Session opening slide
The Big Opportunity

Home to a global energy industry anchored in the UK, powering the nation and exporting to the world

- An exciting place for energy people to live and work
- Maximising economic recovery from the UKCS
- Becoming a global leader in mature basin solutions
- Leveraging our expertise, innovation and technology
- Securing sustained investment from a diverse range of companies
- Being the most efficient basin in the world
- Anchoring capability and expertise in the UK
- Creating a sustainable energy service and technology sector... long after the final economic reserves have been produced
- Attracting the next generation of talented people
- Having an extraordinary knowledge of our geology
- Delivering sustained investment in technology through the cycle
- Being a ‘test bed’ for the development and deployment of technology
- Enabling people to transfer between different parts of the energy sector
- Creating a safe and sustainable low-cost operating model
- Maintaining our position as a world-leader in subsea engineering

Vision 2035
UK oil and gas industry
Vision 2035

Michael Tholen
Vision 2035
UK oil and gas industry

- The world in 2035
- Opportunity for the UKCS
- Unlocking the supply chain prize
- Delivering the vision
The World in 2035

- A rapidly changing world
- Pursuing decarbonisation targets
- Oil and gas within the UK
- Oil and Gas in the energy mix
A wealthier, more efficient, less carbon intensive world

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2035</th>
<th>Change (%)</th>
<th>Annual Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP* (trillion US$)</td>
<td>105</td>
<td>204</td>
<td>+ 95%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Population (billions)</td>
<td>7.3</td>
<td>8.8</td>
<td>+ 20%</td>
<td>0.9%</td>
</tr>
<tr>
<td>GDP per capita* (thousand US$)</td>
<td>14</td>
<td>23</td>
<td>+ 62%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Energy demand (billion boe)</td>
<td>13.1</td>
<td>17.2</td>
<td>+ 31%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Energy intensity (toe per US$m)</td>
<td>126</td>
<td>84</td>
<td>- 33%</td>
<td>-2.0%</td>
</tr>
<tr>
<td>Net CO₂ emissions (billion t CO₂)</td>
<td>33.5</td>
<td>37.7</td>
<td>+13%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

GDP / GDP per capita* at $2010 prices and US$ purchasing power parity - BP Energy Outlook 2017
Oil and gas providing half the world's energy in 2035

Primary energy consumption by fuel

- Renewables*
- Hydro
- Nuclear
- Coal
- Gas
- Oil

Billion toe

Shares of primary energy

- Oil
- Coal
- Gas
- Hydro
- Renewables*
- Nuclear

*Renewables includes wind, solar, geothermal, biomass, and biofuels

BP Energy Outlook 2017
Global climate change targets will drive energy technology trends

Shell – Pathways to Net-Zero emissions
The UK has already set progressive decarbonisation targets through to 2050.

80% GHG reduction by 2050 vs. 1990 baseline.
Oil and Gas - providing two thirds of the UK’s energy in 2035

**Primary Energy Demand**
- Coal 7%
- Nuclear 7%
- Renewables & waste 10%
- Natural gas 38%
- Oil 37%

Oil & Gas accounts for 75% of the UK’s energy mix in 2017.

198 MTOE

**Final Energy Use**

- **Transport**
- **Domestic**
- **Industrial**
- **Services**

60 MTOE

- **Electricity**

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UK oil and gas industry

**2035**

- Coal 2%
- Nuclear 17%
- Renewables & waste 13%
- Natural gas 30%
- Oil 36%

by 2035 that is still expected to be 66% of the UK’s energy mix.

200 MTOE

BEIS - Energy & Emissions Projections 2016

Oil & Gas UK
How can the UKCS contribute to this energy future?
The UKCS still possesses substantial oil and gas resources

Produced

Future Resources

43

2-6

2-5

6-9

Yet-to-find
Potential Additional Resources
Reserves

10-20 bn boe

Billion Barrels - Source: Wood Mackenzie, OGA, Oil & Gas UK
Achieving the vision for the UKCS delivers a valuable future

$/bbl
Price

+ Production

<table>
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<tr>
<th>Year</th>
<th>Baseline</th>
<th>£280 billion</th>
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<tr>
<td>2015</td>
<td></td>
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<tr>
<td>2020</td>
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<td>2025</td>
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<td>2030</td>
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<tr>
<td>2035</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Vision</th>
<th>£420 billion</th>
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<tbody>
<tr>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
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<tr>
<td>2025</td>
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<td>2030</td>
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<td>2035</td>
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Sustaining current output will require focus across the E&P life cycle

- **Exploration**
  - 15-30 E wells pa

- **Capex**
  - £6-8 billion pa

- **Opex**
  - £5-7 billion pa

- **Decommissioning**
  - £1 - 2 billion pa
The UKCS will face intense competition

UKCS Competitiveness

Cost of Product ($/bbl, p/th)

Alternative Energy Sources

Cost of Supply (finding / dev’t / op’s)

Carbon / Energy Intensity
The UKCS will need to remain internationally competitive

Estimates of technically recoverable resources and cumulative oil demand

Oil supply of lower-cost producers

Low-cost producer’s share of global liquids production (right axis)

BP Energy Outlook 2017
Opportunity for the supply chain
The Industrial Strategy will be key to the future of the UK’s supply chain.

- Exports
- Diversification
- UKCS

Achieving an additional £150 billion in Supply Chain Revenue.
Vision 2035
The Big Opportunity

A £290 billion opportunity

Delivering a £920 billion prize

Vision 2035
UK oil and gas industry

Graph showing revenue/turnover from 2016 to 2035 with the following milestones:
- £150bn Additional turnover
- £140bn Additional gross revenue
- £280bn
- £350bn
- £420bn
- £500bn

Revenue/turnover (billion, 2016 prices)

- Baseline supply chain turnover from exports
- Vision supply chain turnover from exports
- Baseline gross production revenue
- Vision gross production revenue
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A united industry combining MER and Industrial strategy to deliver the Vision

MER UK

“Realise full hydrocarbon potential of the UKCS

“A significant producer in 2035”

Industrial Strategy

“Expand range and market coverage, double exports

“A global energy industry, anchored in the UK, powering the nation and exporting to the world”

Vision 2035

Vision 2035

“Delivering an additional £290 billion over the next 18 years”

Increasing the prize by half over the next twenty years