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What is the future for gas?

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Good morning Ladies and Gentlemen and welcome. I am very pleased to have been given the opportunity to speak to you here in Paris as I believe we have reached an important inflection point in the evolution of global gas markets with deep implications as to how we power our economies in the 21st century.

To put this perspective in context though, it's helpful to remind ourselves of both the long and short term forces that we've experienced over the years.

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In the short term, it has truly been a remarkable last two years. From boom times 18 months ago with...

- historically high gas prices providing the signal to producers to continue investment in both LNG and new gas fields;
- High energy usage from both retail consumers and gas fired power generation as global economic growth powered ahead;
- And more localized demand factors, in Asia driving high LNG prices, and in the US driving the construction of import terminals.

And then to severe recession with...

- The largest fall in gas demand seen in recent memory as global economic recession took hold;
- Leading to an excess supply of gas and LNG diverted to the

Atlantic Basin, driving lower spot prices and significantly higher storage levels in Europe and the US; and a continued pull back in upstream investment as marginal gas fields become uneconomic;

Against this near term volatility we've seen the much longer market trends of globalisation of gas and climate change. The improvements in technology that have been applied to the gas value chain over the last 50 years have resulted in a complete reshaping of our industry, and what was essentially a 'localized' energy source now sees gas supplies shipped around the world.

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Centrica has had a 'front row seat' to this evolution - 50 years ago our own British Gas was a trailblazer with the first trans-continental LNG shipment from the US into Canvey Island in the UK aboard the 'Methane Pioneer' – which had a capacity of 5,000 cubic metres. In 2008 the Al Khuwair carried forty three times as much LNG to Centrica in the UK, exemplifying the economies of scale and cost competitiveness of exporting LNG across the globe.

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And on a global basis, we've seen both gas demand and gas supply shift up dramatically. Gas became the heating fuel of choice in Europe and North America, displacing everything from wood to oil to coal, and in power generation where the need for additional, flexible capacity was needed to meet surging demand in virtually all markets. Additionally in the 1970s concern about SO₂ emissions and acid rain made gas the fuel of choice. At the same time,

improvements in technology drove the ability to move gas from prolific sources of the world to consuming markets everywhere.

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As the global trade of gas has expanded we have seen a gradual narrowing of spreads and basis differentials. The convergence of NBP and Henry Hub prices this summer is expected to stay in place for the rest of this gas year, as the two markets compete for LNG imports. The rise of LNG has helped to bring the gas markets much closer together and we should see the global convergence continue, though possibly with continuing seasonal and regional influences.

The climate change agenda is the other macro trend that is and will shape the agenda for the gas market. The CO₂ challenge today is infinitely greater than the SO₂ challenge of the 1970s. As we strive to find solutions to rising green house gas emissions while not choking off economic growth, all 'fossil fuels' including gas have and will continue to come under increasing scrutiny. This is particularly the case as the world contends with the challenge of finding a global successor to the Kyoto agreement at Copenhagen in December.

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It is against this backdrop – the long term evolution to a global market, the imperatives of climate change, and at the same time the need to manage the short term price volatility that creates the inflection point. Just as coal was for the 19th century and oil for the 20th, I believe gas can be the fossil fuel that both drives the 21st century forward and acts as a bridge to the low carbon economy of the future.

However, it will not necessarily evolve in this fashion. Without constructive engagement from those of us in the industry, it will lose its place in the global merit order. To become the fuel of the future requires new “partnership” between demand holders and resource holders. If successful, this will advantage consumers and the environment as well as the gas industry.

While there are many possible scenarios for the gas industry, I’d propose looking at the future for gas from two vantage points.

The first is dominated by:

- concerns about volatile wholesale and consumer prices;
- gas being unable to demonstrate that it is a reliable source of supply; and
- the climate change agenda branding all fossil fuels as bad

All of which leads to ...

- renewed calls for energy independence;
- a continuing push toward renewable electricity;
- Significant investment in Nuclear and CCS; and
- More energy efficiency and reduced consumer demand,

The second scenario would see gas as:

- a key part of the solution to climate change ; and
- would see new relationships being forged between “demand holders” and “resource holders” to meet the challenges of energy security and climate change. This requires
 - New partnerships along the value chain; and
 - New forms of co-investment

Which, in turn, leads us to ...

- Global gas demand rising as gas fired power generation is seen as a relatively cheap, clean power source that displaces coal and backs up intermittent wind; and
- More secure supply and stable pricing of gas, sufficient to deliver expected returns across the value chain, and provides us with more stability in consumer end prices.

I'd like to explore these two scenarios in a little more detail as evidence of this critical inflection point for gas.

These two possible outcomes are I believe in the balance – so we have a choice as to which one we proceed with.

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European demand is forecast to drop by approximately 1.2 trillion cubic feet, or 6% of consumption, in 2009. Market commentators suggest a slow recovery in gas demand is expected from 2010, not reaching 2008 levels for three years.

More recently we have seen a collapse in US demand, leading to US storage stocks at record, levels and prices this summer as low as \$2/MCF.

Lower gas prices will, to some extent, encourage greater running of gas fired generation as coal moves to the margin. Nevertheless recovery in gas demand is not a given.

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The UK continues to face the challenges of a rapid decline in its own gas production which peaked in 2000. So the UK has gone from a position of surplus to imports in 2004. Now only five years later the UK expects to import 50% of its gas needs this winter. UK prices have increasingly been affected by global volatility and concerns about availability of supplies have heightened concerns about gas import dependency.

Unlike the US, the UK has a limited potential upside to its supply side with no new opportunities such as shale. Consequently, the UK government has turned to reducing gas demand and encouraging diversity in generation. Consumers are actively encouraged to adopt energy efficiency measures and zero or low carbon generation is being promoted by the Government. The UK approach is mirrored across much of Europe.

In fact, if governments worldwide follow the actions of the UK government, we will see a fundamental shift from fossil fuel to wind and nuclear generation. At the same time we are seeing massive prospective investment planned for clean coal and carbon capture and storage technology, where the technology still remains unproven on a commercial scale. This will mean a potentially material reduction in gas fired generation - one of the leading drivers of global gas demand.

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A 23% fall in US reserves in the ten years between 1977 and 1998 was followed by a dip in gas production. This led the US to a

significant investment in LNG import capacity. But more recently a focus on energy independence and an increase in commodity prices during the boom has seen a shift into unconventional sources of gas.

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Future reserves, particularly in shale, create a significant substitute to any foreign LNG imports. Up until now, unconventional gas has been regarded as too difficult, too expensive and too demanding. However, this has changed, estimates of shale US reserves could be as high as 2000tcf.

Some shale gas enthusiasts have even suggested that ironically the recent increase in US gas production could, in theory at least, see a return to US gas exports though I suspect domestic politics would deter such a move.

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Comments in the markets about negotiations over deferrals of unwanted gas volume, and increases in volumes of spot purchases ahead of Long Term Contracts in continental Europe are a further reflection of a fall-off in gas demand, strong availability of LNG and high continental storage stock levels.

You might think that these downward pressures on demand have created a buyers market. This is not the case as what we are seeing is very much a short term effect but gas economies, whether producers or consumers, need security in the long term not see-sawing between feast and famine.

Markets like the UK that have long term supplies of piped gas but no long term LNG contracts are therefore exposed to the volatility and lack of security of spot markets.

All global markets, even deep and liquid ones like the US and UK need to ensure security of supply and security of demand. A “stronger partnership” is needed.

If we “do nothing” as a gas community, we risk this first scenario continuing.

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Lets consider a world where this “stronger partnership” occurs, and gas is the fossil fuel of choice – what are the benefits?

Future gas demand could be driven higher by changes in technology leading to the drive towards not only low cost centralised generation but also to new forms of distributed generation in consumers’ homes and premises. Small but potentially important examples of this are two gas technologies that could more economically and more efficiently provide heat whilst at the same time producing power, the Stirling Engine and the Solid Oxide Fuel cell. Centrica’s British Gas subsidiary is already starting to install these on a trial basis in customer’s homes.

Both of these microgeneration technologies produce lower CO₂ emissions. Resource holders and demand holders should be working together to stimulate this gas demand and technology –

much like the large automobile manufacturers and Utilities are working together to accelerate 'electric vehicles' – which in turn will require low carbon gas fired electricity.

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If we look at centralised generation the potential for gas is vast. If the US replaced all its coal-fired power plants with low carbon modern gas fired generation, the US could reduce its emissions by 1.3bn tonnes of CO₂. So on its own such a fuel switch could contribute a reduction in US emissions by more than the 17% reduction from 2005 levels envisaged under the recent Waxman-Markey Bill.

A similar analysis for the EU would result in 29% reductions from 1990 levels, compared to the EU's target of only a 20% reduction by 2020. Although these targets are theoretical maxima and the cost of replacing installed plants is high, it is important to understand that the EU's 20% renewable energy target is also a result of European concerns about the reliability of gas supplies and over reliance on gas imports. If this concern could be addressed the heavy reliance on expensive renewables might be reduced.

Similarly, in China a switch from coal to gas could result in emissions reductions of 1.8bn tonnes of CO₂. A reduction of 28% from 2007 levels.

But the China story is not so straightforward. China has been adding coal fired generation at a rapid pace in recent years adding over 90GW of new coal-fired plant in 2006 alone, so much of the

current generation capacity could be expected to remain on the system for many years to come.

So a better way of looking at the possible market for gas in China is to look at the 330GW of new coal that could be expected onto the system by 2020 and the 1bn tonnes of CO₂ savings that gas could deliver if it displaced that coal – this alone would avoid a 16% increase in China's emissions.

CCS is not yet a proven technology. Gas, on the other hand, is already a proven technology and is much cleaner than coal but cost will clearly be a key factor. If we embrace tighter and global carbon markets, the greater additional costs on coal might just be the deciding factor in favour of gas.

Ultimately to meet CO₂ targets for 2050 we will have to go further but gas could provide the crucial bridge to a low carbon world. Additional renewables and nuclear will take some time to be brought on in sufficient quantities so cheaper gas generation can fill the gap. The choices we make in the next 10 years or so will determine whether or not we meet the challenges of climate change but those choices are also largely irreversible. So now is the time to act. Far better to move from coal to gas now than to wait till clean coal technologies are proven.

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Major markets for gas such as Japan, Germany and the UK will remain import dependent. These markets are reliant on strong relationships between major resource holders and companies like

Centrica driving consumer demand.

All markets, even deep and liquid ones like the US and UK, need to ensure security of supply. Despite massive investments the UK does not yet have enough control of its security of supply. Its domestic needs depend on foreign imports. The UK is still finding its feet in this new import dependent world.

Politicians even pro-market ones are shocked by the volatility seen in recent times with a tendency to find quick solutions to 'fix' the perceived problems of high wholesale prices.

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All participants need to consider how the value chain is shared.

Co-dependency of supply and demand has been key in developing global infrastructure particularly in LNG, where all LNG is in effect contracted forward reserved for particular markets and the proceeds used to collateralise construction and shipping costs. Historically, little of that LNG was divertible but the spot market is growing with diversion rights for the seller. Unfortunately this optionality does not provide the buyers with the security of supply they require.

International stability and trust is required when gas crosses borders as the reserves lie outside the "demand holders" jurisdiction and control.

In this context, the UK needs to merge its successful competitive market based on spot prices and gas on gas competition with the

model of long term relationships between LNG producer/suppliers (“resource holders”) and supplier of gas consumers (“demand holders”).

I believe there may be a parallel to be drawn from Global Oil Markets. In that market, we have competitive and global price signals. However, there are regional, term and quality price differentials providing signals for investment and optimisation between regional markets.

Yet (even though quite open and competitive), the oil market relies on many forms of long term relationships for security of supply and demand. For example, on many occasions Refinery owners and Crude resource holders establish long term contractual relationships, both deeming it necessary to underpin investment in upgrades, stimulating new product demand capturing new markets or securing upstream monetisation. The prices however are set by reference to well known international benchmarks set by deep liquid commodity markets.

A sustainable and leading global competitive gas market in the 21st century requires both a transparent global gas price reference and long term relationships to underpin both security of supply and demand.

Slide 16 and conclusion

Is the international community going to promote cooperation and open markets or remain with the existing arrangements?

“Demand holders” and “Resource holders” have to decide whether they

- want to move gas in and out of markets flexibly always seeking optionality over security, in which case we have to accept the consequences of progressive gas demand reductions, a growing shift to renewables and continued price volatility and savings in the investment cycle; alternatively
- build on traditional models of longer term relationships, using the competitive markets to price gas, but sharing the economic rent through the cycle to promote gas as a stable, reliable source of energy that will help us meet our climate change objectives.

If we work together on this we can help ensure that gas is the fuel of the 21st Century that provides the crucial link to a global low carbon economy.

Thank you.