



Innovating to meet the challenges ahead

Innovation Open House
Shell Technology Centre Amsterdam

Gerald Schotman

Chief Technology Officer, Royal Dutch Shell plc
July 2, 2014



Gerald Schotman (1961) is Executive Vice President Innovation and R&D, responsible for Shell's technology maturation by driving innovative technologies from discovery to deployment. He is also Shell's Chief Technology Officer. In this role he is responsible for Shell's global technology portfolio and strategy. Gerald has been appointed per 1 July 2009.

Gerald graduated as a Civil Engineer from Delft University of Technology in 1984 with honours. Following a short research assignment at Delft University, he joined Shell in 1985.

Throughout his career, Gerald has worked in a range of technical, economic, and strategic assignments. Prior to his current position, Gerald was Vice President of Strategy and Portfolio Management for Shell's exploration and production business, tasked with strategy development and establishment of Shell's aspired asset portfolio.

Gerald is Dutch citizen, married and has three sons with whom he shares an interest in field hockey, sailing and hiking as well as skiing in the French Alps.

Good morning everyone. While I was preparing today's Innovation Open House, a story in The Wall Street Journal caught my attention.

The article asked whether all the important stuff already been had invented. Two economists from Northwestern University were interviewed. They represented opposite poles in the debate over the future of the 21st century economy. On the one hand, rapid innovation driven by robotic manufacturing, 3-D printing and cloud computing. And on the other, years of job losses, stagnant wages and rising income inequality.

These issues are not just of academic interest. They relate to the speed of innovation and how growth is driven by new technology, versus the fact all low-hanging fruit has been picked.

I don't share the belief that innovation has stalled. As I see it, we have actually reached the next wave of innovation – because our capacity to innovate and the incentives to innovate are greater today than at any other time in history.

No room for business as usual

The world's population is still growing fast, particularly in and around cities. Every four days, the global population grows by the size of Amsterdam. So there's no room for business as usual with resources scarce, demand surging and the impact of climate change to be tackled.

We need much more innovation to meet the challenges ahead. We have to deliver the energy the world needs rapidly and tackle climate change challenges, while keeping our energy sources affordable.

The big question is this: can our industry innovate fast enough to do that? Over the last century, oil and gas have seen several waves of impressive innovation. And Shell Technology Centre Amsterdam played a key role. I strongly believe my job as Chief Technology Officer is about taking a wider perspective on technology. I am curious: what innovations are taking place elsewhere that could help us create more value in the energy sector?

In a nutshell, I see the next wave of innovation as a coming together of oil and gas with non-oil and

gas innovations. We all encounter examples of this kind of combination in our daily lives.

The first is Smart everything: objects that can sense and communicate with others, such as wearable computing – as in Google Glasses; Smart cars; and connected homes – houses designed to communicate data throughout, so people can control the heating remotely, find out what's in the refrigerator, and generally save labour and effort.

Another example is Robotics: now appearing everywhere, from entertainment and education to caretaking and healthcare, logistics and security, and oil and gas exploration and production.

Urban visualization

But the innovation I am most excited about is urban visualisation. This is about analysing complex patterns in city areas to understand how we can best live, travel and make the most of our recreation time. In our industry, applying these Big Data and visualisation techniques can facilitate the transition to greater energy efficiency and sustainability; we can also use them to develop new services for city stakeholders.

All the examples I mentioned have potential to enhance business in the oil and gas industry, if we engage with them... And they have something in common. They are all about well-informed decision making and the ability to make decisions faster – something the oil and gas industry needs now, more than ever.

Unlikely partnerships generate many of the best and brightest innovations. This is one reason why we organized our Innovation Open House today with more than 15 technology companies and start-ups to demonstrate their ideas.

How can we innovate fast enough?

Innovation is not about pursuing every idea, but about finding and nurturing the right ones. Therefore creating opportunities and building an innovation community is important. Which is why we are here today: we want you to be part of our innovation community, so that together we become greater than the sum of our parts and really attack some of the mounting energy challenges we are facing.

Shell doesn't have one way of innovating. Instead, we have an open innovation toolbox with a suite of programmes. Our longest established programme – for nearly 100 years now – is our partnering with universities and research councils.

We also pursue a range of other options in order to develop and deploy new products and services faster. Three examples...

GameChanger

The Shell GameChanger programme identifies and nurtures unproven ideas that have the potential to drastically impact the future of energy. Over a decade ago, within GameChanger, we posed the question: what would it take to produce gas at sea, hundreds of kilometres off the nearest coast, turn it directly into stable liquefied natural gas, and then transfer it onto ships that will transport it directly to markets. In 2012 engineers cut the first steel for Prelude, the world's first and largest floating liquefied natural gas facility. A revolution in natural gas production: it is a vessel the size of 4 soccer fields, laid end to end, weighing as much as 6 large aircraft carriers.

Shell Techworks

Shell TechWorks aims to speed up technology delivery by physically embedding itself in select global innovation hot spots – places with a high density of universities, applied research institutes, start-ups and venture capital activity. Shell has opened its first TechWorks office in Boston, Massachusetts, with a rich mix of Shell staff and external minds to co-create business solutions.

Through our Gamechanger program and Shell TechWorks, we collaborate closely with entrepreneurs to do rapid prototyping of revolutionary ideas or adaptation of innovation from other industries like space, the medical industry or the gaming and animation industry'.

Shell Technology Ventures

STV, or Shell Technology Ventures, is the corporate venturing arm of Shell. STV is focused

on accelerating deployment of new technologies in the field of oil and gas and renewable energy. Over the next six to eight years we plan to invest several hundred million dollars in promising solutions through STV.

An STV project that is already working is our investment in GlassPoint Solar Inc. In this pilot, sunlight is being used instead of natural gas to heat water into steam. The steam is then used to heat the oil in a field, making it flow more easily into wells for recovery. This and other kinds of enhanced oil recovery offer substantial potential: a 1% increase in the global recovery of hydrocarbons could deliver three additional years of annual production at today's levels.

Most recently, STV has invested in some exciting examples of Future Energy Technologies that use wind turbines with two blades instead of the traditional three, and in novel ocean bottom seismic technology.

And just this morning we announced our latest STV investment in self-learning monitoring technology from Veros Systems, which is our third investment in three months time.

Collaborating to meet the challenges ahead

We are convinced that open innovation simply must be part of the solution to the global energy challenge. And we have an exciting morning planned. And thank you for being part of this growing community to help the Netherlands be a world leader in energy innovation.

As we move forward in this transition to more efficient, more sustainable energy, our collective wisdom is key. Now it's your turn. What excites you about what your industry is currently doing? What other ways do you know to address the challenges ahead? I look forward to this huge opportunity for collaboration.