

**10** YEARS  
Est. 2008



Oakley Greenwood

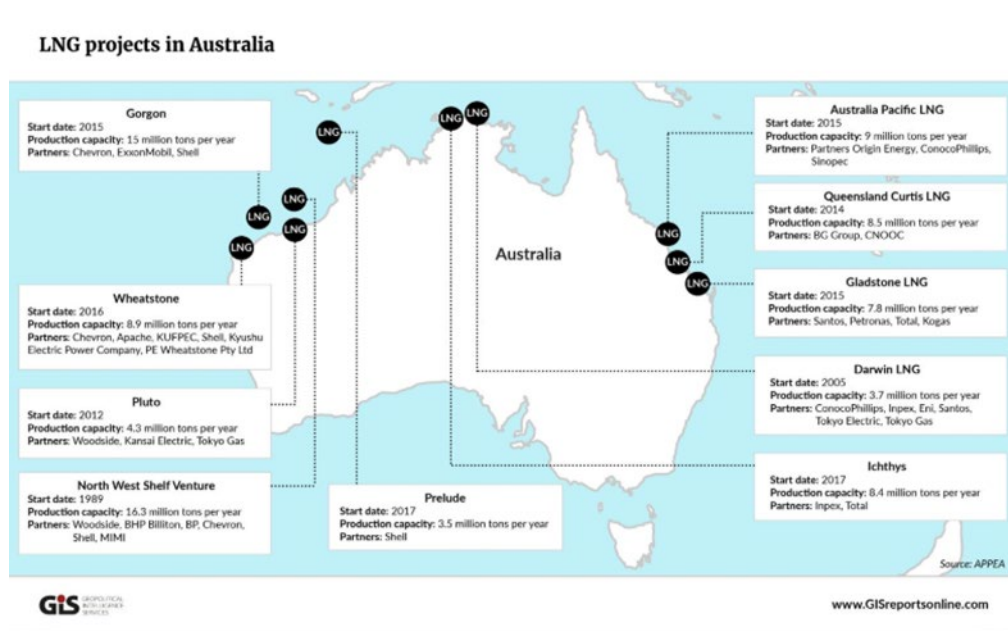
# Woodside Trucked LNG

prepared for:  
**International Gas Union - Taskforce 2**  
**Energy for All**

## LNG Industry in Australia

In 1989 the Woodside-operated North West Shelf (NWS) Project delivered its first LNG cargo, marking the beginning of Australia's LNG industry. Since that time, the NWS Project has expanded to five LNG trains, and likewise Australia's LNG industry has grown to include other projects including Pluto, Gorgon and Wheatstone, Ichthys in the Northern Territory and Gladstone LNG in Queensland, the latter supplied by coal seam methane. Australia is now the largest global producer of LNG with circa 88 Million Tonnes of LNG production capacity.

Figure 1: LNG Producing Assets in Australia



Source: GIS

## Australian LNG - Key Destinations

Australia is a key supplier of LNG to Asia. Below is a table of the top destinations for Australian LNG in 2018:

Table 1: Australia's Key LNG Export destinations 2018:

| Country     | LNG Millions of Tonnes | Australia's share of Market |
|-------------|------------------------|-----------------------------|
| Japan       | 29.0                   | 35%                         |
| South Korea | 8.2                    | 18%                         |
| China       | 24.0                   | 44%                         |

These LNG supplies are used primarily in power generation, as well as cleaner source of fuel in transport and industry. LNG also helps to reduce pollution in export markets where it displaces higher emission fuels.

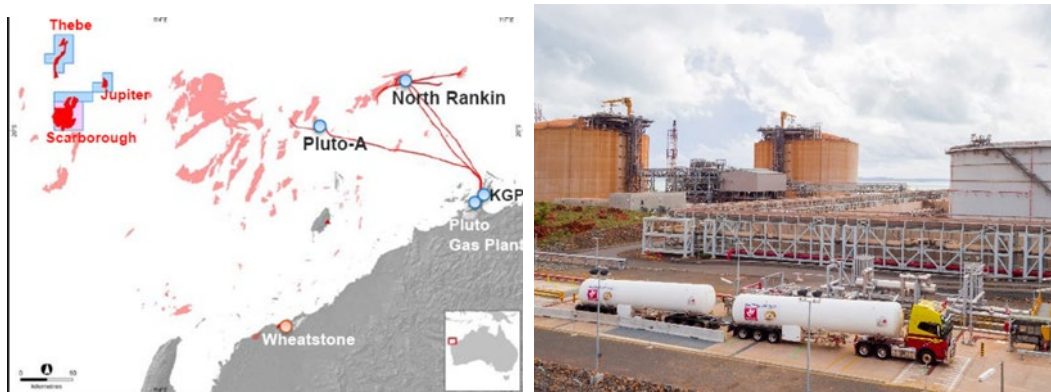
## Importance to development of local industry

The huge investment in LNG projects in Australia supplies the energy-hungry countries in Asia and enables the development of domestic gas supplies in Australia, supporting thousands of jobs. These developments have also spawned the growth in downstream industries and supply of gas and power to local cities and communities.

## Pluto LNG Project - innovation with Trucked LNG

The Woodside owned and operated Pluto LNG plant, commenced operations in 2012 (90% owned by Woodside Energy) and has recently entered a new phase with production commencing from the Pluto LNG Truck Loading Facility. It represents a key milestone towards development of a local LNG market for remote power generation and transport fuels.

Figure 2: Pluto trucked LNG



Source: Photos courtesy of Woodside

The facility is now able to deliver seven LNG truck loadings per day (15 TJ/day equivalent), each one transporting the equivalent of more than 80,000 litres of diesel. At this initial capacity, replacing that diesel with LNG could reduce lifecycle greenhouse gas emissions by more than 120,000 tonnes per year. The facility's capacity can be doubled by moving to 24-hour operations, and further expanded if needed to meet future market demand.

During construction of the facility, more than 60 workers, many of them local, were employed on the project and \$4 million worth of fabrication contracts were awarded to local businesses.

Woodside's initial focus is on supplying trucked LNG to mining operations and communities in the Pilbara, Kimberley and elsewhere in WA for use in power generation, supporting regional development through provision of reliable, flexible and includes delivered LNG, regasified LNG, integrated LNG power solutions and integrated LNG-plus-renewables power solutions.

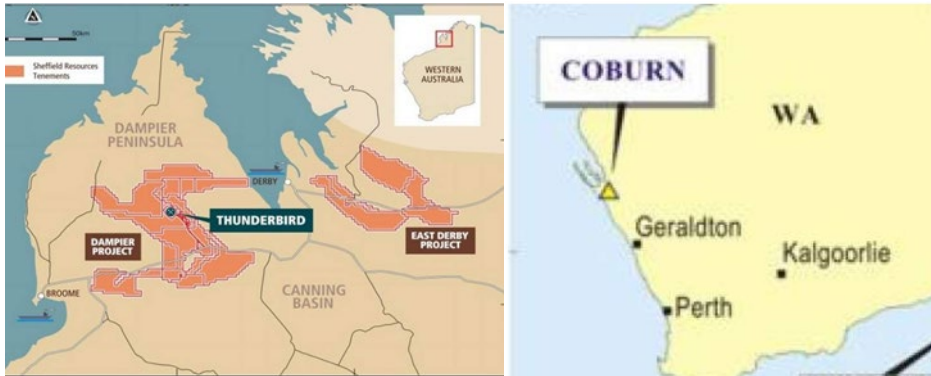
"We have formed a downstream joint venture with EDL Energy to develop integrated solutions and offer miners a suite of solutions which best meet their needs; including gas facility storage and vaporisation, gas-fired power generation and renewable generation," O'Neill says.

To date, Woodside has secured an agreement with Sheffield Resources to supply LNG to its Kimberley Thunderbird project some 450 kms away.

Then in December 2019, Strandline Resources announced it has selected Woodside and EDL to provide a fully integrated energy solution for its Coburn mineral sands project, in Western Australia (900 kms away).

The parties have signed a non-binding proposal for the development of a 27 MW integrated trucked LNG, storage and power station facility, comprising gas and diesel back-up generators combined with state-of-the-art solar and battery technology. Strandline is expecting to finalize a 15-year power purchase agreement over the coming months preparatory to the commencement of construction.

Figure 3: Trucked LNG Customers



Source: Company websites

## Energy Transition - LNG for trucking and shipping

In the longer term, LNG from the Facility could support the transition towards cleaner fuel for trucks and trains in the region's heavy transport sector. Woodside is also planning to develop infrastructure to enable LNG to be supplied to the international shipping industry, particularly iron ore carriers operating from the Pilbara to Asia, the busiest bulk carrier trade in the world

### LNG-fuelled bulk carrier ships would emit less greenhouse gases

A transition within the Pilbara's bulk shipping industry to LNG fuelling could make a significant further contribution to reducing emissions.

Analysis by Energetics (consulting firm) shows that if LNG from Woodside were used in iron ore carriers operating from the Pilbara, life-cycle greenhouse gas emissions are up to 33% lower than would be the case if heavy fuel oil were used. This assumes LNG is sourced from Woodside's Karratha facilities and the ships are bunkered in the Pilbara, and that those ships use high pressure (diesel cycle) engines.

If all of the ships carrying iron ore from the Pilbara were LNG-fuelled, it could also provide a reduction in greenhouse gas emissions up to 5.8 million tonnes per year, equivalent to taking 1.8 million cars off the road. In addition, a switch to LNG could nearly eliminate sulphur and particulate emissions.

The shipping industry is focused on the International Maritime Organisation's 2020 deadline for ships to comply with a 0.5 percent global sulphur cap on heavy fuel oil.

Now we are in 2020, there is growing consensus that LNG is the best solution for today and into the future, as there are no alternative solutions that can match LNG's emissions profile and scalability. The growth of LNG infrastructure worldwide will ensure adequate supply of the fuel to the maritime industry.



## Green Corridor

Last year saw the conclusion of the Green Corridor joint industry project, in which the gas producer joined forces with other resources giants to assess the commercial feasibility of LNG-fuelled iron ore bulk carriers on the trade route from the Pilbara to Asia.

Woodside's partners in the Green Corridor project included Rio Tinto, BHP and Fortescue Metals Group.

In mid-2019, mining giant BHP issued the first LNG-fuelled bulk carrier tender, which is to ship up to 27 million mt of iron ore, or about 10% of its exports.