



Energy: Bust or Boom

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International Petrochemical Conference
San Antonio, Texas, 25th March 2007



Rob Routs is Executive Director Downstream (Oil Products and Chemicals) and a Member of the Board of Royal Dutch Shell plc. His other responsibilities are Trading; Europe and Sub-Saharan Africa (excluding Nigeria).

Rob was born in Australia and graduated in Chemical Engineering from the Technical University of Eindhoven in the Netherlands, where he obtained a PhD in Technical Sciences.

He joined Shell in the Netherlands in 1976 and worked for Shell Canada from 1978 until 1999, finally as President of Oil Products. He then led Shell Global Solutions – the Group’s research and technical services group – before becoming CEO of the Equilon refining and marketing joint venture in the United States.

Following the Group’s acquisition of Texaco’s interests, he became the CEO of Shell Oil Products US and President of Shell Oil Company.

He became a Group Managing Director, joining the Committee of Managing Directors in 2003, and became Executive Director Downstream in October 2004.

The political, economic and environmental challenges facing the energy industry are huge. It needs to meet growing energy demand in environmentally responsible ways. It also needs to respond to changing markets and provide new and more efficient forms of energy to increasingly demanding consumers. However, by marshalling technology; by applying commercial skills to develop new markets; and developing ways of making new energies viable, the industry can secure its future. That means the answer to the question energy boom or bust - is definitely boom as the energy industry adapts to change and puts the skills and technology in place to seize the opportunities ahead.

I'm delighted to be here at this opening symposium for this year's international petrochemical conference.

This event always gives us much to think about and, looking at this year's programme, I'm sure the discussion will be as stimulating as ever.

You've asked me to reflect both on our industry's heritage over the past thirty years and to think about what might lie ahead. Looking back, what is clear is that we have been through a period of huge change in our society and in our economy. And it's equally clear that the energy and petrochemical industry have played a key part in many of those changes.

However, what has not changed is the way our industry has been resilient to change, to upheaval, and to a volatile oil price. What has also remained constant is the political interest in our industry. In 1977, Jimmy Carter was outlining an energy plan that called for improved fuel efficiency and a focus on biofuels. In 2007, we've seen a state of the union address focused on reducing oil consumption and boosting renewable fuels.

However, what is different today is the fact that energy – the way we produce it, the way we consume it and the associated costs - are topics of discussion around kitchen tables as well as boardroom tables, at gas stations as well as in Congress. And those discussions are very broad ranging because it's clear that we cannot talk about energy without talking about politics; without talking about economics; without talking about the environment.

Those debates look set to dominate the policy agenda for many decades ahead as we face up to the huge global

challenges in meeting growing energy demand. However, alongside those challenges I think we also can see exciting business opportunities. By marshalling technology; by applying our skills to develop new markets; and using our commercial abilities to make new energies viable, we have an opportunity to secure the future of our business.

Our history shows that adapting to change is what we are good at. And, I'm confident that we will continue to maintain that record. That means we're not in any way a sunset industry. Or, in other words, I come down on the side of boom not bust.

However, I do not underestimate the challenges we will face in this fast changing environment both in meeting growing energy demand and in doing so in an environmentally responsible way.

According to estimates by the International Energy Agency, the world's energy needs could increase by about 50 per cent by 2030. That's the equivalent of about 100 million extra barrels of oil a day. And most of this demand will be from new markets, in India and China in particular.

In order to meet this demand we will need to explore in more remote regions; develop in ever deeper water; and overcome more difficult geology. That will require the industry to push technology to its limits; and for investors and, indeed consumers, to understand that this means costs will increase.

Meeting the challenges of increasing demand are familiar ones to the energy industry. The challenge of reducing the carbon dioxide from energy production is something new. But it's a challenge we must address. We have now passed the stage of debating whether or not the

science supports the fact that the climate is changing and why, and now we need to take action to respond to the growth in carbon emissions.

I will talk later about the range of alternative energies that could play a role in helping us do this. However, I want to underline the fact that fossil fuels are likely to remain a central part of the energy mix for many decades ahead. That does, however, mean carbon dioxide emissions will grow but there may be ways of managing that growth.

Carbon dioxide abatement technologies, carbon sequestration and the development of alternative cleaner fuels are all ways in which we can begin to reduce or manage carbon emissions. That's why a number of companies in the energy sector are supporting research into a range of carbon dioxide management options. This may allow us to reach that goal of cleaner fossil fuels – and offers business opportunities. By adapting our business in this way, we can secure its future – create the boom rather than the bust scenario.

These environmental challenges, alongside that need to supply more energy, mean that our business, more than ever, is subject to external economic, political, and social forces. We then have to deal with an additional complicating factor in that the energy business is such a long term one. We are making decisions now about projects that may not start production for a decade and which may then have a lifetime of thirty years.

So one of the key skills required in our industry is the ability to look ahead and to make informed judgements about the future. We have to be able to assess future energy demand – look at which markets are growing and, equally, those markets that are declining, and those that are changing.

That has been the case throughout our history and, as I've mentioned, I think we've been pretty successful in responding to those changing markets. However, we now have an additional question to address – what kind of energy we will be using in the decades

ahead?

I have mentioned the continuing role for oil and gas but that may come in different forms, whether that is gas to liquids where natural gas is used in transport fuel, or biofuels, or unconventional resources such as oil shale.

Then there are questions about alternative energies -which alternatives will become viable – and how quickly? How big a role can wind and solar play? Is hydrogen a practical option?

In Shell we use scenarios to explore alternative possible futures to help inform the direction of our business. Our most recent scenarios have looked at the different trade offs between three societal aims: security, economic efficiency, and social cohesion and how a different emphasis on each of these will produce different patterns of economic growth. And how that, in turn, will affect energy demand growth and energy investment.

New markets

One of the themes that emerge very clearly perhaps not surprisingly from all this work is the phenomenal growth in the developing economies of Asia. The figures are truly astonishing; China's GDP growth is likely to remain at about ten per cent this year, coming on top of several years of similar growth. And China is expected to be the world's second biggest Oil Products market by 2010.

We are also seeing similar rapid economic growth in India, another market with huge potential. These are clearly factors that will have a profound effect on the future of our business.

Shell, like many other parts of the industry, is reshaping its Downstream portfolio to reflect those changes. The Nanhai petrochemicals plant in southern China, which started production last year, is a good example of that approach. Costing \$4.3 billion it was the largest Sino-foreign investment ever undertaken and will produce more than two million tonnes of petrochemicals a year to supply that very fast growing Chinese

market.

We're also developing a presence to serve retail customers in China, India and Indonesia. These are all challenging markets but clearly ones with huge future potential and it will be vital for our industry to seize the opportunities they present.

Of course, it's not just the consumer markets that are changing but also the supplier market. Middle East suppliers, are taking an increasing role, especially in the Asian market. The Middle East clearly is a hugely attractive location for building crackers because of its tremendous feedstock cost advantage.

And that is changing the nature of the supplier market. Ten years ago national chemical companies and national oil companies made up only about 11 percent of the global total. Today their share has increased by half to about 17 percent and is expected to increase by another 50 percent to make up about a quarter of total capacity by 2015.

That clearly demonstrates that existing players in the industry face an increasingly competitive and globalised market. That means improving our responsiveness to customers, and to changing markets, and to improving efficiency will become ever more important.

Improving performance has been a key focus across the industry in recent years. And that focus on improving turnaround times, upgrading equipment and ensuring best practice has been delivering good results. That has been accompanied by action to ensure we make the most of the oil chemical advantage, and certainly at Shell, we have seen significant efficiency savings through the integration of refineries and petrochemical plants at a number of locations around the world.

However, what is clear is that if any petrochemicals business wants to retain its edge in this competitive global market, it will need to maintain that relentless focus on performance improvement.

I have talked about the broader

environmental challenges the industry faces in respect of climate change. But there are other more specific environmental issues affecting our business too. I see there is a session on the European REACH regulations later in the week. That underlines environmental considerations key to how we do business in a way they weren't thirty years ago. And the successful businesses in the future will be those that can manage those factors effectively.

New challenges

Having looked at new markets, and new challenges I'd like now to turn to new energies. To return to our topic of energy boom or bust – some forms of energy will boom, some may well go bust. The difficulty at the moment is determining which of the range of possibilities will fall into which category.

I will focus on the role of alternative fuels in downstream energy solutions as this is the part of the business I am closest to. But clearly there are other possibilities in other elements of the energy business.

In Downstream the greatest challenges come from meeting the growing demand for personal transport. Fifty years ago, there were about 70 million vehicles on the road across the world. Today there are probably more than 900 million, and current growth trends suggest that number could double by 2030. But we are making good progress in developing new forms of fuels that will help us meet that growing demand.

This ranges from synthetic fuels such as gas to liquids to advanced second generation biofuels. And I think is where the petrochemicals industry is likely to play an increasing role.

Biofuels are potentially an option to develop emission free transport fuel. Biofuels, have, of course, been available for some time but there have been some challenges around costs and competition for land use with agriculture. Already today 20 per cent of the US corn crop is used to produce ethanol and corn prices

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have risen sharply. And that has left governments scratching their heads to try to find sustainable ways of introducing biofuels, for both environmental and security of supply reasons.

But we are now seeing some exciting developments of second generation biofuels which can provide solutions to these challenges. These developments are being driven by applying cellulose ethanol technology and also by using tried and tested gas to liquids technology to produce biomass to liquids. The latter can produce high quality synthetic fuels that can be used in conventional diesel engines.

And I believe those developments mean there is real potential for the biofuels market to grow. This could, in turn, help governments meet their policy objectives and give customers further choice over the fuels they use.

Shell has been investing in research and development in Syngas and in the Fischer-Tropsch process for the last 35 years - as long as I have been with the company. And for the last fifteen years we have produced synthetic fuels from natural gas in a small 12000 barrel a day plant in Malaysia. Now the way is open to produce the same clean fuels from biomass and from coal.

For example, the first Choren biomass to liquids demonstration plant will start up in the fall in Germany. And this opens up a whole range of new technological opportunities for the petrochemicals industry. These

opportunities include large scale access to new chemical feedstocks such as straight chain paraffins, synthesis gas and sugars. And new developments in biotechnology, driven by the desire to produce biofuels on a commercial scale, may well also open up avenues for the production of polymers and high value chemical intermediates.

As I set out at the beginning of my speech, this industry has a wonderful heritage and great track record of success. However, I think perhaps there has never been a more exciting time to be part of the energy industry. We are seeing rapid change. We are seeing extraordinary growth in demand as living standards rise. We are seeing continuing innovation and technological developments which place our industry firmly at the heart of solutions to some of the world's most pressing challenges

So let me end on an optimistic note. Shell will be celebrating its centennial this year. We've enjoyed some tremendously exciting years and we've lived through the ups and downs in our industry. Looking forward the answer to the question energy boom or bust - is definitely a boom in new opportunities and exciting technologies. The political, economic and environmental challenges we face are huge. But there are solutions being developed. I continue to believe in the ingenuity of our people.

And, I know I am biased, but I think there are few other industries that have such potential to transform lives and drive human progress.

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