Global Offshore Prospects
Society for Underwater Technology
Houston, Texas
13th January 2011
Edited version – forecasting slides omitted

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Douglas-Westwood / New York
Our Business

History and Office Locations
- Established 1990
- Aberdeen, New York & Canterbury

Activities & Service Lines
- Market research & analysis
- Commercial due-diligence
- Business strategy & advisory
- Published market studies

Industry Sector Coverage
- Oil & Gas
- Renewables
- Power

Large, Diversified Client Base
- 600 projects, 400 clients, 50 countries
- Leading global corporates
- Energy majors and their suppliers
- Investment banks & PE firms
- Government agencies
Gathering Steam

Macro Oil Outlook

Offshore Oil & Gas

Conclusions
Short Term Oil Outlook

- Strengthening recovery, to new peaks in consumption: 87.6
- Forecast for 2011 up 1.2 mbpd compared to Jan. 2010 forecast
- OECD up modestly in 2010
  - US up 200k
  - EU up 200k
  - Japan down -150k
- China up 6%, +500k
- Other non-OECD: +900k
- Global consumption up 1.8 mbpd over last year

EIA World Oil Consumption, Actual and Forecast, million barrels per day (3 mma)
Source: EIA STEO Jan. 2010 and Jan 2011
• North Sea and Mexico continue decline
• Canada flat
• Brazil underperforms
• FSU—mostly Azerbaijan—doing well
• Geezers China and USA at front of the pack
• OPEC NGLs are leading the way
• Total world supply up 2.0 mbpd, half is NGLs
• EIA expects 2011 largely flat
• Adequate spare capacity today—but ¾ of it is in Saudi Arabia alone
• IEA sees demand rising slowly, less than 1.3 mbpd/year in 2011, vs. up 2.5 mbpd in 2010
• Previous recoveries strong demand growth during first three years
  • After 2002: 7.7 mbpd
  • After 1976: 7.3 mbpd
• If previous patterns hold true, a possible supply crunch in 2012/2013
• What will Saudi do?
Supply Risks: Iraq and Bakken

- Iraq
  - Output up 300 kbpd to 2.7 mbpd
  - Potential to increase by 0.5 mbpd per year to 6-7 mbpd
- Bakken
  - Output up 80 kbpd to 380,000 bpd
  - Potential to add 80 kbpd / year, potentially to greater than 1 mpbd or more
  - Like gas shales, production is front-loaded
  - More to come from other sources?
China Unconstrained Demand
Source: EIA, Douglas-Westwood Analysis

China Crude Oil Production and Constrained Demand
Source: EIA, Douglas-Westwood Analysis

- World’s second largest economy: 10% GDP growth
- “Astonishing” oil demand growth
- 18 million light vehicle sales vs. 13.6 million prior year (12.6 m for US in 2010)
- 120 million new cars by 2015 = all passenger vehicles UK + France + Germany
- In 2010, China was 1/3 of total global oil demand growth (less than other Asia and non-OECD)
- China’s foreign oil dependence rises from 1 in 2 bbls to potentially 9 in 10 by 2030
• We assume supply is flat to modestly increasing
• Historically, US could not add oil consumption at more than 4% of GDP—equals $86
• In last three months of 2010, US up 230 kbpd at average $85
• US up 700 kbpd in December at $89
• WTI at $92—above our expectation of mid-to-high $80s for 2011
• If US can reset to a higher tolerance for oil prices, a substantial oil price rally could be in store
NYMEX Natural Gas Futures: 2011-2020
Source: NYMEX, as of 12 January 2011

Pretty miserable price deck.
• Oil is three times as valuable as nat gas on a btu parity basis!
• Reversion to historical relationship: natural gas as ‘junk fuel’ compared to oil?
• We’ve seen this pattern before: ’70’s oil shocks
• At first, the relative price of oil rose with OPEC actions
• But over the next few years, natural gas re-valued as consumer economies switched over from oil.
• Natural gas—not oil—was the primary beneficiary of the oil shocks
• Natural gas will revalue against oil
• Price arbitrage encourages greater use of and switching to natural gas
• Pace of ratio decline similar to historical precedents
• Oil price spike in 2012-2014 drives ratio and prices back up
• Ensuing recession reduces energy prices
• Price arbitrage trend continues afterwards to ‘convenience discount’ threshold
• Modelled 1974-1983 period
A View on Future Natural Gas Prices

- Oil prices remain high
- Switching to gas continues
- Natural gas price rises over time to approach btu price parity with oil
- Second half of the decade sees high natural gas prices
- A very different view than the futures strip
- “Rigs, Recessions and the Tyranny of the Futures Curve”
• 2010 second warmest year in satellite record, probably modern record

• But temps dropping rapidly with fading of 2010 La Niña

• Cool through June
Recent Trend: Higher Priority for Energy Production or Environmental Protection

With which one of these statements about the environment and energy production do you most agree — [ROTATED: protection of the environment should be given priority, even at the risk of limiting the amount of energy supplies -- such as oil, gas and coal -- which the United States produces (or) development of U.S. energy supplies -- such as oil, gas and coal -- should be given priority, even if the environment suffers to some extent]?

<table>
<thead>
<tr>
<th>Year</th>
<th>% Environment</th>
<th>% Energy production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>58</td>
<td>34</td>
</tr>
<tr>
<td>2008</td>
<td>50</td>
<td>41</td>
</tr>
<tr>
<td>2009</td>
<td>47</td>
<td>46</td>
</tr>
<tr>
<td>2010</td>
<td>50</td>
<td>43</td>
</tr>
</tbody>
</table>

Source: Gallup

- Macondo reversed priority of energy over environment
- Swing of 23 percentage points within a month
• Recovery in 2010, up 10.2% to $442 bn
• Continued growth in 2011 to $490 bn, up 10.8%—new peak
• US spend up 8%, Canada up 5%, international up 12%
• Spend up $48 bn in 2011, of which 82% to international
E&P companies prepared budgets assuming $77 oil on average, up from $70 last year.

Expect capex to materially decrease in the industry if oil prices fall much below $60.

Expect capex to increase materially if oil prices sustain above $90, up from $85 last year.
Offshore capex to $360 bn by 2013

Gathering pace of recovery
Deepwater Capex to reach new highs

- Deepwater production to double
- Shallow water growth 20%
- $137 billion Capex over the next five years

Deepwater fundamentals look strong
High oil prices, ample capacity in the system
Spend to reach $89 bn in 2013 (+57%)

Source: “World Offshore Drilling Spend Forecast 2009-2013”
EnergyFiles & Douglas-Westwood
By 2018, 58 new drilling rigs
- 23 being delivered by 2011
- 9 in 2012
- 28 being built in Brazil 2013 to 2018

By 2020
- 49 VLCCs
- 135 supply & service vessels
- 45 production platforms
- 7 wellhead platforms
- 140 manifolds
- 629 compressors
- 229 subsea wellheads
- 417 subsea trees

- Spend of $224 bn to double output by 2014
- Capex & Opex to total $1 trillion to 2020
• 47 jackups to be delivered 2011-2013
• 42 have no contract
• Many low spec, older rigs stacked (60+); many may never re-enter service
• Demand for high spec rigs
• 17 orders, 17 options since October
- 52 floaters to be delivered 2011-2013
- 24 have no contract
- Weakness in mid-water utilization and rates
- Modest strength in deepwater segment
- Healthy orderbook has not deterred new orders: +8 since early October
- Rig prices are favorable: $550-$600 million, down $50-100 million
### FPS Sector: What Happened in 2009?

<table>
<thead>
<tr>
<th>Unit Name</th>
<th>FPS Type</th>
<th>Notes</th>
</tr>
</thead>
</table>

- **Awarded 2009**
- **Not Awarded in 2009**

For more information please contact Douglas-Westwood.

- 1H 2009 was quiet. Second half of 2009 saw some recovery in the market.
- Ten contract awards (from an expected 25).
The Floating Production Sector: What happened in 2010?

<table>
<thead>
<tr>
<th>Unit Name</th>
<th>Region</th>
<th>Operator</th>
<th>Deployment Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brotojoyo</td>
<td>FPSO</td>
<td>Asia BP</td>
<td>Upgrade</td>
</tr>
<tr>
<td>BW Athena</td>
<td>Western</td>
<td>Europe</td>
<td>Ithaca</td>
</tr>
<tr>
<td>Ener Cidade de Rio das Ostras</td>
<td>Latin America</td>
<td>Petrobras</td>
<td>Upgrade</td>
</tr>
<tr>
<td>EWT FPSO</td>
<td>Latin America</td>
<td>Petrobras</td>
<td>Upgrade</td>
</tr>
<tr>
<td>CLOV FPSO</td>
<td>Africa</td>
<td>Total</td>
<td>Newbuild</td>
</tr>
<tr>
<td>Erawan Erawan</td>
<td>Asia</td>
<td>Chevron</td>
<td>Conversion</td>
</tr>
<tr>
<td>Glad Dowr FPSO</td>
<td>Australasia</td>
<td>ENI</td>
<td>Upgrade</td>
</tr>
<tr>
<td>Helix Producer</td>
<td>North America</td>
<td>BP</td>
<td>Upgrade</td>
</tr>
<tr>
<td>Mi FPSO (Mi)</td>
<td>Asia</td>
<td>CACT</td>
<td>Upgrade</td>
</tr>
<tr>
<td>Muni FPSO (ex Muni)</td>
<td>Latin America</td>
<td>Petrobras</td>
<td>Conversion</td>
</tr>
<tr>
<td>OSX-1 FPSO (ex Nexus 1)</td>
<td>Latin America</td>
<td>OGX</td>
<td>Newbuild</td>
</tr>
<tr>
<td>Petrojarl Cidade de Itajai FPSO</td>
<td>Latin America</td>
<td>Petrobras</td>
<td>Conversion</td>
</tr>
<tr>
<td>Terang Sirasun Batur TSB FPSO (ex BW Genie)</td>
<td>Asia</td>
<td>BP</td>
<td>Conversion</td>
</tr>
<tr>
<td>Theseus FPSO</td>
<td>Latin America</td>
<td>Petrobras</td>
<td>Conversion</td>
</tr>
<tr>
<td>Tubular Bells FPSS</td>
<td>North America</td>
<td>BP</td>
<td>Newbuild</td>
</tr>
<tr>
<td>Virini Voyageur FPSO (Sevan 300No 3)</td>
<td>Western Europe</td>
<td>E.On</td>
<td>Upgrade</td>
</tr>
</tbody>
</table>

- 19 FPS orders placed in 2010, including 12 FPSOs
- Combined order value of $6.9bn (FPSOs = $6bn)
- Market is recovering....
• FPSOs account for 80% of forecast global FPS expenditure
• 87 FPSO deployments expected 2010-2014 – $35 billion spend
• Long term >200 FPS opportunities tracked
• Global FPS market to be worth $45 billion over 2010-2014 period
Gas – the potential for FLNG

- Long talked about as a solution for stranded gas assets
- Liquefaction – finally becoming a reality? - $20 bn spend forecast
- Shell Prelude project currently and design and engineering phase, more environmental requirements to be met
- Impex and Petrobras -- Australia, Indonesia, Timor, Brazil?
- Mentality is still utility-driven
- Capital costs and required natural gas price?
- Stranded fields or associated gas?

Source: The World FLNG Report Douglas-Westwood
• In 2009 the subsea completed wellstock stood at approximately 3,400 wells.
• We anticipate 3-5x growth for deep and ultradeep segments by 2015 over 2002 levels
• Deepwater subsea completions primarily takes place in the deepwater golden triangle of West Africa, Gulf of Mexico and Latin America
• Large growth, in percentage terms, in Asia
Subsea technology is vital to offshore production

Subsea tree installations to increase from 2011 onwards:

• The market remains strong despite a decline in activity during 2009-2010
• Installations forecast to pass 2008 levels by 2012
• Africa to remain the largest market for subsea trees in period up to 2015
• Brazilian market starting to ramp up installations from 2012

Subsea Tree Installations 2006-2015 by Region
Source: Douglas-Westwood

For more information please contact Douglas-Westwood
Subsea revenues have been buffered by backlog

- Tree orders are not the full measure
- 07-09 rising revenues from backlog
- FMC was market leader with 45-47% share over the period 2007-2009

Source: FMC

Subsea Production Business
Source: Douglas-Westwood
• Market as a whole increases from $4.5 bn in 2008 to $7 bn in 2014
• 10% annual growth
• Driven by subsea well intervention
• Africa takes lead over from Gulf of Mexico and North Sea by 2014
• 550 new work class ROV’s to 2014
• Market reaching to $3.2 billion by 2014
AUV – Autonomous Underwater Vehicles

- Self-guided underwater survey and inspection vessels
- From 1 to 5 meters long
- Priced from $150,000 to $7 million
- Very hot topic recently—military contractors looking for commercial applications
- Greater acceptance for not only deep, but shallow water, oil and gas survey
- But a small market...
• Arctic Circle: 6% of Earth’s surface or 8.2 million sq. miles + north and east Canada + Greenland

• Today, over 400 fields discovered with approx. 240 BBOE

• Further 412 billion Boe yet undiscovered (USGS), technically recoverable resources for Arctic, comprising
  • 90 bn barrels of oil
  • 1,669 tcf of natural gas
  • 44 bn barrels of NGL
  • Approx 84% offshore

• 22% of global o&g reserves?

• But, USGS recently reduced Alaska oil resources by 90%

Credit: Hugo Ahlenius, UNEP/GRID-Arendal
Some Arctic Projects

- **Norway - Goliat**
  - Predominantly oil
  - Extended shutdown, now back on line

- **Cairn**
  - Two drilling rigs off coast of Greenland
  - Modestly promising results to date

- **Hebron – ExxonMobil**
  - East Canada
  - Fourth Newfoundland field
  - 400 – 700 m barrels, 92 meters
  - First oil 2017

- **Shell**
  - Chukchi and Beaufort seas
  - Air permits pulled
  - One year delay
  - Macondo will cast a long shadow

Source: Eni Norge

Source: Sevan
• >7,000 fixed platforms, >200 floating
• 185,000 km subsea pipelines
• 3,600 subsea wells operating
• 690 offshore drilling rigs
• Increasing costs and energy intensity per barrel
• Demand for major modification work increasing
• N. Sea decommissioning
• GoM P&A
  • Offshore O&M - $62 billion spend in 2010 and growing rapidly.
  • Over $330 billion worth of expenditure expected over the next five years.
• UK – 260 platforms, 2.4 million t. steel, 5,000 wells
• Total spend to exceed $30 billion
• Super heavy lift vessels could reduce the platform decom. cost by $2-3 billion
• Wider impact as timing coincides with N Sea offshore wind build

GOM – 3,500 disused wells to be plugged and 650 old platforms removed

For more information please contact Douglas-Westwood

The Gulf Moratorium

- Macondo blowout: April 20, 2010
- Moratorium: nominally lifted in October
- But no new permits issued; industry remains at a standstill
- Result: GoM production down 13% from 2011, not up 6% as earlier expected—equals 220 kbpd difference
- Govt to expedite 13 companies, including Chevron and Shell, to resume work on a 16 projects that were already under way when the moratorium took effect.
- The 16 projects must still comply with new safety rules
- Safety rules are yet to be clarified
- Resume GoM activity H2 2011 – 2012?
- Oil prices will put administration under pressure
• US and EU economies seems to be on firmer footing—enhanced appetite for oil
• Global economic growth continues strong—China firmly on path to motorization
• Oil supply outlook remains restrained
• Will OPEC answer the call for its nominal spare capacity?
• Oil prices are high—above our expectations—but few visible drivers to push them down materially in 2011
• OFS pricing competition should remain pronounced in 2011
• Spare capacity in offshore sector: rigs, equipment, services
• High oil prices and restrained cost pressures should encourage operators to bring projects forward—activity levels should pick up
• Market players appear to be anticipating the next cycle—gap in rig orders and building may not be as pronounced as earlier expected.
• Administration will be under pressure to re-open the Gulf.

A good year for the offshore business.
Thank you. Thank you.