



Unconventional world, unconventional thinking

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We are living in unconventional times – in all senses of the word.

Global economic output has been sporadic since the economic crash of 2008. Several regions face ongoing challenges in maintaining growth and employment.

The price of oil has fallen and returned to a pattern of volatility after an unusual period of stability at over \$100.

We live in a world full of risk: conventional, familiar risks such as conflicts and disease; and unconventional risks such as cyber-crime.

This region of course has its share of challenges – but it also has many countries and areas that represent islands of great stability in a turbulent sea.

And throughout all of this, here and around the world, demand for our products continues to rise – with global energy demand growing 2.3% last year - and BP's Energy Outlook foresees demand rising by around 40% by 2035.

Fossil fuels are projected to provide the majority of the world's energy needs in the coming decades – even in the scenarios that project very stringent action to limit carbon emissions.

From our perspective the major change is on the supply side – where unconventional resources are making an increasing contribution.

We can see that the recent fall in oil prices can be attributed in large part to the rise in US unconventional production.

And also in the fact that unconventional resources now equate to the current estimate of global proved oil reserves.

So these are unconventional times for the world and – literally – for the industry.

At times of turbulence we are particularly mindful of our role supporting the National Oil Companies and the countries that they serve.

Any IOC operating in the Middle East has to be very aware that oil and gas in the short and mid-term is the primary driver of economic growth.



So our priority is to support the National Oil Companies and governments in the production of their oil by reducing our costs while delivering excellent overall performance.

With that as background, I would like to share three brief examples of what this means in practice for us in BP and for our partners in this region.

Iraq: the Rumaila story

My first example is a story of a brownfield rehabilitation.

The Rumaila oilfield spans 1,600 square kilometers to the west of Basra in Southern Iraq. It accounts for nearly a half of the country's revenue and delivers a remarkable 1.4% of total global oil production.

I was in Iraq from Day 1 when BP was the first IOC to return to the country in 2009.

By the way, in my early days I heard something profound – Iraqis told me they would rather have peace than oil.

I carry that humbling statement with me every day and regularly remind my teams of it.

BP is the lead contractor at Rumaila, having signed a Technical Service Contract in a partnership with PetroChina with Iraq's state-owned South Oil Company to operate through the Rumaila Operating Organisation the Rumaila oilfield.

What we and our partners found in Rumaila in 2009 was equipment and facilities that were faltering and an underlying decline rate of around 18 per cent. In short, the legacy of a field that had received little investment, where working conditions were harsh, and workers were demoralized by a regime that ruthlessly demanded production targets, regardless of the challenges.

In those very early days a handful of us would fly into Basra and stay at a military base next to the airport. Clearly an unfamiliar territory for an oil worker from the West, but we were nevertheless thankful for the protections from rockets directed our way.

Leaving the base we were surrounded by security wearing body armour. It felt very odd at the time when all our South Oil Company colleagues greeted us wearing their normal clothes.



Back in early 2010 we might have had 10 people on the ground but we rolled up our sleeves and got on rebuilding a world class oil and gas operation. We built a finance and a procurement department virtually from scratch, not to mention removing tens of thousands of unexploded ordinance from the field.

We had to demonstrate to our SOC colleagues in Basra and the Ministry of Oil in Baghdad that even with limited resources we could be trusted and could deliver immediate results.

Considering the difficulties they had faced over the decades, they were extraordinarily welcoming. They also had a deep understanding of what Rumaila once was and what it could once again become. This was to prove very important.

I can now look back over the last five years and say how immensely proud I am of what we have achieved so far together in Iraq.

Rumaila Operating Organisation now has over 6,000 people – 93% are Iraqi - and contracts over 22,000 more people. Both BP and PetroChina are remunerated for their capital investment and receive a taxable \$2 a barrel on all production above pre-contract output levels. The net effect is that Iraq retains well over 95% of the revenue.

Within two to three years we were able, through the Rumaila Operating Organisation, to implement modern management systems and bring in much needed new equipment to help rebuild the fields.

We have set out a vision and values that unify us all. We call it the Rumaila Way and it remains at the center of everything we do.

The Rumaila Way has helped us become the first field in post-war Iraq to achieve an initial performance target of 1.4 million barrels per day – nearly a 30% increase on a year before.

Safety has been improved. 1.5 million hours of training and development have been delivered. We have supported community initiatives and united people around the 'One Team' Rumaila ethos. Through a transparent modern procurement process, \$3bn worth of contracts have been awarded to Iraqi suppliers, providing tens of thousands of jobs for the region.

So there has been considerable change over the last few years, but fundamental challenges remain, particularly at a time of austerity.



A consequence is that the original targets set out in the Technical Service Contract of 2009 were changed at the back end of last year to ensure that capital expenditure on Rumaila's development is more aligned to Iraq's overall development.

While this will extend the field's production out to 2035, the mid-term challenge – increasing production by 50% by 2020 – cannot be underestimated – particularly considering the difficulties Iraq continues to face internally in the north and that the industry faces generally.

But if I have learnt anything from my time supporting both Rumaila in the south and Kirkuk in the north, it is that the Iraqi people are so determined they will overcome hurdles most would find overwhelming.

Supporting Abu Dhabi to achieve 70% recovery across its giant fields

Speaking of challenges, that brings me to my second example – one that brings unconventional thinking to conventional fields.

Abu Dhabi has a vision to achieve 70% recovery from its onshore and offshore super-giant carbonate fields.

This is twice the typical recovery factor delivered from conventional oil fields and it is very ambitious. We will have to wait and see whether these recoveries can be achieved. But BP applauds the ambition and desire to make a step change in performance.

To put this into some context, BP estimates that each 1% improvement in recovery factor, delivered across all the Middle East conventional oil fields, equates to between 16 and 20 billion boe, that's the equivalent of finding a new super-giant field.

BP believes that the biggest challenge will be in achieving the “near perfection” performance at the reservoir level, from the microscopic pores in the rock to the safe and reliable operation of the wells.

To do so we will be predominantly focusing our technology support in Abu Dhabi with Enhanced Oil Recovery (EOR).

As part of our commitment to developing local research capability, BP is helping build EOR technology capability in country. We are currently testing whether our Carbonate Ionic Design EOR technology will improve recovery at the super-giant Lower Zakum field,



one of the world's largest offshore fields, which is operated by the ADMA-OPCO, where BP is a partner.

Oman's Khazzan natural gas field story

Let me turn now to my third example, the unconventional Khazzan and Makarem tight gas fields in Oman.

The two adjacent fields hold an estimated 100 trillion cubic feet of natural gas, and following first gas in 2017 are expected to deliver a third of Oman's gas power – or around 1 billion cubic feet of natural gas a day.

BP is working in partnership with the Oman Oil Company and at the height of its construction this \$16 billion project will employ around 10,000 people in the field.

Extracting unconventional gas from Khazzan and Makarem is one of the most ambitious technical challenges BP has faced anywhere in the world.

The reservoirs are located in some of the oldest and hardest sandstone rocks in the world, formed in the Cambrian and Precambrian periods, so they are equivalent to the hardest granites.

They are of very low permeability.

And there was only very limited experience of drilling and producing deep horizontal gas wells in Oman.

But we have brought to the project our technical strengths and our long experience.

Our proprietary seismic technology, called distance separated simultaneous sweeping or DS3, has allowed vast areas of seismic data to be acquired across the field in a fraction of the time and cost that would normally be required.

This was followed by 11 appraisal wells and the building of an Extended Well Test pilot plant, all of which informed the design of a new Central Process Facility (CPF).

And we have drawn on the horizontal well drilling skills we have developed around the world – particularly state-of-the-art hydraulic fracturing techniques imported from North America where BP is a leading producer of tight gas.

I'm pleased to say we are having some good results both in drilling, fracking and with subsequent flowrates.

Again a time for unconventional technology and unconventional thinking.

Our Middle East heritage

I have spoken about three very different projects, but with many parallels – and many connections to BP's historic heritage in the Middle East.

We were the first IOC to operate in many of the countries in this region and some of these historical links can still be seen today. BP was at the forefront of the discovery of oil here in the UAE in 1958 and, from my own experience, there are people still working on the Rumaila and Kirkuk oil fields in Iraq who remember working with BP over 40 years ago! They were young men and women then but their memories run deep and are passed on from generation to generation.

The BP pioneers back in the 1920s were probably considered unconventional at the time. Much of this spirit remains. 'Courage' and 'respect' are two of our business's core values today, along with safety, excellence and teamwork.

Oman, like many countries in the region, has undergone a major transformation over the last few decades, partly driven by natural energy resources but also by longer-term thinking led by His Majesty Sultan, Qaboos Bin Said. Oman has one of the most advanced education and health care systems, not just in the Middle East but in the world. The Khazzan/Makarem fields are more than simply new energy sources - they are catalysts to economic development.

Rumaila likewise generates both energy and revenue for the Iraqi government to help fund the country's development. Getting the balance right between short-term revenue generation and sustaining a long-term development is a major challenge. Our role is to support the workforce in day-to-day operations and work with colleagues at the National Oil Companies and Government departments to find that balance in the country's best interests.



So these are unconventional times – but as unconventional gas demonstrates, unconventional times can also bring great opportunities – if we are open to unconventional thinking.

What gives me greatest hope in this new order is what I have seen on the ground here in the Middle East. Over the last fifty years, the Middle East has been transformed by oil and gas and nowhere in the world are the people I meet more aware of its importance to social and economic development and to ensuring they act responsibly for future generations. I look forward to continuing to work with you in the years ahead.