



The future of energy and mobility

Peter Voser

Chief Executive Officer
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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.

In 2011 he joined the Board of Directors of leading Swiss healthcare research company Roche.

In November 2006 Peter was appointed a member of the Swiss Federal Auditor Oversight Authority. Since April 2010 he has been a Director of Catalyst, a non-profit organisation working to build inclusive environments and expand opportunities for women at work.

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.

Growing populations and rising affluence mean that global energy demand could double by mid century. As car ownership grows and mobility increases, demand for transport fuel is also growing quickly. In this speech, Peter Voser, Chief Executive of Royal Dutch Shell, explains why the world will need to draw on a range of different energy sources to meet this demand, including natural gas and biofuels. He sets out three key pillars of Shell's future energy strategy: producing more energy, cleaner energy and smarter energy.

Introduction

It's a pleasure to be here with you to discuss the future of energy in general, and mobility in particular.

Malaysia is a fitting place for this discussion. Like others in Asia, you have bold and ambitious plans to transform your country in the coming decades. The future looks bright, with many opportunities, but also some challenges. Many of the future energy challenges the world will have to face are common to this part of the world ... in China, India, and South-East Asia ... where populations have been growing and incomes rising.

Many of the answers to these challenges will also come from here. For instance, Shell recently began to produce its first Gas-to-Liquid products at our Pearl plant in Qatar. We drew on our experience operating a similar plant in Bintulu, Sarawak, since the 1990s. What we learnt in Malaysia has helped give the world a major new source of energy to meet its future needs.

It is also fitting that we are discussing the future of energy and mobility at our second Shell Eco-marathon Asia here in Kuala Lumpur. Some 100 teams from 13 countries around the region have come to help find new ways to "get the most out of every drop of fuel". So we are tapping the energies of Asia's youth to help tackle the energy challenges they will face in the years to come.

Asia's surging energy needs

This future energy challenge arises from several powerful forces now at play. Every second, five new babies are born ... many of them here in Asia. The result is the world's population is expected to grow to more than 9 billion people by 2050.

Growing to 9 billion people from today's 6.8 billion is like adding another China and another India to the world. And those people will have basic needs for food, water and energy, which must be met.

In addition, hundreds of millions more will emerge from energy poverty in the coming years, buying their first refrigerator, computer or car.

What will all this mean for overall energy use?

Global energy demand is expected to double by mid-century from its level in 2000. But it could rise even more ... perhaps tripling ... if we just continue using energy as we do today.

By 2050, this could leave a gap between supply and demand about equal to the size of the energy industry's entire output in 2000.

Somehow, we will have to close this gap. It could either be by an enormous ramping-up of energy supplies, or a dramatic curbing of demand, or some mix of both. Exactly how this will be done is uncertain. Our scenario planners call this a "zone of uncertainty".

The decisions we make around energy use will determine whether we will face a period of extraordinary opportunity for policymakers, businesses like ours and for society at large. Or whether it will be a period of extraordinary misery, as price shocks and knee-jerk policy reactions impact our ability to produce and consume energy smartly.

Whatever the case, we are entering an era of major transitions ... some of which could be volatile.

One such transition will be the shifting of energy demand from West to East ... from the developed to the developing world in general, but to Asia in particular. The International Energy Agency estimates by 2035, energy consumption in the developing world could rise by 64 percent compared with 3 percent in developed countries. China, India and Brazil lead the way. The I-E-A expects those countries to double their energy consumption over the

next 40 years. By then, these three economies could account for a third of global energy use.

A major contributor to this surging energy demand will come from the quest for mobility among Asia's growing middle class. The IEA expects the number of vehicles to triple to 2 billion by mid century, with many of these added to Asia's roads. The number of vehicles on the streets of South-East Asia is expected to rise threefold to over 90 million over the next 20 years. These vehicles will need fuel ... and we will have to meet this need responsibly, given the rising CO₂ emissions this entails.

Doing so will call for a "hybrid" of fuel options – biofuels, hydrogen, natural gas, electricity, along with petrol and diesel. Shell is involved in all parts of this mix.

In our view, biofuels are the only low-carbon transport fuel that can be scaled up fast enough to tackle carbon emissions from transport in the next 20 years. In June, we finalised our joint venture with Cosan ... Brazil's largest producer of ethanol ... to form Raízen. It is our first involvement in producing biofuels on a large scale. From cultivation to use, Brazilian sugar-cane ethanol produces around 70 percent less CO₂ than conventional fuels. That's also less CO₂ than any other commercially available biofuel.

We are also working on development of the next generation of biofuels, to be produced from agricultural waste products, such as straw. But it will take some time until these products become commercially viable.

Natural gas is another transport option. Compressed Natural Gas is sold as passenger vehicle fuel, while Liquefied Natural Gas is an alternative fuel for heavy trucking and shipping. Gas-to-liquid fuels can help reduce pollution in the many rapidly growing cities around the world. It has also been tested as a fuel for airplanes.

Hydrogen holds huge promise, but the technical and commercial hurdles are equally huge. Delivery on that promise seems always just around the corner.

Electric mobility offers attractive possibilities for reducing transport emissions. Several countries in Asia ... including China, Japan and Singapore ... are at the vanguard of developing and testing electric vehicles. But while many like the idea of being able to simply plug in their cars to their power sockets, we need to ask, where does the electricity come from? If the electricity comes from burning coal, then the hoped-for

benefits of lower CO₂ emissions will not be fully realized.

It is noteworthy that some of the countries which are driving hardest on introducing electric vehicles are also those that have moved quickly towards adopting alternative energy sources – Denmark using wind, Israel using solar and France with nuclear power. But perhaps a more direct route for Asia to take in making electric vehicles more acceptable environmentally would be to use more natural gas, both in its existing power plants and the many new ones being built.

The debate over the best source of energy to meet Asia's growing electricity demand has intensified following the nuclear accident in Fukushima, with people in many countries revisiting the debate on the role of nuclear energy.

I believe it is still too early to draw any conclusions about the long-term impact of the events in Japan on global energy supply. Rather than speculate on this, we are all likely to agree on the need to diversify our energy resources.

Our Scenario planners believe by the middle of this century, about 30 percent of the world's energy demand could be met from renewable resources such as wind, solar and biomass. That is less than some people want. But even getting to 30 percent will take a huge global effort to achieve.

It also means that, even in 2050, 70 percent of the energy mix will still come from conventional resources: nuclear, coal, oil and gas. So, in the short and medium term, the only substitutes for nuclear power are coal and gas. Many countries are opting for coal to generate electricity, because it is available locally, or because they believe its costs are lower. But in our view, natural gas is a better option.

Natural gas is the cleanest fossil fuel. Natural gas-fired power plants produce 50 percent to 70 percent less carbon emissions than coal-fired plants. Natural gas plants can be built faster and at lower cost, and they are easy to switch on and off, so they can compensate the fluctuations in electricity from wind and solar power.

In short, natural gas is the fastest and least costly way for countries to manage their CO₂ emissions, even as they meet their growing energy needs.

Meeting the future energy challenge

Clearly, many complex issues will have to be weighed as the world seeks to grapple with its future energy needs. So, you might

"...natural gas is the fastest and least costly way for countries to manage their CO₂ emissions"

ask, just how is the energy industry, and Shell, going to help do so?

Let's be clear: Heavy investment in production will be needed. The IE-A estimates the world will need to invest 1 trillion dollars every year for next 20 years in new energy projects if it is to meet the surging demand. Failing to do so will mean greater price volatility in energy markets in the developed world, while consigning many millions to energy poverty in the developing world.

This is why at Shell, the three pillars of our future energy strategy can be summed up simply as: More energy, cleaner energy and smarter energy.

- For more energy, we are developing new sources of oil and gas that the world will need. We are investing 100 billion dollars from 2011 to 2014 to do so. In 2010, we invested more than 1 billion dollars in technology research and development ... more than any other international oil company. We are developing technologies to enhance oil recovery from our production sites, as well as to enable us to go into deeper and more challenging locations to deliver more energy.
- For cleaner energy, we are producing more natural gas, the cleanest fossil fuel. By 2012, more than half of our production will be natural gas.
- For smarter energy, we offer products and services to help consumers "get the most out of every drop" of energy. These include fuels, lubricants, detergents, and road-laying bitumen products, which help them save money and lower their CO2 emissions.

The scope for efficiency gains from smarter use of energy is vast. Last year, for example, a young Thai team set a record of nearly 1,522 kilometres on a litre of fuel. That's enough to get you from Kuala Lumpur to Bangkok! So clearly, a combination of the right engine, fuels, and driving techniques can make all the difference.

In line with this, our Shell FuelSave fuel, which was launched in Malaysia, Singapore, Thailand and Hong Kong, last year, helps you save up to a litre of fuel with each 50 litre fill-up, and at no extra cost.

We also introduced Shell FuelSave Partner. This enables fleet operators to track and curb fuel wastage, saving as much as 10 percent a year in fuel consumption.

But beyond smarter fuels and usage, we are also going to have to get a lot smarter about how we plan and build our cities. Today, over half of the world's population lives in cities. By 2050, this could rise to three-quarters. According to the United Nations Habitat group, this would require the development of a new city of 1 million people every week for the next 30 years.

Many of these cities will be built here in Asia. How they are planned and built will make a critical difference, since about 80 percent of CO2 emissions are produced in cities. Smaller, more compact, cities use energy more efficiently than sprawling low-rise ones. Making greater use of public transport, and integrating it better with other facilities, can make a big difference to energy demand.

For example, the average American motorist drives twice as much and uses three times as much energy as the average motorist in Europe. Residents in Tokyo, where 80 percent use public transport, typically take an hour to get to work. In Los Angeles, where 80 percent drive their own cars, the typical daily trip to the office takes twice as long.

Now, why is that? Our study of 20 developed economies found much of this difference can be explained by how spread out many American cities are. Low energy prices and fuel efficiency standards contributed to this development pattern.

Similarly, large government subsidies to keep energy prices low can shape the way consumers behave. The IE-A says governments spent the equivalent of more than 300 billion dollars on fuel subsidies in 2009. Removing these subsidies completely by 2020 would save enough energy to meet the needs of Japan, Korea and New Zealand. Clearly, lower subsidies lead to greater efficiency, and savings, which ultimately benefits the consumer.

How to make it happen?

Major policy decisions can shape how communities and companies respond. Government policies should encourage cost-effective ways of meeting higher demand, while lowering environmental impacts. China, for example, plans to nearly double the share of natural gas in the country's energy mix in the next few years. That's a very powerful driver.

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Stable and certain tax regimes that provide industry with incentives to invest, matching its long-term investment cycle, will also help.

Long-term, thriving partnerships between national oil companies and international oil companies will be critical. Working together, we can do much to make more oil and gas available by pooling our skills and capital.

Putting an appropriate price on carbon will make a big difference. Our preference is for some form of carbon markets for CO₂ pricing. In our view, market approaches, which give companies an incentive to find the most cost-effective solutions, work better than governments trying to second-guess business decisions.

Conclusion

Our challenge is a triple one: We need to produce more energy for a world with more people, where millions are shaking off energy poverty and climbing up the energy ladder, while also building a more sustainable energy system for the future.

But human ingenuity has faced many big challenges like this in the past, and surmounted them. This gives me confidence the world will be able to meet its future energy challenge. If you need any convincing, I urge you to visit the youthful teams who have come from around Asia to Sepang to take up the Eco-marathon challenge. Their passion and enthusiasm to push the boundaries on fuel efficiency is inspiring and infectious. Every time I watch these young people at work, it gives me renewed hope for the future.

So, like many of you in Asia, we at Shell we are both pragmatists and optimists when it comes to the future, and the world's ability to meet its energy needs.

To do so, we will all have to work together ... governments, businesses and communities ... to help ensure the world finds ways to deliver more energy and less CO₂.

I look forward to hearing some of your ideas on how we can do so.

Thank you.

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