The three keys to a successful global energy transition

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Ben van Beurden became Chief Executive Officer (CEO) with effect from January 1, 2014.

Ben joined Shell in 1983, after graduating with a Master's Degree in Chemical Engineering from Delft University of Technology in the Netherlands.

Ben's career in Shell spans both Upstream and Downstream activities. He has held a number of operational and commercial roles, including some 10 years in the LNG business, and a variety of positions in Downstream.

In January 2005, Ben became Vice President, Manufacturing Excellence, based in Houston, USA. In this role he was responsible for standards in operational excellence and high-performance initiatives in refining and chemicals manufacturing.

In December 2006, he was appointed Executive Vice President, Chemicals, based in London, UK.

During his tenure in the role, Ben was appointed to the boards of a number of leading industry associations including the International Council of Chemicals Associations and the European Chemical Industry Council.

From January to September 2013, Ben was Downstream Director and had regional responsibility for Europe and Turkey. He has been a member of the Executive Committee since January 2013.

Ben, a Dutch citizen, is married to Stacey and has three daughters and a son. He enjoys reading, running and travelling with his family.

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The world can and must succeed in its ongoing global energy transition to a low carbon system. In this speech, Ben van Beurden argues that there are three areas in which efforts should be focused: energy demand, energy supply and cleaning up the emissions that remain. This is a complex task in which Africa and Asia are at least as important as Europe. Shell will play its part, and many others will have to play theirs, but there are no easy answers.

Ladies and gentlemen,

I am very grateful for this opportunity to speak to you today, and especially to be able to do so in this beautiful building – the gathering place for Rhodes Scholars: a group of people united by a motivation to fight 'the world's fight' with public duty as their highest aim.

Change

Rhodes scholarships have changed over the last 115 years, evolving as the world evolved… from colonial roots… into an inclusive institution well-equipped for today's challenges.

If you look at Shell over a similar timeframe there has also been much change as we have adapted to a changing world.
The company started off by selling shells. It moved into trading in rice, silk and industrial machinery, before moving into kerosene. Later petrol, then petrochemicals and liquefied natural gas as well… now New Energies too.

The truth is that change is constant. It must be embraced. If any institution wishes to survive… it must be willing to move on as the world moves on around it.

Of course, the energy transition is change on a global scale, and it must be embraced too. It is unstoppable.

Solid foundations

None of us can foresee exactly how the transition will play out. It is far too complex. But there are three solid foundations on which to base some assumptions.

Firstly, the world's population will grow. There are currently over 7 billion people on the planet and the UN expects that number to exceed 11 billion by the end of the century.

Secondly, all those people will seek to improve their living standards. That could mean a first car… or it could mean a first lightbulb, all of it will involve the consumption of energy.

When you combine these two factors it makes it likely that the transition will take place against the backdrop of an energy system that is doubling in size.

So that leads to the third founding fact… the world is going to have to meet much more demand while significantly reducing greenhouse gas emissions.

Global challenge

The challenge would be complicated enough if only these three factors were at play. But there is more to it.

The population in Asia, for example, is predicted to rise 900 million by 2050, with its energy demand increasing by around half. When you dig into the UN projections another thing hits you quickly. 3.2 billion of the 3.8 billion extra people we can expect on this planet by the end of the century… will be in Africa… the vast majority in sub-Saharan Africa. That has big implications for the energy system… and for emissions too.

None of that lets Europe and the developed world off the hook over climate change. What happens in England is important, but what happens in Ethiopia is at least as important. From Denmark to the DRC, from the Netherlands to Nigeria, to China, to India… there is a lot of work to do.

While a country in Europe must evolve its energy infrastructure to be much cleaner and achieve great efficiencies… countries

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starting with minimal energy infrastructure, limited financial resources and a rapidly growing population have an entirely different task.

Powerful drivers like this offer huge opportunities, but they are also what make the energy transition the real challenge that it is. They are the reason simple solutions are not good enough.

We see a lot of wind and solar being added to the world's energy system. That has to happen. In fact, it must accelerate.

But consider this: if the whole power sector went zero carbon tomorrow, then that would only decarbonise some 20% of end-users' energy needs. Fossil fuels still dominate the other 80%. This is the reality. Change will come, but not at the flick of a switch.

Keys to success

This does not mean the world cannot succeed in the energy transition. It can. It must.

There are three areas in which the world must focus its efforts: energy demand, energy supply and cleaning up emissions. The world must advance… in all three areas… at the same time. Every element of society – including Shell – has a role to play.

Looking at demand first. This planet needs a societal shift away from high carbon intensity. But we need to be clear about the relationship people have with energy. Everything we do needs energy. How can people be encouraged to change their behaviour when energy consumption is so entwined with their lives?

A large part of the answer is to put a cost on the emissions connected to that consumption… it is through government-led carbon price mechanisms. These have the effect, over time, of pulling both consumers and industry towards low-carbon products.

But that is not enough. People are not going to abandon their homes because they become more expensive to heat. Nobody is going to buy a new car just because the cost at the pump rises. People need extra help. This means two thing need to happen in step: on one side, regulation and standards for industry and companies… on the other, support such as price incentives for consumers.

And there is another aspect to demand. The world needs to make a massive shift towards consuming energy as electricity.

The Shell Scenarios team estimates that, if the world is to stop adding carbon dioxide to the atmosphere, it must use half its energy in the form of electrons. That means electric cars, electric heat-pumps and more digitalisation – and not just in England, but also in Ethiopia. That change will take time. So energy demand must change. And supply must change too.

There is little point in shifting to electricity if that electricity is produced by burning coal. Decarbonising the supply of electricity, alongside a switch of consumption, is a first step to decarbonising society.

Ultimately this means renewable power generation, driven by regulation, feed-in tariffs and innovation.

Issues like intermittency and storage mean the world is still some way off from meeting its electricity needs with renewables. Intermittency can be mitigated by a transition to natural gas, which produces around half the CO_2 of coal when burnt for power.

I will now look at the third area in which the world must focus its efforts: cleaning-up the emissions that remain.

Even with the right policies, the right societal backing and enough collaboration, infrastructure does not change overnight. Different parts of the world will evolve in different ways and at different speeds. Also, there are some areas of the economy that will not be able to achieve zero carbon.

The industrial sector emits as much CO2 as the power sector… and it cannot simply switch to 100% electrical inputs. The basic chemical processes of steel and cement manufacture mean they will inevitably emit CO_2. Today, there are no easy

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replacements for hydrocarbons that can provide the intensity of heat required for these and other industrial purposes. The weight and capacity limits of batteries mean there is no immediate zero-carbon solution for air travel, for shipping, for heavy freight. In short, there is no "off button" for emissions.

Cleaning up will mean using nature to offset remaining emissions. But it will also involve technology, especially carbon capture and storage. More than that, carbon capture and storage will need to be combined with the sustainable use of biomass as a fuel to create a net negative impact on emissions. If the world can address demand, fix supply and clean up what remains, it has every chance of success.

Role for Shell

I am determined Shell will play its part, both as a consumer and as a producer of energy, wherever it makes commercial sense.

On the demand side – the energy Shell consumes in order to operate – that means tackling the CO_2 intensity of our operations: improving the emissions profile of our assets and choosing to invest where it makes sense from both an economic and a global emissions perspective. As you may have read in recent days, Shell's executive bonus structure is now partly determined by how we manage our greenhouse gas emissions.

On the supply side, Shell is very active. Through its joint venture Raízen, Shell is, for example, already one of the world's biggest producers of low-carbon biofuels and Shell is investing in the next generation of low-carbon biofuel technologies. The BG Group deal not only refreshed our oil reserves, it also redoubled our commitment to natural gas as a lower-carbon fuel.

We have recently established our New Energies business, to focus on finding fresh opportunities in the energy transition. That business will work out how Shell's expertise can unlock value with business models in new fuels and renewables that make sense for a company like us.

We already know Shell is not about to invent the next wind turbine blade or solar PV cell. If Shell is to succeed in the energy transition we need to work out where the potential business value is for us. That is why Shell recently bid for, and won, the tender for Dutch offshore windfarms in Borssele. And it is why Shell is involved in building a nationwide network of hydrogen filling stations in Germany. We have just opened our first hydrogen fuelling point in the UK too, by the way.

And Shell is also engaged in the effort to clean up emissions. We installed a carbon capture and storage facility on a site in Canada that now removes and puts deep underground more than a million tonnes of CO_2 every year. But also here we can and should do more.

Thriving through change

I would like to make just a few final comments.

All of this action makes sense to Shell from a global emissions perspective… and, I repeat, also from an economic perspective. We are a business, after all. It is in our interests to stay resilient as the world changes and to make sure that the future offers opportunities for Shell. And it is also in our interests to operate in a way that brings benefits to society.

I firmly believe, with that approach, a company like Shell can not only make a difference to the world but can also thrive in that world as it changes.

I believe we must be relevant to today's world, reshape ourselves for the future and play a role in the energy transition. Part of that role is about participating in the energy transition debate and contributing to the design and application of the policies that are needed to push society down the right decarbonisation pathways.

The knowledge, experience and skills in a company like Shell give us the ability – and, more than that, the duty – to play a meaningful role here.

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We will work with governments, NGOs, partners and consumers through this transition.

We will keep making the case for a meaningful price on carbon and for the right and effective energy transition policies.

We will invest time and money to develop low carbon energy solutions for the future.

The energy transition is complex. Shell will play its part… and many others will have to play theirs. But there are no easy answers.

This changing world will not be well-served by simplistic thinking. That is something that any Rhodes scholar would appreciate. And it is also something that will never change.

Thank you.

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