



Making intelligent energy happen

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It is a great pleasure to be part of this morning's session on the theme of "Making Intelligent Energy Happen". I am looking forward to hearing the views of the other speakers and to sharing in the experiences from different parts of our global upstream industry.

I will focus on BP's North Sea business and the role Intelligent Energy plays.

The North Sea is, and will continue to be, one of the most important business areas for BP globally. And Intelligent Energy has been at the heart of our success in the region. A couple of years ago, we made a deliberate decision to place it at the core of our strategy and our experience so far suggests that was very much the right thing to do.

I will share BP's recipe and look at some examples of how this subject is making a real difference to our North Sea business. I will also discuss what has perhaps not worked so well and where we need to go further.

But first, I would like to share some data on the North Sea in 2010 – the elements which make it a uniquely attractive but challenging area and which provide the background to why Intelligent Energy has such a key role.

It is generally accepted that there are up to 25 billion barrels of oil and gas still to be produced from the UK Continental Shelf – an impressive figure for a mature province and a significant prize still to be won.

But there are challenges.

Production is in decline – there is now just one UK field with oil production over 100,000 barrels a day and the average is just 8,000 barrels a day.

The level of exploration and appraisal activity fell by 40 per cent in 2009 compared to 2008 and the average size of new discoveries is also falling.

Commodity gas prices have halved in the past year and the average oil and gas realisation for BP in the North Sea in 2009 was just \$50 a barrel.

And we are still working hard to reverse the rapid cost inflation which came with the previous period of high oil prices – our unit costs more than doubled between 2004 and 2008.

At BP, we believe these challenges can be overcome.

BP has been in the North Sea since the beginning – discovering the UK's first commercial gas field at West Sole in 1965. That field is still producing today some 45 years later. Over that period we have produced some 9 billion barrels of oil and gas and invested over \$80 billion in our North Sea business. And we have just announced significant investment plans for the future - including a second development in the Clair field west of Shetland – a \$6bn project which will have a design life of 40 years.



We can see continued high investment of around \$3bn annually sustaining a 300,000 barrel a day business here for the next decade and beyond.

And we expect continuing success in adding to our existing 3bn barrel portfolio of resources still to be developed and produced, through exploration, incremental additions to mature fields and improving recovery factors.

So as you can see there is much to do and we expect to remain the major operator in the North Sea for a long time to come.

But we won't be able to do any of these things simply by relying on the technologies, organisational model and commitment which worked in the past.

The increasing technical and commercial challenges have presented us with a "New Frontier", requiring the application of new technologies combined with new ways of thinking and working – and that includes Intelligent Energy.

Technology has always been a major element of our past successes in the North Sea and that will continue but we need to go further. We have always been good at sourcing or developing the technologies we need - that is not an issue. But technology for its own sake is not the answer. We need to improve the way we apply technology and how we extract maximum value for our business.

How can we better apply technology to extract more oil and gas from our mature reservoirs in the North Sea, to unlock more value from the skills in our offshore and onshore teams, to get the expertise to where the problems are more quickly and more effectively?

These are the challenges we have identified for Intelligent Energy.

As I am sure is the case in many companies, the concept of Intelligent Energy has been maturing inside BP for quite some time. Our global approach has been crystallized under our Field of the Future™ Technology Flagship programme. Globally, we have an aspiration that The Field of the Future™ programme can increase production by 100,000 barrels a day by 2017 and support the addition of 1bn barrels of reserves. The North Sea business has played a key role in supporting this programme from the very beginning almost 10 years ago.

Like many other upstream companies at that time, we began to piece together a view of how to benefit from the rapid advances in information and communication technologies.

We invested \$50m in building a fibre optic network to make offshore communications in the central North Sea as fast, reliable and efficient as onshore communications. We have added to this over the years so that nearly all of our North Sea fields are now connected.

But this was just a beginning. The key question for our North Sea business was how best to use technologies such as fibre optic networks, advanced sensors, processing power enhancements, improvements in data storage and visualisation techniques to help us make better decisions, faster ... to enable us to get more oil and gas out of our reservoirs more quickly and efficiently .. to put the expert where the problem is.

The answer lies in our recipe for Intelligent Energy.

The application of technology is obviously a core element of our recipe for intelligent energy but it requires more than just technology.

I said earlier that we have always been good at developing technology but that we have often fallen short when it comes to maximising the real value of technology. We are putting that right by adding two key ingredients – the right organisational model and the right leadership actions. Combined with



deployment of the right technology, these create a powerful recipe for Intelligent Energy in our North Sea business.

What do I mean by the right organisational model?

Our global upstream business is just completing the move to a functional organisation from an asset based model which we have been using for the past decade and more.

In fact, we completed our own North Sea business transformation to a functional organisation almost two years ago now and it has created the conditions for Intelligent Energy to flourish.

Moving to a functional model is helping to improve business performance through standardisation, shared learning and the deployment of capability to the right areas. The key benefit is that it enables us to rapidly transfer learning and good practice around our organisation, whereas previously we had to “sell” the idea into each asset. We found it hard to resist customisation and “reinventing the wheel”.

The functional model really energises people to do what they do best and what they enjoy doing. They can concentrate on “pushing the frontier” in their own specialist areas of responsibility, rather than being just part of a general approach.

So, having the right organisational shape is, for us, very important.

And there are two acts of Leadership which are just as critical for ensuring that extracting value from Intelligent Energy is successful.

First is simply the act of declaring that implementing an Intelligent Energy strategy will be a priority for our organisation. Having set this direction, it is important that people are granted the space to be innovative, to push the frontier, to experiment.

Secondly, it requires the discipline of sticking with that strategic direction even when things don't work, and when some experiments fail. It's easy to be discouraged and to lose sight of the fact that a real difference can often be achieved more through a small number of successes rather than a single “breakthrough”. We have seen that value delivery from Intelligent Energy is often achieved through accumulating many small benefits, so leadership is necessary to hold on to the vision and secure the total prize.

Without this declaration of intent and the discipline not to change course, our Intelligent Energy agenda could not be a success.

So, organisation and leadership are as important as the technology in our recipe for Intelligent Energy.

Let me give some examples from our North Sea business and what we have learned from false starts as well as successes.

The organisational changes I described earlier coincided with a move to a new North Sea HQ so we had a fantastic opportunity to customise our hardware and onshore support facilities.

As many of us know, one problem critical to business performance has always been the effectiveness of communication and collaboration between offshore and onshore teams; making sure that we apply our best collective expertise to operational problems in a timely fashion.

To address this, we provided a dedicated ACE – advanced collaborative environment – in Aberdeen for each of our major operating assets in the UKCS, plus functional support ACEs for Drilling and Production Enhancement – a total of ten.



These ACEs are very much places of work and not just meeting places – and they have underpinned our intent to improve efficiency through seamless integration of the offshore and onshore teams.

This has not always been easy. A lot of this was new to BP, certainly on the scale that we were trying to deploy. Add to that the change in our business structure from asset driven to functionally driven, and some of our decision making was not as swift in the early stages as it should have been.

However, it is a sign of the successful embedding that now we have to worry that the barrier is not the audio-visual link between offshore and onshore, but the partitioning between the onshore ACE and the rest of the onshore team – such has become the quality of the integration.

This has been so successful that one of our OIMs (Offshore Installation Managers) told me that “now we have the ACE, we don’t need regular ‘awaydays’ any more”. That means we got to ‘business as usual’ with this capability within 9 months of initiating the project – a fantastic result!

Using the ACEs efficiently means that we can now have an onshore specialist working “virtually” on four or five different installations or reservoirs in one day. In a world of scarce resources – this matters!

We have a huge catalogue of benefits derived – many are small efficiency improvements, or better conversations leading to the faster diagnosis and resolution of problems, or identification and mitigation of risks.

To give one specific example: A recycle valve failed on a gas train, losing around 30,000 barrels a day. Without the ACE, the solution would have involved emails, conference calls, photographs – all taking time to set up and organise. With the ACE, the faulty seal was quickly identified and fixed because we were able to get the right expertise onshore on to the problem, viewing high definition close ups of the valve and identifying the solution quickly.

Overall, the ACEs have made a significant impact. In the first year of operation we generated value well in excess of the 1% of production on which the business case was based.

For BP, the North Sea business also includes Norway – and this has been an important area of testing and innovation. A recent example has been the integration of a number of components to address problematic wells on the flanks of the Valhall field. These wells were proving very difficult to operate – suffering seriously from slugging behaviour.

The solution came through collaboration between our onshore and offshore teams, and our technical experts in Sunbury. Together they were able to apply the necessary technical skills and dynamic well modelling expertise to diagnose the performance problem, and devise an improved methodology for starting up and managing the wells. This included the implementation of a novel automated slug controller to further extend the well flowing cycle.

A key indicator for me was that when I visited the facility, the offshore operators talked about the solution, and they knew the names of the remote technical experts in Sunbury – this was a different level of collaboration to that which I had ever experienced before.

And effective it was – this collaboration delivered 3,000 barrels per day of production that would otherwise have been lost. The slug controller along with the use of dynamic modelling to support cycling wells is now a proven capability being applied to other assets in the global BP portfolio.

Another example with a beginning in Norway. Valhall is probably well known to many of you as the home of a permanently installed seismic array – the Life of Field Seismic array installed in 2004. Several surveys in, they derive value through spectacular imaging of fluid and pressure responses. We have built on this experience and have begun to see results from a similar installation on the giant Clair field, in the Atlantic margin west of Shetland.



This is a technically challenging, fractured reservoir – and one in which conditions are not amongst the best for seeing a 4D response. For this reason, we decided to install an array over the core area of the field only, where the initial wells are located, to confirm if a useable 4D response could be acquired. If successful, this would assist greatly in understanding reservoir performance and driving operational decisions such as offtake strategy and new well locations.

We have now established that we are seeing a 4D response. This is beginning to have an impact on our understanding of the reservoir, how we manage it, and in improving the planning and delivery of new wells. We can identify unswept areas for planning new producers, injection targets in intervals showing offtake and pressure connection, and areas of overpressure that might create drilling difficulties.

We will drill a well this year, CP24, located on the basis of the 4D signal which will recover around 10 million barrels of oil. Further value from the seabed seismic array is currently being accessed through an improved reservoir image, which we are using to target wells into more uncertain areas of this complex reservoir.

My final example involves the use we make of real-time data and the proprietary tools we have developed in BP to support our activities.

The challenge for most operational teams is that there is often a lot more that can be done with real time information from the asset than they can easily handle. A real opportunity to improve production and staff efficiency exists if we can find a way to more easily connect this information to operational decision making – driving a greater depth of analysis through the collaborative organisation I've already described.

One solution we have developed is in the area of monitoring, alerting and analysis of real time data from wells. This is now enabled by our Integrated Surveillance Information System (ISIS), which provides automated conditioning of well surveillance data, alerting us on changes of well behaviour and analytic functions such as a virtual flow meter.

This has allowed us to put in place more accurate and efficient work flows for well production allocation than was previously possible, typically saving 2 days per month per asset of valuable engineers' time.

For problems where a more sophisticated modelling approach is required, we need a way to quickly connect the detailed analysis work done by in-house or external experts to the operational decision makers. Our Model Based Operational Support Toolkit – MBOS - enables us to take these specialist analyses together with real time data and provide a tool for operators to understand their current operating point and make adjustments with confidence.

Gas plant stability on our Schiehallion FPSO was quite poor, mostly due to slugging in deepwater risers and the effect that was having on the well stock. Operating guidelines for those risers, tied together with real time data from the plant, enabled operators, with onshore support to change the dynamics of the problem. This made the plant more stable and enabled more gas and oil to be produced – in this case around 3,000 barrels per day.

We find that the solutions to such problems are often non-intuitive – so that is where effective use of the ACEs gives the team the confidence to implement the solutions and secure the prize.

So in summary, we made a conscious decision to place Intelligent Energy at the heart of our North Sea business and I hope some of the examples I have shared show that it is making a difference.

It is not just about technology. Our recipe is to combine leading edge technology with the power of a functional organisation, all enabled by what we like to think of as bold leadership.



And we are still learning.

Intelligent Energy is a dynamic concept and so we do not expect to stand still but to continually improve what we apply and where we apply it. Resting on our laurels is not an option.

Intelligent Energy is no longer new. It is now quite simply “how we work”.

Thank You.