



Oil & Gas
Authority

Exploration Strategy



Contents

1. Foreword	3
2. Executive summary	4
3. Introduction	5
4. Current status	6
4.1 Introduction	6
4.2 The current situation	6
5. Strategic themes, objectives and targets	7
5.1 Introduction	7
5.2 Regional exploration (Promotion)	8
5.3 Licence and work programme stewardship (Regulation)	8
5.4 Subsurface technical assurance and portfolio management (Influencing)	9
6. Implementing the Strategy	12
6.1 Delivery	12
6.2 Further OGA support	13
6.3 Stakeholder engagement	14
7. Acknowledgements	15

1. Foreword

The Oil and Gas Authority (OGA) was established to regulate, influence and promote the UK oil and gas industry, in conjunction with other regulatory authorities, and has a range of powers to deliver this remit.

The development of a series of strategies and associated delivery programmes represents a key step in setting out how the OGA, government and industry should work together to maximise economic recovery (MER) from the United Kingdom Continental Shelf (UKCS) – a core recommendation of the Wood Maximising Recovery review.

The MER UK Strategy underpins the OGA remit and became a legal obligation on licensees in March 2016. It describes how MER should operate in practice, setting out a legally binding obligation on licensees and others to take the steps necessary to secure the maximum value of economically recoverable hydrocarbons.

The MER UK Strategy also sets out a range of supporting obligations and safeguards, as well as the actions and behaviours required to achieve collaboration and cost reduction.

The purpose of these strategies and delivery programmes, developed in collaboration with industry and the MER UK Boards, is to promote a new way of working across the oil and gas lifecycle. The strategies set the key direction and the delivery programmes provide further direction and detail on the implementation of each strategy.

2. Executive summary

The OGA is committed to maximising the economic recovery of hydrocarbons from the UKCS through safe and cost effective exploration and appraisal (E&A) activities. These activities must encompass the full range of undiscovered and undeveloped opportunities within the UK, including frontier and mature area potential, in order to deliver value that supports and extends the life of producing hubs as well as new field developments.

This Exploration Strategy supports the MER UK Strategy and has three priority areas:

- **Regional exploration** – Promoting exploration opportunities in the UK through both regional and targeted approaches
- **Licence and work programme stewardship** – Regulating the optimal use of the UK's acreage through licensing activities and stewardship
- **Subsurface technical assurance and portfolio management** – Influencing the technical work carried out by licensees in order to improve exploration performance and ensure prospective resources are efficiently and fully exploited

The Exploration Strategy is supported by a number of other strategies, including:

- **Asset Stewardship Strategy** – Applies across the exploration and production (E&P) lifecycle and consists of four main elements: a set of stewardship expectations, industry data surveys, benchmarking, and stewardship reviews
- **Information Management Strategy** – Efficient exploration and robust subsurface technical evaluations must be supported by data which are comprehensive, high-quality and up-to-date
- **Technology Strategy** – The OGA is working with industry, the research community, the Oil and Gas Technology Centre (OGTC) and government to develop, deploy and promote new technologies and techniques to fully unlock UKCS potential and enable expansion into the global export market

The Exploration Delivery Programme for revitalising exploration activity on the UKCS, centred on the three priority areas, will be published separately.

3. Introduction

In order to maximise the economic recovery of oil and gas resources from the UKCS, exploration and appraisal activity must be revitalised in both mature and frontier plays. This is a considerable task against a backdrop of the recent fall in the oil price and relatively high costs.

However, the need for this revitalisation is urgent, given the decline in production from existing infrastructure and the consequent risk of premature cessation of production and potential decommissioning of critical hub facilities.

This is exacerbated by pressure on the supply chain, which has resulted in the stacking and scrapping of rigs and seismic acquisition vessels and job losses within a highly specialised and skilled workforce.

E&A activity in the UK fell to its lowest level for many years in 2015 with just 13 exploration and 13 appraisal wells drilled. E&A must be appropriately stimulated and supported in order to encourage increased drilling of Prospective and Contingent Resource portfolios (refer to Figure 1).

Efficient and successful exploration requires evaluations of subsurface risk and uncertainty at the 'regional' and 'play' level so that dependencies at the local lead and prospect level can be quantified and understood in order to secure an optimal drilling and investment strategy.

Such regional evaluations require efficient access to a comprehensive and high-quality well and seismic database on a basin-wide scale, incorporating lessons learned from both success and failures. Ideally a portfolio approach should be taken when selecting which wells to drill within the national prospect inventory and the commercial partnerships carrying out such activity should be prepared to share more knowledge and the risk and rewards of such exploration opportunities.

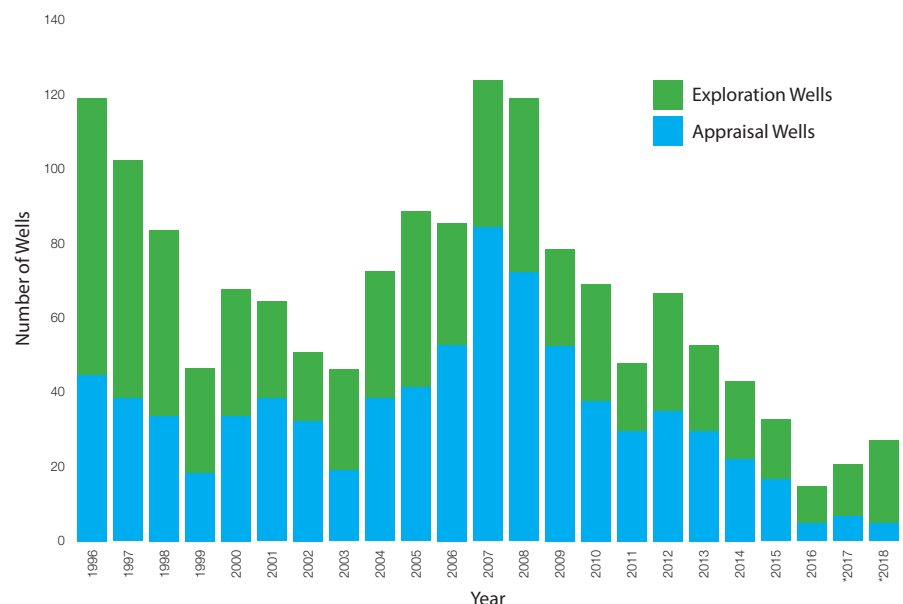
Enabling and supporting these activities requires a fit-for-purpose licensing framework that provides the conditions to execute work programmes and commercial activities. The OGA is undertaking a first-principles-based review of the licensing regime for the UKCS to ensure it is fit-for-purpose.

The OGA has been stimulating and supporting ongoing industry activity.

An example of this includes the introduction of the Innovate Licence, which offers a flexible approach to licensing and allows licensees to work with the OGA to design an optimal work programme. This enables more appropriate phasing of activity, rental fees and competency tests and implements a stage-gate process for effective monitoring of progress.

Figure 1: UKCS Exploration and Appraisal Well Count*

* 2017 and 2018 Well Forecast from Operator Engagement



4. Current status

4.1 Introduction

E&A drilling activity in the UKCS has declined considerably from its peak in 1990. Although overall success rates have been steadily improving since then, the average discovery size within the mature basins of the UKCS has been decreasing. This is a function not only of basin maturity, but also the tendency for operators to focus on lower risk field development infill and near-field opportunities that generate short-term cash flow.

Despite this, the UKCS remains an attractive exploration destination, with lower finding costs and larger discovered volumes compared to some neighbouring basins during 2015¹. The UK has a well-established exploration skills base, including world-leading expertise in geoscience and engineering, which provides a solid platform for recovery.

Rejuvenation will require a significant increase in the levels of exploration activity while maintaining success rates and average discovery or cluster size through selective drilling. This requires improved subsurface understanding and the application of modern, subsurface data acquisition, processing and analytical techniques. Of equal importance is the improvement of 'full-cycle' prospect economics through cost reduction, collaboration, and the timely sharing of knowledge, equipment and technology.

4.2 The current situation

The discretionary nature of exploration expenditure has resulted in reductions in activity and capability within companies of all sizes. Some companies are now actively taking advantage of heavily discounted rigs and vessels and selectively acquiring interests in new assets and prospects; however others are struggling to meet their obligations and finance their debt.

While the OGA is maintaining flexibility with regard to licences and work programmes, some partner misalignments and a stagnant divestment/acquisition market have resulted in a number of E&A projects stalling. The UKCS has a large inventory of prospects and unappraised/undeveloped discoveries, with up to 9.2 billion barrels of oil equivalent (boe) undiscovered resource potential².

Historic barriers, such as restricted infrastructure access, partner misalignment and limited rig availability, have meant many of the prospects within this inventory remain undrilled despite having been available to industry through several licensing cycles. The acreage landscape has become increasingly fragmented and the natural end to the fallow initiative, coupled with recent relinquishments, has created the opportunity for more appropriate licence cycle times, coherent block offerings, and collaborative partnerships.

Within the last three to four years, the E&A market has transformed from one where rig availability and cost increases have been an acute constraint on activity, to one where there is a glut of drilling units, resulting in rentals falling to half or one-third of peak day rates and the permanent removal of some unutilised drilling capability.

Of equal importance to the health of the industry is the state of the multi-client and proprietary seismic acquisition market, which has transitioned from extensive, wide-area high-quality surveys to a handful of limited-area, predominantly field development targeted surveys. Once such geophysical and well data have been acquired, they should be made available in a timely and accessible way in order to facilitate effective exploration, yet this has been hindered by fragmented data systems with no unified approach to reporting and publishing.

The companies which have been the most successful explorers in recent years have invested most aggressively in modern seismic surveys. Such geophysical activity needs to be stimulated as a first step towards prospect generation, reducing subsurface uncertainty and polarising risk, which should ultimately lead to more high-quality, drillable, exploration opportunities. The OGA is providing parallel support by promoting the industry internationally to create new inward investment and renewed innovation and skills.

¹ Richmond Energy Partners (2016) Surviving the Perfect Storm: The State of Exploration 2016. Presentation by Keith Myers at APPEX Conference, London, 1 March 2016. Available online at <http://www.richmondep.com/document/the-state-of-exploration-apex-2016/>

² <https://www.gov.uk/guidance/oil-and-gas-uk-field-data#uk-oil-and-gas-reserves-and-resources>

5. Strategic themes, objectives and targets

5.1 Introduction

The OGA Corporate Plan 2016–2021 defines the following OGA priority for revitalising exploration.

OGA Priority

Implementing a licensing regime that encourages high levels of exploration, using analysis and insights to proactively influence and help incentivise exploration on the UKCS.

Exploration is not only a means of establishing new field developments, but is also important for supporting continued production from existing critical hubs. It is difficult to be prescriptive about the activity levels required for success across the UKCS's diverse portfolio.

The estimated number of E&A wells required to replace the projected decline in reserves through production, using current discovery rates and volumes, is in the region of 50 wells per year.

To reach this target over the next five to 10 years will require opportunities to be matured progressively to be ready to drill, supported by technical personnel. It also requires improvements in information and data access and analysis along with sustained capacity in the supply chain.

A crucial attribute of a successful E&A portfolio is a balance of risk versus value-based reward that delivers an optimum return on investment through investing in the efficient frontier³.

Exploration activity must be undertaken across a range of opportunities, from higher-risk/high-reward prospects to lower-risk/lower-reward near-field prospects.

A skilful balance of interventions that tackles the underlying technical, economic, commercial and operational issues needs to be implemented, recognising that a broad spectrum of measures is likely to be more successful than any single remedy.

The OGA Corporate Plan 2016–2021 identified 10 actions required to revitalise exploration activity in the UKCS for the direct benefit of MER UK. These actions support three strategic priorities and are summarised in Figure 2.

The MER UK Strategy sets out obligations in relation to exploration.

³ Rose, P.R. (2001) Risk Analysis and Management of Petroleum Exploration Ventures, AAPG. ISBN-13: 978-0891816638

5.2 Regional exploration (promotion)

This will involve promoting exploration opportunities in the UK through both regional and targeted approaches, including sharing knowledge, high-quality data and best practice. In addition to supporting continued drilling activity in mature areas, the exploitation of new and emerging plays needs to be encouraged and appropriately incentivised.

Near-term actions

The MER UK Exploration Board, supported by the OGA, sets strategic direction, priorities and work streams

The OGA is working with industry and government to explore ways to promote and incentivise exploration in frontier and mature areas of the UKCS and promote the UKCS internationally

The OGA is delivering the 2016–2017 UK Government-funded seismic acquisition and reprocessing programme and publishing the subsurface data packages. The OGA and the industry are evaluating the potential for further seismic acquisition programmes under a variety of business models, including technology demonstrator projects. Work is being carried out to provide the basis for future investment in multi-client and proprietary seismic data, including the use of cutting edge acquisition and processing techniques

The OGA is working with industry and academia to promote regional studies and improve geological understanding of UKCS frontier and mature areas

Medium-term actions

The OGA will provide high-quality geological maps such as play fairway maps integrating with neighbouring countries including Norway, Netherlands, Denmark, Ireland, Faroe Islands and other neighbouring jurisdictions

Delivery of significantly improved regional prospectivity and Yet-to-Find analyses in order to promote opportunities and communicate the size of the prize

5.3 Licence and work programme stewardship (regulation)

The OGA is regulating the optimal use of the UK's acreage through licensing activities and work programme stewardship and is ensuring that work obligations or equivalent are delivered by licensees.

Near-term actions

The OGA is fully implementing flexible licensing through the Innovate Licence and will award acreage in the 29th Offshore Frontier Licensing Round

The OGA is ensuring licence management is efficient and fit-for-purpose for all licence holders. The OGA is identifying barriers to planned activity and facilitating their resolution

Medium-term actions

The OGA is proposing new model clauses for production licences

The OGA will launch, manage and deliver the 30th Offshore Mature Licensing Round and subsequent licensing activity

5.4 Subsurface technical assurance and portfolio management (influencing)

The OGA is influencing the technical work carried out by licensees so that exploration performance is improved and prospective resources are efficiently and fully exploited through selective activity and shared drilling campaigns. Where necessary, the OGA works towards ensuring technical and commercial alignment of partnerships within and across joint venture groups.

Near-term actions

The OGA is continuing to share lessons learnt with industry and is introducing a process of rigorous pre- and post-drill evaluation with operators to evaluate exploration performance and areas for technical improvement

The OGA is undertaking pre-drill technical evaluations and work with companies on their prospect inventories to help stimulate drilling campaigns and is supporting prospect generation and the technical maturation of opportunities, including in open acreage

Medium-term actions

The OGA is developing standards and good practice for play and prospect assessments

The OGA is implementing systematic technical reviews with operators to provide an independent technical opinion, ensure that good practices are followed, and identify areas where the OGA can guide projects towards successful activity and investment

Figure 2: Exploration Strategy overview

Why	Ambition	To create an environment that stimulates exploration of a balanced portfolio of frontier and mature areas			
	Purpose	To create an environment that stimulates exploration of a balanced portfolio of frontier and mature areas			
What	Strategic Priorities	Regional Exploration			
		Promote and incentivise exploration activity across the UKCS			
	Strategic Themes	<ul style="list-style-type: none">• Play-based exploration• Sharing of high-quality data and knowledge• Global promotional activities			
	This Means	Promoting exploration opportunities in the UK through both regional and targeted approaches, including sharing knowledge, high-quality data and best practice. Supporting continued drilling activity in mature areas and encouraging/incentivising exploitation of new and emerging plays.			
How	Actions	Exploration Strategy	MER UK Board	Promote and Incentivise	Geophysical Data
		Work with the MER UK Exploration Board and industry to develop an Exploration Strategy and publish corresponding Delivery Programme	Sustain the MER UK Exploration Board with clear priorities and work streams	Work with industry and government to promote and incentivise exploration in frontier and mature areas of the UKCS and support UK-based research and geoscience services	Publish UK Government funded seismic data packs and evaluate potential for further data acquisition programme and application of new geophysical technology
	Key Supporting Strategies	Information Management			

Exploration activity within the UK, allowing industry to create value through drilling and mature area prospects, leading to the discovery of new oil and gas reserves

maximise economic recovery from the UKCS

Licence and Work Programme Stewardship	Subsurface Technical Assurance and Portfolio Management
Regulate E&A activity	Influence high-quality subsurface work
<ul style="list-style-type: none"> Deliver licensing activity Ensure best use of acreage Monitor work programme delivery and compliance 	<ul style="list-style-type: none"> Manage the national portfolio of prospective resources Improve technical standards Remove barriers to activity
Regulating the optimal use of the UK's acreage through licensing and licence stewardship. Ensuring work programmes are delivered by licensees and enforcing licence obligations.	Influencing the technical work carried out by licensees to improve exploration performance and to exploit prospective resources efficiently and fully through selective activity and shared drilling campaigns. Ensuring technical and commercial alignment of partnerships within, and across, joint venture groups.

Physical	Regional Studies	Geological Maps	Offshore Licensing	Dry-Hole Analysis	Prospect Inventory	Yet-to-Find
UK ent- ismic ages ate or ta n es cation al ies	Promote regional studies, working with industry and academia, to improve geological understanding of UKCS frontier and mature areas	Provide high-quality geological maps such as play fairway maps, integrating with neighbouring countries including Norway, Netherlands, Ireland, etc	Implement a flexible licensing strategy for frontier and mature acreage and ensure licence management is efficient and fit-for-purpose for all licence holders	Continue to share lessons learned and performance benchmarking with industry through process of rigorous pre- and post-drill evaluation with operators	Undertake pre-drill technical evaluation and work with companies on their prospect inventories to help stimulate drilling campaigns, support prospect generation and opportunity maturation	Deliver significantly improved regional prospectivity and Yet-to-Find analyses

Asset Stewardship

Technology

6. Implementing the Strategy

6.1 Delivery

The MER UK Exploration Board has been established and reports to the MER UK Forum. This Board, and the leveraging of its membership and expertise, is crucial in delivering the Exploration Strategy. Membership of the Board includes representation from across industry and it has identified six focus themes which complement the overall Exploration Strategy priorities. These are:

- **Promoting Exploration** – Promoting UKCS exploration opportunities internationally, to existing players in the UK energy market, exploration decision makers, investors, technical experts, service providers and academia
- **21st Century Roadmap Initiative** – Creating a five-year plan of regional subsurface studies to support ongoing exploration initiatives and future licensing activities
- **Licensing Strategy** – sets out 10 Stewardship Expectations for industry, across the oil and gas lifecycle, including in relation to exploration, which, if followed, are intended to help facilitate delivery of the MER UK Strategy obligations
- **Technical Assurance** – Including access to appropriate technical data and expertise, benchmarking exploration performance, use of appropriate logging and sampling strategies during well execution, and the quantification of the Yet-to-Find potential of the UKCS
- **Exploration Forum** – Providing a mechanism for open communication between the OGA and industry on exploration matters
- **Working with HM Treasury and HMRC** – Continuing to support HM Treasury and HMRC by providing updates on the current state of the market, discussing concepts, ideas and opportunities for potential intervention, including non-fiscal measures

6.2 Further OGA support

In addition to working closely with the MER UK Exploration Board and associated work groups, the OGA is undertaking further complementary work as well as working with other industry stakeholders. This includes subsurface technical evaluations targeted at generating and maturing prospects in open acreage, in addition to OGA investment in regional and play maps.

Additional work which supports and complements the Strategy, includes:

Asset Stewardship Strategy

- Places a number of expectations on industry in areas such as exploration
- Sets out expectations on gathering appropriate data for performance analysis, tracking and benchmarking
- The OGA will influence positive outcomes through face-to-face stewardship reviews with operators, including licensing and subsurface technical discussions

Information Management Strategy

- Establishment of a unified data store, providing simplified access to information and data
- Enhanced data analysis and insights through aggregated data and benchmarking information
- The potential for delivery of data through cloud computing systems and the provision of software as a service to help cost control, reduce duplication, and enhance data integrity and accessibility

Technology

- Promoting the adoption and application of new geophysical technologies and techniques
- Championing UK expertise in structural geology, stratigraphy, reservoir modelling, and many other specialist domains
- Small pools and well cost reduction work, co-ordinated by the MER UK Technology Leadership Board, exploring the use of technology to reduce cost and unlock some of the 300+ undeveloped discoveries within the UKCS
- Supporting academic research communities working towards improving exploration success at the play and prospect scale and maximising recovery at the reservoir and pore scale

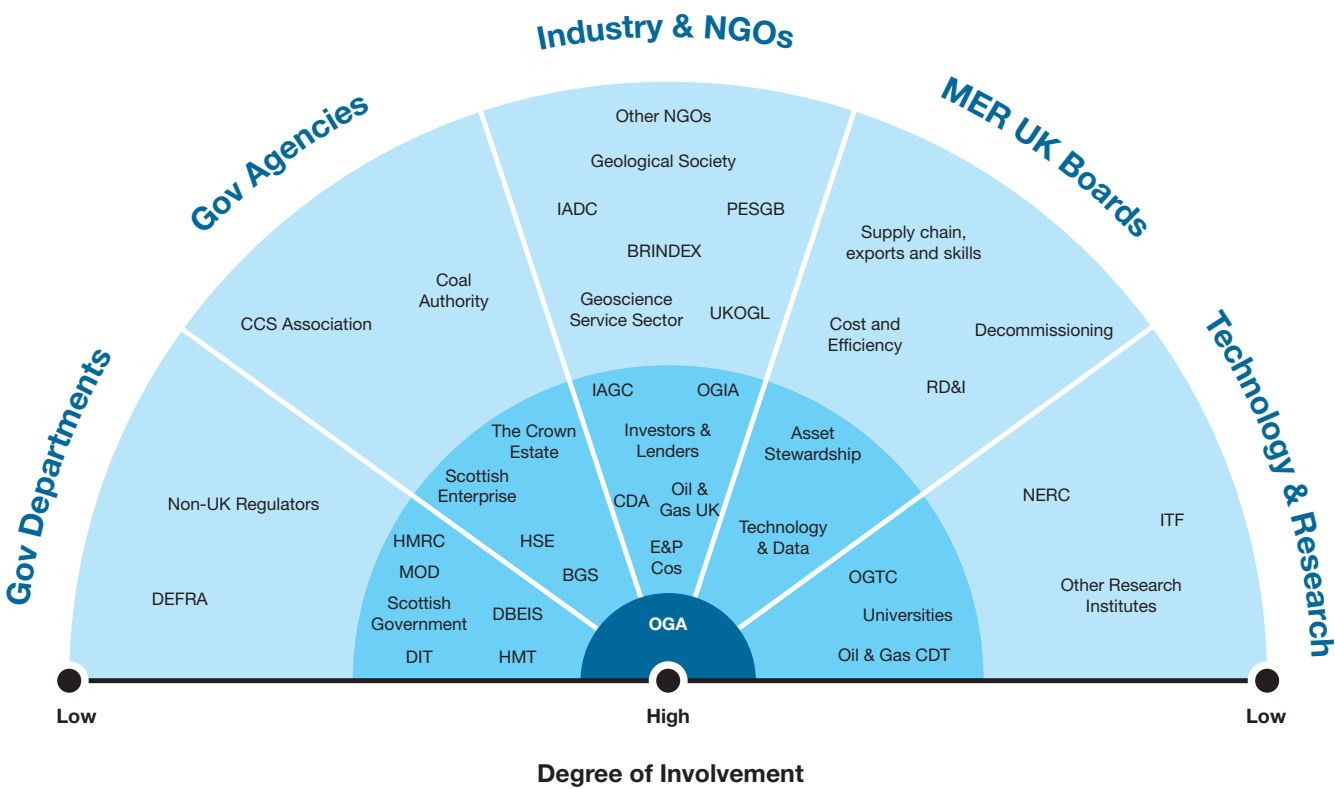
MER UK Supply Chain, Exports and Skills Board

- Assisting capability in skills, new business models, and growing supply chain exports potential

6.3 Stakeholder engagement

Key stakeholders and their relative degree of involvement with the OGA are indicated in Figure 3.

Figure 3: Stakeholder engagement



BGS	British Geological Survey
BRINDEX	Association of British Independent Oil Exploration Companies
CCSA	Carbon Capture and Storage Association
IADC	International Association of Drilling Contractors
IAGC	International Association of Geophysical Contractors
PESGB	Petroleum Exploration Society of Great Britain
UKOGL	UK Onshore Geophysical Library
OGIA	Oil and Gas Independents Association
CDA	Common Data Access
CDT	Centre for Doctoral Training

7. Acknowledgements

This Exploration Strategy has been compiled with the help, input and advice of many people and organisations. The OGA would like to acknowledge the following specific contributors:

The MER UK Exploration Board, comprising representation from the following organisations:

- Apache Corporation
- BP
- Chrysaor
- DONG
- ENGIE
- ENI
- Oil & Gas UK
- Shell
- Statoil

Additional advice and input has been provided by:

- BEIS
- HMRC
- HM Treasury
- Health and Safety Executive

The MER UK Exploration Board work streams have also had support from individuals in the following organisations:

Ashton Lister, Azinor Catalyst, Bayern Gas, BGS, Burgate Exploration, Cairn, Centrica, Chevron, Encounter Oil, ExxonMobil, Hurricane Energy, Ithaca Energy, Maersk Oil, Nexen/CNOOC, OGIA, Parkmead Group, Siccarr Point Energy, Total

