Prospects good, challenges great – the state of the oil and gas industry

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Jeroen van der Veer is Chief Executive of the Royal Dutch/Shell Group and President of Royal Dutch Petroleum Company. He has been a Managing Director of Royal Dutch Petroleum since 1997.

He joined the Group in 1971 and worked in manufacturing and marketing in the Netherlands, Curaçao and the United Kingdom. In 1984, he returned to Shell Nederland as manager of Corporate Planning, and then of Pernis Refinery. After an assignment in Shell International, looking after Africa and Canada, he became a managing director of Shell Nederland in 1992. Four years later he became president and chief executive of the Shell Chemical Company in the United States.

He is a non-executive director of Unilever, serving as a member of the Nomination and Remuneration Committees.

He was born in Utrecht in the Netherlands. He has two degrees – one in mechanical engineering from Delft University and another in economics from Rotterdam University.

He is married and has three daughters.

The world will need much more energy and most of it will come from fossil fuels for the foreseeable future. To secure these supplies the industry must make the most of maturing reserves, develop new resources – in more difficult conditions or from unconventional sources – and greatly expand gas delivery chains. At the same time, companies will be expected to help find solutions to intractable environmental challenges. Effective carbon solutions will be needed, if the world is to continue enjoying the benefits of efficient fossil fuels. Doing all this will depend on maintaining the pace of investment in new capacity – where the international industry has a vital role – on delivering the benefits of innovation, and on integrating global strengths – particularly those of national and international companies – to drive advances everywhere.

The state of the oil and gas industry today can be summed up very simply: 'prospects good, challenges great'.

The world will need much more energy, and most will come from fossil fuels for the foreseeable future. Demand is likely to increase considerably more over the first three decades of this century than it did over the previous 30 years *(figure 1)*. And, of course, in this industry we don't just need to meet new demand, but must constantly replace produced reserves just to stand still.

Doing this will require more expensive and more difficult projects. Meeting changing patterns of demand will also need huge investment in delivery chains and downstream infrastructure.

This will be challenge – and opportunity – enough. But our customers and society also need us to help find solutions to intractable environmental challenges.

So the business prospects for this industry are clearly good. This is, most definitely, not a 'sunset' industry. Energy will remain one of the most important and dynamic industrial sectors.

But we face great challenges in delivering the energy people need. In looking at how the industry is responding, I will focus on three essential themes: investment, innovation and integration. But first let me consider the changing energy context.

Shifting patterns

This is a defining period for our industry, comparable to the 1970s. Major shifts will require us to change the way we operate.

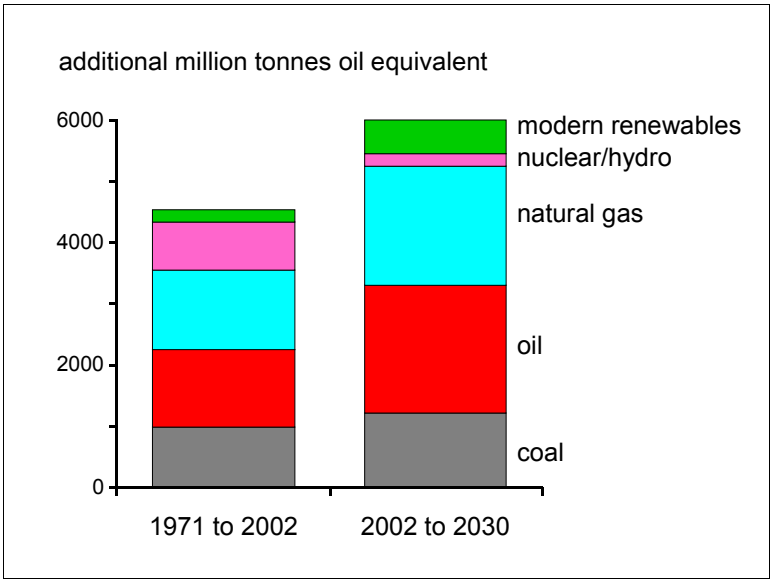

Figure 1: The increasing demand challenge
(IEA World Energy Outlook 2004)

First, developing Asian countries are now the primary drivers of growing energy demand. They accounted for nearly half last year's very rapid rise in oil consumption, and could be consuming a quarter of the world's oil by 2030 *(figure 2)*.

Second, concerns for supply security are rising as consumers become increasingly dependent on imported energy. Developing Asian economies could be importing three quarters of their oil by 2030. Europe even more.

Third, global energy intensity – the amount of extra energy for each additional unit of GDP – is increasing *(figure 3)*. This reverses a long-term downward trend and reflects the scale of Asian development.

Energy needs increase rapidly with industrialisation, urbanisation and expanding mobility, but slow as needs are met. But this depends on the energy

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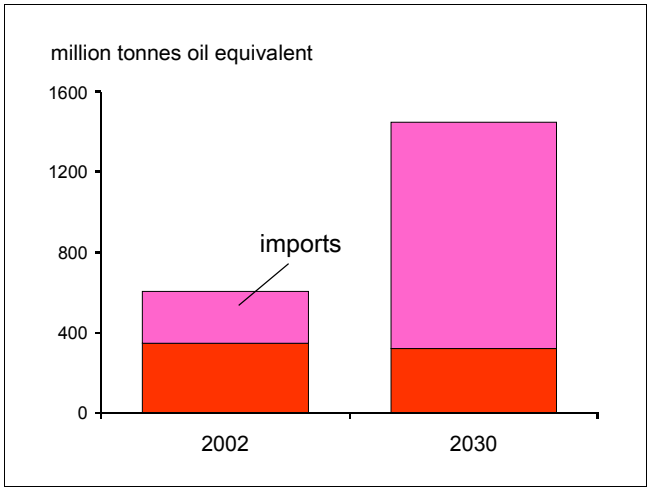


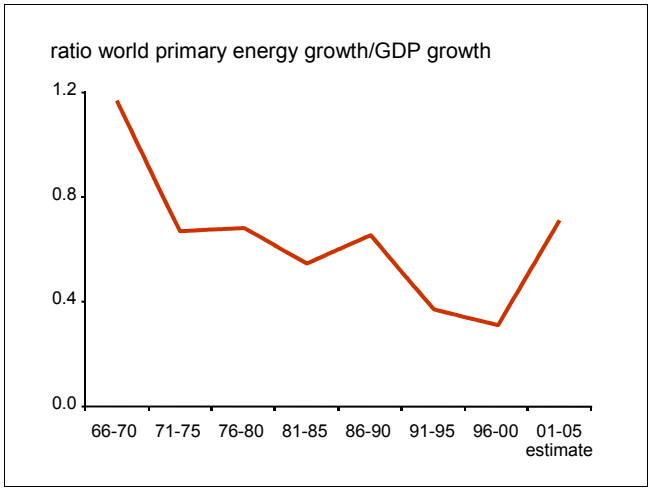


Figure 2: Developing Asia – oil demand 2002-30 (IEA World Energy Outlook 2004)

Figure 3: Energy intensity increasing

choices countries make, as well as the technological possibilities.

Fourth, hydrocarbon resources are maturing, in major exporting areas as well as consuming ones. Of course, there is still much more oil and gas to find. But we need to apply new technologies to extend recovery.

Fifth, there is increasing focus on the potential of unconventional oil and gas resources. This includes possibilities for using coal in new ways, as well as renewable sources such as biomass.

Sixth, the international gas trade is expanding very rapidly, in both the Pacific and Atlantic. It is no longer a buyers' market.

Finally, ratification of the Kyoto treaty suggests that the world is starting to get to grips with the challenge of carbon dioxide. This will have a profound impact on our industry.

How much extra energy will the world require?

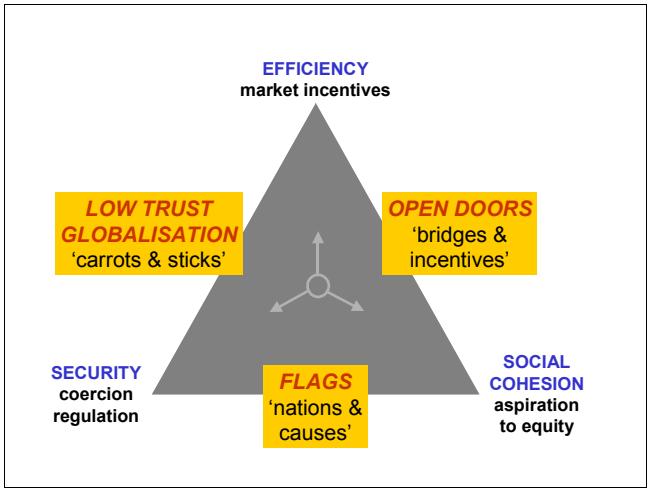
The IEA reference case has energy consumption growing by some 60% from 2002 to 2030, two thirds from oil and gas.

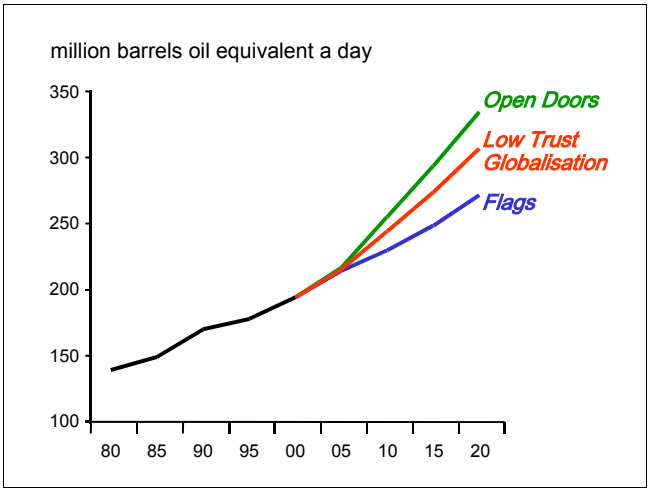
In Shell we use scenarios to explore alternative possible futures. Our latest scenarios explore different trade offs between three societal aims: security, economic efficiency and social cohesion *(figure 4)*.

Different choices will affect patterns of globalisation and produce different rates of economic and energy growth. Our *Open Doors* scenario explores a world of increasing economic integration and international cooperation, where spreading knowledge supports strong

Figure 4: Shell scenarios – balancing complex trade offs

Figure 5: Shell scenarios – world energy demand 1980-2020





productivity growth. The global economy grows more rapidly than in our other scenarios, where barriers inhibit flows of trade, capital and learning. By 2025 the world is 40% more prosperous than in our *Flags* scenario, where the global economy is most fragmented.

In the slowest of our scenarios, energy demand grows at the same rate as from 1980 to 2000. In the others, growth is significantly faster *(figure 5)*.

What about energy prices – are they bound to remain high?

This is a vital question for our customers. I understand their pain – particularly as many in this part of the world are also affected by the weaker dollar.

Economic logic suggests that high prices will reduce demand and encourage investment in supply. But the elasticity of energy demand is not clear, particularly in buoyant developing economies. Prices also reflect uncertainty, in a system that no longer has sufficient spare capacity to be shock proof.

Projects now underway should reduce this tightness. But we must maintain the pace of investment in capacity. I think the necessary sustained, heavy investment in increasingly difficult and capital-intensive projects will require higher long-term prices than we have been used to in recent decades.

But the future is uncertain and companies must be able to respond to different scenarios.

Industry challenges

What does all this mean for the industry?

Our primary responsibility is to secure the energy supplies to meet the world's increasing needs. Nobody should underestimate this challenge.

It means

- making the most of maturing reserves,
- developing new resources, in more difficult conditions or from unconventional resources,
- and greatly expanding gas delivery chains.

And, if the world is to continue enjoying the benefits of efficient fossil fuels, we also need to find effective carbon solutions. The industry should see this as an opportunity.

Finally, we have to continue reducing the local impact of producing and using energy. In some cases this is our direct responsibility – how we manage our projects. We must also play our part in providing wider solutions.

All this depends on committing investment, delivering innovation and harnessing integration.

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Committing investment

The IEA thinks total energy investment could be $16 trillion over the first three decades of this century.

Oil and gas could account for $6 trillion of this – $200 billion a year. It could be more. That's the equivalent of building 170 of Kuala Lumpur's amazing Petronas Towers every year.

Much more of this investment will be in developing countries than in the past, accounting for a significant proportion of their GDP. The perceived risks for investors will be higher.

International oil and gas companies will continue to play a vital role as investors. It is our core business. We understand the risks and possibilities far better than banks, who gain confidence from our involvement. And we know that developing resources requires continuing, long-term commitment.

In Shell, we plan to invest $15 billion a year over the next few years, three quarters on upstream projects.

As well as hard cash, this requires talented, skilled and experienced people, and superior organisational capabilities.

Energy projects will be increasingly challenging – in scale, scope, complexity, difficulty and sensitivity. The massive Sakhalin II oil and LNG project in Russia is an example of the sort of challenges that will be increasingly common.

Projects will only succeed if they respond to environmental and social sensitivities. This requires strong capabilities not just goodwill – skills and experience, clear standards, and effective processes at the heart of project

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management. It depends on being able work with others, including local communities and environmentalists.

Sakhalin Energy recently decided to reroute a planned pipeline to help protect endangered whales. This was done on the advice of independent scientists convened, at the company's request, by the World Conservation Union.

A major international operator must have the resources to undertake many major projects simultaneously, harnessing that global experience to enhance its capabilities.

Delivering innovation

Innovation will be key to meeting our energy challenges. We have to develop new tools, new products, new ways of working. But innovation alone is not sufficient. We have to deliver the benefits – applying tools successfully and getting products to customers.

There is no magic bullet for increasing recovery. But we do have an expanding palette of better tools

- new ways of monitoring reservoir conditions more accurately and systematically,
- more flexible, productive and cost effective wells,
- automated 'smart' systems for managing production processes underground, and
- improving enhanced recovery techniques – with the potential for novel chemical and biological methods.

But they aren't the sort of tools that can just be bought off the shelf, plugged in and switched on. Rather they depend on advanced skills – and continuing, long-term investment – to choose, apply and integrate the best technologies to suit particular conditions.

It is the same with accessing new resources.

The industry's remarkable advance into deep water has involved many new and improved technologies. But progress depends on learning to put them together to provide the efficiency and reliability required for deepwater conditions and economics.

The experience of doing this in the Gulf of Mexico is now being applied around the world – including here in Malaysia where there have been exciting discoveries and exploration is moving into water up to four kilometres deep.

Delivering economic unconventional resources is an equally long-term process.

Shell Canada has been working for decades to access the billions of barrels of resources in Alberta's oil sands. At Peace River various steam injection techniques have been used to produce bitumen since the 1980s. There are now plans to expand output following success with long horizontal wells, used alternately for injection and production. The major Athabasca oil sands mining project came on stream in 2003. The long-term goal is to expand capacity from the present 155,000 barrels a day to more than 500,000 – in a succession of building blocks to maximise construction efficiency.

Unconventional oil and gas is an essential part of Shell strategy and we are pursuing other opportunities and techniques.

Another approach is to use gasification and Fischer-Tropsch conversion to turn gas, coal and biomass into high quality fuels.

The superior qualities of Gas to Liquids fuel enable a significant reduction in local emissions from today's cars and support the development of better engines. With experience from our first plant at Bintulu here in Malaysia – and advances in our technology – we now plan to build a plant ten times the size in Qatar.

The IEA thinks GTL output could reach 1.5 million barrels a day by 2020.

Coal gasification offers the potential for countries like China to use their coal to produce a range of products – including gas for efficient combined cycle power generation and high quality liquid fuels. Together with Sinopec we are constructing a coal gasification plant for chemical feedstock in Hunan. And we are working with Chinese coal

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companies on the potential for producing liquid fuel. Coal gasification produces significantly less carbon emissions than conventional coal burning, and there is the potential for sequestering the carbon dioxide contained in the process.

Finding effective ways of capturing carbon from fossil fuels is a vital challenge.

The industry is working on underground sequestration, for storage or to enhance recovery of oil or coal bed methane. Another possibility is mineralization, fixing carbon in inert construction material.

Advanced biofuels – from Biomass to Liquids or enzymatic conversion of cellulose to make bio-ethanol – could have an important role. Shell is working on both. Blending biofuels into regular fuels allows them to be introduced without converting vehicles and infrastructure.

Using hydrogen as an energy carrier opens up the long-term prospect of carbon free energy. But initially it would mainly come from fossil fuels.

The energy system – on which the world depends – is not suddenly going to be switched onto a new track. Advances must be integrated into the existing system in a continuing drive for sustainability.

Harnessing integration

This industry has learned the value of integration at many levels

- integrating technical disciplines so teams can pursue new possibilities more effectively together,
- integrating development and operations to improve long-term effectiveness,
- and integrating the work of staff and contractors to ensure more efficient collaboration.

Integration will be increasingly important. Many of the things I have mentioned – such as GTL and oil sands – depend on close upstream-downstream integration, from resources to customer. The integrated oil company has certainly not had its day.

But let me focus on two vital areas of integration

- integrating within organisations to harness global capabilities more effectively,
- and integrating the strengths of national and international companies to better meet our shared challenges.

In Shell, we believe that global integration is vital for achieving strategic clarity, ensuring standards, focusing resources, transferring knowledge and gaining wider access to talent. It is about being able to bring our global strength to bear everywhere we operate.

We can find good examples of what it means here in Kuala Lumpur.

Global integration depends on world-class IT. Cyberjaya is home to one of our three major IT centres, employing 1,200 people and serving Shell companies around the world.

One of our shared service centres – with 450 employees, mostly accounting graduates – is also based here, providing financial and other services to Shell companies in Asia and the Middle East.

And this is the main Asia Pacific centre for Shell Global Solutions, providing advanced technology services and consultancy for Shell companies and others across the region. This will employ some 250 people by the end of this year.

These are examples of how countries in this region are grasping the opportunities of globalisation. They do so from a strong competitive base of high quality, well-qualified and strongly motivated people.

Malaysia is also, of course, one of our most important exploration and production operations – working as a production sharing contractor with Petronas, in partnership with Carigali – as well as for our LNG and GTL businesses.

I hope that Tan Sri Hassan will not mind if I say that Petronas are tough but fair people to do business with, absolutely determined to always get the best for Malaysia. We know that we can only maintain our position by demon-

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strating – day in and day out – that we add real value and help meet national aspirations.

That relentless focus on delivery – to meet the expectations of our partners and customers everywhere – is the strength of international companies. If we don't there are always others ready to take our business.

I believe that combining the local direction and strengths of national companies with the global knowledge and relentless drive of international ones is essential for meeting our shared challenges. It is truly win-win.

Turning prospects into reality

It is no exaggeration to suggest that the course of the 21st century will depend on this industry's ability to meet the world's energy needs without destroying our environment.

Those challenges offer many business opportunities. But we should not underestimate the challenge of turning prospects into reality.

Doing so depends on

- maintaining the pace of investment,
- finding innovative solutions and delivering their benefits,
- and harnessing global strengths to drive advances everywhere.

I believe this industry has the commitment and creativity to meet those challenges – nowhere more so than here in Asia.

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"The course of the 21st century will depend on this industry's ability to meet the world's energy needs without destroying our environment. Those challenges offer many business opportunities. But we shouldn't underestimate the challenge of turning prospects into reality. I believe this industry has the commitment and creativity to do so – nowhere more so than here in Asia."

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