UKCS challenges

**E&P decline**
- All-time low for exploration and appraisal

**Increased costs**
- Existential crisis on costs, efficiency and margins

**Sharp drop in price**
- Slow down in investment; pressure on profitability

Economic challenges intensified since the Wood Review
**Key recommendations**

- Urgent need for **enhanced stewardship**
- New **Maximising Economic Recovery** strategy (MER UK)
- Commitment from **industry to collaborate**
- **Stronger tripartite relationship** between industry, government and regulator
- New independent regulator with **additional powers and resources**

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**Sector strategies**

- Regional development and infrastructure
- Asset Stewardship
- Revitalise exploration
- Technology and Decommissioning

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**Prize of additional 3-4 billion barrels**

**375,000 industry jobs to protect**
About the OGA

Creating the OGA

- New independent regulator
- Effective stewardship resources
- New powers, better resourced and funded
- Catalyst for change and facilitator of action
- Encouraging collaboration

Role of the OGA

- Licence offshore oil & gas
- Licence onshore oil & gas
- Licence carbon capture & storage

Priorities

- Wood Actions
- Cost & Efficiency
- Fiscal Reform
- Rapidly implement
- Industry to urgently take action
- Trusted advisor to Treasury

The OGA has a key role to play in driving action
Building the OGA

Historically

From 1 April

DECC
OGA Executive Agency (Civil Service)

Energy Bill 2015
OGA Government Company

c. summer 2016

Rapid progress on all fronts
<table>
<thead>
<tr>
<th>Exploration &amp; production including:</th>
<th>Oil and gas policy including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onshore, offshore &amp; CCS licensing</td>
<td>Overall oil &amp; gas policy</td>
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<tr>
<td>Field development plan consents</td>
<td>DECC</td>
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<td>Cessation of production approvals</td>
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<td>Pipeline works authorisation</td>
<td>DECC – WRIT</td>
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<tr>
<td>Infrastructure</td>
<td>Oil &amp; gas parliamentary processes</td>
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<tr>
<td>Commercial matters &amp; changes of control</td>
<td>DECC – OGA sponsor team</td>
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<tr>
<td>Flaring &amp; venting consents</td>
<td>Decommissioning</td>
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<tr>
<td>Metering &amp; allocation</td>
<td>DECC - OGED</td>
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<tr>
<td>Production outages</td>
<td>Fiscal and taxation</td>
</tr>
<tr>
<td>Decom efficiency, costs, technology</td>
<td>HMT &amp; OGA trusted advisor</td>
</tr>
<tr>
<td>Decom programme approval, execution &amp; monitoring</td>
<td>Supply chain and business impact</td>
</tr>
<tr>
<td>Environmental management and inspection</td>
<td>DECC - OGED</td>
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<tr>
<td>Health &amp; Safety management</td>
<td>International relations</td>
</tr>
</tbody>
</table>

**Key**

OGA: Oil and Gas Authority  
OGED: Offshore Environment & Decommissioning Unit  
WRIT: Wood Review Implementation Team  
DECC: Her Majesty’s Treasury  
FCO: Foreign and Commonwealth Office  
BIS: Department for Business, Innovation & Skills
Rapid recruitment

Layer light structure with clear accountabilities – 179 max headcount
## Exploration Roadmap

<table>
<thead>
<tr>
<th>Measure</th>
<th>Year</th>
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<tbody>
<tr>
<td>Share dry-hole review with industry</td>
<td>2015</td>
</tr>
<tr>
<td>Licensing strategy for frontier &amp; mature acreage</td>
<td>2015</td>
</tr>
<tr>
<td>Work with HMT &amp; Industry to enhance exploration</td>
<td>2015</td>
</tr>
<tr>
<td>Provide high quality geophysical data Rockall &amp; MNSH</td>
<td>1Q 2016</td>
</tr>
<tr>
<td>Undertake rigorous pre &amp; post-drill evaluation</td>
<td>2016</td>
</tr>
<tr>
<td>High-grade operator PI to stimulate drilling</td>
<td>2016</td>
</tr>
<tr>
<td>Manage release of geophysical &amp; well data</td>
<td>2016</td>
</tr>
<tr>
<td>Produce high quality geological maps</td>
<td>2018</td>
</tr>
<tr>
<td>Provide industry with regional prospectivity &amp; YTF</td>
<td>2018</td>
</tr>
</tbody>
</table>

**Measures to revitalise exploration in UKCS**
**Revitalise exploration**

- **Well reviews and analysis**
  - Rigorous analysis of failed wells
  - Fundamental technical work must improve
  - Introduce OGA quality assurance process

- **Improve data quality**
  - OGA will coordinate data quality and sharing
  - In-depth evaluation of regional prospectivity
  - Provide high-quality digital geological maps

- **Future licensing rounds**
  - R29 2016 – under-explored frontier blocks
  - R30 2017 – mature parts of the basin
  - Time to evaluate existing work commitments

- **UK Government-funded seismic**
  - >40,000 km of new and legacy data
  - Rockall Trough, Outer Hebrides
  - Mid-North Sea High
  - Total area 220,000 km²
  - Data available early 2016

We will work with operators to ‘high-grade’ prospect inventories
Geophysical Programme

Rockall Trough

- The Rockall Trough area is under-explored with just 12 exploration wells since 1980
- A proven working petroleum system with Benbecula discovery in 2000
- Most of the seismic data are pre-1998

Mid-North Sea High

- New advances in seismic acquisition broadband technology, longer streamer length and advances in processing technology can now improve deeper imaging
- Plan to also acquire data close to shore to transfer critical onshore knowledge

40,000km of new and legacy data
## Programme Timing

<table>
<thead>
<tr>
<th></th>
<th>1Q15</th>
<th>2Q15</th>
<th>3Q15</th>
<th>4Q15</th>
<th>1Q16</th>
<th>2Q16</th>
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<tbody>
<tr>
<td><strong>12 months from funding to data delivery</strong></td>
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<tr>
<td><strong>Budget Approval</strong></td>
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<td>![Yellow]</td>
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<tr>
<td><strong>Rockall Base &amp; Extension</strong></td>
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<tr>
<td><strong>MNSH Base &amp; Extension</strong></td>
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<td><strong>Data Release</strong></td>
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</tbody>
</table>
Rockall Programme

Quality new data acquisition coupled with legacy data
MNSH Programme

New Seismic (ca 11,000 km)  Legacy Seismic (ca. 14,000 km)

Quality new data acquisition coupled with legacy reprocessed data
Imaging Improvement

1977 reprocessed 1995
Geikie Fringe Line OH-45A

2014 Q-Marine ObliQ
Geikie Fringe Line 8

Quality new data acquisition coupled with legacy data
Data Package

• Processed seismic data, pre-stack time migrated, in workstation format and field tapes if requested
• Database of released well data & OGA report
• Gravity and magnetic maps
• Seismic Data:
  • New acquisition from Rockall & MNSH
  • WesternGeco legacy data
  • Reprocessed data examples from MNSH
• Provisionally 5,000km of Irish seismic data with key Irish tie wells
• BGS Palaeozoic Study for participants & purchase

Comprehensive high-quality data package
29th Frontier Round

*Subject to SEA Approval

<table>
<thead>
<tr>
<th>4Q15</th>
<th>1Q16</th>
<th>2Q16</th>
<th>3Q16</th>
<th>4Q16</th>
<th>1Q17</th>
</tr>
</thead>
</table>

- Geophysical data processed & finalized
- Industry workshops & data promotion
- Industry prep & data package commitments

Data package release followed by 29th Round Announcement

Operator Evaluation

Round closes

OGA Evaluation

Awards made

29th Round - Rockall & MNSH acreage & nominations from industry
30th Mature Round

**Timeline**

- **2Q16**: Fallow blocks relinquished
- **3Q16**: 3rd Round blocks relinquished
- **4Q16**: 6th Round blocks relinquished
- **1Q17**: Further 3rd, 6th, 27th & 28th Round blocks relinquished

**Key Points**

- OGA development regional strategies coupled with geotechnical updates
- **30th Round Announcement**
- **Operator Evaluation**
- **Round Closes**
- **OGA Evaluation**
- **Round Award**

30th Round - Focus on infrastructure-led exploration
Dry Holes Lessons Learnt

Geology

- Develop a better regional understanding using GDE & Play Fairway maps
- Improve quality and expand scope of well data in CDA e.g. biostratigraphic & geochemical
- Understanding trap integrity/fault and top seal key issue; prospects being under-risked

Geophysical

- Data quality of seismic for prospect generation can be poor
- Reprocessing together with data scaling and conditioning
- Improved depth conversion required, more sophisticated velocity modelling
- Potential seismic anomalies e.g. bright and flat spots, need to be carefully analysed

Approach

- Prospects evaluation needs integrated - technical input from geophysicists, geologists and engineers
- Prospect evaluation teams need to ensure there is good linkage with field teams
- Staff movement and turnover can lead to disconnects in prospect generation and post well analysis

Back to basics
Stewardship Framework

Enhanced Asset Stewardship

Maximise Value (MERUK)

Exploration

Licence, Consent, FDP, CAP obligations

OGA Operator Scorecard

Stewardship Expectations
  Licence & Legal
  Exploration & Appraisal
  Major Projects & Developments
  Reservoir Management
  Base Management
  Decommissioning
  Commercial
  Technology Strategy

Streamlined Data surveys

Decommissioning

Asset stewardship covers whole life cycle of asset
**Asset Stewardship**

<table>
<thead>
<tr>
<th>Task</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>OGA Operator Internal Scorecard</td>
<td>3Q 2015</td>
</tr>
<tr>
<td>Robust &amp; fair contracting process</td>
<td>3Q 2015</td>
</tr>
<tr>
<td>Develop enhanced asset stewardship strategy</td>
<td>4Q 2015</td>
</tr>
<tr>
<td>Stewardship expectations established &amp; published</td>
<td>1Q 2016</td>
</tr>
<tr>
<td>Data survey reviewed and streamlined</td>
<td>2Q 2016</td>
</tr>
<tr>
<td>Annual review of selected FDP’s</td>
<td>2016</td>
</tr>
<tr>
<td>Maximise value assets prior to COP</td>
<td>2016</td>
</tr>
<tr>
<td>Deliver focused EOR strategy &amp; reserves</td>
<td>2020</td>
</tr>
</tbody>
</table>

OGA will set clear expectations building on existing processes
# Operator Scorecard

<table>
<thead>
<tr>
<th>Metric</th>
<th>Operator Plan (Calendar year)</th>
<th>Operator Actual</th>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>Production volume (mmbcf gross)</td>
<td>100</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>PE (%)</td>
<td>75</td>
<td>80</td>
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<tr>
<td>Operating costs (£m gross)</td>
<td>750</td>
<td>760</td>
<td></td>
</tr>
<tr>
<td>Capital inv (£m gross)</td>
<td>500</td>
<td>300</td>
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</tr>
<tr>
<td>Reserves Adds (2P mmbcf gross)</td>
<td>35</td>
<td>20</td>
<td>Data from HSE Inspectorate</td>
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<tr>
<td>Well activity (wells pa)</td>
<td>2</td>
<td>3</td>
<td></td>
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<tr>
<td>Maintenance backlog (hrs)</td>
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## Compliance

<table>
<thead>
<tr>
<th>Metric</th>
<th>Timing</th>
<th>Status</th>
<th>Comment</th>
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</thead>
<tbody>
<tr>
<td>Flare consent (tne)</td>
<td></td>
<td>4000</td>
<td>4075</td>
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<tr>
<td>Active ARN's</td>
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<td>0</td>
<td>1</td>
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<tr>
<td>Commercial Collaboration</td>
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<td></td>
<td>Subjective, qualitative metric - red, amber or green</td>
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</table>

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Timing</th>
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<th>Comment</th>
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<tr>
<td>Exploration well spud date</td>
<td>2Q</td>
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<td>Numerous milestone entries required if multiple wells</td>
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<tr>
<td>Infill well spud date</td>
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<td>Numerous milestone entries required if multiple wells</td>
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<tr>
<td>Facilities project 1st oil</td>
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<td>Major Project Define/ Select gate</td>
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<tr>
<td>FDP submission</td>
<td>4Q</td>
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</table>
Production Efficiency

Historical PE Performance

Current Top 20 PE Performance

Leaders engaged

- Top 20 oil and gas producers 2014 performance and 2015 plans
- Constructive - high level of transparency and growing cooperation
- Moving forward with far greater transparency on data, performance and improvement plans
- OGA now leading PETF work in collaboration with industry & OGUK

Significant opportunity for improvement in this area
EOR Strategic Themes

Existing EOR Projects

Readiness for future EOR projects

Forums and JIP’s

Technology Development & Innovation

Economics and cost improvements

Future miscible EOR & CO₂ EOR Policy

Centre of Expertise & Knowledge Capture

Add 300 mmboe reserves by 2020 through polymer & low sal
Regional Development & Infrastructure

- Undertake a facilitation role to resolve misalignment: 2Q 2015
- Work to understand commercial misalignments: 4Q 2015
- Develop regional & hub strategies: 2016
- Maximise development of discovered reserves: 2018
- Technical assurance HMG CCS & approve permits: Ongoing

OGA will provide an evidence based, strategic overview to understand risk and opportunities in order to deliver best value option for MER UK
Regional & Hub Strategy

- PI & undeveloped discovery maturation plan
- Base production profile
- Major project inventory
- OPEX profile
- CAPEX profile
- Risks & mitigation to deliver plan
- Decom strategy to maximize value

Enhanced stewardship survey returns will be used to develop regional and hub level strategies
Focus on priorities

Tackling immediate risks and seizing opportunities

Case study: Operational Gas Group (OGG)

- Mature fields shortage of fuel gas
- Collaborative operator approach
- OGA facilitating process
- First gas 3Q 2015

Relative value at stake

Tackling immediate risks and seizing opportunities
Protect critical infrastructure

Immediate action
- Commercial facilitation
- Sullom Voe Terminal
- Theddlethorpe Gas Terminal

Economic assessments
- Evaluate investment drivers
- Anticipate risks & opportunities
- Early stage involvement

Regional plans
- Develop hub strategies
- Optimise infrastructure
- Integrated MER UK approach

Urgent action underway to avoid premature decommissioning
## Phase 1 Regional Focus

<table>
<thead>
<tr>
<th>WOS</th>
<th>NNS</th>
<th>CNS</th>
<th>SNS</th>
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<tbody>
<tr>
<td>Fractured Basement</td>
<td>Quad 9</td>
<td>Quad 15</td>
<td>Carboniferous</td>
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<tr>
<td>Gas Export</td>
<td>Cormorant Alpha</td>
<td>Shearwater</td>
<td>Infrastructure rationalisation</td>
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<td>Ninian</td>
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<td></td>
<td>Brent Alpha</td>
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<td>SVT</td>
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</tbody>
</table>

**Legend:**
- Exploration & Undeveloped
- Critical Infrastructure & Asset Stewardship

Strategic reviews undertaken by OGA & industry will provide an understanding of risks, opportunities & options to maximise value for UKCS.
Undeveloped Discoveries

Discovered volumes per basin (mmboe)

Discovered volumes per play (mmboe)

Over 300 discoveries with potential of over 3.0 billion boe