Issue 47
Spring 2020

wireline

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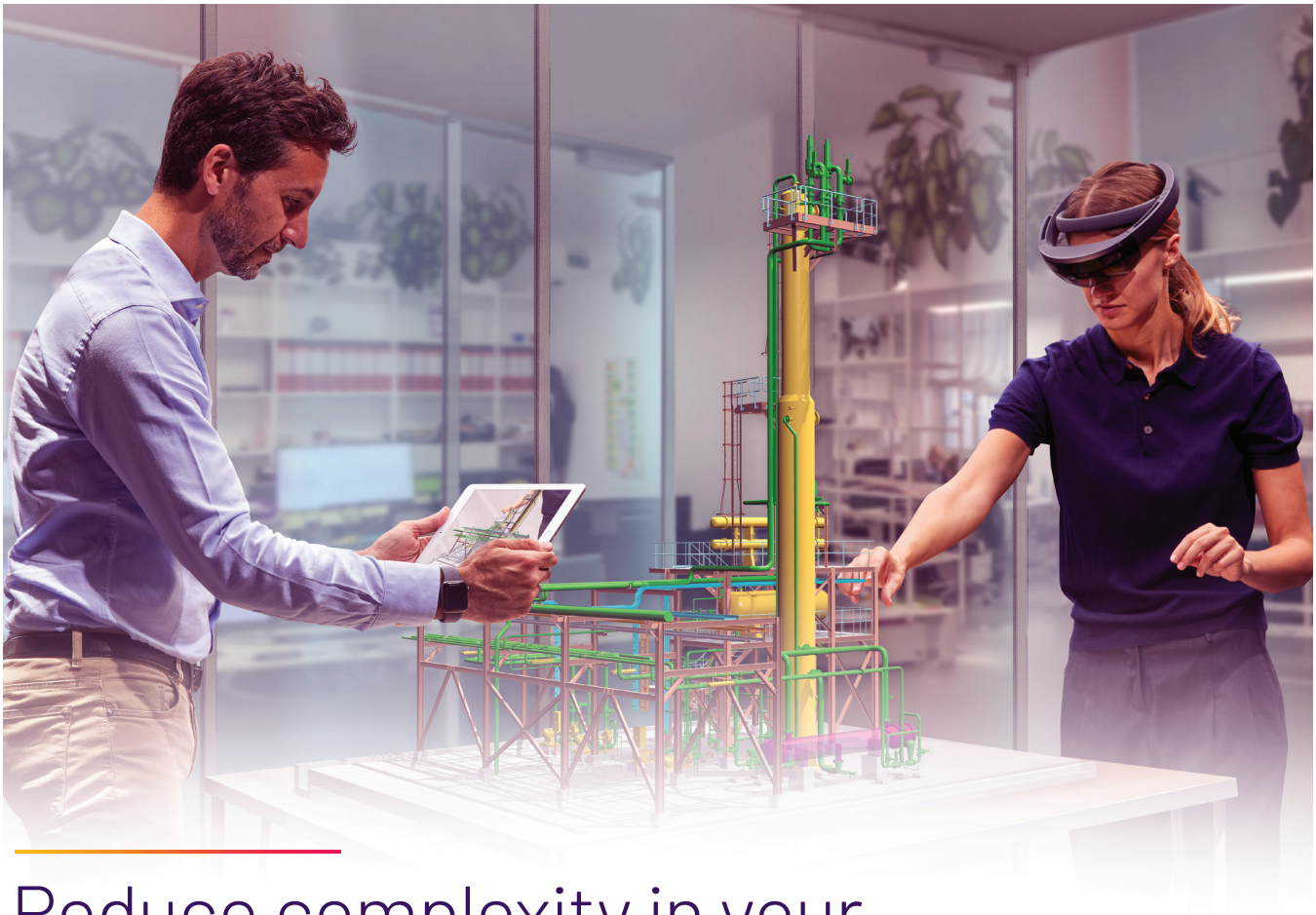
The magazine for the UK offshore oil and gas industry

OGUK



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Issue 47 | Spring 2020

Welcome to Issue 47

Welcome to the 47th issue of *Wireline*, the magazine for the UK offshore oil and gas industry.

2020 is already set to be a year of transformation for the UK, within the energy sector and beyond. With policymakers and industry aligned behind the drive to reach net-zero carbon emissions by 2050, and 2045 in Scotland, discussion has moved away from questions around 'when' and 'why,' and is now focusing on 'how'. Plans for how to manage the next two decades of decarbonisation — nationally and internationally — will be brought to the fore when Glasgow hosts the 26th UN Conference of the Parties (COP) in November.

OGUK and its members remain aligned behind Roadmap 2035, a blueprint designed to guide the industry's efforts towards supporting and achieving our net-zero commitments. In a recent speech in Edinburgh, OGUK CEO Deidre Michie outlined how the Roadmap translates into industry action, in the form of reducing emissions from production to become a net-zero basin by 2050, and in supporting the development and deployment of CCUS, hydrogen and other low-carbon technologies.

One initiative that exemplifies and unifies many of these efforts is the Hydrogen Coast, the collective name for a network of hydrogen and CCUS projects being undertaken along Scotland's northeast coast, from Orkney to Fife and further afield. In this issue, Wireline speaks with project lead Pale Blue Dot about the potential opportunities that this new infrastructure can bring, and the central role that oil and gas companies play in its delivery [p. 38].

OGUK members are equally busy; we step aboard the Well-Safe Guardian ahead of the completion of its refurbishment into the country's first bespoke well decommissioning asset [p. 20] and learn how Quartzelec's new condition monitoring technology is making strides in asset integrity [p. 18].

Following a turbulent yet rewarding 2019, we also speak with independent producer IOG as it moves forward with plans to develop a suite of southern North Sea gas fields using the recommissioned Thames Pipeline. CEO Andrew Hockey explains the story behind the company's unique plans inside [p. 26].

If you'd like to see your business in the next issue, we welcome any positive news and stories from any member organisation at editorial@oilandgasuk.co.uk. Feel free to share Wireline with any interested colleagues, or request additional copies for your office or reception using the same email address.

In the meantime, we wish you all the best in 2020 — and thanks for reading.

Design, Digital & Editorial Team
OGUK

Wireline is published by OGUK, the voice of the UK oil and gas industry.

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Katy Heidenreich (top) has assumed the post of OGUK Operations director, while Trevor Stapleton (below) has become OGUK Health, Safety and Environment director.

Reshaped OGUK to support net-zero blueprint

OGUK has kicked off 2020 with ambitious plans to champion the sector as part of a diverse energy mix. Two new directors have joined OGUK's leadership team under the continued direction of chief executive officer Deirdre Michie OBE.

Trevor Stapleton has assumed the role of OGUK Health, Safety and Environment (HSE) director, while Katy Heidenreich has taken the post of Operations director. Both commenced their new roles on 3 February 2020. The two directors join a reshaped leadership team to support industry in its delivery of Roadmap 2035: A Blueprint for Net Zero.

Matt Abraham will take on a more focused brief as Supply Chain and Exports director, harnessing his extensive experience in contractor companies to help grow exports and support a resilient, competitive and diverse supply chain. Meanwhile, Mike Tholen will become OGUK's Sustainability director, using his own deep experience in the industry to help drive action to deliver a net-zero basin, from the operational production of oil and gas, and assisting the UK in reducing its total greenhouse gas emissions through to adoption of technologies including carbon capture utilisation and storage (CCUS).

Graham Elgie continues as OGUK's Finance and Corporate Services director and Gareth Wynn as OGUK's Stakeholder and Communications director.

CEO Deirdre Michie added: "2020 is synonymous with perfect vision and we are wasting no time in getting to work delivering industry's ambitious plans for the future outlined in Roadmap 2035: A Blueprint for Net Zero.

"I'm delighted to announce these changes to our leadership team which will enable us to even better support companies and to help drive action as we work to inform, engage and advocate the importance of this industry as part of a diverse energy mix.

"Katy and Trevor each bring an incredible amount of experience and are highly regarded by their peers. Their strategic insight will be critical as we gear up to deliver our blueprint for net zero, demonstrating the practical steps companies are taking to reduce emissions, meet UK energy needs and develop our people and skills for the future.

"This industry has a positive role to play in providing solutions to the UK's net zero challenge and we are already in action with our Roadmap. Leading from the front, OGUK is proud to champion our dynamic and diverse industry and we look forward to continuing to work with all of our stakeholders in the year ahead."

Image right : (L-R) OGUK Graduate of the Year Erin Ingram, Apprentice of the Year Ashley Thomas and Mentor of the Year Teresa Waddington

Image below: Delegates attend the Offshore Decommissioning Conference at the Fairmont Hotel, St Andrews.

10th Decommissioning Insight Report launched in St Andrews

Over 450 delegates attended the Offshore Decommissioning Conference, held jointly with Decom North Sea last November in St. Andrews.

The event saw the launch of the annual *Decommissioning Insight* report. Reaching its tenth year of publication, OGUK's *Decommissioning Insight* forecasts UK decommissioning activity and expenditure over the next decade, revealing that while activity on the UKCS is expected to increase, expenditure will remain consistent at around £1.5 billion per annum, demonstrating the sector's improving efficiency performance.

OGUK decommissioning manager Joe Leask commented: "Decommissioning is not the end of our industry; it offers a new beginning. Four years ago, industry stepped up to the challenge to cut decommissioning costs by 35% and we are well on the way to achieving that. We must apply the same collective determination and pioneering capabilities to deliver the net zero carbon challenge. This includes the re-use of old facilities for carbon capture and storage, presenting new opportunities to generate new value from old assets and help deliver the net zero future that industry has made to commitment to deliver."

Operators across the sector contributed data to the report, which plays a fundamental role in providing market intelligence that highlights predicted activity and cost trends. During the conference attendees heard from representatives for regulators, service providers and operators, including presentations from the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED), OGA, Crown Estate, Atkins Global, Chrysaor, Repsol Sinopec — and many more.

As Leask noted, a key question during the conference was how the decommissioning sector can respond to the demands of net zero. This informed a series of discussions under the banner of 'Decommissioning the Future', with presentations from the National Decommissioning Centre and DNV GL examining the implications that decarbonisation would have.

Download the 2019 *Decommissioning Insight* report via the OGUK website.

OGUK Awards recognise energy transition excellence

Over 550 people gathered at the annual

OGUK Awards last November to celebrate the achievements of outstanding individuals and companies working on the UKCS.

Held at Aberdeen's P&J Live and sponsored by Shell U.K. Limited, the event recognised 30 finalists — selected from a record 100 entrants — for the 10 awards on offer. Hosted by BBC journalist Victoria Derbyshire, the awards included categories for excellence in decommissioning, business innovation and a new award for 2019 celebrating work that supports energy transition.

Notable winners included a fledgling industry star who unlocked £20 million of additional value for her company and a business that is using 3D printing to champion improved safety and environmental performance.

VP of upstream for Shell U.K. Limited, Steve Phimister, noted that: "It has been hugely rewarding to celebrate the talents and achievements of all the people who help the UK oil and gas industry make such a vital contribution to today's energy sector. These are also the people who will play a key role in shaping the future success of the industry, as the UK navigates the energy transition."

OGA publishes energy integration report

Integrating the UK offshore energy sector, including forging closer links between oil, gas and renewables, can reduce carbon emissions from oil and gas production and support delivery of the UK's net-zero target according to a report published by the Oil and Gas Authority (OGA) in late 2019.

Titled "UKCS Energy Integration: Interim Findings," the report discusses the first phase of the UKCS Energy Integration project — led by the OGA in conjunction with BEIS, the Crown Estate and Ofgem — and considers options to help feed into a new strategic vision of the UKCS as an integrated energy basin.

OGUK Award Winners

Apprentice of the Year (sponsored by OPITO)
Ashley Thomas, BP

Graduate of the Year (sponsored by ECITB)
Erin Ingram, TAQA

Mentor of the Year
Teresa Waddington, Shell U.K. Limited

Diversity and Inclusion Award (sponsored by Spirit Energy)
CNR International (UK) Ltd

Workforce Engagement Award
PD&MS GROUP

Business Innovation Award
SME – WFS Technologies

Large Enterprise – TOTAL E&P UK

Excellence in Decommissioning Award
Repsol Sinopec Resources UK

Energy Transition (sponsored by Fairfield Decom Limited)
BP

The Oil and Gas Authority Award for MER UK (sponsored by Oil and Gas Authority)
Neptune Energy – BP – Japex UK E&P Ltd

Image below: Deloitte Energy, Resources & Industrials senior insight manager, Netti Farkas Mills, presents findings from the Collaboration Index.

It also considers how oil and gas infrastructure and capabilities can be leveraged for CCS, and to support renewable energy production and hydrogen generation, transportation and storage.

Read the report on the OGA website.

New guideline promotes good practice in project delivery

OGUK has published a new Project Collaboration Toolkit. In support of the Oil and Gas Authority's Asset Stewardship Strategy, this new guideline provides companies with a systematic framework for ensuring oil and gas projects are delivered on time and within budget.

Industry experts including operators, contractor companies and the Engineering Construction Industry Training Board (ECITB) have contributed to the guidelines. They cover all stages of a project from initial concept through to commissioning, handover and close out, and are intended for use by project teams, senior management, joint venture partners, project owners, assurance and review teams, supply chain companies and the OGA.

Katy Heidenreich, OGUK's operations director, noted: "Improving how the sector stewards our oil and gas assets is vital to securing a safe and sustainable future for the UK Continental Shelf. These guidelines provide companies with a systematic method for strengthening their processes to achieve repeatable, predictable delivery of oil and gas projects which meet their cost and schedule targets."

Members can access and read the guidelines for free via the OGUK website.

Deloitte and OGUK publish fifth UKCS Collaboration Index results

December 2019 saw the publication of results from the annual UKCS upstream supply chain collaboration survey. Compiled and launched by OGUK and Deloitte at a co-hosted event, the fifth annual report charts the significant progress made by industry since 2015. Oil and gas production is 20% higher than it was five years ago, production efficiency has improved and operating unit costs have stabilised at a more sustainable level.

The overall Collaboration Index result for 2019 is 7.0, down from 7.1 in 2018. Mixed collaboration success results suggest that collaboration is not improving as much as expected and suppliers are being seen as less engaged and less willing to collaborate by the operator community during the year.

As with previous years, there are three main parts to the report: Collaboration Review, Collaboration Index and Framework for Action. Cost reduction remains top of the priority list for collaboration, with knowledge sharing and learning being the second driver. 67% of respondents say they reduced costs by business transformation methods compared with 30% using traditional methods.

Read the full report via the Deloitte website.

New Outlook on Energy Transition

December 2019 saw OGUK publish its second *Energy Transition Outlook* Report. The document considers the changing energy landscape in the UK and outlines progress achieved by the oil and gas sector over the past year to provide industry and economy-wide solutions towards reducing emissions.

Against this landscape, the report calls for urgent action to progress low carbon technologies critical to the UK and Scottish Government's net zero ambitions. Overall, it finds that investment in the UK energy sector will need to double in order to achieve a decarbonised economy.

Government and industry must therefore work together to progress to the next stage five key projects across the UK which look to capture, transport and store carbon dioxide from heavy emitting industrial processes including power plants. The oil and gas industry is in a unique position to lead in the development of Carbon Capture Usage and Storage (CCUS), with five projects situated across the country already being explored.

Below top: OGUK business pathways for a low-carbon transition, as set out in the *Energy Transition Outlook 2019*.

Below: Members of the public test their energy knowledge as part of the Do You Know Your Energy campaign.

PROGRESSING UK Oil and Gas Production on the Path to Net-Zero Emissions	DEVELOPING a World-Leading Offshore Low-Carbon Industry	SUPPORTING and Deploying Emissions Mitigation Technologies	EXPANDING Other Low-Carbon Business Opportunities
Aim to be producing **1.1 million bpd** in 2035	**0.5 $MTCO_2e$** GHGs from production and operations by 2050	Support the development of a **CCUS** industry	**Expand and support** low-carbon business
Reduce reliance on international imports, maintaining **energy security**	Significantly **reduce emissions intensity** from operations	Advocate for **hydrogen fuels** development around the UK	Enable the **transfer of skills** across the offshore energy sector
Maintain international competitiveness in alignment with **Roadmap 2035**	Understand and reduce wider upstream emissions (logistics, supply chain)	Explore other mitigation technologies	

The report also calls for joint action to increase the potential for low-carbon hydrogen to be used as a fuel for heat and transport.

Commenting on the report, chief executive Deirdre Michie noted: "As our report shows, there is lots of work to be done in a huge market which is only getting bigger as global demand for energy continues to grow. The Climate Change Committee report published [last year] noted CCUS was critical to our net zero ambitions. Our challenge, working with others including the OGTC's Net Zero Solutions Centre, is to realise CCUS and other low carbon technologies as an opportunity for British businesses."

OGUK asks: Do You Know Your Energy?

In a changing world we all have a duty to reflect o n h ow w e c an r educe o ur i mpact on the environment. OGUK's 'Know Your Energy' campaign aims to increase awareness of where energy comes from, the emissions resulting from its use and how oil and gas powers the nation's everyday lives as part of a diverse energy mix, allowing us to make informed choices about energy and how we use it.

Central to the campaign is an informative website and interactive quiz, designed to give visitors to the site the opportunity to flex their know-how and see how energy savvy they really are.

OGUK lead business adviser and Know Your Energy project lead, Harry Thorne, said: "In the UK we are very lucky to have a secure, reliable and affordable supply of energy that helps power our everyday lives, however we don't often stop and think about where that energy comes from and how it reaches us."

Visit doyouknowyourenergy.com to learn more and test your knowledge in our quiz.

Image below left: (L-R) Alistair Macfarlane, Scott Robertson and Pauline Innes.

OGA appoints new leadership roles

The Oil and Gas Authority (OGA) has begun 2020 with a trio of new leadership appointments.

Scott Robertson has been promoted to Director of Operations. Scott will be responsible for the OGA's exploration, production, and technology agenda. Having been with the OGA since June 2015, Scott developed and implemented the OGA's Asset Stewardship Strategy and was responsible for stewarding the large portfolio of oil and gas activity in the Central North Sea. Scott replaces Gunther Newcombe who will be retiring in March 2020.

In December 2019, Pauline Innes was appointed as Head of Decommissioning. Pauline has a background in the public sector, working for Scottish Government in social and economic policy before joining the Department for Business, Energy and Industrial Strategy (BEIS) in 2015 to work in offshore oil and gas decommissioning.

In October 2019, Alistair Macfarlane was promoted to Area Manager — SNS and EIS. Alistair has been with the OGA since May 2016 as Business Development Manager for the Central North Sea Team and was primarily involved in shaping and delivering the OGA's work on Area Plans and providing commercial guidance to industry. Alistair is a qualified accountant with 30 years' experience in finance, commercial, planning and change management.

OGUK sets out industry's response to climate commitments

Addressing an audience of politicians, policymakers and campaign groups in Edinburgh on 30 January, Deirdre Michie OBE outlined the details of its response to UK and Scottish Government net zero commitments in a keynote speech.

The plans, praised as "bold" by media outlets, outlined 60 actions across five key areas and included news that the sector is developing a detailed action plan to tackle emissions from the operational production of oil and gas. Deirdre Michie said delivery of the plan will mean "we will have delivered a truly fair, inclusive and sustainable transition to a low carbon future where our transformed and thriving industry is part of the solution."

Michie continued: "While all industries, businesses and people need to think about what they can each do, our industry needs to be generous in deploying our skills, infrastructure and expertise to help find those solutions. And we are already stepping up to the challenge."

"Stepping up to reduce carbon emissions to net zero by 2050 in the UK and by 2045 in Scotland is also an opportunity for the UK's oil and gas industry to shine in a competitive global market — sustaining jobs, contributing to public services through taxation, providing secure energy supply and diversifying as we help to find solutions."

Read the full speech on the OGUK website.

Blueprint for net zero goes to Canada

At the invitation of the Newfoundland Environmental Industries Association (NEIA) OGUK Stakeholder & Communications director Gareth Wynn visited St John's to explain Roadmap 2035 and how it was developed.

Canada is the world's fourth-largest producer of oil and gas, but a relatively small proportion of this comes from offshore production, although this is growing. Like the UK, citizens and the Government of Canada are wrestling with the challenge of how to balance the ongoing need for energy with the need to tackle the greenhouse gas emissions linked to climate change.

Gareth Wynn said: "In the UK, we were one of the first major industry sectors to respond positively to the Committee on Climate

Change report and to the Government net-zero targets with a clear action plan setting out how our sector can play our part in tackling emissions at the same time as continuing to provide a large part of the energy the UK needs. Our Canadian colleagues were interested to hear how we went about developing the roadmap and engaging the industry to get behind it.

"It was an interesting time to arrive in St John's in Newfoundland, just 24 hours after they had lifted a state of emergency as a consequence of huge snowfalls over the preceding weeks."

Further international outreach sessions for Roadmap 2035 and the UK industry's efforts in decarbonisation are expected throughout the year.

Exploring the future of the UKCS

OGUK's annual Exploration Conference has become a key date in the industry's exploration calendar. The event offers professionals a unique opportunity to share their experiences and insights on the exploration challenges that exist in the North Sea and Atlantic Margin.

In the spirit of open collaboration, during the event, operators present case studies describing the challenges of drilling exploration and appraisal wells, offering an insight into the successes and failures in this challenging area.

The programme of events for this year's conference featured multiple case studies from a range of operators including oil and gas majors, independents and new entrants. In 2020, 100% of delegates described the conference as excellent or good.

The conference provides an ideal forum for information sharing, learning, networking and discussion — helping the industry to improve exploration success and avoid potential mistakes.

Image above: BP North Sea exploration manager Dr Chrysanthe Munn chairs a panel discussion at the 2020 OGUK Exploration Conference in London.

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Industry Insights for Young Professionals

London / Aberdeen

14 May

Offshore Safety Awards

P&J Live, Aberdeen

21 May

Breakfast Briefing – Supply Chain and the Energy Transition

P&J Live, Aberdeen

3 June

OGUK Annual Conference

P&J Live, Aberdeen

30 June

Breakfast Briefing – Carbon Storage for the 21st Century

White & Case, London

Sponsored by White & Case LLP

1 July

Aviation Seminar

Ardoe House Hotel, Aberdeen

16 September

Share Fair

P&J Live Aberdeen

TBC

Diversity & Inclusion Conference

Aberdeen

Sponsorship and exhibition opportunities are available.
For more information email events@oilandgasuk.co.uk

Member News

Glencraft partners with Apache to create luxury offshore mattress

Apache North Sea has partnered with Aberdeen manufacturer Glencraft to provide its Beryl and Forties platforms with new luxury mattresses. Following an order for over 1,000 mattresses for the company's assets, Glencraft — a social enterprise and Royal Warrant holder — developed a new design, specifically created to provide quality and comfort, whilst meeting the stringent fire safety standards required for offshore working.

Believed to be the first design of its kind in the country, the hand-finished Merida Crib 7 meets BS 7177: 2008 standards and is constructed from all-natural materials sourced in the UK. The Merida 7 is aimed at improving both the mental and physical wellbeing of offshore workers by providing quality mattresses for a quality sleep — all while reducing the impact and risks of fatigue.

"Apache's work with Glencraft is an example of the value which can be generated by an integrated supply chain management team," noted Apache Contracts & Purchasing Manager, Paul Keith. "The process has been a journey for both Apache and Glencraft. We took the time to learn about the science behind a quality mattress, whilst sharing our knowledge on the safety, strength and durability required for the offshore environment. We also considered the environmental impact and costs associated with future disposal and change out of the mattresses, to ensure we picked the right product for the needs of our business."

Glencraft managing director Graham McWilliam added: "I'm genuinely excited about the introduction of this offshore luxury mattress to our range. It will undoubtedly make a difference to the experience of the offshore workforce whilst on the platform. The feedback from offshore has been tremendous and the team here at Glencraft look forward to our continued partnership with Apache."

The new models are already being used on the Forties Alpha and Delta platforms, and will be replaced on a phased approach across the remaining platforms over the next 12 months.

Wood awarded contract for wind modifications

Services group Wood has been awarded a contract by Equinor to deliver modifications to two offshore installations in the Norwegian North Sea to connect electric power from floating wind turbines that form part of the Hywind Tampen development.

Equinor's landmark project replaces energy generated by gas turbines with electricity from a floating wind farm located between the Snorre and Gullfaks fields, reducing emissions by more than 200,000 tonnes per year.

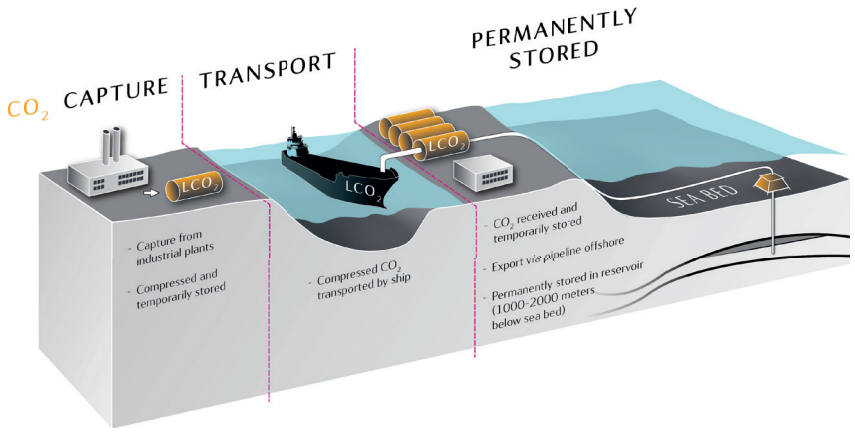
Tampen will consist of 11 wind turbines — based on Equinor's Hywind technology — each with capacity of 8 MW. Totalling 88 MW overall, the project will be capable of meeting about 35% of the annual power demand of the five Snorre A and B, Gullfaks A, B and C platforms.

As part of the three-year contract, Wood will provide the topside modifications necessary for the Snorre A and Gullfaks A platforms to integrate the Hywind flwitoating turbines with the system's existing power facilities. The scope of work also includes equipment installation on the floating wind turbines and upgrades to the onshore control room in Bergen which will remotely operate the wind farm.

Dave Stewart, CEO of Wood's Asset Solutions business in Europe, Africa, Asia & Australia, added: "The Snorre A and Gullfaks A facilities will be the first oil and gas platforms to be powered by a floating offshore wind farm. We are proud to support Equinor on what is a flagship project for the North Sea's energy transition journey."

Below left: Glencraft employee Scott Bertram adding wool and cotton layers to an Apache offshore pocket spring mattress.

Below: Visualisation of the CCS chain. Credit: Equinor



Equinor launches plan for carbon-neutral operations by 2030

Equinor has launched a new climate roadmap which aims to ensure a competitive and resilient business model in the energy transition, and one which is in line with the Paris Agreement.

As part of this plan, Equinor aims to reduce the net carbon intensity of energy produced — from initial production to final consumption — by at least 50% by 2050. It will also grow renewable energy capacity tenfold by 2026 to position itself as a global offshore wind major and aims to attain carbon-neutral global operations by 2030.

"We are setting new short-, mid- and long-term ambitions to reduce our own greenhouse gas emissions and to shape our portfolio in line with the Paris Agreement. It is a good business strategy to ensure competitiveness and drive change towards a low-carbon future, based on a strong commitment to value creation for our shareholders," explained president and CEO Eldar Sætre.

"Equinor's strategic direction is clear. We are developing as a broad energy company, leveraging the strong synergies between oil, gas, renewables, CCUS and hydrogen. We will continue addressing our own emissions in line with the emitter pays principle. But, we can and will do much more. As part of the energy industry, we must be part of the solution to combat climate change and address decarbonisation more broadly in line with changes in society," he continued.

The ambition to reduce net carbon intensity by at least 50% by 2050 takes into account scope 1, 2 and 3 emissions, from initial production to final consumption. This means that by 2050 each unit of energy produced by the company will, on average, have less than half of the emissions compared to today. The ambition is expected to be met primarily through significant growth in renewables and changes in the scale and composition of the oil and gas portfolio. Operational efficiency, CCUS and hydrogen will also be important, and recognised offset mechanisms and natural sinks may be used as a supplement.

Equinor also expects production capacity from its share of renewable projects to reach 4–6 GW by 2026, mainly based on the current project portfolio, and rising to 12–16 GW, dependent on the availability of attractive opportunities.

Operationally, it aims to reduce the CO_2 intensity of its globally operated oil and gas production to below 8 kg per barrel of oil equivalent by 2025 — largely by reducing its own emissions — and to reach a carbon-neutral level by 2030. Remaining emissions will be compensated either through quota trading systems, such as EU ETS, or high-quality offset mechanisms.

Chrysaor joins Mocean subsea energy project

Wave energy start-up Mocean Energy has teamed up with Chrysaor, subsea energy storage experts EC-OG and AUV specialist Modus in a project to look at using renewables for subsea power.

Funded by the partners together with the Oil and Gas Technology Centre (OGTC), the project will look to use Mocean Energy's Blue Star wave energy converter and EC-OG's HALO subsea energy storage system to power subsea tiebacks or residential AUVs.

If industry feedback is positive, the partners will press ahead with a technology field trial using a Mocean Energy prototype in the seas off Orkney later this year. Once proven, these technologies could provide backup power in case of umbilical failure, and potentially provide power for fleets of autonomous AUVs.

Mocean — a graduate of the OGTC's TechX accelerator programme — secured £3.3 million from Wave Energy Scotland in 2019 to build and test a half-scale version of its technology at sea. The device is currently being fabricated.

"Our first step will be an industry workshop at the OGTC in Aberdeen on 27 February where we will gather information on real-world applications and our field trial plans," said Mocean Energy managing director Cameron McNatt. "We then plan to forge ahead with a field trial later this year at our test site in Orkney."

Modus chief commercial officer Nigel Ward added: "This project will demonstrate capability to provide temporary or semi-permanent modular subsea residency for HAUV systems controlled by over the horizon technology. This innovative approach to survey and inspection will reduce the numbers of personnel offshore, providing significant safety benefits and cost savings."

Image below: Wellvene's Bronson Larkins with Gillian King of Tendeka.

Member News

Iqarus leads JIP to explore life-saving treatment for saturation divers

Ten subsea companies have pledged £65,000 towards a medical research project which aims to determine the best procedure for resuscitation of divers in a diving bell.

Led by Philip Bryson, medical director of diving services at Iqarus, the joint industry project (JIP) will find out how resuscitation techniques should be delivered to a casualty in a diving bell at depth.

Divers at depth are exposed to a multitude of hazards that increase the risk of losing consciousness and requiring CPR. Divers are accompanied by a bellman who monitors the divers' life support and stands by to administer first aid if required.

However, diving bells present unique challenges to first aiders performing CPR as the confined space prevents casualties from lying flat so that traditional compressions can be administered.

Over the years Iqarus has provided support and advice to subsea companies in relation to diver health and well-being, and Bryson is one of the most qualified experts in this field.

He said: "Current procedure advises that once the diver has been recovered from the water into the bell they are hoisted upright by a pully system, a safe distance from the walls of the bell that are lined with equipment, and compressions should be administered either by the bellman's head or knee.

"Although this procedure is widely adopted and taught in diving training establishments, there is currently no medical research to support its effectiveness or explore better methods. The JIP is therefore seeking to provide this evidence and to see if resuscitation techniques can be improved.

To date the JIP is being funded by Boskalis, DFS Diving, KD Marine, Kreuz Subsea, Rever, Shelf Subsea, Statoil, Technip and Total. A further £15,000 is still to be secured from the industry to complete the research.

Once delivered, the research will be shared with organisation from across the international diving industry, including the Diving Medical Advisory Committee, and hopes to shape the future of diver resuscitation training.

Tendeka partners with Wellvene on swellable sealing solution

Global completions service specialist Tendeka has worked with design engineering and manufacturing company Wellvene to create and qualify a new version of its swellable sealing solution, SwellStack.

Downhole safety valve seal bores can become corroded or damaged due to intervention activity such as wireline. Standard chevron stacks commonly provided for insert safety valves may be unable to effectively seal within these damaged bores. This results in a leak path for hydrocarbons to migrate up the control line. In such cases, the only solution is to perform a straddle installation or workover the upper completion and replace the damaged valve. Both options are costly and time consuming.

The patented technology provides a cost-effective sealing solution, compatible with all Wellvene and original equipment manufacturer (OEM) insert safety valves. It ensures production can be reinstated to wells that are closed in due to the failed sealing of an insert safety valve, eliminating any requirement to consider higher-cost and long-lead straddles or workovers.

Originally launched by Tendeka in 2013, SwellStack has been used in more than 180 installations globally prior to the release of this next-generation design. Comprising of swellable O-ring technology and a bespoke chevron seal design, the O-ring expansion within the damaged bore activates the seals to both provide integrity for up to 10,000psi in liquid and gas.

Innovation in Motion

Quartzelec has supported the sector in a number of ways for over two decades. Most recently, its expertise has expanded to include condition monitoring. *Wireline* met with Quartzelec's Aberdeen Business Unit Manager, Paul Oliver to learn more.

The Quartzelec business in Aberdeen has been supporting many sectors, including the oil and gas industry, for over 20 years. As an independent service provider to the UK and global markets, it has built particular technical authority in the field of rotating electrical machines. *Wireline* sat down with Aberdeen Business Unit Manager, Paul Oliver, to discuss two new technologies the company is offering the industry.

In the last decade, Quartzelec has increasingly been using its knowledge to focus on evaluating the health of rotating machine assets. The product-specific business of Quartzelec, Quartzteq, has been leveraging its experience in condition monitoring to develop LIFEVIEW®, which provides flexible, modular and versatile on and off-line condition monitoring. The LIFEVIEW® PDA-II is one solution particularly suited to the industry. Often fitted onto high-voltage machinery to specifically monitor partial discharge (PD), the ATEX-certified system offers flexibility, with additional sensors and modules available to monitor other important parameters (measured relative to PD).

A surge in PD can result in earth faults, phase-to-phase faults or shorted turns that eventually cause defects that require machine repair or rewind. The LIFEVIEW® PDA II provides a continuous monitoring of a machine's PD activity, warning operators when a reading is beyond a defined limit. The additional data collected also gives insights into the insulation conditions of the machinery.

"Many of our customers have typically opted for an annual surveillance trip that allows us to establish the current status of many of their high-voltage machines enabling us to take snapshot readings of partial discharge," Oliver tells *Wireline*.

From these annual readings, experts at Quartzelec make recommendations based on their analysis of the gathered data. "We can identify equipment trends and if readings start to fluctuate, critical problems can be identified before they manifest themselves. We can then recommend intervention and maintenance can be scheduled," he explains.

"Traditionally, it can take some time to establish a trend, especially if the 'check-ups' only occur annually," Oliver continues. Quartzelec's PDA-II system can be retro-fitted onto machines for continuous PD monitoring. "The PDA-II system alleviates the need to mobilise people offshore resulting in huge economic and workforce savings," he says. Offshore workers can access the system, download data reports and send them remotely to Quartzelec to perform analysis.

"When the LIFEVIEW® system is fitted to critical machines, it offers clients peace of mind, as equipment is being monitored 24/7," Oliver shares. "Customers will know when an intervention is needed, or in some cases, when they don't need to intervene even when there is maintenance scheduled. User-friendly easy-to-read results means users can make informed decisions about critical equipment safety which can also result in time and money savings."

Condition monitoring systems not only save money but more importantly, they ensure critical safety. "If you get a machine that goes outside specification, it needs to be checked to avoid catastrophic failure," Oliver explains. "With ongoing monitoring, you can predict what might happen and therefore avoid problems."

Condition monitoring systems ensure critical safety.

Paul Oliver
Aberdeen Business Unit Manager at Quartzelec.

Above: Installed LIFEVIEW® PDA II with readings being taken at a waste management site in Portsmouth.

"Intervening before the point of failure is reached allows customers to plan maintenance, manage their uptime much better and be cost effective."

In 2019, Quartzelec also adopted and introduced a new technology to North Sea customers. Motion Amplification is a video camera and software package that detects and records subtle motion and amplifies it to a level visible with the naked eye.

"This new technology has revolutionised the way the vibration of a machine can be monitored," Oliver comments. "What the camera allows us to do is observe the entire structure, cables, and the whole machine and see how any vibrations directly impact both the immediate machinery and what knock-on effect it has on surrounding equipment."

Without using the Motion Amplification technology there is no easy way to monitor all elements of the machine and structure. Pipework failures occur frequently offshore and are mostly due to fatigue resulting from vibration. This technology allows operators to see what is happening and add additional supports where necessary to reduce risk of a failure.

"Preventative maintenance is significantly more effective. The resulting Motion Amplification video shows exactly what is happening inside machinery," he explains. This new alternative to traditional ways of monitoring vibration is significantly more insightful and helps operators make accurate and appropriate decisions about what subsequent actions should be taken.

In the case of equipment failure, Quartzelec has the capability and expertise to support industry professionals and rectify the problems identified. Oliver adds: "We have a workshop in Aberdeen, which provides support services including the repair and rewind of HV/LV electric motors and generators plus the associated static plant, all backed up by impressive test facilities, access to spares and storage facilities."

There is a great benefit for oil and gas operators to invest in equipment that allows them to remotely and/or effectively monitor the condition of their machinery.

"Using either of these technologies individually can have a significant and positive impact on safety, performance and extended reliability. Together they provide significant advantages that make a compelling and cost-effective solution that will help the oil and gas sector remain operational, meet future demands and deliver economic benefit to the British economy."

Changing of the Guard

Wireline speaks with Well-Safe Solutions ahead of the completion of refurbishment on its first dedicated well decommissioning asset, the Well-Safe Guardian.

More than £15 billion is forecast to be spent on decommissioning on the UKCS over the next decade. Well decommissioning alone represents some 45% of this expenditure, and consequently is where some of the greatest efficiency gains and cost reductions can be realised.

Founded in August 2017, Well-Safe Solutions is one of the first movers in the provision of specialist, end-to-end well decommissioning. Its aim is to offer a "one-stop-shop" for operators' plugging and abandonment (P&A) requirements, taking advantage of in-depth knowledge and bespoke technology to do so faster and with greater cost efficiency.

So far, appetite for the service has been encouraging: the past two and a half years have seen the company secure several major contracts, the growth of its staff from a handful of people to nearly 100, and a move to larger premises to accommodate demand. "It's been a bit of a blur, but really exciting," reflects CEO Phil Milton. "Demanding too — there has been an awful lot of work to do given we started the business effectively from scratch."

Central to Well-Safe's strategy is the operation and ownership of its own dedicated decommissioning assets. The first of these, the semi-submersible Well-Safe Guardian rig, was acquired from previous owner Diamond Offshore in April 2019 and is now nearing the end of an eight-month refurbishment programme.

Although the purchase of such assets was always the plan, Milton says: "We hadn't set out to buy the Ocean Guardian (as it was) from day one, it was more the capabilities we were looking for, the right tool for the job."

Given it would focus entirely on well decommissioning there was no need for many of the mod-cons of newer rigs, such as a second derrick or offline pipe racking facilities. The reputation of the rig was, however, influential to the decision; the 700 Series Guardian has been in service since 1985, drilling hundreds of wells over its lifetime in the North Sea. He continues: "The history of the unit was really important, as was the clients' perception... The Guardian was a well-respected and well-regarded unit with good performance working for operators here – it was one of the top performing units in the Diamond fleet at the time."

The Guardian also brings some class-specific performance advantages, such as the model's proven ability to handle the harsh winter conditions of the North Sea. A frequent maintenance regime by Diamond has also meant that, according to Milton, "we've found it to be in every bit as good condition as we'd anticipated."

Fit for the future

Left: The Well-Safe Guardian undergoing refurbishment at NIgg Energy Park.

Well-Safe has put total investment in the Guardian in the region of $100 million, and the scale of work scopes over the past few months highlight how extensive this programme has been. Since its arrival at the Nigg Energy Park in August it has undergone a full refit of all accommodation modules, from the bedrooms to offices and the canteen, complete with new wiring, wi-fi and safety systems.

"The history was really important, as was the clients' perception... The Guardian was a well-respected and well-regarded unit."

"From a crew welfare and comfort point of view it's a significant improvement on what was there previously. We want our crews — both Well-Safe employees and our subcontractors working with us to deliver these projects — to be comfortable and to have somewhere nice to go when they're not working," he explains.

"It's important for welfare and for mental health as well. We really wanted them to feel that we do care about that aspect and demonstrate to the crew and the marketplace that we've invested in the Guardian for the foreseeable future. We see a long-term future for the unit and the business model so let's make sure it's fit for purpose for the next 10–15 years."

As well as accommodation interior work, the rig has seen a full repaint from 1m below the waterline, as well as new anodes and structural inspection of the legs. Its blow out preventers (BOPs) are being recertified by their original equipment manufacturer (OEM) and will be rebuilt on the Guardian in March 2020, as well as an extensive overhaul of the moonpool crane.

Similarly, all anchor handling equipment has been refurbished or replaced. This is particularly important given the vessel's intended duties. Milton adds: "We will more likely be moving from one well to the next much more frequently than you would on a drilling operation where you may be sitting on it for 60, 90, 120 days... When we plug and abandon a well we may only be on it for 14–30 days, so you need to have an anchoring system that allows the unit to move from well to well as efficiently as possible but also make sure that it's fit for purpose."

The project is on course for completion by the beginning of April, with further enhancements being made next year, in the form of a new 12-man saturated dive spread, and a subsea intervention lubricator (SIL).

Above: Visitors touring the Well-Safe Guardian during a week of rig visits.

Below right: Well-Safe Solutions CEO Phil Milton leads a tour of the Guardian in February 2020.

"We were new kids on the block in terms of our business, but we've actually got the most experienced P&A team in the UK working for us."

The latter has been developed in collaboration with the Oil & Gas Technology Centre (OGTC) and will allow for riserless interventions. Final negotiations for the 14-month design and manufacture contract are ongoing, but delivery is slated for Q2 2021 onwards.

With these pieces installed the Guardian becomes what Well-Safe describes as a "one module solution" — a drilling rig that can do conventional P&A operations but can also conduct riserless work usually limited to smaller, monohull vessels — with the added ability to deploy divers.

"We can really reduce the amount of visits you would have to do to a well where conventionally you'd have to go with an LWIV, then a rig, then perhaps a construction vessel afterwards — effectively we can do all these scopes and visits required in a single visit with a single asset leading to considerable project savings due to a reduction in duration, savings on fuel leading to a reduction in environmental impact."

The first of many

What, then, is the key to a successful refurbishment programme? Milton is thankful for no great surprises during the project so far, putting this down to a very thorough project plan to which the organisation and its supply chain partners have been able to adhere. He adds: "The plan we put in place treated this as a huge project, and the detail in that plan was excellent. Our operations, QHSE, HR, contracts and purchasing teams all worked together really well, and have delivered a very successful project in getting the rig ready to go to work on time and forecast to be under budget — which for a company of our age, having never owned an asset before, is a pretty amazing achievement."

He also believes that the experience held within the team will help set the business apart from those who look to offer similar services: "The amount of systems and processes and policies that you have to put in to run a business like this properly is a huge undertaking," he says. With Well-Safe acting in various capacities as an asset owner, and operator, and a well engineering and project management company — in addition to logistics, waste stream and personnel management — he believes these foundations put the company ahead of potential competition.

"I think we have been watched with interest," he reflects. "We were new kids on the block in terms of our business, but we've actually got the most experienced P&A team in the UK working for us in terms of the amount of well experience, so although we are a new entity we are certainly not an inexperienced entity."

That team is being proven on its current projects, including contracts with Repsol Sinopec and a recent award to decommission up to 21 wells on the Schooner and Ketch fields in the UKCS, operated by DNO North Sea.

The Guardian, meanwhile, is set to be finished in April, ready for active duty. Well-Safe hopes it will be the first of many assets, with the potential addition of another semi-submersible and a jack during 2020 into early 2021.


WELL-SAFE
SOLUTIONS

Roadmap 2035: En route to COP26

OGUK executive adviser Sophie Guy-Pearson explains how Roadmap 2035 informs industry conversation ahead of COP26 later this year.

Vision: a word interpreted in many ways but put simply, it's the ability to think about or plan the future with imagination and wisdom. As the UK prepares to host the 2020 United Nations Climate Change Conference (COP26) in Glasgow this November, we're doing all we can to help others see and understand our industry's crucial contribution to delivering a net-zero economy.

The UK has a clear opportunity to be an energy world leader — developing, producing and using secure and affordable domestic energy, while being at the frontier of innovation for lower-carbon technologies.

We've spent the past year or so developing Vision 2035 into Roadmap 2035 to make sure what we visualise becomes a reality. It's about our industry supporting an accelerating energy transition through our people, expertise and infrastructure, while meeting as much of our country's oil and gas needs from home-produced resources.

In 2019, almost 20 companies hosted Vision roadshows and over 5,000 people across the sector joined the conversation about the exciting future of our industry through the energy transition. In developing the blueprint for net zero and for meeting UK energy demand we engaged extensively with members of the workforce, unions, industry leaders and other stakeholders including regulators, trade associations, government departments and policy makers.

Their invaluable feedback enabled us to identify sixty actions across five key themes that map out how the industry will set about creating a safe, sustainable, socially acceptable future for itself. This was published in industry's Roadmap 2035: A Blueprint for Net Zero, launched at Offshore Europe in September of last year.

Above: OGUK executive adviser Sophie Guy-Pearson.

Below left: CEO Deirdre Michie explains Roadmap 2035.

The Roadmap offers a pragmatic route where we can continue to support hundreds of thousands of jobs, make a positive contribution to public services through taxation and provide secure and affordable energy, while also helping our industry and the UK more generally secure a successful, fair and inclusive transition to a net-zero economy.

Roadmap to reality

The current climate of thought, in which many believe a change to cleaner energy is not happening fast enough, places extra pressure on the industry. How can this new decade be one of meaningful achievements to safeguard our collective future in discussions about the new energy mix? Many factors play a role in making that a reality, including our championing of a diverse and inclusive workplace — a key theme in Roadmap 2035.

In September 2019 OGUK helped launch the Diversity & Inclusion Taskforce, encouraging industry to come together to drive action towards recruiting and retaining diverse people, representative of wider society. That's important as many successful leaders admit they never get a good outcome by listening only to the people they agree with because that approach limits input by 50%. In addition to the substantial expertise that exists in our industry, we need people with fresh perspectives, innovative mindsets and transferable skills to help us rise to the net-zero challenge.

According to the UKCS *Workforce Dynamics* report published by OPITO and RGU's Energy Transition Institute, by 2025 there will be approximately 4,500 people employed in roles that don't currently exist.

We're anticipating the demand for expertise in areas including low-carbon energy, data science, data analytics, artificial intelligence, robotics, material science and cyber security to name but a few. The potential to be recognised as a global leader in carbon management is a key ambition in the Roadmap's aim to develop people and skills.

This wealth of knowledge, alternative viewpoints and new expertise is crucial to supporting our commitment to deliver the transition to a lower carbon future as a signatory of the 2015 Paris Agreement. Climate change is a global issue and the UK has great potential to lead by example, especially as our industry's Roadmap is one of the first major industrial responses to government plans to reduce or offset carbon emissions to net zero by 2050 in the UK and 2045 in Scotland.

In setting out our target to support net-zero, the UK is among a small group of countries embracing the climate change challenge posed to all industries, businesses, families and individuals. To protect our planet for future generations, we're taking action in a constructive, collective and co-ordinated way. That means having an inclusive and continuing conversation.

Momentum is building. In January our chief executive Deirdre Michie OBE delivered a keynote speech to an audience of politicians, policymakers and campaign groups in Edinburgh, outlining our plans for playing a key role in a transition that ensures people can continue to have affordable and low-carbon energy.

In the same month, stakeholder and communications director Gareth Wynn shared Roadmap 2035 with Canada's Newfoundland and Labrador Environmental Industry Association (NEIA), and explored how our sector is responding to climate change internationally.

More and more we hear about the specific actions companies are taking to reduce production emissions, to support the delivery of low carbon technologies which will help other heavy emitting sectors to decarbonise, and most importantly, to forge a new and exciting path into the future.

We recognise that our ambition to reduce emissions from 14 million tonnes of CO_2 equivalent ($mtCO_2e$) — currently 3% of the UK's total greenhouse emissions — to 0.5 $mtCO_2e$ in line with the Climate Change Committee outlook is a major challenge. It will require significant investment, new technology and close working with the other sectors, like renewables, across the UK. And as our world-class supply chain diversifies its products and services, the door will open to more international opportunities.

We look forward in 2020 to contributing to the COP26 conversation. Whatever the views on where our energy comes from, the debate must be one that is rigorous and inclusive rather than polarised. That way, we and others can see clearly how we can be a positive force in the new energy mix.

ROADMAP 2035

A blueprint for net-zero

The five key themes are:

Supporting net-zero: How industry is aiming to reduce its own scope 1 emissions i.e. greenhouse gases produced directly from our own production operations. It is also about the role of our industry in helping the UK reduce its scope 3 emissions i.e. indirect greenhouse gases resulting from the consumption of our oil and gas in the form of transport, electricity generation and heating.

Helping meet UK energy needs: How industry will continue to provide a secure source of energy for the UK for decades to come, in line with the Committee for Climate Change's (CCC) forecasts.

Growing the economy and exports: Industry's role in helping the supply chain to grow and flourish both at home, globally, and in other related sectors.

Driving technology and innovation: Ways in which industry will continue to drive the technology agenda and come up with innovative ways of working.

Developing people and skills: Industry's aim to become a diverse and inclusive place to work, equipping employees with a robust and transferable skillset.

More at **roadmap2035.co.uk**

Independent's Day

Following a year of challenges and changes, IOG is now well on the path to completing its landmark pipeline recommissioning project and creating a new SNS gas production hub

From debt restructuring and a hostile takeover bid, to appraisal wells and a farm-out deal with a Warren Buffett-backed partner, Independent Oil and Gas (IOG) has seen many of the struggles and successes that a mid-size independent could expect to encounter — and all in the last 12 months. Now fully funded, the company and its partners are setting about the business of realising a long-planned development strategy for a suite of southern North Sea (SNS) gas fields.

Speaking with *Wireline* in January 2020, and following months of investment roadshows, CEO Andrew Hockey is emphatic as to the AIM-listed company's direction: "We aim to be a mid-cap gas producer that uses our refurbished infrastructure to bring indigenous gas to market." Its route to accomplishing this lies chiefly in the Thames Pipeline, a 24-inch concrete-coated pipeline which connects the now shut-in Thames field to the Bacton Gas Terminal on the coast of Norfolk. Bought for £1, IOG plans to use 60km of the westward portion of the pipeline to export gas from a cluster of SNS fields that make up its core project.

However, as the first company in the UK to embark on a full-scale pipeline "re-commissioning" project, the route has not always been straightforward. Hockey adds: "The portfolio was put together with the intent of re-using the pipeline and before anyone would believe us, we had to demonstrate it worked — so that's exactly what we did. Then people started to realise that our ideas actually make good economic sense."

Consequently, much of IOG's effort over the past few years has been taken up with proving that concept is viable, as well as securing the assets, expertise and funding to realise its ambitions. With this groundwork now complete, the next 18 months will mark a wholly new stage of life for the company. "Before pipeline testing we were just a bunch of people with an idea that was great in principle, but unfunded in practice. The big breakthrough last year was to become a company with a fully funded idea on its way to being turned into reality," he reflects.

Quite a year

IOG's core portfolio represents around 420 billion cubic feet (bcf) of gross 2P and 2C gas reserves - roughly 72 million barrels of oil equivalent (boe) – and is comprised of the Vulcan satellites hub, Blythe hub and the Goddard discovery, the latter of which was added to expand the project in early 2019. Split 50:50 between operator IOG and its new partner CalEnergy Resources, the development will net each a total of 210 bcf.

Following a two-phase development plan, IOG is targeting peak annual gross production rates of around 140 million cubic feet per day (24,000 boepd) across the six fields, delivered to shore via the recommissioned pipeline. Gas will then pass through the refurbished Thames Reception Facilities at Bacton, undergo processing and cleaning at the Perenco-operated portion of the site, before it is injected into the National Transmission System and sold into the market.

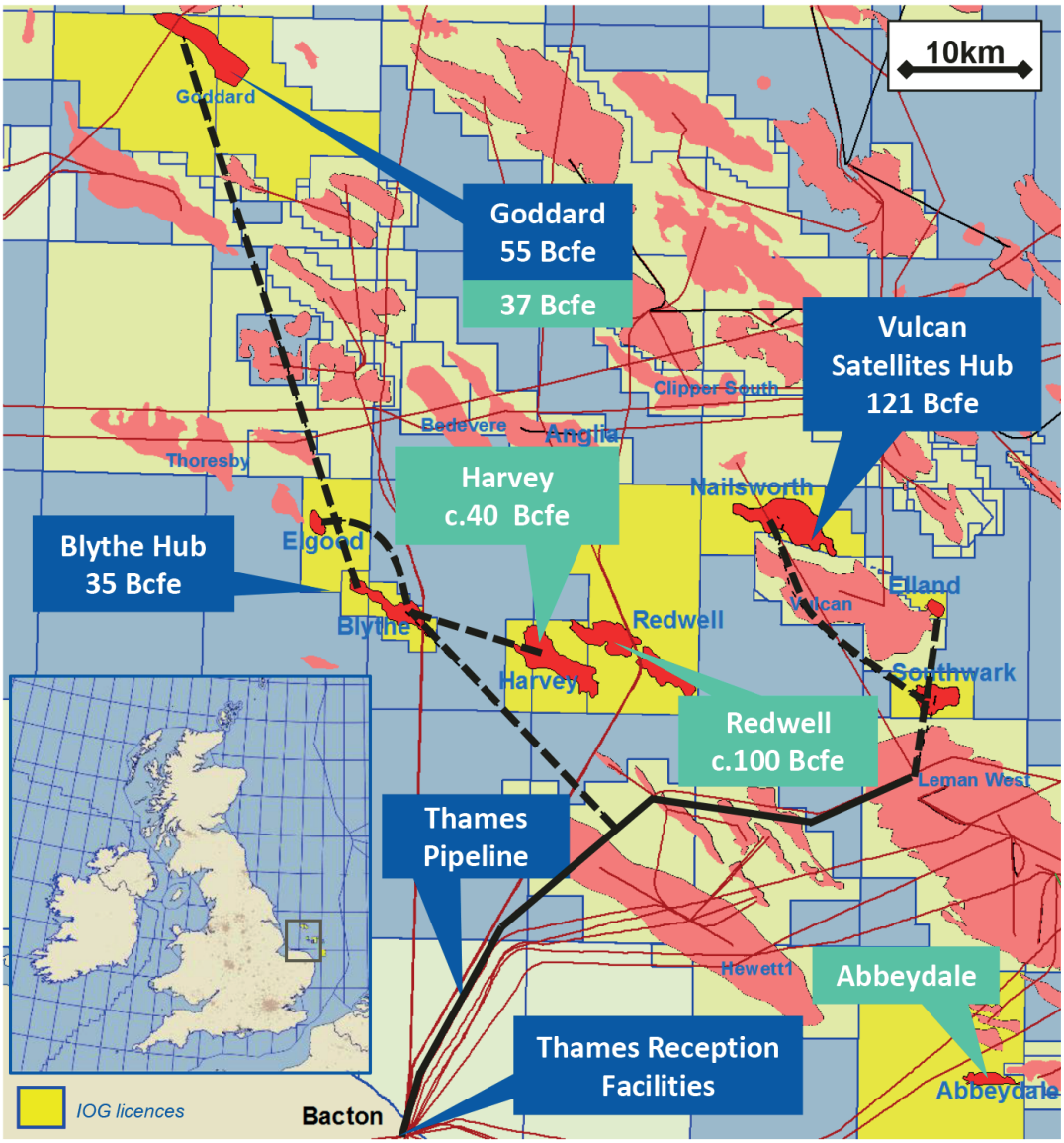
Alongside its core assets, IOG is also appraising additional incremental opportunities at the nearby Harvey, Abbeydale and Redwell discoveries, all of which could be tied back to the Thames infrastructure if they are deemed viable.

Hockey believes that the company's position as of the end of 2019 distinguishes it from its peer group. "Almost uniquely among our peers we are fully funded to deliver our project," he notes. Even now, IOG is made up of less than 30 staff, although there are plans to gradually expand the team as operations require. This position is of course no accident — but it is testament to the experience IOG has managed to draw on during a challenging and transformative period.

"We've had a quite a year," he adds. "Although it was incredibly hectic and stressful, it was also very rewarding because we met every challenge that was put in front of us. That said, we are only looking ahead now to ensure we deliver similar success in the next phase."

Having secured multiple licences since its inception in 2011, the company still held 100% of these interests until mid-2019. "We had a very clear view with the board that the strategy would be to farm down 50% for a development carry and get the bulk of the project financed that way, and do the rest with the bond," he says. Yet, following the collapse of London Capital & Finance and its energy-financing unit London Oil & Gas early last year, IOG was pushed to settle its outstanding debt with the latter's administrators.

This also necessitated defending the company from a potential hostile takeover by rival Rockrose Energy. "In our opinion there was never really any offer for the



IOG's Core and Incremental assets around the Thames Pipeline infrastructure.

Core Assets

Incremental Assets

equity, they were more interested in buying the debt from the administrators and using that to get control of the company," Hockey posits. This defence effort came just as IOG was preparing to raise £19 million in new equity from City backers, shareholders and management in April, which it did successfully.

The proceeds were partly to fund the company through the selection process for a suitable farm-down partner, and specifically one that was able to fund its share of investment from its own balance sheet rather than by raising additional debt. CalEnergy Resources — a unit of Berkshire Hathaway, the conglomerate run by magnate Warren Buffett — emerged as a strong contender early on. "They were interested in increasing their position in the SNS so they were a logical party to bring into our competitive process," Hockey explains. "They didn't want to overpay for production, they were looking for a near-term production portfolio like this that they could invest in and that they could see healthy returns from in a reasonable time-frame, as well as lower-risk upside potential."

"The portfolio was put together with the intent of re-using the pipeline and before anyone would believe us, we had to demonstrate it worked."

The IOG team on a site visit to the Thames Reception Facilities at the Bacton Gas Terminal.

In a deal announced in late July, CalEnergy agreed to farm into 50% of IOG's core project, committing to £40 million up front on completion and two development carries of £60 million and £65 million on Phase 1 and 2, respectively. The deal also includes an Area of Mutual Interest (AMI) agreement, whereby the two companies will work together 50:50 on any future developments around the Thames pipeline infrastructure, as well as options on future development opportunities and Licensing Rounds.

The agreement also left operatorship with IOG, offering another distinct advantage, and in Hockey's view "a real testament to the team that is in place here."

The rest of the project funding was raised via a €100 million bond issued on the Nordic bond market in September last year. The partners then approved a final investment decision in late October, signing off work schedules for 2020 at the same time and setting the project towards first gas targeted in July 2021.

In addition to securing external partners, Hockey says IOG has put a lot of effort into strengthening its management team and board over the last twelve months, picking experienced board members from engineering, finance, subsurface and commercial backgrounds. It has also recruited several management team members with proven backgrounds in SNS gas development, all of which has helped add credibility to its plans.

"Transformational is a bit cliched, but it was transformational because we turned the whole thing around and IOG is a completely different company now in terms of capital structure, shareholder base, the team – it's all completely different from what it was even just a year ago."

Preparing a pipeline

Work is now underway to prepare the facilities and infrastructure to support the two phases of development across the core portfolio. As of January, Hockey says the team are working with contractors under effective heads of terms for the design of two platforms — one each at Southwark and Blythe — with EPC and construction slated to begin early in the year, pending FDP approval.

As with other recent SNS projects, these will be normally unmanned installations (NUI), with minimal production and processing facilities. Tiebacks include a 7km link from the Southwark platform to the Thames Pipeline, planned to be laid this summer, and a 24km line from Blythe to Thames laid in the autumn. A subsea wellhead at Elgood will also be tied back to the Blythe platform via another 10km line. Further tiebacks between the Thames infrastructure and the Nailsworth, Elland and Goddard fields will then be laid in phase two.

IOG will also be building an internal drilling team to manage its 12-well campaign, with five wells planned for phase one and seven in phase two.

"We are actively looking around us for other potential hubs in the area. We would prefer to stick to UK gas at the moment, but there are opportunities to create others."

Open-water drilling is planned to begin early in 2021 at Elgood, before moving to Southwark-1, which will be the first well brought into production. This will be followed by a well at Blythe and the simultaneous hook-up of Elgood to the Blythe platform, before the drilling team move back to Southwark for the final two wells, with completion expected in early 2022.

Meanwhile, extensive refurbishment work will take place on the Thames Reception Facilities at Bacton Gas Terminal. Of the £280 million in capital committed to the Phase 1, onshore work here will account for around 10%. Nevertheless, this appears to deliver significant value; even with the cost of refurbishment, Hockey says the pipeline "saved us £100 million up front in CAPEX and over £100 million in terms of life of field OPEX that we don't have to spend on transport tariffs to other people. It is fundamental to the overall economics of all these fields."

He cites September 2018 as the point at which he believes the rest of the industry began to take a proper interest in the pipeline's potential. Following asset integrity surveys, the team conducted a full operational test of the pipeline, pressurising to 150 bar for a full 24 hours. "That showed it can cope with a flow of 550 million cf/d, which is way over what we need," he explains. "Our portfolio only needs to use about 40% of that for the core project at its peak production level. It's a real asset."

Hockey also credits regulatory support from the Oil and Gas Authority (OGA), particularly when it came to completing the numerous tasks around acquiring the pipeline — reassuring given the department's focus on 'the right assets in the right hands.' "This really is MER in action," he affirms.

He also believes that ownership of the pipeline and assets sets IOG apart as an investment proposition: "I think it's pretty much a unique position, the ownership of infrastructure that we have. We don't have to go to the majors to get our gas to market...and once you've got the core project up and running, it delivers really good returns." Indeed, following first gas in July 2021, IOG projects it can begin generating free cash by October.

Beyond the financial advantages, the re-use of the infrastructure has implications for the carbon intensity of IOG's gas production as well. As sustainability and environmental disclosure becomes a greater issue for investors and regulators, the company hopes that its indigenous production, minimal facilities and refurbished pipeline will set it apart from its peers. Adds Hockey: "When we were out on the bond roadshow, we were repeatedly asked about our approach to ESG and to our carbon footprint and we are able to respond with confidence. We're now doing further work to try to demonstrate how this should be an exceptionally low-carbon-footprint project in the North Sea context."

Hub for the future

Additional tie-backs — be they to IOG-CalEnergy ventures or other SNS-focused producers — could make the infrastructure even more lucrative, providing what he calls a "strategic platform" for new business. "Operators in [the SNS] now are tending to be smaller," Hockey adds. "There are a lot of new operators coming in and picking up gas opportunities in licensing rounds that we think potentially could come through our infrastructure, potentially through M&A or through tariffing."

IOG also has other incremental opportunities to consider. A recent appraisal well at Harvey delivered "mixed" results; while the gas volumes demonstrated at the specific well location were deemed sub-commercial, the well data has enabled the company to define the remainder of the Harvey structure at an initial mid-case estimate of 40 bcf, and has assisted new mapping of the nearby Redwell discovery (formerly Wherry), indicating mid-case recoverable resource volumes "in the region of 100 bcf" equivalent. The data is now with CalEnergy, with a farm-in decision anticipated by late February.

The two AMI partners have also co-operated on applications for additional licences in the OGA's recent 32nd Round, announcements for which are expected in Q2 2020.

Looking further afield, Hockey is confident that IOG's model can be replicated to create other gas hubs. "We are actively looking around us for other potential hubs in the area. We would prefer to stick to UK gas

Above: Infrastructure at the Thames Reception Facilities, currently in the process of refurbishment.

at the moment, but there are opportunities to create others. They might look a bit different, but the hub concept doesn't have to be the same each time – the key is to remain focused on building up the returns," he explains.

Progress over the next 18 months will, of course, be critical in terms of IOG's future development and growth plans. Hockey acknowledges that it could be a potential takeover target, and the attempt by rival Rockrose last year proves there is some appetite for its assets and infrastructure. Nevertheless, he says the team's day-to-day job will remain building the business and focusing on its strategic platform. "We can give this dedicated management focus, without getting distracted on other things." he notes.

IOG's emphasis on the importance of indigenous North Sea gas and its focus on predictable returns with minimal cost and carbon implications are encouraging — and very much aligned with the aims of both Roadmap 2035 and the OGA. Its successful progress since 2011 also proves that a small, talented group is capable of delivering innovative projects that previous generations of North Sea E&P players may not have considered. Despite the trials of a challenging year, Hockey and the team are confident that IOG has plenty more opportunities in the recommissioned pipeline.

UKEF backs SME success

Wireline speaks with UKEF export finance manager Alistair McMillan about how the agency is helping the supply chain.

UK Export Finance (UKEF) is the UK's export credit agency that provides export finance, credit insurance and guarantees. Nearly all developed countries have at least one ECA.

It provides financing to help UK companies of all sizes and in all sectors win, fulfil and get paid for export contracts. It also helps overseas projects secure long-term financing to help them access the UK supply chain and introduce UK small to medium-size enterprises (SMEs) to export opportunities.

What are the main priorities for UKEF in 2020 and beyond?

Last year, we celebrated our centenary and provided record levels of support for UK exports. Now we're looking to the next 100 years and how we can sustain this success.

To do this, we will continue to innovate and enhance our product range to ensure it meets the needs of customers of all sizes. This means enhancing our offer to widen UKEF's support across the UK supply chain.

If businesses were to export more, Britain would see even stronger economic growth. And the right finance, or insurance, can make all the difference for a company looking to sell overseas. We will raise awareness of our offer so that UK businesses can realise these benefits.

How do oil and gas suppliers fit into these priorities?

The UK's oil and gas sector remains a significant source of skilled jobs and plays a vital role in the UK's energy security. The expertise we have in the UK can play a vital role in supporting the ongoing energy mix and the transition to cleaner energy — both in the UK and overseas.

Many of the UK companies who will meet the global renewable energy and low carbon needs of the future are those who are transitioning from oil and gas. UKEF's support will be important to them during this transition as they become leading exporters in this area.

In what ways can UKEF support OGUK members and the wider supply chain?

We provided £2.4 billion of support for oil and gas projects around the world in the last financial year. Much of this has helped secure funding for huge overseas projects that needed UK goods and services. Support from UKEF is conditional on UK businesses being involved.

Take UKEF's recent support for the Dhi Qar and Samawa gas-fired power stations in Iraq. As part of our support for the project, we arranged an event with the project sponsors attended by nearly 200 UK suppliers. Several UK companies have won contracts to supply to phase 1 of the project, and the sponsor is on track to achieve $230 million of UK content.

We have many more events that bring overseas buyers together with UK suppliers planned for 2020, including in the energy sector. Visit www.events.great.gov.uk to sign up to future UKEF events.

Can UKEF help with access to alternative funding processes?

UKEF fills in gaps where the market won't offer support to viable exports. We don't compete with the private sector, we complement it.

We work closely with banks and alternative fund providers when offering support. Specifically, we can secure financing for exports by guaranteeing a bank up to 80% of the value of a contract and insuring against non-payment or buyer default.

Our industry vision, Roadmap 2035, seeks to increase our export potential — how can UKEF help with that?

The government is committed to helping the UK become a net-zero economy by 2050, and the oil and gas sector has an important role to play in decarbonisation.

As I said before, we are always seeking ways to enhance our product range to better meet the financing needs of exporters. Our upcoming general export facility means UKEF can provide financing to support an exporter's overall working capital requirements, rather than just providing those related to specific export contracts.

This is one of a number of initiatives that will help businesses increase their exporting potential.

What role can UKEF play in the energy transition, nationally and internationally?
We are already playing a role in driving UK content into overseas renewables projects across the globe. We recently provided £230 million of support for the Formosa 2 offshore wind farm project in Taiwan so that more UK companies will be involved in its construction.

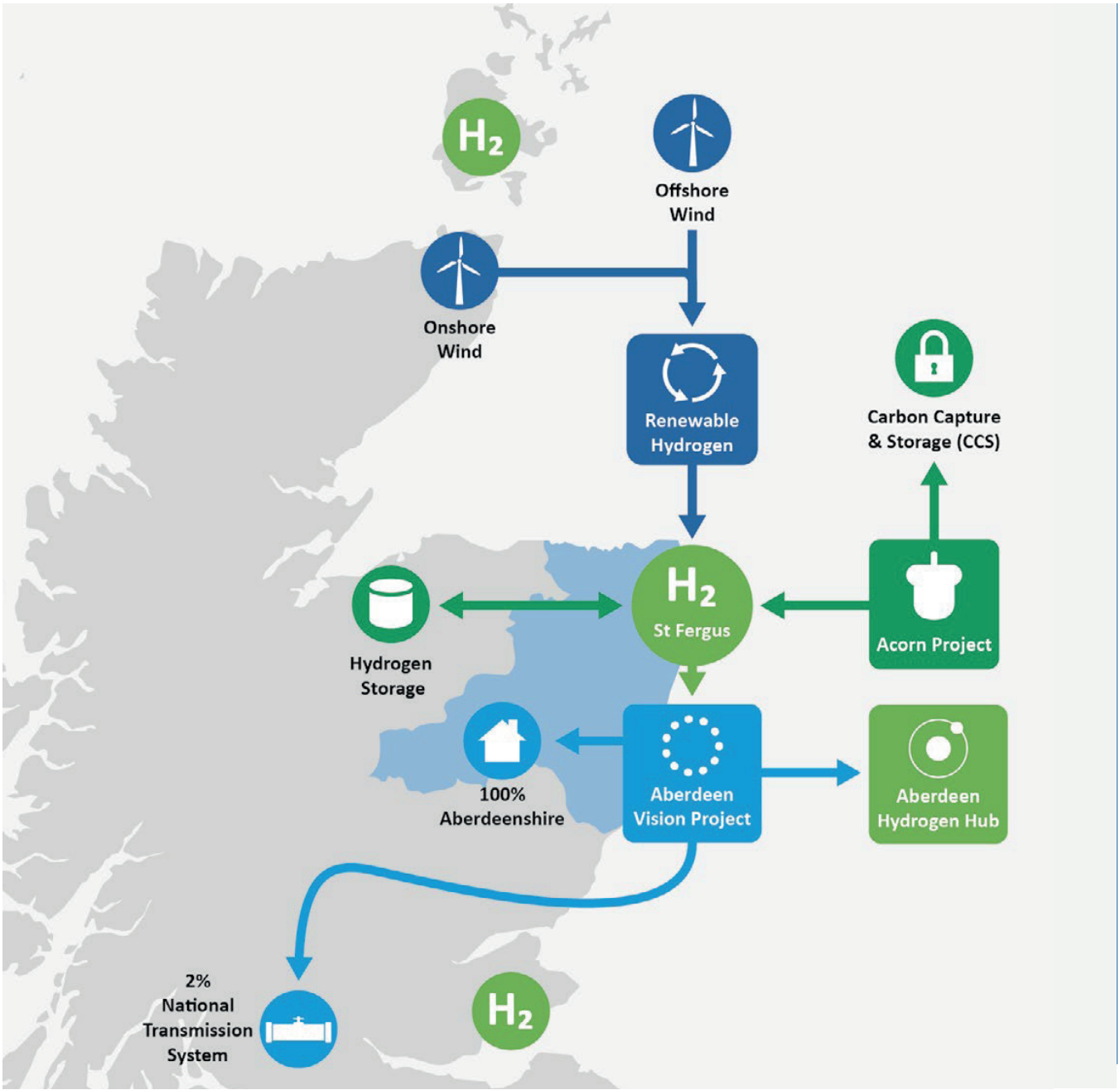
We are also financing renewables companies exporting from the UK. Our support for JDR Cables' contract to supply the Meerwind Süd and Meerwind Ost windfarms off the North Sea coast of Germany helped them double the speed of their development.

How has the organisation responded to challenges over its funding for fossil fuel projects?
Any support we provide is subject to the project meeting strict criteria, including compliance, environmental and social requirements. That said, we are further strengthening the way we assess climate change risk and developing the breadth of our support for the renewable energy and clean growth sectors.

How can businesses and SMEs seek support from UKEF?
If you would like to find out how UKEF can help you win orders, fulfil contracts and get paid, then visit www.great.gov.uk/trade-finance/ or if you have questions, please feel free to contact me directly!

"We can secure financing for exports by guaranteeing a bank up to 80% of the value of a contract and insuring against non-payment or buyer default."

UKEF
Export Finance Manager
Alistair McMillan



The coastal path to net zero

A series of major projects along Scotland's east coast highlights the benefits of joined-up thinking around hydrogen and CCS infrastructure. *Wireline* explores how this Hydrogen Coast could play a decisive role in meeting net-zero targets.

As the energy industry steps up strategic efforts to achieve the UK's net-zero carbon emission objectives, a host of pioneering new projects are beginning to take shape. In some areas of Scotland, various key initiatives are already in motion. Extending along the east coast from Orkney through Aberdeenshire and on to Fife, these schemes are all focused on providing the infrastructure, technology and demand for hydrogen.

Last year saw the unification of much of these efforts under the banner of the "Hydrogen Coast." Associated projects range from the harnessing of renewable energy sources such as wind to produce hydrogen (also called 'green' hydrogen), to the planned creation of major new facilities to decarbonise natural gas from North Sea fields supported by carbon capture and storage technology, (distinguished as 'blue hydrogen').

Collectively, this cluster of projects are positioned to capitalise on the east coast's natural assets and its existing industry infrastructure to forge a hydrogen economy and help Scotland achieve a 75% carbon reduction by 2030 and meet its aim of becoming net-zero by 2045. In doing so, the projects could open up new long-term opportunities for oil and gas operators and supply chain businesses alike.

The hope is that by drawing on the specialist resources, existing skills and technical knowledge of the energy sector, the Hydrogen Coast could position Scotland as a national — and global — leader in the energy transition.

Heat exchange

Hydrogen of course already plays a role in the energy mix — as exemplified by its use within some refining applications and transport systems — but the ambition of those involved in these projects is to take hydrogen's status to another level. "We're increasingly seeing the opportunities for hydrogen to play a key role in the decarbonisation agenda and we believe it's essential in getting us to net-zero," says Sam Gomersall, commercial director with Pale Blue Dot Energy, project developer of Acorn CCS and Acorn Hydrogen.

Pale Blue Dot has a specialist focus on the low-carbon energy transition and is a pivotal player in some of the central elements of the Hydrogen Coast. "It's not there yet, but we believe hydrogen will become a huge part of the energy industry in the coming years — not just a peripheral, tacked-on element, but a significant sector in its own right," adds Sam. "People in the oil and gas industry are perhaps not yet fully aware that it's coming down the road, but it could happen both quickly and at scale, presenting multiple opportunities within a Just Transition."

UK energy consumption is effectively divided into three sectors, with around half of our energy used for heat, a quarter for transport and a quarter for electricity generation.

"There's good progress already in terms of starting to use renewables to decarbonise power and we're also beginning to move ahead in transport, with the emergence of both hydrogen and electric vehicles, but the big challenge revolves around heat," says Sam.

"Most of that comes from natural gas and, at the point it's used, it emits CO_2. One of the options that we and others are looking at is to displace some — and eventually all — of that gas with hydrogen. This means we would be using clean fuel at the point of use."

Those principles are driving some of the key projects within the Hydrogen Coast portfolio, including the Acorn Hydrogen project at the St Fergus gas terminal and the Aberdeen Vision programme. The former facility receives North Sea gas and is responsible for processing around 35% of the UK's gas supply.

Led by Pale Blue Dot working in conjunction with partners, Acorn comprises two central programmes. The first component involves establishing carbon capture and storage (CCS) infrastructure at St Fergus to capture the CO_2 by-product of both the natural gas and hydrogen production process, and transport it offshore for permanent geological storage using existing oil and gas infrastructure. The second involves the creation of new facilities at St Fergus, whereby natural gas would undergo a reformation process to produce hydrogen for export into the national transmission system.

Plans to produce this hydrogen feedstock are closely interlinked with the Aberdeen Vision project, which is focused on using hydrogen to help decarbonise the local and national gas transmission systems. This programme envisages progress over three phases. The first would see a 2% concentration of hydrogen blended with natural gas exported from St Fergus into the national transmission network for use across Scotland and northern England. The scale of the terminal's exports means this phase alone would eliminate around 400,000 tonnes of CO_2 annually from the energy system.

The second phase would involve scaling up hydrogen production at the complex and adding a 20% blend to the gas supply for the Aberdeen city and shire region. This would entail installing a new pipeline from St Fergus to Aberdeen to transport pure hydrogen for injection at strategic points — and to offer a local 100% hydrogen hub for transport and other applications.

The final anticipated phase would see natural gas replaced entirely with hydrogen for the region's heating and other purposes, a process that would entail the staged transition of the local distribution network.

"Acorn production is all about scale — the most important aspect is to get started with the formation of new facilities that can put a 2% blend into the national system. We'd then need more production capability to get to 20%, so it's about phased and incremental development," Sam adds.

"We see hydrogen as an essential part of the oil and gas industry's future as it will enable operators to continue producing natural gas that will ultimately be exported from St Fergus as hydrogen — so the end user will be using a clean fuel."

Connection and collaboration

Inherently linked with the planned production capabilities are the proposals to develop CCS, which would involve building new technical facilities at St Fergus and using existing infrastructure to pipe the CO_2 offshore. There are three offshore gas transmission pipelines no longer required for petroleum use which could be used for transport, with the CO_2 stored deep underground using new wells. The strategy also envisages CO_2 emissions from the UK and Europe being imported for storage via, for example, the nearby deep-water facilities at Peterhead or by existing onshore pipeline infrastructure.

It's proposed that CO_2 emissions from the current St Fergus processing facilities will be used to bring the new CCS system into use, realising an early environmental gain ahead of the hydrogen production facilities becoming operational. This CCS technology must be in place before hydrogen production begins at St Fergus and Sam says the CCS Front End Engineering Design (FEED) is already underway. The Acorn hydrogen production facility preparation is at the Concept Select or Pre-FEED stage.

With a final investment decision anticipated towards the end of 2021, and all necessary consents and permitting requirements being progressed, there are hopes the CCS project will go live in 2024, with the first 200-MW reformation unit for hydrogen production due on stream in 2025.

The close links between offshore operations and the hydrogen economy are further exemplified by other elements of the Hydrogen Coast collective, such as the Surf 'n' Turf community project in Orkney. This scheme would see surplus electricity from tidal power devices at the European Marine Energy Centre and from the onshore Eday Renewable Energy turbine, used to generate hydrogen.

The Hydrogen Coast coalition has strengthened in recent times through increased engagement among the various diverse parties — within and without the energy sector. "The connections manifest themselves in lots of different ways across the organisations," says Sam. "It has seemed increasingly appropriate to have informal collaboration, but it's certainly not designed to be exclusive — anyone with a stake in the topic can become involved."

Its ability to reach other sectors is boosted by organisations such as the Scottish Hydrogen and Fuel Cell Association, which features participation by several project representatives, while the CCS agenda is given further impetus via the North East Carbon Capture, Usage and Storage (NECCUS) Alliance.

"There aren't big opportunities today but the key for supply companies is perhaps to start skilling up and addressing any technology gaps, so they'll be in a position to capitalise on hydrogen developments as they arise."

Pale Blue Dot Energy
Commercial Director
Sam Gomersall

The St Fergus Gas Terminal
Credit: Shell

The Alliance brings together industry, academia and government to provide collective support for the Scottish energy transition. Pale Blue Dot is among the founding members, and Sam adds: "It's a great example of how a coalition of the willing can be formed to achieve net-zero goals."

More broadly, Sam says there has been sustained support and encouragement from the Scottish and UK governments, Scottish Enterprise and Opportunity North East (ONE), among other bodies. That support in part recognises the potential economic gains: initial estimates from the Centre for Energy Policy at the University of Strathclyde suggest that by 2030 anywhere between 7,000 and 45,000 UK jobs would be associated with Scotland securing 40% of the carbon storage element of a European CO_2 management market.

Scaling up

The opportunities for players in the oil and gas sector to capitalise on the transition are also diverse, says Sam. "For operators, it depends on their future strategy, but the Acorn plans will offer a net-zero route to market for natural gas," he adds.

As operator of the St Fergus Terminal, Shell will also play a key role in Acorn, as well as project partner Total. Commenting on the project, a Shell spokesperson told *Wireline*: "Shell has been working with partners to shape the basic concept and are providing our input and expertise through a Technical Development Service Agreement. The next steps depend on progress in developing the policy and regulatory frameworks required to support CCS at scale in the UK and the outcome of the current work scope."

On the supply chain side, larger contractors are already exploring the opportunities both in terms of supporting hydrogen production and helping deliver CCS solutions. While this new sector won't arrive overnight, the groundwork could be laid now for the facilities and skills that will come to the fore over the next decade. "There aren't big opportunities today but the key for supply companies is perhaps to start skilling up and addressing any technology gaps, so they'll be in a position to capitalise on hydrogen developments as they arise," he continues.

Onshore, those possibilities encompass developments such as the chemical processing facilities for hydrogen production, which would offer opportunities for EPC companies and specialist vendors.

Aberdeen's Hydrogen Bus project
Credit: Aberdeen City Council

Offshore, CCS would still require many of the major work scopes associated with conventional oil and gas work, including pipelines and subsea infrastructure, drilling and downhole equipment.

"We believe most of the potential gaps lie in skills and assets at the moment; the technology is more about refinement than breakthrough advances," says Sam. "Supply chain companies might benefit from looking at the services they currently provide and assessing what they might offer in the hydrogen space, then look at what skills, expertise and training they might want to invest in."

He says the skills gap may exist in areas such as health and safety, where very specific specialist support is required, and in technical areas such as materials.

Overall, he adds, the Hydrogen Coast is putting Scotland on the global map. With Aberdeen already taking a lead in hydrogen-powered transport and Orkney demonstrating the potential for island communities when it comes to the production of hydrogen from surplus renewables, these projects are already raising the profile of hydrogen as a power source.

That international status will support the energy industry's ability to take its emerging hydrogen capabilities into other regions — just as it has done with its North Sea oil and gas expertise.

"Acorn Hydrogen and the Hydrogen Coast initiative is critical to get everything moving in the UK, but hydrogen is being looked at in many other countries," says Pale Blue Dot's communication and stakeholder engagement lead, Kirsty Lynch. "These projects put us at the forefront of development in this area — Aberdeen in many respects has led the way in the development of oil and gas expertise, and this is part of the next phase of energy supply from the region.

"As the supply chain grows its hydrogen expertise, it should open up other opportunities to support hydrogen and CCS projects elsewhere in the world."

HYDROGEN COAST PROJECTS AT A GLANCE:

Aberdeen Vision Project: SGN and National Grid with Pale Blue Dot Energy and DNV GL
Acorn Hydrogen: Pale Blue Dot Energy, Department for Business, Energy and Industrial Strategy (BEIS), The Scottish Government, Chrysaor, Shell and Total
Acorn CCS: Pale Blue Dot Energy, EU Innovation and Networks Executive Agency, BEIS, The Scottish Government and Chrysaor, Shell and Total
Aberdeen Hydrogen Bus Project: Aberdeen City Council, EU High Vlo City and Fuel Cell and Hydrogen Joint Undertaking (FCHJU), Innovate UK, Stage Coach, First Group, The Scottish Government, Scottish Enterprise, Scottish Hydro Electric Power Distribution, SGN
The Hydrogen Hub, Aberdeen: Aberdeen City Council, Scottish Enterprise, Opportunity North East
Surf'n'Turf, Orkney: Orkney Islands Council, EMEC Orkney, ITM Power, EU, FCHJU, The Challenge Fund, Scottish Government, Local Energy Scotland, Community Energy Scotland
Dolphyn ERM Project: ERM, Engie, Tractabel Engie and ODE
H100, Fife: SGN
HyStorPor, offshore: University of Edinburgh
BigHit, Orkney: Orkney Islands Council, EMEC
Flotta Terminal, Orkney: OGTC
HyDIME, Orkney: Ferguson Marine, Orkney Islands Council, EMEC, HSSMI
Methiltoune, Fife: SGN
Dundee Bus Project: Dundee City Council

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