



Welcome and the Challenges Ahead

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Capricorn Resort

Yeppoon, Australia

11th – 16th September 2011

By telephone link - Peregrian Springs, Qld





IEA Greenhouse Gas R&D Programme

- **Welcome**
- **Current Pathway to Commercialisation**
 - 1st generation plants – new and retrofit
 - ✓ Reduces technology risk – primarily costs
 - ✓ Supports “learning by doing” in integrated plants – through improvements in energy use and techniques
- **Challenges Ahead**
 - Reducing energy penalties and costs of next generation plants
 - ✓ Reducing recycle flows through better materials and new techniques
 - ✓ Improving oxygen separation technologies

Alstom	Schwarze Pumpe	2008	30MWth	Lignite
Hitachi Babcock	Schwarze Pumpe	2010	30MWth	Lignite
IHI	Callide	2011	30MWe	Coal
Alstom / AL	Lacq	2009	30MWth	Gas/Oil?
CIUDEN	El Bierzo CFB Facility	2011	30MWth	Coal
CIUDEN	El Bierzo PC Facility	2011	20MWth	Coal

Vattenfall - Janschwalde (PC - 250MWe)
KEPCO/KOSEP - Yongdong (PC - 100MWe)
FutureGen2 - Illinois (PC - 100MWe)
Endesa/CIUDEN - El Bierzo (CFB - 300MWe)

Finish Line

**Target :
"Commercialised by 2020"**

By 2014-2018
Demonstration of
50- 300MWe full
scale power plant.

2011 – Callide –
World's first 30MWe
retrofitted Oxy-coal
power plant

2011 – CIUDEN –
World's first 30MWt
Oxy-CFB Pilot Plant

2009 – Lacq – World's
first 30MWt
retrofitted Oxy-NG
boiler

2008
**World's FIRST 30 MWt
full chain demonstration
at Schwarze Pumpe Pilot Plant**

2007
B&W CEDF (30MWt)
large scale burner testing started

2003 - 2005
Vattenfall (ENCAP ++)
CS Energy / IHI Callide Project

1998 – 2001
CANMET
US DOE Project / B&W / Air Liquide

1990 - 1995
EC Joule Thermie Project
- IFRF / Doosan Babcock / Int'l Combustion
NEDO / IHI / Jcoal Project

1980's
ANL/Battelle/EERC completed the first
industrial scale pilot plant

**By the end of 2010/2011,
Users (i.e. Power Plant Operators)
will have 6 burner manufacturers
fully demonstrating "Utility Size
Large Scale Burners" which should
give a high level of confidence
toward demonstration**

**First large scale 35MWt
Oxy-Coal Burner Retrofit
Test done by
International Combustion**

B&W	CEDF	2008	30MWth	Coal
Alstom	Alstom CE	2010	15MWth	Coal
Doosan Babcock	DBEL - MBTF	2009	40MWth	Coal



IEAGHG Programme and the Oxyfuel Network

John Topper

Managing Director, IEA Environmental Projects
(Operating Agent for IEA GHG)

Capricorn Resort

Yeppoon, Australia

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Members and Sponsors



What IEAGHG does



- ***Technical evaluations of mitigation options***
 - Comparative analyses with standardised baseline
 - >100 technical studies published since 1991
- ***Assist international co-operation***
 - International research networks
- ***Assist technology implementation***
 - Assist in research collaboration (i.e. Weyburn)
 - GCCSI
- ***Disseminate information***

Oxyfuel Combustion Research Network



- ***We have Established a forum to discuss the different issues on the development of Oxyfuel Combustion...***
- ***We have promoted and encouraged collaboration and cooperation...***
- ***We have provided a centre of knowledge for this technology***
 - Young Researchers Forum
 - APP OFWG Capacity Building Course
 - Workshops and Conferences

Young Researchers' Forum



1st Workshop (December 2006)
Hamburg, Germany
(20 participants)



2nd Workshop (September 2008)
Gothenburg, Sweden
(33 participants)

3rd Workshop (October 2010)
Stuttgart, Germany
(39 participants)



IEA Greenhouse Gas R&D Programme
3rd Young Researchers Forum for
Oxyfuel Combustion R&D
4th and 5th October 2010

Asia Pacific Partnership – Oxyfuel Working Group (APP-OFWG) Capacity Building Course



<http://www.newcastle.edu.au/project/oxy-fuel-working-group/>

- **Capacity building activity with an objective to promote awareness to the oxyfuel combustion technology within Asia Pacific Region**
- **Organised by Prof. Terry Wall of Newcastle University. IEA GHG supported this activity since it started in 2007.**
- **Capacity Building Course Completed and in Planning**
 - 1st APP OFWG Capacity Building Course (5/6 February 2008, Daejeon, South Korea)
 - Attended by 65 participants
 - 2nd APP OFWG Capacity Building Course (12/13 March 2010, Beijing, China)
 - Attended by 75 participants
 - **All course materials with Chinese translation published in Newcastle University and IEAGHG websites**
 - 3rd APP OFWG Capacity Building Course (11/12 Sept. 2011, Queensland, Australia)





1st Workshop (Nov. 2005)
Cottbus, Germany
(64 participants)

2nd Workshop (January 2007)
Windsor, CT, USA
(88 participants)



3rd Workshop (March 2008)
Yokohama, Japan
(103 participants)

1st Oxyfuel Combustion Conference



xyfuel
Combustion
Conference



Capricorn Resort, Yeppoon, Australia
11th – 16th September 2011

WORKING TOWARD DEMONSTRATION AND COMMERCIALISATION...



Oxyfuel Combustion Meetings in Numbers

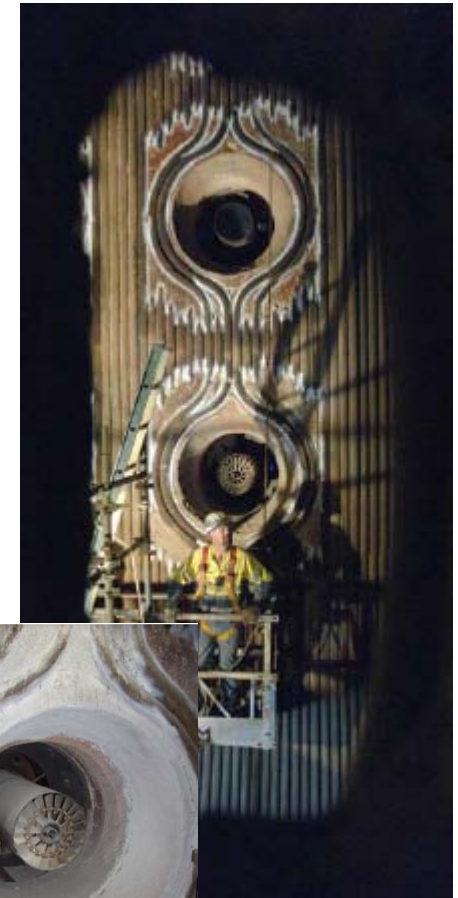


Meetings	1st Workshop	2nd Workshop	3rd Workshop	1st Oxyfuel Combustion Conference	2nd Oxyfuel Combustion Conference
Location	Cottbus, Germany	Windsor, CT, USA	Yokohama, Japan	Cottbus, Germany	Yeppoon, Australia
Host	Vattenfall	Alstom	IHI, J-Power and Jcoal	Vattenfall	CS Energy / COSPL
Participants	64	88	103	286	202
No. of Countries	17	16	18	26	20
No. of Presentations	13	30	36	94	108

Callide Oxyfuel Projects Ltd.



- ***Callide A Project – would be the world's 1st oxyfuel retrofitted power station.***
 - First oxyfuel pilot plant that will actually produce electricity.
 - Installation of 2 new Wall Fired Burners
 - A unique position to provide information related to the burner – burner interaction
 - Project Scope (2-4 years operation):
 - Oxygen plant (nominal 2 x 330 tpd ASUs)
 - Boiler refurbishment and oxy-fuel retrofit (1 x 30 MWe Unit)
 - CO₂ compression & purification (75 tpd process plant from a 20% side stream)
 - Road transport and geological storage (~ 30 tpd liquid CO₂)



Courtesy of CS Energy, IHI

Site Visit - Reminders



- **Group A:**
 - Travel starts 06.00 sharp
 - Breakfast at the hotel start 05.30
 - Bus loading will start at 05.45
 - Arrival to Rockhampton Airport (Return Trip) is 15.30.**(Please ensure to check your flight schedule if flying on the Friday).**
- **Group B:**
 - Travel starts 07.00 sharp
 - Bus loading will start at 06.45
 - Arrival to Rockhampton Airport is at 16.30.
- **Group C:**
 - Travel starts 08.00 sharp
 - Bus loading will start at 07.45
 - Arrival to Rockhampton Airport is at 17.30.



**Wish you all a
very enjoyable
Conference!**

Website: <http://www.ieaghg.org>

