Digitalisation and energy transition: thriving through times of unprecedented change

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Yuri Sebregts
EVP Technology and Chief Technology Officer, Shell
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Yuri Sebregts leads a global Technology organisation of more than 3,000 people, combining technical, scientific and commercial expertise. These teams are based at Shell’s major technology centres in Amsterdam, Houston and Bangalore, and at smaller technical centres located close to Shell’s customers and partners.

Yuri is responsible for Shell’s technology strategy and new technology development, as well as external technology commercialisation activities. These range from research and development programmes delivered both in-house and through collaborations with external partners, to deployment of technologies across Shell’s operations, as well as catalyst manufacturing and sales, and technology licensing and technical services to third parties.

He also oversees the company’s digitalisation activities to apply proven and new digital technology solutions to Shell’s existing businesses and emerging new business models.

Yuri joined Shell in 1991 and has held various technical and commercial positions in Europe and the USA, including Chemicals, Lubricants and Refining.

He is a board member of the MIT Energy Initiative, Stanford Global Energy Council and the Dutch ECN/TNO Strategic Advisory Board. He has also been invited to address high-level forums and industry conferences, including the International Petroleum Technology Conference and Exhibition, CERAWeek and World Petroleum Congress.

Yuri was born in The Netherlands and completed his MSc in chemistry at Leiden University before joining Shell.
Digitalisation and the energy transition are two fundamental transformations that are changing the world and the energy industry. There are commonalities in the way we could rise to the challenges and opportunities of these transformations. In this speech, Yuri Sebregts sets out three of these common ways: collaborating with others, building capability and giving customers choice.

Ladies and gentlemen.

It’s a privilege to be here in Florence with you in this beautiful venue.

We live in unprecedented times.

The world needs to move to a cleaner energy system if it is to meet growing energy demand for human development while preventing catastrophic climate change. This transition has begun and is driven by many factors, including economic growth, customer choice, emerging technologies, and national policies.

**Blurring industry boundaries**

At the same time, digital technologies are transforming our lives in ways that were unimaginable even a decade ago. Digitalisation is also changing the energy industry. Industry boundaries are blurring across the value chain, and companies are repositioning themselves to protect and grow their margins.

Take for instance a company like DNV GL, whose roots stretch back to 1864 in the maritime industry. DNV GL has created an open industry digital platform to explore new business models enabled by digitalisation. They not only commercialise their own digital products on this platform, but it is a marketplace for digital innovation across the shipping industry.

This type of new digital market places brings together customers and suppliers, allowing them to interact and transact in a redefined business model. I expect that we will see more of such gamechangers in our industry.

**Two transformations**

The energy transition and digitalisation are two fundamental transformations that are changing the world and our industry. They are two transformations that are not intrinsically connected. They are independent transformations, and yet they have the opportunity to impact each other positively.

The ways we are rising to the challenges and opportunities that these transformations present to us at Shell have much in common. Today, I would like to talk to you about three of these common ways: ‘collaborating with others’, ‘building capability’ and ‘giving our customers choice’.

I’ll start with ‘collaborating with others’.

**Collaborating in digital subsurface**

Let me give you an example in subsurface digitalisation.

Shell has been working together with Baker Hughes over the last few years to develop a new static reservoir modelling tool, JewelSuite, which we incorporate into our integrated modelling platform, PetroSigns.

With the key contributions made by the engineers in Baker Hughes, PetroSigns can provide a ground-breaking, collaborative working environment for our subsurface and wells engineers to create fully integrated models.

We started to deploy PetroSigns in the Gulf of Mexico in 2018 on the Stones asset, and now have multiple other deployments in key assets in other regions as well.

Once completed, we expect to add value to our business through improved, faster field development and optimisation decisions.

But it doesn’t stop there. The entire industry grapples with large siloed data. Across the industry, our geoscientists spend up to 70 percent of their time just looking for data and getting it ready for analysis. This clearly slows down our speed of decision making.

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**Innovating across subsurface**

For this reason, Shell was a founding member of the Open Subsurface Data Universe or OSDU forum together with the Open Group consortium. The aim of the forum is to create the industry standard for a cloud-based data platform that delivers secure, reliable, and global access.

OSDU opens up an ecosystem to innovate across the subsurface community — enabling new digital technologies and best business practices. We see this as a critical enabler for sustainable digital transformation — enabling fast replication and scaling of digital solutions.

Over time, our vision is that Petrosigns will transform into a cloud enabled solution connected to the OSDU data platform to benefit from the fast scaling and replication. The OSDU forum is already very active, currently has over 180 member companies and is still growing.

**Collaborating in hydrogen mobility**

As you may know, Shell has an ambition to decrease the net carbon footprint of our energy products by around 20% by 2035 and by around 50% by 2050. That is a very large challenge and we will not be able to do this alone. We have to rely on each other’s strengths, and do this together.

For example, if we want to progress the infrastructure to make any emerging fuel, like hydrogen a viable alternative for mobility, we must collaborate with vehicle manufacturers, energy companies and retailers and other players along the value chain. And we rely on governments to ensure enabling laws and regulations are in place.

In Germany, we are part of a joint venture called H2 Mobility to develop a nationwide network of hydrogen refueling stations. There are currently 81 hydrogen refueling stations built, with the aim to have 100 refueling stations in total up and running in the middle of this year. 40 of the 100 are planned to be at Shell retail sites in Germany.

Through this collaboration, we are building capability in refueling technology whilst ensuring the highest safety standards whilst as building capability in the construction of hydrogen refueling stations.

And building capability is the second common way that I would like to expand on as a response to the energy transition and digitalisation.

**Building capability in battery storage systems**

One way to build capability in a large organisation like Shell in the energy transition space, is to bring start-up companies into the Shell group. These companies’ entrepreneurial spirit and innovative perspective change and challenge us in Shell — thereby building our capability.

Sonnen is one such example. Shell acquired sonnen last year — a German company that provides battery storage systems to households and small businesses with rooftop solar panels.

Apart from covering their own power needs, owners of sonnen batteries can share their surplus of energy with each other in a smartly, optimized way.

Currently sonnen is active in Germany and Italy, with the USA and Australia being large potential growth markets — sonnen helps build our capability in smart energy storage systems. And at the same time, Shell is driving growth of sonnen to a new level, with the aim to help speed up the transformation of the energy system.

**Building capability in electric charging**

Another example is in electric vehicle charging. The energy system is increasingly moving to a more electrified system.

According to the International Energy Agency almost half of all vehicles sold in 2030 in Europe could be electric vehicles. Therefore this is a huge potential market. Shell has acquired two companies - Greenlots and New Motion— both in the electric charging business.

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“Shell is driving growth of sonnen to a new level, with the aim to help speed up the transformation of the energy system.”
And through those acquisitions we are gaining capability in this market and offer a range of alternative energy sources to our customers in North America, Asia and Europe.

**Building in-house capability**

In the digital space, we have been building our in-house capability organically and today, our core team of specialists – cutting edge data scientists - consists of a diverse group of 350 people. This is up by 200 compared to only two years ago.

Many specialists joined us from iconic companies, including from digital native companies. The team is spread in 4 hubs across the globe and we are actively growing the team further. Our digital centre of excellence has over 280 digital initiatives in-flight covering all the major businesses – from exploration to new energies.

We have over 2000 members in the Shell.ai network, a network we use to share knowledge and good working practice on a.i. across the organisation.

Digitalisation has already enabled more than $1 billion of cost reductions, production increases and increased customer margins across Shell’s businesses in 2018 alone. Although it’s still early days, it is clear that this will increase significantly in the years to come.

Finally, let me expand on the third common way that we are responding to the energy transition and digitalisation: giving our customers choice.

**Giving our customers choice**

It’s probably obvious why this is important. But let me expand on this.

We believe that how the energy transition plays out over the coming decades will depend a lot on the choices customers make. The market – encouraged by the right government policies – will decide which cleaner energy solutions will thrive in the future. Customer choice will drive transformation at scale.

Our approach is to provide our customers with a range of cleaner energy products and cleaner power – to give them choice and flexibility.

Let me give you some examples.

**E-fluids**

As I mentioned before, we offer an electric vehicle charging infrastructure to customers, but we are also working with original equipment manufacturers (OEMs) to develop a line of fluids engineered specifically for the powertrains of hybrids and electric vehicles. The development of e-fluids builds on decades of research in Shell laboratories and working together in close technical collaboration with OEMs. E-fluids allow greater choice by improving the driving experience of electric vehicles.

Of course the switch to electric vehicles will take time.

**Carbon offset**

In the meantime, a second example is that we are offering drivers in the UK and in the Netherlands the option to offset their own carbon emissions from traditional fuels through nature based solutions. Using nature to capture carbon from the atmosphere presents an immediate opportunity.

Customers who visit a Shell station in the Netherlands or the UK are able to drive carbon neutral through the use of nature-based carbon credits. This means that for each liter of fuel customers buy, an equivalent amount of carbon credits is purchased to offset the emissions from the production, delivery and use of that fuel purchased.

**Digital to improve customer experience**

In the UK, this is done through our new loyalty programme GO+. GO+ in itself is an example of using digital technology to improve customer experience. Behind GO+ are artificial intelligence solutions that help us understand our customers patterns of energy consumption and also the consumption of other goods and services that they buy from us.

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And in that way we can make their interaction and customer experience with Shell even better.

With their permission, the app looks at the full transaction history of a customer and uses the information to tailor the offers and rewards to the preferences of the individual combining their data with other aggregated data to look for meaningful patterns.

The machine learning in the app responds to feedback – learning from things the customer does not select as well as drawing conclusions from things they do select. As our connection points with our loyal customer base increase, so will our ability to continuously improve our understanding of what they want from Shell and our ability to offer that in a changing world.

In closing, the energy transition and digitalisation are two transformations that are redefining our industry. We live in exciting times full of opportunity. To stay competitive and resilient in a changing world, Shell is responding to these two forces in three common ways: collaborating with others, building capability and giving our customers choice. Let’s make the future. Thank you.