## Contents

**Introduction from the Chief Executive** 3
**Current context** 4-5
**Vision 2035** 6
**The big opportunity** 7
**Energy transition and Vision 2035** 8
**OGA background** 9
**Regulatory framework** 10
**Exercise of the OGA’s powers** 11
**Delivering value** 12
**Changing face of ownership** 13
**Fiscal measures** 14
**UK performs favourably** 15
**UKCS commercial landscape** 16
**Substantial potential** 17
**Resource base** 18
**Project activity** 19
**UK oil and gas production projection/scenarios** 20
**Measuring success** 21

### Create the right conditions (27)
- Significance of the supply chain

### Drive regional development (28-29)
- Area plans
- Marginal discoveries

### Leverage technology and data (30-33)
- Leverage technology
- Technology
- Digital transformation
- OGA data centre

### Improve decommissioning efficiency (34-35)
- Reducing decommissioning costs
- Decommissioning

### Develop people, processes and systems (36-40)
- Onshore licensing and consents
- The way forward
- Oil & Gas MER UK Forum, Steering Group and Task Forces
- MER UK in action
- Experienced leadership

### Revitalise exploration (22-23)
- Revitalise exploration
- Exploration

### Improve asset stewardship (24-26)
- Asset stewardship – driving improvement
- Further example operator benchmarks
- Wells

### Key publications (42-43)

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Front cover: Courtesy of BP Exploration
Introduction from the Chief Executive

The Oil and Gas Authority (OGA) works alongside the UK oil and gas industry and government to maximise the economic recovery of the UK’s oil and gas resources (MER UK).

Our official forecasts estimate there are potentially over 20 billion plus barrels of oil equivalent (boe) remaining in the UK Continental Shelf (UKCS) and decades of productive life. Vision 2035, co-created with industry, sets out two specific ambitions; to add an additional 3 billion barrels of production by 2035 and to grow supply chain turnover by being a world leader in specific sub-sectors, doubling the UK’s share of service sector exports.

Oil and gas still accounts for about 75% of the UK’s primary energy demand with around 60% met by the UKCS. Oil and gas are expected to play a key role in the global energy mix for decades.

However Vision 2035 can play a meaningful role in the UK’s energy transition. There are opportunities for closer partnerships between oil and gas and renewables for mutual gain, while carbon capture presents an opportunity to re-use existing infrastructure. Likewise, a healthy oil and gas industry can support the continued growth of our world-class domestic supply chain, helping it diversify into alternative energy markets.

The OGA has a firm focus on maximising economic recovery of oil and gas and our central production projection out to 2050 is now 3.9 billion barrels higher than it was in 2015. A mix of field life extensions, infield reserve additions, enhanced oil recovery, new projects and discoveries, have helped add this additional 45% in production.

One of the keys to unlocking these and other opportunities are data and digitalisation. We continue to maximise the value from the wealth of UKCS data; making it openly and transparently available for all and our new National Data Repository promises to be a real game-changer.

Our stewardship data provide evidence that industry is collaborating to sustain improvements. Compared to 2014, costs are down, production is up and the UKCS is globally competitive. Decommissioning activity has progressed well with an impressive 7% (like for like) cost reduction in just one year. Operators are clearly thinking more strategically about technology uptake and there is evidence of more collaborative partnering with the supply chain and improvements in commercial behaviours more generally.

Looking ahead industry must focus on sustaining cost efficiencies and progress higher levels of more efficient drilling.

We’re asking industry leaders to work towards the exciting future which Vision 2035 offers; it’ll require exceptional partnerships and business models delivering value at pace, operational excellence across the lifecycle and widespread deployment of technology, including digital. Most importantly, in my opinion, it’ll require full inclusion, diversity and genuine workforce engagement.

Dr Andy Samuel
Chief Executive
Current context

Infrastructure

- 7800+ wells drilled to date
- 250+ subsea systems
- 20,000 kms+ pipelines
- 320+ fixed installations

Exploration success rates

- 5.4bn boe in production or under development
- 175 in 2017
- 83 in 2018

Development

- UKCS projects
  - Number of projects: 7 in 2017, 19 in 2018
  - CAPEX (£ billion): 0.7 in 2017, 3.8 in 2018
  - Reserves (mmboe): 100 in 2017, 470 in 2018
  - NPV10 (£ billion): 1.1 in 2017, 4.2 in 2018

Resources

- Remaining potential: 10bn - 20bn+
- 10bn
- 20bn+

Performance has turned around
Production: barrels of oil equivalent per day (boepd)

<table>
<thead>
<tr>
<th>Year</th>
<th>Production (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1.42</td>
</tr>
<tr>
<td>2015</td>
<td>1.57</td>
</tr>
<tr>
<td>2016</td>
<td>1.63</td>
</tr>
<tr>
<td>2017</td>
<td>1.63</td>
</tr>
<tr>
<td>2018</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Production efficiency (PE)

Unit operating costs

Supply chain

£27bn turnover

c.40% through exports and supporting c.80% of UK oil and gas jobs

Jobs

> 280,000 jobs in the UK delivered through or supported by upstream oil and gas activity

Source – Oil & Gas UK and EY

Source – Oil & Gas UK
Vision 2035

- Baseline supply chain turnover from exports
- Vision supply chain turnover from exports
- Baseline gross production revenue
- Vision gross production revenue

- £150bn Additional turnover
- £140bn Additional gross revenue

- £420bn
- £350bn
- £280bn
- £500bn

- Total value added
  Increased UK supply chain turnover from capturing larger share of exports markets

- MER UK
  Increased gross revenues from UKCS oil and gas production

- Realise full hydrocarbon potential of the UKCS
- World class competitiveness
- Expand service sector range, market coverage, double exports
- Increase the prize by half again over the next 20 years

Vision 2035 – A single compelling vision for the offshore oil and gas industry
The big opportunity

- Digital
- Simplification
- Efficient decom
- Use it or lose it
- Consolidation
- Transparency
- Extend life
- Halve well costs
- Job and skills
- Technology
- Exports
Energy transition and Vision 2035

Looking forward oil and gas will continue to play a role in the UK energy mix. The OGA fully supports the transition to a low carbon economy, and works collaboratively with industry, government and others to harness the necessary expertise, skills and infrastructure of the UK oil and gas sector to help achieve it.

**MER UK and the energy transition**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Schematic</th>
<th>Potential Applications</th>
</tr>
</thead>
</table>
| **Platform Electrification** | ![Schematic](#) | • SNS: power existing gas hubs from nearby windfarms  
• WoS: use floating offshore wind to create ring main |
| **Power-to-Gas**          | ![Schematic](#) | • SNS and EIS: use redundant infrastructure                                             |
| **Gas-to-Wire**           | ![Schematic](#) | • SNS and EIS: convert late-life infrastructure into offshore power generation         |
| **CO₂ transport and storage** | ![Schematic](#) | • SNS and EIS: use redundant infrastructure                                             |
| **North Sea Wind Power Hub** | ![Schematic](#) | • Integrate UK offshore power and gas (including hydrogen) activities                  |

**Emissions**
- Lowering emissions offshore, emissions trading scheme in place

**Technology**
- To maximise economic recovery, lower emissions and unlock CCUS

**Gas**
- Gas could play prominent role in energy transition, replacing coal. 3.8tcf tight gas opportunity in SNS

**CCUS**
- OGA screening for potential capture use prior to decom

**Synergy with renewables**
- Oil and gas and renewables actively partnering

**Gas to Wire**
- Mutual benefits from linking gas production to wind power
Creating the OGA

New independent authority created April 2015, became government company (GovCo) on 1 October 2016

Effective stewardship of resources

New powers, better resourced and funded

Catalyst for change and facilitator of action

Encouraging collaboration and behavioural change

Focused on delivering regulatory excellence and a high-quality service and value-for-money to industry

Providing expertise and evidence to HM Treasury

Transparency

OGA role

The OGA regulates
the exploration and development of the
UK’s offshore and onshore oil and gas resources and the
UK’s carbon storage and gas storage and offloading activities

The OGA has an important role to promote investment in the UKCS, create value in the UK through exports and develop the prosperity of the industry including wider supply chain

The OGA has a critical role to influence and encourage a culture of greater collaboration on the UKCS, improve commercial behaviours, and help enable a more efficient industry

Regulate
Influence
Promote

OGA values: accountable, fair, robust and considerate
# Regulatory framework

## Legislative Context
- **Infrastructure Act 2015**
- **Energy Acts 2011 and 2016**
- **Petroleum Act 1998**

## Principal Objective
The principal objective is that of ‘maximising the economic recovery of UK petroleum’

## Central Obligation
- **MER UK Strategy**: ‘to take the steps necessary to secure that the maximum value of economically recoverable petroleum is recovered’
  - Includes safeguards to protect and promote investment

## Supporting Obligations
- **Exploration**
- **Regional development**
- **Asset stewardship**
- **Technology**
- **Decommissioning**
- **Collaboration**
- **Cost reduction**

## Execution
- **Facilitation**
- **Licensing regime**
- **Strategies and delivery programmes**
- **MER UK plans**
- **Regulatory powers**

## Regulatory Powers
- **Non-binding dispute resolution**
- **Information and samples**
- **Meetings**
- **Licence model clauses**
- **Third party access**
- **Sanctions**

## Guidance
- **Statutory, non-statutory and Stewardship Expectations**

## Sanction Notices
- **Enforcement notice**
- **Financial penalty notice**
- **Operator removal notice**
- **Licence revocation notice**
Exercise of the OGA’s powers

The OGA uses ‘measured escalation’ to manage ‘issues’, where the OGA seeks primarily to influence the outcome, and ‘cases’ where the OGA will consider intervention with regulatory powers.

Separately the OGA enforces licence obligations and deadlines to drive the pace of delivery and ensure that the right assets are in the right hands.

Striking the right balance

OGA interventions

- **Sanctions**: Enforcement notice, financial penalty notice up to £1m, licence revocation, operator removal.

- **Rewards**: Greater value via collaboration, transparency and better data access, timely, effective decision making, MER UK benefits all.

The OGA uses the full toolkit to drive MER UK outcomes.

<table>
<thead>
<tr>
<th>Key steps in the ‘Measured’ Escalation Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Successes to date</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
</tr>
<tr>
<td>9 Facilitation</td>
</tr>
<tr>
<td>30 Enhanced facilitation</td>
</tr>
<tr>
<td>16 Formal intervention</td>
</tr>
<tr>
<td>5 OGA Powers</td>
</tr>
</tbody>
</table>

OGA interventions:

- **Stewardship**: Area Plans, Asset Stewardship, strategic use of data.

- **Facilitation**: Operational escalation.

- **Enhanced facilitation**: Issues.

- **Formal intervention**: Regulatory intervention.

- **OGA powers**: Cases.

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The OGA interventions:

- **Facilitation**: 9
- **Enhanced facilitation**: 30
- **Formal intervention**: 16
- **OGA powers**: 5

OGA interventions:

- **Sanctions**: Enforcement notice, financial penalty notice up to £1m, licence revocation, operator removal.

- **Rewards**: Greater value via collaboration, transparency and better data access, timely, effective decision making, MER UK benefits all.
Delivering value

<table>
<thead>
<tr>
<th>Significant resource potential</th>
<th>Right assets, right hands</th>
<th>UKCS exploration</th>
<th>Access to infrastructure</th>
<th>UKCS operating environment</th>
<th>UKCS operating costs</th>
<th>Energy transition</th>
<th>Decommissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>The UKCS has between 10-20bn+ barrels yet to be produced</td>
<td>M&amp;A spend of $5.6bn in 2018 with 22 assets changing hands</td>
<td>The OGA provides flexible licensing terms and no-cost data to industry</td>
<td>OGA has well established powers to facilitate development tie backs and help resolve tariff issues</td>
<td>Asset stewardship is driving improvements and highlighting opportunities</td>
<td>Lifting and development costs substantially reduced</td>
<td>The OGA supports energy transition and the exciting opportunities that this brings</td>
<td>The OGA is working with industry to develop strategic decommissioning plans to reduce costs</td>
</tr>
</tbody>
</table>

*Source: Wood McKenzie

Systematically removing barriers to deliver value for investors
Changing upstream mix in the basin 2014 to 2018

Changing face of ownership

Key:
- Average Daily Production
- 41 thousand boe/d
- Small cap
- Mid cap
- Large cap /Supermajor
- Private equity/Infrastructure funds
- Other
- Utilities

Each pie chart represents a geographical area

Current production changed hands in past 5 years: 23%

Operator shares of infrastructure based on throughput

Changing upstream mix in the basin 2014 to 2018
Fiscal measures

The three *Driving Investment* principles for tax policy-making:

1. The overall tax burden will need to fall as the basin matures

2. In setting fiscal policy the government will consider the wider economic benefits of oil & gas production, in addition to revenues

3. A ‘fair return’ will take account of the global competitiveness of commercial opportunities in the UK and UKCS, commodity prices and costs

In line with UK Government’s *Driving Investment* principles various measures introduced including packages worth £1.3 billion and £1 billion introduced in 2015 and 2016

1. Supplementary Charge reduced from 32% to 10%

2. From 1 November 2018, transferable tax history will give buyers increased certainty they can get tax relief for their decommissioning costs

3. Petroleum Revenue Tax permanently reduced from 50% to 0%

4. Introduction of new basin-wide Investment Allowance

5. 2 x £20 million for new geophysical surveys in 2015 & 2016 and £5m for exploration data in 2017

Delivering on *Driving Investment*
UK performs favourably

Leading on returns, payback, break-evens and value

<table>
<thead>
<tr>
<th>IRR% and reserves</th>
<th>Payback periods</th>
<th>Break-evens and value per bbl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>UK</td>
<td>Value per barrel (post tax)</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Norway</td>
<td></td>
</tr>
<tr>
<td>DW GoM</td>
<td>Angola</td>
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</tr>
<tr>
<td>9</td>
<td>4</td>
<td>7</td>
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<tr>
<td>5</td>
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<td>3</td>
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</tbody>
</table>

Number of projects in each region

- UK post tax IRR is 13% higher than next highest basin
- MER UK Forum and Task Forces: the OGA and industry jointly committed to maintaining current cost disciplines
- UKCS still has diverse portfolio of opportunities, from large, complex developments to small, low cost tie-backs
- Opportunities and dramatically lower unit costs mean UKCS boasts world-class payback periods
- Recent investments in UK projects have delivered world-class returns in terms of breakeven and value per barrel
- OGA’s marginal discoveries initiative illustrates the continuing potential of the UK

Source: OGA/Wood Mackenzie

UK was already fiscally competitive – made more so by Budget measures
The OGA supports and encourages innovation in new models to finance UKCS operations, for example:

**Vendor finance**

Chrysaor and Baker Hughes commercial partnership

Baker Hughes to fund a portion of CAPEX, for a potential higher return

Risk and reward sharing drilling programme

Operator and service provider working together to realise value

**Private equity**

Siccar Point acquisition of OMV UK

$1 billion transaction backed by Blackstone and Blue Water Energy

Siccar Point becomes a full lifecycle oil and gas company

Example of an asset portfolio which is now a company priority

**Late life specialists**

BP/EnQuest SVT and Magnus transactions

No cash upfront from EnQuest; transaction funded by deferred consideration

Operator focussed on bringing down costs and extend life

BP has stated this transaction highlights right assets right hands

**Innovative development models**

Tolmount development

Antin Infrastructure Partners to part own platform and pipeline and pay for terminal upgrade

Development expected to produce 500bcf of gas with peak production of 300 mmscf/d

First gas target Q4 2020 as per licence commitment

**Decommissioning**

BP and Serica Erskine transaction

BP responsible for costs up to a gross £174 million; with £31.32 million net to Serica

BP will meet Serica’s estimate of decom costs at the point of sale

Innovative approach to facilitate right assets right hands

For further examples of the OGA and Industry working together to achieve MER UK, please refer to our website www.ogauthority.co.uk

The OGA does not provide endorsements or investment recommendations.
<table>
<thead>
<tr>
<th>Geographical Region</th>
<th>Key Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>West of Shetland</td>
<td>Deepwater, subsea development hub, least developed region&lt;br&gt;High number of exploration awards in 30th Round with 75% increase in licensed acreage&lt;br&gt;Potential to unlock large oil resource volumes by making gas export available&lt;br&gt;Significant gas potential with over 10TCF* of resource base (*Trillion cubic feet)</td>
</tr>
<tr>
<td>Northern North Sea</td>
<td>Mature area with well established fields and infrastructure&lt;br&gt;Recent field redevelopments e.g. Penguins (Shell)&lt;br&gt;Incremental gas resource opportunities (Quad 9 Gas)&lt;br&gt;Opportunities for decommissioning specialists</td>
</tr>
<tr>
<td>Central North Sea</td>
<td>Significant prospectivity and marginal discoveries&lt;br&gt;Mature, near field infrastructure and export capacity available&lt;br&gt;Number of recent exploration successes</td>
</tr>
<tr>
<td>Southern North Sea/East Irish Sea</td>
<td>Opportunity to deliver new developments and leverage field developments&lt;br&gt;Potential to deploy new technology to unlock tight gas&lt;br&gt;Collaborative relationship with renewables sector&lt;br&gt;Significant decommissioning projects in near to mid term</td>
</tr>
</tbody>
</table>
Resource base

2017 changes

Prospects Leads and Plays

- Billion boe added from new discoveries in 2017
  - 0.18 billion boe

Billion boe moved into sanctioned from project approvals in 2017

- 0.1 billion boe

Billion boe produced in 2017 with 74% production efficiency

- 0.6 billion boe

2017 Resource and reserve maturation

- 4.1 billion boe prospective resources in mapped prospects and leads
- 11.2 billion boe in plays
- 7.5 billion boe unsanctioned (5.4 from proposed new developments and other discoveries)
- 5.4 billion boe sanctioned

Range of total potential resources ca. 10 to 20bn boe

Significant remaining resource potential
The OGA does not provide endorsements or investment recommendations. Those projects listed are not necessarily a definitive list and the locations are indicative.

2018 sanctioned projects added 490 mmboe to reserves
UK oil and gas production projection/scenarios

An additional **3.9bn boe** added to projections since March 2015

Contributing factors to the **3.9bn boe** added since March 2015

Strong progress towards Vision 2035
341 success stories were recorded, between 2015 and 31st January 2019, across the OGA in partnership with industry and government.

The OGA has developed a success stories tracker, dashboard and methodology to allow impact to be quantified (relative to what would have happened in the absence of support or intervention) using three key metrics:

- **Tripartite barrels (mmboe)**: 1918
- **Costs mitigated £m**: 845
- **Value of investments £bn**: 3.7
- **Time saved to industry (fast-tracked consents)**: 3828 DAYS
- **Decommissioning cost savings (£M)**: 501

<table>
<thead>
<tr>
<th>Impact on industry</th>
<th>Action by the OGA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protect existing barrels mmboe</td>
<td>Influence</td>
</tr>
<tr>
<td>New barrels added mmboe</td>
<td>Promote</td>
</tr>
<tr>
<td>Reduced or avoided costs through improved or accelerated outputs</td>
<td></td>
</tr>
</tbody>
</table>

- **Production volume**
- **Technologies**
- **Exploration opportunities**
- **Supply chain initiatives**
- **Decommissioning opportunities**
- **Decommissioning cost reduction**
- **Resource maturation**

**Expected future volume of oil and gas production**

**Capital expenditure committed to new projects**

**Reduced or avoided costs through improved or accelerated outputs**
Revitalise exploration

The OGA has opened up large areas of acreage to industry that offer the opportunity for high-impact exploration growth – now looking to industry to drill more targeted wells based on enhanced data.

The OGA has provided substantial incentives and data packages to support licensing rounds and help stimulate interest, including:

- £40 million UK govt funding for new seismic acquisition in frontier areas and reprocessing legacy data
- Digital geological maps to promote enhanced, regional understanding prospect and discovery reports
- Post well analysis of 98 exploration and appraisal wells in the Moray Firth and the UK Central North Sea
- In support of the 32nd licensing round the UK government has also provided £5million funding for rock physics analysis and petroleum systems database

Proposed future licensing plan

All rounds alternating between frontier and mature areas

<table>
<thead>
<tr>
<th>Round</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>31st Supplementary Q1</td>
<td>Mature - Greater Buchan Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32nd</td>
<td>Mature Areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33rd</td>
<td>Frontier Areas</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key: Round opens, Round closes, Licence awards

For indicative purposes only

Legend
- Exploration wells drilled since OGA established
- Restricted Blocks
- 30th Round Awards
- 31st Round Blocks Offered
- 31st Supplementary Round Blocks Offered
- Licenses awarded in previous rounds

Note: Licence Rounds and timings are contingent on the Strategic Environmental Assessment (SEA), with the next SEA assessment planned in 2020/21.
Revitalising exploration activity

- Targeting yet-to-find potential, new prospects & plays
- Innovative licence framework, low entry barriers
- National Data Repository (NDR) of well and seismic information
- Improving performance: technical stewardship and technology
- Integrating exploration into Area Plans
- Focusing on value not volume

Exploration success rates

<table>
<thead>
<tr>
<th>Year</th>
<th>No. Exploration Wells</th>
<th>Technical Success Rate %</th>
<th>Technical finding cost $/boe</th>
<th>Technical Volume mmboe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>13</td>
<td>69</td>
<td>9</td>
<td>83</td>
</tr>
<tr>
<td>2015</td>
<td>15</td>
<td>53</td>
<td>5</td>
<td>115</td>
</tr>
<tr>
<td>2016</td>
<td>11</td>
<td>45</td>
<td>5</td>
<td>64</td>
</tr>
<tr>
<td>2017</td>
<td>15</td>
<td>47</td>
<td>3.5</td>
<td>131</td>
</tr>
<tr>
<td>2018</td>
<td>7</td>
<td>43</td>
<td>1</td>
<td>175</td>
</tr>
</tbody>
</table>

2018 performance shows continued improvement despite low well-count
Asset stewardship – driving improvement

Asset stewardship is crucial to maximising economic recovery from the UKCS and to delivery greater value overall. The asset stewardship expectations are embedded through regular interface with industry.

**Benchmarking**
OGA now benchmarks 18 different metrics with 69 sub elements - driving industry wide performance improvements

**Stewardship Expectations**
Key area of focus: Resource progression & production optimisation

**Tiered stewardship reviews**
OGA & Operator strategic engagement framework through tiered approach

**Rationalised industry surveys**
A single source of current, aligned and robust data covering the whole asset life cycle across the UKCS

Asset Stewardship Strategy defines good asset stewardship and sets in place a framework for delivering, monitoring and measuring continuous improvement.
Further example operator benchmarks

**Production Efficiency (PE)**
- Colours represent year on year change
- Operator X

**Unit Operating Cost (UOC)**
- £/boe
- Operator X

**Reserves Replacement**
- 2017 Reserves Replacement
- Operator X

**Wells Data Cleansing**
- Operator X

**Exploration Performance**
- KPI derived from basket of 7 exploration metrics
- Operator X

**Seismic Compliance**
- Acquisition
- Processing
- Operator X

**Field Recovery Factor**
- Field quality index
- Operator X

**Collaboration**
- OGA View, Operator’s View
- Operator X
Wells

The need to keep on drilling

The Story so far

Wells focus areas for industry

Leverage technology and data

Significant resource potential remaining

Delivering

44 billion barrels

19 E&A Wells

56 Development wells

2128 Wells in operation

7800 wells drilled to date

Development drilling has fallen 50% from 2015 to 2017

Only 18% of future E&A wells (2018 to 2020) have financial approval

Development drilling

The need to keep on drilling

The need to keep on drilling

2017 low well activity

19 E&A Wells

56 Development wells

2128 Wells in operation

Delivering

44 billion barrels

Significant resource potential remaining

7800 wells drilled to date

Development drilling has fallen 50% from 2015 to 2017

Only 18% of future E&A wells (2018 to 2020) have financial approval

Huge value from existing wells

In 2017

Safeguarding 21 million boe production through interventions

Added 22.5 million boe production (by improving underperforming wells and/or reactivating shut in wells)

but...

but...

33 million boe were not achieved as a result of well losses

Around 600 wells shut in with significant remaining reserves: 30% of existing active well stock

Well abandonment

240 open water suspended E&A wells

Average age of 27 years, raising the issue of mechanical integrity

All require to be permanently abandoned

Wells Strategy and Wells Stewardship Expectation being developed with industry, focusing on performance improvement, regulatory compliance and increased activity

…but...

but...

33 million boe were not achieved as a result of well losses

Around 600 wells shut in with significant remaining reserves: 30% of existing active well stock

Well abandonment

240 open water suspended E&A wells

Average age of 27 years, raising the issue of mechanical integrity

All require to be permanently abandoned

Wells focus areas for industry

• Increase drilling activity
• Increase value of new wells
• Reduce cost of well construction

• Increase surveillance and intervention rates
• Increase productivity of wells
• Reduce losses from wells
• Reduce number of shut-in wells

• Abandon inactive wells
• Reduce cost of well abandonment
Significance of the supply chain

<table>
<thead>
<tr>
<th>OGA Supporting</th>
<th>SCAPs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Pathfinder</strong></td>
<td>Supply Chain Action Plans (SCAP), now an integral and mandatory part of the FDP &amp; Decommissioning Programme approval process, require operators to demonstrate how they are:</td>
</tr>
<tr>
<td>Online project data</td>
<td><strong>Delivering maximum value from project activity</strong></td>
</tr>
<tr>
<td>Operators provide opportunities and challenges to service sector</td>
<td><strong>Delivering Field Development Plan &amp; Decommissioning Programme commitments</strong></td>
</tr>
<tr>
<td>Engagement and collaboration ‘One North Sea’</td>
<td><strong>Contributing to Total Value Add (TVA) through supply chain engagement</strong></td>
</tr>
</tbody>
</table>

**UK supply chain/exports turnover**

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>£35bn</td>
</tr>
<tr>
<td>2016</td>
<td>£30bn</td>
</tr>
<tr>
<td>2017</td>
<td>£27bn</td>
</tr>
</tbody>
</table>

Vision 2035: Up to £500 billion pounds in export value by 2035

- **2015**: £35bn
- **2016**: £30bn
- **2017**: £27bn

Service sector: anchored in the UK, enabling MER UK and exporting to the world
Area plans

Four plans have already moved to stewardship

**Penguins:** Unlocking new opportunities in a mature field

**Fram, Arran, Columbus & Vorlich:** Delivering an additional 62mmboe

**Gannet:** Protects production beyond previous export route cessation of production

**Tight Gas in Southern North Sea:** Two tight gas infill wells have been spudded in the last 12 months in Galleon and Chiswick

Area plans integrate exploration through to decom

Optimise infrastructure, extend life for **MER UK**

OGA establish plan & timing – **use it or lose it**

New operators, new partnerships - **right assets right hands**

Industry best placed to deliver detail per behavioural guidelines

Unlocking discoveries undeveloped for decades

Creating value and driving collaboration
Marginal discoveries

A significant contribution to achieving MER UK is the exploitation of over 300 undeveloped marginal discoveries which offer opportunities for clustering and aggregated discovery volumes. Most are within, but some are outside tie-back distance and therefore may be better suited to stand-alone type solutions.

Potential solutions to unlock this prize:

### Clustering

Cluster development could lead to significantly improved CAPEX efficiencies

Potential clusters of undeveloped discoveries in CNS and Moray Firth

### Technology

Available and potential future innovations can unlock marginal developments, such as:

- State-of-the-art inversion
- Advanced structural models
- High-angle, ERD
- Improved drilling technique
- Subsurface scope simplification
- Low cost NUI
- Efficient topsides modifications
- Multilateral wells
- Tie-backs of the future
- Standalone facilities

### Contracting strategy

Novel contracting strategies including:

- Appropriate risk/reward sharing and greater collaboration between operators and supply chain
- Transactions funded by deferred consideration
- Tariff payments once production commences based on minimum rate
- Functional tender rather than price tender
- Collaborative Contractor Club

**Breakdowns of discovery volumes – 3.2 bn boe of potential**

- **WOS**: West of Shetland
- **NNS**: Northern North Sea
- **MFB**: Moray Firth Basin
- **CNS**: Central North Sea
- **SNS**: Southern North Sea
- **EIS**: East Irish Sea

---

**Source:** OGA data

Drive regional development
Leverage technology

We work with the industry to make sure that existing technologies are deployed to their full effect and relevant new technologies are developed and used to maximise economic recovery from the UKCS

MER UK Forum – technology priorities and ownership

<table>
<thead>
<tr>
<th>Demand</th>
<th>Exploration Task Force</th>
<th>Asset Stewardship Task Force</th>
<th>Efficiency Task Force</th>
<th>Decommissioning Task Force</th>
<th>Supply Chain Task Force</th>
</tr>
</thead>
</table>

Priorities

- Technology Leadership Board
  - Task Forces: Define the business needs and own eventual solutions
  - TLB: Define industry priorities and engage with delivery organisations
  - Industry Technology Network: UKCS Technology Managers meeting quarterly to share learnings on technology adoption

Delivery

- The Oil & Gas Technology Centre
  - Takes forward themes into execution
  - Government-backed and industry-led
  - Solution centres, Centres of Excellence, Innovation Hub and Technology Acceleration

Supply Chain

- Anticipates technology need
- Provides innovation in response to industry demand
- World leading capabilities

Research/ Academia

- Provides expertise knowledge and routes to funding
- Access to advanced facilities
- Research into early stage technology

OGA role

- Oversees industry engagement
- Holds operators to account in their Technology Plans/Asset Stewardship Expectations

Increasing quality and detail of submitted technology plans

<table>
<thead>
<tr>
<th>2016 Total 66 Operators</th>
<th>2017 Total 72 Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Submission</td>
<td>5</td>
</tr>
<tr>
<td>No plan</td>
<td>18</td>
</tr>
<tr>
<td>Limited plan</td>
<td>8</td>
</tr>
<tr>
<td>Good summary plan</td>
<td>16</td>
</tr>
<tr>
<td>Comprehensive plan</td>
<td>21</td>
</tr>
</tbody>
</table>

No plan
Limited plan
Comprehensive plan

Increasing quality and detail of submitted technology plans

Technology Insights
<table>
<thead>
<tr>
<th>Existing assets</th>
<th>OGA expectations</th>
<th>New developments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection drones</td>
<td>Operators submit technology plans</td>
<td>Tie back of the future</td>
</tr>
<tr>
<td>Corrosion under insulation inspection</td>
<td>Well-identified asset needs</td>
<td>System simplification</td>
</tr>
<tr>
<td>Thermite P&amp;A</td>
<td>Demonstrate use of appropriate technologies</td>
<td>Plug-n-play</td>
</tr>
<tr>
<td>OGA Technology Insights – Industry learnings</td>
<td>OGA Technology Insights – Industry learnings</td>
<td>Re-usable</td>
</tr>
</tbody>
</table>

**Work with the Industry**

**Collaboration with OGTC**

- Mechanical connectors
- Composite spoolable
- Low cost, reusable platforms
- Subsea chemical injection
- Subsea power generation
- Unmanned buoys
- Versatile production units

**OGA requirements**

- Operators submit technology plans
- Well-identified asset needs
- Demonstrate use of appropriate technologies

**New developments**

- Innovative standalone facilities
- Low Capex / Low Opex
- Re-deployable (multi-use)

**OGA expectations**

- System simplification
- Plug-n-play
- Re-usable

**MER UK requires best-in-class, innovative technologies**

**OGA Technology Insights – Industry learnings**

- Work with the Industry
- Collaboration with OGTC

**National Decommissioning Centre officially opened**

**Leverage technology and data**
Digital transformation

Early in 2019 the OGA successfully launched the United Kingdom’s first offshore Oil and Gas National Data Repository for petroleum-related information and samples (NDR). The NDR is a key piece of the UK’s digital infrastructure.

National Data Repository

Huge data collection from UKCS offshore oil and gas wells, 2D and 3D seismic surveys, infrastructure, licences and fields

Operated by the OGA on the behalf of the nation, industry and other interested parties

Enables the retention and reporting obligations of relevant persons to be discharged

Ensures that maximum value is derived from petroleum-related information by analytical techniques such as machine learning and artificial intelligence

Ensures the sustainable long-term curation of petroleum-related information and samples

Links to the National Geological Repository

The UK’s first National Data Repository - new national digital infrastructure
OGA Data Centre

The OGA’s most visited website area provides key stakeholders maximum value from wealth of UK data; licence, wells and field data can be queried and downloaded.

Comprehensive data only a few clicks away

Drilling activity by region

Supports the OGA strategy of making as much information and data publicly available as soon as possible.
Reducing decommissioning costs

On track for major cost reductions

2017 (P50) cost estimate 2016 prices

£59.7bn

£58bn

(P50) updated 2018 inventory, 2017 prices

£55.7bn

(P50) like for like: 2017 inventory & 2016 prices

2016
Set Strategy

2017
Established Cost baseline

Current Activities

Target
Established <£39bn

>35% cost reduction target

First decom cost estimate report

Updated cost estimate report and progress

Benchmarking cost reduction performance with Tiered reviews

New micorsite to share lessons and individual case studies

All current and future wells, platforms, infrastructure, pipelines and terminals

Decommissioning presents significant opportunities for innovation, cost reduction and development of UK skills and capability, and has the potential to deliver a competitive market advantage to the UK on the global decommissioning stage.
Minimum target of £39bn based on industry achieving 35% improvement on 2017 P50 probabilistic estimate of £59.7bn (2016 prices) – ultimately increased competence and cost effectiveness of operators and their contractors will deliver the targeted cost savings

Engage early on decommissioning plans with operators

Publicise benchmarks using OGA Stewardship Survey data

Identify cost reduction opportunities/challenges for decommissioning

Promote collaboration across industry

Support supply chain to develop capacity and efficiency

Ensure MER UK behaviour implemented

Several operators are already achieving step changes in cost outcomes through adopting different approaches, learning-from/sharing-with others, and challenging previous norms
Onshore licensing and consents

The OGA’s role for onshore oil and gas includes:

**Regulation:** ensuring that an effective licensing system and regulatory controls are in place, including mitigating the risk of induced seismicity

**Monitoring activity:** overseeing operators to ensure competency and that progress is being made on over 200 licences

**Collaboration:** recognising that high levels of public interest demand transparency, active engagement and close working with government, other regulators and the Shale Environmental Regulator Group (SERG)

Features of OGA’s onshore activity

**Jurassic oil hybrid play:** Testing underway and drilling planned to appraise the potential of the Kimmeridge resource play

**Carboniferous shale gas:** Hydraulic fracturing operations and 3D seismic surveys completed in 2018

**Ongoing exploration:** At least three exploration wells expected to be drilled in 2019

**Stewardship:** of over 50 onshore existing and producing oil and gas fields
The OGA priority themes were set out in 2015 and were refreshed in 2019, to refocus on the next five years, with updated KPI's

<table>
<thead>
<tr>
<th>KPI</th>
<th>Area</th>
<th>KPI Measure</th>
<th>KPI Target</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Revitalise exploration</td>
<td>Discovered recoverable reserves</td>
<td>200 mmboe additional recoverable reserves (5 year rolling average)</td>
<td>Annual</td>
</tr>
<tr>
<td>2</td>
<td>Enhanced asset stewardship</td>
<td>Recoverable reserves</td>
<td>80% UKCS average production efficiency</td>
<td>End 2022</td>
</tr>
<tr>
<td>3</td>
<td>Cost efficiency</td>
<td>Cost efficiency</td>
<td>Maintain average UOC within +/- 15% of the 2017 level (2017 prices)</td>
<td>Annual</td>
</tr>
<tr>
<td>4</td>
<td>Regional development</td>
<td>Resource progression</td>
<td>300 mmboe from 2C to 2P annually</td>
<td>Annual</td>
</tr>
<tr>
<td>5</td>
<td>Improve decommissioning efficiency</td>
<td>Decommissioning cost</td>
<td>35% reduction in forecast total decommissioning costs from 2017 baseline estimate</td>
<td>End 2022</td>
</tr>
<tr>
<td>6</td>
<td>Cost certainty</td>
<td>For 90% of all assets, an AACE class 3 estimate (or better) should be submitted to the OGA at least three years before each planned decommissioning activity</td>
<td>End 2021</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>People, processes and systems</td>
<td>Staff engagement</td>
<td>10 percentage point improvement in OGA positive engagement score</td>
<td>End 2024</td>
</tr>
</tbody>
</table>
Oil & Gas MER UK Forum, Steering Group and Task Forces

**MER UK Forum**
Small focused membership including industry task force leads, ministers and officials, Oil & Gas UK and chaired by the OGA. Others will be invited according to the agenda.

**MER UK Steering Group**
Steers the task forces, discusses and reviews strategic issues such as Industrial Strategy, collaboration and senior level OGA/industry engagement.

**Industry Cultural Change Champion**
Develop people, processes and systems.

**Six industry-led Task Forces focused on core areas and Industry Cultural Change Champion**
- Exploration Task Force
- Technology Leadership Board
- Asset Stewardship Task Force
- Decommissioning Task Force
- Efficiency Task Force
- Supply Chain and Exports Task Force
## MER UK in action

### Exploration
- Apache near field exploration
  - Invested in high quality 3D seismic to uncover near-field prospectivity
  - Callater achieved first oil only 23 months after discovery
  - Garten discovery marks 2500th UKCS exploration well - Fast track development c.5 months from discovery to FDP approval

### Wells
- CNR International (UK) Ltd
  - Contributed to the Ninian field producing the highest production rates since 2009
  - Excellent collaboration with the Supply Chain
  - Delivered significant results
  - MER UK Award Winner

### Development
- Buzzard Phase II
  - Novel alliance contracting strategy, delivering highly effective collaboration across the supply chain
  - Potential to extend the life of the field by 10 years
  - First oil expected Q1 2021

### Supply Chain
- Repsol Sinopec
  - Digital asset Integration
    - 4G technology connecting platform to onshore support
    - £60m savings on one platform alone
    - High performance from data analytics

### Technology
- Spirit Energy / Oil and gas Technology Centre
  - Thermite P&A
  - Transformational technology which could significantly reduce well decommissioning
  - Piloted by Spirit Energy in the UK

### Decommissioning
- CNR Ninian cost reduction
  - Average cost per well <P10 compared with the current NNS OGA P50 benchmark of £3.6 million
  - One team approach, innovative technical approaches and continuous learning
Experienced leadership

Board of Directors and Company Secretary

Executive team
### Who does what in UK government

#### Exploration and production including:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onshore, offshore, carbon storage, gas storage and gas unloading licensing</td>
<td>OGA</td>
</tr>
<tr>
<td>Environmental aspects of onshore regulations</td>
<td>SERG</td>
</tr>
<tr>
<td>Field development plan consents</td>
<td>OGA</td>
</tr>
<tr>
<td>Cessation of production approvals</td>
<td>OGA</td>
</tr>
<tr>
<td>Offshore pipeline works authorisation</td>
<td>OGA</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>OGA</td>
</tr>
<tr>
<td>Commercial matters and changes of control</td>
<td>OGA</td>
</tr>
<tr>
<td>Flaring and venting consents</td>
<td>OGA</td>
</tr>
<tr>
<td>Metering and allocation</td>
<td>OGA</td>
</tr>
<tr>
<td>Production outages</td>
<td>OGA</td>
</tr>
<tr>
<td>Offshore decom efficiency, costs, technology</td>
<td>OGA</td>
</tr>
<tr>
<td>Offshore decom programme approval, execution and monitoring</td>
<td>BEIS – OPRED</td>
</tr>
<tr>
<td>Offshore environmental management and inspection</td>
<td>BEIS – OPRED</td>
</tr>
<tr>
<td>Health and safety management</td>
<td>HSE</td>
</tr>
<tr>
<td>Supply chain action plans</td>
<td>OGA</td>
</tr>
</tbody>
</table>

#### Oil and gas policy including:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall oil and gas policy</td>
<td>BEIS</td>
</tr>
<tr>
<td>Legislation</td>
<td>BEIS</td>
</tr>
<tr>
<td>Oil and gas parliamentary processes</td>
<td>BEIS – OGA</td>
</tr>
<tr>
<td>Offshore decommissioning</td>
<td>BEIS – OPRED, OGA, HMT</td>
</tr>
<tr>
<td>Fiscal and taxation</td>
<td>HMT</td>
</tr>
<tr>
<td>Supply chain and business impact</td>
<td>BEIS &amp; OGA</td>
</tr>
<tr>
<td>Environment</td>
<td>BEIS – OPRED</td>
</tr>
<tr>
<td>International relations and trade</td>
<td>BEIS, DIT, OGA, FCO</td>
</tr>
</tbody>
</table>

### Key

**BEIS**: Department for Business, Energy and Industrial Strategy  
**DIT**: Department for International trade  
**FCO**: Foreign and Commonwealth Office  
**HMT**: Her Majesty's Treasury  
**OGA**: The Oil and Gas Authority  
**OPRED**: Offshore Petroleum Regulator for Environment and Decommissioning  
**SERG**: Shale Environmental Regulator Group (Oil and Gas Authority, Health and Safety Executive and Environment Agency)
Key publications

**Strategic overview**
Published with industry sector strategies setting direction

**New stewardship regime**
Worked with industry to develop 10 expectations, and implementation guides, spanning the whole lifecycle and the stewardship review process
All OGA publications can be found at: https://www.ogauthority.co.uk/news-publications/publications/

**Guidance**

Worked with industry to provide guidance on our powers and how they are being used.

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**Sector wide data**

The OGA provide reports, including reports using data from the annual stewardship survey, to help industry improve and benchmark performance.