The future of North Sea oil & gas. *With fifty successful years for the industry in the North Sea basin, how do we plan for sustainable success in the coming decades? We asked more than thirty senior executives for their views.*

A sea change

"The North Sea is here to stay and is alive and kicking."

Eirik Waerness,
Chief Economist, Statoil

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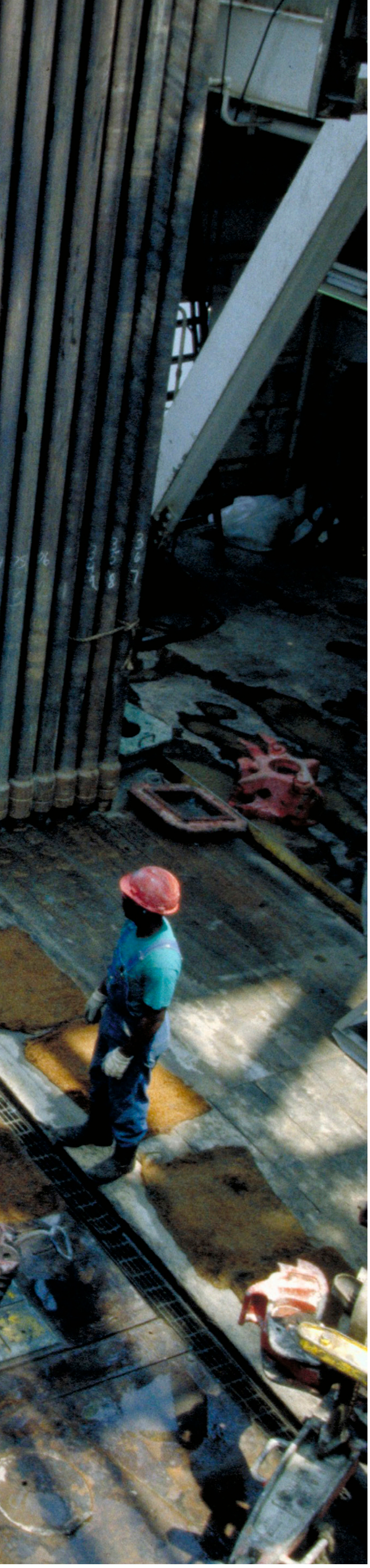
Foreword



For all of my living years the North Sea has been producing oil and gas and making a significant contribution to European economies. As the world transitions towards a lower carbon future, what will that contribution look like in thirty years' time?

The basin has been at an inflexion point for the last couple of years as it grappled with first rampant cost inflation and then a rapidly declining oil price. More recently the North Sea has witnessed an unprecedented level of turmoil. The precipitous decline in oil prices, which started in the summer of 2014, triggered a wave of restructuring and cost reduction that impacted all companies in the basin. Majors, independents, oil service companies – all of them felt the pain as they sought to shed cost, with some succumbing to insolvency.

Now as oil prices begin to recover, there is a sense that we are finally seeing light at the end of a very dark and long tunnel. However, while there may be a temptation to see a price recovery as the panacea to all ills, the reality is the North Sea still has to address a number of fundamental challenges. These range from a fragmented ownership base to endemic cost inefficiencies. This report will highlight some solutions to these issues, including for example the creation of a joint venture vehicle to consolidate smaller and disparate assets under one operator.

More fundamentally however, the energy industry is transforming as we move to a lower carbon world. As one of the more mature basins in the global energy sector how will the North Sea and its constituent stakeholders take a lead in this transformation?

It's clear that leadership is key. How this leadership vision is framed and the framework that the industry can adopt to maximise the opportunities through transformation will be vital - be it as pioneers for new technologies, embracing and expanding greener solutions or exporting the skills of the more than 400,000 people who work across the North Sea sector.

In pulling this report together we have interviewed more than thirty senior stakeholders from across the oil and gas industry in the UK, the Netherlands and Norway. Many of the insights and solutions captured in this report are the product of their thoughts.

The driver for transformation is the industry itself. Our aim is to guide the sector through this journey of transformation in order to maximise the economic recovery from the basin, as we seek to continue to support the industry for decades to come.

Alison Baker, UK & EMEA Oil & Gas Leader, PwC

Executive summary

Set against the backdrop of the Wood Review and "lower for longer" oil prices, the North Sea oil and gas industry is undergoing a significant period of change. And as the pressures to transition to a lower carbon world mount following the COP21 initiative, this may suggest the basin's days are numbered. Or are they?

We interviewed more than 30 senior stakeholders from the UK, the Netherlands and Norway, across the value chain in the North Sea to gauge their views. This report is the culmination of their insights and views on the state of play in the North Sea, alongside some potential solutions for sustainable success.

The general consensus is that the North Sea does have a future. However, a number of fundamental issues will need to be addressed in the next 24 months if the basin is to avoid a rapid and premature decline.

Insights

- The ***North Sea is an exciting prospect play with potentially 20-30bn boe of undiscovered resources*** – particularly West of Shetland, the Atlantic Margin and on the UKCS/NCS border;
- ***The window of opportunity to effect change is getting smaller*** all the time. According to some respondents the basin has some 24 months to turn around performance. Time is of the essence if a suite of solutions can be deployed to rescue the basin;
- ***Significant progress to support the North Sea in the UK has been made*** including the Wood Review, the establishing of the Oil and Gas Authority, favourable changes in taxation – but there is more still to do;
- There is a recognition that ***collaboration is important, but not at any price*** – there is a need to recognise mutual benefit – perhaps a need to simply "work together better" (even though this goes against the ingrained culture of the basin, and that must change);
- ***Leadership is lacking*** – the basin needs new ideas – it needs disruption and change whilst recognising the benefit of the wisdom and experience that has gone before;
- It's been said many times that it's essential to attack the cost base of the North Sea and ***ensure cost efficiency is embedded*** irrespective of the vagaries of the oil price;
- ***M&A activity has stalled*** due to a number of factors (including the decommissioning liability issue, unnecessary complexity and lack of funding). Despite these obstacles, deals can be and have been done through innovative solutions to these challenges;
- In the UK, ***low carbon was not top of mind*** for industry participants as they focus on cost reduction. In contrast, the responses from the Netherlands reflected a sector already planning an expansion of renewables post decommissioning.

> ***"The people who will turn off the lights in the Norwegian sector haven't even been born yet."***
> *Eirik Waerness, Chief Economist, Statoil*

Solutions

- ***Capital is vital*** for the future and different kinds of capital are needed across the life cycle. Innovations such as consortium financing, where counterparty risk is collective, could build an area or asset approach to a project rather than a company focused one. ***Government establishing clear support around decommissioning*** could also make a huge difference to smaller operators – a decommissioning guarantee scheme to lessen the burden of abandonment letters of credit for example;

- ***There is a real need for a "North Sea champion" –*** leading the way in innovation, best in class working and cooperation. And the mindset of the basin needs to change – truly embedding the notion of working together for mutual risk/reward. Cost efficiency is paramount and goes beyond cost reduction, especially when combined with a reduction in complexity and a leaner way of operating;

- Collaboration is an over used word, particularly in relation to the North Sea – ***the key is ensuring there is real mutual benefit for all parties.*** A salient example could be the creation of a "super JV" which consolidates smaller and fragmented assets under one sole operator. Such a JV would boast scale for cost efficiency and ensure a better bargaining position vis-à-vis suppliers. This would also enable a more coordinated approach to the decommissioning of the asset pool. Additionally, this would be a fantastic opportunity for the kind of consortium based approach to financing mentioned earlier;

- ***Government and regulators across the basin have a role to play*** – from ***clearly articulating their vision for the future to signposting the way ahead*** on topics such as infrastructure ownership, encouragement for exploration, decommissioning and the transition to low carbon. They all need to set a blueprint for the future;

- ***Leadership is a vital component*** too – recognising the importance of our global centre of excellence in Aberdeen, and other regional centres such as Stavanger, and their true potential, as well as the economic benefit for the region are vital. Additionally nurturing the talent of the future to drive those truly transformative changes, are key traits of real leadership; in the industry, operators and the supply chain will need to show leadership;

- Finally, ***the elephant in the room is decommissioning*** but turning this to a positive could provide a further extension to the future by maximising efficiency from late life assets and exporting skill sets. Moreover, ***aligning our decommissioning planning to the transformation journey towards a lower carbon future would ensure a seamless transition and secure our energy future.***

The North Sea – 50 years and counting

Since the UK Continental Shelf Act came into force in 1964, we have seen more than 4,000 wells drilled at a cost of more than £50bn and more than 45bn boe produced to date. Depending on who you speak to, there is suspected to be somewhere in the region of 20-30bn boe of resources remaining and still to be exploited. Considering the last number, it is no surprise that all other things being equal, the future of the basin can be measured in decades. And that does not even take into account what might be achievable with advances in technology and innovation, as we seek to maximise the economic recovery from the basin.

From first gas at West Sole in 1967 and first oil at Argyll & Duncan in 1975, we have certainly come a long way – there are now more than 300 platforms operated by some 75 different companies and more than 1,500 licences.

And despite, several oil price crashes, most recently in 2014, the basin has generated in excess of £300bn to the UK Exchequer and supports a workforce of more than 350,000 in the UK alone.

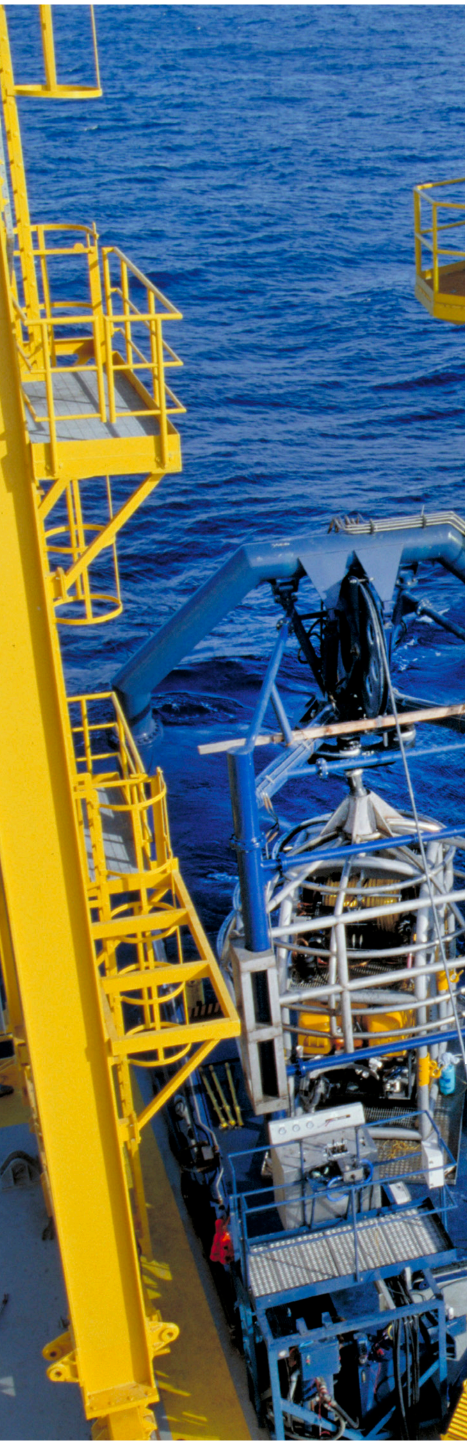
Whilst major discoveries may be less frequent now than in the early days of the basin, the near term future of the North Sea is assured with large projects such as Clair Ridge, Kraken, Catcher, Mariner, Laggan-Tormore, the Quad 204 (Schiehallion) redevelopment and the giant Johann Sverdrup development near the Norwegian Continental Shelf border with the UK Continental Shelf (UKCS).

It is hoped that the introduction of new basin wide seismic may lead to more discoveries and the potential of West of Shetland and alternate play types, such as fractured basement reservoirs, has still to be fully exploited.

In this report, as we have done with previous publications such as Northern Lights, we will take a look at the North Sea in more detail and ask some fundamental questions: what has the industry done well?; what works and what needs a rethink?; and how can we make those real, dynamic changes that will continue to transform the future of the basin for the better?

"The next ten years will be very different from where we are now – market dynamics are changing and the North Sea will need to evolve and adapt to those changes."

Paul de Leeuw, Robert Gordon University Innovation Centre




Our report – what we did and why

The North Sea has reached a fork in the road, which direction we follow will depend on what action we take and how quickly we do it.

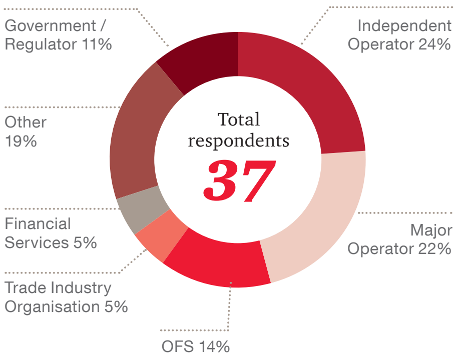
There is no doubt that commitments made by national governments at COP21 in Paris signal an intention to cut down on hydrocarbons and move towards a cleaner and greener future. But, and it is a big but, that transition will not happen overnight and we will need to bridge the gap until such times as those renewable alternatives can compete in scale with their hydrocarbon ancestors.

And, to continue producing competitively from the North Sea in particular, it is clear that some transformative changes are required.

With this premise in mind, we sought to interview senior stakeholders from across the industry and in the UK, Netherlands and Norway to find out what their concerns are, but more importantly, how they believe we can transform the North Sea to meet our needs and bridge that gap to a lower carbon future.

Figure 1

Profile of Respondents Interviewed by Segment



Our research involved 37 face to face interviews, with a broad cross section of interested parties.

And the general consensus was that the North Sea still has a future, despite the high operating costs and impact of lower oil prices.

As to the question whether the North Sea had a future more than half of those interviewed felt it did (as illustrated in Figure 2).

And this does not perhaps tell the full story – many respondents who replied "terminal decline" were talking in the literal sense of a declining oil basin, which is a fact. They key is how we manage that decline for the greater good of all stakeholders in the basin.

In terms of measurement of optimism, there was a significant element of sitting on the fence – neither overly optimistic nor overly pessimistic (as illustrated in Figure 3). The view was that a lot depended on making real, transformative and sustainable change over the medium term, underpinned by a sense that we need to start taking those actions now. Indeed some commented that the time for change was four or five years ago.

Key findings from interviews

(all respondents from UK, Netherlands and Norway)

Figure 2

Responses about the Future of the North Sea

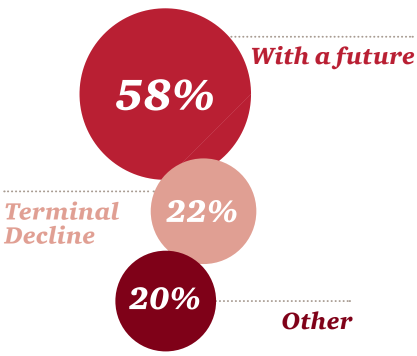
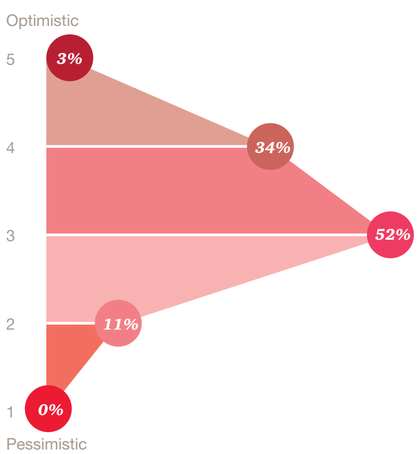


Figure 3

Profile of Respondents by Degree of Optimism Regarding the Future of the North Sea



"This is the age of hydrocarbon man and it still has a while to go."

Jeremy Cresswell, Energy Editor, Press & Journal

Insights

Setting the scene – the Wood Review

The Wood Review was published in 2014, before the current "lower for longer" oil price situation occurred. The review recognised there were some fundamental issues with the UKCS which needed to be addressed to ensure that we were able to maximise the economic recovery from the basin. The key findings of Wood were:

- There is a need for more collaboration and more proactive and involved stewardship
- HM Treasury should continue to build on the steps already taken (e.g. the creation of brownfield and new field allowances) to incentivise future recovery
- The Department of Energy & Climate Change (DECC) should: create a new arm's length regulatory body; provide it with a number of additional powers and capacity; task it with developing and implementing, with industry, strategies in key areas (exploration, infrastructure etc.)
- Industry must make a series of commitments (co-operation in achieving effective field cluster developments, sharing infrastructure, greater asset stewardship etc.) and will be held to account by the new regulator

It is clear that the industry as a whole has been successful in enacting at least some of those recommendations. HM Treasury has made step change improvements to the fiscal structure in recent times. The taxation issue in particular, whilst not necessarily impacting too many companies in the current climate, sets the right tone by reducing the tax rate and creating a new investment allowance. The Oil & Gas Authority (OGA) has also been established as the regulator aiming to shape and guide the future of the industry.

With these key recommendations in mind, we make the following observations following our review:

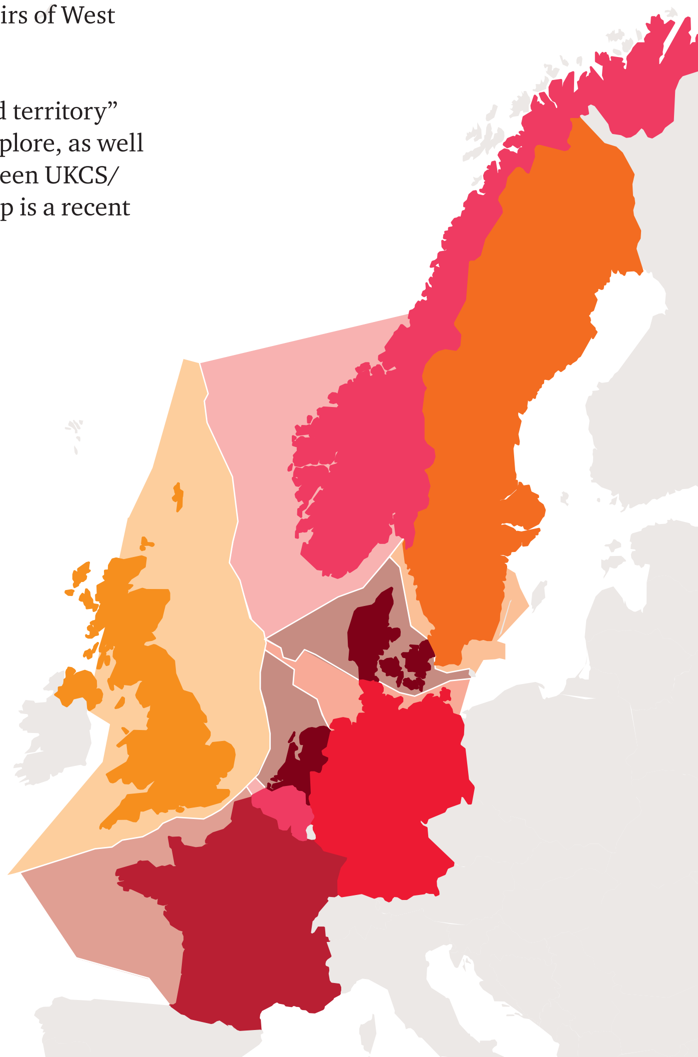
There is still significant potential in the North Sea

Genuine excitement exists among operators that there are opportunities to exploit, such as tight gas in the northern North Sea. There are new plays too, for example Hurricane Energy has discovered more than 400m bbls in the fractured basement reservoirs of West of Shetland.

There is also the "uncharted territory" of the Atlantic Margin to explore, as well as the "border" region between UKCS/NCS where Johann Sverdrup is a recent example of the kind of success which can be had. As for the Dutch sector, there is still gas potential to exploit in the short term, with an expectation the basin can offer opportunities for the renewables sector once decommissioning gathers momentum.

There is also real recognition that the basin has much to offer in terms of a generally attractive fiscal regime, low geopolitical risk, an excellent supply chain and a world leading centre of excellence in Aberdeen (in addition to other regional hubs of technical expertise across the UK).

But, as time goes on, the materiality of the opportunity will undoubtedly lessen and change – what may seem major opportunities to the independents will become less significant for the majors. This will be an inevitable evolution for the basin and consequently the investment framework for the basin will need to reflect this dynamic.



The window of opportunity for change is getting smaller

Whilst many believe in the future potential of the basin, this is tempered with the view that the window of opportunity to take advantage of that potential, is short and closing. There is a sense of urgency in the industry, a feeling the sector really has only one more cycle left and one last wave of success. Moreover, the clock is ticking as to when these changes need to be implemented before we see the North Sea decline at a far greater rate of knots than it should do.

However, that all said, if managed correctly, the North Sea can still provide a few more decades of production and activity.

And a key factor in that is addressing the issue of fragmentation (particularly in the UK sector) – there is a consensus view that there are too many players with differing viewpoints which can hinder progress. Furthermore, fragmentation can be a barrier to the efficient running of the basin. Another consequence of this is the impact on asset integrity which is in decline in some places and low oil prices could mean less attention is being paid to infrastructure. This may result in leaving assets stranded with no exit routes for the hydrocarbons.

The importance of maintaining and managing infrastructure and infrastructure hubs cannot be underestimated in relation to security of supply and health and safety.

Report card – some progress but we could do better

As mentioned earlier, the Wood Review stressed the need for the government and the regulator to work for the greater good of the basin, encouraging new investment and maintaining a stable regime.

The recent UK government fiscal measures, which more than halved the supplementary charge and effectively abolished PRT (Petroleum Revenue Tax) were roundly praised by industry. Nevertheless, given the low oil price there are few companies paying tax in the short term and as such the fiscal impact has been limited. Additionally, the news of further seismic surveys has been widely applauded by the sector.

The introduction of the Oil & Gas Authority has been welcomed. However, views varied across the board as to its effectiveness thus far and the style of leadership demonstrated. For example, some operators felt that the "stick" approach of leadership would not be effective, whereas others felt there was a need to name and shame inappropriate behaviours by specific sector participants. What was common, nevertheless, was the view that the OGA's number one focus has to be shaping and changing the mindset and behaviours of the industry to meet the challenges of transformation into the future.

Moreover, there was a common view among operators and oil services that the government approach is not integrated – different agendas exist between DECC, OGA and the Treasury and more needs to be done to align those agendas, as well as ensuring alignment to the needs of the industry from small oil services companies all the way through to the super majors. And that alignment is best served by ensuring a wide range of skills and experience across the value stream. At present for example, oilfield services companies feel there is too much focus on the operators and too much "big oil" influence in terms of how they work and how they act – oil services need a voice.

"This is a basin that still offers significant opportunities for all types of companies and it's this diversity that will be key to its success."

Deirdre Michie, Chief Executive, Oil & Gas UK

Collaboration remains important – but not at any cost

Underpinning Wood, was the encouragement for industry to work together better – the word "collaboration" is often used, but it is clear that this is a word which is not generally welcomed by the industry. The original principles of the Joint Operating Agreement should still apply and companies need to find a way to work together that engenders trust and honesty, as well as working smartly together in a mutually beneficial way for the greater good of the project. Addressing that inherent lack of trust and effective working relationships in general across the industry, is vital in the transformation journey.
That collaboration, or co-operation if you prefer, needs to apply across the value chain with each element being clear on how their contribution benefits themselves and others. And it is vital that we do not just collaborate or cooperate for the sake of it – players' first focus has to be on cost efficiency and the understanding that they are running a business to make money.

Beyond that, efforts to "collaborate" have not been widely successful and have been borne more out of necessity, for example sharing helicopter drops to cut costs, than out of a real desire to work together in a positive way. Premier recently announced its intent with other several North Sea players to merge parts of their operations, including logistics, procurement and finance departments. This may become a template for future operations in the region.

"Collaboration and complementarity have been around since 2011, but we haven't seen radical changes in working relationships, cost efficiency, or indeed recognition of where competition has its place, and complementarity has its role."

Dr Marcus Richards, Senior Industry Executive

From smaller companies there was a feeling that something needs to be done to encourage new ideas and new entrants – new ways of working together which benefit all and ensure that the, oftentimes adversarial relationship between operators and oil services, does not revert to type once prices start to recover.

This relationship between operators and oil services, sometimes described as 'pugilistic' by those interviewed, was commented on from different angles. Some of the operators felt oil service companies were too focused on "unrealistic" margins. This meant escalating costs for operators in periods of buoyant oil prices. Conversely, in periods of lower prices, operators typically discount oil services rates in an aggressive manner. As for service providers, several felt in the current environment of low oil prices they were demonstrating the required flexibility to price contracts appropriately taking into account the cashflow challenges of operators (by offering, for example, deferred compensation options).

Follow the leader

There is no doubt that the basin would never have got to where it now is without solid leadership but there is a feeling that there is a time for a changing of the guard.

Leadership with new ideas and thinking outside the box is needed – change innovators, change drivers and disruptors are key to the longer term prosperity of the basin. That said, much like the sensei, this needs to be combined with wisdom and experience.

Large operators tend to export their best talent to more frontier basins, and those in the North Sea, whilst excellent at the management of existing assets may be less adept at innovation and bringing in the new thinking that is needed to drive the future.

This is particularly true when it comes to decommissioning. There is a real danger that a general level of inaction and focus on cost reduction could lead to a loss of talent and therefore a need to import decommissioning skills. As a result, North Sea players could miss the opportunity to become the global leaders in decommissioning, diversifying their offering away from a traditional focus on production to one of the potential growth areas of the future.

“All the signs were there before prices dived. Everyone was taking their cut. There was a capital efficiency problem. The fundamental issue is ensuring that the cost base is attacked forever and we don’t revert to past behaviours.”

Andrew Hockey, Non-Executive Director, Fairfield Energy

Cost efficiency needs to be central to business operations

There is no doubt that, compared with many other basins around the world, the North Sea is a high cost operating area (see Figure 4) but, during our interviews, it was widely recognised that much of this was self-inflicted. As an industry, we knew that there was a cost efficiency problem in the North Sea long before prices crashed – even at US$110/bbl it was obvious. What the drop in price has done has been to accelerate the realisation of the problem and its impact and provide additional stimulus for changing things as soon as we can.

To some extent, operators have, in the past, abdicated their responsibility on cost management to the supply chain, as industry has shifted to outsourcing, and use of sub-contractors has increased complexity.

Moreover, the basin suffered from unrealistic salary expectations. High oil prices masked the inefficiency of paying over the odds in a sellers’ market and skills that were in demand were able to command top dollar salaries from the highest bidder.

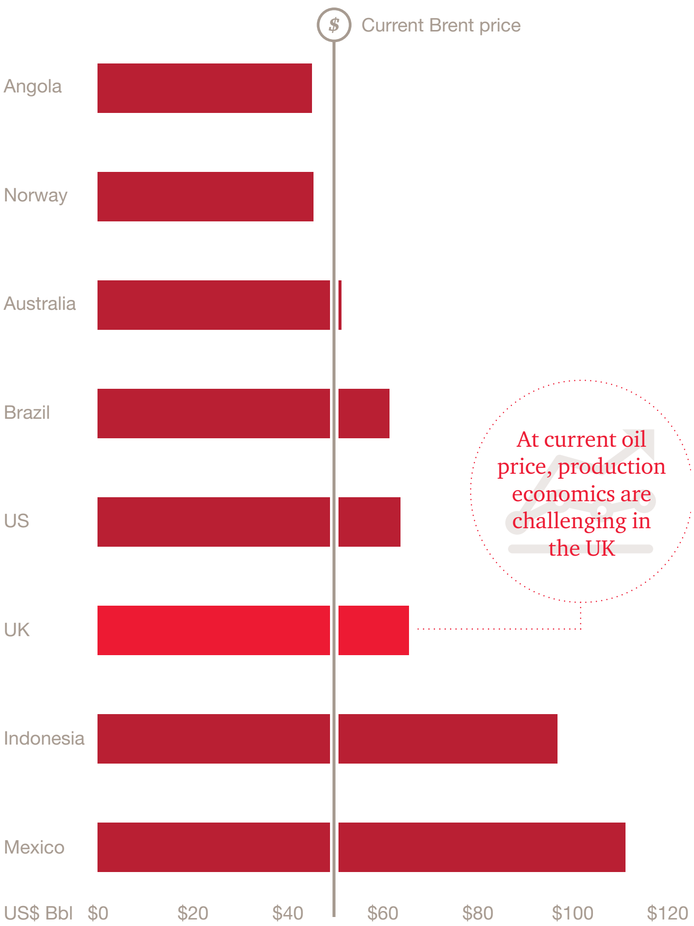
From a supply chain perspective, there was focus on increasing margins and no real incentive to participate in the risk equation, and as a result costs spiralled, particularly for rig day rates and support vessels. It is worth pointing out that the high rig demand at the top of the oil price resulted in a large number of new rigs being produced, which has now led to a distortion in the rig market. And as market conditions continue to stagnate, and operators continually review their cost base, there will inevitably be further consolidation in the supply chain, thereby reducing choice and potentially increasing costs as things improve.

From a cost efficiency perspective there are two real fundamental questions which need to be addressed:

1. How much of cost reduction to date is sustainable?
2. How much is actually just coincidental, or kicking the can down the road?

Figure 4

Average Offshore Breakeven Oi Price (Selected Countries)



Source: Rystad Energy; PwC Strategy & Research

> *"It takes too long to get stuff done in the North Sea so we need to facilitate a reorganisation to align interests better between the various stakeholders or face collapse – we need to consolidate and rationalise as the place has become too fragmented."*
>
> *Tony Craven Walker, Executive Chairman, Serica Energy*

To deal or not to deal... that is the question

A specific area of concern, particularly as some of the majors seek to exit the North Sea basin, is the complexity of actually getting a deal done – this can be extremely time consuming and often mired in red tape and legalese. One example of this was the deal Serica Energy did to acquire an 18% interest in Erskine from BP. This was a relatively small transaction, with a consideration of around US$13m, however, it still took a year to complete. Clearly this corresponds with our previous point around recognising that what is material for one company may be noise level for another and the latter view can be detrimental in completing a deal quickly and cleanly with the right level of focus.

Another factor impacting deal completion is the question of the decommissioning liability. This has been covered in many recent reports, not least our own blog series on decommissioning, but the fact remains that concluding a mutually beneficial approach to this is time consuming and can hamper deals – it is unfair to expect a small operator to take the burden when the larger players have extracted most of the economic value. Moreover, it is worth noting new entrants will not obtain a tax deduction for decommissioning, as they will not have the same tax history as long term incumbents.

Again, the Serica deal with BP was an example of what can be achieved. In this case decommissioning costs were met by BP up to a maximum fixed level to reflect estimated costs inflated with RPI, with Serica being responsible for any costs above that level and sharing in any savings.

Underlying all of this of course is access to capital – you need funding, in a lot of cases, to get a deal done and there is concern that a number of banks have retreated from the sector, and the North Sea in particular. Often this kind of behaviour tends to be cyclical and they are likely to return when conditions improve, but this does not help matters near term where the M&A market is in a state of inertia.

The transition to low carbon

Perhaps surprisingly (or not), many of our respondents felt that the prospect of a low carbon future was not on the agenda in the UK. Their focus remains primarily on cost reduction with a view to maximising economic recovery from the basin. That said, there is a recognition of the importance of gas as a bridging fuel in the low carbon transition, and hence a greater focus on gas may be required.

However, it is recognised that for a truly joined up approach to energy, we need to ensure the basin has a clear roadmap that will take it from a hydrocarbon world into a low carbon future, thereby paving the way of a smooth transition for the UK.

Furthermore, the transition to a low carbon world carries with it a great weight of public expectation, therefore it is incumbent on the North Sea oil and gas industry to find a way to proactively contribute to the debate and the forward planning.

The Dutch perspective is rather different. There was a feeling that the industry was moving more quickly towards decommissioning over the next five to fifteen years. As a result the focus is more on maximising revenues from hydrocarbons to fund renewable energy projects in the basin, such as wind farms and tidal initiatives. Moreover, there is an expectation that the decommissioning skills developed in this sector can be exported to other mature basins in the future.

The Way Forward Over the Next 5-15 Years

In our interviews we asked respondents to identify which themes were fundamental to transforming the North Sea basin over the next 5-15 years.

Of the choices we discussed with our interviewees, the following were identified as key to the future transformation of the basin:

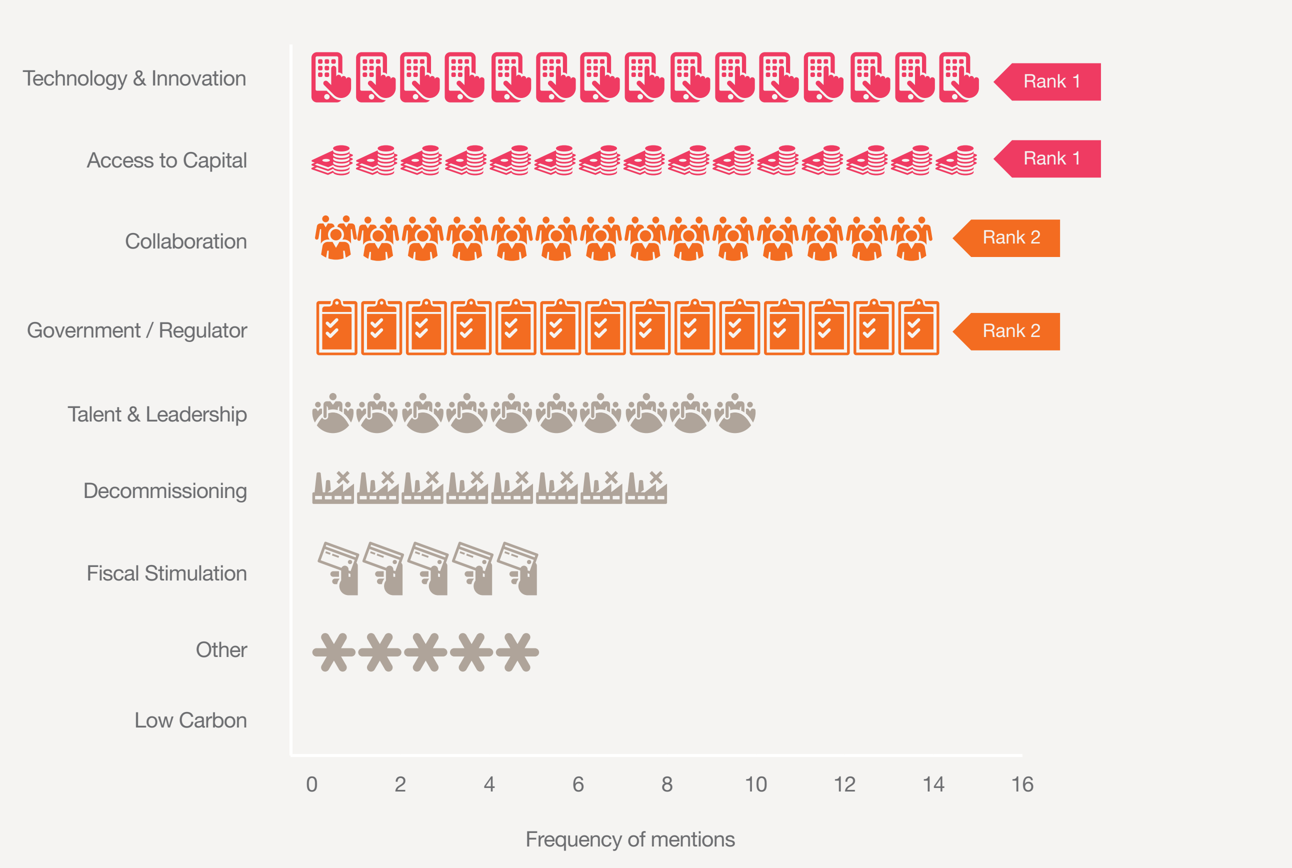
Interestingly from the UK perspective, 'Decommissioning' and 'Fiscal Stimulation' were considered noticeably less important than the other themes. Given the immediate challenges facing the basin, decommissioning was considered somewhat too distant an issue to address and with low oil prices, fiscal measures were considered less relevant.

'Access to Capital' was universally ranked the most important issue in the North Sea, alongside 'Technology & Innovation'. 'Collaboration' and 'Government' were equally ranked in second place.

Perhaps more interesting were the comments made around these topics and the sub themes emerging from our interviews.

Figure 5

Top Themes for North Sea Identified by UK Respondents



Access to Capital… a little context

Access to capital was identified as the number one factor affecting the transformation of the North Sea. Clearly without capital there will be no investment in any of the projects, initiatives and actions required to sustain the future of the basin.

Given the diverse funding requirements of players in the North Sea, there is a need to reinvigorate the capital profile of the sector, to encourage new investment and enable the transformation journey.

During the interview process, respondents noted that as oil prices had fallen, several institutions and traditional providers of capital had retreated from the basin. As a consequence there has been inertia in terms of funding new projects and new deals. A degree of nervousness has entered the markets following several insolvencies across the sector which is impacting availability of funding. That said, larger companies with stronger balance sheets and greater diversity in their asset base, found access to capital less problematic so long as the project economics were robust.

Nevertheless what is evident is the need for different kinds of capital:

- Equity to encourage activity to fund exploration
- Bond and capital market financing to fund ongoing activities of producing companies
- As for the traditional reserves based lending (RBL) market place, this has been hampered by its reliance on a discounted oil price – projects which are borderline economic may not therefore attract RBL financing and alternatives must be sought
- Similarly, covenant based financing is under pressure due to the low oil price and we have seen several examples of companies renegotiating their covenant positions in order to continue to trade

Beyond this, decommissioning places a large burden on the capital availability picture, particularly for smaller companies who must provide a letter of credit to cover their share of the liability.

Against this backdrop of diverse funding requirements, respondents highlighted a number of capital options to explore going forward:

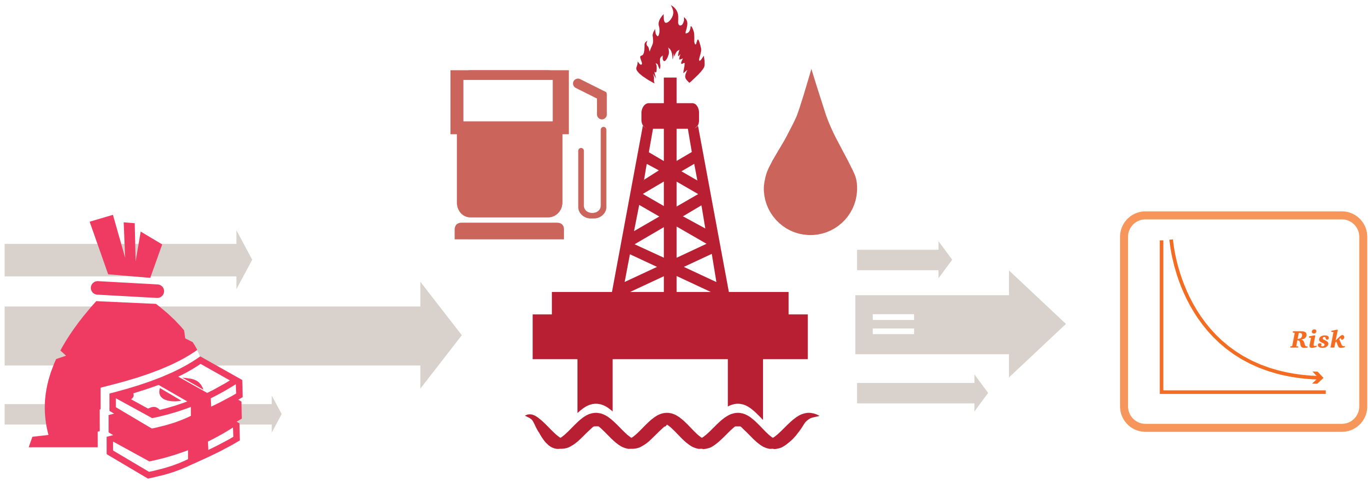
…possible solutions

Consideration of consortium financing with collective counterparty risk

- The risk is shared among the joint venture partners and financing is provided on an overall basis
- The attraction of this could be that banks might be able to reduce their exposure to a particular area by providing less on aggregate to the consortium, whereas the consortium may be able to attract a syndicate financing approach rather than reliance on one institution
- The downside is that banks may rate the risk based on the lowest common denominator and this would need to be addressed

The government should consider setting up a decommissioning fund or a guarantee scheme which helps smaller companies cover their letter of credit requirements for decommissioning

- In this case the government would effectively underwrite the letter of credit based on contributions to the fund. Those contributions might be based on economic value extracted from a field, for instance



"The whole basin has a history of seeing challenges and overcoming challenges. And as before operators, partners and their supply chain are going to have to work together to sustainably answer these challenges."

Ben Taylor, Country Commercial Lead – UK & Ireland, Shell

Technology & Innovation… a little context

During the interviews, 'Technology & Innovation' was equally identified as the number one factor in enabling the future transformation of the basin. 'Technology & Innovation' helps differentiate us from other basins and enhance economic recovery. And this theme is not just about inventing and deploying new tools. It is about inventing new and better ways of doing business – ways which can make the industry leaner, more efficient and fit for the future.

…possible solutions

From our conversations a number of ideas were generated:

- There is a need for a North Sea Champion: who is the company or innovator of the future who will lead the way in transformation, best in class working and cooperation?
- Introduce a new mind set of working together: truly embed the notion of working together, identifying the mutual benefits and shared risk/reward rather than simply collaborating for the sake of it
- Embed an attitude that focuses on cost efficiency: one step further on from cost reduction, seeking to ensure that the cost base remains manageable, efficient and does not spiral out of control once prices recover
- Reduce complexity: specifically for oil services providers they need to consider an integrated service offering for all phases of project work with reduced interfaces and hence reduced costs. More broadly all industry participants need to focus on a 'simpler North Sea' where there is more consolidated ownership, greater clarity on key hubs and strong industry focus on maximising economic recovery
- Leverage 'big data' better: there has been much talk about the use of technology to reduce costs. Digital oil fields, unmanned platforms and more broadly the use of 'big data' have been widely referenced but industry wide adoption of these technologies has been mixed. There is a large prize to be had in using existing information much better to plan logistics, drive inventory efficiency and to decide where best to drill. Managed effectively, the data could be a driver for more collaborative working.

All easier said than done perhaps. And yes much of this might have been said already but it is definitely worth reiterating.

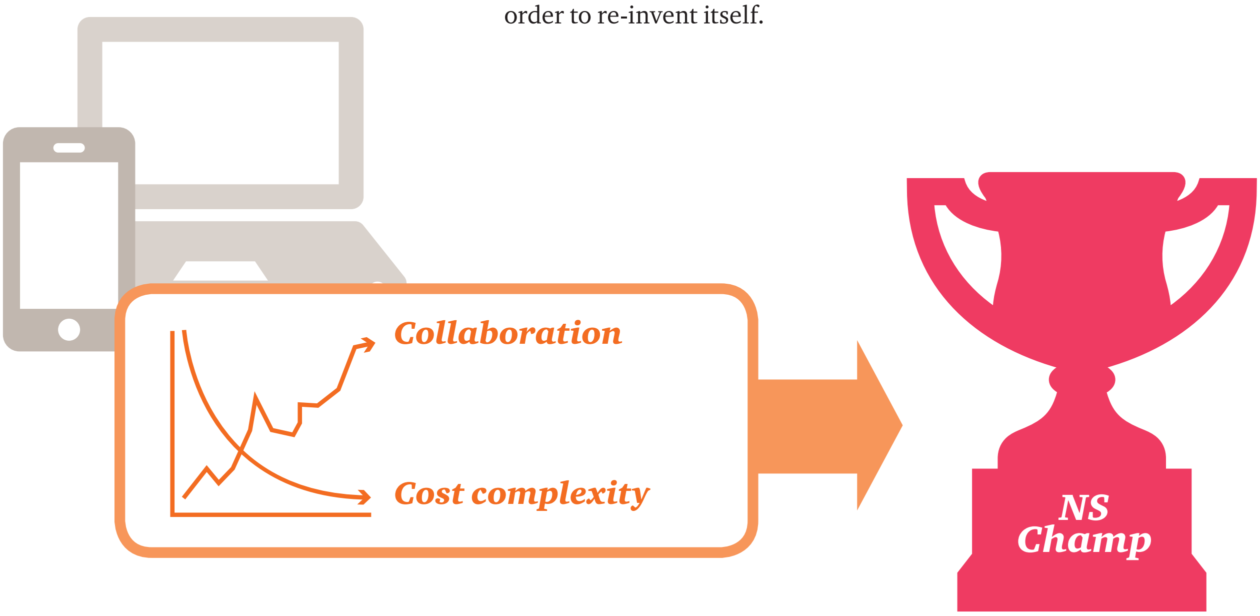
In particular, in early 2015, PwC issued a report covering seven fundamental steps to secure the future of the UKCS ('Seven fundamentals to drive excellence in oil and gas operations'). These steps are still relevant today, and, in particular, the notion of learning lessons from other industries is a vital step in the self-medication required. The industry needs to look outside and take a step back – view other industries – in order to re-invent itself.

A salient example is the automotive sector where the industry recovered from a devastating crisis and followed a path of shared technology platforms and joint venture arrangements, and witnessed the arrival of new entrants such as Tesla.

Moreover, the industry can learn lessons from other low margin industries and LEAN manufacturing processes, simplifying processes, reducing waste and red tape. Simplification is vital – the industry has managed to make the simple, highly complex and tailored.

And as well as looking outside of the industry, we can also look to other basins - this means learning the lessons from other mature basins around the world in order to realign cost structures and how people collaborate, innovate and work together. This requires a fundamental change in relationships between oil and gas companies and the service sector for the basin to operate in a different way and the recognition that the players are changing with an increasing focus on small to medium size companies.

The industry is in need of disruption – new entrants with new ideas about how to work. There has previously been a "we've always done it this way" approach – and the sector needs to embrace these disruptors rather than pushing back in order to innovate and re-invent itself for the future.



Collaboration...a little context

Collaboration was also identified as a key theme in our interviews. That said, whether you call it collaboration, cooperation or working together, the key fact remains that this needs to be cooperation that is for the benefit of all parties to the transaction, not just for the sake of it.

...possible solutions

Aside from simply working together, there could be other ways of making a real step change in cooperation, for example:

- Establish a joint venture vehicle that consolidates smaller assets of multiple operators under one sole operator. This would give the investment vehicle the scale to deliver cost efficiencies that prove elusive to smaller, more fragmented assets. Collectively, the owners can negotiate more effectively with the authorities and suppliers, as well as the government. The biggest barrier for owners from joining together has been in valuing the trade-off between size of the potential decommissioning liability and risk-based value from the assets.
  A neutral party with an acceptable methodology that produces a schedule of relative shares is potentially the best way to make progress on this. There are a number of known synergies on platforms and wells in terms of supply costs (we estimate 10% to 15% of current cost base). Similar savings could come from coordinated decommissioning. Furthermore, such a consolidation would enable restructuring of operational and management organisations for operators. Moreover, this approach will encourage technical innovation and help establish what is core to late life operations and decommissioning

- A similar approach can also be applied to financing – consider consortium financing / collective counterparty risk, as mentioned in the earlier 'Access to Capital' section, which focus attention on area based outcomes rather than asset based ones.

Government and Regulator… a little context

Many respondents in our interviews recognised the positive contributions made by the government and the regulator in the UK North Sea for example. The government was applauded for its decision to lower tax rates for the North Sea in the recent budget. The OGA was lauded for helping draft the MER UK strategy, securing £40 million of government funding to shoot new seismic over frontier areas, with the data now available to industry, plus the introduction of more flexible licence terms ahead of the upcoming 29th licensing round. OGA teams have also intervened to help operators solve commercial problems that might once have gone unresolved. Similarly, the OGA helped create the Maximising Economic Recovery UK Forum which replaced the PILOT programme and Oil and Gas Industry Council. Whilst in the Netherlands, the regulator is seen as being more progressive there is still scope for a wider view of the energy journey, from hydrocarbons through to renewables.

…possible solutions

The majority of our respondents emphasised the necessity for the government and the regulator to set the vision and scope for the future of the North Sea. Countries such as Saudi Arabia and Norway have taken a long term view on the future of oil and how their country will evolve over the medium to long term. The UK similarly needs to set what the end game for the North Sea will be.

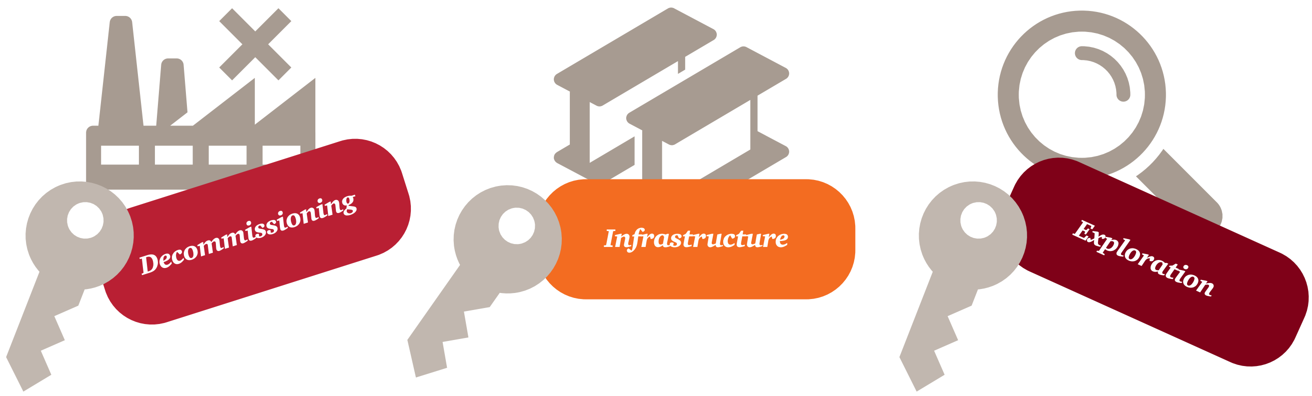
As part of this visioning piece there are several key elements including:

- The need to envisage what the sector will look like in 10 years to set the blueprint
- The vision needs to be holistic taking into account offshore and onshore oil and gas in the UK and how this feeds into a low carbon future (such as perhaps emphasising the preferential fiscal treatment of gas production over oil)
- And this vision needs to be underpinned by government agency alignment for the greater good of the basin

"Now is the time for everyone to demonstrate leadership to ensure we harness the expertise, imagination and tenacity that has built the UKCS into one of the UK's greatest industrial success stories."

Andy Samuel, Chief Executive, Oil & Gas Authority

Beyond the vision and the blueprint, there are probably three key areas where the industry is keen for the government and the regulator to take a more active role:



Looking at these in turn:

Decommissioning

- Government should become an equity player in decommissioning and show willingness to take on risk and cost for decommissioning. If the government assumes a degree of risk with the majors, independents can focus on squeezing out the last drops of oil from the North Sea

- The government should consider setting up a decommissioning fund or a guarantee scheme which helps smaller companies cover their letter of credit requirements for decommissioning

- An alternative option would be to establish a Decom plc – a government owned vehicle which acquires late life assets at zero cost and manages the decommissioning, paid for by the operators

- Finally, over the long term the government should focus on the need to develop a transferable, exportable and scalable skill set around decommissioning which can secure the future of the UK services industry

Midstream / Infrastructure

In the UK North Sea the government needs to address the infrastructure ownership recognising the importance of infrastructure hubs to energy security. The government will need to work closely with industry. However if there is discord the OGA will need to step in and take the lead

- The aim should be to encourage operators to farm out the ownership and the maintenance of infrastructure to a third party, allowing the operators to focus on reservoir development

- Infrastructure could be run and owned by a third party and/or nationalised. The end goal would be to establish a 'National Grid' model for North Sea pipelines and hubs where operators would pay a tariff to the owner

- The infrastructure model can be rolled out to include having a national shared pool of critical equipment such as drilling units, heavy lifters, and develop a UK Offshore Equipment plc, government backed entity, with tariffs which are competitive and encourage their use

Exploration

- Incentivising exploration in the UK North Sea will be fundamental to ensuring the medium term sustainability of the basin. Norway is typically held up as a benchmark where tax measures were introduced to stimulate more exploration. Perhaps for the UK a package of smaller scale measures including tax and regulation could be considered to reduce costs

- Making more 3D seismic available to update old data will further enhance exploration opportunities whilst reducing the cost burden on explorers

Leadership...a little context

Underpinning all of the messages of this report is the theme of 'Leadership' - the industry needs change drivers in leadership roles – innovators, entrepreneurs and disruptors. And, more importantly, it is vital that these leaders are not drowning in "big oil" behaviours, rather that they are aligned to the materiality concept discussed earlier.

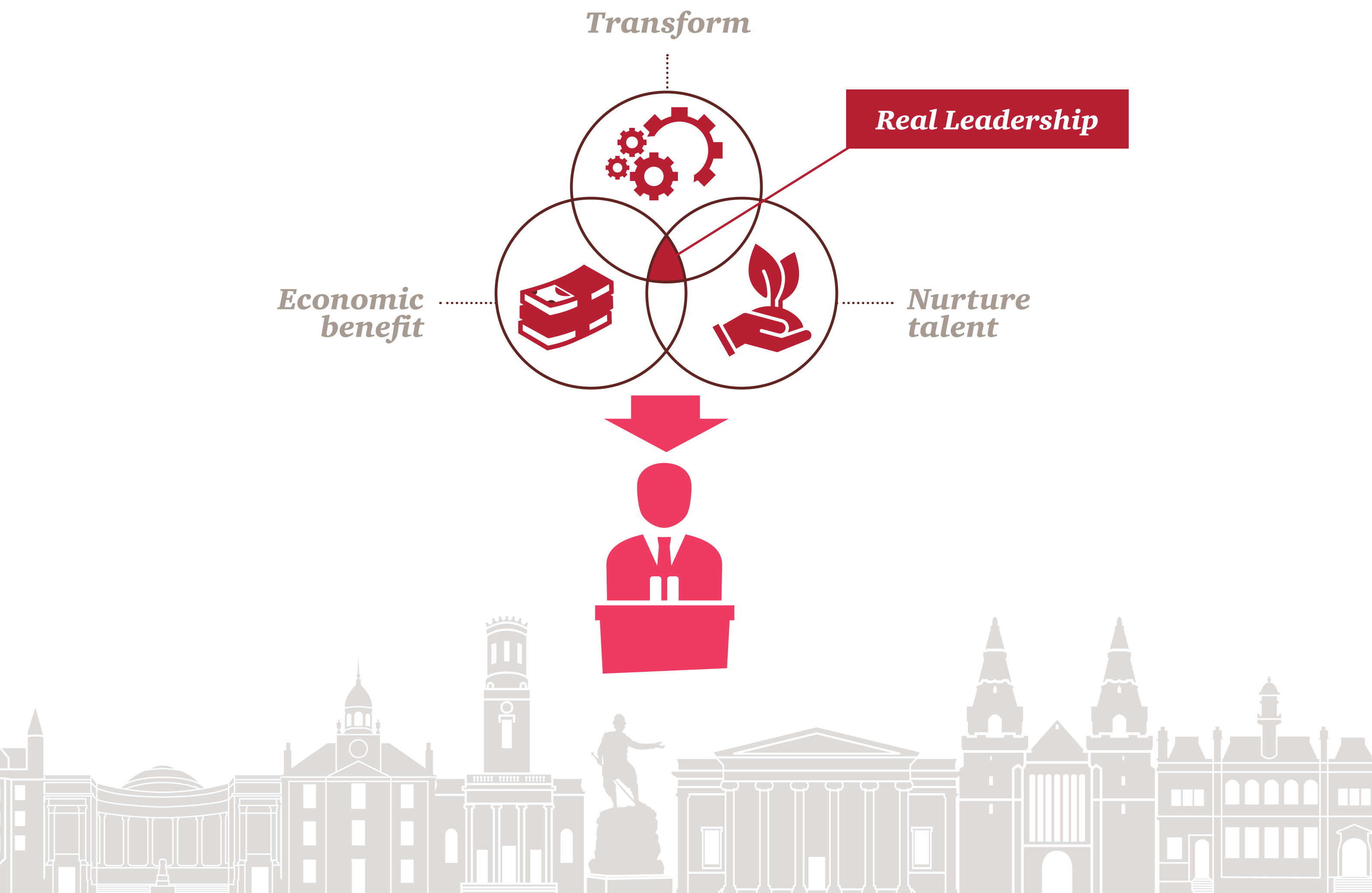
There is a real concern that the current round of redundancies could cause a leakage of talent out of the industry. Today's talent are tomorrow's leaders and at this stage the industry cannot afford another big crew change as it heads towards its most transformative years – maximising economic recovery, into late life decommissioning and low carbon.

The industry needs to find new ways of incentivising and retaining talent through the cycle which do not cause costs to spiral once again.

...possible solutions

It was difficult to quantify what our respondents shared about their thoughts on leadership going forward but there was a broad and common sentiment on what those elements of leadership should encompass, namely:

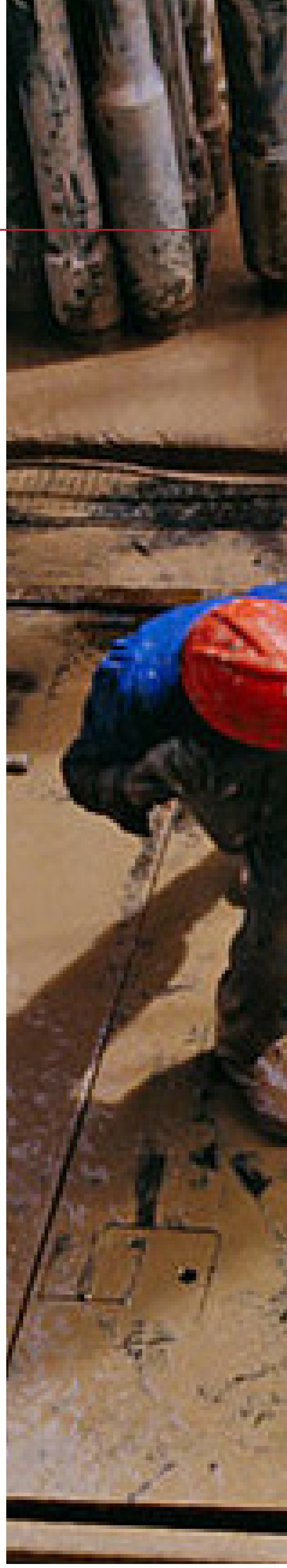
- In the UK, industry and government need to do a better job in explaining how the North Sea benefits the national economy, so attracting new talent will be easier
- It is equally important that the future role of North Sea is clearly articulated in the context of a low carbon future as this will be critical in attracting a younger generation of talent with a very different perspective from the generation currently operating in the North Sea
- The sector also needs a small handful of companies to take the lead and facilitate this transformation of the basin. Premier's leadership in floating the merging of operations is one small example. This level of leadership needs to replicated across the whole basin. Moreover, a new way of thinking is required – one that is not bound by the traditions of the past. To some extent, a new entrant with expertise from another sector might be better placed to militate for this change
- Oil services also have a major leadership role to play with regards to the overall transformation of the basin. There is an expectation that mainly operators will drive the change agenda. However, given the talent and innovation prevalent in the supply chain, these firms should play a bigger part



"There is a dearth of good leadership in the North Sea. Good leadership is not just about being technical it is also about being entrepreneurial to turn something into a money making business. We have become very bureaucratic and process driven."

Francis Gugen, Chairman, Chrysaor

The Dutch Sector of the North Sea –
Summary Findings



Our Dutch respondents identified 'Collaboration' as the number one theme, with 'Technology & Innovation' and 'Government & Regulator' in equal second place. 'Talent & Leadership' was ranked third place. Interestingly, none of the respondents referenced 'Access to Capital' as an issue

Insights

Whilst respondents saw a future for the Dutch North Sea sector, the focus was primarily on gas extraction. However, there was recognition that low gas prices were accelerating the demise of the basin at present. Unlike in the UK sector, there was an expectation that within the next five to fifteen years the expectation is that the focus would moves towards decommissioning and potential re-use of assets.

Similar to their UK counterparts, our Dutch respondents believed the Netherlands was well placed to become world leaders in decommissioning and to export these skills to other mature basins.

Post decommissioning the consensus view was the renewables sector (such as offshore wind, tidal energy) would generate the next wave of investment opportunity in the sector. In fact to some extent the sector was already maximising revenues from hydrocarbons in order to fund the future of renewable energy.

There were equally concerns that the government was not demonstrating sufficient leadership to steer the low carbon evolution of the basin.

Solutions

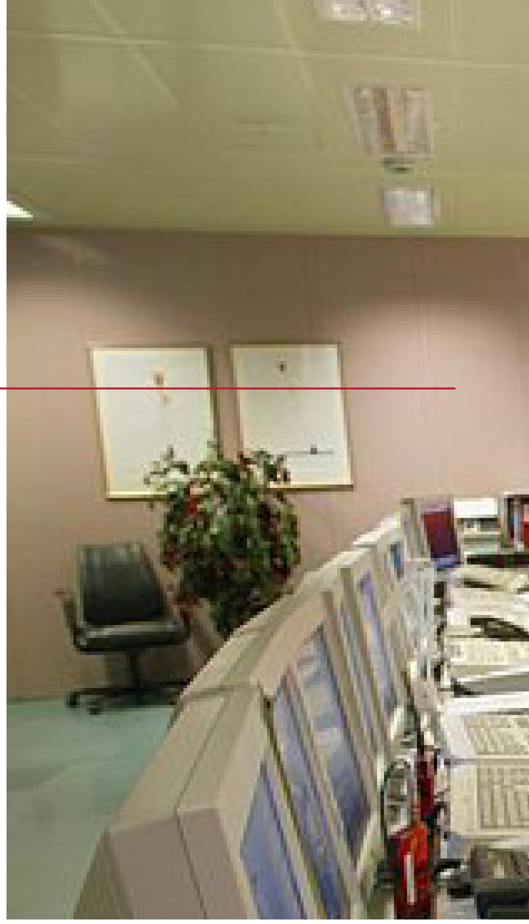
Leadership

In the Netherlands the government will need to take a leading role in coordinating interest and policies to chart a clear path from decommissioning to renewables. Overall, the government needs to play an active role as a key investor in this transformation, ensuring the transition from one sector play to another, and guaranteeing the skills and expertise from the hydrocarbon world are transferred to and deployed in a low carbon world.

The Dutch government will also need to work with other sovereign states in the basin to better align policy and seek a more common approach in matters related to licensing and tarrifs.

Figure 6

Top Themes for North Sea Identified by Dutch Respondents



The Norwegian Sector of the North Sea – Summary Findings

Our Norwegian respondents identified 'Collaboration' as the main issue facing the Norwegian sector, followed by 'Technology & Innovation', and, in particular, standardisation and industrialisation. The third most important theme for the NCS is 'Government & Regulator', including tax incentives for late phase/mature assets.

Interestingly, despite the NCS being relatively exploration and development intensive, 'Access to Capital' was not raised as critical for transformation.

Insights

Like the rest of the oil and gas industry, the Norwegian sector faces a headwind triggered by the 2014 oil price drop. There are more than 100 explored fields which require a significant reduction in the break even point to become profitable. And for fields of less then 50m bbls the current fiscal arrangements mean they make no profit. Changes are clearly needed to the fiscal regime to encourage the development of those fields. For the Norwegian oil and gas industry to become profitable, players in the NCS have begun to take measures to arrest the inefficiency that surged prior to the oil price drop. There is a common understanding that the industry should use this opportunity to address some of the main cost drivers, e.g. expensive staff rotation arrangements.

Senior executives in Norway tend to characterise the NCS as a mature basin. However, they are conservatively optimistic in regards to the opportunities in the basin. The optimism stems from the unexplored areas in the Barents and North Sea. Furthermore, political stability and financial stimulation are favourable in Norway compared to other less mature basins worldwide.

Solutions

'Collaboration' and 'Technology & Innovation' are considered to be the key themes underpinning the transformation of the NCS. The feeling is that both E&P and OFS players need to form stronger working relationships, collaborating along several important dimensions, e.g. technology, processes and contractual risks. More needs to be done around standardisation of documentation in particular and even better "industrialisation" of the sector.

Senior executives sense a significantly stronger climate for collaboration today compared to 12 - 24 months ago, and therefore, are focussed on the creation of win-win solutions. Rather than creating over-engineered, bespoke solutions, "good enough" is an important terminology that has entered the Norwegian oil and gas industry's vocabulary: E&P companies should analyse their portfolio of products and solutions they employ and strive for "good enough" standardised products and solutions. Statoil is seen as a front-runner in aggressively pursuing such standardisation, seeking "win-win" solutions.

As for 'Government and Regulator' respondents noted that the Norwegian government has played an instrumental role in the development of the NCS. For example, the 78% tax rebate has not only increased the exploration appetite for the E&P majors, but has attracted smaller exploration companies that otherwise could not fund the exploration costs. Lundin Petroleum is an excellent example; the small exploration company that is accredited for being the main driver behind discovering Johan Sverdrup. That said, for fields of less than 50m bbls, stimulation to the fiscal regime, perhaps by looking at capex depreciation or an uplift in tax allowance, could unlock many more projects.

Besides opening up more acreage, the Norwegian government has several tools to stimulate the industry. For example, as some of the NCS giant assets are in their late production phase, asymmetry between corporate and governmental profitability may arise. The government may consider easing a particular asset's tax rate to maximize the overall profitability of the project. Similarly, the government ought to consider introducing tax incentives to encourage E&P companies to develop the relatively large number of mid-sized hydrocarbon deposits already discovered.

Leaders also noted that oil and gas companies must avoid doing short-term cost-cuts as a knee-jerk reaction to the current situation, but rather focus on initiatives that generate fundamental and sustainable improvements.

Respondents are concerned about losing critical competence and capacity in certain segments, that could create a bottleneck for future growth, or inflate future cost. Respondents also noted that a change to offshore shift arrangement is long overdue. The current rotation, in addition to the already high wage level, make a Norwegian offshore employee 85%more costly than their UK equivalent.

Leadership

For the NCS to succeed, respondents noted the importance of long-term commitment to asset and exploration strategy. The E&P companies' licenses and asset portfolios must harmonise with the companies' capabilities. An example of this is Capricorn Norge (Cairn Energy), which is relatively unknown in the context of the NCS. However, Capricorn was the "winner" in the 23rd NCS license round. Capricorn's license wins are largely ascribed to the commitment and focus the company has had over several years to win licenses they assessed as attractive and a fit to their exploration capabilities.

Management must assume accountability in simplifying the ways in which their company is working. Old and unchallenged work processes have a tendency to stick with a company even though they do not create value. "We've always done it this way", can be a blinkered mindset and can result in non-value creating processes. If your organization holds "not fit for purpose" processes, it is time to clean up.

"The long term future of the North Sea will be very different."

John Pearson, AMEC/Foster Wheeler

Conclusion

The North Sea basin has gone through enormous change since hydrocarbon production first took off in the 1960s. Not least, the last couple of years have witnessed seismic changes in the industry, as the oil price collapse triggered a radical restructuring of the sector. Through all this change and turmoil, the oil and gas industry has proved itself resilient to change, adapting quickly to a changing environment.

Looking ahead these challenges are set to grow. The North Sea faces twin existential challenges, as a mature basin seeks to eke out another cycle of production success, while simultaneously tackling the pressures associated with operating in an increasingly low carbon world.

The North Sea can still play a valuable role in generating employment, stimulating economic growth, meeting our needs for security of supply in energy, and acting as a bridge to a more low carbon world in the medium term. Hopefully, this report will create a platform for all sector participants to engage in a dialogue to identify the way forward and ensure the basin has several more decades yet of success ahead.

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