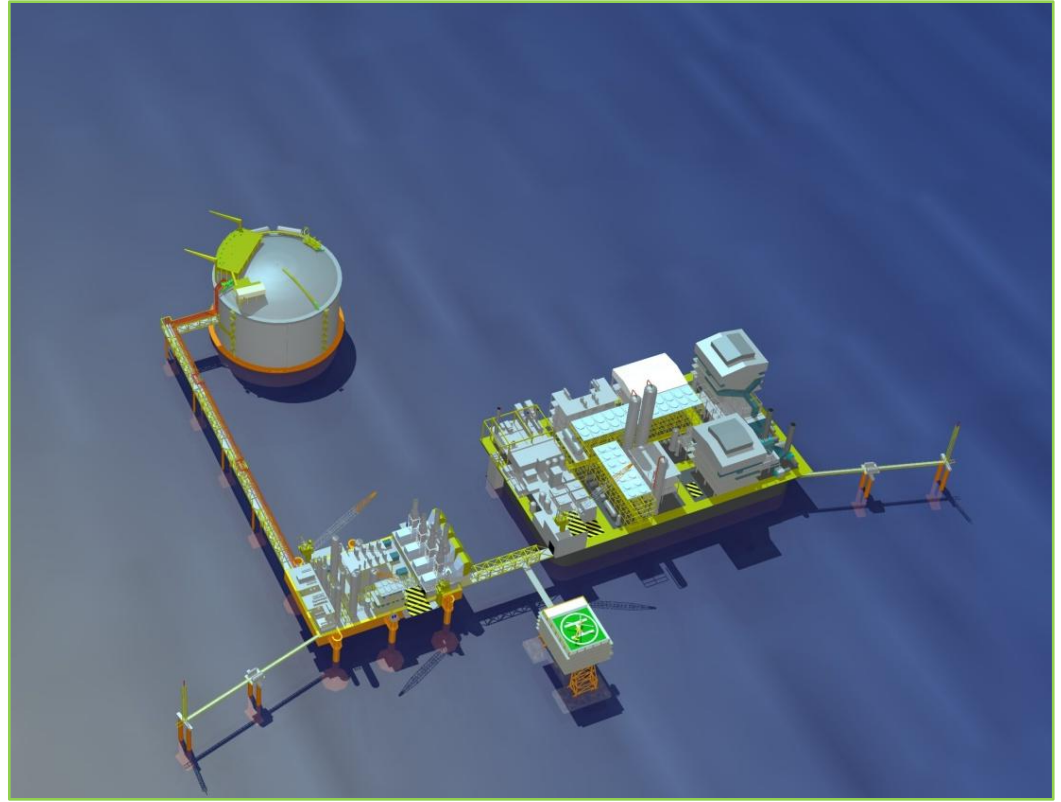


**MEOAustralia**

energy for the future



Presentation to SPE Melbourne:

**Timor Sea gas monetization –**

**The Tassie Shoal Methanol and LNG Projects**

17<sup>th</sup> June 2009

John Robert, Development Engineering Manager



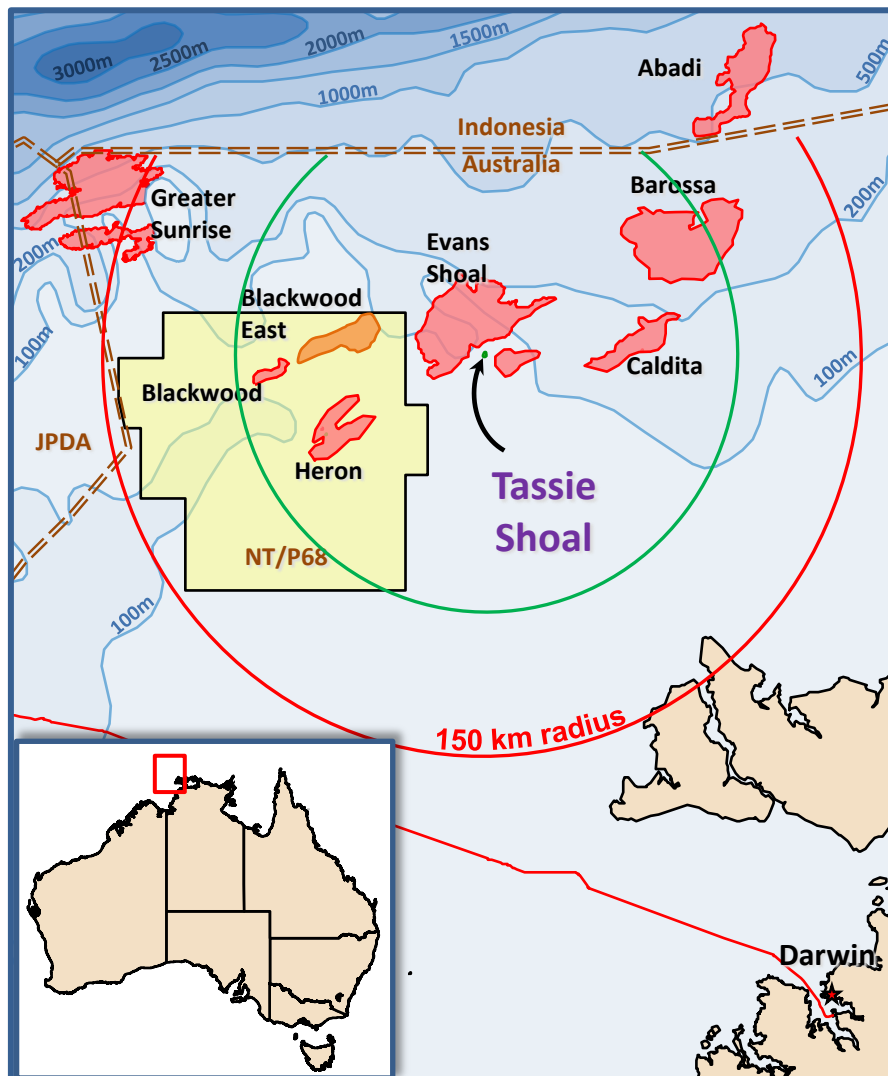
**MEO Australia**

energy for the future

# Bonaparte Basin gas fields

~25 Tcf is stranded due to location &/or gas quality issues

Most have CO<sub>2</sub> & distance issues



**Evans Shoal**  
(Santos, Shell, Petronas, Osaka Gas)

~6+Tcf	25% CO <sub>2</sub>	4 bbl/MMscf
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**Barossa/Caldita**  
(ConocoPhillips/Santos)

~3.4 Tcf	12% CO <sub>2</sub>	5 bbl/MMscf
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Others just distance

**Greater Sunrise (FLNG? Land?)**  
(WPL/Shell/ConocoPhillips/Osaka Gas)

~5.4 Tcf	4% CO <sub>2</sub>	40 bbl/MMscf
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**Abadi (FLNG?)**  
(Inpex/Pertamina)

~10 Tcf	8% CO <sub>2</sub>	20 bbl/MMscf
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MEO discoveries, NT/P68

**Blackwood**  
(MEO – 100%)

Appraisal planned 2010

**Heron**  
(MEO – 90%)

Appraisal planned 2010

# Tassie Shoal – potential industrial hub

Solution to location & gas quality issues

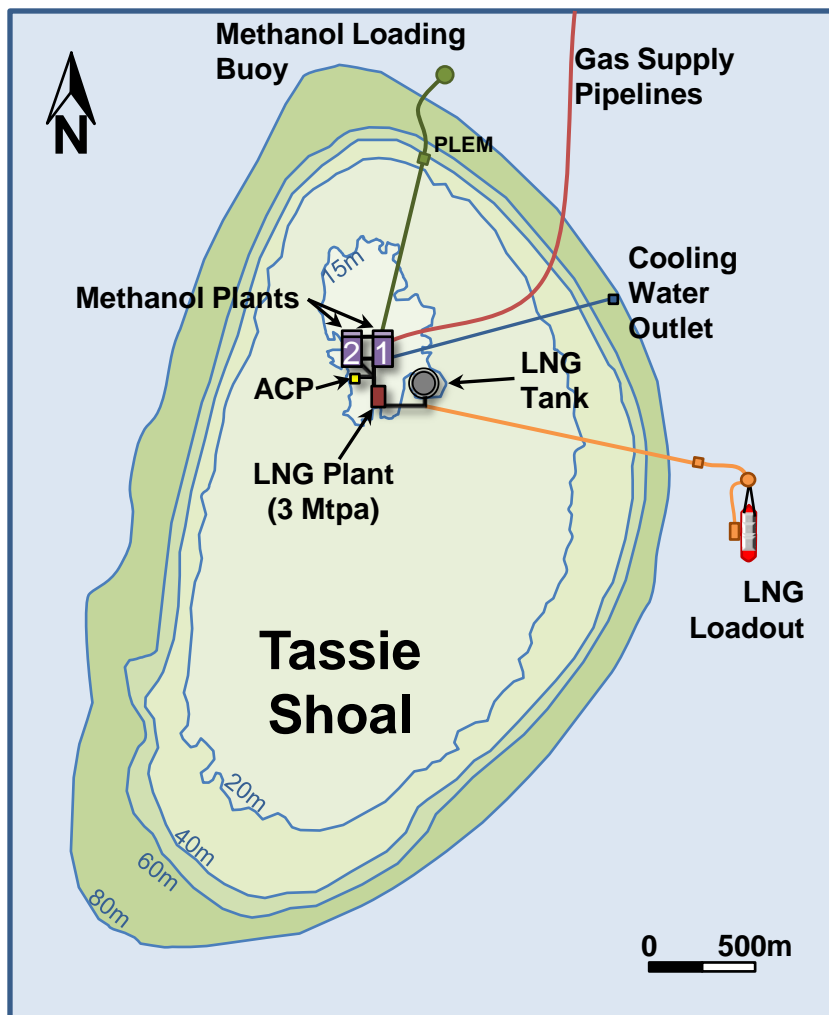
## Tassie Shoal:

Relatively mild metocean conditions

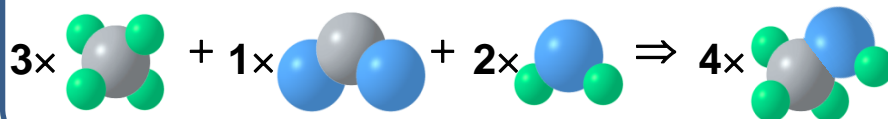
25 Tcf of undeveloped gas within 150km

As Hub, eliminates long pipelines to shore

CO<sub>2</sub> sequestered into Methanol derivatives



Methane + CO<sub>2</sub> + Steam ⇒ Methanol



Methanol Production absorbs 25% CO<sub>2</sub>

Environmental approvals secured:

1 x 3 Mtpa (expandable to 3.5 Mtpa) LNG plant

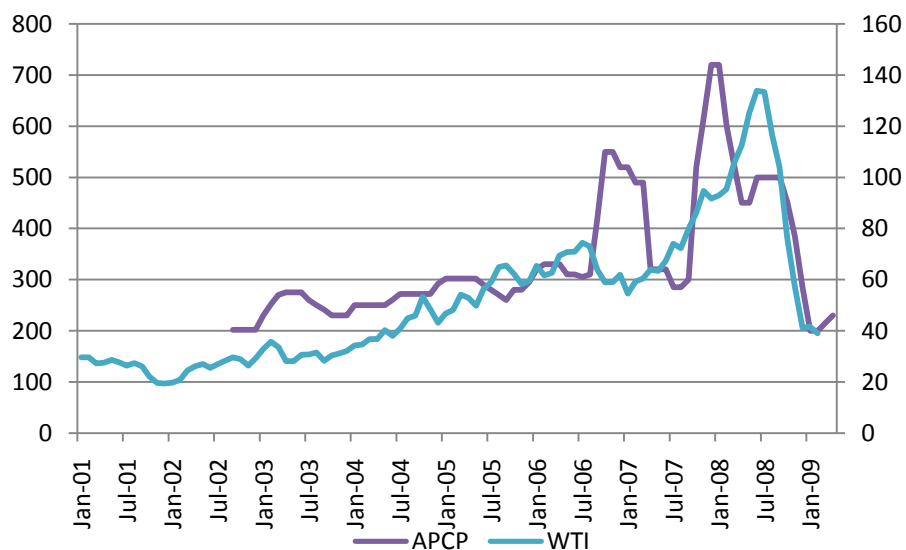
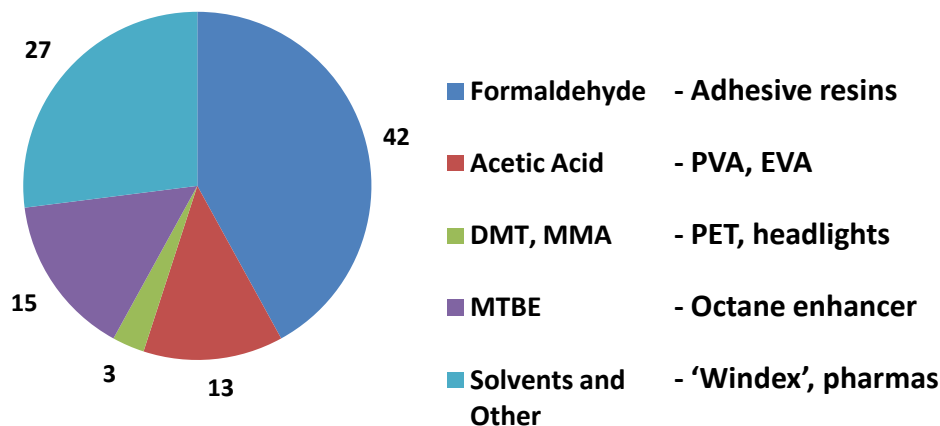
2 x 5,000 tpd (1.75 Mtpa) Methanol plants

MPF status granted until Dec 2011

# Why Methanol?

Can be made from high CO<sub>2</sub> gas

**Methanol Derivatives %**



and Methanol has many uses

Global demand ~40 Mt/y

Growth historically @ GDP + 1%

Diverse predominantly non-fuel uses

Significant growth potential

Usually premium over fuel value

Price correlates with energy prices

Coal-based production (China) sets floor  
price

# Tassie Shoal Methanol Project (TSMP)

## Main Elements

**Methanol Storage inside CGS**

**Product loadout via SPM avoids jetty  
and tugs**

**Separate structure for  
Accommodation and Control**

**Ready for FEED studies in 2010 once  
gas supply confirmed**

**All potentially re-locatable, subject to  
water depth**



# TSMP Process Features

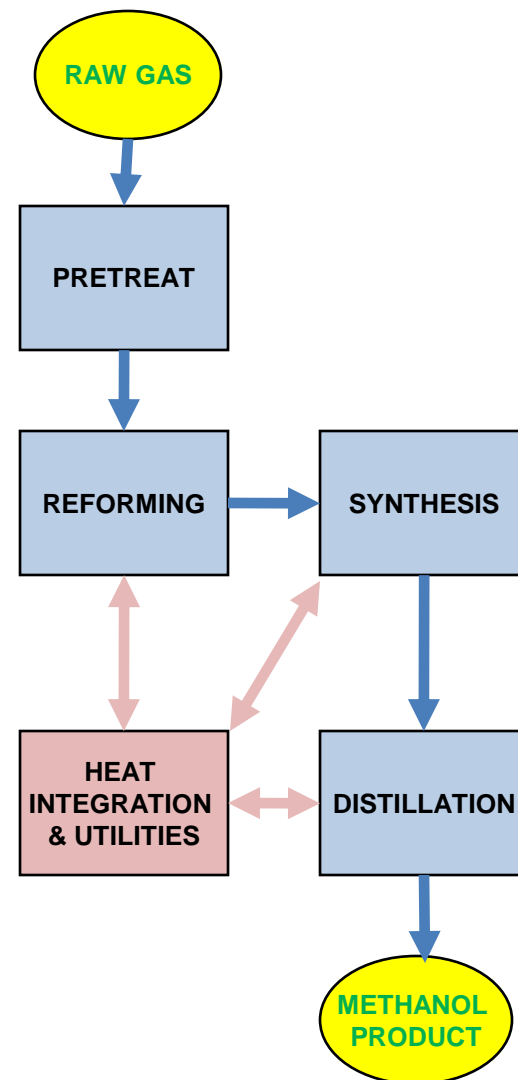
**Condensate, water, sulphur removed from raw gas**

**DPT Steam Methane Reforming (SMR) Process**

not O<sub>2</sub> based so can consume CO<sub>2</sub>

3 column distillation saves air cooler plot area

**Robust power generation, steam, nitrogen and thermal  
desalination systems**



# Methanol topsides, sub-structure and storage



Substructure CGS: ~200,000 t

Base: 170m x 93m x 35m height

Process deck: 180m x 100m (wave deflection)

Installed by ballasting in 14m water depth

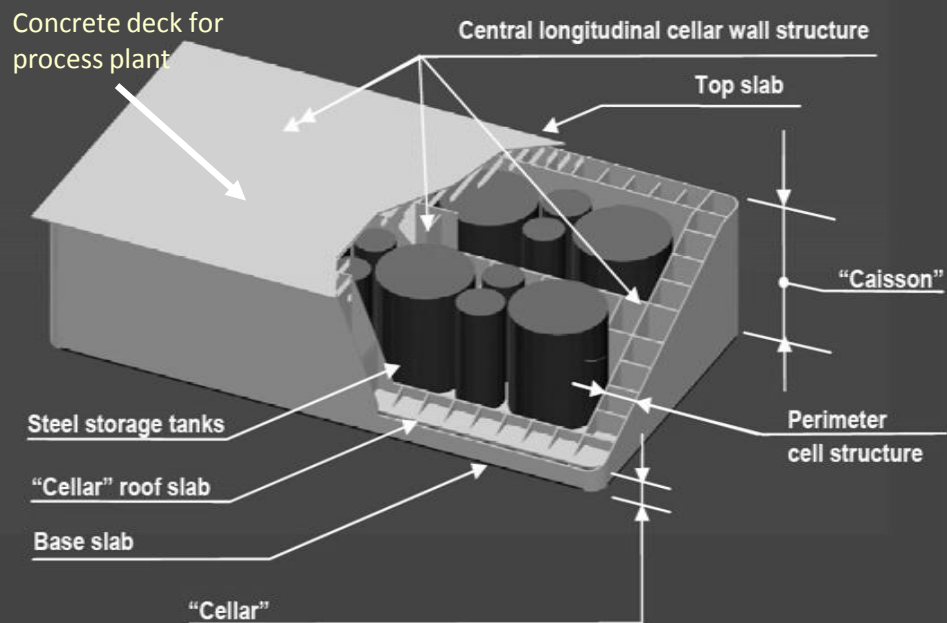
Storage in steel tanks for 20 days final product

Methanol capacity: 5,000 tpd, 1.75 Mt/y

Topsides 35,000 t

Total height CGS & topsides 95m

Enhanced 'stick-build' on deck





# Substructure Precedent

ExxonMobil Adriatic LNG  
Re-gas terminal  
constructed by Aker  
Kvaerner in Spain.

Very similar footprint to  
TSMP but higher structure  
due to greater water depth  
at Adriatic site





# LNG Project Elements

## 3 Mt/y LNG Production Module

Standard pretreat section: CO<sub>2</sub>, H<sub>2</sub>O & Hg removal

Air Products (APCI) DMR chilling and liquefaction

Fractionation plant for refrigerant makeup

Utilities: power gen, steam, water cooling systems

## ProductionACE self-installing barge platform

100 x 50 m, on six caisson legs

**LNG Storage – 170,000m<sup>3</sup> conventional tank on CGS**

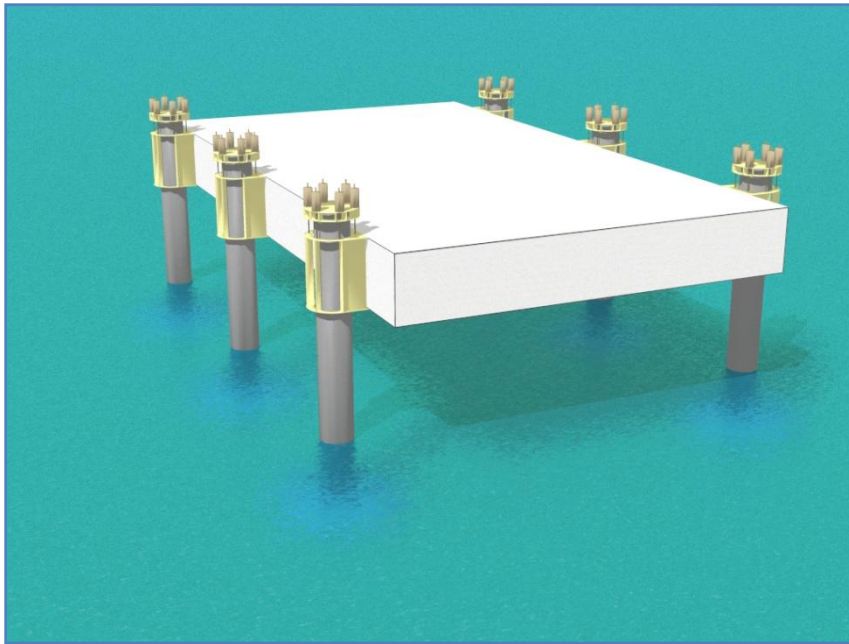
**LNG Load out Jetty or Hi-Load semi-sub**

**Separate structures for ACP and possibly flare**



# LNG Substructure

**Production ACE platform for LNG  
process equipment**

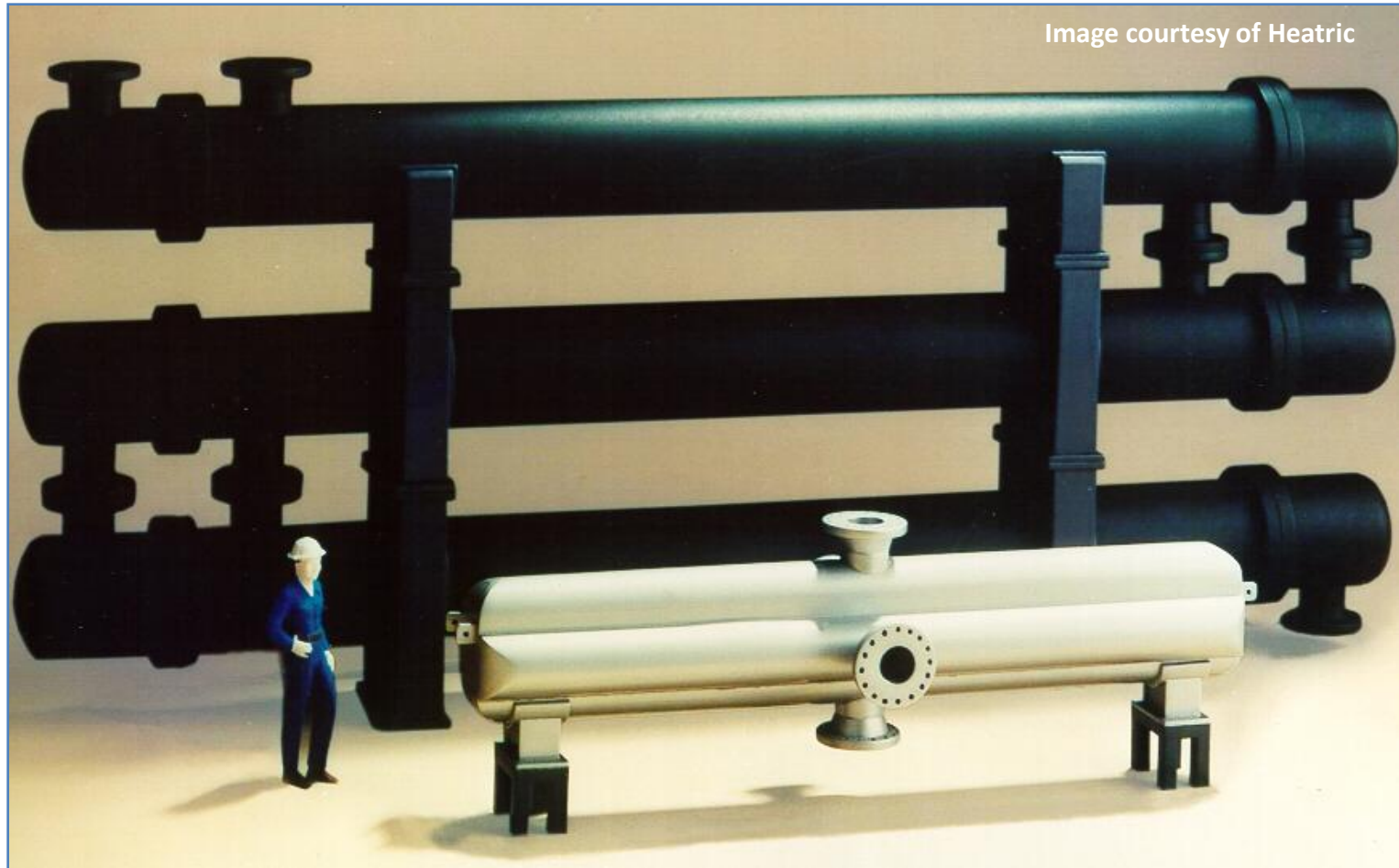


**Similar to  
Hang Tuah Compression platform  
for ConocoPhillips, Indonesia**



# Compact Water Cooled Exchangers

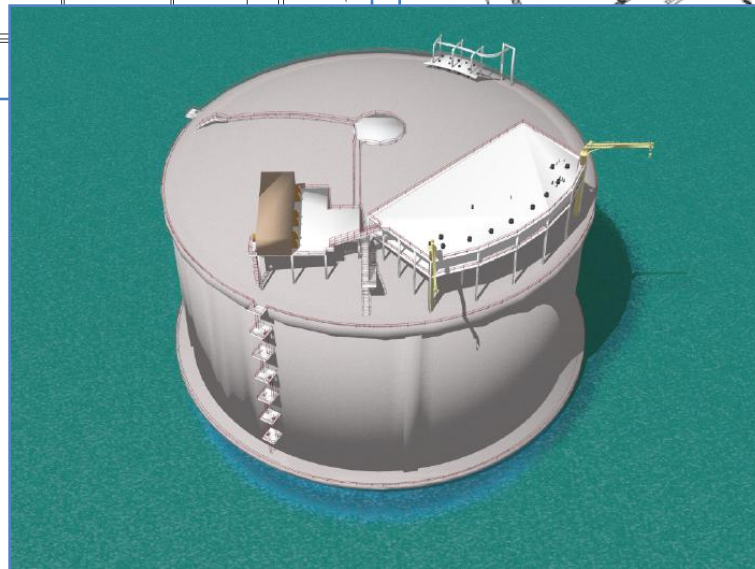
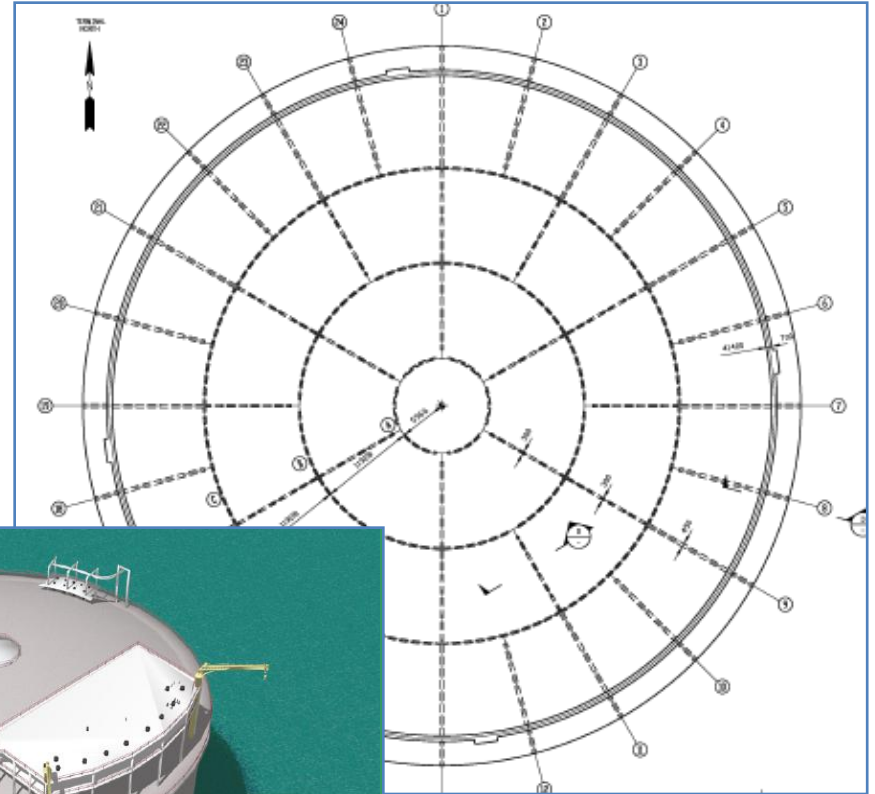
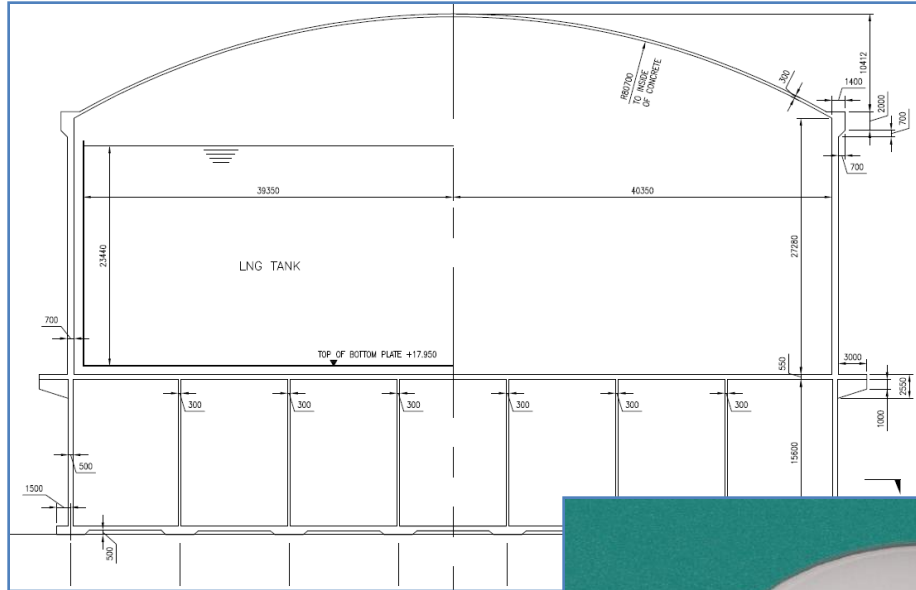
- Indirect seawater cooling with closed loop circuit
- Extensive use of compact printed circuit heat exchangers (PCHEs) – up to 1 / 25<sup>th</sup> plot area of air coolers





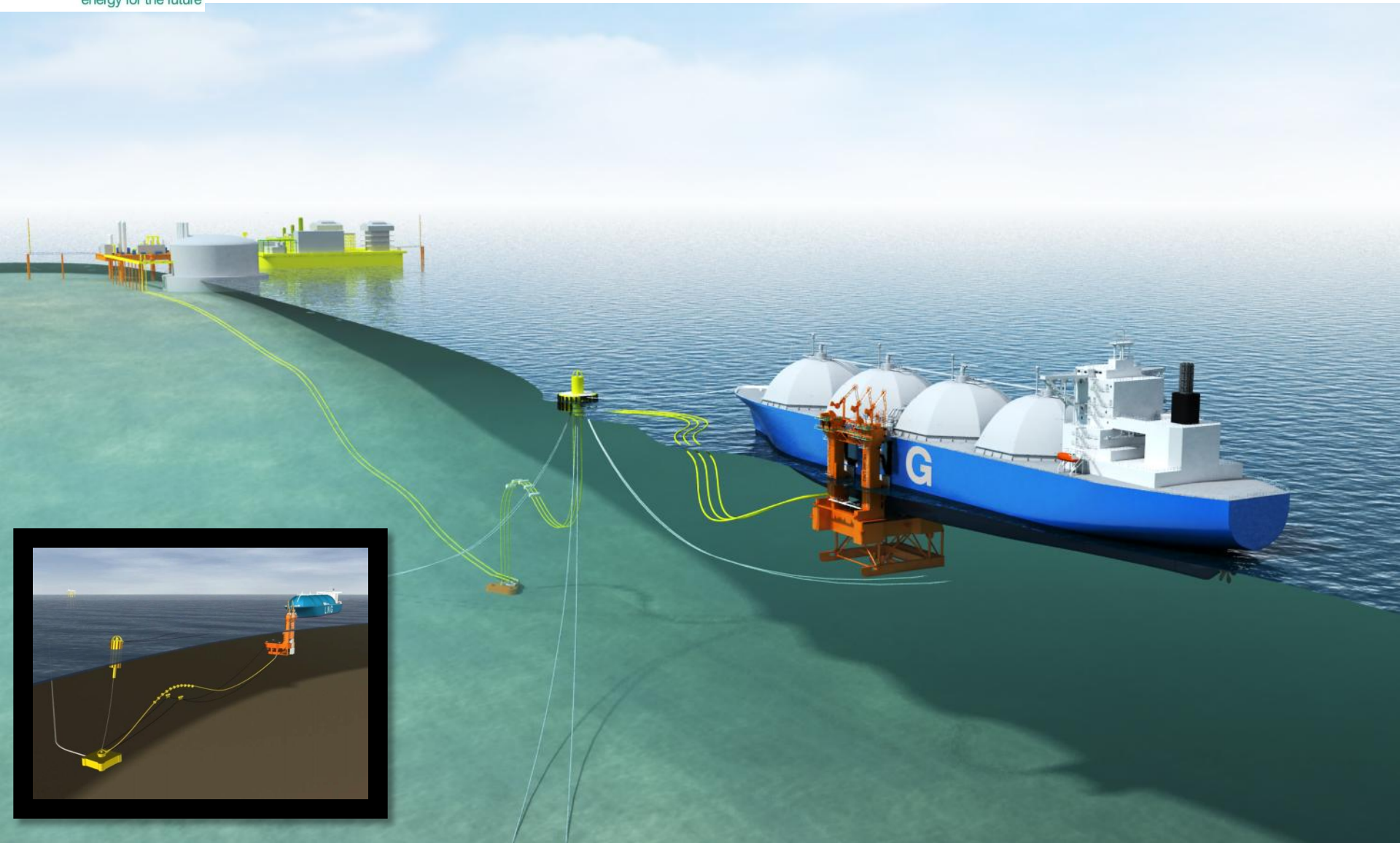
# Nickel Steel LNG Tank Inside GBS

Conventional secondary containment LNG tank on concrete caisson



# Possible *HiLoad* LNG Loading System

Replaces Jetty and Tugs service

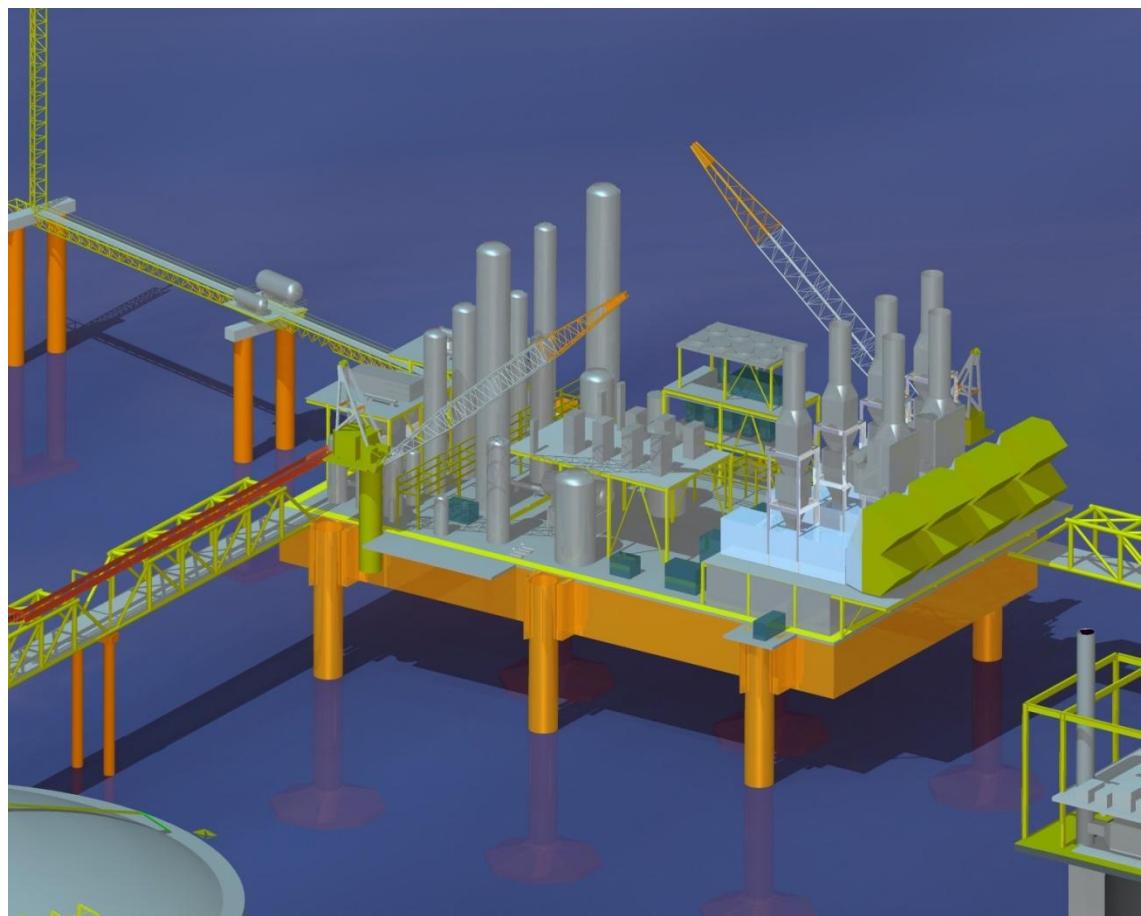




# Timor Sea LNG Project

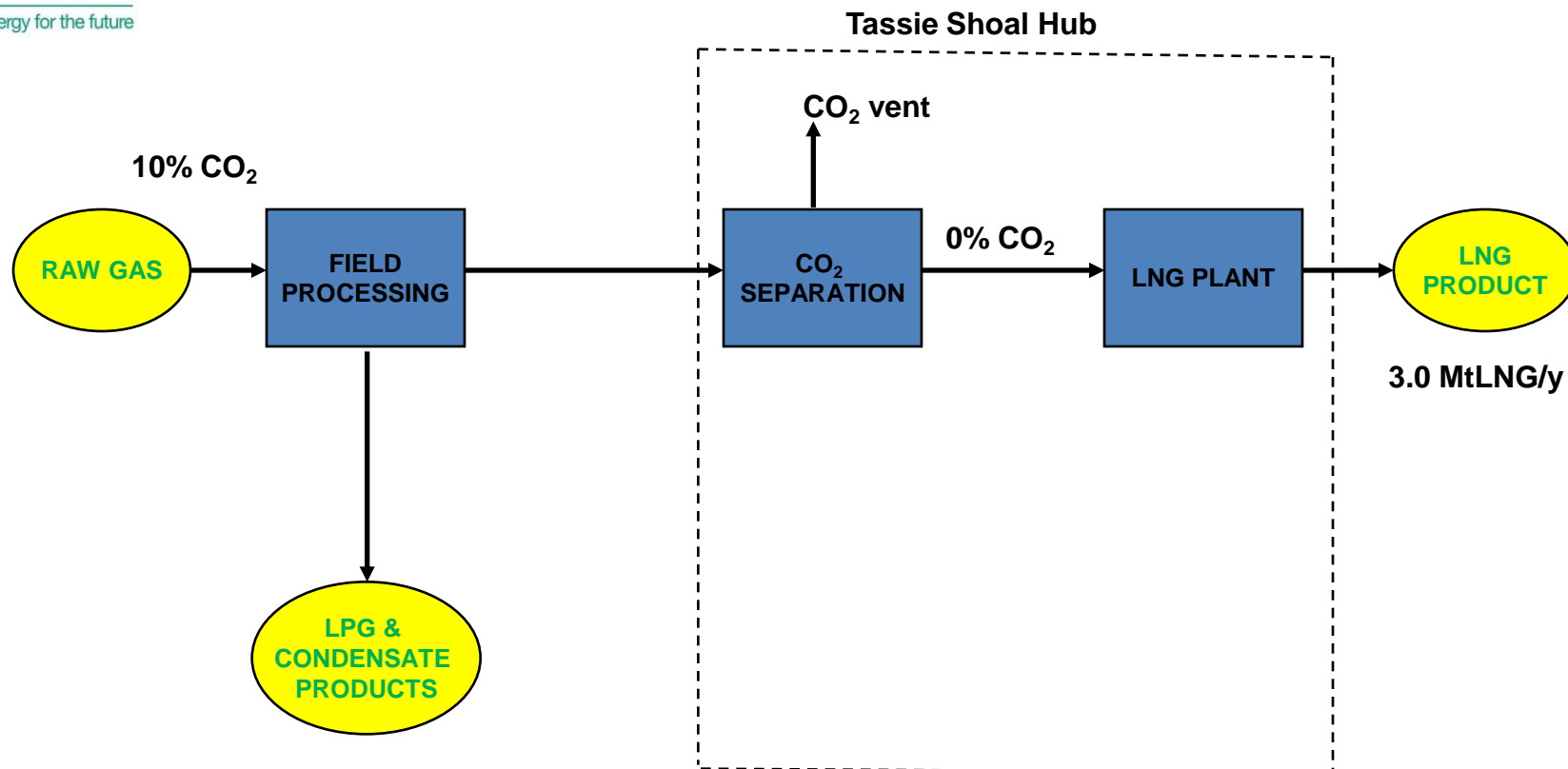
## - Innovations

- **Indirect seawater PCHE cooling**
  - dramatically reduces plot area
- **Electric drives with N+1 power island**
  - increases service factor
- **Aero-derivative gas turbines**
  - give increased efficiency and uptime
- **APCI DMR process**
  - approaches onshore plant efficiency
  - compact and avoids propane hazards
- **Single module built on ACE platform**
  - LNG tank on CGS caisson
- **HiLoad system for LNG offloading**
  - eliminates need for tugs
  - avoids close vessel approaches to facilities



# Tassie Shoal Projects

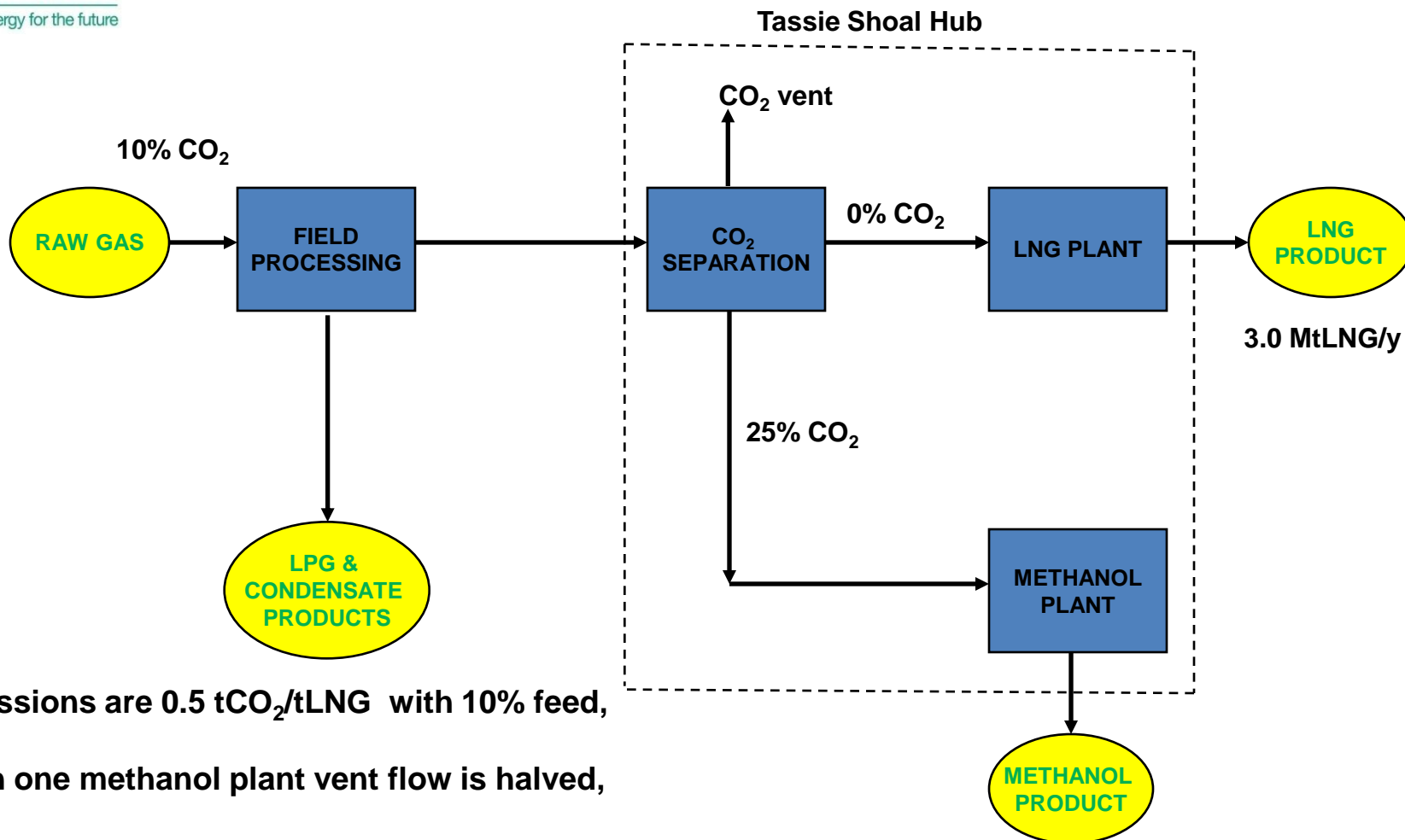
## LNG from high CO<sub>2</sub> gas



Emissions are 0.5 tCO<sub>2</sub>/tLNG with 10% feed

# Tassie Shoal Projects

## An Integrated LNG / Methanol Solution



Emissions are 0.5 tCO<sub>2</sub>/tLNG with 10% feed,

With one methanol plant vent flow is halved,

emissions are reduced to 0.35 tCO<sub>2</sub>/tLNG

With two methanol plants vent flow is zero and emissions reduced to 0.2 tCO<sub>2</sub>/tLNG

# Tassie Shoal Projects

– a regional gas commercialisation solution

- **Conservative technologies**
  - innovative combinations
- **Competitive delivered cost of product**
- **Strategically located**
  - access to Asian growth markets
- **Environmental approvals in place**
- **Rapid gas commercialisation path**
- **Ready for FEED studies pending gas supplies**





# **The Tassie Shoal Projects**

**John Robert  
Development Engineering Manager  
MEO Australia Limited**

**June 2009**

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