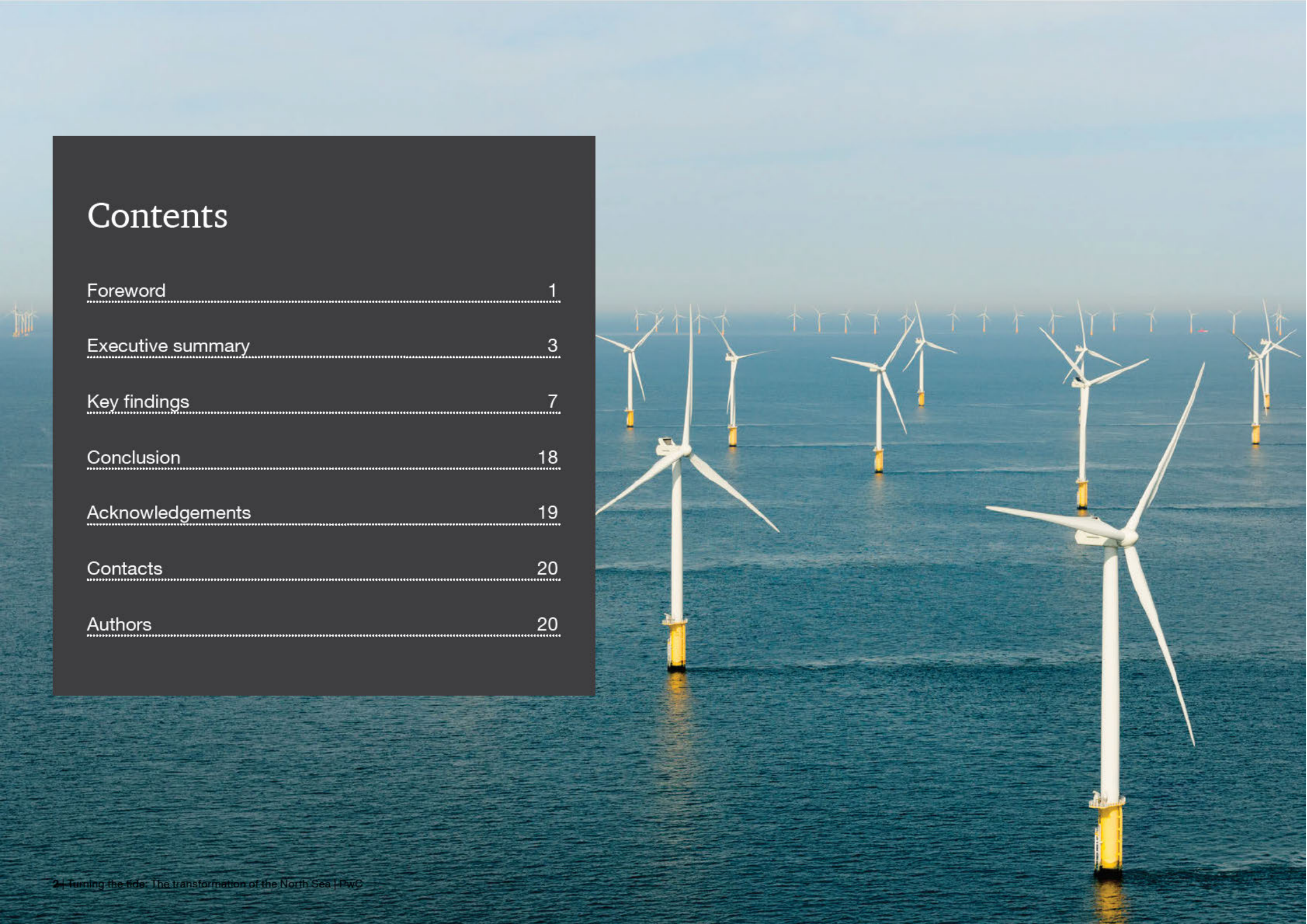
Turning the tide – The transformation of the North Sea

November 2019

pwc | OGUK

Contents



Foreword

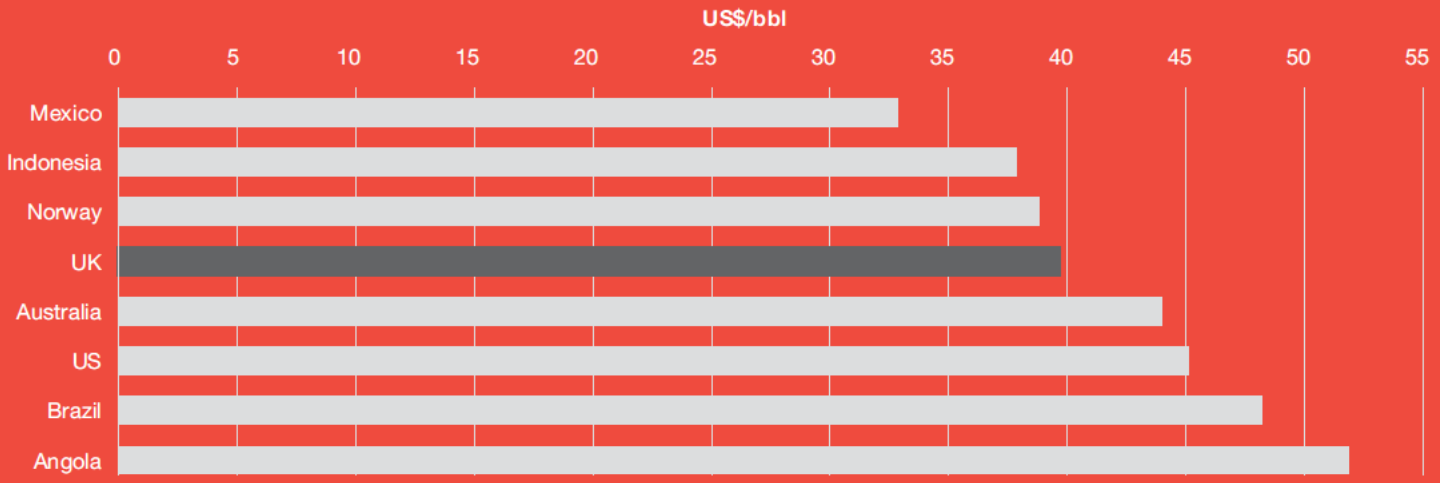
In 2016 we published **'Sea Change – the Future of North Sea Oil and Gas'**, in which senior oil executives saw the UK Continental Shelf (UKCS) as having a two year window to transform and ensure a profitable and productive future.

Three years later, PwC and Oil & Gas UK (OGUK) have collaborated to assess how the basin has evolved. We interviewed more than 20 key and senior industry stakeholders across the value chain, exploring their views on the basin's competitiveness, how investment flows are changing and the important part the UKCS will play in energy transition.

We spoke to a spectrum of companies from large to smaller operators, oil services providers, funders and regulators to name a few. The findings of these interviews form the basis of this paper.

Following the oil price crash in 2014 prices have largely moved within a new lower range, albeit with higher volatility. It is likely the 'lower for longer' price outlook will continue. Against this backdrop, oil and gas companies in the UK North Sea have focused on cost reduction. The progress made in this area has been impressive. As shown in Exhibit 1, the UK now has an offshore breakeven price that is competitive with many other basins. Of course, there are other factors at play too, such as tax, prospectivity and resources. But the underlying message remains that the UKCS is a competitive basin.

Exhibit 1: Current average breakeven oil price for selected offshore basins



Source: Rystad Energy; PwC Strategy& research

Additionally, we have seen a changing of the guard in the UKCS. The larger upstream companies have increasingly focused their portfolios on higher value strategic plays such as West of Shetland, whilst some US majors have refocussed on North America onshore unconventionals. For some exploration and production (E&P) companies, the space this has created has allowed smaller more agile companies to step in. Private equity (PE) backed companies like Chrysaor, Siccar Point and Neptune Energy have taken on significant portfolios of assets. Their lighter corporate structure combined with highly skilled teams has enabled them to improve production costs and efficiency. As a result, what was formerly non-core for the majors in terms of assets, has become lucrative for these smaller operators.

But will this wave of investment continue? Is the basin as economically attractive as it needs to be to continue to draw in and retain investors? As for the move to a lower carbon world, will the energy transition drive the market away from hydrocarbons to a cleaner more sustainable future? And what important role can the UKCS play in the energy transition?

Combining this with our experience helping our members and our clients navigate this landscape we hope to shed some useful light on how to develop strategies for approaching the UKCS.

If there are any aspects of this report that you would like to discuss please feel free to get in touch.

Deirdre Michie
Chief Executive, OGUK

Drew Stevenson
UK Energy Sector Leader PwC UK

Executive summary

Every few years there are those doomsayers who prophesise the imminent demise of the UKCS. Despite this, the basin remains resilient. Through a combination of financial discipline and innovation the sector has successfully navigated periods of economic turbulence and uncertainty. And yet there is more to be done.

Our interviews probed views around the UK North Sea's competitiveness, investment trends and the impact of the energy transition.

With regard to competitiveness, several key themes emerged:

- While the supply chain in the UKCS had been financially squeezed as far as possible, new ways of working between operators and oil services companies are critical and examples of this collaboration are already emerging
- In an era when investment costs are capped, continued innovation in terms of business models and technology are essential to enhance the productivity and realise the full potential of the UK North Sea
- Partnership models, currently being explored, will be critical for sustaining the future of the North Sea, for big and small companies alike

As for investment trends, private equity firms, independent operators and oil services companies are critical players in the UKCS, with the majors pulling back to core areas. In the longer term, the interviews suggested the emergence of private capital from developing countries is likely to play a greater role in funding regional growth.

In terms of the impact of the energy transition, these discussions yielded a diverse set of insights, including:

- Investor sentiment is evolving quickly and placing an added hurdle in front of many oil and gas sector investments
- Upstream oil & gas companies are likely to face increasing investor scrutiny and pressure to improve the carbon footprint of their operations
- The North Sea oil and gas sector will need to articulate the value it brings and the importance of hydrocarbons in facilitating the energy transition to broader stakeholders
- The UKCS has the potential to become a show case for the energy transition – from low carbon solutions (such as the development of carbon storage and the production of hydrogen) to decommissioning

Against this backdrop, companies operating in the UKCS will need to weigh up several key questions:

- What are the growth strategies that will allow operators and oil services companies to grow their businesses sustainably in a dynamic and evolving market?
- What are the core capabilities market players need to develop to be successful and how do they acquire these capabilities? Is it through acquisitions or partnerships?
- And finally, how should oil and gas companies position themselves to flourish in a world where we are accelerating our transition to a lower carbon society?

These are fundamental questions to pose and some might argue even existential. For nearly 50 years, oil and gas from the North Sea have shaped the UK's economic prosperity. We are now witnessing the dawn of a new low carbon era where the North Sea has the potential to shape the energy transition and underpin the nation's ongoing prosperity.

> “
>
> Competition for the global investment dollar from other hydrocarbon basins and, increasingly, from alternative energy sources, will only increase. As an industry we have to continue to find ways to develop oil and gas safer, cheaper, faster and with a smaller carbon footprint. But if ever there was a region renowned for its ability to drive positive change, it's the North Sea.
>
> **Ariel Flores**
> North Sea Regional President of BP

Key trends and themes in the UKCS

Three years ago, the industry was in intensive care and many of the vital signs made poor reading. Investment had collapsed. Drilling activity was in decline and exploration activity was at an all-time low. Downsizing and job cuts were the order of the day and few expected the UKCS to regain its competitive form.

Oil and gas production is up by 20% since 2014, rising from 1.4 million barrels of oil equivalent per day (boe/d) to 1.7m boe/d in 2018. Production efficiency is at its highest for a decade and unit production costs have halved to US$15-16/boe. The industry sanctioned £3.3 billion of investment in the UK North Sea in 2018 and there is a rich diversity of companies investing in field developments, as shown in Exhibit 2. In response, employment across the sector is finally beginning to improve and companies are pursuing growth strategies.[1]

Exhibit 2: Prospective field investment decisions

Premier Oil	Premier Oil is planning to approve further development opportunities around its Catcher hub, in the form of the Laverda and Catcher North subsea field tiebacks.
i3 Energy	The i3 Energy-operated Liberator field is being progressed towards FDP.
Independent Oil and Gas Plc	Independent Oil and Gas (IOG) hopes to make an FID on its Blythe and Vulcan gas hub in the southern North Sea in the second half of 2019, following a farm-down to CalEnergy.
Wintershall-DEA	Wintershall-DEA is progressing the Winchelsea project in the southern North Sea.
Parkmead Group	Parkmead aims to make FID on the Perth development in late 2019, with first production slated for early 2022. The field will be tied into the Scott infrastructure in the central North Sea.
Ping Petroleum	Ping Petroleum is making progress on the Avalon field and hopes to be in a position to commence drilling activity in late 2019.
Siccar Point Energy	Front-End Engineering and Design (FEED) has been commenced for Cambo, operated by Siccar Point, with indications that an investment decision could be reached in late 2019 or early 2020.
Repsol Sinopec	Repsol Sinopec is progressing plans for the Tain field in the central North Sea, which would be tied back to the Bleo Holm FPSO.
Dana Petroleum	Dana Petroleum hopes to make an investment decision on its Platypus field tieback to the Cleeton platform in the southern North Sea in Q1 2020.
Hibiscus Petroleum	Hibiscus Petroleum is currently in the pre-FEED stage of its Marigold and Sunflower developments in the central North Sea.
Shell	The host facility for Shell's Jackdaw facility has been selected (Shearwater) and the project is now moving into the FEED stage. This has benefitted from the investment sanctioned in 2018 to upgrade the gas export infrastructure around the Shearwater hub.
EnQuest	EnQuest is currently assessing options for its Eagle investment opportunity.
Equinor	Equinor is progressing work on the Rosebank field west of Shetland, with the application of learnings from across its portfolio in order to optimise the development. An investment decision is now being targeted for 2022.

Source: OGUK

[1] For more details please refer to OGUK's Economic Report 2019

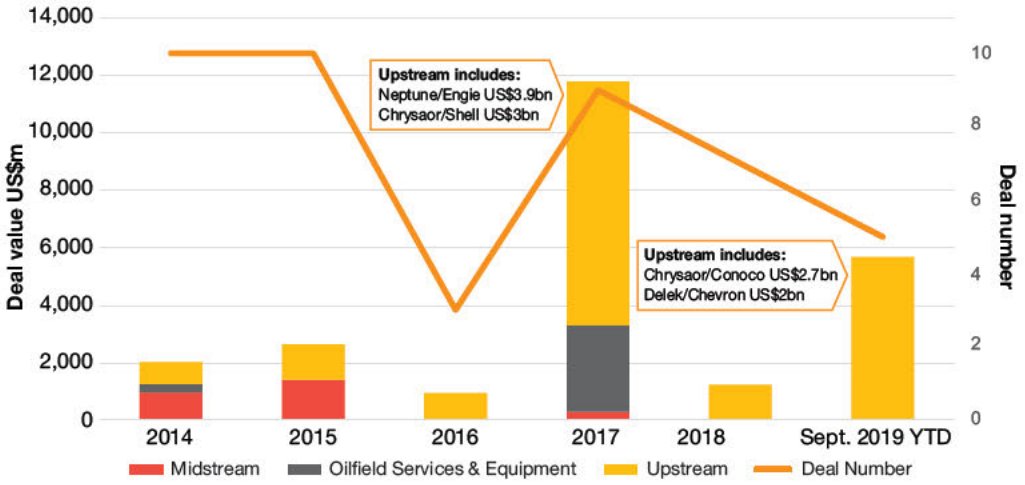
Moreover, E&P companies operating in the basin have been showing improved financial performance. The following three examples are illustrations of this point. Ineos made pre-tax profits of nearly £100m in 2018, compared with losses of £47.3m the year before. Ineos also announced it was investing £500m to extend the life of the Forties Pipeline System by 'at least 20 years'. This not only illustrates the capital Ineos is willing to deploy but incidentally is a powerful vote of confidence in the North Sea's future. As for Premier Oil it saw earnings in 2018 rise by nearly 50% on the previous year to reach $882m, while Enquest saw its core earnings rise by 135% to total $716m for the same period.

So, given this broader turnaround in the UK North Sea, what has driven the transformation?

Firstly, there have been hard choices taken by many companies to resize their organisations and bring new focus to their businesses. Whilst cutting the cost base and driving efficiency have been hard enough to achieve, the big challenge facing companies is how to maintain their competitiveness in years to come. No-one expects oil prices to rise and 'save the day', rather companies have to remain lean.

Secondly, the current wave of new entrants to the basin has helped bring a new dynamism to the basin. There has been a wave of transactions reshaping the basin, as illustrated in Exhibits 3 and 4.

Exhibit 3: M&A in UKCS



Source: IHSConnect; PwC Strategy& research

Exhibit 4: Major transactions in UKCS (selected examples)

Year	Buyers	Sellers	Industry	Deal level	Total transaction value US$m
2017	Neptune Energy	ENGIE	Upstream	Asset	3,916
2017	Chrysaor	Royal Dutch Shell plc	Upstream	Asset	3,024
2017	Wood Group	Amec Foster Wheeler	Oil Services	Corporate	2,700
2019	Chrysaor	ConocoPhillips	Upstream	Asset	2,675
2019	Delek/Ithaca Energy	Chevron Corporation	Upstream	Asset	2,000
2017	Delek	Ithaca Energy	Upstream	Corporate	1,285
2014	Antin Infrastructure Partners	BG Group	Midstream	Asset	953
2015	North Sea Midstream Partners	Total	Midstream	Asset	914
2016	Siccar Point Energy	OMV	Upstream	Asset	750
2015	INEOS	DEA/LetterOne	Upstream	Asset	750
2019	HitecVision/Petrogas	Total	Upstream	Asset	635

Source: IHSConnect; PwC Strategy& research

As a result of these deals, we are seeing an influx of nimble and agile companies focused on making the UKCS a success for their investors, whilst maintaining a traditional focus on safety and environmental performance. The new entrants are also challenging the incumbent players to perform differently and adapt their ways of working to suit this mature basin.

Thirdly, operators are starting to build fresh and more durable relationships with their supply chain that are relationships of equals, respecting each other's expertise and bringing a shared ambition to create value. During the oil price downturn the supply chain diversified geographically (refocusing on regions outside the UKCS) and into different sectors. As a consequence, operators have now to actively attract suppliers to engage in the UKCS.

Looking ahead, the pace of change will remain relentless. The oil and gas industry will play a vital role to help the UK economy achieve net-zero carbon emissions by 2050, through an increasing use of technological expertise to support the transition to renewable energy, such as offshore wind, and through the use of existing infrastructure to support carbon abatement measures, such as CCUS. Moreover, the sector must remain focused on maximising economic recovery. The evidence in this report shows progress is being made but there is more to do.

Key findings

UKCS Competitiveness

1. The supply chain in the UKCS has perhaps been financially squeezed as far as possible. New ways of working between operators and oil services companies are critical and examples of this collaboration are already emerging.
2. In an era when investment costs are capped, more innovation is necessary in terms of business models and technology to ensure productivity and sustain the UK North Sea.
3. Partnership models will be critical for sustaining the future of the UK North Sea, for big and small companies alike.

Extracting incremental cost savings from the supply chain is not a viable strategy going forward

Most operators interviewed agree the supply chain has been squeezed hard enough in the UK. There is a risk that continuing pressure could precipitate bankruptcies across oil services companies which will be detrimental to competition.

Some respondents articulated a more nuanced view on cost reduction suggesting the focus perhaps needs to be more on value than cost. For some oil service providers this in itself is still a difficult concept to accept given behaviours over many years. Since the oil price collapse, supply chain teams have been conditioned to address costs rather than look at value driven solutions.

To some extent both parties, operators and oil services companies, are still locked in a traditional mindset. Many operators struggle to separate cost controls from value creation and are still intent on addressing contractor margins and price points. In the same way, service providers are still too focused on costs. It is surprising this sentiment continues to exist despite the many initiatives encouraging collaboration in this area in recent years. Nevertheless, there are examples of operators and oil services companies exploring and establishing new ways of working. An innovative service partnership was struck up between Chrysaor and BHGE in 2018 to deliver a multi-well contract covering the drilling, completion and subsea tie-in of development wells on Chrysaor's operated assets. Both parties will share the risks and rewards of this initiative.

Operators and infrastructure owners can work collaboratively too. An example of this is Premier Oil which is leading the development of its Tolmount Main gasfield, using an innovative partnership model. Premier, which has a 50% stake in the field, will fund some of the costs to develop the site including project management and development drilling. Premier's partner, Dana Petroleum, has a joint venture with Kellas Midstream, a UK gas infrastructure company owned by Antin Infrastructure Partners, which will pay for the construction of a new platform and pipeline to export the gas to shore. In return Premier will pay a tariff for the transportation and processing of Tolmount gas through the infrastructure.

"

There is just no benefit in choking the life out of the supply chain. They are the breeding ground of innovation, people and technology.

Phil Kirk
CEO of Chrysaor

The industry as we know it today has changed. Operators and the supply chain now have to adapt to numerous variables in order to be successful. By considering a total expenditure approach, which focuses on total cost of spend over the long term, paired with commercial collaboration, companies can turn traditional ways of working upside down.

Romain Chambault
Director of Oilfield Equipment, Europe at BHGE

Compared to other industries we still have more to do in terms of application of new technology and innovation.

Paul de Leeuw
Director of the RGU Energy Institute

Further innovation needed across business models and technology

All companies we interviewed agree more innovation is necessary for the UK North Sea. Given the sector has been successful in removing costs from the system, operators have to explore other ways to increase profitability and this is where innovation comes in.

Some of the smaller independents referenced their efforts to explore pooling back office functions to reduce costs after the oil price downturn. These initiatives encompassed for example, centralised procurement services to obviate the need for multiple functions across operators which were not always fully utilised. This approach worked for repetitive orders that were not complex. However, more bespoke orders were still undertaken by in-house specialists. But in the end, the challenge with these initiatives was it required significant effort to set up for what was perceived as minimal returns. Looking ahead, operators flagged potential growth areas in centralised operations across a number of dimensions:

- The centralisation of procurement across the basin using large scale 'fulfillment' centres to meet operator needs for parts and equipment. Rather than the operators each maintaining separate warehouses and inventories, the point was raised by some about whether a single fulfillment centre spanning the entire basin could be established in the future.
- There are opportunities to centralise operations at the field development level. Given each operator developed their fields and wells independently, there is potential to standardise operations by clustering field developments and using a centralised approach to connect multiple fields with tie backs and hubs. Many of the smaller operators interviewed feel this approach presents significant potential for success.
- This concept of clustering could be extended to logistics where each operator typically duplicates the efforts of other players in the basin. So for example with supply vessels transporting equipment and goods across the basin to multiple fields and operators: could it be feasible for a single vessel to address the needs of multiple fields and operators in a cluster? While the cost – benefit analysis of this approach is evident, there are concerns that this might be difficult to implement as each operator would typically prioritise its fields first. It is worth noting this approach is already evident in the Central North Sea where a number of operators have collaborated to implement a vessel sharing platform, the Aberdeen Marine Logistics Alliance (AMLA).[2]

Focus on long term value rather than short term savings in cost

Aside from clustering and centralising operations, some operators would like to see a shift away from realising immediate cost savings to achieving longer term value. For example, one company highlighted the importance of the fabrication stage, where modest increases in capital expenditure could reduce significantly long term maintenance spend. It explained that sometimes at the design stage of fabricating a piece of equipment there was a temptation to use cheaper materials to reduce capital costs. This might translate into using a supplier to apply paint to an installation whereby the number of protective coatings was curtailed to keep costs down.

However, in a marine environment where there is a high risk of corrosion, such a decision could become expensive in the long term due to the additional maintenance required. A real life example illustrating this mindset was an operator which decided to thermally spray aluminium on a jacket and topside. While this was a more expensive solution in the short term, it reduced the need for remedial measures during the life of the asset thereby reducing overall maintenance costs in the long run.

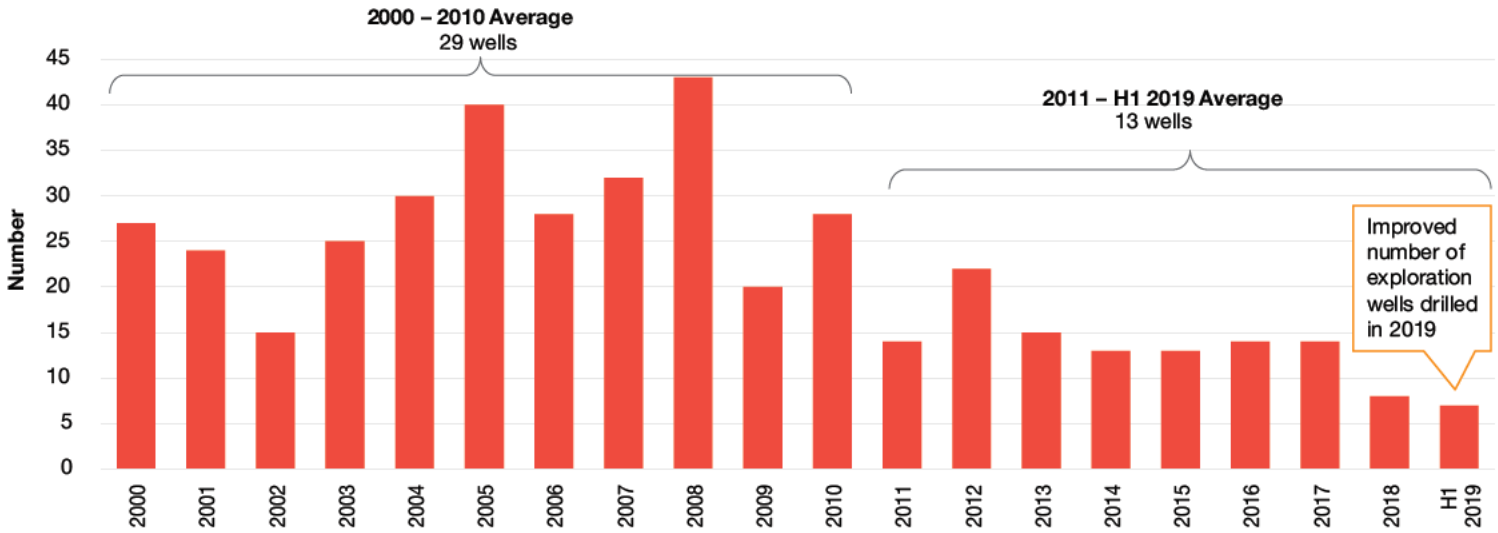
Exploration is the life blood of the basin

While many operators flagged the importance of innovation in terms of business models and the use of technology, they consistently emphasised the need for ongoing investment in exploration to keep unit costs down.

In this area more progress has to be made to ensure the overall competitiveness of the basin. In recent years the number of exploration wells has been in worrying decline, as illustrated in Exhibit 5. However, it is worth noting that the recent pick up in activity has been driven by a number of factors including: increased commercial risk appetite; better access to data; increased diligence on well design; better scoping and execution; and more flexible licensing rounds.

[2] http://www.amla.uk/#home

Exhibit 5: Number of exploration wells drilled in the UKCS (2000 – H1 2019)



Source: Oil & Gas Authority; PwC Strategy& research

> The UKCS presents investors with a diverse portfolio of opportunities across the basin, from large, complex developments, to small, low cost tie-backs, with significant value for investors regardless of which part of the lifecycle they wish to invest in.
>
> **Andy Samuel**
> Chief Executive of the Oil & Gas Authority

A portfolio of technologies and its effective implementation will be critical to prolonging the life of the basin

According to the Oil & Gas Authority (OGA), technology has a very important role to play in the North Sea. The OGA describes the UKCS as one of the world's most technologically advanced and diverse hydrocarbon provinces with a successful track record in pioneering new technologies throughout a 50 year development and production history.

The OGA has identified more than fifty existing technologies critical for the future of the UKCS while supporting operators to deploy the best technologies for their assets.

Successful implementation of technology is seen as critical to extend the life of mature fields and reduce their eventual decommissioning costs. It also can help improve the economics of many new, smaller or technically challenging fields, possibly unlocking up to half of the three billion barrels of oil equivalent of existing discoveries the OGA believes are not, as yet, being developed.

As a result, many companies feel it is critical to:

- Share experiences of deploying recent technologies
- Collaborate on developments and piloting to reduce cycle time and risk
- Engage more closely with the supply chain, where most technologies were developed and deployed

Digitalisation will be key to retaining competitiveness

Several of the oil service companies discussed how they had invested seed funds for digital innovation. Initially some have focused on digital equipment and hardware, such as tablets, head cams and wearables. However, some have struggled to deploy this technology effectively and often the technology is not always aligned with the approach of operators nor their requirements.

As a consequence, some oil services companies have shifted their emphasis to embracing wider digital services, using technology to process data and deploy analytics, often partnering with a technology third party.

Many companies referenced the increasing importance of digital solutions to enhance productivity, citing pioneering options such as digital twin technology and the use of drones for offshore inspections. However, there is strong support for the application of data analytics to drive preventative maintenance solutions. A key challenge here is the sheer volume of data generated in daily operations. According to Cisco, a typical offshore oil and gas platform can generate 1-2TB of data every day (in every day language a terabyte represents about 300,000 photos). Given this, simply capturing this data is a challenge. However, AI is seen as essential to mine this information and recognise patterns to produce insights.

In all these examples, those interviewed argued that innovation and technology both have important roles to play but have to be unlocked together.

All operators will need to adapt to behave more like tech start-ups

Many of the operators referenced the need to emulate tech start-ups in terms of agility and innovation. Their ability to pilot new ways of working, failing fast but then learning and scaling up quickly are characteristics many operators admired, small and large. One PE-backed operator emphasised the need to move at speed, demonstrating how it went from the exploration of a well to a field development plan approval within a year.

Partnership models need to be adopted to nurture competitiveness of the UKCS

All respondents recognised that the increase in the number of smaller operators in the North Sea is a positive development.

However, many commented that the future success of the independents will require new partnerships between the smaller operators and oil services companies. Because the independents sometimes lack detailed in-house knowledge, the oil service companies are well placed to support them providing new operating capabilities. More broadly, there is a need to develop new contractual partnerships with aligned incentive schemes. It was suggested operators should partner with the supply chain, and for the supply chain to benefit from a share of proceeds over time. However, clearly this needs a rebalancing of the risk dynamic and the question is, who would be willing to do that?

The nature of these partnerships varies. However, a common theme across many interviews was the idea of operators focusing on their core competencies and outsourcing other activities to oil service companies. For example, an operator might view its strengths as commercial deal making and subsurface capabilities. In which case partnering with an oil services provider which operates and maintains production assets would make sense.

The outlook for decommissioning remains positive

In preparing this report, we expected that decommissioning would be a key area of interest. This remains a topical theme, as illustrated by Shell's removal of a second platform, Brent Bravo, from its iconic Brent field in the North Sea in June 2019. That said, interestingly, none of the people interviewed highlighted decommissioning as a major theme.

Given the renewed focus by operators on maximising economic recovery from more mature assets, some decommissioning projects are perhaps now not as imminent as previously believed. A good example of this is the French operator Perenco, which announced it was investing in extending the life of two gas fields in the southern North Sea (as part of the Southern Hub Asset Rationalisation Project). Furthermore, a number of vendors have facilitated M&A activity by assuming some of the decommissioning liabilities. In 2017 Shell divested a package of North Sea interests to Chrysaor. In that transaction Shell retained a fixed liability of US$1 billion for future decommissioning with Chrysaor covering about $4 billion. Eon also agreed to shoulder about half of the decommissioning costs of selected fields which were acquired by Premier in 2016.

Certainly the longer decommissioning can be deferred, the more likelihood there is that new technological solutions and different ways of working might help to further extend the life of assets whilst also reducing potential future decommissioning liabilities. And these liabilities are significant. According to the OGUK, decommissioning expenditure in the UK is expected to average £1.5 billion per year over the next decade.

> "What we have seen in recent years is the new entrants to the basin are well financed, robust, with skilled, highly qualified leadership teams, backed by boards steeped with experience. The broader the mix the better for the North Sea as they bring fresh innovation. Diversity of operator is a strength for the basin especially in the context of net zero emissions by 2050 and the Energy Transition.
>
> **Steve Phimister**
> VP & Director of Shell UK & Ireland

UKCS Investment

1. PE, smaller operators and oil services are critical players in the UK North Sea, with the majors pulling back to core areas
2. In the longer term, the emergence of private capital from developing countries is likely to play a greater role in funding UK North Sea growth

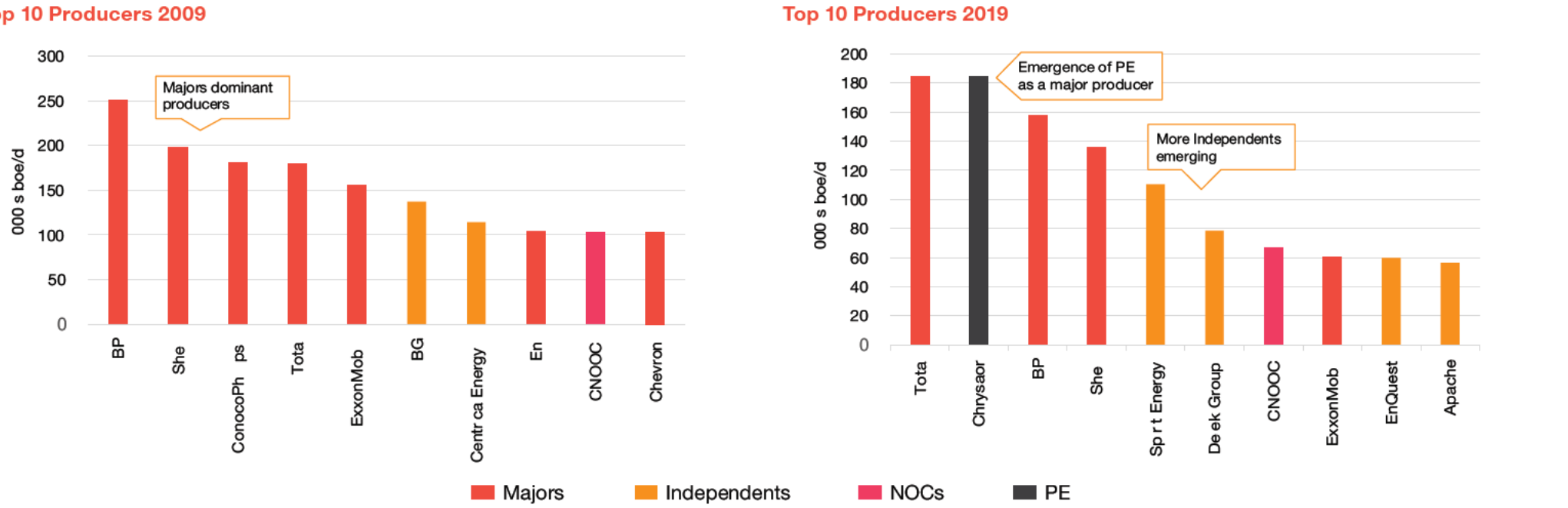
The mix of companies operating in the UKCS is evolving

Many respondents felt the ongoing trend of majors (predominantly US) exiting the UKCS to seek more material plays in other basins would continue. In their wake it was possible that some majors would retain at best some non-operated assets, almost as a form of annuity.

While it was recognised that PE was a major play now (see Exhibit 6) and fulfilling a significant role in funding the growth of certain UKCS operations, there are questions raised about the future exit of PE. For example, what will happen once PE firms seek to leave the region? Will there be enough buyers in the market to allow PE to exit? Will capital markets want an influx of E&P stock market listings? If PE firms simply sold on their assets to other PE firms is that a good thing? Some of the interviewees felt the smaller PE firms might merge with similar PE-owned peers to gain scale while the larger ones might seek to IPO.

> “One of the key strengths of the North Sea is its diversity of players. From private equity and NOCs to oil service companies, independents and oil majors. Each of these companies bring considerable skills and expertise that will sustain and transform the basin for many years to come.
>
> **Drew Stevenson,** UK Energy Sector Leader, PwC UK

Exhibit 6: Evolution of top 10 oil & gas producers in the UKCS (2009 – 2019)



Source: Rystad Energy; PwC Strategy& research

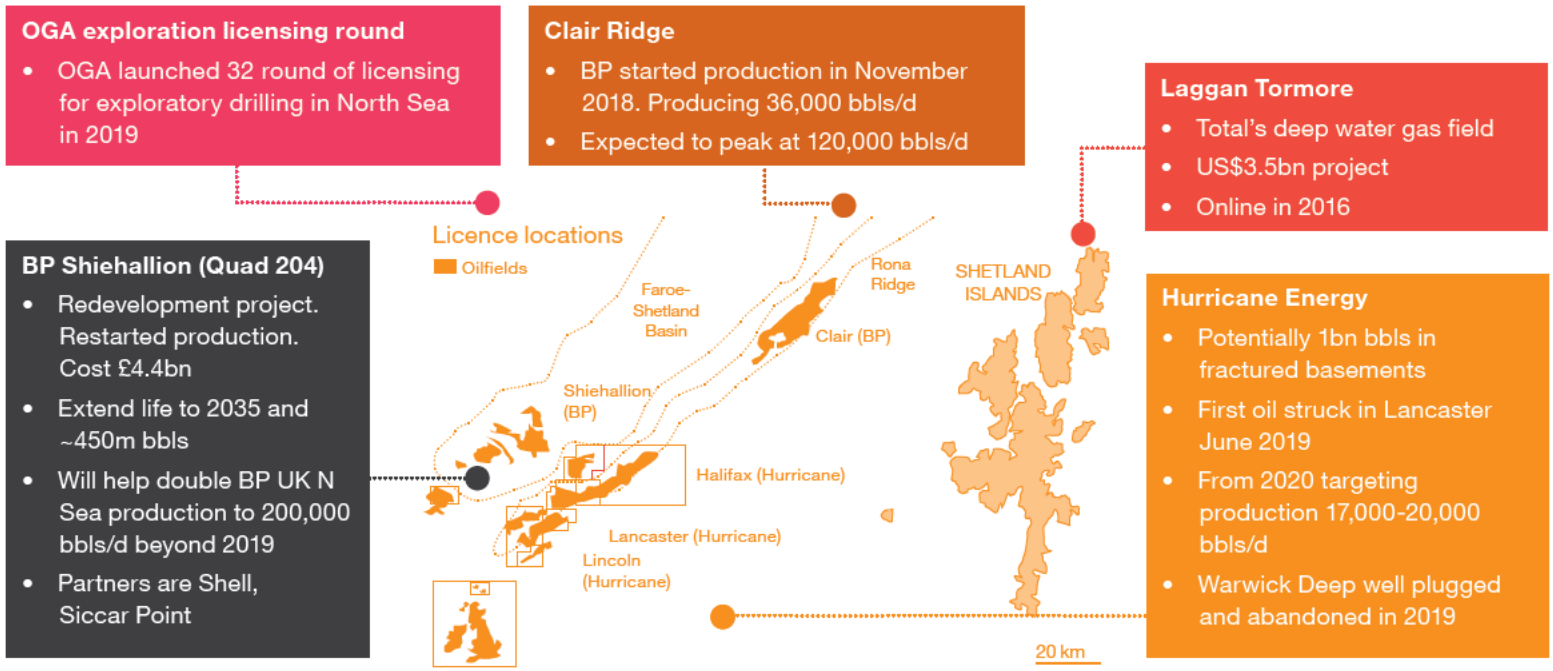
For the time being the current trend of PE plays will have implications for the basin. Many respondents felt PE-backed operators will seek the rapid development of fields (in contrast to larger IOCs which might sit on them while they were adjusting their investment profile). In this PE-focused basin, respondents felt there could be an increased investment focus on tie backs and less on greenfield developments. The interviews also yielded an expectation that PE firms could now play a longer term role in the UK than previously anticipated. When the wave of PE firms first emerged in the UKCS after the oil price downturn of 2014, many commentators expected a traditional PE approach to investments – that is reduce costs and improve operational efficiency with an objective of divesting the investment after a typical PE hold period. However, the reality is we continue to see ongoing investments by PE firms which are also focusing on growth and exploration.

Respondents also recognised the ongoing trend of smaller and independent companies replacing the majors. They highlighted the specific capabilities these operators brought as they optimised late life asset plays. With PE exiting the region over the medium term, respondents suggested there might be further consolidation, with larger independents acquiring smaller ones.

As for other types of companies increasing their profile, some respondents singled out the oil services companies. With smaller operators proliferating, there was a view oil services should play a greater role in developing the basin. Oil services companies were perceived as being well placed to partner with smaller operators to leverage their technical skills and knowledge, as well as operating fields. Moreover, those interviewed saw more oil service companies entering the UKCS potentially having a role to manage assets about to be decommissioned, as they extended the production life for several years. Admittedly, oil service companies will need significant balance sheet strength to deliver on this potential. For those smaller service companies new business models will need to be developed to enable this opportunity.

As for which parts of the UKCS would continue to attract investment, many respondents highlighted the West of Shetland as one such current hot spot (see Exhibit 7). This particular area was viewed as a capital intensive frontier region.

Exhibit 7: West of Shetland activities – selected examples 2019



Source: Wood Mackenzie; Rystad Energy; Strategy& research

Expect private capital from further afield to play a greater role in funding North Sea growth

Many companies interviewed felt the operating environment from a sustainability perspective will become more challenging. Regulatory pressures and investor expectations are likely to increase with operators struggling to raise public funding unless they significantly improve the carbon footprint of their operations.

In this context it is more than just reducing methane leaks or preventing flaring. It is more about making major investments in renewable sources or adopting carbon abatement technologies. This pressure is particularly salient for single asset plays (that is companies focused on a particular field development) or any operator that does not have a low carbon diversification strategy.

In this context, traditional providers of funding will find it increasingly challenging to invest in the UKCS. Changing public attitudes could mean that pension funds may be reluctant to invest due to the sustainability hurdles. Infrastructure funds may likely retreat unable to find attractive returns, aside from some isolated development plays.

As a result operators may increasingly seek private capital. And this capital is likely be provided by sovereign wealth funds and family businesses emanating from Asia and the Middle East, for example. These investors are less sensitive to environmental challenges and more keen to diversify their investments in a stable regulatory and fiscal regime. Respondents highlighted that we are already seeing elements of this transpiring with Delek's (the investment vehicle of an Israeli billionaire) acquisition of Chevron's assets.

Impact of the energy transition

1. Investor sentiment is evolving quickly and placing an added hurdle in front of certain oil and gas sector investments
2. Smaller independent exploration and production companies are likely to face increasing investor scrutiny and pressure to improve the carbon footprint of their operations
3. The North Sea oil and gas sector will need to articulate the value it brings and the importance of hydrocarbons in facilitating the energy transition to broader stakeholders
4. The UKCS has the potential to become a show case for the energy transition – from low carbon solutions to decommissioning

Public sentiment around 'green' issues is changing and this will present challenges when making decisions on investments in the oil and gas sector

Many of the companies we interviewed recognised that investors are finding it harder to invest in the oil and gas sector because of oil price volatility and increasing concerns around climate change. These concerns are already manifesting themselves in other ways. It is worth noting that the number of oil and gas producers listed on London's Alternative Investment Market (AIM), fell by more than 20% in the decade to 2018.

To compound this further, companies we interviewed acknowledged that investor sentiment towards oil and gas companies is weakening further in the wake of recent events. The activities of Extinction Rebellion, media focus on Greta Thunberg and the UK government's 'net zero' announcement are collectively underlining the urgency of climate change but are also stoking hostility in some parts of the public against the oil and gas sector. As illustrated in Exhibit 8, there have been separately a number of high profile announcements from investment funds and investors reducing their exposure to the oil and gas sector, in particular the upstream part of the value chain.

> From the largest international oil companies producing renewable energy to the independents addressing their carbon footprint – we have to have a story that people can believe in.

Phil Kirk
CEO of Chrysaor

Exhibit 8: Recent investor announcements impacting oil and gas

Entity	Date	Decision
Legal & General	2019	Legal & General Group divested its funds in Exxon Mobil stating the oil and gas producer had not adequately addressed climate change
London Stock Exchange (LSE)	2019	Oil and gas companies listed on the LSE reclassified under a 'non-renewable energy' category. The move was designed to distinguish between hydrocarbon focused companies and greener producers
National Trust	2019	National Trust announced it was divesting its £1 billion portfolio from fossil fuels
Norwegian Sovereign Wealth Fund	2019	The fund, worth some $1 trillion, announced it would dispose of its investments in 134 companies that explore for oil and gas but retain stakes in integrated oil firms with a diversification strategy

Source: PwC Strategy& research

Some independent operators may have to face increasing investor scrutiny and pressure to improve the carbon footprint of their operations

With increased public scrutiny of the sector, many independent operators feel they need to intensify their efforts to improve their carbon footprint. Whereas in the past, they might have focused on reducing methane leaks or improving energy efficiency for incremental improvements in emissions containment, this may not suffice. Independent operators recognise they may need to invest in carbon abatement technologies, such as carbon capture, utilisation and storage (CCUS).

In an interview the chief operating officer of Wintershall Dea, Maria Moræus Hanssen, conceded their future strategy might consider investing 'in some sort of renewables or some technology being part of the energy transition'.[3]

In 2019 Chrysaor and Shell became partners with Acorn, which is developing a carbon capture, utilisation and storage (CCUS) project at the St. Fergus gas plant near Peterhead.

Clearly, this potential new level of abatement investment will have implications for the future strategy and funding requirements of some of the independents; they may need to set aside funds for the deployment of these new carbon technologies.

Participants in the UKCS need to articulate better the importance of hydrocarbons in facilitating the energy transition

Following on from this, most respondents feel that there is an important and perhaps unpopular narrative to be told to the public about the UKCS contribution to the national economy and its role in the energy transition. While those interviewed recognised the urgency to move to a lower carbon world, the reality is the global economy still depends heavily on hydrocarbons. Therefore making that transition will require time, given the contribution of renewables to primary energy demand is still small despite growing quickly.

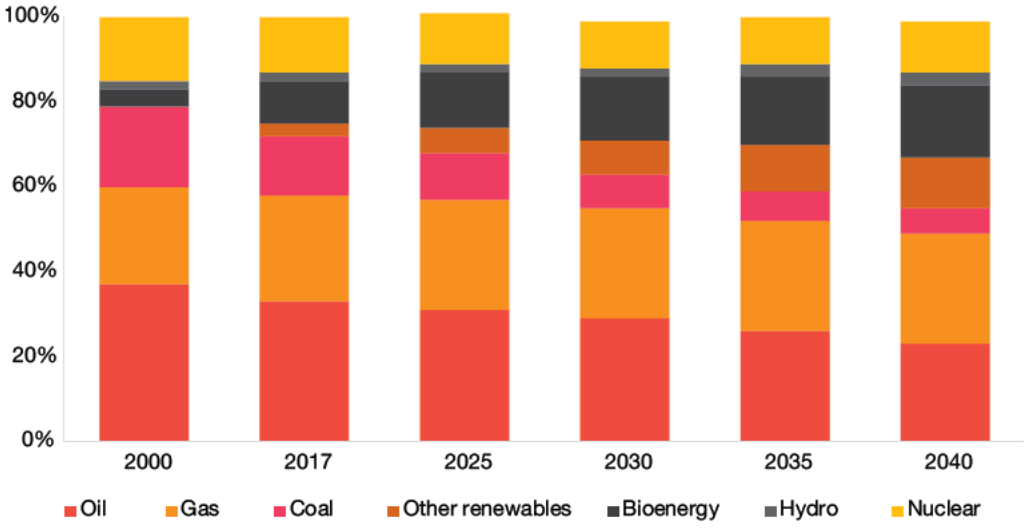
Moreover, gas potentially has a particularly important role as the bridging fuel to a low carbon economy. As illustrated in Exhibit 9, according to the International Energy Agency, 55% of energy demand is still expected to be met by hydrocarbons (gas, oil and to a lesser extent coal) in 2040 in Europe.

> "The government needs to set out very clearly that there is an energy transition and it involves oil and gas. Without the latter your world ends.
>
> **Alistair Stobie**
> CFO of Hurricane Energy

> "The current portrayal of the industry as dirty is flawed – we all need to work together to get that message across.
>
> **Mitch Flegg**
> CEO of Serica Energy

[3] Navigating Europe's Oil & Gas Landscape, Colombia Energy Exchange, May 2019

Exhibit 9: EU energy consumption by fuel



Source: IEA World Energy Outlook 2018 (New Policies Scenario); PwC Strategy& research

Having said that, the UKCS is already witnessing a transformation in terms of operators adopting new technologies and low carbon ways of working:

- Premier Oil has invested in a PowerBuoy which obtains its energy from the ocean. Located in the Huntington field, its self-sustaining intelligent platform provides communications and remote monitoring services to monitor the local environment and alert shipping of its position. This technology obviates the need of deploying a diesel powered boat with additional staff.
- BP broke new ground trialing the use of Unmanned Surface Vehicles (USVs) in partnership with XOCEAN. Combining subsea sensors with these remote control boats, BP was able to undertake shallow water pipeline inspections in the North Sea

The potential to become a show case for the energy transition

Looking further ahead, some respondents see the UKCS basin evolving in many different ways, as innovation in technology and business models develop. There is the potential to replace gas turbines on some offshore platforms with power sourced from renewable sources, such as offshore wind and solar parks. Equinor is already exploring this option in the Norwegian North Sea at the Troll C, Sleipner and Gudrun platforms. Needless to say new build offshore wind are an attractive proposition for the basin. In the most recent such announcement, there are plans afoot for Equinor and SSE to create the world's largest offshore wind farm at Dogger Bank in the North Sea. This will be a £9bn investment and capable of providing energy for 4.5m homes.

Some companies interviewed speculate about a future world where carbon dioxide becomes a tradeable commodity and the North Sea sees the development of carbon storage and transportation solutions given the extensive infrastructure already in place. At the Offshore Europe event in 2019, the CEO of Total, Patrick Pouyanne, talked about the need to bolster investment in new technologies like carbon capture and storage, with the potential for the North Sea to become a 'giant cave for CO2 in Europe' by using depleted gas fields.

> "The UK North Sea could evolve into a microcosm of the energy transition, becoming a broader energy space with the growth of offshore wind farms for example. It could evolve into a lab for broader energy experimentation that becomes the base to export talent and solutions to other regions.
>
> **Julio dal Poz,** Senior Advisor in Strategy at Equinor

Going one step further, in the event a hydrogen economy develops in the UK, the UKCS could become a production, storage and transportation hub for hydrogen. With the evolution of offshore wind farms perhaps this could become a source of 'green hydrogen' through electrolysis – albeit the latter is more a potential long term trend. And as for decommissioning, many respondents see the UK North Sea, in light of its maturity, developing new services and solutions to decommission fields – with these skills and learnings being subsequently exported to other basins. In all these examples there is a significant growth opportunity for the supply chain to enable and deliver this low carbon transformation.

All respondents highlighted this transformation of the basin is necessary not only from an energy transition perspective but also in terms of attracting new talent. The interviews highlighted how the oil and gas sector is keen to recruit young people from a variety of backgrounds (from engineers to software developers) to invigorate the industry and help it transform for a low carbon world.

> Diversification holds great potential for the industry but we need to learn lessons from offshore wind where much of the fabrication opportunity went abroad – to capitalise on the potential, we need to think differently at policy level and industry level to successfully diversify through the energy transition.
>
> **Colette Cohen**
> CEO, Oil & Gas Technology Centre

Conclusion

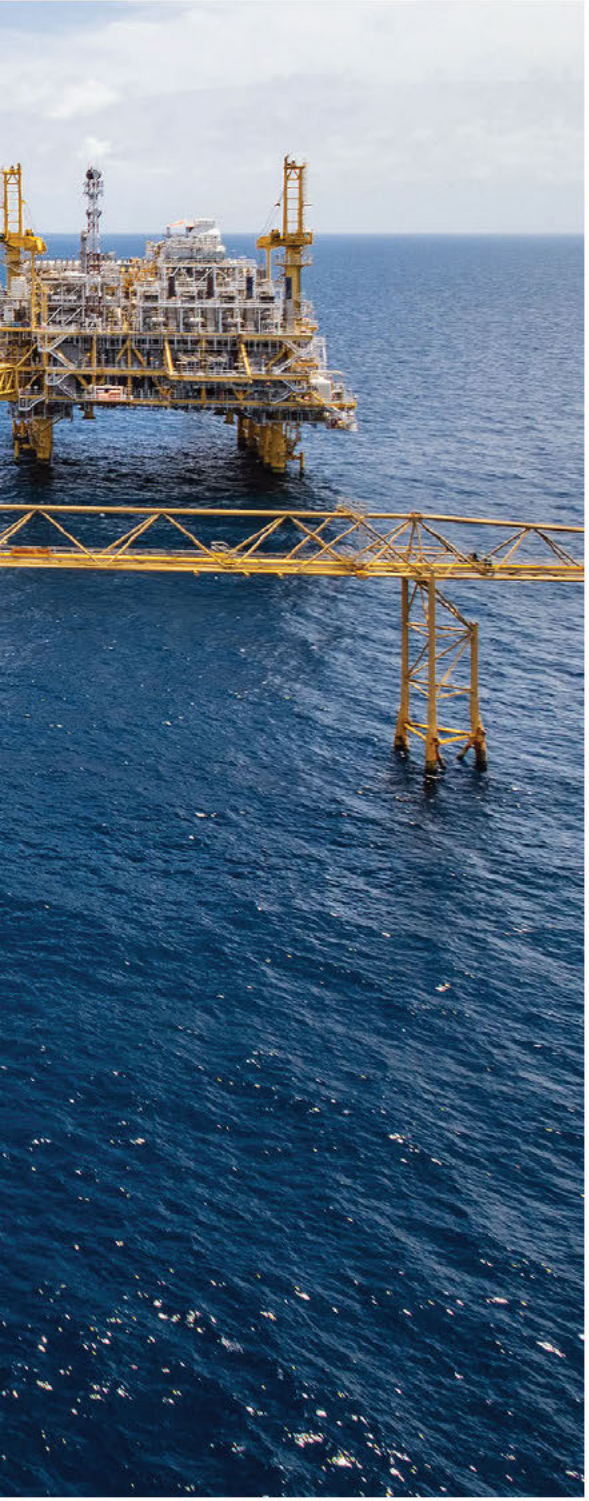
There is no doubt the basin remains resilient. Despite a number of cyclical downturns the UKCS somehow manages to emerge from the turbulence stronger and more dynamic than before.

However, looking ahead, an array of challenges face the industry. These range from how to promote innovation and develop new business models and partnerships to more fundamental issues around the basin's future in the context of the energy transition.

Against this backdrop, companies operating in the UKCS will need to weigh up several key questions:

1. What are the growth strategies that will allow operators and oil services companies to grow their businesses sustainably in a rapid evolving market?
2. What are the core capabilities market players need to develop to be successful and how do they acquire these capabilities? Is it through acquisitions or partnerships?
3. And finally, how should oil and gas companies position themselves to flourish in a world where we are rapidly transitioning to a lower carbon society?

Those companies that can develop a growth strategy around their core capabilities will be best placed to navigate the North Sea's transformation and participate in shaping the energy transition.



Acknowledgements

To research and fully understand the dynamics around the UKCS, we spoke to a number of companies and individuals who are at the very heart of this resilient basin. We would like to thank everyone who contributed to the report for their insights and time.

Name	Company
Romain Chambault	BHGE
Graham Sword	Bluewater Energy
Tom Woolgar	BMO
Ariel Flores	BP
Phil Kirk	Chrysaor
Kenneth Baillie	DnB Bank
Julio dal Poz	Equinor
Alistair Stobie, Rebecca Jones	Hurricane Energy
Geir Tuft	Ineos
Les Thomas	Ithaca Energy
Andy Hessel, Guy Appleton	Kellas Midstream
Peter Jones	Neptune Energy
Andy Samuel	Oil & Gas Authority
Steve Jenkins	Oil & Gas Independents Association
Colette Cohen	Oil & Gas Technology Centre
Deirdre Michie & Mike Tholen	OGUK
Jon Carpenter	Petrofac
Simon Clark	Premier Oil
Drew Stevenson & Alan McCrae	PwC
Paul de Leeuw	Robert Gordon University
Mitch Flegg	Serica Energy
Steve Phimister	Shell
Brian Chalmers	Wood

Contacts

Drew Stevenson
UK Energy Sector Leader, PwC UK

M: +44 (0)7710 002801
E: drew.stevenson@pwc.com

Alan Barr
Head of Deals Aberdeen, PwC UK

M: +44 (0)7740 639871
E: alan.barr@pwc.com

Kevin Reynard
Office Senior Partner, Aberdeen, PwC UK

M: +44 (0)7725 706789
E: kevin.d.reynard@pwc.com

Neil Leppard
Director – Upstream Deals, PwC UK

M: +44 (0)7841 783894
E: neil.leppard@pwc.com

Authors

Adrian Del Maestro
Director, PwC UK

M: +44 (0)7900 163558
E: adrian.delmaestro@pwc.com

Mike Tholen
Upstream Policy Director, Oil & Gas UK

M: +44 (0)7793 061029
E: mtholen@oilandgasuk.co.uk

Craig Stevens
Head of Sales & Marketing – Energy, PwC UK

M: +44 (0)7738 844839
E: craig.w.stevens@pwc.com

191023-162856-TW-OS