The natural gas revolution: a secure, abundant force for good

31st Annual CERAWeek Executive Conference
Houston, Texas, USA

Peter Voser
CEO, Royal Dutch Shell plc
March 7, 2012
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.

Since April 2010 he has been a director of Catalyst, a non-profit organisation that works to build inclusive environments and expand opportunities for women and 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 a number of 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.
The “natural gas revolution” is changing global energy dynamics, including the outlook for energy security in the United States and elsewhere. In this keynote speech to the annual 31st annual CERAWeek Executive Conference in Houston, Peter Voser outlines what the industry and policymakers must do to ensure society fully leverages the many benefits of natural gas. He calls for well-targeted and robustly enforced regulations to ensure tight and shale gas production meets the highest standards. He also urges the industry to do a better job of listening and responding to public concerns about the environmental and operational challenges associated with gas production.

It’s been called “the natural gas revolution,” the “golden age of gas” and the “shale gale”.

Whatever title we give it, the natural gas story is being rewritten as I speak. It is developing into a far more compelling narrative, one with the potential to change the world for the better.

Thanks to new technology and innovation, today we can affordably tap into vast fields of tight gas and shale gas embedded in rocks deep in the earth, recovering a resource that just a few years ago was considered out of reach.

Today I will share with you my view on the implications of the natural gas revolution and the role gas can play in meeting our future energy needs as a “secure, abundant force for good”. I will also take a look at what our industry and policymakers need to do now to ensure society benefits from this abundant resource for decades to come.

You are all well aware of the scope of the global energy challenge. Our world is headed toward what we at Shell describe as a “zone of uncertainty”, a period of significant stress between energy supply and demand between now and 2050.

Underlying global demand for energy is likely to double or even triple in the first half of this century. The world needs to invest heavily in energy production, both in traditional sources and in renewables.

Natural gas likely will play a far more significant role in meeting this challenge than we previously assumed. In fact, this year – for the first time – Shell expects to produce more natural gas than oil.

But while we expect gas to play a larger role in meeting the world’s future energy needs, it’s not entirely clear today how this new story will play out. How will policymakers around the world address its challenges and opportunities?

Most importantly, can our industry earn the public trust by developing this cleanest fossil fuel responsibly and safely – in a way that protects the environment and reduces greenhouse gases?

I think we can and will. But we face some hard work ahead.

A secure, abundant force for good

First, while we all recognise the significance of this opportunity, our industry needs to do a better job of convincing the world that natural gas is a force for good.

It’s affordable, it’s clean burning and it benefits the economy. It’s a natural ally to renewables like wind and solar. And its supply is diverse, which enhances energy security.

That last point is particularly significant here in North America. President Obama recently said the United States could become “the Saudi Arabia of natural gas.” That’s no exaggeration. But while the potential of the natural gas boom is dramatic, it is just one chapter in this evolving story.

The others include: increased oil production from the Gulf of Mexico; potentially huge

“Most importantly, can our industry earn the public trust by developing this cleanest fossil fuel responsibly and safely – in a way that protects the environment and reduces greenhouse gases?”

“President Obama recently said the United States could become ‘the Saudi Arabia of natural gas.’ That’s no exaggeration.”
deposits in Alaska and elsewhere in the Arctic; and the growth in tight oil and heavy oil, including oil sands. Together, these developments promise to dramatically improve the outlook for energy security here and elsewhere around the world.

Production of tight oil in the United States alone has increased five-fold since 2000, helping reverse a nearly 40-year decline in oil production. The U.S. Energy Information Administration recently estimated this resource could help increase U.S. oil production by one-fifth in this decade.

And this is not just a North American story. The addition of these resources to the world’s energy bank, especially natural gas, is already changing global energy dynamics.

While the Western Hemisphere will still need to import oil, CERA estimates the need could fall by as much as half in this decade. This will mean less oil from the Middle East and West Africa. That oil will instead flow in increasing volumes to Asia.

As IHS CERA Chairman Daniel Yergin has noted, the Western Hemisphere is emerging once again as an energy powerhouse. In his words: “Innovation is redrawing the map of world oil … and remaking our energy future.”

Global economic impact
The growth of the U.S. energy market also is having a ripple effect, contributing significantly to the economic recovery.

The President, in his recent State of the Union address, noted natural gas activities alone could support more than 600-thousand U.S. jobs by the end of this decade.

The new abundance of gas is helping the United States and other countries rebuild their economies and become more competitive. It’s doing this not only through job creation, but by reducing energy costs and boosting other critical industries, such as chemicals manufacturing.

In fact, several major chemical companies have recently announced plans to open or re-open plants in this country, bucking the trend of recent years.

At Shell, we have also been working hard to find other ways to use this abundant resource, by investing in the natural gas value chain. Liquefied natural gas for transportation is a great example. LNG holds tremendous promise as a cleaner transport fuel. As an alternative to diesel, it’s a smart way to reduce emissions of sulphur-oxides and particulates.

For example, in Singapore and the Dutch port of Rotterdam we are looking at opportunities to use LNG as a marine fuel. In western Canada, Shell’s preparing to make LNG available this year to fleet operators along the busy truck route from Calgary to Edmonton.

We will install a small-scale gas-liquefaction plant in Alberta and dispense LNG at Shell/Flying J truck stops throughout western Canada. Drawing on the region’s natural gas to produce the LNG, we believe fleets on this route could see a reduction in greenhouse gas emissions of up to 20% on a well-to-wheels basis.

We are also investigating ways to use LNG as a transport fuel in the rail and mining sectors, as well as in oil and gas drilling. And natural gas can provide a cleaner source of electricity than coal for the world’s growing fleet of electric vehicles, which would further reduce many countries’ need to import oil.

Another example of the expanding value chain is gas-to-liquids technology, which transforms natural gas into higher-value liquid fuels and chemicals. Shell is a pioneer and leader in GTL technology, with a track record of research and production going back four decades.

Last year, we opened the world’s largest GTL plant in Qatar. The Pearl GTL plant produces GTL gasoil, a clean-burning diesel-type automotive fuel; GTL kerosene that can...
Peter Voser Address to 31st Annual CERAWeek Executive Conference

be used for jet fuel; and a variety of chemical feedstocks for lubricants, detergents and petrochemicals.

We think GTL technology could make a lot of sense in North America. It would further reduce the need for imported oil while deriving greater value from this region’s natural gas resources.

Safety & Environmental Issues

So, yes, there are a lot of positives about the gas revolution. But, as you know, we face serious issues around the safety and environmental impact of developing these resources. This has generated increased public scepticism.

Many of those who live in areas where natural gas is being developed worry that modern production techniques will harm their environment and endanger their health. The irony, of course, is that those techniques are tried and tested – they are what have made the abundance of gas possible.

And, yes, not all of the concern and criticism is based on facts or rational argument. But it is our reality, and these concerns need to be addressed.

And let’s be honest: As an industry, we have not always done our best to engage in the public debates about these issues. This has resulted in some misconceptions taking root, especially about the impact of hydraulic fracturing, or “fracking”.

We need to do a better job of listening and responding. To this end, Shell last year announced five operating principles for our onshore tight oil and gas operations. These provide a framework for protecting water, air, wildlife and the communities in which we operate.

We have invited comment on these principles, and we are committed to support regulations consistent with them. Our hope is they can be applied over time to all tight oil and gas operations around the world.

To that end, the US Energy Secretary’s Shale Gas Production Subcommittee (on which Mr. Yergin sat) examined potential measures to ensure public safety and protect the environment in shale gas production. As it notes in a recent report, “a prudent balance between development and environmental protection is best struck by establishing a strong foundation of regulation and enforcement”.

The fact is hydraulic fracturing has been performed more than 1.1 million times in the United States alone over the past 60 years. Documented instances of freshwater contamination have been extremely rare.

When problems have occurred, they were simply due to poorly designed wells. When a well is designed and constructed correctly, groundwater will not be contaminated.

As an industry, we should insist on strong regulation and enforcement to ensure everyone in the industry does the job right.

We also support President Obama’s call for regulation to disclose chemicals used in hydraulic fracturing fluids. Indeed, we support regulations to promote transparency and public engagement by the tight and shale gas industry in relation to all of its activities.

In the United States, Shell already publicly discloses its fracturing fluid chemicals through the FracFocus online registry to the extent permitted under our supplier contracts.

Another major public concern about hydraulic fracturing is excessive water use. Sound operational practices can keep water consumption to a minimum. We design our operations to reduce the amount of drinkable water we use. Wherever practical, we use non-potable water and recycle water from our operations.

“There is a lot of positives about the gas revolution. But, as you know, we face serious issues around the safety and environmental impact of developing these resources. This has generated increased public scepticism.

Many of those who live in areas where natural gas is being developed worry that modern production techniques will harm their environment and endanger their health. The irony, of course, is that those techniques are tried and tested – they are what have made the abundance of gas possible.

And, yes, not all of the concern and criticism is based on facts or rational argument. But it is our reality, and these concerns need to be addressed.

And let’s be honest: As an industry, we have not always done our best to engage in the public debates about these issues. This has resulted in some misconceptions taking root, especially about the impact of hydraulic fracturing, or “fracking”.

We need to do a better job of listening and responding. To this end, Shell last year announced five operating principles for our onshore tight oil and gas operations. These provide a framework for protecting water, air, wildlife and the communities in which we operate.

We have invited comment on these principles, and we are committed to support regulations consistent with them. Our hope is they can be applied over time to all tight oil and gas operations around the world.

To that end, the US Energy Secretary’s Shale Gas Production Subcommittee (on which Mr. Yergin sat) examined potential measures to ensure public safety and protect the environment in shale gas production. As it notes in a recent report, “a prudent balance between development and environmental protection is best struck by establishing a strong foundation of regulation and enforcement”.

The fact is hydraulic fracturing has been performed more than 1.1 million times in the United States alone over the past 60 years. Documented instances of freshwater contamination have been extremely rare.

When problems have occurred, they were simply due to poorly designed wells. When a well is designed and constructed correctly, groundwater will not be contaminated.

As an industry, we should insist on strong regulation and enforcement to ensure everyone in the industry does the job right.

We also support President Obama’s call for regulation to disclose chemicals used in hydraulic fracturing fluids. Indeed, we support regulations to promote transparency and public engagement by the tight and shale gas industry in relation to all of its activities.

In the United States, Shell already publicly discloses its fracturing fluid chemicals through the FracFocus online registry to the extent permitted under our supplier contracts.

Another major public concern about hydraulic fracturing is excessive water use. Sound operational practices can keep water consumption to a minimum. We design our operations to reduce the amount of drinkable water we use. Wherever practical, we use non-potable water and recycle water from our operations.

We need to do a better job of listening and responding. To this end, Shell last year announced five operating principles for our onshore tight oil and gas operations. These provide a framework for protecting water, air, wildlife and the communities in which we operate.

And let’s be honest: As an industry, we have not always done our best to engage in the public debates about these issues. This has resulted in some misconceptions taking root, especially about the impact of hydraulic fracturing, or “fracking”.

We need to do a better job of listening and responding. To this end, Shell last year announced five operating principles for our onshore tight oil and gas operations. These provide a framework for protecting water, air, wildlife and the communities in which we operate.

And let’s be honest: As an industry, we have not always done our best to engage in the public debates about these issues. This has resulted in some misconceptions taking root, especially about the impact of hydraulic fracturing, or “fracking”.

As an industry, we should insist on strong regulation and enforcement to ensure everyone in the industry does the job right.

And let’s be honest: As an industry, we have not always done our best to engage in the public debates about these issues. This has resulted in some misconceptions taking root, especially about the impact of hydraulic fracturing, or “fracking”.

We need to do a better job of listening and responding. To this end, Shell last year announced five operating principles for our onshore tight oil and gas operations. These provide a framework for protecting water, air, wildlife and the communities in which we operate.

And let’s be honest: As an industry, we have not always done our best to engage in the public debates about these issues. This has resulted in some misconceptions taking root, especially about the impact of hydraulic fracturing, or “fracking”.

We need to do a better job of listening and responding. To this end, Shell last year announced five operating principles for our onshore tight oil and gas operations. These provide a framework for protecting water, air, wildlife and the communities in which we operate.

And let’s be honest: As an industry, we have not always done our best to engage in the public debates about these issues. This has resulted in some misconceptions taking root, especially about the impact of hydraulic fracturing, or “fracking”.

We need to do a better job of listening and responding. To this end, Shell last year announced five operating principles for our onshore tight oil and gas operations. These provide a framework for protecting water, air, wildlife and the communities in which we operate.

And let’s be honest: As an industry, we have not always done our best to engage in the public debates about these issues. This has resulted in some misconceptions taking root, especially about the impact of hydraulic fracturing, or “fracking”.

We need to do a better job of listening and responding. To this end, Shell last year announced five operating principles for our onshore tight oil and gas operations. These provide a framework for protecting water, air, wildlife and the communities in which we operate.”
That said, it can take twice the amount of fresh water to extract shale gas than conventional gas. But this is not the whole story.

The extraction phase only accounts for a small fraction of the total amount of water used to generate power. Studies done by Harvard and MIT researchers show the water intensity of shale gas ranks among the lowest of all fuel sources. Across the life cycle, shale gas-fired power consumes only half the volume of fresh water per megawatt hour consumed by coal and nuclear.

At our operations in Groundbirch in Canada and Pinedale, Wyoming (USA), Shell re-uses gas-processing water for hydraulic fracturing, reducing water use by half.

A third area of concern is greenhouse gas emissions, especially methane, from shale gas production. Some environmental groups that once supported switching from coal to gas for electricity generation are no longer doing so over concerns about methane leakage.

This is an issue we need to take seriously.

This controversy was sparked by a couple of well-publicised studies that we believe greatly exaggerated the emissions released during the production and distribution of shale gas. They also overlooked the steps the industry takes to contain the amount of methane released during production.

The International Energy Agency found on a well-to-burner basis, emissions from shale gas exceed those of conventional gas by as little as 3.5% in the best-case scenario and by 12% in the worst.

At Shell we manage our operations to keep emissions to the lower number. It is obviously in our economic interest to capture as much gas as possible. We know methane releases can be significantly reduced by using proven technologies. For example, at Pinedale, we installed a system to help us stop methane leaks detected with an infrared camera.

But clearly more research and hard data are needed to understand the true extent of methane releases from the natural gas industry. To that end, Shell is among operators working with the Environmental Defense Fund to accurately measure methane emissions from natural gas production here in the United States.

It’s also important to remember overall greenhouse gas emissions from shale gas-fired power are still only around half of those from coal, across the lifecycle from production to use.

Conclusion
In summary, the gas revolution offers the world a tremendous opportunity to help meet the growing demand for affordable energy in the coming decades. At the same time, it offers the fastest and cheapest route to reduce power-sector emissions of CO₂ significantly.

These gas resources, combined with new oil opportunities in the Gulf of Mexico, in Arctic Alaska and in deposits of liquid-rich shale and heavy oil, mean North America is positioned to become far more energy secure than it has been in decades.

This growth in the energy sector, especially the abundance of affordable natural gas, is leading to a rebirth of the petrochemicals industry while helping to make this region’s manufacturing industries more competitive globally.

The scale of the gas revolution makes it vital that the public discussion and policymaking be based on hard facts and rigorous analysis.

There are environmental and operational challenges associated with the production of tight and shale gas. But our industry has the expertise to effectively deal with these challenges, especially if we are governed by well-targeted and robustly enforced regulations.

“It’s also important to remember overall greenhouse gas emissions from shale gas-fired power are still only around half of those from coal, across the lifecycle from production to use.”

“These gas resources, combined with new oil opportunities in the Gulf of Mexico, in Arctic Alaska and in deposits of liquid-rich shale and heavy oil, mean North America is positioned to become far more energy secure than it has been in decades.”
It’s time we address these issues and get the word out that natural gas is a secure, abundant force for good. As an industry, we need to listen and respond to public concerns, to become more transparent about our operations, to build trust.

And we need to cooperate with government and non-governmental organisations that have a stake in developing this resource the right way.

Finally, it’s time to ensure the work of each and every operator is done to the highest standards. The reality is the lowest performer in our industry sets the standard by which we are all judged.

This “gas revolution,” this “golden age of gas,” this “shale gale” is the best, most promising opportunity we have today to make substantial progress towards a cleaner, more secure, more abundant and more affordable energy supply.

The story is being rewritten now. But how the final chapters play out will be based not on what we say here today, but on what we do in the months and years ahead.

Our industry has the talent, the experience and the capability to do the job right. It’s time we make it happen. I’m confident we will.

Thank you.
Recent speeches by Shell’s senior leadership

- Growing global energy demand: a defining moment for Louisiana, *Marvin Odum*
- Shell and corporate tax, *Simon Henry*
- Meeting the needs of 9 billion people, *Marvin Odum*
- Qatar’s role in the energy landscape of the future, *Peter Voser*
- New Frontier: Engineers and the global energy challenge, *Malcolm Brinded*
- The case for shale and tight gas, *Malcolm Brinded*
- The integration challenge, *Marvin Odum*
- 9 billion reasons to address the world’s energy challenge now, *Peter Voser*
- Growing cities, growing responsibility, *Marvin Odum*
- Changing direction towards a new energy future, *Jorma Ollila*
- Canada: a proving ground for responsible oil and gas development, *Marvin Odum*
- New upstream risks and opportunities: the natural gas revolution, *Malcolm Brinded*
- An effective regulatory environment starts with collaboration, *Marvin Odum*
- An era of volatility and opportunity: the outlook for CFOs in the energy industry, *Simon Henry*
- The energy challenge and the need for new talent, *Hugh Mitchell*

For more information, please visit [www.shell.com](http://www.shell.com)