



Energy for the Generations

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Jeroen van der Veer is Chief Executive of Royal Dutch Shell plc. He leads the Executive team and is accountable for business performance and implementing strategy. Since 2004, he has led Shell through major change – simplifying governance and organisation, and clarifying direction and accountabilities.

He joined Shell 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 in Rotterdam.

After an assignment coordinating Shell businesses in Africa and Canada, he became a Managing Director of Shell Nederland in 1992. In this post, he led major reorganisations as well as a \$2 billion upgrade of Pernis refinery. In 1995, he moved to the United States as President and Chief Executive of the Shell Chemical Company. He was appointed a Group Managing Director in 1997.

Jeroen was born in Utrecht in the Netherlands in 1947, and is married with three daughters. He has two degrees – one in mechanical engineering from Delft University and another in economics from Rotterdam University.

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

Jeroen van der Veer discusses the connection between food prices and bio-fuels, and three lessons we can learn from this in our search for clean and secure energy. First, we must keep an eye on the law of unintended consequences. Second, the vision of a secure and clean energy future must be more than a rich man's concern, and third, we need the right mix of realism and idealism. While we must push the growth of alternative energy, fossil fuels are widely expected to remain dominant for decades to come, with coal making a comeback. This makes energy efficiency in the *fossil* part of the global energy mix urgent.

I would like to start off by reflecting on the relationship between food and energy, bio-fuels to be precise, as an introduction to my main question for tonight: how to secure energy that is Clean, Cheap and Convenient - the three Cs - for ourselves and future generations.

Late last year, I noticed a tiny newspaper report about a Chinese government decision to limit the conversion of corn into ethanol. The reason was that ethanol production was beginning to compete too much with food production. So instead, China now intends to produce ethanol from the less tasty crops of sorghum and cassava.

In another story, we learn of a tortilla war in Mexico. Tortillas, as you know, are made from corn, much of which Mexico imports from the United States. Domestic corn production suffered a decline in the 1990s, when cheap US corn flooded the Mexican market. But now the situation is reversed. The United States, in an effort to reduce oil-imports, uses nearly a quarter of its corn yield for the production of ethanol. The global price of corn has risen to the highest level in ten years – and this has translated into a higher price for tortillas. Millions of poor Mexicans are the unintended victims.

I'm the first to admit these two stories are simplifications. But I believe they tell us several things about how and how *not* to work for a sustainable energy future.

First, in our search for clean and secure energy, we must keep an eye on the law of unintended consequences. Every solution creates a new set of problems, it is said, . . . so why not try and think more than just one step ahead? It does not take an Einstein to figure out

that one cannot turn corn into fuels and eat it too. What does take an Einstein is to discover ways of producing bio-fuels that compete less directly or not at all with food. I count myself lucky that Shell and its partners have quite a few Einsteins working to crack the bio-code. With our partners Choren and Iogen, we are currently developing ways of producing second generation bio-fuels from residues like straw and wood chips. We will be separating the wheat from the chaff, so to speak.

Meanwhile, there are many options to cushion the impact of first generation bio-fuels on food prices. We must ensure diversity in the types of crops we use. We should grow them in parts of the world where arable land is under-used, boosting local economies and creating a synergy between food and fuel production. And we should avoid import-restrictions, so that we make use of each region's natural strengths, while creating a truly global market for bio-fuels. If we do all of that, there will be a bright future for bio-fuels.

My second observation for tonight is that the vision of a secure and clean energy future must be more than a rich man's concern, if it has any chance of succeeding. We don't want to pit 900 million car drivers against two billion people who have no access to modern energy services at all. Imagine you're unfortunate enough to live in a poor neighbourhood in one of the world's mega-cities. It is of course possible that you wake up every morning worried about climate change. But it is more likely that your main concern is how to find affordable food.

A third observation is that we need the right mix of realism and idealism. A vision may show the way forward, but

“The vision of a secure and clean energy future must be more than a rich man's concern.”

the facts tell us where the journey begins. So let me discuss some of these facts.

Facts and Vision

The most important fact is that energy demand is rising and will continue to rise. Another fact is that fossil fuels are and will remain the dominant source of energy for decades to come. Fossil fuels make up between 80 and 85 percent of the world's global energy mix. With stringent international measures, we could reduce that share to around 77 percent by 2030.

Solar and wind energy together provide around 0.15 percent of the world's total primary energy consumption. Bio-fuels add 450.000 barrels of oil equivalent per day, or around 0.2 per cent. This is about the same as the daily consumption of Greece or Pakistan. A major part of the remainder is made up of nuclear energy.

The use of alternative energy, such as solar and wind, is set to grow. If we look to 2050 and beyond, renewables could perhaps begin to make up as much as a quarter of the global energy mix. But very few people realise just how far we have to go to reach that point. For instance, if the UK would fit 20 million roofs each with 4 square metres of standard silicon-based solar panels, this would generate less full time equivalent power than a typical power station fired by gas or coal, or no more than 1 percent of UK electricity capacity. As we say in the Netherlands, only the sun rises for free. However, we clearly need to improve our performance in exploiting its energy.

As for wind energy, the London Array offshore wind farm that Shell is a partner in, will have up to 341 wind turbines, generating the equivalent of about 1 percent of the UK's electricity demand. The project has received some positive support from NGOs. However, compare that to China, which last year alone added conventional generating capacity roughly equivalent to the entire UK stock of power stations. Clearly, if we want wind energy to make a difference, we will need more

commitment from all stakeholders and greater speed in realising the projects.

Another important fact is that coal is making a comeback, particularly in China and India, where it is abundant and cheap. In the United States, too, more than half the electricity is generated by coal-fired power plants. In the European Union the figure stands at 36 percent. Anybody who is concerned about carbon emissions cannot be happy with these figures, since coal is at the dirty end of the emissions scale. However, wishing coal away will not alter the facts. A more useful approach might be to invest in a combination of "clean coal" techniques, such as coal gasification, which turns coal into synthetic gas, and coal-to-liquids. And I would include the capturing and underground storage of CO₂ in this list, as well as techniques that convert CO₂ into solids that could serve as building materials.

One more fact: electricity generation is now responsible for 41 per cent of global energy-related carbon emissions. That could rise to 44 per cent by 2030, as electricity takes a bigger share of energy consumption. Some people say the "future is electric". They point to initiatives in the automotive industry and Silicon Valley to promote plug-in hybrid cars. I am sympathetic to this development. But before we get electric about such future prospects, let's remember that it would require generating more power than we do already.

Now let's turn to the vision of a realist. I'll try to keep it as transparent as the synthetic fuel, made from natural gas, which we added to the diesel of an Audi-race car last year. And you will forgive the salesman in me for mentioning that this was the first diesel car to win the 24-hour race in Le Mans . . . and the Le Mans series of 8 races in the US. (This year, the rules have changed: diesel cars will not be allowed to carry the same volume of fuel as petrol cars.)

Two things are pretty obvious to me: one is that the most certain way to balance the three Cs is energy efficiency.

"Coal is making a comeback."

The best way to use energy is not to use it. The best way to mitigate CO2 emissions is not to emit them. Gains may be made at the well, in car engines, in manufacturing industries, or in office buildings and homes. The possibilities to save energy are legion and not restricted to the energy industry.

The other certainty is this: yes we need to promote renewables. But if we really care about the C of clean, and if we accept the argument that fossil fuels will remain dominant for at least the coming three decades, then making efficiency and CO2 gains in the fossil part of the global energy mix is the most urgent task we face.

Let me give an example. Shell is investing billions of dollars in an effort to cease all continuous flaring of waste gas at oil wells, especially in Nigeria. We will turn waste gas into pipeline gas for power-generation and Liquefied Natural Gas, or LNG. Ultimately, this should reduce CO2 emissions by around 30 million tonnes per year.

As the International Energy Agency has pointed out, there are several other countries where continuous flaring is still a reality. With today's gas prices, putting a stop to flaring and gathering the gas isn't just good for the environment, but it is also a commercial opportunity.

A global cap-and-trade system for CO2 emissions is a precondition to making fossil fuels cleaner and promoting renewables around the world. In any cap-and-trade system, companies that invest large sums to capture and store CO2 should receive credits for that. If carbon has a cost, then getting rid of it should bring a reward. Power generation in particular offers opportunities for limiting emissions. Since power plants are stationary, it is relatively easy to capture the carbon they

emit.

As regards Kyoto, the post 2012 system should be based on two pillars: first it must be global, to establish a level playing field for all. Second, it should go beyond CO2 and greenhouse gas emissions, and include global energy security.

The seventh generation

In choosing the title for my speech of tonight, I was inspired by what I read recently about the traditional Chiefs of the native-American Iroquois nation. Before taking a decision, they have to weigh its impact on the welfare and well-being of the seventh generation to come. Indeed, leadership is foresight. We, the carbon-humans of the twenty-first century are very advanced technologically. We know that the costs of taking action against CO2 today are much lower than they would be for future generations. That is why we should secure energy for the generations. The alternative could be an inter-generational market failure.

Now, if I think about Shell's role in meeting this challenge, I believe that we are well placed to make a tangible contribution and at the same time sustain our business for many years to come. We have a strong resource base, with lots of good investment opportunities, so that we can help secure energy supplies. We are well positioned in second generation bio-fuels, and in renewables, one of which we will grow into a major business. And thanks to our Einsteins, we will pass exciting technologies on to future generations - including and especially to young scientists joining Shell. After all, as Erasmus would point out: for talent to bring a reputation, it needs to be visible.

***“We should secure energy for the generations.
The alternative could be an inter-generational
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