WHAT THE HEADLINES ARE SAYING

Cost blowouts and skills shortage threaten gas projects

$100b LNG projects imperiled by LNG rush

Chevron finds huge cost blowout at Gorgon: report

Santos Reports $2.5B Increase in GLNG Price Tag

Triple whammy sparks $5bn blowout for BG's Gladstone project

Sector booms amid concerns

Cost of PNG LNG rises to $US19 billion

Too many parallel runs for all, overside back on the drawing board.
LARGE SCALE PROJECTS ARE PRONE TO COST AND SCHEDULE OVERRUNS
CHANGE BECOMES MORE DIFFICULT AND EXPENSIVE
FOR ANY ONE PROJECT THE VALUE CHANGE THROUGH THE PROCESS WILL BE UNIQUE

Assess
• Value identification

Select
• Value enhancement

Develop
• Value Protection

Execute
• Value Realisation
CARNARVON BASIN LNG DEVELOPMENTS

Source: RISC
## GORGON POTTED HISTORY

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>Gorgon discovered</td>
</tr>
<tr>
<td>2000</td>
<td>Io-Jansz discovered</td>
</tr>
<tr>
<td>2001-2</td>
<td>JV determines to build plant on Barrow Island, with Geosequestration</td>
</tr>
<tr>
<td>2003</td>
<td>Barrow Island Act enacted</td>
</tr>
<tr>
<td>2007</td>
<td>Approval for a 2 Train development</td>
</tr>
<tr>
<td></td>
<td>Pluto FID</td>
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<tr>
<td>2009</td>
<td>Approval for a 3 Train development</td>
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<td></td>
<td>FID September 2009 ($37bLn, 2014)</td>
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<tr>
<td>2011</td>
<td>Wheatstone LNG FID</td>
</tr>
<tr>
<td>2012</td>
<td>Cost and schedule increase  ($52bLn, Q1 2015)</td>
</tr>
<tr>
<td>2013</td>
<td>Further Cost and schedule increase ($54 bLn, Q2 2015)</td>
</tr>
</tbody>
</table>

“Clearly we underestimated the challenges (of working on Barrow Island)” Chevron to WA Inquiry into FLNG
CSG-LNG FACILITIES AT GLADSTONE

Sources: EIS submissions, RISC estimate for Arrow
# COMPARISON OF SINGLE SITE ALTERNATIVE

<table>
<thead>
<tr>
<th>Scope aspects</th>
<th>Current Developments</th>
<th>Single Site Alternative</th>
<th>Cost Saving $Mln</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNG Trains</td>
<td>6 (potential for 10)</td>
<td>6 (potential for 8)</td>
<td>0</td>
</tr>
<tr>
<td>Utility and Support systems</td>
<td>3</td>
<td>1</td>
<td>700</td>
</tr>
<tr>
<td>LNG Storage Tanks</td>
<td>6</td>
<td>2 / 3</td>
<td>500</td>
</tr>
<tr>
<td>LNG berths : Jetties</td>
<td>3 : 3</td>
<td>1 : 2</td>
<td></td>
</tr>
<tr>
<td>MOFs</td>
<td>3</td>
<td>1</td>
<td>1000</td>
</tr>
<tr>
<td>Dredging</td>
<td>100%</td>
<td>50-75%</td>
<td></td>
</tr>
<tr>
<td>Site clearance</td>
<td>3 sites</td>
<td>1 site (say 1.5 times current largest)</td>
<td>1000</td>
</tr>
<tr>
<td>Construction Camps</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
DOES THE PROCESS DRIVE POOR BEHAVIOUR

Approval to Proceed with Concept Selection
GATE 1

Approval of Development Scenario and to Commence FEED
GATE 2

Project Sanction
GATE 3

Assess  Select  Develop  Execute

Typical estimate accuracy for Gate approval:
Gate 1: +/- 50%
Gate 2: +/- 30%
Gate 3: +/- 10%
SOME COMMON OBSERVATIONS FROM PROJECTS

Planning
- Planning for success – “Planning Fallacy”
- No or poor use/application of probabilistic methodologies
- Cost and schedule estimates prepared independently
- Poor use of allowances and contingencies

Over confidence
- Under-estimation of time or complexity
- Confusing increased detail with increased accuracy/confidence
- Lack of awareness of potential for scope change
- Lack of recognition of dependencies and inter-dependencies
- Ineffective risk identification and management
CONCLUDING REMARKS & SUGGESTIONS

- Major projects continue to suffer from cost and schedule overruns.

- Evidence that decisions made early in the life cycle have significant impact on the ability of a project to realise the predicted value.
  - Re-assess and confirm earlier decisions are still applicable in the light of new knowledge, or changing conditions.

- Evidence that it is not possible to understand complex projects at the level of detail implied/required by the current approval processes.
  - Improve approaches to planning and risk management.
  - Change from a prescriptive range of requirements to identifying the actual anticipated range of outcomes.