



# Floating LNG at Sunrise

## UBS Resources Conference

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Good morning. It's great to be here in Sydney again. Last year I took this opportunity to speak to you about "how size matters" in the LNG industry, how Woodside had built an enviable portfolio of growth projects. Today I'm excited to be talking to you about the quiet achiever in our portfolio, the Sunrise LNG development.

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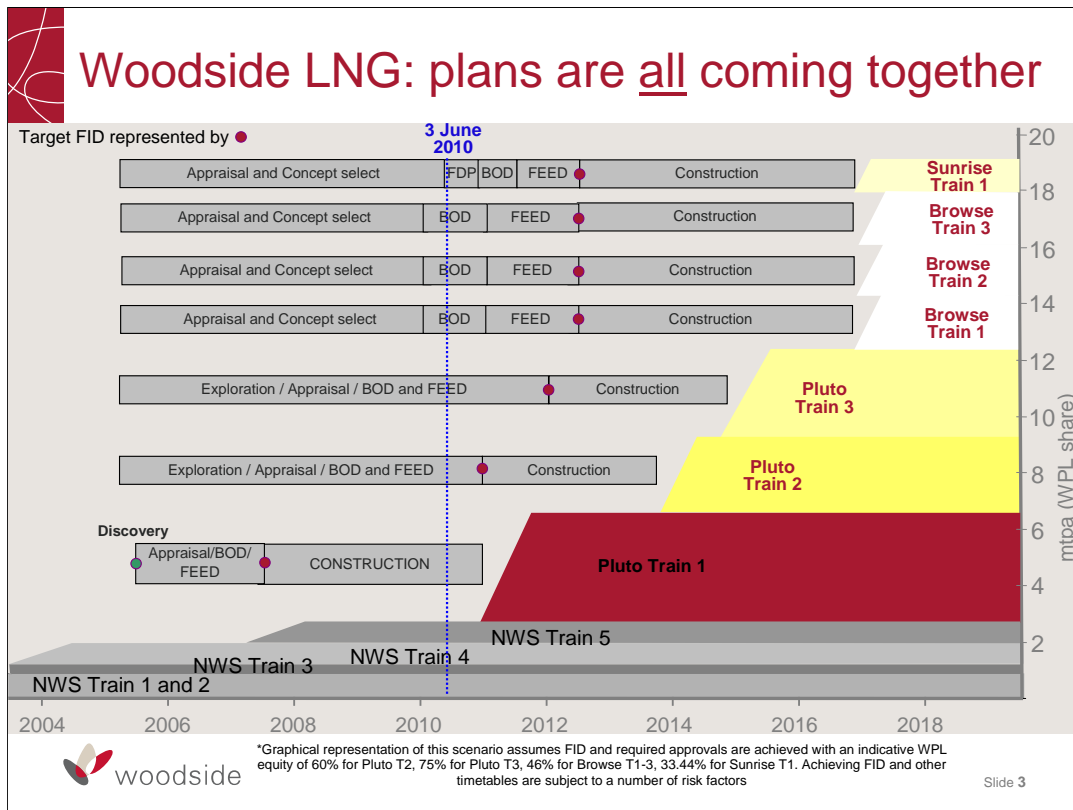
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References to “Woodside” may be references to Woodside Petroleum Ltd. or its applicable subsidiaries.



Slide 2

Now before I proceed, our usual disclaimer.



I showed a version of this slide at our full year results briefing in February. For us, nothing has really changed. We continue to meet the targets we have set ourselves.

The slide shows our foundation equity position at NWS via five trains and with the addition of our Pluto Train 1 driving our equity production to over 6 mtpa. Building onto that is Pluto 2 & 3, shown with an assumed place holder equity. It also shows our three Browse trains and our Sunrise train driving us towards that 20 mtpa equity mark.

We have made significant progress on all our growth projects. Our explorationists continue to progress towards our Pluto expansion goal along with discussions with other resource owners and our Browse team are working diligently through the Basis of Design process and securing land access and environmental permits at the State's Kimberley LNG Precinct, James Price Point.

Now we always seem to talk about NWS, Pluto, and Browse, all great projects but today I want to focus on Sunrise. It has taken great strides of late and ...if you will excuse the pun...its time for this project's day in the sun!

## Sunrise: momentum building

- Valuable resource
- Treaties between Australia and Timor-Leste provide a clear set of rules
- Multiple development options evaluated
- Floating LNG unanimously selected by Sunrise JV
- Robust economics
- Floating LNG maximises total revenue to Australia and Timor-Leste, and maximises return to Sunrise JV
- Obligation to select preferred development concept has been fulfilled
- Floating LNG (FLNG) selection report submitted to regulators



Slide 4

I'm sure many of you know that the Sunrise project has had a long history. Today, rather than dwell on that history, I want to talk about the more recent progress the project has made, as it is very significant.

The project is blessed with a liquids rich resource of over 5 TCF of gas and importantly, following ratification of the International Unitisation Agreement (IUA) and Certain Maritime Arrangements in the Timor Sea (CMATS) in 2007, a clear set of rules have been established for the development of the Greater Sunrise resource.

As I'll explain in more detail shortly, the Sunrise Joint Venture attained a major milestone late last month. On 29 April 2010, following completion of a rigorous technical and commercial evaluation of a number of development options the JV unanimously, let me repeat...unanimously selected Floating LNG as the preferred development concept for Greater Sunrise.

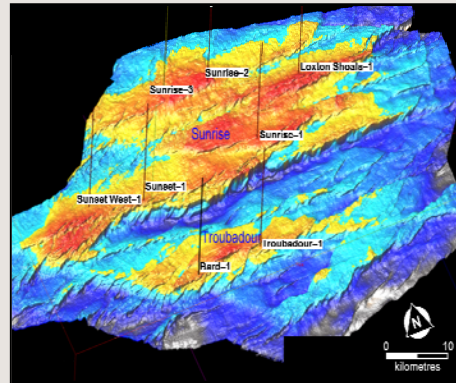
Evaluation results demonstrate that Floating LNG has robust economics, maximising total revenue to Australia and Timor-Leste and maximising the return to the Sunrise Joint Venture.

And this is something we can categorically say, Woodside and its Joint Venture participants have fulfilled all of our obligations under our Retention Leases and Production Sharing Contracts to select a development concept.

We are committed to working with the Australian and JPDA regulators to progress the development within the regulatory framework established under the treaties and have taken the first step by submitting our Floating LNG selection report to the regulators.

## Rich gas resource

- Contingent resource volumes
  - 5.13 Tcf dry gas
  - 226 MMstb condensate
  - unanimously agreed by Sunrise JV
  - independently certified
- Excellent gas quality
  - high gas condensate ratio
  - low CO<sub>2</sub> ~ 5%
- Phased development
  - 7 production wells at field start-up
  - 26 production wells at full field development



3D representation of the Greater Sunrise Fields

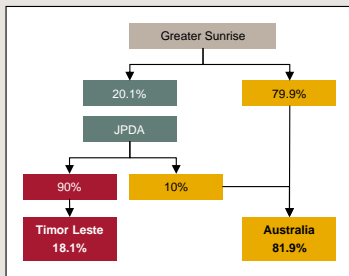
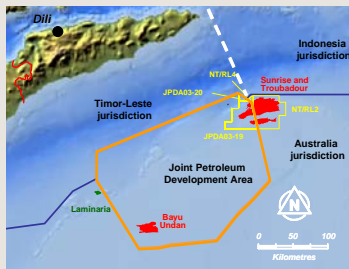


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Like our Browse project the appraisal work at Sunrise is complete and there's joint venture agreement to a 5.13 Tcf contingent resource with almost a quarter billion barrels of condensate. You might want to think about it as a liquids project with associated gas. One of the enablers to reaching concept select was the unanimous agreement by the JVP's on the size of the prize. In addition to the high liquids content the field is blessed with low Co<sub>2</sub>.

Like most mega projects the development and the capex will be phased. We plan to produce from 7 wells at field startup. At full field development the field will be produced from 26 wells via a distributed subsea gathering system, comprised of a number of main flowline headers extending radially from the FLNG facility. The system is sized to meet the peak LNG production rate, with additional deliverability (wells and flowlines) in the event of well failure.

# Ownership and development of Sunrise



Apportionment of the Greater Sunrise Fields



JPDA = Joint Petroleum Development Area

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- Resource shared by Australia & Timor-Leste
  - Straddles boundary of Australian waters & JPDA
  - Timor Sea Treaty and International Unitisation Agreement ratified by both countries
  - Australia – 81.9%, Timor-Leste – 18.1%
- Sunrise JV has exclusive rights:
  - to develop the fields and
  - to market the gas and condensate
- Regulatory framework established:
  - Two regulators (Aust & JPDA) are to provide:
    - In principle approval of development concept; and
    - approval of development plan following submission

We have two sets of titles under two regulatory regimes. As Greater Sunrise straddles both Australian territory and the Joint Petroleum Development Area or JPDA we hold both Retention Leases in Australian waters and Production Sharing Contracts (PSCs) in the JPDA which give the Sunrise Joint Venture exclusive rights to develop and market Greater Sunrise gas.

The IUA apportions 79.9% of the Greater Sunrise oil and gas resource to Australia and 20.1% to the JPDA. The JPDA is managed on behalf of the Australian and Timor-Leste Governments by the ANP. Under the Timor Sea Treaty 90% of the oil and gas located in the JPDA is apportioned to Timor-Leste and 10% to Australia.

The combined effect of the IUA and the Timor Sea Treaty is that approximately 82% of Greater Sunrise oil and gas is apportioned to Australia and approximately 18% to Timor-Leste as shown on the slide.

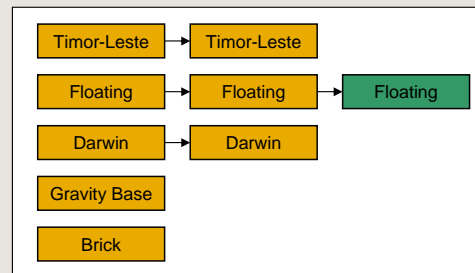
The final piece of the treaty puzzle is the CMATS treaty which provides for the even distribution of upstream petroleum revenues from Greater Sunrise. Effectively this more than doubles the petroleum revenue to be received by Timor-Leste. More on that later.

It is important to reiterate that these recently signed treaties are well defined, and drafted over a period of time with significant due diligence.

Under these arrangements both the Australian and Timor-Leste regulators must provide “in principle” approval of the chosen development concept prior to submission of the Development Plan for approval, and clearly sets out the criteria against which the Development Plan will be assessed.

## Rigorous concept selection process

- Rigorous technical and commercial evaluation
- To develop reservoir to best commercial advantage consistent with good oilfield practice
- Multiple concepts evaluated including:
  - greenfield LNG plant in Timor-Leste (**TLNG**)
  - floating LNG facility located over Sunrise field (**FLNG**)
  - brownfield expansion of existing Darwin LNG plant (**DLNG**)
- FLNG unanimously selected by Sunrise JV
- FLNG selection report prepared by Sunrise JV includes a comprehensive evaluation of all three concepts



Selection of Development Concept for Greater Sunrise



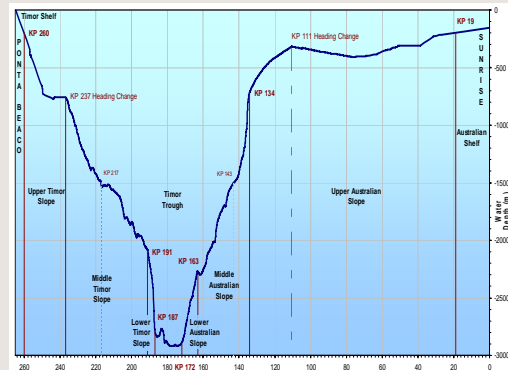
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In mid 2008 the Sunrise Joint Venture completed its concept screening process, eliminated Brick LNG (BLNG) and a Gravity Based Structure (GBS) from the development options. Following this we undertook an extensive technical and commercial evaluation of Timor LNG, Floating LNG, and Darwin LNG. The overall basis of this assessment was to ensure that the Sunrise Joint Venture selected the option that would develop the fields to the best commercial advantage consistent with good oilfield practice as required by the IUA. This process involved more than 300,000 hours of effort by all teams in the Sunrise Joint Venture spanning Woodside, ConocoPhillips, Shell and Osaka Gas.

The technical evaluation concluded that while risk profiles varied across development options there were no technical impediments to either FLNG, DLNG or TLNG. The commercial evaluation, which thoroughly analysed the commercial drivers for each development concept including capital and operating costs, production rates, schedule, and valuation metrics amongst other things, has led to the final joint venture decision. Subsequently on 29 April 2010 we announced that the Sunrise Joint Venture unanimously selected FLNG as its preferred development concept for Greater Sunrise. A detailed analysis of each of the three development options was included in the detailed report presented to the regulators in Dili and Canberra. Now it is time for the regulators to properly consider that analysis.

## Due consideration of TLNG

- Of the three development concepts considered in detail, TLNG has the **highest capital cost** and presents significant **technical risks due to:**
  - greenfield nature of LNG development
  - pipeline construction, integrity and operability risks



Sunrise to Ponta Beaco (Timor-Leste): TLNG Pipeline Route Profile



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As part of our ongoing work of ensuring that all three development options DLNG, FLNG, and TLNG were given full consideration the Sunrise Joint Venture conducted a detailed technical and commercial evaluation of the TLNG option. As mentioned in the last slide, we found that there were no technical impediments to TLNG, however it has the highest capital cost by approximately \$5 billion compared to FLNG and presents significant technical risks.

For example, the greenfield nature of the development requires a new LNG loading jetty, extensive site clearing and preparation, and basic infrastructure like airport, water, sewerage etc and presents significant technical risks around the construction, maintenance and operability of the pipeline due to water depths in the seismically active Timor trench approaching 3000 meters.

In light of these issues, it became apparent that FLNG and Darwin LNG better satisfy the commerciality test requirements under the IUA.



## FLNG economics

- Economic return exceeds Woodside's hurdles (NPV / IRR / VIR etc)
- Comparative economics
  - Sunrise FLNG is the “sister” of Shell’s Prelude FLNG.
  - Prelude LNG is reported to have robust economics, including an IRR ~15%\*
  - Relative to Prelude\*, Sunrise has:
    - relatively benign ocean conditions and similar water depth.
    - higher volumes of condensate and gas
    - lower levels of CO<sub>2</sub> and other inerts; and
    - higher capex reflecting larger field and higher production rates

\* Wood Mackenzie Asset Analysis December 2009



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While I cannot get into the specific details on the economics of Sunrise FLNG development, I can say that at this stage in the development the calculated returns are robust and exceed all Woodside's threshold economic hurdle rates.

The most simplistic analysis I can provide is to offer a broad comparison with Prelude which is Shell's other FLNG project and “sister” of Sunrise. It is currently in a Front End Engineering & Design phase for the development of 3.25 Tcf of gas and 120 million barrels of condensate off the Western Australian coast.

Prelude, under Wood Mackenzie's analysis has an internal rate of return of approximately 15%. Sunrise by comparison is located in relatively benign ocean conditions and similar water depths. Sunrise is a larger condensate and gas resource than Prelude. Sunrise also has lower levels of CO<sub>2</sub> and inerts. However it is anticipated that Sunrise will have a higher capex than Prelude. This is of course driven by Sunrise's larger resource and higher planned production rates.

## FLNG – an emerging global solution



- FLNG – leading technology for developing remote offshore gas fields
  - monetise offshore stranded gas
  - reduce capital costs (e.g. export pipeline)
  - lower environmental footprint
- Emerging FLNG Developments e.g.
  - Pre Salt, Santos Basin (Petrobras, Brazil)
  - Abadi (Inpex, Indonesia)
  - Prelude (Shell, Australia)

The development of floating LNG has been underway for a number of years now. It is an exciting new development for the LNG industry for a number of reasons.

FLNG can provide the opportunity to monetise stranded gas, generally located in remote offshore fields. It can reduce capital costs by eliminating the need for export pipelines, LNG loading jetties, shipping channel dredging, site clearance etc. All of these elements will allow FLNG a lower environmental footprint.

There are also a number of other potential FLNG developments occurring around the globe. In Brazil, Indonesia, and Australia to name a few, the use of FLNG is being pursued as an innovative and viable development concept.

## FLNG – a good fit for Sunrise

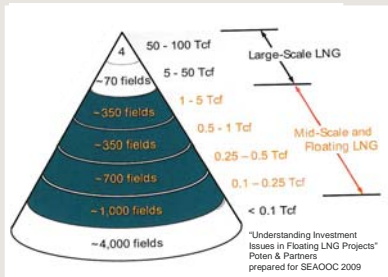


Image courtesy of Shell



### ▪ Sunrise is well suited to Floating LNG

- moderate reservoir size ( $\approx 5$ Tcf gas)
- benign sea conditions in the Timor Sea
- Timor Sea Treaty contemplates FLNG for Sunrise

### ▪ Sunrise utilises Shell FLNG

- FLNG developed over 10 years by Shell
- Technip and Samsung contracted by Shell to deliver multiple FLNG facilities under a “design one, build many” philosophy
- Shell has commenced FEED for Prelude
- Sunrise to be 2<sup>nd</sup> facility built using Shell FLNG

From a technical perspective FLNG is the best fit for Sunrise. Greater Sunrise is a moderately sized field, remotely located in an ocean with favourable metocean conditions. The Timor Sea Treaty even contemplates and makes reference to the use of FLNG at Sunrise.

As shown above it's current limitations are the size of the LNG facilities and its storage which limit the field size appropriate for FLNG. In other words each FLNG facility is an entire greenfield solution so it does not scale up well. Sunrise is about perfect...the maximum size for best economic utilisation.

While FLNG technology has been developed by Shell for more than 10 years, Shell recently awarded a contract to Technip and Samsung to deliver multiple FLNG facilities.

The Sunrise Joint Venture will take advantage of Shell's emerging portfolio of FLNG developments with Sunrise earmarked to follow Prelude off the production line.

## Shell's Floating LNG solution at Sunrise

- Combines proven technology on a floating facility (liquefaction, production, storage, offloading)
- Permanently moored using internal turret
- Production capacity
  - LNG ~ 4 mtpa
  - Condensate ~ 10.3 MMbbls p.a.
- Storage
  - LNG – 310,000 m<sup>3</sup> (146,000t)
  - Condensate – 800,000 bbls
- Option to produce and store LPG
- Field life ~30 years



Image courtesy of Shell



Slide 12

I would like to spend a few minutes going into the detail of Sunrise FLNG, as it is an important development for the global LNG industry. It integrates offshore hydrocarbon gathering and processing facilities with traditionally onshore pre-treatment, liquefaction, storage and loading facilities into one unit located in the field.

The Greater Sunrise FLNG facility will be approximately 480 metres in length and 75 metres wide, with the topside weighing approximately 50,000 tonnes. For those shipping or military buffs that makes it 50% longer than a US Nimitz class aircraft carrier. For you Sydney-siders that's 3 times the length and half the width of the Sydney Cricket Ground.

It will be permanently moored using an internal turret at a location above the Greater Sunrise Fields in water depth between 175 and 400 metres and has been designed for a 1 in 10,000 year weather event.

The facility is capable of producing approximately 4 million tonnes per annum of LNG and 10.3 mmbbls per annum of condensate.

It can store both LNG and condensate and has the option to separate and store LPG.

LNG offloading will be in a side by side configuration with offloading rates at 10,000m<sup>3</sup> per hour.

During normal operations the facility will have around 150 people on board. During major maintenance campaigns up to 400 people will be accommodated.



## FLNG: win win win

- Maximises total petroleum revenue for Timor-Leste and Australia
  - Timor-Leste: approx US\$13 billion# for its 18.1% share (adjusted upwards from approx US\$6 billion due to revenue sharing agreed under CMATS)
  - Australia: approx US\$19 billion# for its 81.9% share
- Delivers the best return for the Sunrise JV
- High profile international project paves way for further foreign investment
  - Successful execution of a “mega project” under an international treaty regime will enhance Timor-Leste’s attractiveness for foreign investment
- Stimulates further social development in Timor-Leste

# Based on Sunrise JV modeling assumptions which include but are not limited to

- Resource = 5.13 Tcf dry gas and 226 mmstb condensate, field life - 30 years
- Peak production rate = 4 mtpa LNG per annum and 10.3 MMbbl per annum
- LNG price = indicative Asia-Pacific pricing inflated by CPI
- Royalties = as per current regulatory and contractual regime



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So contrary to what you may hear in the media about the Sunrise JV “stealing” the resource from Timor-Leste, let me just say that based on JV modelling assumptions, not too dissimilar from the assumptions we ask our Board of directors to make a Final investment Decision on, Timor-Leste will earn approximately US\$13 billion over the life of the project for its 18% share. The Timor-Leste share of petroleum revenue has more than doubled following the Australian Government’s concession made in the CMATS agreement. At the same time the Australian government stands to earn approximately US\$19 Billion from its 82% share.

Just as important however is that the development of Greater Sunrise will be viewed by the global community with interest. Successful execution under the international treaty regime will obviously enhance Timor-Leste’s reputation as a opportunity for foreign investment.

## Stimulating social development in Timor-Leste

- **Ongoing social investment**
  - Education, development, health services, environment, arts
    - (eg World Vision water for life, Alola foundation, Junior achievement in Timor-Leste)
- **Following in principle approval of FLNG**
  - Substantial training opportunities for Timor-Leste
    - external education scholarships
    - traineeships provided by participants in the Sunrise JV
  - Local content and employment opportunities
    - direct employment of Timor-Leste nationals
    - local industry content – other infrastructure
    - local business opportunities



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In addition to the petroleum revenue that will flow to Timor-Leste, the Sunrise JV continues to partner with a number of international and Timor-Leste based Non Government Organisations (NGOs) delivering projects that are having tangible positive impacts on the well-being of the Timor-Leste people.

The Sunrise JV stands ready to take this investment to a new level. As I have said previously the Sunrise Joint Venture is committed to progressing the FLNG development in a way that provides substantial long term benefits to the people of Timor-Leste. We are really looking forward to discussing with the Timor-Leste Government the opportunities for scholarships, traineeships, employment and local industry content and business opportunities.

## Key Messages

- Unanimous selection of FLNG by the joint venture participants reaffirms robustness of Sunrise economics
- Floating LNG maximises total revenue to Australia and Timor-Leste, and maximises return to Sunrise JV
- Woodside has fulfilled all its obligations under international treaties
- Regulatory approvals now required
  - in principle approval of the selected development concept
  - approval of the development plan



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So in closing let me reiterate the key points,

The Sunrise Joint Venture attained a major milestone in April with the unanimous selection of Floating LNG as the development concept for Greater Sunrise.

The FLNG option maximises total petroleum revenue at over US\$30 billion to Australia & Timor-Leste, and it maximises the return to the Sunrise joint venture.

And, to be absolutely clear...Woodside has fulfilled all its obligations under international treaties. We have selected the concept that provides best commercial advantage consistent with good oilfield practice.

We have submitted a Floating LNG (FLNG) selection report which includes feasibility studies on all three options with very clear reasoning behind our decision.

Now it is the regulator's turn to act.

The various treaties and agreements specify the rules by which the regulators are to review the development concept and proceed. We look forward to working with the regulators and moving forward on this great project.