



Advancing the energy transition through innovation

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Introduction

Your Excellency, ladies and gentlemen. Good morning.

I am well aware of the very high regard in which the British Business Group is held here in Abu Dhabi, and also in Dubai, and it is a great pleasure to be invited to join this meeting.

Your group does so much to enhance and develop business relations with the UAE, and also to embody the commitment of British businesses to the country.

The continuity you can offer and support is increasingly important in our fast-changing world.

I think we can all agree that much has happened since last year's breakfast, in business, politics and in the oil and gas industry in particular.

The low price environment has become the new price environment.

Talk of peak oil demand has become louder – if not more definitive on the timing.

And the pace at which technology – and digital innovation in particular – is transforming our sector continues to surprise, creating new opportunities for ourselves and tech companies alike.

This profound period of transition in the energy world is, of course, particularly relevant for this region, given it produces more barrels of oil a day than any other region – around 32 million compared to 19 million from North America – and it has oil reserves that are more than double those of any other region: over 800 billion barrels, compared to South and Central America's reserves of 328 billion barrels.

While change – or transition – is very much underway, what I would like to do this morning is illustrate how this transition is offering opportunities and continuity for the business community, as well as challenge.

The energy transition

Let me start by defining the challenge, which while easy to express, is complex to deliver.

In short, more energy is needed to meet growing global demand, while at the same time greenhouse gas emissions need to fall very substantially.



When we look at global energy demand, BP anticipates, in line with others, that it is likely to grow by nearly a third by 2035.

That is the equivalent of adding another China and a half's worth of energy to global demand.

And that's an appropriate comparison given that almost all global energy growth, some 95%, will emerge from developing economies, notably from China and my home country of India.

There are two factors driving this change.

Most significantly, increasing productivity will account for three-quarters of the growth.

Additionally, the global population is growing. The UN projects an increase from 7.6 billion today to 8.6 billion in 2030 and 9.8 billion in 2050.

The good news is that growth in energy demand goes hand in hand with improving quality of life for many currently living below the poverty line.

Since 1990, around the time when I joined BP, world GDP has grown around 230% - fuelled by a 60% growth in energy consumption.

This energy has provided fuel for vehicles, heat and light for homes, refrigeration for medicines and power for water pumps.

Energy has directly supported wealth creation too.

To give just one example from BP. Since establishing operations in 1994 we together with our partners have invested about \$66 billion in Azerbaijan and in addition to creating jobs, building infrastructure, providing training and supporting communities, our activities have generated more than \$100 billion in contributions to government.

That is the growth side of the challenge, but what of the emissions side?

The good news is that, despite global energy demand growth averaging 1% a year, carbon emissions have been essentially flat, with little or no growth in the past three years.

This is in sharp contrast to the 10 years before that, where carbon emissions grew on average by almost 2.5% per year. So good progress, but the reality is that emissions need to come down further and faster.

BP has long recognised the role we can play in helping reduce our contribution to GHGs from energy.



It involves innovation in all areas of the business.

In my area of Alternative Energy, naturally, but also in more efficient production of oil, a shift to gas, and more efficient products.

There is scope for greater innovation with our partners in business, in academia and in government.

So let us look at some of those innovation opportunities:

- In the fuel mix.
- In technology.
- In market conditions.
- And in partnerships.

Innovation in the fuel mix

So what does an innovative fuel mix look like?

Let's begin by looking at the role of renewables, one of the great energy growth stories of the past few years.

If I told you that the global consumption of renewables had increased by 50 or 100% over that time you may think that sounds impressive.

The actual figure is 870%.

It is astounding levels of growth, and renewables are likely again to increase by 300% over the next two decades.

There is unquestionably a renewables revolution and for BP's part, we have worked in this space for more than 20 years.

Not all our investments have paid off, but today we have a buoyant biofuels business in Brazil, and wind business in the US.

In fact, our wind activities helped avoid around 2.54 million tonnes of CO₂ in 2016, and today our US wind business has a generating capacity capable of powering all the homes in a city the size of Birmingham back in the UK.



Renewable energy in abundance is important in the future energy landscape.

But it is only part of the story.

Even with historic levels of growth over the next couple of decades, renewables are likely to account for around 10% of the total energy mix.

Though some analysts differ on the number, even the most aggressive forecasts place renewable energy at around 30% of the total mix in 20 years' time.

This is because renewables start from a base of just 3% today.

So renewables are an important part of the future energy mix, but the world can't go to bed one night using one type of fuel, and wake up the next day using another. It is not that simple.

And fortunately it does not have to happen this way in order to reduce emissions.

We need less coal, yes. But there is still an important role for oil and gas.

Even when we consider BP's fasted projected growth for renewables, oil and gas still accounts for 48% of primary energy in 2035.

At 1.6% growth per year on average, gas grows more quickly than either oil or coal; overtaking coal to be the second largest fuel source by 2035.

Utilised properly, oil, and in particular gas, can help satisfy energy demand and help lower GHG emissions.

Gas emits half the emissions of coal when burned for power.

It is also increasingly accessible and abundant in supply, making it a flexible and attractive option.

BP's strategy is to shift the balance of its portfolio towards gas and 6 out of the 7 BP major projects this year are gas – with 8 more by 2020.

Innovation in technology

At the heart of this work is of course technology, and technological innovation is my second area of focus.

BP has always been an innovator. Our research laboratories in Sunbury, south-west London, opened 100 years ago and are still at the heart of our global R&D ecosystem.



Our partnerships with academia and business are transforming what we do.

Let me give you just a handful of examples.

Oman is a good place to start with our Khazzan project – one of the 6 gas projects I mentioned - and one of the most technologically advanced energy projects in the world.

Khazzan is deliberately designed to be low in greenhouse gas emissions through the use of a central processing facility that reduces the need for processing equipment at each individual well site.

Castrol is another example, and a great British brand and part of the BP family.

Castrol is helping some of the fastest vehicles in the world go even faster.

That includes Renault's Formula 1 cars and something called Bloodhound, which is a British combination of a car, a fighter jet and a space rocket which is aiming to go above a thousand miles per hour on land with the help of a suite of Castrol lubricants and technology.

We're also working with the likes of GE, Schlumberger and others to harness the benefits of digital to transform our operations in our Upstream business.

For example, we have a data lake of over a petabyte into which a billion data records from our operations are pumped every day. That works out to be the equivalent of double the daily tweets published on Twitter.

We have an algorithm that helped us see through layers of salt to uncover a new 'field in a field' - holding a billion barrels of oil. It took just a fortnight to process the algorithm in our supercomputer in Houston – with 20th century supercomputers it would have taken 1000 years.

And we're also working with a range of small start-up businesses, invested around \$200 million through our venturing arm in potential breakthrough technologies.

One example is Solidia Technologies, who can produce concrete with between 30 and 70% less CO₂. Great potential given that concrete is the single most-used substance on the planet, apart from water.

Innovation in the market

Of course for innovative technology to flourish innovative market conditions have to be in place. My third area of innovation.



You only have to look at what has happened in the US with shale, and in Mexico, with the energy reforms to see how change can have an immediate impact.

BP was the first global brand to open a retail fuels station in Mexico following deregulation of the retail fuels market, and it has proved extremely popular.

We are likely to have 1,500 fuel stations in the country within five years, changing the landscape of fuel retailing in the country.

We see time and again how open and constructive partnerships with governments, NOCs and supply chain partners are providing prosperity and opportunity.

BP sees this in our work in the Middle East, a region that is in our DNA, and where we first struck oil over 100 years ago.

Innovation in partnerships

The UAE is a good example of one of our best and most innovative partnerships, with the government and in particular with ADNOC.

BP has operated in this great nation since 1939.

Our net share of production from Abu Dhabi alone is 260,000 barrels of oil a day.

And our 10% interest in the ADCO onshore concession confirms us as long-term strategic partners, and we encourage more innovative partnerships as we look to the future.

Conclusion

It's a future where the Middle East will have a major stake in.

Today the region produces a third of the world's oil and a fifth of all gas.

It has important role to play in advancing the energy transition.

And as such also understands the importance of renewables, with thriving competitive solar industry.

So the Middle East is helping provide the energy the world needs and helping support the low carbon the world wants.

We see this innovative technology, as mentioned with our major project in Khazzan.



We see positive and innovative market conditions that allow foreign investment.

And we see innovative, long-serving partnerships, built on trust, respect and results.

BP is one of the top International Oil Company investors in the Middle East .

The UAE is a good place to do business.

It is a country and region important in helping global goals to fuel economies, help human prosperity and address climate change.

So it is also the right place to do business.

As you enjoy this year's ADIPEC I do hope you can drop by BP's stand to discover more about working in this great region.

And I thank you for your attention this morning.