



Shell Downstream: Getting the most out of every drop of energy

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Mark Williams was appointed Director Downstream with effect from January 1, 2009.

Prior to this, Mark was Executive Vice President (EVP) Supply & Distribution (S&D), where he had responsibility for crude oil and refined products supply for Shell's global refining and marketing businesses.

Mark's other previous positions have been EVP, Global Businesses, Vice President of Strategy, Portfolio and Environment for Oil Products.

Mark was born in 1951 in Houston, Texas. His qualifications include a Master's Degree in Theoretical Physics from Oxford University (1975) and a Doctorate & Master's Degree in Physics from Stanford University (1979).

He joined Shell in 1979 as a research physicist for Shell Oil Exploration and Production. Highlights of his career include being Engineering Manager for the US Gulf of Mexico during the early days of deep water, working as Operations Manager for Shell Oil Western EP Operations, being Head of Staff Planning for Shell Oil Exploration and Production, Head of Downstream Strategy for Shell Oil during the merger with Texaco, and Head of Transportation (pipelines and distribution) for Equilon Enterprises LLC, the Shell and Texaco joint venture in the United States.

Mark and his wife, Candace, have two children. His interests include amateur astronomy and astro-imaging, yacht racing, mountaineering, cycling and weight training.

In the coming decades all countries, including Norway, must find more energy at a much-reduced cost to the environment. In this speech, Royal Dutch Shell Downstream Director, Mark Williams, focuses on why governments and industry need to work together to build a secure, affordable and sustainable energy system. He also describes how Shell’s groundbreaking fuel economy products are helping its customers get the most out of every drop of energy.

Introduction

It’s great to be here in Oslo. Some of you may have seen the comedy film “Local Hero”. It tells the story of a Texas oil company’s doomed attempts to purchase an oil field on the north coast of Scotland.

The project is ultimately derailed by the chief executive’s obsession with astronomy. Played by Burt Lancaster, he flies over from Houston to help seal the deal. But instead ends up stumbling around on a beach in a frenzy of excitement as the Northern Lights appear in the sky.

Ladies and gentlemen, there is a great deal of truth in the cliché that real life mirrors fiction.

I have a burning passion for astronomy. I am from Houston. And I would love to see the Northern Lights here in Norway.

So any of my Norwegian colleagues at Shell who have seen that film could be forgiven for breathing a sigh of relief when my plane takes off tomorrow.

For Shell, Norway is a critical centre of business. Through fields like Ormen Lange and Troll, the country makes a massive contribution to Europe’s energy security.

And Shell is investing billions of dollars to develop the country’s energy resources. With our recent discovery in the Gro Prospect, Norway will be right at the heart of our business for many years to come.

What’s more, the country’s technical expertise and know how will be needed to drive low-carbon innovation, most notably in carbon capture and storage technology.

This evening I want to offer some thoughts on an issue that Norway’s recent election campaign brought into sharp focus.

How to develop an energy supply that is secure, affordable and sustainable. And how my business – Shell Downstream – can help drive a revolution in global resource consumption.

The energy challenge

As a former academic, I like to start by defining a few assumptions.

One safe assumption is that global demand for energy will double by 2050, despite the occasional economic slowdown.

That demand will be driven by 3 billion more people on the globe, by economic growth and by the needs of the 2 billion people who today live on less than a dollar a day and lack access to clean and affordable energy.

All energy sources will be needed to satisfy this demand – from oil, coal, natural gas and nuclear power to biofuels, solar and wind. And even then security of supply will come under severe pressure.

Meanwhile, the world urgently needs to manage greenhouse gas emissions to limit the effects of climate change.

And the stark reality is that the development of new sources of secure and sustainable energy will take decades of effort.

The sheer scale and complexity of the global energy system makes it tough to shift to something significantly different.

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Historically, it has taken 25 years for new primary energy sources and carriers to obtain a one per cent share of the market, even after commercial introduction.

Right now, biofuels are just reaching a 1% share of the market. Wind will do so by the middle of the next decade, 25 years after the first large wind-parks were built in the US and Denmark.

So best predictions are that renewables will just about reach 30% of the energy mix by 2050, which leaves fossil fuels and nuclear still responsible for carrying the bulk of the load.

Over that same period, according to the International Energy Agency, the world will need to invest some \$26.3 trillion in its energy supply by 2030.

So even in tough economic times, the world needs to invest in more energy on one hand, and in ways to reduce energy's environmental impact on the other.

Norway

I see Norway playing a leading role in tackling these dual goals.

With a history of environmental leadership, it aims to be carbon neutral by 2030. Norway introduced a carbon tax in the 1990s, and also has a carbon emissions trading scheme, which it has linked with that of the European Union.

Meanwhile, the country's highly successful oil and gas industry will supply a significant portion of its energy and prosperity for decades to come.

So what is our role at Shell?

Satisfying long-term demand

As a first priority, Shell must continue to satisfy long-term energy demand. I worry when I read that our industry is reducing investment in upstream production by one-fifth. And that investments in alternative energies are dropping by 40%. That's a recipe for another supply

crunch... leading to another price spike... leading to another economic slow down.

That's why at Shell we're determined to stick to our investment plans – about \$32 billion this year – even through the deepest recession in a generation.

With easily accessible resources dwindling, for example, we're developing our ability to operate safely in the Arctic and deep waters. And improving the enhanced oil techniques that allow us to squeeze as many barrels as possible from existing fields.

Those are the energy supply solutions my colleagues in the Upstream are working on.

But I see an opportunity for our business, especially in the Downstream to address the demand side of the energy challenge as well.

Global revolution in resource consumption

In the coming decades, I think we'll see significant changes in the way billions of people use energy – in their cars, factories, offices and homes.

Put more simply, each of us will need to find ways to use less energy. The easiest and cheapest way to limit the impact of energy on the environment is to conserve it.

And not just fossil fuel energy. Even renewable sources of electricity put pressure on the planet's resources.

For example, neodymium is a rare earth metal, which is needed for the strong magnets in wind turbines and car batteries. Mineable concentrations of the stuff are rare and difficult to produce in environmentally friendly ways.

So the prize will go to whomever can find ways for the world to use all kinds of energy more efficiently – to consume less of it while sustaining our economies and standards of living.

In transportation, for example.

“The easiest and cheapest way to limit the impact of energy on the environment is to conserve it.”

Transport accounts for roughly one-fifth of global energy use and energy-related CO2 emissions. Demand will only increase further in the next decades as the number of cars and trucks on the road doubles.

And transportation consumes the vast majority of our end products. As the largest supplier of transport fuels and lubricants – serving 10 million customers every day in our retail stations alone – we can be front and centre in easing the strain on global resources.

Let's be clear that all types of fuel will be needed to power the two billion cars on the road in 2050 from petrol and diesel to alternative sources like hydrogen, biofuels and natural gas.

Electric vehicles are generating a lot of excitement these days and seem bound to grow in numbers – especially hybrid vehicles that marry the advantages of pure electric motors with the quick and easy refills and long range offered by traditional liquid fuels.

All this helps to explain why Shell has intensified its focus on ways to help our customers use less fuel, reduce their carbon emissions and save money. With all those cars using so much fuel, we need to find ways for the world to get the most out of every drop.

FuelSave

Enter our latest product for retail customers, FuelSave.

The most advanced fuel economy product in the market, it helps drivers save up to one litre of fuel per tank at no additional cost, based on a 50-litre fill-up.

And here's the exciting part: there is a business case behind offering customers ways to use less of our product.

We have launched FuelSave in five countries in Europe and Asia this year. And it has been so popular with consumers that even while it helps each

customer use less fuel, it has won us more market share and volume.

We are also working directly with automakers to develop joint technologies and products that optimise the combination of vehicle, fuel, and lubricant...again, working on ways to help each customer use our product more efficiently.

We're especially excited by the possibility of biofuels – which might account for as much as 10% of the transport fuel mix by mid-century.

Shell is already the world's largest distributor of transport biofuels. We've been active in formulating standards for the more sustainable sourcing of today's fuels, which will be critical to reducing the carbon intensity of road transportation over the next decade. With partner companies and universities in the US and Europe, we are also working on future fuels that use non-food biomass, like crop residue or even algae.

Smart use of low-carbon, sustainable biofuels blended with conventional petrol and diesel could make a real difference in the years ahead.

And by the way, we're not ignoring those electric vehicles. Over the long term, we think carbon capture and storage technology could help produce cleaner electricity to "refuel" those cars, especially if applied to coal fired power stations.

Norway is leading the way here, with Statoil's CCS project at the Sleipner gas field storing carbon dioxide under the North Sea for the past decade.

Shell is involved in a string of CCS demonstration projects across the world, including the CO2 technology centre, TCM, at Mongstad, with the Norwegian government and Statoil. The project aims to capture the carbon dioxide from a gas-fired power station and refinery cracker, and support the development of this

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critical technology. And our technological expertise is making a strong contribution.

And in the meantime, the world can deliver sharp emissions reductions from electric power generation by replacing coal with natural gas – a much cleaner fossil fuel that emits half the carbon dioxide of coal.

By 2012 gas will account for around half of our energy production.

And it's worth noting that Norway's success in increasing its natural gas production throughout difficult recent months should stand the country in good stead in the years ahead.

Energy efficiency in industry

Important as the transport sector may be, it will only be one part of a truly global revolution in resource consumption. And the energy industry must continue to deploy its expertise across as many industries as possible.

For example, the most important ingredient of conventional concrete is, of course, cement. Yet the cement industry is highly carbon intensive. So much so that if it were to grow rapidly without taking steps to curb its emissions it could emit as much this century as the full use of current proven natural gas reserves.

At Shell, we are developing a sulphur-based binder, called Shell Thiocrete, which replaces conventional cement in concrete.

Initial studies indicate that Shell Thiocrete could reduce the lifecycle CO₂ impact of concrete by between 30% and 50%, depending on what it is used for.

An added advantage is that the sulphur we use is a by-product of our oil and gas production: again, "getting the most out of every drop."

These are just some of the ways in which Shell and the energy industry will help to reduce the pressure on global resources.

Public policy

So yes, I'm very proud of what we're doing. I think the role we play in helping customers use energy more efficiently is a vital one, and potentially a lucrative business.

But industry will not be able to do the job alone. Policy-makers must produce their own response to the energy challenge.

As a first priority, Governments will have to find ways to open up access to oil and gas reserves, in ways that make economic sense, while minimizing potential risks to the environment.

In time, for example, Norway will come to a decision about whether to open up its Arctic coastline to exploration and production.

As in several countries, this is an understandably sensitive issue. But with production declining in the North Sea, these resources could make an invaluable contribution to supply security.

Through Shell's work at Sakhalin in Russia we have learned a thing or two about working in these tough conditions; it is possible to safely develop resources in sensitive areas.

Climate change policy

With December's United Nations climate change summit looming, a second task is to agree a global framework for tackling climate change.

A first step is to put a price on carbon emissions; and the best way to achieve that is through a global carbon market.

This would generate massive opportunities for wealth-creation. On one estimate, American participation in a global scheme could send the annual value of the global carbon market beyond \$2 trillion by 2020. And that would unlock massive investments in technologies for reducing carbon emissions.

“..the world can deliver sharp emissions from electric power generation by replacing coal with natural gas..”

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Government support for the rapid and large-scale deployment of CCS is also needed. Which makes the Norwegian government's recent decision to boost funding of this nascent technology a smart move.

Elsewhere, government regulations should aim to reduce the overall carbon dioxide intensity of the transport sector on "a well to wheel basis".

Copenhagen is an opportunity to make headway on all these fronts.

Conclusion

But whether a deal is reached at Copenhagen or further down the line, it's clear that the smartest governments will be the ones that establish predictable, stable regulatory frameworks that

incentivise new energy sources and CO2 technologies.

For our part, Shell will continue to provide our customers with much-needed products and services, while continuing to invest heavily in the future.

I'm an optimist. I'm a believer in human ingenuity and the power of technological innovation. I've seen the power of governments and capitalist enterprises working together to achieve sweeping positive changes in the way we live and work.

And I'm proud to be working for a company like Shell at the centre of unlocking the solutions to the world's energy challenge.

Thank you very much for listening.

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