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The Customer and the Changing Energy Landscape
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Good morning. It is a pleasure to be back in Houston, where I spent two very enjoyable years while at BP. Centrica's North American business, Direct Energy, is based here and we supply three quarters of a million customers in the state of Texas alone.

The United States is also a market where we are partnering with our customers to pioneer some cutting edge capabilities in the control and use of their energy. These consumer-driven trends are beginning to transform the energy market. And it is that transformation which I would like to focus on today.

Energy prices and their near term impact will of course attract a lot of attention here at CERA this week. But these other underlying trends in energy will, I think, be more significant over the longer term.

The good news is that natural gas will play a major role as a primary energy source to enable these changes, especially in countries with well-established distribution systems to the end-user. However, these trends will continue to reduce energy use per unit of GDP, and change where and how energy is used. We, in the oil and gas industry, don't have a good track record at monitoring demand shifts closely. I hope today I can provide some insight into those shifts which I think will have a major impact on all of us.

These trends are being shaped principally by two forces; Governments, who establish the policy framework; and consumers, who are the real enablers of change within it.

In policy, I believe we are now entering a new phase, one based on pursuing natural and pragmatic pathways to achieve our energy and climate change objectives more effectively, with more awareness of the unintended consequences of moving too fast - such as extra costs to consumers or greater intermittency of supply.

For power and heat, the natural pathway is to focus on energy efficiency; very importantly.....natural gas; nuclear power where it is supported by Governments; and - over time - the steady growth in competitive renewable generation. It is also essential to move away from unabated coal.

Cost-competitive renewables are an essential part of this solution, and they are becoming more competitive by the day. The levelised cost of utility-scale solar PV in countries such as the United States has decreased by 16% a year between the years 2000 and 2015. The cost of onshore wind is now, in some cases, within the same range as new gas generation.

Natural gas will have a central role. Gas, renewables and nuclear are expected to show the fastest growth over the next 20 years as sources of power. Of these, natural gas is likely to play the key material role in the transition to a lower carbon economy for both heat and power. Gas is cleaner than coal, cheaper than nuclear and more reliable than intermittent renewables.

Governments have a key role to play in creating the right policy framework to open up these practical pathways and make them easier to pursue.

But it is customers, within the framework established by Governments and regulators, who are the real enablers of change, and their behaviour is fundamental to the future energy mix and where and how energy will be used.



Looking through the lens of the customer, there are three key drivers transforming the energy system and changing how, where and when energy is produced and consumed.

The first is what customers want and are now able to do. Customers want affordable energy; they want choice; they want control and the ability to use less energy; and, increasingly, they want lower carbon.

In terms of affordability, not surprisingly survey evidence shows that price is still the primary factor influencing most customers' choice of energy supplier.

In terms of choice - it has never been greater. Customers here in Texas now have over 350 different electricity products to pick from, with individual suppliers offering up to 30 different options to suit customer needs.

Next, there's control and the desire to use less energy. More customers are acquiring the means to control their energy use proactively and remotely. Centrica is helping them to do that. We have sold over half a million smart thermostats in the UK and North America, and our new installations are running at more than 3,000 every week.

Customers also want to control their own power generation. US residential solar capacity is forecast to nearly double in two years - from 5.4 Gigawatts in 2015 to 10 Gigawatts by 2017.

Finally, lower carbon. As we all know, Environmental awareness has increased across society and is an important factor in purchasing decisions.

So, the first key driver transforming the energy system is what customers want and are now able to do, which is significantly different to only ten years ago.

The second key driver of change is the availability of technology. The viability and adoption of distributed generation and storage technologies at the point of consumption by households and businesses is set to grow rapidly. According to some forecasts, distributed generation, such as solar and small scale flexible gas turbines, could grow from a 2% global market share in 2014, to 12% in 2030.

Distributed energy generation is economic today and will become more so, particularly because of "power-by-the-hour" energy pricing.

Electricity storage is also poised to become an established and affordable technology. Lithium-ion battery prices fell by over 50% between 2012 and 2015.

By 2020 hundreds of millions of smart meters, smarter grids and an estimated 50 billion connected devices will enable the demand-side response technologies which allow consumers to become more actively engaged in reducing and flexing their demand.

So, that's the first two drivers of change: what consumers want and are now able to do; and available technology at the point of use.

The third driver of change is data and actionable insight.

Big data and analytics provide suppliers and customers with the ability to extract meaningful insights from this intelligent system, and change their behaviour, so reducing the amount of energy they consume.

Customers will benefit from usable data and insight through energy usage reports, combined with demand response programmes and time-of-use pricing.

Here in the United States, the concept of “behavioural demand response” has already taken off. Our Direct Energy business launched a programme last year which allows customers to earn bill credits for adjusting their consumption during peak weather and demand periods. This uses data to identify critical periods and relay signals back to customers.

So, we have looked at the three drivers transforming the energy landscape – what the customer wants and can do; the availability of technology; and data and actionable insight.

These changes have consequences for everyone and it’s those global impacts which I’d like to finish with.

I see five major impacts of change.

The first is that there will be a fundamental shift in where energy is generated and managed. This arises from more viable technologies, increased choice and many types of solutions for energy management at point of use. It will give communities, businesses and individuals more control over their energy. And it will remove the locational separation between generation and consumption.

We are already seeing the evidence of this, and at Centrica, distributed energy and power is changing the way that we relate to our business customers so that we can deliver what they really need, including energy efficiency, flexible generation, and energy management systems.

For example, Direct Energy is helping the New York Times to realise around \$600,000 a year in additional revenue through participating in demand response programmes using its 12 Megawatts of installed diesel-fired emergency generation capacity.

The second impact is that distributed energy has the potential to accelerate access to energy for millions of people in developing countries without incurring the large infrastructure costs of building a central grid. There’s a parallel here with the telecoms industry. Mobiles have enabled developing countries to become substantially connected without fixed lines. In 2013, it was estimated that 1.2 billion people - 17% of the global population - did not have access to electricity.

Distributed generation will enable faster rollout. It takes up to 3 years to build a new gas-fired plant; days to erect a solar installation.

The third major consequence of the changes in the energy market is a new competitive landscape with new value chains, business models and competitors.

We face new challengers in terms of technology, energy supply and generation, energy management and - of course - access to customers.

Google has launched a WiFi router which could double as a smart home hub. Amazon has stepped up its efforts in the Connected Home market, partnering with appliance makers, including GE and Samsung.

So at Centrica, we are going head-to-head with the likes of Google, Amazon and Samsung. We are deploying connected home devices, already providing data analytics on energy use to 3 million customers, and developing innovations such as the “connected boiler” which can tell you in advance that it is going to break down.

The fourth major impact is that getting from today's energy market to the energy market of the future will involve huge complexity in the transition. The system will be turned on its head and we will see the customer become the price setter rather than the price taker.

One important question is whether distributed energy will increase to the point where it will challenge the economics of the central grid and generating system.

We could see distributed systems, historically seen as back-up, becoming more mainstream, while centralised generation and grid systems are forced to fill more of a back-up role. This would be a huge change.

According to some forecasts, more decentralised new generation capacity will be added globally over the next decade than centralised capacity.

The fifth and final impact is that - with all this choice and drivers to use less and lower carbon energy and to diversify the energy mix - energy use and GDP growth will continue to diverge, as will CO2 emissions and energy use.

All these impacts lead to one over-arching conclusion.

There will, inevitably, be winners and losers as we make the transition to the energy market of the future.

Some infrastructure across both central generation and grid capacity will never be fully utilised. In 2014, European utilities mothballed or decommissioned a total of 50 Gigawatts of capacity, 4.5% of total power capacity and 8.3% of thermal plus nuclear capacity. It is difficult to see that trend reversing itself. Much undifferentiated central generation capacity will continue to earn marginal or, at best, cost-of-capital returns.

Some hydrocarbons will be left in the ground.

In all these supply sectors, including in exploration and production, the winners will be those with advantaged assets.

This is a transformational moment for the energy industry, which bears comparison to the revolution we have seen in the communications sector over the past 20 years.

It is difficult for Governments to grasp the implications of these changes and challenging for businesses like ours to manage them.

But the real winner will be the consumer, and those of us who can respond to this transformation with new capabilities and imagination.

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