



The Industry Renaissance: the next steps

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Harry Brekelmans became Projects & Technology Director and a member of the Executive Committee of Royal Dutch Shell plc on October 1, 2014.

He joined Shell after graduating in 1990 with a degree in Petroleum Engineering from Delft Technical University in the Netherlands. He began his career in the research and development department of Shell's Exploration & Production (E&P) business in the Netherlands, followed by a variety of assignments in Egypt and the UK.

Harry was appointed Internal Audit Manager for Shell E&P Europe in 2003. In 2005, he became Global Audit Manager for both the E&P and Gas & Power businesses. From 2007, he was Chief Executive Officer of Salym Petroleum Development, a Shell joint venture in Russia. In September 2009, he became Executive Vice President (EVP) for Shell Group Strategy & Planning. In mid-2011, he returned to Russia as Country Chairman and EVP for Russia and the Caspian region. He moved back to his native city, The Hague, the Netherlands, in early 2013 to take up a new role as EVP for Upstream International Operated.

Harry is a member of the executive committee of the World Business Council for Sustainable Development and a board member of the Global Leadership and Technology Exchange. Both organisations seek to connect business, government and civil society in seeking more efficient, low-carbon growth.

Harry is married to Petra and they have two children. The family enjoy travelling and sports, especially tennis and running.

The world faces a great challenge and industry must play its part by providing more and cleaner energy. Harry Brekelmans takes inspiration from the Renaissance and says that the way to do this is greater partnership, technology and innovation

Ladies and gentlemen,

It is a great pleasure to be back here with you. Indeed, this is becoming something of a tradition – in a city that is so full of tradition.

The last time I was with you, I talked about the industry renaissance. I said that we had to change as the world was changing. That a renaissance takes time, dedication, new ways of working – and that the key to success was collaboration. It still is.

Last year, I took my inspiration from the Duomo. This year, I move a little south, to what is modestly known as “the old bridge”: the Ponte Vecchio.

This is a project that has stood the test of time. Earlier versions of the bridge may have been swept away, but more than 650 years later, this one still stands. It was a feat of great collaboration between architects and engineers, stone masons and city planners. Each with their own part to play. From concept to design to construction, they had to work together to find new ways to surpass the challenges of their time. So do we.

As an industry, we have made it through some very challenging times. Oil price volatility. Market uncertainty. Geopolitical shifts. And we have made it through in robust form, as a result of the interventions we have made.

In Shell, we have bridged our own troubled waters. We are well underway in transforming our company – and in positioning it as a true world-class investment case. We continue to make improvements, not only to safety, to cost, to revenue ... but to our cash flows and our carbon footprint.

And if we want to keep doing so, we must continue to collaborate – and we must continue to compete. We must accelerate on the digital journey, driving for far more standardisation – but also, selectively driving

for more sophistication across our supply chains.

This is how we will make ourselves resilient and ensure that we thrive through the energy transition. These are the next steps in our own renaissance. And just like the bridge builders of old, we need to couple quick, practical action with the long-term view. Because the future is at stake.

Right now, humanity faces what is possibly one of the greatest challenges it has ever faced. The question is, how does the world meet a growing demand for energy, while seeking to move to a cleaner, lower-carbon energy system to tackle climate change and air pollution? We all have a responsibility to our societies and we must all play our parts. We, as an industry, need to provide more and cleaner energy. So how does a company thrive in a time of energy transition? First and foremost, it looks into the future.

One of the ways we do this at Shell is through our scenario work. Our most recent is the *Sky* scenario. It sets out a challenging, but technically possible route the world could follow, to transform the global energy system and meet the aim of the Paris agreement. That aim is to restrict the rise in global average temperature in this century to well under 2 degrees Celsius. And to do this, the world will need unprecedented and sustained collaboration. And not just across industries, but across regulators, governments and civil society.

The challenge grows more urgent by the day. In October 2018, the Intergovernmental Panel on Climate Change published an updated perspective on how the world might meet the limit of 1.5 degrees Celsius. It called for an extraordinarily rapid transition, with emissions falling sharply by the early 2020s.

But human history shows us that we can rise to great challenges. We can aim high. We should believe in the possible. The

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renaissance too, came from a critical moment in time. Just think of how the world moved from dark uncertainties, to the enlightened age of reason and scientific inquiry. Think of the advances in medicine and banking and astronomy. The pure forces of science and innovation.

The renaissance mindset led humanity to reach far beyond the horizon. It created the foundations for the growth and prosperity we enjoy today. Consider the progress from Leonardo da Vinci's sketches of flying machines ... to the moment the Wright brothers first took off in North Carolina ... to the momentous moon landings ... One small step can become a giant leap.

And now... The Ponte Vecchio stands today. Life expectancy rose from about 20 in late 14th-century Florence, to 72 across the world today. City states have risen out of the desert sands. The internet connects the world in a way we never thought possible. Great threats have been eradicated and great opportunities taken.

But there is much more to do – and we all have a role to play. So, what are we doing, at Shell?

When it comes to our vision for providing more and cleaner energy, we need commercial innovation and we need technology. But neither of these will be sufficient, if it is not fuelled by collaboration and partnership. In November 2017, we announced our ambition to reduce the net carbon footprint that includes not just emissions from our own operations ... but also, those generated by the third parties who supply energy to us for production ... and, critically, it includes our customers' emissions when they use the energy products we sell.

And we want to keep pace with society. Our ambition is linked to society's progress towards meeting the aims of the Paris agreement. Our ambition is to cut our net carbon footprint by about half by 2050 and by about 20% by 2035.

In December 2018, we took another important step towards turning this ambition into a reality. We committed to setting specific net carbon footprint targets for shorter periods of three or five years. We will set the target each year, for the next three- or five-year period.

This is an aim that will drive transformation in Shell's portfolio through the medium and long-term, as we move to a mix of products with a lower-carbon footprint. One critical element will be growth in our gas business, because natural gas produces between 45% to 55% fewer greenhouse gas emissions than coal when used to generate electricity, and less than one tenth of the air pollutants.

And we keep moving in gas. In late 2018, we announced that together with our partners we had taken a final investment decision on LNG Canada – a major project in Kitimat, in British Columbia. Construction has started and first LNG is expected before the middle of the next decade.

Collaboration was at the heart of the project. It was planned and designed on behalf of the five joint venture partners, by working closely with local communities, First Nations and government to ensure that sustainable development was considered in every aspect of the project. For example, it has been designed to achieve the lowest carbon intensity of any LNG project in operation today. It will do this through its use of ultra high-efficiency GE turbines, and the partial use of hydropower.

This project, positioned as it is on the Pacific Coast, is very well placed to supply the developing cities and markets of East Asia, as gas displaces coal and LNG demand grows rapidly.

But cutting Shell's net carbon footprint is not just about increasing our gas business. We are expanding in electricity, for example. We are now involved in almost every part of the power value chain, from generation to trading, wholesale supply and direct supply to customers in their homes.

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Our involvement in renewable power generation has increased too. We recently announced our investment in an offshore windfarm in the New Jersey area. And this follows our investments in the solar company Silicon Ranch Corp in the USA, and the Borssele 3 and 4 wind farm project in the Netherlands.

Achieving our net carbon footprint ambition also means growing our biofuels sales. It means hydrogen filling stations for fuel-cell electric cars and charging points for battery electric cars.

We are already one of the world's biggest producers of sugarcane ethanol, through our joint venture in Brazil, Raízen. It produces about 2 billion litres a year of ethanol, and continues to develop advanced biofuels. In hydrogen, we are part of a joint venture to establish a network of 400 refuelling stations across Germany by 2023. We also have hydrogen refuelling stations in Canada, the USA and the UK. And for electric vehicles, Shell has acquired NewMotion, which has the largest network of charging points in Europe.

But some emissions are very hard to remove from the global system. In steel and cement manufacturing, for instance, and in aviation. To take this as my example, it would mean airlines and fuel suppliers working together, along with engine manufacturers, regulators and governments to decarbonise the industry. It will require tremendous effort, but it can be done. Indeed, Shell is now part of a group that has begun supplying sustainable aviation fuel at San Francisco airport.

And when it comes to industrial facilities and power plants, carbon capture and storage is a key technology in helping to reduce emissions. Shell has just such a facility: the Quest project, in Alberta, Canada. Since it started, little more than three years ago, Quest has captured and safely stored more than 3 million tonnes of CO₂.

Shell is also working to help to protect and grow forests and wetlands as natural ways of capturing and storing CO₂. We have, for

instance, teamed up with Wildlife Works, who have developed the Kasigau Corridor Project in Kenya. The project protects 500,000 acres of threatened forest, while preserving biodiversity and wildlife habitat.

It is not only technical and commercial innovation that runs through all of these examples, it is partnership. From Quest, where we are working with our joint-venture partners and the government, to Canada LNG to the forests of Kenya. Each partner has a part to play – and it is now, more than ever that we need to bring our talents together and take action.

These projects are just some of what Shell is doing to work towards its net carbon footprint ambition. But we know that you, in your companies, are also doing great things. And that together we can reach greater heights and surpass the toughest challenges.

Getting there, however, will require many small steps. Just as Ponte Vecchio was built stone by stone ... All of us here, today, play an important role in delivering energy to customers, each and every day. It is imperative that we do this responsibly, reliably, lawfully and efficiently. That we provide returns and dividends to shareholders, so that they can supply the capital and investment on which society thrives. And that at the same time, we transition our product portfolio to enable our customers to continue to enjoy better lives on a healthier planet.

And, as we have been discussing today, there is another crucial part to ensuring the future of our industry. We must attract, develop and inspire the next generation of talent.

For Shell, this means supporting educational programmes for the scientists, engineers, technologists and mathematicians of the future. It means investing in young start-ups. It means the NXplorers scheme for schools, which teaches a systems approach to problem-solving.

Just one example, is the Devanahalli Girls' School, just outside Bangalore, in India. I

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want to celebrate their work. Their careful thinking. Their use of new concepts such as "feasibility funnels". In this school, the pupils have not only thought hard about how to provide clean water to their local community, they have come up with their own scenarios.

Just as each individual who worked on the Ponte Vecchio had a role to play in the bigger task, so we all have a role to play in working towards a cleaner, more prosperous world. From Devanahalli to Kenya, from the

North Sea to the shores of Kitimat, from Florence to Beijing.

From working together on our own renaissance ... to enlightening the next generation ... to rising to the great challenge of climate change.

Together, we can ... and together ... we will.

Thank you.

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