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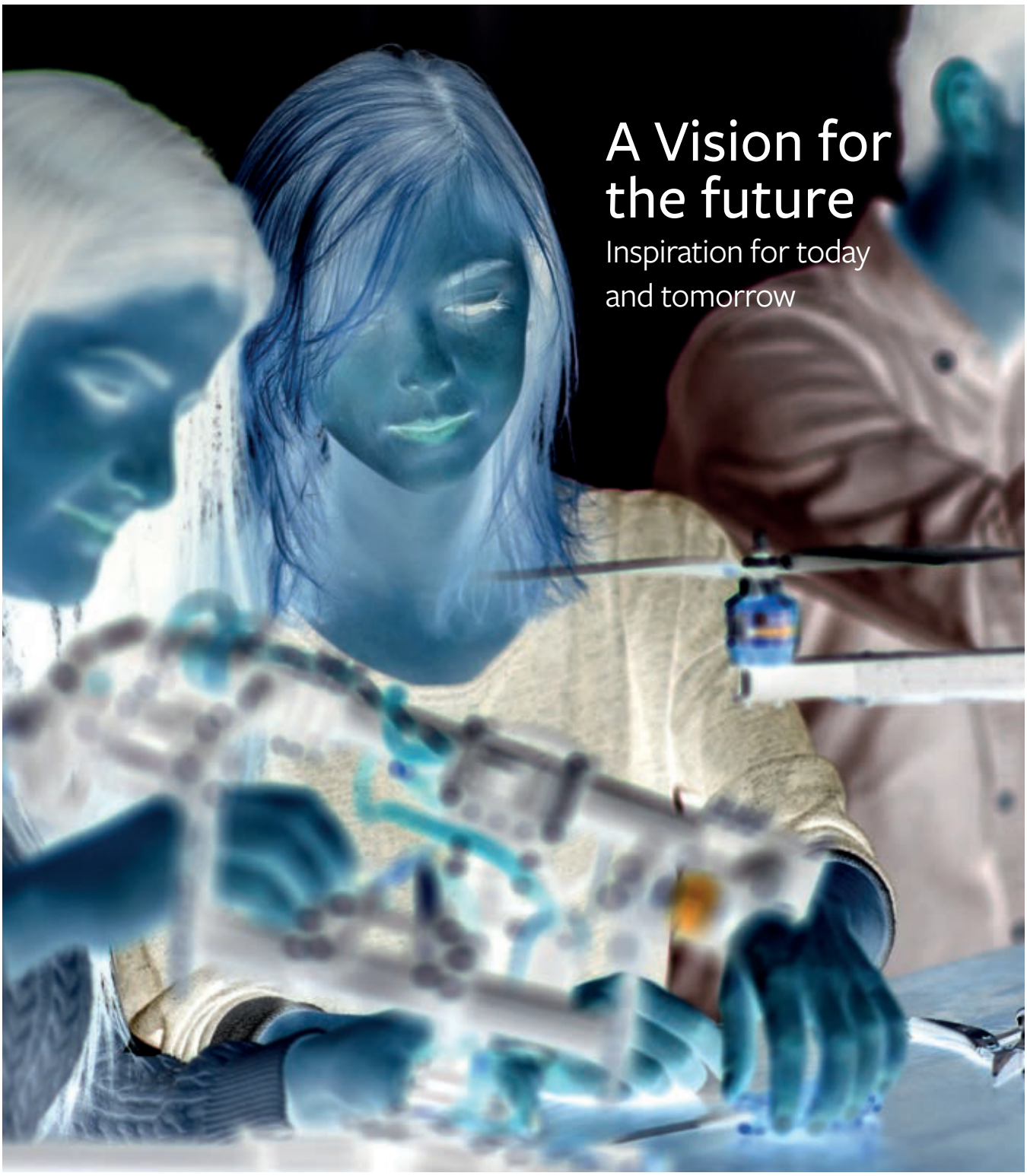
Spring 2019

wireline



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Issue 44 | Spring 2019

Welcome to Issue 44

Welcome to the 44th issue of *Wireline* magazine which, as you may have noticed, has a new look for 2019. With a refreshed publication and a developing online presence, we hope to expand the reach and scope of *Wireline* as a platform for the successes, challenges and goals of Oil & Gas UK (OGUK) members and the wider industry.

Aside from our new look however, we'll continue with business as usual: being a voice for industry and exploring the most important issues facing the UK offshore sector and its workforce. With that in mind, this issue also contains the first of a new dedicated section which profiles and promotes the work of individuals and companies in our membership. If you have good news that you think should be shared, let us know at editorial@oilandgasuk.co.uk.

From an exploration perspective, good news has arrived early this year. January saw CNOOC announce a major gas discovery at its Glengorm prospect, representing almost 250 million barrels of oil equivalent. Shared between CNOOC (50 per cent operator), Total and Euroil (25 per cent each), the discovery also lies close to the Elgin-Franklin platform and the Culzean project, offering promising opportunities for a swift tie-back.

OGUK also welcomed the launch of the National Decommissioning Centre in January. Established as a partnership between the University of Aberdeen and the Oil & Gas Technology Centre (OGTC), the campus outside Aberdeen will combine academic and industry expertise with the aim of assisting in the 35 per cent cost reduction target set by the Oil and Gas Authority (OGA). Wireline covers the opening of the centre in more detail inside [p.16].

This issue also looks at the two overarching drivers for the organisation in 2019: Vision 2035 [p.18] and the energy transition [p.34]. In each article we explore the widespread changes in the UK continental shelf (UKCS) and wider energy industry, how they affect the oil and gas sector and our goals for the medium-term.

Looking offshore, we also profile two of the more intriguing developments underway in the North Sea. First, we hear from the companies behind the Tolmount Main development — Dana Petroleum, Premier Oil and Kellas Midstream — and the first-of-its-kind midstream model that has enabled the project to proceed [p.28]. We also speak with Apache North Sea for insight into how its team took the Garten prospect from discovery to production in just eight months [p. 38].

Finally, we look at the emergence of new 'turnkey' decommissioning providers — companies offering to take entire assets from late-life through to removal, re-use and recycling — and how these dedicated companies may change the face of decommissioning in the North Sea and beyond [p. 22].

For now, we hope you enjoy the new-look Wireline and look forward to bringing you plenty more news, stories and insight in the coming year.

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Oil & Gas UK

Wireline is published by Oil & Gas UK, the voice of the UK oil and gas industry.

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Industry excellence recognised at Oil & Gas UK Awards

More than 500 people from across the industry gathered to celebrate pioneering individuals and companies for their contributions in business innovation, workforce engagement and decommissioning at the 2018 Oil & Gas UK Awards, held in Aberdeen in November.

Hosted by Channel 4 presenter Cathy Newman, the ceremony recognises outstanding performance from companies, as well as high-performing individuals, for their unique, positive and notable contributions to the sector.

Praising the winners, Deirdre Michie, chief executive of Oil & Gas UK, said: "Our awards are a highlight of the industry calendar and are an opportunity to celebrate the achievements of the people in our pioneering sector, which continues to adapt, improve and build its strength even in the face of the tough challenges in recent years.

"Hearing about the remarkable achievements by companies and individuals reinforces the bright future which lies ahead for the UK's offshore oil and gas industry."

Winners

Apprentice of the Year (sponsored by OPITO)
Ryan Fernando, Aker Solutions

Graduate of the Year (sponsored by ECITB)
Gareth McQueen, Shell U.K. Limited

The Oil & Gas UK Mentor of the Year Award 2018
Giuseppe Tizzano, BP

The Oil & Gas UK Diversity and Inclusiveness Award 2018 (sponsored by Spirit Energy)
BP North Sea BRGs

The Oil & Gas UK Workforce Engagement Award 2018 (sponsored by Fairfield Energy Limited)
Shell U.K. Limited

The Oil & Gas UK Business Innovation Award 2018
SME – AIS Training
Large Enterprise – Stork, A Fluor Company

The Oil & Gas UK Excellence in Decommissioning Award 2018
CNR International (UK) Limited

The Oil & Gas Authority MER UK Award 2018 (sponsored by Oil and Gas Authority)
CNR International (UK) Limited
HGSL, Dana Petroleum and Premier Oil

UK government backs CCUS

Energy Minister Claire Perry officially launched a government action plan to deliver the UK's first carbon capture usage and storage (CCUS) project by the mid-2020s. Launched at the International CCUS Summit in Edinburgh on 28 November, the

plan highlights the critical role of oil and gas in enabling carbon-capture technologies to be deployed at scale by the 2030s.

The plan includes an investment of £175,000 in Project Acorn in St Fergus, Scotland, which will be matched by Scottish government and EU funding. The government also plans to work with industry and other bodies to identify existing oil and gas infrastructure which could be re-used to support the development of CCUS in the UK.

Commenting on the action plan, Oil & Gas UK chief executive Deirdre Michie said: "The UK's offshore oil and gas industry stands ready to support the development of carbon capture, usage and storage. Our supply chain is uniquely positioned to deliver cost effective, competently engineered solutions for CCUS.

"As the UK Government's plan notes, our world-leading sector enjoys a highly skilled and experienced workforce, established infrastructure and existing support for the work of the task force. Coupled with our ambition to meet more of the UK's energy demands from indigenous resources over the longer term, outlined in Vision 2035, we recognise the important role we have to play in moves towards a lower carbon economy."

Read the *UK Carbon Capture Usage and Storage deployment pathway* at gov.uk.

Decommissioning Insight 2018

Oil & Gas UK's 2018 *Decommissioning Insight* was launched at the Offshore Decommissioning Conference in St Andrews, in late November 2018, and provides a fresh forecast of activity over the next ten years (2018–27).

The report reveals that decommissioning expenditure is expected to run at about £1.5 billion per annum over the next decade, 20 per cent lower than forecast in 2017. Reductions have been driven by improved productivity (including cost reduction, efficiency improvement and deflation) coupled with the movement of some work beyond 2027. This demonstrates that the decommissioning market is maturing and making significant inroads to deliver on the OGA's 35 per cent cost reduction target.

The report finds that 1,465 wells are expected to be decommissioned over the next ten years, representing one-fifth of total UKCS well stock. The UK continues to represent the majority of work; over 950,000 tonnes of topsides are scheduled for removal across the North Sea, of which just over 605,000 tonnes will be from the UKCS.

As a result, decommissioning on the UKCS offers first-mover advantage for skills, expertise and the supply chain, which UK companies can capitalise on – with the correct help

To find out more, download a copy of the *Decommissioning Insight 2018* now.

LOGIC launches standard decommissioning contract

Oil & Gas UK subsidiary LOGIC (Leading Oil & Gas Industry Competitiveness), has published a new standard contract, aimed at helping companies committed to delivering offshore decommissioning excellence. The standardisation of legal contracts, spearheaded by LOGIC in partnership with industry, improves the efficiency of drafting, executing and negotiating commercial agreements.

The not-for-profit organisation, which this year marks its 20th anniversary, continues to play a key role in helping companies improve competitiveness by simplifying transactional processes in the offshore oil and gas industry. More than 24,000 downloads of LOGIC's suite of Standard Contracts have been recorded globally since April 2014.

Image left: Decommissioning manager Joe Leask addresses the Offshore Decommissioning Conference in November 2018.

The general conditions of contract for offshore decommissioning covers complete decommissioning of infrastructure, from cessation of production to delivery of structures to shore. It is available from the LOGIC website.

Commenting on the release, LOGIC managing director Graham Elgie said: "This model contract developed by Oil & Gas UK's Legal Issues Forum provides companies and their contractors with a framework for working towards commercial agreements in a timely, co-operative and effective manner. This couldn't have been achieved without the support and expertise provided by industry, particularly the members on our Decommissioning Task Finish Group."

Environment Report 2018

The 2018 *Environment Report* was launched in December 2018, providing an update on the environmental landscape of the UK offshore oil and gas industry to the end of 2017. The report analyses and interprets data gathered and monitored by the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED), and considers performance across a range of areas including emissions to atmosphere, chemical discharge, waste disposal and produced water.

The insight also provides a summary of activities undertaken by Oil & Gas UK groups over the last year to support the development of new environmental legislation, to share lessons learnt and good practice, and to improve industry environmental management.

2017 saw a reduction of 3 per cent in the volume of produced water discharged to sea during oil and gas production compared to 2016, although the total amount of dispersed oil contained in the produced water discharged rose slightly to 2,140 tonnes. Meanwhile, reinjection of produced water increased by 10 per cent on the year and is at its highest recorded level.

Greenhouse gas (GHG) emissions per installation were lower in 2017 than in 2016. Industry's GHG emissions contribute around 3 per cent of the total UK emissions, the same proportion as in 2016. Over the same period carbon dioxide (CO_2) emissions from the UKCS saw an increase from 13.1 million tonnes in 2016 to 14.2 million tonnes in 2017, although the sector's long-term trend for CO_2 emissions continues to fall.

Commenting on the report, Oil & Gas UK environment manager Katie Abbott said: "The UK Continental Shelf is a mature and complex basin, and the challenges that accompany the production of hydrocarbons here mean that the data outlined in this report are equally complex.

"While innovative technology is contributing to environmental performance, through enhanced oil recovery which includes produced water re-injection, and the reduction in associated gas flared, challenges remain in other aspects.

"With that in mind, this annual report provides an opportunity for industry to review environmental performance indicators, reflect on the compliant practices and focus on areas where there are opportunities to drive further improvements."

To find out more, download a copy of the *Environment Report 2018* now.

Seismic survey vessel

CDA to operate UK's first oil and gas National Data Repository

Common Data Access Ltd (CDA) has confirmed a deal with the Oil and Gas Authority (OGA) to launch the UK's first National Data Repository (NDR) for offshore geoscience data.

The heart of the repository will be the collection of technical well and seismic data established by CDA and its industry members over the past 25 years. Users will be able to obtain the majority of the information free of charge, gaining access to one of the largest quantities of geoscience technical data ever made available.

The NDR was initially rolled out to UKCS licensee companies on 20 February and is slated for launch to the public in March.

Call for comments on IMHH 2022

The current industry mutual hold harmless deed (IMHH) 2012 scheme expires on 31 December 2021 and LOGIC is looking to begin the preparation for IMHH 2022 during 2019. This preparation is well in advance but consistent with the timeline taken for IMHH 2012, with that Deed being signed in 2009.

A call for comments on any changes required for IMHH 2022 was put to IMHH signatory contacts in 2017. However, some of the comments received did not reflect an understanding of what the scheme is intended for (as minuted at the Legal Issues Forum meeting held November 22 2018).

Therefore, LOGIC now seeks the comments from Oil & Gas UK groups, including the Legal Issues Forum, Supply Chain Forum & Operators Legal Committee.

Should you have any suggested amendments to make to the current IMHH 2012 Deed, then please advise LOGIC by the end of March 2019. If comments are received, a Task Finish Group (TFG) may be formed to review the suggested amendments. If a TFG is set up, it will be with a timeline of completion for end Q2 2019.

If no comments are received, LOGIC will advise of the sign-up process for IMHH 2022 later in the year.

To submit comments or queries, please contact LOGIC via logic@oilandgasuk.co.uk

Leading supply chain voice joins OGUK board

Oil & Gas UK has appointed a new member to its board to bolster ongoing efforts to maximise economic recovery from the North Sea and reaffirm strong competitive conditions.

Sian Lloyd Rees, UK country manager and SVP of customer management at Aker Solutions, has been appointed to represent the services sector as the trade association looks to boost supply chain opportunities both at home and abroad. With over 25 years' experience, Sian Lloyd Rees joined Aker Solutions following

several key leadership roles in blue chip and start-up companies.

Her career began in the oil and gas industry at Stena Offshore and Halliburton before progressing into the IT industry with positions at Petrocosm and Oracle.

Commenting on her new position, Lloyd Rees said: "I'm delighted to join the board of Oil & Gas UK and look forward to championing our industry as we look to realise our ambitions outlined in Vision 2035.

"Our industry is still facing many challenges and our continued efforts to deliver safe, reliable and affordable energy for the UK will be ensured through improved efficiencies, application of technology, and collaboration.

"I look forward to being part of the board, working alongside Oil & Gas UK's leadership team as they seek to deliver tangible results."

Images below, from top: Oil & Gas UK chief executive Deirdre Michie addresses attendees.

Oil & Gas UK operations optimisation manager, and author of *The Oil Industry's Best Kept Secret*, Katy Heidenreich presents at the launch event.

New book profiles energy industry's leading women

November 2018 saw the publication of an inspirational new book, aimed at shining a light on leading women in the UK's offshore oil and gas industry.

Titled 'The Oil Industry's Best Kept Secret: A book full of inspiration and advice', the project, penned by author and Oil & Gas UK operations optimisation manager Katy Heidenreich, aims to encourage more girls to pursue careers in the energy sector.

Oil & Gas UK supported the guidebook's publication and praised Katy Heidenreich for shining a light on talented women working in the industry.

It includes profile pieces, advice and facts drawn from interviews with high-profile women across the sector. Participants include Dame Judith Hackitt, chemical engineer and leading health and safety expert who most recently led the UK Government's independent review into building regulations and fire safety following the Grenfell Tower tragedy; lead geologist at Shell UK Ltd, Caroline Gill; and BHGE wireline field specialist, Lauren Adams.

For more information, visit www.womenininindustry.co.uk

Image below: (L-R) Subsea UK CEO Neil Gordon; OGUK continuous improvement manager Mariesha Jaffray; Scottish Enterprise head of oil and gas David Rennie; Subsea 7 SVP projects and operations for SURF and conventional and ETF Chair Phil Simons; Bel Valves CEO Bruce Heppenstall.

ETF Roadshow goes subsea

Oil & Gas UK's Efficiency Task Force (ETF), in conjunction with Subsea UK and Scottish Enterprise, hosted a free ETF Breakfast Roadshow for the subsea community at the Chester Hotel in Aberdeen in November 2018. The event explored and shared ways the subsea community can work together to improve the competitiveness of the UKCS.

Over 70 delegates attended the roadshow, where ETF members presented on case studies exploring good practice guidelines for subsea standardisation and simplification. The session also included examples from ongoing subsea optimisation initiatives, including the Scottish Enterprise Subsea Action Plan and an update on the underwater initiatives being progressed under the sector deal proposal.

Speakers included Phil Simons (Subsea 7), Dr Mariesha Jaffray (Oil & Gas UK), Colin Thomson (Oil & Gas UK), Neil Gordon (Subsea UK), David Rennie (Scottish Enterprise) and Scott Cameron (Subsea 7). Presenters, as well as Bruce Heppenstall (Bel Valves), who facilitated discussion around barriers and challenges faced specifically by the subsea community.

Phil Simons, senior vice president at Subsea 7 and ETF chair, said: "The ETF roadshows continue to play an important part in sustaining the industry-led efficiency efforts set out in 2015. At each roadshow it has been rewarding to hear the diverse mix of ideas being shared, and the possibilities these offer to achieve greater simplicity and efficiency, while also challenging old habits."

Dr Mariesha Jaffray, Oil & Gas UK's continuous improvement manager, added: "We know that through collaboration, companies are able to reduce costs, share knowledge and maximise the economic recovery from the basin. The roadshows are a great opportunity to share the good work being done across industry to improve efficiency. They are also key to building on what the Efficiency Task Force has already achieved."

Engineering scholarship offered to Shetland pupils

January 2019 saw Oil & Gas UK decommissioning manager Joe Leask launch the third year of his successful STEM scholarship programme. Aimed at students from Shetland's Anderson High School (AHS)—which Leask himself attended—the scholarship provides funding to help students pursue further education in STEM subjects.

This programme aims to select a well-rounded candidate based on the criteria introduced by the Curriculum for Excellence. After an initial presentation by Joe, AHS students are invited to submit their interest via a CV, with the school helping them to develop real-life experience in preparing a professional document.

Successful candidates are passed to interview and selected based on their enthusiasm, potential and drive. The winner will then receive £500 towards further education in science, technology, engineering and maths subjects.

"Engineering is a very broad topic and I am keen to encourage a wide variety of students into the field and to support expertise and interest in every area," Leask said. "At present, the skills shortage is particularly apparent in the North Sea decommissioning industry. One of my goals is to shape this industry, and creating awareness and developing talent is one way to progress towards achieving this."

Images below taken at the 2019 Exploration Conference.

Exploration Conference reflects industry's determination to revitalise exploration

Education, engagement and transparency were keywords at this year's Exploration Conference in London where Oil & Gas UK operations optimisation manager, Katy Heidenreich, welcomed nearly 200 delegates to participate in the popular annual event aimed at boosting exploration on the UK Continental Shelf.

Now in its sixth year, the conference has a track record for promoting transparency in information sharing, learning, networking and discussion to help improve exploration success. Reviews of six challenging well campaigns were shared by BP, Chevron, Shell UK, Azinor Catalyst, Apache and Norske Shell, providing delegates with valuable insight into different geologies, complex projects and regional locations.

The event attracted international interest with participants travelling from countries including Norway, the Netherlands and Germany keen to learn from their peers and contribute to collective knowledge on the topics under discussion. Ensuring the expertise of experienced explorers and well specialists is shared with next generation was a prominent theme during the interactive questionnaire and panel sessions, where it was noted that this year's event had attracted more young professionals than ever before.

Discussions also centred on the importance of broadening education about the role oil and gas will play in the lower-carbon future.

Events

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20 March

Business Outlook 2019 Aberdeen Breakfast Briefing

AECC, Aberdeen

Sponsored by Deloitte

20 March

Business Outlook 2019 London Breakfast Briefing

White & Case LLP

Sponsored by White & Case

15 May

Oil & Gas UK Examining Doctors Conference

The Hub, Edinburgh

4–5 June

OGUK Industry Conference – An Industry in Transition

AECC, Aberdeen

Principal Sponsor TOTAL

25 June

Oil & Gas UK Aviation Seminar

AECC, Aberdeen

Sponsored by CHC

29 August

Offshore Safety Awards

TECA, Aberdeen

4 September

Economic Report 2019 Aberdeen Breakfast Briefing

TECA, Aberdeen

4 September

Economic Report 2019 London Breakfast Briefing

White & Case LLP

12 September

Legal Conference

TECA, Aberdeen

Sponsorship and exhibition opportunities are available.
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Member News

GreatWhite circles waters of Loch Kishorn

Scotland's Loch Kishorn will once again host an offshore drilling rig, as Kishorn Port Ltd (KPL) secures its first major contract. The loch was last home to the Ninian Central oil production platform — the largest concrete oil structure ever moved across earth — which was towed out of the port in 1978. In late 2018 however, the yard welcomed the mammoth Ocean GreatWhite, a semi-submersible offshore drilling rig.

Owned by drilling contractor Diamond Offshore, the Ocean GreatWhite weighs 60,800 tonnes and is a sixth generation harsh-environment drilling rig capable of drilling to 10,000m in 3,000m of water. And with a draft of over 23 metres, Loch Kishorn provides ideal sheltered conditions for a rig of this size.

The Ocean GreatWhite has been in transit for over five months, travelling from Singapore. While at Loch Kishorn, the rig will be prepared for a program set to start in the North Sea early 2019.

KPL director Alasdair Ferguson visited the rig while it was still in transit, adding in a statement that: "I couldn't fail to be impressed by the sheer scale of the Ocean GreatWhite. We hope that the berthing and support to the rig will herald a new era of engagement in the oil and gas industry at Kishorn."

KPL was created in 2008 to restore the Kishorn Yard and dry dock as a major facility for supporting the North Sea oil and gas sector and the manufacturing of renewable energy components. The group secured a comprehensive Masterplan permission in 2013 and has been promoting the yard for the last 6 years.

Director Simon Russell added: "After many years of working on the Kishorn project, this is a great step towards its future regeneration and the creation of local jobs and opportunities."

Augean wins Shell decommissioning contract

Augean North Sea Services (ANSS) has secured a contract to support Shell in decommissioning the Curlew floating production, storage and offloading (FPSO) vessel. Augean will provide specialised industrial cleaning, NORM Decontamination and waste management before the vessel can be dismantled, recycled and disposed of, to ensure environmental compliance.

ANSS is an environmental services company supporting the oil and gas industry, providing waste management services and industrial cleaning. In 2017, ANSS began developing a decommissioning decontamination facility in Dundee, in collaboration with Forth Ports and other tenants of the port of Dundee, where the Curlew FPSO will be docked.

Port manager of Forth Ports Dundee, David Webster, said: "This decommissioning related contract from Shell will bring an exciting large-scale project to the Port of Dundee. As with all of the other major Dundee projects to date we continue to prove that the Port of Dundee's marine and infrastructure capabilities are suitable for large-scale oil and gas activities. Our supply chain partners such as Augean North Sea Services have been very successful by choosing to be based within the port and working closely with Forth Ports to deliver and execute these contracts."

READ expands offering with PDS acquisition

READ Cased Hole, a global provider of production logging, well integrity and reservoir evaluation services to the oil and gas industry, has acquired US-based well integrity specialist Proactive Diagnostic Services. The acquisition positions READ to better support operators worldwide in the provision of data interpretation expertise and downhole technologies.

Founded in 1995, PDS provides a number oilfield services including surface readout and memory diagnostic technologies, data analysis, and proprietary software. With its roots in the Alaskan oil industry, the company has since also expanded into the Gulf of Mexico.

PDS president and CEO Joey Burton said: "Our passionate team has really focused

Image left: Diamond Offshore's Ocean GreatWhite rig.

Image below: (L-R) PDS president and CEO Joey Burton and READ CEO Roy Martin.

on providing superior service quality to our customers. I have every confidence that this unwavering commitment to supporting oil and gas operators in Alaska and throughout the US will flourish under READ's ownership and guidance."

In January 2019, READ also announced an exclusive partnership with Luxembourg-based ALT to test and characterise the latter's ABI-43 tool—an acoustic borehole imaging technology from the mining sector which it says can offer a new, cost-effective solution for downhole casing and cement evaluation in oil and gas.

New research shows a positive outlook for the UK oil and gas sector

Industry professionals are reporting increased confidence in the prospects of the UK oil and gas industry. Confidence levels have quadrupled from 18 per cent to 71 per cent in just two years, according to research carried out by DNV GL for its ninth annual report on the outlook for the oil and gas industry, this year titled *'A test of resilience.'*

Around 67 per cent of senior oil and gas professionals believe that more capital-intensive oil and gas projects could be approved in 2019 and 68 per cent plan to increase or maintain capital expenditure this year.

Hari Vamadevan, DNV GL regional manager for UK and West Africa said: "The significant boost in expectations for spending are welcome signs of an industry that is, for the most part, prepared to close the chapter on a string of challenging years."

A third (33 per cent) of respondents also believed stricter cost efficiency would take hold in their organisation this year. About

41 per cent experienced price inflation from suppliers in 2018 and even more (44 per cent) expect supplier to drive price inflation in 2019. Skills shortages and an ageing workforce are considered the biggest barriers to growth (39 per cent).

Fortunately, recruitment is back on the agenda for many companies with 48 per cent of UK senior professionals reporting that they expect to grow their workforce in 2019. Furthermore, over one-third (37 per cent) of UK oil and gas professionals expect increased spending on research and development.

Digitalisation is the research and development priority for companies in 2019. The priorities of the UK's industry digitalisation agenda all relate to data sharing, integration and access. Close to two thirds of respondents (63 per cent) believe their companies will prioritise the quality and accessibility of data in 2019.

With regards to carbon emissions and the energy mix, DNV GL's research shows that industry professionals in the UK are focussed on preparing for long-term decarbonisation. Decarbonisation operations in the UK are driven primarily by business opportunities and competitive advantage, while social and political pressure and regulations came second in terms of influence. A third (35 per cent) of UK respondents are looking to increase investment in renewable energy. A quarter (25 per cent) of respondents expect a significant increase in the part hydrogen plays in the energy mix in 2019.

ASCO enhances supply chain visibility with cargo tracking

ASCO, a provider of specialist materials and equipment management, has announced the roll-out of the first phase of its Paperless Driver's Initiative in Q1 2019.

The programme will initially focus on ASCO's driver fleet transporting cargo to and from its Peterhead onshore supply base, and leverages investment the company's Integrated Logistics Management System (iLMS). The system provides its customers with end-to-end visibility of their supply chain activities, allowing them to track their assets and benefit from the cost efficiencies of integration.

In Q1 2019 ASCO drivers will return cargo to vendors by transmitting consignment information, signatures and approvals via a handset-based app.

"In the same way that couriers use a handset to confirm the delivery of a package, our drivers will be able to return cargo to supply chain vendors without the need to produce paper copies. Real time electronic proof of delivery will then be available to our customers and their vendors via the iLMS dashboard," Jim Titmuss, group IT director, explained.

This is part of a range of enhancements that are being introduced at ASCO's flagship Peterhead Hub to improve service.

ASCO has been working with its clients to make them and their supply chain partners aware of the changes. Willie Smith, transport and distribution manager, adds: "We will engage with the vendor community to make these changes a success, and we're encouraging people to come forward if they have any concerns or questions regarding the planned change."

Centre of attention

The opening of the National Decommissioning Centre marks a step forward in developing home-grown UK expertise. *Wireline* spoke with key staff to learn more about the centre's key priorities and its world-class facilities.

Worth up to £826 million in funding, the Aberdeen City Region Deal has already proved transformative in developing a new blueprint for north-east Scotland. In the energy sector in particular, the creation of key organisations such as the Oil and Gas Technology Centre (OGTC), as well as investment in start-ups, transport links and digital infrastructure, are laying the foundations for the industry of the future.

The latest component to this strategy is the launch of the National Decommissioning Centre (NDC), a global research and development (R&D) hub developed in partnership between the University of Aberdeen and the OGTC.

Government ministers joined local leaders and industry supporters on 11 January to celebrate the launch of the £38 million partnership. The Newburgh site was opened by UK Government Minister for Scotland Lord Duncan and Scottish Energy Minister Paul Wheelhouse MSP, and forms part of the north east's Energetica Corridor.

Led by interim director Professor Richard Neilson of the University and OGTC industrial director Dr Russell Stevenson, the NDC will link academic and commercial expertise, with the aim of becoming the global leader in decommissioning. Its focus will be on reducing costs, extending field and asset life and re-thinking much of the common conceptions about the discipline, all of which will underpin the delivery of a 35 per cent decommissioning cost-reduction target set by the Oil and Gas Authority in 2016.

Bundles of activity

The site houses facilities for technology trials and rapid prototyping, with a hyperbaric testing vessel capable of simulating ocean conditions of 6,500m, an indoor freshwater immersion tank, environmental chambers for temperature testing from -40°C to +180°C and hangar space for technology design and construction.

New resources have been added too, including a 15kW industrial laser — a promising avenue for future subsea cutting tools — a new digital visualisation and collaboration suite, and a supercomputer cluster enabling the fast simulation and modelling of innovative decommissioning scenarios.

Alongside technical developments, projects will be initiated to study the financial and legal implications of decommissioning, particularly in issues such as liability once removal or derogation is complete.

Dr Stevenson also noted planned work on subsea bundles – another consistent industry challenge – and new methods of cleaning and waste disposal, as well as environmental research such as the DNA-mapping of marine growth and development of more eco-friendly methods of growth prevention.

Leveraging the power of the computing cluster, several projects will be highly data-driven and focused on streamlining and modelling many of the complex and disparate elements of a typical decommissioning scope. According to Stevenson, these will include tools to aid decision-making, software to better calculate the extent of greenhouse gas emissions during the decommissioning process and advanced AI modelling which will explore how human planners would react to certain criteria, such as new regulations or technology.

It is this multi-disciplinary approach which sets the NDC apart from many of industry and academia's previous efforts, which can often be somewhat siloed. "We see this very much as part of the centre's USP," he adds.

Professor Neilson too is enthusiastic about the ground-breaking nature of the centre. "The University of Aberdeen has the only MSc in decommissioning of offshore structures in the world at the moment – there are MSc programmes in nuclear decommissioning, but this is a first in this area." The University has also set up a centre for doctoral training in decommissioning.

At present the NDC is in advanced discussions with several anchor partners, each of whom will receive board seats and a say in steering the direction of the centre's research programme over three to five years. "We've already undertaken a scoping exercise with industry which has informed the initial research plan," explains Professor Neilson. "The NDC has a steering group which includes the director of the NDC, the industrial director of the OGTC and representatives from industry and partner companies. This group will frame the research programme and ensure that it meets industry's needs."

The NDC will also collaborate with R&D institutions, and industry bodies in the UK and internationally, while other industry or commercial partners would be welcomed to conduct research or project-specific work.

However, Neilson says the real promise of the NDC is in carrying this academic and practical expertise worldwide. "We believe there is a major opportunity to export skills and technology – most of what we develop here...should have direct applicability in other basins. The UK is at the forefront of decommissioning and the NDC has the opportunity to help capitalise on that."

Image left: Attendees at the opening of the National Decommissioning Centre, January 2018.

All roads lead to Vision 2035

Vision 2035 sets out the potential of the UK oil and gas industry to secure resources at home and boost supply chain exports abroad. OGUK chief executive Deirdre Michie explains more about the campaign, and why it matters.

As the UK's offshore oil and gas industry emerges from one of the most prolonged downturns in its history, it faces some of its biggest challenges to date. Globally, energy demand continues to rise unabated alongside the increase of global GDP, with oil and gas still expected to satisfy nearly two-thirds of the UK's energy needs by the late 2030s.

At the same time companies continue to face fierce international competition for investment against other basins, requiring the industry to focus on sustaining and deepening its competitive position through efficiencies and cost focus. From securing the next generation of skilled talent to seizing fresh opportunities in technology and decommissioning, industry stands at a crossroads.

We speak to Oil & Gas UK chief executive Deirdre Michie about the industry's Vision 2035, what it is and why it might hold the key to unlocking the full potential of the UK's pioneering energy sector.

What's your verdict on where industry is now?

In our 2018 *Economic Report* we said that industry is at a crossroads. What we're seeing as we emerge from one of the most sustained downturns in our history, is that the tremendous effort from industry with the engagement of Government and regulator are yielding results: improved operational performance, a more competitive and stable tax regime and a sector that is more efficient and open to new technology and smarter ways of working.

In 2018 we also saw more project approvals than in the previous three years combined. We ended the year on a bit of a high, with Apache's Garten coming onstream just eight months after discovery, and Total making a significant discovery with Glendronach. But we continue to see real pressures on the supply chain, which is critical to our success and will be looking to see how we can support the work flow increasing in the coming months. Keeping that pipeline of work flowing will be critical to sustained recovery, which is why we are still concerned about the record-low drilling rates in the basin.

Given that as an industry we are very much at a crossroads what we do this year will likely be what sets our path to the future. When we look at the challenges we face and the opportunities ahead of us, all roads lead to the need for a shared view of the future – one that we can all get behind, and that is Vision 2035.

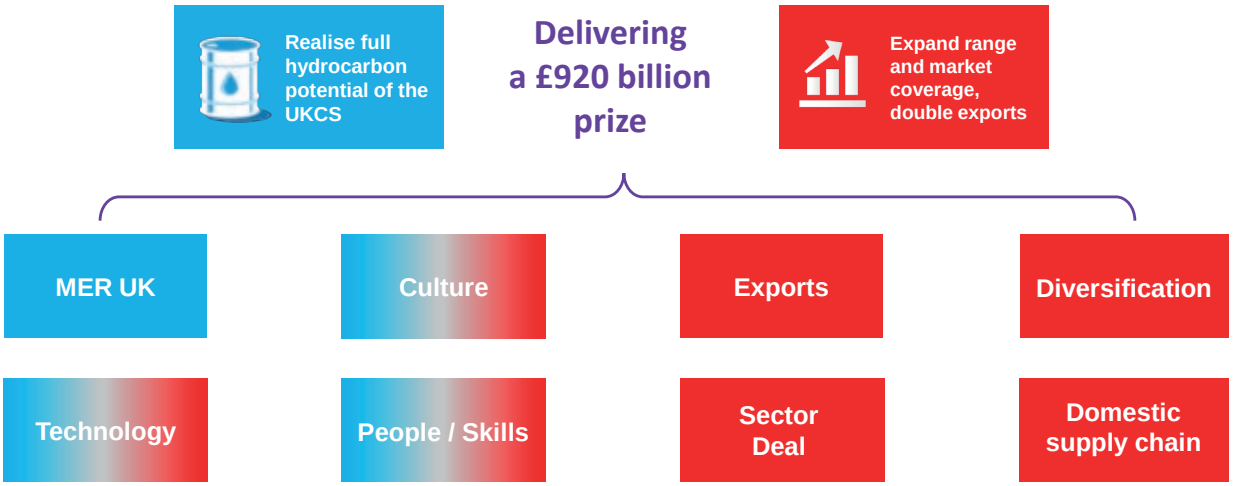
Can you tell us more about Vision 2035 and why we need it?

In essence, Vision 2035 is about a shared ambition of the potential of the UK's oil and gas industry. It has two main strands. One is about extending the productive and competitive life of our indigenous industry, sustaining jobs and contributing to the UK's economy and security of supply. The other is about taking full advantage of our world-class supply chain to support the industry at home, enabling it to win a bigger slice of the global market for energy services and to win business in other sectors.

By adding a generation of productive life to the UK Continental Shelf (UKCS) and expanding supply chain opportunities, we can ensure the UK's offshore oil and gas industry can continue to power the nation, support highly skilled jobs, contribute substantially to the economy and compete on the world stage for many years to come. It's a vision that has been developed and driven by industry, for industry.

That's the big picture; the value we can add for businesses, people, economy and society. In terms of numbers, it means realising the full hydrocarbon potential on the UKCS through our Maximising Economic Recovery (MER) agenda, which will result in us still producing more than one million barrels of oil and gas a day in 2035 – 70 years after production first started. Delivering the Vision will add billions of pounds of revenue to the books of companies in the supply chain, positioning it to double its share of international business and diversifying. This is why the Vision is important. Today, oil and gas provide about 75 per cent of the UK's primary energy, and are expected to serve 66 percent of demand by the 2030s.

Success requires industry wide engagement



Despite common misconception, UK oil and gas is in fact competing with imports – and not with new low-carbon technology – because even in an optimistic scenario for the decarbonisation of the UK and a positive view of production, output of oil and gas from the UKCS will be substantially less than what the UK needs.

We need as much of this demand as possible to be met by indigenous production, ensuring that the UK has a secure supply of energy for years to come.

Where did it come from?

The Vision itself was developed by the Oil and Gas Authority (OGA), OGUK, industry and governments in 2016 when we recognised the need for a shared clear and compelling vision for the future. It doesn't have a single "owner".

Delivery of the Vision is being steered through a collaborative task group of industry leaders, each charged with reaching out to the industry to deliver the widest buy in possible. In the Vision 2035 Task Group we have the Oil and Gas Technology Centre (OGTC), OPITO, Scottish Enterprise, OGUK, OGA, the Supply Chain Export Task force and the Culture Change Champion. They are supported by a cross-industry communications advisory group and all are working together to plan how best to communicate the Vision and to illustrate the positive steps being taken to realise it.

Why the focus on 2035?

The benefit of a date some 16 years out is that it enables us to be brave in what we consider is achievable because it is beyond our typical three-year business planning cycles, without feeling so far in the future that we couldn't relate to it, or could get away without doing things right now to achieve it. By the time we get close to 2035 our focus will have to be further out but for now it provides a helpful way to visualise and express what we can achieve in the longer term.

2035 allows us to be bold without being imaginary; one analogy is that instead of dreaming up time travel we are thinking about how technological advances will transform our travel.

You've said Vision 2035 is owned by everyone. Who is ultimately responsible for ensuring it's delivered?

We all are! Having said that, I've set up a Vision Task Group with the support of the other organisations involved to help provide a point of focus on each of the areas central to its success. In the short term, this Task Group will help define what success could look like for each area and identify the practical steps that are being taken towards achieving them.

In the short term this will allow us to highlight activity and progress, but more importantly will open up conversations and spur longer-term actions as more and more people look to support the Vision. We've got a very important opportunity to provide create space for everyone to help realise the vision in whichever way they can. An important message we'll be looking to get out there is encouraging people to pick up the spirit and principle of Vision 2035 and run with it.

What does 2035 look like to you?

To me, 2035 would see a successful oil and gas industry in the UK, which continues to power the nation and to export its skills and capabilities across the world. We will be led by a passionate, diverse and talented generation of leaders who recognise how critical our industry is to so many of the challenges the world faces.

For someone just entering the sector, Vision 2035 should mean the possibility of rewarding jobs in an industry which can take them all over the world. That might be in technology, big data, engineering, communications or finance, and it might even mean taking their skills into different sectors. By having a shared vision of where this industry is going, I am

convinced our own people, investors, governments and businesses will see more opportunities and it will inspire our industry to thrive and realise its potential.

How can people learn more about Vision 2035?

As the champions of our industry, OGUK has a proud history of representing our membership, which includes operators, contractors and SMEs, to governments and decision makers. We are excited to be a key part of Vision 2035 and will be using it to tell a positive and compelling story about our industry and what it can continue to be in terms of its economic and societal contribution.

It's why we're leading a Vision 2035 campaign in collaboration with other industry bodies, to give everyone the tools to bring the vision to life in their own business, to their investors and to the people in our communities. In the coming months we'll be formally launching our campaign which will include a website, shared materials for anyone in the industry to use and more information about how to get involved. We've been working closely with our members and other bodies in developing this campaign and we look forward to bringing it to life!

You spoke about the challenges facing industry, can you tell us more about them? How will the Vision help you tackle them?

We're operating in a fiercely competitive global market, and many of our challenges must be seen within that international context. Relative to other basins, we know that the UKCS does have higher operating costs, so it's important if we're to remain competitive and attract investment that we continue our focus on driving technological and process innovation to take efficiency to the next level.

Drilling remains at record-low numbers, indeed when it comes to exploration the levels haven't been seen since 1965, so attracting capital investment is key to finding new resources to progress them through to production. Maintaining a healthy production profile is critical for our security of energy supply, for our supply chain and of course to realise our shared ambition of maximising economic recovery from the basin.

One of our biggest challenges, operating in a competitive global market, will be attracting and retaining the brightest minds from diverse backgrounds. Without fresh talent and the openness of our people to embrace positive change, those challenges will be much harder to tackle. The Vision brings all of this together, with industry singing from the same hymn sheet on what we want to do, why we need to do it and how we're going to do it.

Our industry is very fortunate to enjoy many insightful and committed leaders who are ambitious for the future of the sector. This is very powerful, and the Vision can help channel this in the same direction.

"By having a shared vision, I am convinced our own people, investors, governments and businesses will see more opportunities and it will inspire our industry to thrive and realise its potential."

How key will technology be?

As we look to 2035, the digitalisation of our work will be increasingly important, particularly in remote operations, condition monitoring, sensor technology, visualisation, analytics and robotics. In the UK, we're fortunate to have a supportive government, a proactive research and development landscape with bodies including the OGTC and the Oil and Gas Innovation Centre (OGIC) supporting innovation, as well companies themselves at the forefront of these advances.

One of our members, OPEX Group, helps operators increase production through the smart application of predictive analysis. It's just one example of the world-class expertise housed here in the UK, which, with the right support, can be exported across the world and even into other sectors.

By identifying technology as a key theme of Vision 2035, we're clearly identifying where we can add the most value towards adding a generation of productive life to the basin and expanding supply chain opportunities.

You talk about technology – what will 2035 mean for jobs?

We know that our industry will need 40,000 new people to replace those retiring or leaving and among those up to 10,000 will be new roles which don't currently exist. This was identified in the Workforce Dynamics Review with OPITO and RGU's Oil and Gas Institute, which found that these new roles will be required in areas such as data science, data analytics, robotics, nano-technology, change management and more.

What this means for jobs and for our people is that yes, we will require new skills and need to ensure we prepare the workforce of the future to support this, but also, that the UK's oil and gas industry will continue to need a very highly skilled workforce.

For anyone considering their career options, Vision 2035 shows that the UK's offshore oil and gas industry is an attractive, pioneering and rewarding place to work and will be for many years to come.

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Dedicated to decom

A new delivery model has emerged in the decommissioning market, as specialist providers step in to offer late-life management and 'turnkey' services. *Wireline* spoke with two of them to find out more.

The decommissioning market is changing, both on the UK Continental Shelf (UKCS) and further afield. As many of the foremost oil-producing basins mature, platforms and installations at the vanguard are reaching the end of their lives, and questions of what to do with them — and how best to do it — have moved beyond the hypothetical and into widespread practice.

Oil & Gas UK's 2018 *Decommissioning Insight* estimates that around £15.3 billion will be spent on decommissioning in the region over the coming decade, with nearly 1,500 wells scheduled to be taken out of operation and over 950,000 tonnes of topsides earmarked for removal across the North Sea. Already, the data suggest that progress is being made; projected costs are down by around 20 per cent from 2017 forecasts — due in part, the report says, to ever greater levels of expertise and efficiency in this specialist arena as well as efforts to improve life extension and push work further down the road. This in turn is supporting more cost-effective project planning.

It also reflects a shift in the provision of decommissioning services and expertise, particularly exemplified in the emergence of new 'turnkey' providers who seek to shepherd projects from late-life through to removal, recycling and disposal.

Companies like Decom Energy and Maersk Decom are among the first to occupy this new space. Offering dedicated decommissioning packages, they are drawing on their own distinctive knowledge, experience and resources to create a fresh option when it comes to the post-production removal of offshore infrastructure. This new model is gaining ground against a backdrop of rising demand and opportunity on the UKCS.

The development of this growing bank of expertise — potentially positioning the UK as a leader in offshore decommissioning — is being nurtured among these turnkey organisations.

Trick of the tail

"Our business model is about taking control of an asset, say two years out from cessation-of-production (COP), at a point when it's beyond major capital expenditure," says Decom Energy managing director Graeme Fergusson.

"Our goal is to deliver those final barrels, in line with the Maximising Economic Recovery (MER) agenda. But at the same time we have a focus on decommissioning — accelerating some of the work that might otherwise be left until after COP. There's a lot you can get done up front, while still producing, that makes the tail end much more economically efficient."

Graeme says the emergence of groups like Decom Energy represent a "natural evolution" of the UK industry.

"The UKCS has great explorers, developers and producers, and if they think of themselves in that way they don't really want to focus on decommissioning. They are looking elsewhere for those solutions," he adds. "Our contention is that late life operators aren't necessarily the best people to decommission an asset, because they're programmed to extend field life.

"Upstream oil and gas companies are used to building and safeguarding assets for the long term. Finding oil and developing production is their specialism — and so it should be, as that's what creates value in that context."

The key to cost-efficient decommissioning, he says, lies in looking at field numbers in the round and getting beyond the common approach of the economics being driven primarily by a COP date that regularly moves, influenced by factors such as the oil price. The potentially "huge slew of decommissioning expenditure" that kicks in after COP needs to be factored into the equation at a much earlier stage.

Late life, early start

Jens Klit Thomsen, chief commercial officer at Maersk Decom, says: "What we want to do, in order to create the best possible decommissioning solution, is to be involved as early as possible – to work with the operator and get as much data as possible."

Maersk Decom was formally established in 2018 as a joint venture (JV) between Maersk Drilling and Maersk Supply Service, capitalising on the capabilities, assets and wider resources of the two companies to form a single decommissioning proposition. The 50/50 JV involves an overall investment of approximately US$20 million for the first years of operations, all overseen from headquarters in Denmark.

Both entities have a long track record in their respective fields: Maersk Drilling in supporting oil and gas production globally (it currently has a fleet of 24 drilling rigs), and Maersk Supply Service in the provision of marine services ranging from anchor handling, towing, mooring and installation, to subsea construction (supported by a fleet of 44 offshore support vessels).

The JV also builds on the companies' track record in decommissioning, not least in their joint work on the Janice, James and Leadon subsea fields in the UK North Sea. Maersk Supply Service has provided the marine assets on all three fields and led the planning, logistics, subcontractor management and engineering elements of the project, while Maersk Drilling has performed several well decommissioning campaigns.

Jens, who was then with Maersk Supply Service, played a pivotal role in assembling the integrated solution which was delivered via an Aberdeen-based joint project team.

"This project was a very good test case to see how the combined knowledge, experience and asset base in Maersk could form a really comprehensive solution in the decommissioning space," adds Jens. "It was decided to create a dedicated decommissioning company to allow us to take our new experience and learnings to the wider market."

With three years of decommissioning work now behind it — the Janice, James and Leadon project is scheduled for completion during 2019 — Jens says the JV is heavily focused on taking that experience into future contracts. "We are looking to develop continuously and create the most responsible and sustainable decommissioning solutions; from a safety and environmental standpoint, this is the most effective way of driving such projects," he says.

Jens explains that Maersk Decom deploys a lean organisational structure, based on a highly experienced team of specialist leads in areas ranging from partnerships, contracting and procurement to wells and waste management. It reaches into the resources of both Maersk Drilling and Maersk Supply Service — and the wider supply chain — to assemble an integrated, fit-for-purpose solution for each individual project.

"We have core project management capabilities, but we can scale on a project basis," says Jens. "We believe it's important for us to keep all the leading functions in-house to ensure we capture all the learnings from projects and incorporate those into planning for the next one."

Those same principles apply at Decom Energy, where its team of about 100 people reflects the holistic approach to the business. "We don't have lots of people working for us," says Graeme. "That's not what we are about; we are proud of our team leading the way in the final stage of the industry lifecycle, excelling in project management, technical and commercial expertise — all with the added benefit of an operator background. Our goal is to provide end-to-end-support, effectively to be the decommissioning arm for the licence owners who can have confidence in our own operator credentials."

"A key advantage for operators is that they don't have to build in-house decom teams, then subsequently disband them when the project is complete. Working with us means they don't have switch their internal resources to decommissioning activity and to have to go through the decommissioning learning curve."

Image overleaf: Decommissioning work at Janice, James and Leadon. Credit: Maersk Decom.

Image top: The Maersk Inventor. Credit: Maersk Decom.

Image right: Decom Energy managing director Graeme Fergusson.

Defying convention

Decom Energy — the parent company of UK-based operator Fairfield Energy — has its origins in a strategic decision taken by those behind the business to explore this potential gap in the market.

Fairfield took the decision in 2015 to cease production from its Greater Dunlin Area assets in the North Sea. Graeme, at that time chief financial officer with Fairfield, explains: "It was absolutely the right thing to do — Dunlin was 40 years old, and since COP in mid-2015 all our projections about likely future value have proved to be correct. It was right to approach decommissioning in this planned and controlled way."

That year Fairfield transitioned to a decommissioning operator, putting the decommissioning of the Greater Dunlin Area at the heart of its business and establishing a team focused on fit-for-purpose delivery. "Our strategic intent was to take our existing workforce with its in-depth asset knowledge, skills and experience and to provide career opportunities in decommissioning via the execution of a major decom project," adds Graeme.

"We could then take that expertise into new projects. It would give us demonstrable capabilities — a track record, which people obviously want to see."

Dunlin has been a highly complex decommissioning project, encompassing 45 platforms wells, which in many cases have posed technical challenges, as well as two subsea fields with 16 wells. It also involves 20,000 tonnes of topsides materials, a concrete gravity-based structure and an intricate network of subsea infrastructure.

Graeme says that, through delivery of a multiple-workstream project, Decom Energy has developed greater insight into not just the technical challenges of decommissioning, but also commercial aspects and how to manage stakeholders. "At Dunlin we are two thirds of the way through the plugging and abandonment (P&A) programme and are progressing subsea infrastructure decommissioning and preparations for the removal of the topsides. It's been a learning experience over the past three years – of developing best practice and taking real benefit from working in a complex decommissioning environment," he adds.

At Maersk Decom, Jens says the dedicated decommissioning model presents an opportunity to explore new commercial innovations — examining commercial and contracting models that incentivise the entire supply chain — as well as technical improvements.

He cites the example of using an anchor handling winch on a Maersk Supply Service vessel to recover flexible flowlines as part of the Janice project. "The conventional way is to recover them and cut them into pieces as you go along," he says. "But spooling them around the winch means we've been able to complete the work about 20 times faster.

"A key advantage for operators is that they don't have to build in-house decom teams, then subsequently disband them when the project is complete."

Fairfield Energy's Dunlin Alpha platform.

"It's important for us to keep all the leading functions in-house to ensure we capture all the learnings from projects and incorporate them into planning for the next one."

Maersk Decom
chief commercial officer
Jens Klit Thomsen

"The innovation lies in using a tool that was designed for something else in a completely different way, and achieving major efficiencies in a safe manner."

Jens says the JV closely follows technological developments in the market and sees the supply chain as a key part of its package. "Because we want to offer the full solution, then we have a focus on collaborating with the supply chain and forming relationships with the best suppliers of equipment and services.

"What is unique about decommissioning is that no two fields will be the same, so specialist solutions will be needed for individual projects." Jens explains. However, housing those skills in one place also allows expertise to continually improve, meaning these specialist solutions can be used more widely, and unique problems become more of a rarity.

Support from the supply chain is also an integral feature of the delivery model at Decom Energy, where the team has built a fit-for-purpose, integrated planning process. Graeme says these cost-efficiency principles are aligned with the strategic priorities of the Oil and Gas Authority (OGA), and its industry-wide objective to reduce decommissioning costs by at least 35 per cent (from baseline estimates made in 2016).

"What we have seen is that actually having control of a decommissioning project, across all its aspects, is key to an efficient outcome," he adds.

"If we can do it well here, we can do it well anywhere."

Shared benefits

While some UKCS assets are undergoing life extension, the volume of work for decommissioning practitioners is set to grow considerably. And even amongst the relatively new role of whole-service providers, already competition is increasing as more players vie for that workload. Major service companies such as Baker Hughes GE and Petrofac are also positioning themselves to provide similar turnkey offerings.

At this stage, Decom Energy's primary market focus is on the UKCS. "There are other major markets close by, such as Norway, that are not a million miles behind in terms of decommissioning requirements, so our initial expansion plans are around the UKCS and nearby," explains Graeme.

He adds, however, that there has been a "huge amount of interest" from other energy regions, including South East Asia and South America, in how decommissioning is being approached in the UK.

Decom Energy has hosted a series of international visitors, but Graeme says varying regulatory environments around the world will shape the longer-term strategic approach to internationalisation. "We are developing expertise in the UKCS which is largely transferable to markets such as Norway. Beyond that, we can explore how it might be applied more widely," he adds. "We've been hugely encouraged by our discussions with operators in the UK market, and strongly believe that the services we offer can lead to a step change in decommissioning delivery."

Maersk Decom, meanwhile, is projecting the addition of up to three new projects to its work schedule every year post-2020, again with a primary focus on the UK owing to the scale of the market opportunities. "We view the UK as a huge market and recent reports have underlined that," says Jens. "It is our focus area for now and it presents an opportunity for us to deliver effective solutions and develop a standardised approach, then take that experience and export it."

The success of these new turnkey models will of course depend on the market. However, Jens is confident that this is an avenue worth pursuing, and one which will be beneficial for all stakeholders: "We've talked to the market a great deal and have had very positive feedback from the operator community and the regulatory organisations. There's a shared view that this approach is needed to drive efficiencies in the decommissioning market."

Decom Insight

Since his appointment at Oil & Gas UK, decommissioning manager Joe Leask has noted the advent of this new type of decommissioning service provider. He is already confident of the effect they will have in terms of cost and efficiency on the UKCS, commenting that: "Continuity of projects and concentration of skills is vital for decommissioning cost efficiencies. In addition, the more companies using this model means increased competition, and that will be instrumental in driving costs down."

Dedicated companies with visible pipelines of work will also be better able to deliver continuous improvement in their operations, as opposed to the somewhat 'stop-start' approach of previous campaigns, which may limit the transfer of knowledge in operators or larger contractors with a broader focus. On the skills too, Leask says that the development and concentration of specialists in these areas will also ensure that their experience is not sapped away to other projects – all of which should also help to maintain costs.

The test for this new kind of provider will now be in securing sufficient volumes of contracts to ensure steady work. "It's perhaps easy to sell this model to the top level of management, but there may be a difficulty in pitching it to the technical levels of the industry whose jobs could be impacted by these models," he noted. While the turnkey model may be attractive on a project-by-project basis, the timing and alignment of multiple campaigns across the region will be equally important.

Oil & Gas UK has various methods of engagement with the decommissioning sector, from facilitating dialogue through Forums and Work Groups, to communicating knowledge and good practice at events and through publications, to working directly with governments and regulators to ensure fit-for-purpose legislation.

Most importantly, in Joe's view, is the fact that expertise honed on the UKCS is exportable globally. The UK has the opportunity to lead the way in terms of regulation, technical expertise and execution of complex decommissioning projects, and in turn the supply chain has the opportunity to the lead world in in the provision of new skills and services. "We need to make sure we take advantage of the spend on decommissioning by operators in the UK sector to develop a world-leading supply chain which can benefit the UK economy by selling their wares abroad," he added. "If we can do it well here, we can do it well anywhere."

Centrica's Easington terminal, where gas from Tolmount Main will be brought ashore.

Tolmount: all for one, one for all

The first greenfield project of its kind on the UKCS, Tolmount Main has united three very different companies to create a new blueprint for field development.

Holding around 1 trillion cubic feet (tcf) of gas, the Greater Tolmount Area is one of the largest prospects on the UK Continental Shelf (UKCS). Despite its sizable resource however, the path towards development has not always been smooth.

Located across Blocks 42/28c, 42/28d and 42/28e, around 40 miles off the Yorkshire coast, the southern North Sea prospect was first awarded to Dana Petroleum in 2005. Early exploration efforts — both by Dana and later under E.ON, which farmed in with a 50% operator stake — failed to make much progress, with drilling campaigns plagued by rig issues and well collapses. It wasn't until 2011, after an extensive redesign, that the partners successfully identified and flow-tested a gas column in the Lower Leman Sandstone Formation, and a further two years before appraisal wells confirmed the extent of the resources.

Compared with those early days, the project's fortunes now look very different. The fully appraised Tolmount Main gas field is estimated to hold around 500 billion cubic feet (bcf) of recoverable resources and forms the centrepiece of an award-winning partnership between E&P companies and a pioneering midstream infrastructure business. Having reached a final investment decision (FID) in August 2018, Tolmount is now on course to produce first gas by late 2020 and, at its peak, will produce up to 300 million cubic feet per day (cfd).

"We believe that it is the first independently owned greenfield offshore pipeline in the UK."

Alongside the ongoing co-operation between licence partners Dana and Premier Oil — the latter took on its 50% operator stake during the acquisition of E.ON E&P's UK portfolio in 2016 — the addition of energy infrastructure company Kellas Midstream (formerly known as CATS Management) has been instrumental in bringing the project to fruition. In a first-of-its-kind arrangement, a separate joint venture (JV) between Dana and Kellas has mobilised investment for the creation of a new minimal facilities platform and 48km pipeline known collectively as the Humber Gathering System, or HGS, which will carry gas to the Centrica Storage-operated Easington terminal.

It is the interlocking nature of these ventures that makes this project unique. "It went from one 50/50 partnership to two 50/50 partnerships," Kellas Midstream's operations director Alan Murray explained to Wireline. "The Tolmount field operators remained the same, but Humber Gathering System Limited (HGSL), a Kellas entity formed specifically for this project, and Dana became partners in the infrastructure."

Under the terms of the deal, Kellas and Dana will jointly fund, construct and own the infrastructure, with Kellas assuming operatorship. Once production begins the venture will be paid a tariff for gas transportation, adjusted based on the volumes delivered. Premier, meanwhile, is responsible for overall project management, and the delivery and completion of wells — but with a significantly reduced capital commitment than would otherwise have been necessary to realise the project.

This kind of co-operation between producers and infrastructure owners opens new routes for future UKCS developments and new perspectives on how Maximising Economic Recovery (MER UK) can be delivered. Wireline sat down with the HGS/Tolmount partners to find out more about how the partnership was created, and whether it could be replicated in future.

On good terms

An onshore tie-in had been the preferred export route for Tolmount for some time, although the project did require the right combination of partners. Dana Petroleum developments manager Eric Bell noted that: "We had ruled out tying into offshore infrastructure and were focused on coming to the east coast, around the Dimlington or Easington terminal infrastructure. That's when Premier came in, and we had a period of reflection before we advanced our FEED activities and

sorted out the ultimate offtake which was the critical feature to get the project going."

With this agreed, the next stage was to identify an infrastructure manager. "At that stage Premier was looking for ways to unlock this development and had considered various ways of making this happen — as a farm-down, a farm-out, raising more capital — and they landed on wanting to get involved with one of the infrastructure companies," Alan added. Conversations between Premier and Kellas Midstream began in early 2017, building on a pre-existing relationship established via Premier's operated interest in the Huntington field, which exports gas through Kellas' Central Area Transmission System (CATS) pipeline, and a partnership was established.

At the same time, Kellas conducted parallel discussions with Dana regarding the creation of a separate venture which would be responsible for building, installing, commissioning and operating the platform and pipeline infrastructure. This culminated in all three partners signing heads of terms agreements in September 2017, a mere six months since conversations began in earnest. "It was a lot done in a short space of time," concurred Premier Oil development projects manager, Craig Matthew, but with several years of FEED and scoping already complete, the parties were keen to identify and enact a swift route to development.

This positive, early engagement proved to be a sound bedrock for the rest of the development process. "We spent a lot of time on those heads of terms," Alan added. "That's one of the lessons we have picked out — getting those principles nailed down early — and we stuck to them right the way through."

Under the agreement Premier would continue as the joint development operator and not only drill, complete and manage the four development wells (subcontracted to Ensco), but also project manage the construction of the independent infrastructure. The preservation of Premier's ability to oversee the project and retain much of the traditional elements of operator-led decision-making and control proved a key decider in moving ahead, Craig noted.

Total development costs for the project stand at around £530 million, with Kellas funding approximately £175 million, and Premier around £90 million. As a partner in both the upstream and midstream JVs, Dana will match each of these respective contributions, totalling around £265 million.

In addition to future revenues from gas sales, the project presents a significant opportunity for the UK supply chain; 50% of that expenditure will be committed to UK companies, covering the platform, pipeline and terminal FEED engineering, and modifications to the Easington terminal to enable gas receival and processing.

The midstream model

Although common in regions like onshore North America, the introduction of midstream operators in the UKCS is relatively novel; with few exceptions, the tendency is for pipelines to be commissioned and built by the field operators themselves. The move towards a leasing model for greenfield developments, similar to those used in FPSO-based projects, opens up a new avenue for North Sea producers.

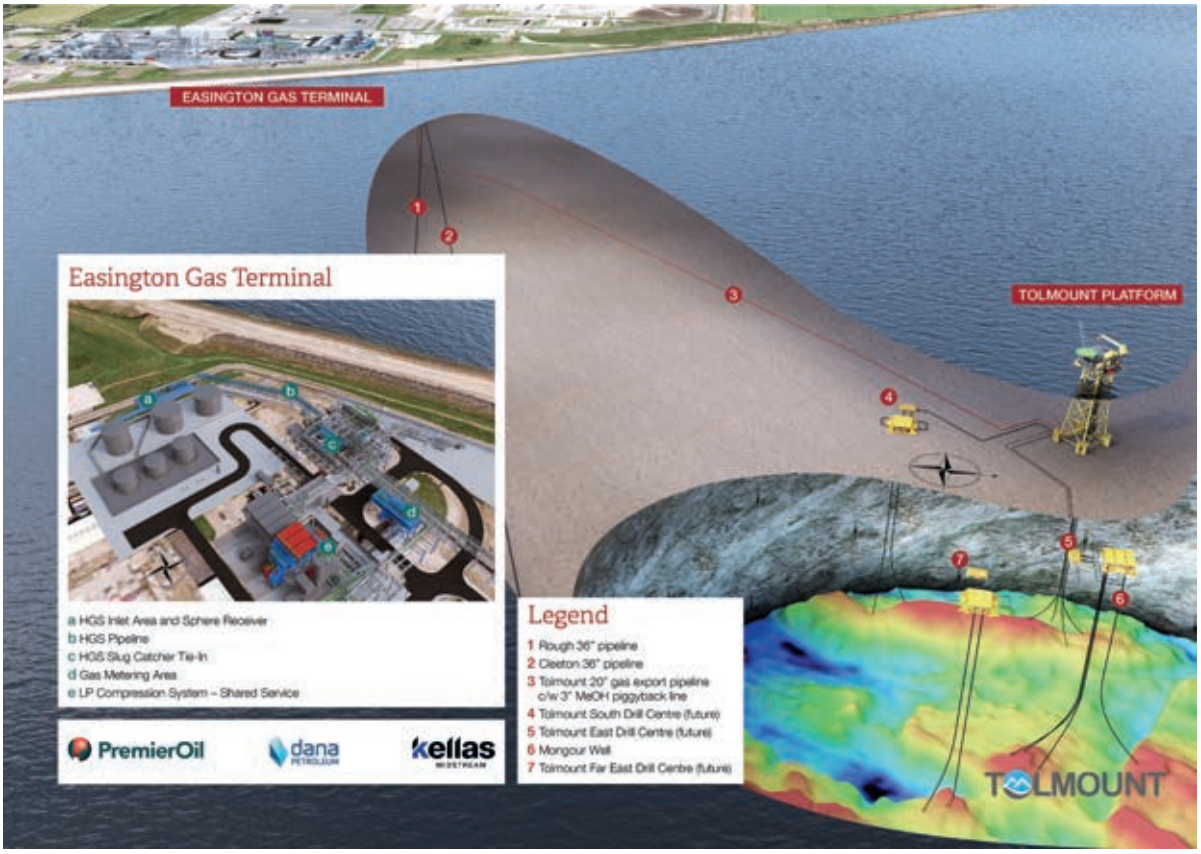
"The convention that we've broken here is that someone else can pay for that infrastructure and the operator therefore has more money to drill more wells, shoot more seismic and do more exploration."

Being ostensibly unique — "We believe that it is the first independently owned greenfield offshore pipeline in the UK," Alan confirmed — this approach presented challenges in writing and navigating commercial arrangements, but was important in unlocking an opportunity that may otherwise have been unavailable. "Upstream E&P companies generally want to invest in drilling wells and shooting seismic and producing their hydrocarbons. They invest in infrastructure as a means of getting that hydrocarbon to a point where they can sell it, and the cost of that infrastructure is a big chunk of the project," he expanded. "The convention that we've broken here is that someone else can pay for that infrastructure and the operator therefore has more money to drill more wells, shoot more seismic and do more exploration."

"The attraction of this model for Premier is that we retain our 50% ownership," added Craig. "With other models like farming down you dilute your stake in the hydrocarbons and we weren't really interested in doing that. It's a very attractive prospect and essentially in boe, [is] the same for us as our Catcher development, so we don't really want to dilute that value."

The construction of the agreement also changes the project's payback terms. In addition to significantly reducing the capital budget needed to get the project

Below: The blueprint for the HGS/Tolmount project.



in motion, Craig noted that it provided a reasonable measure of tax efficiency. "It's a lot better to have the expenditure down the operating curve rather than up front. It has worked for us in a lot of respects, and if we hadn't come up with this arrangement it's hard to see that the project would have actually moved forward," he added.

It is also a gateway opportunity for Kellas Midstream. Although built to accommodate peak production of up to 300 million cfd from Tolmount Main, the HGS platform and pipeline was conceived with overcapacity in mind, allowing for potential expansion of the field and surrounding area. "One of the important features was that the infrastructure was not intended to be Tolmount-specific. The idea was that it should be a system that had potential to bring in either additional Premier-Dana opportunities that we hope are in the area, and third parties," Eric noted. "That was an attraction for Kellas. They didn't just want a single development, they were hoping it would provide an opportunity that the bigger pipeline and higher flow rates bring."

More than that, the setup of the HGS infrastructure, which includes investment in additional risers and J-tubes, enables lower field development and tie-in costs for those future projects. According to Kellas, the pipeline could become a hub for southern North Sea production for at least the next 20 years.

This approach could be transformative for other areas of the UKCS. "From an MER UK perspective, having infrastructure owners rather than field operators owning that infrastructure, it does allow the potential

"From an MER UK perspective, having infrastructure owners rather than field operators owning that infrastructure does allow the potential to create new hubs and to get more out of the ground in these areas."

Tolmount Main / HGS

500 bcf resource

£530m capex

300 million cfd
peak production/pipeline capacity

48km pipeline

Minimal-facilities platform with six-slot well template and helideck access

Onshore tie-in at Centrica's
Easington Terminal

First gas scheduled for
Q4 2020

"We see the HGS/ Tolmount project as being directly replicable in other parts of the North Sea, in the UK side and Norwegian and Dutch sides."

to create new hubs and to get more out of the ground in these areas," Craig said. "If there is another party in there that is a bit broader-minded, then perhaps there is a bit more of a future for some parts of the North Sea if more projects are done this way."

Common ground

Despite the partners' commitment, the path to project sanctioning in August 2018 was not without its challenges. The largest, according to Kellas' Alan Murray, was the sheer volume and complexity of commercial agreements. While there was no silver bullet to overcoming this, he praised the work of commercial teams across the project who worked diligently to create terms that met the needs of all three parties. "It took a little bit of mapping out as to what we needed to do. All of the normal commercial agreements had to be created... [We] had to add additional agreements to manage the hand off between the Tolmount field to the HGS platform, but it wasn't outwith the wit of man to do it, it just took a little bit of time."

This was aided by regular engagement with a management steering committee and — crucially — an open-book economic model between all three companies, which removed many of the traditional barriers encountered during this type of negotiation.

"We spent a lot of time on having a set of fully termed agreements at FID. That was something we were all keen to do and it was a huge amount of work up front for our commercial folks, but going forward the pressure is off and we have aligned how things are going to work in future," he added.

"I think for all parties it just provides that level of clarity and commitment that allows us to go off and manage the project now, without the distractions of ongoing commercial negotiations," echoed Premier's Craig Matthew. "You have to find common ground, you have to find ways that work for all parties, and that was exemplified in the effort that went in pre-FID here."

There was also a late and significant change in scope. In late 2017, some months into discussions, the choice of terminal moved from Dimlington to Easington, creating a ripple effect through the project. Agreements had to be changed and new parties brought into the contracting process, but again the group's commercial teams worked to ensure the course was stayed.

A final learning experience for the group was how it communicated this blueprint to investors, supply chain and to UK regulators, including the Oil and Gas Authority (OGA), Department for Business, Energy and Industrial Strategy (BEIS), Health and Safety Executive (HSE) and Offshore Petroleum Regulator for Environment and Decommissioning (OPRED). All characterised the process as constructive and positive, with Dana's Eric Bell adding that: "I think the OGA were very open to new ideas, but we had to demonstrate it... I think if they saw MER was not being delivered then we would have had more difficulties but fortunately we were able, I believe, to show that it was being served."



(L-R) Premier Oil development projects manager Craig Matthew; Kellas Midstream operations director Alan Murray; Dana Petroleum developments manager Eric Bell.

"Bringing more infrastructure players into the development of the North Sea may offer something that might not appear if we all stayed traditional."

MER to come

Breaking new ground is never straightforward, but in this case the hard work and diligence of the HGS/Tolmount partners has also been noticed by the wider industry. In November 2018 the project was awarded an MER UK Award at the annual Oil & Gas UK Awards, in recognition of the project's contribution to these strategic goals.

Reflecting on why HGS/Tolmount was chosen, all felt that it was the spirit of co-operation that enabled the goals of MER to be met. "Collaboration is a bit of a buzzword that's been around for a few years, and MER relies on collaboration," Eric ventured. "I think you've seen the collaboration between three companies that had different objectives, and they created the alignment to deliver in what is quite a short period of time given the number of agreements and understandings that had to be demonstrated. I think [that] was one of the factors that we were viewed as having done well."

Added Alan: "I think the award panel saw the relationship, the positivity and the "can-do" nature of this... It was all done positively – there were no barriers and we are colleagues, not competitors." Indeed, that spirit has continued through FID and into execution; "Collaboration doesn't stop at the sanction stage," Craig assured.

At the time of writing, engineering and fabrication for the HGS infrastructure is well underway. Rosetti Marino cut first steel for the platform in December and "upwards of £20 million" in expenditure has already flowed through to the supply chain. Engineering and procurement of trees, wellheads and subsea pipeline have all begun, and according to a January operations update from Premier, first gas remains on schedule for the fourth quarter of 2020.

Beyond Tolmount Main, nearby prospects Tolmount East and Tolmount Far East — estimated to hold 220 bcf and 150 bcf of unrisked gas, respectively — are set for further scrutiny. 3D seismic acquisition across the whole area is planned for the first half of this year, as well as an appraisal well at Tolmount East in mid-2019. If successful, this could be developed either as a platform or subsea well and tied back into the Tolmount Main infrastructure, Craig confirmed.

With approval from regulators and accolades from peers, Tolmount marks something of a watershed moment in UKCS corporate collaboration. Kellas certainly is confident that a midstream-backed approach could be applied to other fields and developments in future, at home and abroad, given the right attitude and conditions. "We see the HGS/Tolmount project as being directly replicable in other parts of the North Sea, in the UK side and Norwegian and Dutch sides," Alan confirmed. "It has generated a lot of interest and we are actively speaking to a number of parties."

While all three representatives agreed that the model would not be suitable for every situation, they are hopeful that visibility of a project such as Tolmount may encourage others to think differently when it comes to offshore developments. "If we're successful there may be others that see [this] as a possible mechanism that would allow them to do something different," Eric suggested. "Bringing more infrastructure players into the development of the North Sea may offer something that might not appear if we all stayed traditional."

Primarily though, Tolmount highlights that collaborative behaviour need not undermine a profitable outcome. In fact, it may prove to be the key that unlocks developments that would otherwise have been overlooked (or over-priced). For Kellas' Alan Murray, it's prime example of the right assets being in the right hands: "We have three completely different reasons for involvement, but one solution. It just shows you that businesses can have different motivators, but it can still result in projects moving forward."

Embracing the energy transition

Amid calls for divestment and growing commitments to decarbonise energy, many are questioning the future of the oil and gas industry. The reality however, is that fossil fuels will play a key part in the quest to become more sustainable.

The latest report on global warming from the Intergovernmental Panel on Climate Change (IPCC), released in the autumn of 2018, warned that civilisation has "fewer than 12 years to drastically reduce [greenhouse gas] emissions to limit global warming to no more than 1.5°C." Beyond this threshold, the IPCC suggests that the consequences of such climate change will have a negative impact on the livelihood of millions of people.

Major changes are needed across all industries, particularly in energy, in order to prevent warming beyond this 1.5°C scenario. The IPCC estimates that the global net human-caused carbon dioxide emissions need to fall by 45 per cent by 2030, compared with 2010 levels, with the aim of reaching net-zero emissions in 2050.

To achieve such reductions, an 'energy transition' is needed. This refers to a series of major long-term structural changes facing the energy industry, the goal being to move away from dependency on carbon-intensive fuels.

Changes of this magnitude have happened before; for example, the replacement of coal by oil and gas as the largest suppliers of primary energy after WW2. Now, investment in alternative fuels and renewable energy are needed to limit climate change and pave the way to a net zero-carbon future—a situation wherein any greenhouse gas (GHG) emissions from the production of products that society needs are balanced by actions which remove the gas from our atmosphere.

Routes to a zero-carbon future

In the oil and gas industry, activists, shareholders and governments are increasingly putting pressure on energy companies to align their strategies with global climate change agreements. At the same time, firms across the sector — from the supply chain, to manufacturing, logistics and beyond — are exploring ways to improve their operations to produce fewer emissions and become more sustainable.

In the UK, efforts to decarbonise are largely directed by the 2008 Climate Change Act, a legally binding directive which requires the UK to set carbon budgets to reduce its greenhouse gas emissions by 80 per cent, compared with 1990 levels, by 2050.

There is no quick-fix for wide-scale decarbonisation. In the UK, as of 2018, oil and gas collectively make up 75 per cent of the country's primary energy supply, while renewables and waste (biofuel) make up 12 per cent. The challenge for the industry is to meet the demand for energy while promoting the role of renewables and carbon-neutral fuels in the energy mix.

Even under progressive low-carbon scenarios, continued investment in oil and gas production will be required. The International Energy Agency's Sustainable Development scenario estimates that around $600 billion of investment will still be needed for fossil fuels between 2017 and 2040, according to its 2017 World Energy Outlook.

Natural gas is the leading option in terms of a transition fuel towards a sustainable future, especially for generating electricity and providing heat. Of the three fossil fuels used in electricity generation, natural gas produces the lowest volume of GHGs per unit of energy produced; in many applications, it is also the cheapest and most efficient of the three.

Globally, demand for gas is also forecast to grow in support of both developing and developed economies, again particularly in heating and transport. In the UK, figures from the Department for Business, Energy and Industrial Strategy (BEIS) also show that approximately 80% of the country's 27 million homes are heated by natural gas.

Current UK carbon emissions are over 40% lower than levels in 1990, as a result of a changing energy mix that has increased the contribution of renewables while phasing out coal-fired power by 2025. The substitution of gas for coal in UK power generation has been the largest contributor to reducing UK carbon emissions. These changes have aided our ability to meet the 2020 targets set under the Climate Change Act. The UK's primary energy consumption has also fallen by approximately 18% since 2008 — achieved as a result of reduced energy demand.

75%

of UK primary energy supply is derived from oil and gas

ENERGY

TR&NSITION

Going forward, developments in renewable energy and energy storage technologies raise the possibility of an electricity system driven primarily by clean energy. However, the intermittency of renewables means that additional sources are needed and gas, currently responsible for about 40% of electricity generation, is the most suited for flexible generation.

Moreover, demand for electricity is likely to increase as we substitute other primary energy sources for electricity; for example, from the adoption of electric vehicles in place of petrol or diesel-powered models.

Although cars and light vehicles may increasingly be powered by electricity in future, other transport needs such as maritime transport and aviation will continue to depend on fossil fuels for the foreseeable future. Likewise, domestic heating remains a difficult area to decarbonise, requiring nationwide household infrastructure changes.

If the energy industry is successfully decarbonised, there will still be residual emissions from the production of oil products like certain petrochemicals, synthetic fabrics, lightweight composites and plastics. These will continue to be produced at an industrial level, and those emissions will need to be countered, possibly with large-scale carbon capture, utilisation and storage (CCUS) technology.

Furthermore, the development of technologies for the utilisation of alternative fuels or generation of energy from renewable sources requires energy, most likely sourced from the biggest contributors to the energy mix: hydrocarbons.

The substitution of gas for coal in UK power generation has been the largest contributor to reducing UK carbon emissions.

Changes within the industry

Many oil and gas companies are diversifying their outlook to become 'energy' suppliers. This has seen industry take steps towards exploring and investing into alternative energy, funding research and development while also reducing their respective carbon footprints. In many cases this is in response to the wishes of investors and consumers, but it is also a strategic opportunity. For example, Ørsted (previously DONG Energy) divested its oil and gas assets and rebranded to become a purely renewable energy company; Equinor, previously Statoil, changed its name to reflect a shift towards being a broader energy supplier beyond hydrocarbons alone.

An increasing number of supply chain companies are working in renewables. For example, Wood Group — a company which designs, modifies, constructs and operates industrial facilities primarily for the oil and gas sector — has supported onshore and offshore renewables projects around the world for the last 14 years.

Alternative fuels and carbon-capture technology

A successful transition to a low-carbon future will therefore require sustained investment in oil and gas. "By 2035, there will be an increased presence of renewables and potentially after that there could be an acceleration. But if we do not meet the energy needs with oil and gas in the meantime, it could derail the whole process of advancing in renewable and other low carbon energy," explains Oil & Gas UK energy policy manager Will Webster.

It has been suggested that facilities in the North Sea could be used to enable further decarbonisation by being converted to carbon capture and storage facilities. This technology will play a part in fulfilling the objectives of climate change policies; globally, CCUS is expected to deliver about 14% of total emission reductions.

"Using existing expertise, we can develop newer technologies like hydrogen and carbon capture to help take us to the next phase after 2035."

Traditional fossil fuels may also, in future, be decarbonised using carbon capture and storage technologies. "Using existing expertise and technologies, we can develop and incorporate newer technologies like hydrogen and carbon capture to help take us to the next phase after 2035. From a Member perspective, we need a continuous process of adjustment: ensuring we have enough energy, alongside investing in new technology," he adds.

Demand for gas is also likely to grow to enable a hydrogen economy. Potentially an effective fuel for low-carbon heating and transport, hydrogen could play a key role in the global energy transition. At present, steam methane reformation — the reaction of natural gas with water to produce hydrogen and carbon dioxide — is the most common way to produce the gas

Global Gas Demand by Sector, IEA Sustainable Development Scenario (bcm)

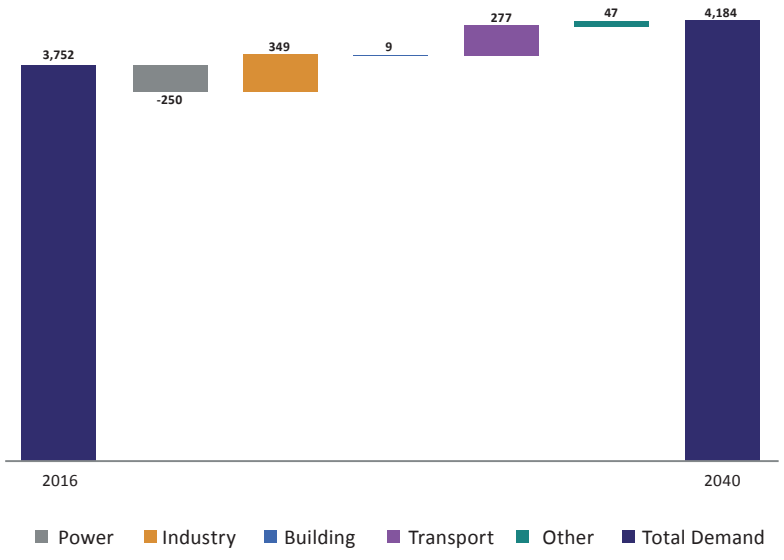


Image above: Turbine mating at Equinor's HyWind project. Credit: Ørjan Richardsen / Equinor

at an industrial scale. This process does release carbon dioxide; however, the amounts released for each unit of energy produced is a lot lower than other fuels and their generation processes. Additionally, widespread adoption of hydrogen will require new supplies of gas feedstock if the fuel is to be affordable.

Hydrogen can be reacted with oxygen in a fuel cell to generate electricity or burnt to produce heat (the by-product from both these processes only being water), enabling decarbonisation in energy end use. Potentially, the carbon implications of steam methane reformation can be resolved by pairing the process with CCUS technology.

The environmental policies decided by the government will play a key part in ensuring emissions reduction and the success of a potential shift to hydrogen. "A shift is needed for policy that deals with the large-scale, innovative interventions such as technology, where the UK has an industrial advantage. For example, the development of CCUS," Will adds.

In fact, carbon capture technology is key for the next phase of the energy transition, as an area where the UK can become a role model for the rest of the world. Sufficient investment could both boost regional industrial growth and support decarbonisation across the whole UK economy.

Vision 2035

The UK's demand for oil and gas will exceed what can be produced domestically, even with nationwide efforts to decarbonise. In that regard, UK oil and gas production is not competing with renewables but with imported oil and gas supplies. To stay competitive with other sources, the challenge will be to develop and create opportunities within the UK renewables sector so that the majority of UK demand is met with indigenous sources and any excess can be sold. This is the context for Vision 2035 and the future of the UK oil and gas sector.

Vision 2035, an industry-wide initiative to raise awareness and secure understanding of the long-term future of the industry, will also equip the industry to play a more proactive and prominent role in the energy transition (see p. 18).

It is also about enabling companies that have developed expertise here in the UK, for example in subsea engineering, offshore operations or decommissioning, to export their know-how and technology to other parts of the world, building the UK's share of the global energy services market.

During the period to 2035, the offshore sector continues to explore and enact ways to lower the carbon intensity of production; for example, via the decommissioning of older, less efficient installations and upgrading to modern, energy-efficient technology and equipment.

For Oil & Gas UK's stakeholder and communications director Gareth Wynn, this is the key message that unites the goals of both the energy transition and Vision 2035: "In this way, today's oil and gas industry will secure its long-term future in providing the UK's energy, provide rewarding jobs and careers and will continue to contribute billions to the economy."

Outlining the role of oil and gas will continue to have in the energy mix and the important role our industry plays economically and as an enabler of the future will be a key part of ensuring that we enable the Government to maintain the fiscal and regulatory environment that is needed to encourage continued investment in UK offshore oil and gas."

Months in the making

Apache North Sea's strategy of pursuing new opportunities close to its existing assets is paying multiple dividends, and its latest success underlines the value of delivering projects at pace. *Wireline* explores the story behind Garten.

The Beryl Alpha platform, to which the Garten field is tied back. Courtesy of Apache North Sea.

As the 2,500th exploration well on the UK Continental Shelf (UKCS), Garten was already a name for the record books. More remarkable still, however, is operator Apache North Sea's success in carrying the field from discovery to production in less than eight months.

Discovered in March 2018 in Block 9/18a Area-W, early results at the Garten well suggested recoverable resources for the field (or structure) exceeded 10 million barrels of light oil as well as associated natural gas. By November, the well was producing 13,700 barrels of oil and 15.7 million cubic feet of gas per day, via a tie back to the Apache-operated Beryl Alpha platform, six kilometres away.

The rapid turnaround gained praise from high places, not least from Oil and Gas Authority (OGA) chief executive Andy Samuel, who remarked that the company's "continued success reinforces the tremendous potential of the UKCS, which Apache is unlocking using advanced data gathering and analytics." So, what was the secret behind the company's success in bringing such significant new levels of production on stream in such rapid fashion?

The answer, according to senior personnel involved in the project, lies in a mix of planning, pragmatism, engagement and empowerment.

Figure of eight

"When we first drilled Garten we knew we had something very special, and we were very excited by it," says operations and projects director Mark Hobbs. "Knowing we had something material for Apache as a company, we were able to focus on work which had previously been done."

Apache initially believed it could bring Garten online in 12 months but – based in part on the operator's experience with its Callater development, which moved from discovery to production in around a year – Mark challenged the project team to do even better, resulting in the company moving its first oil date forward from Q1 2019 to Q4 2018. "That is the Apache way – we strive to push expectations amongst our leadership team and our employees to see what they can do. It was a massive undertaking, but everyone was up for it," he says.

Personal empowerment for project staff was also crucial to the process. Mark continues: "Everyone knows the role they play in the organisation, and my role as a leader and manager is to facilitate our operations as best I can – my job is to get approvals through quickly and empower the team to get after the job in hand, so they can achieve in the set timelines and in a safe manner."

Garten, in which Apache has a 100% working interest, is one of several exploration success stories for Apache that have been catalysed by the 2012 acquisition of 3D broadband seismic survey data for a 1,500 square km area around Beryl.

"We wanted to cover all of the development acreage and the surrounding open exploration acreage under one uniform survey," adds region exploitation and exploration manager Jeff Towart. "Since the mid-1990s there had been a hiatus in seismic acquisition and exploration drilling in the Beryl area. But it was known to be very prolific and our view was that, with modern data and a new set of eyes, we could find new opportunities."

Jeff says Beryl data had previously been made up of a "patchwork" of overlapping 3D surveys of varying vintages and parameters. "Having not just the latest seismic technology, but also a uniform survey that stretches across the whole asset area, has been really beneficial to us. We have been able to take old ideas and re-risk them to the point that we could drill with confidence," he adds.

"There were lots of great ideas from previous times that were never drilled – the uplift in seismic gave us confidence, allied to an Apache culture and strategy which is all about extending field life and maximising the economic value of our assets."

Apache used the data to build a portfolio of opportunities across both exploration and development as part of a wider strategy to focus its activities on prospects close to operating facilities and leverage the value of its existing infrastructure. This process has proved rewarding; an exploration programme which began in 2015 has produced three significant commercial discoveries in the Beryl area: Garten, Callater and Storr.

Delivering at pace

With Garten and Callater already producing, Storr is very much the project of focus for 2019. Work is already

"That is the Apache way – we strive to push expectations amongst our leadership team and our employees to see what they can do. It was a massive undertaking, but everyone was up for it."

Apache North Sea operations and projects director, Mark Hobbs.

under way on the multi-well subsea development and it is scheduled to be online by the end of the year.

With plans to drill at least one exploration well in 2019 and several more in subsequent years, Jeff says it's illustrative that the strategy is paying off. "Having three successful exploration wells already, over a four-year period, is pretty remarkable in the North Sea at the moment."

He says one of the key factors behind recent accomplishments is Apache's decision to deliver via small teams empowered to "get after" projects. "Particularly on the geoscience side, we work as a single team across both development and exploration, and the learnings and knowledge we gain can be shared across the project environment."

With Garten specifically, he says pre-drill evaluation work gave the team confidence in its risking of the prospect. The fast-lane route to production, he adds, was also fuelled by several other key factors.

Perhaps most notably, the exploration well was designed to be developed as a producer in the event of success. The surface location of the well lies also adjacent to a tie-in point on the pipeline linking the Apache-operated Buckland field to Beryl, streamlining the tie-in process. Mark adds that it was "a very happy coincidence" that the well and an intermediate tow-head from the Buckland bundle were in close proximity, which made it easier for them to capitalise on existing infrastructure. It also sat well with the team's decision, made very early on, to tie Garten into the Buckland bundle if pressures allowed.

Jeff also highlights the advantages of having a single integrated team working the project through from exploration to development. This was the concept of the small, empowered team model: it allowed for a seamless process through the project and did

"The company understands the value of what the North Sea delivers and because of that, it wants to keep investing here in the future."

not require transitions from different teams. This characterises much of Apache's project delivery – Jeff notes that a similar model was used on Callater and is now being used on the Storr development.

In addition, Mark says that Apache engaged with Beryl area partners, the OGA, HSE and other stakeholders at the earliest opportunity, allowing them to work through issues ranging from commercial negotiations to field development plans, safety cases and environmental statements as efficiently as possible. It is a theme which runs through the successful developments of recent years, both in Apache and the industry at large.

"All of those take time, but what we did early on was understand our timelines and then challenge those norms through our co-operation with bodies like the OGA," he explains. "It was quickly clear that they were more than willing to work hand-in-glove with us to try to reduce some of the nominal timelines. They could see the value of Garten and what it meant in terms of the maximising economic recovery agenda."

"Our work with all these organisations meant we were able to come up with a critical path which challenged the norms," he adds.

From there, the team adopted a pragmatic approach. "The value to Apache lies in getting tie-ins like Garten back as quickly as possible, using existing infrastructure and tried-and-tested solutions," says Mark. "That has a big impact in terms of front-end design timescales in particular, unlocking a lot of value in terms of the speed in which things can be delivered."

That is not to say that the operator works alone. Apache has fostered close, long-term relationships with many of its tier 1 contractors, suppliers and vendors as well, which Mark believes contributed to the speed of the turnaround. "We have trust in our supply chain, and that element of trust has enabled us to work quickly and efficiently," he says.

Because of that mutual understanding, "there's no need for man-marking or constant checking. There is an appreciation out there that Apache wants things delivered both safely and at pace."

The project team worked to highly compressed timescales during the summer 2018 construction campaign ahead of an autumn commissioning phase that spanned just over three weeks. Mark affirms that, because Apache has been able to progress quickly by keeping things simple and using as much existing infrastructure as possible, its rate of return on such North Sea projects is globally competitive.

In that context, Garten was the best well drilled globally by Apache in 2018. "The speed at which we could bring it in, and its rate of return, supports the global aspirations of Apache. We are able to deliver very impactful projects in very short timeframes that materially impact the company as a whole."

Material gains

Both Mark and Jeff point to the application of a three-zone smart well completion as an example of how advanced technology has supported the securing of project objectives, allowing Apache to fully understand reservoir characteristics for all three zones, maximise reserves and optimise reservoir management.

This also enabled the team to understand the reservoir in the context of future water injection programmes to support longer-term production. Further production wells are also being considered. "There's a tremendous message here for our workforce and for the industry – [that] this is material, and we are delivering a huge amount of production," adds Mark. "We're a strong business that continues to hold its own against younger competitors, and there is plenty of upside as long as we manage costs. If we keep bringing in new oil prospects, we'll stay very competitive regionally, if not globally."

Mark is clear that Apache aims to sustain its business in the North Sea, where its activities primarily centre upon the Forties and Beryl fields. "The company understands the value of what the North Sea delivers and because of that, it wants to keep investing here in the future," he says. "Both Forties and Beryl present big opportunities; they will be around for at least another 15 years, probably longer."

"Our goal is to get to 2040 with Forties, and that is completely achievable. Beryl, meanwhile, is one of the most exciting exploration areas in the North Sea and we're working hard to exploit that potential."

"There were lots of great ideas from previous times that never got drilled – the uplift in seismic that gave us confidence, allied to an Apache culture and strategy that are all about extending field life and maximising the economic value of our assets."

North Sea region exploitation and exploration manager Jeff Towart

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