Technology, strategy and the growth of gas as a source of global energy

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Please note, the Commonwealth Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2006 requires Operators to perform consultation relating to environment plans and oil spill contingency plans. The latest revision of the Regulations includes a requirement for correspondence from stakeholders relating to these plans to be passed on to NOPSEMA and therefore should not be considered to be confidential between the author and BHP Billiton. It is recommended that confidential matters not relating to the environment should be in separate communications.
The global growth of natural gas

- One of the fastest growing commodities
- Becoming increasingly more available
- A preferred fuel
- Multiple different sources of supply

World natural gas consumption (bcf/d)

Source: BHP Billiton; Wood Mackenzie; BP Statistical Review.
Technology has led to greater supply

Subsea high-rate completions / production facilities

Directional and horizontal drilling

Multi-stage fracking

Floating LNG
Wide range of gas exploration and production activities
Involved in all major gas technologies
Western Australia gas continues to be an important investment area
New Onshore US shale is a large, long term technology position
Technology and innovation have driven the phenomenal growth of gas in the US

Development of downhole motors accelerates – key to directional drilling

Initial development of the Barnett shale play in Fort Worth, Texas

US shale gas production rapidly increases as technology continues to improve

1947
Hydraulic fracking first commercially employed in Grant County, Kansas

Early 1970s

1980s-1990s

First commercial horizontal wells

Early 2000s

2002-2008

Multi stage fracking emerges for both vertical and horizontal wells

2010+

Source: US Department of Energy, EIA.
Shale reservoirs have low geologic risk and can be relatively uniform over long distances.

- Continuous geological horizons
- Haynesville and Bossier mapped for 100 miles
- Depth, cost and rock properties vary
- Requires a long term approach on technology
Shale production: minimizing effects on communities and the environment

Timeline and impacts for shale gas development and production (single well)

<table>
<thead>
<tr>
<th>Site Preparation, Drilling, Fracking</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Land disturbance</td>
</tr>
<tr>
<td>• Dust</td>
</tr>
<tr>
<td>• Noise</td>
</tr>
<tr>
<td>• Diesel exhaust</td>
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<tr>
<td>• Water management and disposal</td>
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<tr>
<th>Production</th>
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<tr>
<td>• Reduction in air pollution</td>
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<tr>
<td>• Reduction in GHG emissions</td>
</tr>
<tr>
<td>• Water management and disposal</td>
</tr>
<tr>
<td>• Site restoration</td>
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</tbody>
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Typical surface casing design

Source: IHS; CERA.

Source: American Petroleum Institute.
Shale development has made US gas reserves the largest in the world

Natural gas resource estimate (tcf)

Source: Wood Mackenzie; BHP Billiton.
Shale production can be modulated quickly and has much faster payback than offshore

- Offshore oil and gas offers strong returns on a full development basis but expansion capability is limited post investment.

- Shale developments offer strong returns on an individual well basis and are highly expandable in both the short and long term.

- Current shale drilling and completion technologies recover very low amounts of the hydrocarbons in place.

- Shale is ripe for a long term technology approach which few companies can execute.
How times have changed

The shale revolution in the US

<table>
<thead>
<tr>
<th>2005</th>
<th>Today</th>
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<tbody>
<tr>
<td>Minimal gas production from shales</td>
<td>Haynesville alone supplied about 10% of US gas demand in 2011</td>
</tr>
<tr>
<td>Declining US onshore activity</td>
<td>~700 active shale rigs in 2011</td>
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<tr>
<td>Stagnation in US petrochemicals and other energy-intensive industries</td>
<td>Revitalised investment in petrochemicals and energy-intensive industries</td>
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<tr>
<td>Coal expected to be the primary fuel for power generation</td>
<td>Natural gas seen as the fuel of the future to meet strict emission targets</td>
</tr>
<tr>
<td>US expected to remain a net LNG importer</td>
<td>LNG export project applications total 14 bcfd</td>
</tr>
<tr>
<td>High natural gas prices seen as a drain on the US economy</td>
<td>US economic growth $80 to $100 billion in direct GDP impact and over 600,000 jobs</td>
</tr>
</tbody>
</table>

Source: Wood Mackenzie; PIRA; US Department of Energy; IHS Global Insight; Press reports.
BHP Billiton Petroleum has built a large, advantaged and flexible US shale position

- Over 1.6 million combined net acres across Texas, Louisiana and Arkansas
- Recoverable resources of approximately 8.3 billion barrels of oil equivalent
- Four giant fields, with 50 year lives

BHP Billiton Petroleum Onshore US
BHP Billiton Petroleum’s shale gas properties are among the lowest cost in the US

Comparative ranking of break-even wellhead cost for US unconventional gas plays, 2012
Gas-focused unconventional plays only

**Haynesville**: Largest position in the core, with EURs as high as 15 bcf/well

**Fayetteville**: Shallow reservoir drives very low dry-gas costs

**Eagle Ford**: Emphasis is on the wet gas areas that offer best economics

Near term actions

- Until gas prices rebound, scale back on gas drilling
  - Reduce rig count
  - Hold leases and opportunities

- But **shale gas is not the whole story**
  - Early estimates for BHP Billiton Petroleum’s Eagle Ford and Permian acreage indicate **several billion barrels of liquids in place**
  - Our plans are large, targeting **recovery of about 1.5 billion barrels of liquids**—about **500 million barrels** more than what we reported in November last year
  - We currently assume **single-digit percentage recovery rates**
  - The industry has a record of **more than doubling recovery rates over time**, as technology improves, and we expect to be a technology leader

- So, a significant highly valuable **shale onshore liquids business**
“Texas tops finds from Brazil to Bakken as best prospect” Bloomberg, 23 March 2012

Eagle Ford

- Discovered by Petrohawk in 2008 – we hold a premiere position

- Rated as the lowest cost play among North American shales in the liquids rich regions¹

- Eagle Ford liquids-rich wells are among the highest return and fastest payback of any BHP Billiton investment

¹ Wood Mackenzie.
Eagle Ford offers some of the highest economic returns among US shale plays

@bullet Attractive product mix of condensate and NGL, with current net production at over 50% liquids

@bullet High liquids revenue component provides strong rates of return; many wells in excess of 100%

@bullet Average payback within the first year of production

@bullet Expect to grow to 300 Mboe/day, with 150 Mboe/day of liquids

@bullet Potential for higher recovery factors over time through reduced well spacing or improved technology
Still early in the Permian, but initial well results better than expected

Permian

• Large undeveloped acreage position

• Targeting oil from multiple pay horizons

• Wolfcamp reservoir averages approximately 900 feet thick

• Current net production at about 80% liquids

• Goal is a second 100 Mboe/d business

Investor’s Business Daily
15 March 2012
We are leveraging the flexibility of shales to respond to market conditions

Average FY13 rig mix

Prior outlook

- Gas focused: 48%
- Liquids focused: 52%

Current outlook

- Gas focused: 14%
- Liquids focused: 86%

Gas focused | Liquids focused
Replicating the success of shales globally will require many key factors to align.

- Rig and services availability
- Attractive geology
- Large hydrocarbon markets
- Extensive pipeline network
- Attractive fiscal terms
- Supportive regulatory framework
- Landowners benefit
- Low population density in development areas
Major region-to-region gas flows 2010 outlook to 2025

Source: Wood Mackenzie, 2011; Flows larger than 5 Bcm/year.
Major region-to-region gas flows current outlook to 2025

Source: Wood Mackenzie, 2012; Flows larger than 5 Bcm/year.
In summary…

• **The world needs hydrocarbons.** The growth of shale technology over the last several years is an example of how innovation and technology can help satisfy that need.

• Shale **liquids** developments are now **among the most attractive projects in the world**.

• The **shale revolution** shows **how quickly and deeply things can shift**.

• BHP Billiton’s combination of **resource diversification, technology breadth, strong operational performance, solid financial position** and **long development horizon** provides us with a distinct advantage.

• We intend to pursue both strategies – large conventional resources and unconventional shale resources.

• Our **US** and **Western Australian** positions remain key parts of our longer term forward gas development plan.