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Major deliveries as construction starts on low emission coal project

Construction of new build plant for the Callide Oxyfuel Project is well underway at Callide A Power Station as the world-first oxyfuel retrofit takes shape.

Work on the oxygen plant achieved a major milestone in May when the plant's two massive 'cold boxes' were lifted into place after being shipped to Gladstone from South Korea.

Manufactured by Air Liquide, the cold boxes each weigh more than 69 tonnes and measure up to 30 metres in height. They play a key role in the oxygen plant, which will produce up to 660 tonnes of oxygen per day for the oxyfuel process.

When the plant is operational, pure oxygen will be mixed with recirculated exhaust gases from Callide A and fed back into the unit 4 boiler. Burning coal in this mixture produces an exhaust gas stream rich in carbon dioxide (CO₂), which will be captured and treated at the adjacent CO₂ plant to make it suitable for geological storage.

Other major works on the site are the modifications to the unit 4 boiler, which includes dismantling equipment that will be replaced with oxyfuel plant, modifying existing systems and installing new plant.

This 'bolt-on' technology has the potential to produce electricity with near zero emissions from existing power stations.

The oxyfuel demonstration is scheduled for commissioning in early to mid 2011 and will run for two years. For more information on the project, visit www.callideoxyfuel.com



Air separation units being unloaded at the Port of Gladstone.



Parts of the boilerhouse being dismantled.



Air separation units being installed onsite.



Parts of the air separation units, including cold boxes, installed onsite.

International Spotlight on Callide Oxyfuel Project



Mr Ito and Dr Sasatsu inspect progress on the Callide Oxyfuel Project.

The international spotlight continues to shine on Biloela, with the Deputy Director of Japan's Ministry of Economy, Trade and Industry Coal Division, Mr Hiroshi Ito, visiting the Callide Oxyfuel Project to see the progress of construction at the Callide A Power Station.

Mr Ito oversees the development of clean coal technology and carbon capture and storage projects on behalf of Japan's Ministry of Economy, Trade and Industry.

The Ministry promotes the development of carbon capture and storage technology in cooperation with foreign countries and are supporting the Callide Oxyfuel Project through the Japanese Joint Venture partners.

The site visit follows a presentation Mr Ito made on behalf of the Japanese Government to the first international symposium on the Sustainable Use of Low Rank Coals held in Melbourne.

Mr Ito was accompanied on a tour of the site by Dr Sasatsu of J-POWER. J-POWER (Electric Power Development Co., Ltd.) was established in 1952 through a government initiative to increase the supply of electricity in Japan.

J-POWER brings project management support to the Callide Oxyfuel Project, along with low emission coal technology expertise and over 50 years experience in electricity generation.



Dr Chris Spero (right) provides a tour for Mr Ito and Dr Sasatsu.

Q&A



Victorian company Gas Liquid Processing (GLP) is responsible for the construction of the air separation plant and carbon dioxide purification unit for the Callide Oxyfuel Project. Paul Nield, Engineering Manager, answers some technical questions about GLP's role in the project.

Q: Who is GLP?

GLP is an Australian-owned private company providing gas and liquid processing solutions to the oil and gas, chemical, mining and energy industries around the world. GLP provide engineering for plant and equipment for large and small scale applications, from complete process plant design and construction to the design and manufacture of specific process internals and packings.

GLP has extensive experience in the following industries:

- Petrochemical
- Gas generation
- Gas conditioning and sweetening
- Power
- Mining
- Water and air treatment
- Construction
- Engineering industries

Q: What is the air separation unit and what does it do?

A: The Air Separation Unit, or ASU, separates air into its component parts to produce a pure oxygen stream from air. This is achieved by compressing the air, filtering and cleaning it, cooling it to around -190°C and then using standard distillation techniques to separate it into oxygen and nitrogen streams. The separated streams are at very low temperatures, so to recover the cold and improve energy efficiency, they

are passed through a heat exchanger to be re-heated while at the same time they cool the incoming warm air. The oxygen is used for the process and the nitrogen is returned to the air.

Q: What is the oxygen used for?

The pure oxygen stream is mixed with re-circulated exhaust gases and fed into the boiler. Burning coal with this mixture produces an exhaust gas stream richer in CO₂, which is piped to the CO₂ plant where it will be cooled, cleaned, compressed and liquefied so it is suitable for geosequestration.

Q: How does the carbon dioxide purification unit work?

The carbon dioxide purification unit (CPU) is supplied with flue gas from the boiler. The process includes cooling and cleaning of the gas, followed by compression and further processing to remove unwanted contaminants. The carbon dioxide gas is then liquefied for subsequent road transport and geological storage.

Q: How long does it take to construct these pieces of equipment?

The ASUs and compressors were the first items placed on order by the Project and free issued to GLP for construction. Due to their size they have a lead time of 22 months – before they even get to site. It then takes another 6 to 10 months to complete the onsite works. It has been a truly global process in building these ASUs. The main heat exchangers were built in Europe, and then shipped to India for the piping to be completed. They were then shipped to Korea for enclosing in a steel structure called a cold box. The cold boxes were then shipped to the Port of Gladstone where they were unloaded directly onto trucks and transported to the Callide A Power Station. The cold box enclosure is then filled on site with insulation to ensure the thermal efficiency is maintained with the extreme cold temperatures required to produce the oxygen.

For more information on GLP visit www.glp.com.au

Local companies on a world-stage



Four of the Star Precision Team onsite.

Local companies are already benefiting from the construction of the Callide Oxyfuel Project.

In a major win for the local community, the Callide Oxyfuel Project has enabled the birth of Star Precision Electrical. Childhood friends, Michael McDonald and Stewart Horchner, realised their 25 year dream of working together by forming a commercial and domestic electrical services company.

“The Callide Oxyfuel Project is our major client and is providing us with a great opportunity to grow our new business,” Mr McDonald said.

“We are on-call 24 hours a day, which is something a local company can provide that bigger non-local companies could struggle with. It is good to be involved in such a large scale project that is also good for the environment.”

Local firm, Austins Maintenance, also have a strong presence onsite as the contractor for maintenance

and some fabrication services.

Craig Austin, Proprietor of Austins Maintenance, said that depending on the workload, there could be anywhere between two and twenty people onsite at any given time.

“We send people out depending on our workload, which at the moment is basically helping set up the plant onsite. We are looking forward to the Project getting up and running so we can learn new things from the technology,” Mr Austin said.

Austins Maintenance have a fabrication and machine shop in downtown Biloela and also service the local mining industry, abattoirs and nitrate plant.

These are just a few examples of how local businesses are supporting the Callide Oxyfuel Project. Local businesses which may also benefit from the project include accommodation providers, catering, electricians, plumbers, trades services, and cleaners.

Oxyfuel Project Partners

