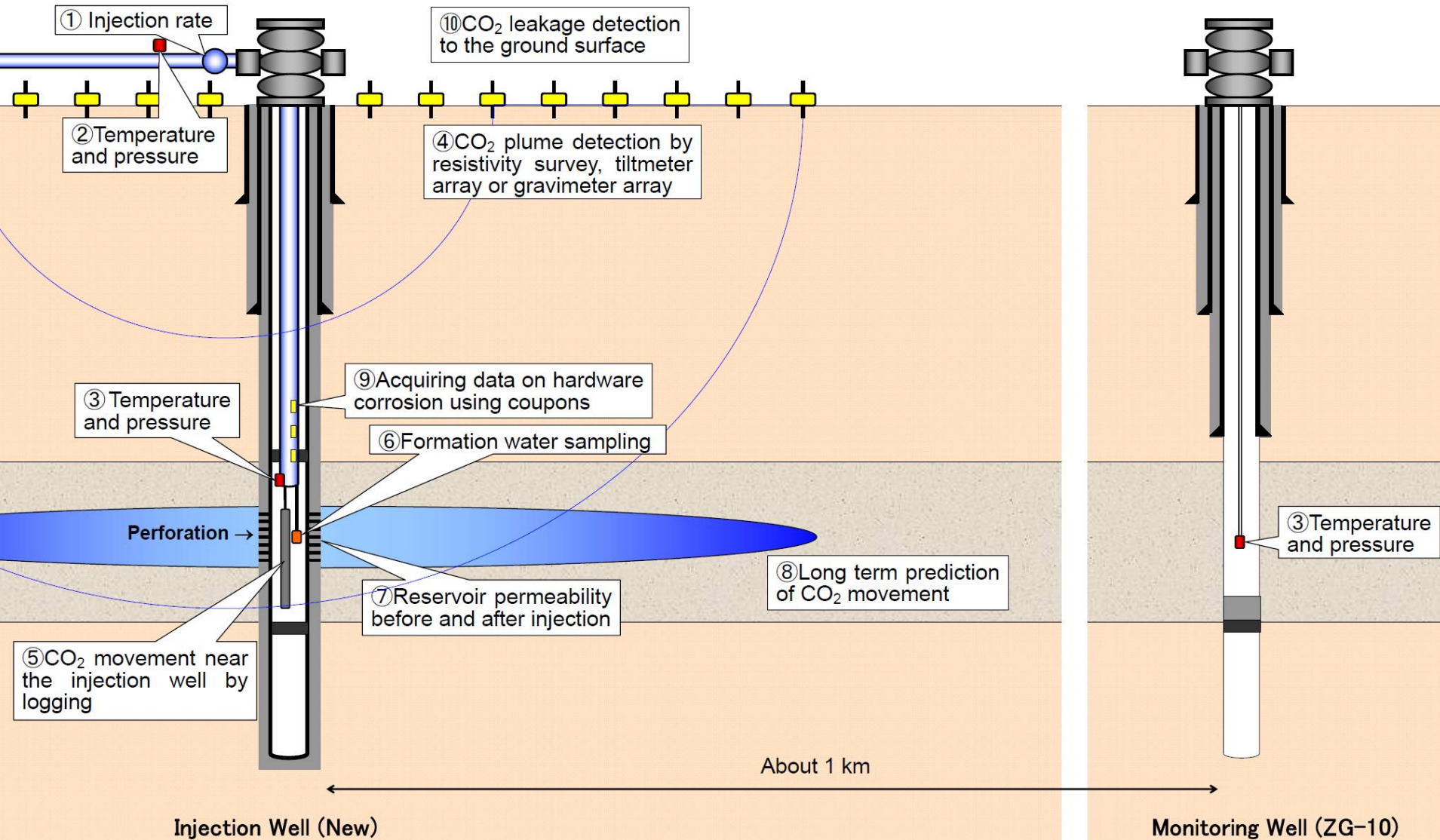
Level 2 – To obtain engineering and cost data for scale up and commercial application

Level 3 – Expand the scientific understanding of CO₂ injection, mass transfer, containment, geochemical behaviour, and monitoring and verification techniques.

Storage Options:

- ZeroGen 10 (Northern Denison Trough) – up to 10,000 t/yr over 1 to 1½ years
- ZeroGen or CTSCo (Surat Basin) – up to 10,000 t/yr over 1 to 1½ years
- Small trails of < 1000 t with several projects (including CO₂CRC – Otway Project) – for scientific purposes

CO₂ storage - Key demonstration items



Concluding comments

- Callide Oxyfuel Project – CO₂ capture is well advanced in construction;
- World-first oxyfuel combustion in existing power station is planned in mid 2011.
- Callide CO₂ storage options are still being evaluated, and actual storage may commence in late 2012
- Callide Oxyfuel Project is a major international collaboration between Japan and Australia – at Government level and industry level

Callide Oxyfuel Project – Participants

Oxyfuel Project Partners



Supporting Collaborators



Thank you

for more information: www.callideoxyfuel.com