The role of technology, innovation and partnership in meeting global energy demand

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Peter Voser

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Peter Voser became Chief Executive Officer on July 1, 2009. Before his appointment as CEO, Peter had been Chief Financial Officer (CFO) and an Executive Director of Royal Dutch Shell since 2004. He was CFO of the Royal Dutch/Shell Group of Companies from October 2004 to July 2005.

Peter was CFO and an Executive Committee Member of the Asea Brown Boveri (ABB) Group of Companies, based in Switzerland, from March 2002 until September 2004.

Peter joined Shell in 1982 after graduating in business administration from the University of Applied Sciences, Zürich. He went on to work in a number of finance and business roles in Switzerland, the United Kingdom, Argentina and Chile.

After moving back to London from Chile in early 1997, Peter became the Group Chief Internal Auditor. In 1999 he was appointed CFO of Shell Europe Oil Products.
He became CFO of the Global Oil Products Business in early 2001 and a member of the Oil Products Executive Committee.

From 2004 until April 2006, Peter was a member of the Supervisory Board of Aegon N.V.. He served on the Board of Directors of UBS AG from April 2005 to April 2010. He was a member of the Swiss Federal Auditor Oversight Authority from 2006 until December 2010.

He is chair of the Board of Directors of Catalyst, a non-profit organisation that works to build inclusive environments and expand opportunities for women in business. In March 2011, he was appointed to the Board of Directors of Roche. In July 2011, His Majesty the Sultan of Brunei awarded him the title of Dato Seri Laila Jasa in recognition of his services to the state of Brunei.

Peter is also active in several international and bilateral organisations, including the European Round Table of Industrialists and The Business Council.

A Swiss citizen, Peter was born in 1958. He is married to Daniela and they have three children.

Technology and innovation have always played a key role in moving the energy industry forward. In this speech to the International Petroleum Technology Conference in Beijing, Peter Voser discusses how technology and innovation are helping to meet the world's future energy challenge today. He also explains the significant influence China will play, and how partnerships and collaboration will be critical in easing the transition to a more sustainable energy future.

When I first read the title of today's session, "Challenging Technology & Economic Limits to Meet the Global Energy Demand", I thought it sounded a bit pessimistic. Indeed, there are limits and challenges to meeting the world's future energy needs.

But I am convinced there is also reason for optimism, that if we make smart and pragmatic choices today, the world's energy future can be bright.

To get there, to meet surging demand and transform our energy system to one that is cleaner and more sustainable, will require a new level of collaboration among business partners and an increased focus on new technology.

Technology's role

Technology and innovation have always played a critical role in our industry. And it is clear their role is even more significant today. Many successful new technologies in our business work because they make exploration, extraction or production of our energy resources more affordable.

They lower those "economic limits". In fact, new technologies and innovation are already providing us with the tools to meet our energy challenges. I'd like to note a few examples from around the world, specifically, the United States, Korea and Qatar.

As you know, in the United States improved technology in hydraulic fracturing combined with horizontal drilling has created what is often referred to as the "shale revolution". It is the most significant energy development in decades.

The same technology holds the promise of unlocking the huge potential of China's shale and tight gas resources. Some experts estimate China's unconventional gas resources could be 50% larger than those in the United States, though much work remains to assess and confirm those resources.

Let's turn now to South Korea. In a shipyard there, work is under way on what we expect to be the first vessel to process, store and transfer liquefied natural gas at sea. It will be the largest floating offshore facility in the world.

This massive display of technological know-how will allow us to tap gas fields that were previously considered too far offshore or too small to be economically developed in the traditional way. It will eliminate the need to devote land and pipelines to process LNG onshore.

Our first floating LNG facility will develop the Prelude gas field off Australia's northwest coast. We hope to build more FLNG vessels to tap other offshore fields, including those in Asian waters, which stands to benefit China.

On the other side of the world, on the desert sands of Qatar, Shell is converting natural gas into liquid fuels and chemical feedstocks at our massive Pearl gas-to-liquids plant. This $20-billion investment is the culmination of more than three decades of research and refinement to perfect this technology. It resulted in about 3,500 patents.

Each of these achievements resulted from developing technology to overcome obstacles, then drawing upon our operational expertise to make it work. It's something we at Shell do well; it's what we bring to the table.

Of our more than 90,000 employees worldwide in 80-plus countries, about half work day in and day out with technology. These are the scientists, engineers and technicians who make our global operation

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work, safely and efficiently.

Adapting this kind of technology to meet China's specific needs is critical if the world is to meet its future energy challenge. China's energy consumption could double by 2030 if current economic growth trends continue.

To meet that demand and that of a growing world outside China, we need to pursue new resources, resources that are going to be more difficult to reach. That means oil fields in deep water or in remote locations like the Arctic. It means unconventional gas and oil trapped in tight rock formations. It means getting the methane trapped in massive coal beds deep underground.

Our strategy involves developing the right concepts for China's energy projects by integrating our in-house technology and operational skills with that of our partners.

For example, the industry traditionally has used large, complex, multi-function rigs to tap into deposits of unconventional gas though hundreds of wells, each drilled individually. But in partnership with CNPC, we have developed a new process that uses smaller, mobile rigs.

The system promises greater efficiency, lower costs, lower emissions, less noise and requires less space. And each rig will operate with fewer people than conventional rigs. This technology is in trials in the Netherlands and the United States. Its lower operating cost should make viable many projects that previously were considered too costly.

The partnership has already signed its first contract to provide well services with this technology to Arrow Energy, a Shell-CNPC joint venture in Australia. And there are potentially several such projects inside China as well.

Partnerships and collaboration

There are many examples of how Shell's technological and operational expertise is being utilised on projects in partnership with China's national oil companies. We are proud of how these strong, mutually beneficial relationships have developed.

I am convinced that strong partnerships will be increasingly critical to ease the transition to a new energy future. As business people, we are accustomed to serving our customers through effective commercial collaboration that drives innovation, efficiency and profits.

What we need to do better – and quickly – is improve our collaboration with other companies, with governments and civil society in every region around the globe. No one company can go it alone anymore; the scale of the energy challenge is too big.

We also need far more co-ordination and collaboration between government policymakers, business, academia and other groups than we are seeing today.

Shell has a long tradition of partnering and collaborating with other independent oil companies and with national oil companies, including those here in China. And increasingly we are partnering with leading companies in other industries, including IT, aerospace, and even video rendering, to create advanced technology solutions.

Here in China, we recently signed two joint agreements with CNPC's research institute to investigate aspects of unconventional gas development and enhanced oil recovery. We also have several other research projects with major Chinese universities and academies.

And we have set up a PhD scholarship program with the China University of Petroleum, which we see as a leading training ground for scientists and engineers.

Shell is also proud to be one of the partners involved in the China Development Research Foundation's energy and environment initiative. The initiative has proposed a series of policy recommendations to help China reach its long-term energy goals.

From our experience, successful partnerships result when both sides are clear on what they want to achieve, when their needs are taken into account in a balanced way, and when they are able to adapt to changing circumstances over time.

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Partnerships and collaboration will play a growing role in helping China make the most of its resources for the benefit of its people, its economy and its natural environment. Such collaboration increasingly will include projects outside China, as well.

Partnering outside China

For example, last year CNOOC acquired a 25% interest in two Shell offshore exploration blocks in the West African nation of Gabon. This will give CNOOC an opportunity to work with us on a major exploration project outside China. It is in addition to the joint deepwater exploration that Shell and CNOOC are planning in the South China Sea.

In Canada, we have joined with PetroChina and other partners to study the feasibility of building and operating a liquefied natural gas export terminal in British Columbia. Canada is the world's second-largest natural gas exporter. Recent discoveries of shale gas have expanded its reserves.

Traditionally, most Canadian gas went to the United States. But that country is now awash in natural gas thanks to the shale revolution. As a result, Canada is looking for new export markets.

For China, natural gas offers a much cleaner-burning alternative to coal for power generation, but also for residential heating and industrial processes.

As I have already mentioned, we see tremendous potential for unconventional gas in China. But much of it remains in the early stages of exploration and appraisal. Pipeline and LNG imports will help keep China's gas supplies secure as it explores its own resources. Some of that LNG could be imported from Canada.

Shell already imports about 2 million tonnes of LNG a year into China, and that figure will rise.

Shell and its Chinese partners are working on additional projects here in China, including a proposed integrated refinery in Zhejiang province. And we believe there is room for even more.

Shell's technical leadership in areas ranging from deep-water exploration and production to enhanced oil recovery could also help China achieve its energy goals. Technology also will play a role in helping the world address climate change.

Carbon capture and storage technology is the best current example, and the most practical. But it needs government support to get off the ground.

China's leadership has wisely recognised the need for this technology to develop, by supporting numerous pilot projects. This is important, as coal remains the dominant energy source here and carbon capture could play a major role in reducing CO_2 from coal plants and other sources.

As I said, I am optimistic about the role technology will play in the decades ahead in helping us meet our future energy challenge. But its benefits will come only from a long-term commitment to research and to finding ways to apply that research in the field.

The pace of growth and scale of China's energy system ensures this nation will have a tremendous influence on how the world addresses this challenge. Indeed, China has a unique opportunity to chart a new path to a more sustainable energy system that supports economic prosperity, and reflects the new reality in which we live.

We at Shell are excited about playing a role in helping China determine its future energy path, through partnerships based on trust, respect, experience, technology and innovation.

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