

NORTH WEST SHELF VENTURE



North West Shelf Venture



Australia's largest oil and gas resource development



Representing an investment of A\$27 billion, the Woodside-operated North West Shelf Venture facilities constitute Australia's largest oil and gas resource development and currently account for more than 40 per cent of Australia's oil and gas production.

The North West Shelf Venture is one of the world's largest LNG producers and supplies oil and gas to Australian and international markets from huge gas and condensate fields in the Carnarvon Basin on Australia's north-west continental shelf. To build this project today would require an investment of more than A\$50 billion.

With a reputation for the safe and reliable delivery of LNG to customers in the Asia Pacific region and other parts of the world, the North West Shelf Venture has delivered more than 2800 LNG cargoes since 1989.

The North West Shelf Venture also produces oil and condensate – a light crude oil – for international energy markets, with more than 1260 cargoes of condensate delivered to date.

The North West Shelf Venture is Western Australia's largest producer of domestic gas and currently provides about 65 per cent of total State production.

The North West Shelf Venture also supplies LPG for the world market and Western Australia.

Production from the North West Shelf facilities accounts for about one per cent of Australia's gross domestic product and contributes more than A\$5 billion each year in State and Commonwealth taxes and royalties.

Almost A\$800 million a year is injected directly into Australian business through operating costs, and thousands of jobs are created during construction and as part of ongoing operations.

In 2009 the North West Shelf Venture celebrated 25 years of domestic gas production in Western Australia and 20 years of LNG exports to the Asia Pacific region, where LNG provides power and gas for Japan's major industrial regions. This includes some 90 million Japanese people, as well as millions of consumers in China and Korea.

Ownership

The six participants in the North West Shelf Venture gas interests are:

- BHP Billiton Petroleum (North West Shelf) Pty Ltd
- BP Developments Australia Pty Ltd
- Chevron Australia Pty Ltd
- Japan Australia LNG (MIMI) Pty Ltd
- Shell Development (Australia) Pty Ltd
- Woodside Energy Ltd (Operator)

The China National Offshore Oil Corporation is also part of the North West Shelf Venture but does not have an interest in its infrastructure.

Marketing agencies

The North West Shelf Venture's agencies provide marketing and technical expertise to support its activities.

North West Shelf Gas

North West Shelf Gas markets domestic gas and administers contracts with gas distribution/aggregation companies, electricity producers, industrial customers and gas traders in Western Australia. www.nwsg.com.au

North West Shelf Australia LNG

North West Shelf Australia LNG markets LNG and administers contracts with power and utility companies in the Asia Pacific region. www.nwsalng.com.au

North West Shelf Shipping Services Company

As the largest carrier of LNG from Australia to Asia, North West Shelf Shipping Services Company provides the vital shipping link between the North West Shelf Venture's LNG production facilities and its customers in the Asia Pacific region. North West Shelf Shipping has a core fleet of seven owned and purpose built vessels and charters in additional ships as required.

www.nwsssc.com.au



History

1970s	North West Shelf Venture discovers vast quantities of natural gas and condensate on Australia's north-west continental shelf.	2001	Fourth phase of development begins with construction of a fourth, 4.4 mtpa LNG processing train at the Karratha Gas Plant. First gas and condensate production from the Yodel subsea development.
1980	First phase of development begins with the construction of the Karratha Gas Plant and a jetty for the loading of LNG and condensate. Construction of the North Rankin A offshore platform and the 135 km subsea pipeline to shore also begins.	2003	The North West Shelf Venture signs a new seven year contract with Korean utility Kogas.
1984	Domestic gas deliveries from the North Rankin field to Western Australia begin. Condensate cargoes also begin leaving the port. Karratha Gas Plant is officially opened on 4 September, marking the first sale of gas to the State Energy Commission of Western Australia.	2004	LNG Train 4 begins production, increasing total annual LNG production capacity to 11.9 million tonnes.
1985	Second phase of development begins with the construction of the first two LNG processing trains and four LNG storage tanks at the Karratha Gas Plant. Agreements are signed with eight foundation customers in Japan for the 20-year supply of LNG.	2005	Fifth phase of development – the Phase V LNG Expansion begins in August with the construction of a fifth, 4.4 mtpa LNG processing train, a second LNG loading berth and associated infrastructure at the Karratha Gas Plant.
1989	First LNG cargo departs for Japan in August following completion of the second phase of development. LNG project is officially launched in September by then Prime Minister of Australia Bob Hawke.	2006	First cargo of Australian LNG delivered to China in June marks the start of a 25-year contract with Guangdong Dapeng LNG. China National Offshore Oil Corporation acquires an interest in the North West Shelf Venture's reserves.
1990	First gas and condensate production from the Perseus field.	2007	First gas and condensate production from the Perseus over Goodwyn subsea development, including the Searipple field. Goodwyn Low Pressure Train is commissioned.
1992	Construction of a third LNG processing train is completed at the Karratha Gas Plant.	2008	Funding of the A\$5 billion North Rankin Redevelopment Project approved in March. Woodside acquires Shell Development Australia's 16.67% interest in the CWLH oil interests in May. LNG Train 5 begins production in late August, boosting total annual production capacity to 16.3 million tonnes. The Angel platform produces first gas in October for processing at the Karratha Gas Plant. The CWLH Venture approves funding for the CWLH Redevelopment Project in December.
1995	The Goodwyn A offshore platform is commissioned. New LPG extraction and storage facilities are commissioned at the Karratha Gas Plant and a second jetty is built for loading LPG and condensate. Debottlenecking of the Karratha Gas Plant lifts annual LNG production capacity to 7.5 million tonnes. Production of crude oil from the Cossack and Wanaea fields begins on the Cossack Pioneer FPSO.	2009	The North West Shelf Venture along with Western Australian Premier, The Hon. Colin Barnett, celebrates 25 years of domestic gas production and 20 years of LNG exports.
1997	Oil from the Hermes and Lambert fields comes on line for processing on the Cossack Pioneer FPSO.		
2000	The North West Shelf Venture signs Letters of Intent with existing and some new Japanese customers, underpinning the fourth phase of development.		



Exploration and appraisal

The principal gas and oil fields in the North West Shelf are located approximately 125 km north-west of Dampier in water depths ranging between 125 and 131 metres, and cover a total area of 3134 km².

The Perseus field is an important long-term supplier of gas into the North West Shelf Venture and represents about one third of its gas resources. Other producing fields include North Rankin, Goodwyn, Angel, Searipple, Echo/Yodel, Cossack, Wanaea, Lambert and Hermes.

Undeveloped reserves include Wilcox, Dockrell, Lambert Deep, Pemberton, Keast, Dixon and Gaea. Current exploration and appraisal activity is centred on the Tidepole and Lady Nora gas/oil appraisals and the Hermes (oil) and Seraph (gas) appraisals.

Other discoveries include Goodwyn South, Pueblo, Sculptor, Egret (oil), Lambert West, Ishmael, Montague (Egret Deep), Pemberton East, Rankin, Haycock, Eaglehawk (oil) and Dixon (oil).

Production and development

Karratha Gas Plant

Located 1260 km north of Perth, Western Australia and covering approximately 200 hectares, the Karratha Gas Plant includes five LNG processing trains, two domestic gas trains, six condensate stabilisation units, three LPG fractionation units as well as storage and loading facilities for LNG, LPG and condensate.

One of the most advanced integrated systems in the world, the Karratha Gas Plant has the capacity to produce:

Domestic gas	12,000 tonnes/day (firm customer commitments equate to approximately 600TJ per day)
LNG	52,000 tonnes/day
LPG	4,200 tonnes/day
Condensate	165,000 barrels/day

In 2008 annual LNG production capacity at the Karratha Gas Plant increased to 16.3 million tonnes with the start-up of a fifth, 4.4 million tonne-a-year LNG processing train.

Offshore facilities

The North West Shelf Venture's offshore production facilities include the North Rankin A, Goodwyn A and Angel platforms, and the oil producing Cossack Pioneer floating production storage and offloading facility (FPSO).

Hydrocarbons from the offshore production facilities are transported to the Karratha Gas Plant for processing via two subsea pipelines, otherwise known as trunklines.

Oil produced from the Cossack, Wanaea, Lambert and Hermes fields in the Carnarvon Basin is processed offshore on the Cossack Pioneer FPSO which currently produces approximately 40,000 barrels of oil per day.

Support services

King Bay Supply Base

Located 2 km south of the Karratha Gas Plant, the King Bay Supply Base comprises marine facilities and warehouses and provides logistical support for the North West Shelf Venture's shipping and offshore drilling and production operations.

Major projects

North Rankin Redevelopment

In March 2008 the North West Shelf Venture participants approved funding of the A\$5 billion North Rankin Redevelopment Project which will recover remaining low pressure gas from the North Rankin and Perseus gas fields, and extend the field life to around 2040.

The project involves the installation of a new second platform – North Rankin B – with gas compression facilities, low pressure separators, utilities and accommodation.

North Rankin B is scheduled for start-up in 2013 and will support the North West Shelf Venture's onshore gas requirements to supply future customer commitments.

CWLH Redevelopment

In December 2008 the CWLH joint venture approved funding of the A\$1.8 billion CWLH Redevelopment Project to support ongoing safe and reliable production from the Cossack, Wanaea, Lambert and Hermes oil fields beyond 2020.

The project scope of work includes the purchase of the Okha floating storage and offloading facility and conversion into an FPSO facility to replace the Cossack Pioneer FPSO and the replacement of associated subsea infrastructure. The project is scheduled for completion in 2011.

Future growth

Greater Western Flank Development

The North West Shelf Venture is progressing pre-development studies, including appraisal drilling of Tidepole-2, to define the development plan sequence for commercialisation of the undeveloped petroleum resources in the Greater Western Flank (GWF) area.

This area, to the south-west of the Goodwyn A platform, contains 14 fields which are estimated to hold approximately three trillion cubic feet of recoverable gas and approximately 100 million barrels of condensate. Concept selection and front end engineering design for the GWF development is expected in 2010.



Community investment

The North West Shelf Venture is proud to support the Shire of Roebourne in delivering services and amenities for the benefit of the local community, and has made significant investments in infrastructure and programs in the region which now exceed A\$300 million.

Committed to contributing to developing local skills, opportunities and to building long lasting relationships within the West Pilbara, the North West Shelf Venture supports community initiatives that focus on health and safety, education, environmental enhancement, protection and rehabilitation, youth development, lifestyle, culture and recreation. These include:

The **Shire of Roebourne Crime & Safety Initiative** which provides funding for WA Police to deliver additional services.

The **Green Machine 636 footpath sweeper**, a joint initiative with the Shire which keeps streets clear of glass, rubbish and dirt.

The **Karratha Education Initiative**, a partnership between the North West Shelf Venture, WA Department of Education, Catholic Education Office, Karratha Senior High School and St Luke's College which is helping to improve and enhance education opportunities for local students.

The **Mingullatharndo Community** project which is assisting Indigenous people to become economically self sufficient through the creation of locally owned and managed businesses, including the Pilbara Indigenous Nursery and other enterprises.

Environment and heritage

The North West Shelf Venture undertakes detailed environmental planning and monitoring at all stages of production and development.

Activities are managed to ensure they comply with the North West Shelf Venture's commitments, and do not cause an adverse impact to the environment.

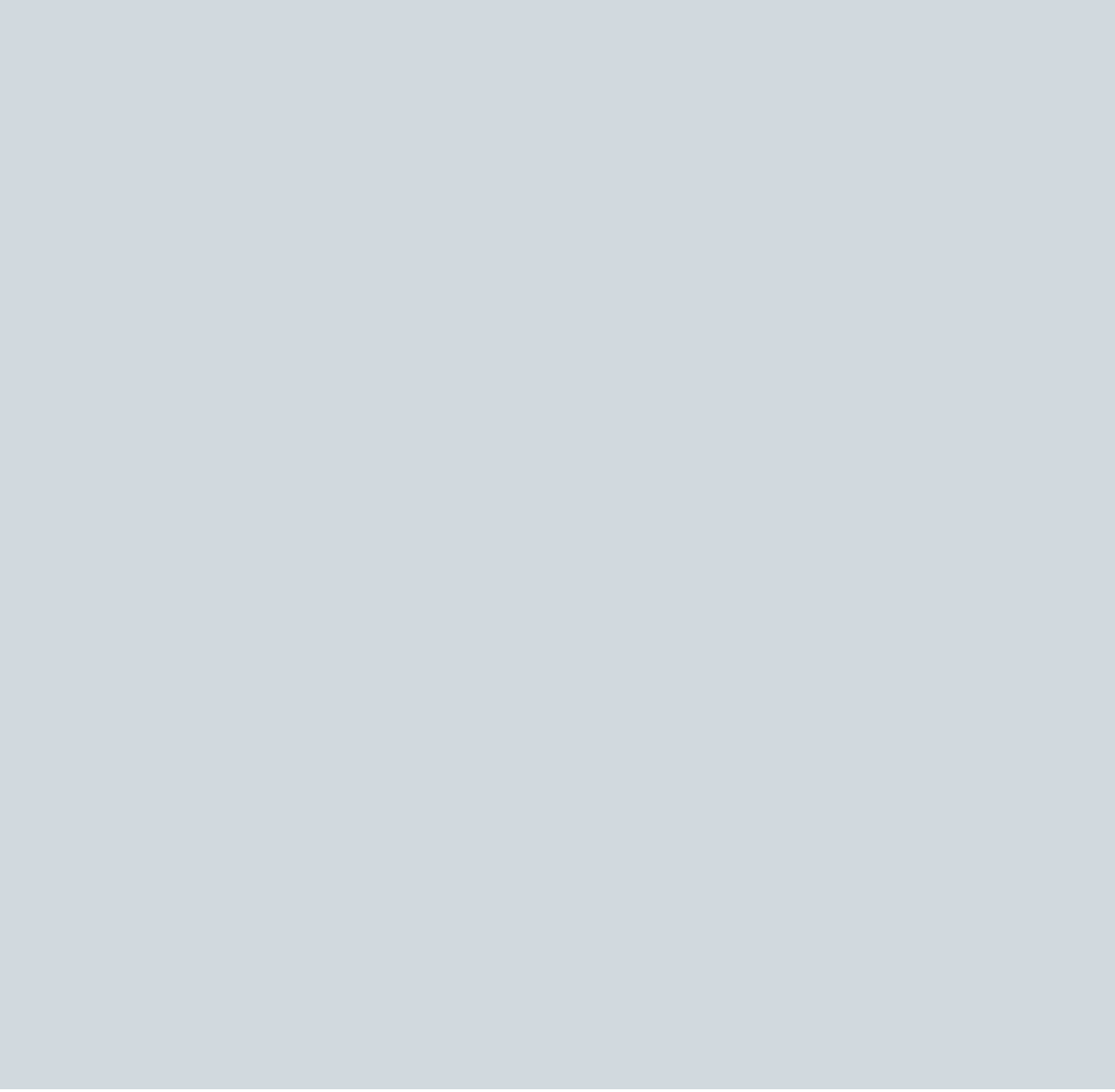
The North West Shelf facilities have successfully operated for many years near sensitive environments that contain protected flora and fauna, cultural heritage values and an ecologically important coastal zone and marine environment.

Health and safety

Woodside has safely and reliably operated the North West Shelf Venture facilities for more than 25 years and takes very seriously its commitment to provide a workplace where health and safety is the number one priority.

More than 1000 people are employed at the Karratha Gas Plant onshore operations, offshore operations and in Perth.

About 450 mariners are employed on the North West Shelf Venture's LNG shipping fleet.



Further information

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