

Partners in energy innovation

By **PIERCE RIEMER**

DIRECTOR GENERAL, WORLD PETROLEUM COUNCIL



PIERCE RIEMER holds a PhD in Applied Chemistry (Gas to Liquids). He began his career at the British Coal Corporation, where he worked in the Corporate Planning and Environment branches of the company. From 1991-1999, he worked for the International Energy Agency (IEA) where he was responsible for the setting up of a number of initiatives, including the organisation's Greenhouse Gas Programme. He was appointed Director General of the World Petroleum Congress in 1999, a position which he still holds.

It is a great pleasure for me to say a few words in this special edition. The World Petroleum Council (WPC) is a non-advocacy, non-political organisation with charitable status in the UK; due to our legacy and educational work. The WPC is dedicated to the promotion of sustainable management and use of the world's petroleum resources for the benefit of all. We need cooperation and dialogue in order to ensure the stability of the energy sector and to strengthen international co-operation. The World Petroleum Council, formed in 1933, has always appreciated its Chinese National Committee who (being a very active committee) have always been supportive of our values and goals. More recently, fully supporting our role with the OPEC Fund for International Development (OFID) in relieving energy poverty and with the World Bank in supporting the Reduction of Gas Flaring Initiative, and generally helping to promote sustainability throughout the industry.

At the moment, our industry is experiencing an extreme downturn, with prices having dropped by 50 per cent in the past year and market expectations looking at a prolonged weakness of oil prices into 2016. That said, no other industry works on time horizons like we do and most of our projects can last for 20 years or more. Like any industry we like certainty. Unfortunately, on the time scale we work to, that is a rare commodity.

There are some certainties, however:

- We know population is increasing
- We know energy intensity is increasing
- We are helping to bring vast populations out of poverty
- We know a larger world population needs energy
- We also know that in the next 30 years China's population increase will be one of the biggest in the world, and that the majority of its population will be out of poverty but will all need energy.

The goal is to provide that energy in a clean and sustainable manner. But most of the time, as an industry, we manage uncertainty – price, geological, technical and geopolitical. We are, as an industry, unbelievably good at what we do. We are essential for modern life – there is no escaping it. We are responsible for economic growth – have been for over 150 years! – and will be for the next 100.

No energy = no growth = no advancement = no social progress

So, although we currently have a surplus of fossil fuels around the world, we must still plan for the future and this is something we know that China is doing well – and at pace.

With production from the North American shale gas industry continuing, in recent years in a far more efficient manner, and OPEC's continued production at high capacity, the markets are faced with a global oversupply of crude which looks like it will last at least into 2016. According to the US Energy Information Administration, crude oil stocks are currently near an 80-year high. At the same time, global economic growth has slowed down more than expected, as has the current demand for oil in major consuming countries such as China.

Rather than simplistic, across-the-board cutbacks that can weaken a company's long-term position, leading companies and countries need to focus on developing sustainable optimisation capabilities.

People are our greatest assets and companies should be encouraged to continue investing in training and working to retain key skills through the down-cycles.

By collaborating across the industry, making structural changes, standardising operations, implementing digital solutions to improve productivity and profitability and optimising internal capability to drive higher efficiency and agility, companies can emerge from uncertain times stronger and more competitive. So, while the business environment may remain difficult and unpredictable, oil and gas companies can take action in numerous areas to reduce the impact to the bottom line and emerge stronger and in a better position to respond to the volatile crude cycle.

Innovation is a strong driver for the industry. With conventional reserves of oil and gas that are easy to access and inexpensive to produce largely gone, the industry is exploring in ever more challenging new frontiers where large oil and gas discoveries are still being made. The development of such new discoveries will require deployment of cutting-edge technologies delivered in an environmentally safe manner.

We are often in China with WPC and we know the scale of innovation and development across all the fields of energy taking place. This innovation has a huge impact on all aspects of the supply chain. Advances ranging from 3-D and 4-D seismology have had a profound impact

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on the way companies explore, drill, produce, process and distribute oil and gas. Improvements in catalysis, distillation and isomerisation are making refining more efficient and reducing costs. For gas, improvements in liquefaction and regasification processes are key for LNG import and export facilities. The future will hold many more advances, as energy companies begin to utilise nanotechnology, biotechnology, and sustainable chemistry solutions.

Innovation in the oil and gas industry does not only contribute to increasing production. Ensuring safe operations is another top priority. This includes finding new ways to monitor the integrity of materials in changing environments or creating new systems for inspection, maintenance and repair. As the industry enters more challenging environments, safety innovations are becoming even more important. Some of the techniques used in deep-sea drilling can be compared to those needed to put a man on the moon. By collaborating with NASA, the industry has managed to develop fibre optic sensing systems that will make off-shore drilling platforms safer.

In the oil and gas sector, collaboration is especially important due to the high cost and long lead times associated with oil and gas advancements. Producers already partner with oilfield service operators and other strategic partners, suppliers or universities. New technologies and innovative thinking, developed in cooperation with research institutes and the academic community, can lead to major advances for the industry.

A PwC Study found that working together with partners outside the oil and gas industry and its core disciplines can also open new opportunities. Nuclear magnetic resonance imaging – originally developed for chemical and medical applications – is now routinely used to map the amount of oil in rock. Even Hollywood can lead to innovations in the oil and gas sector. For example, a partnership with the creative minds behind the Shrek movies helped Shell achieve better visualisation of seismic data to solve some of the future challenges of maintaining ageing deepwater facilities. Total worked with a French robotics engineering firm, Cybernetix, to develop a new Inspections, Maintenance, Repair (IMR) system called SWIMMER (for Subsea Works Inspection and Maintenance with Minimum Environment ROV). It's designed to stay underwater for three months and has a range of 50 km. And oil services company Schlumberger is partnering with Saint-Gobain on crystallography and with Lockheed Martin on advanced computing, as just two examples of the company's many external industry partnerships.

Recent research from Lloyd's Register Energy found that in the near term, automation and EOR are expected to have the greatest impact on the oil and gas sector; in the medium term, it will be high-pressure, high-temperature drilling and multi-stage hydraulic fracturing; from 2025 and beyond, subsea robotics is seen as most promising.

None of these can work without cooperation. Even in the current economic downturn, there are good opportunities for independent oil companies (IOCs) to partner with national oil companies (NOCs) on a long term, sustainable basis. The economic crisis can be a good time to focus on forming and strengthening strategic alliances, particularly with NOCs.

Cooperation between IOCs and NOCs is not without its challenges: there are significant cultural, philosophical and social differences between the two parties that can make working together awkward at best, and sometimes impossible. In addition, the possibility of government changing the rules can pose a real risk and induce added uncertainty. Furthermore, government playing the combined roles of policy maker, regulator, partner and investor is a complex mix requiring considerable skill, understanding and flexibility. However, the potential rewards of enhanced cooperation are significant for both parties and indeed, there are many examples of successful partnerships. The World Petroleum Council (WPC) can facilitate the building of important bridges for the two sides to find ways to work together.

With our project cycles lasting several decades, our industry is a long-term player and we require long-term policies for sustainable development. Many companies, associations and countries have created their own definitions but the real term 'sustainable development' was originally defined by the Brundtland Commission as "development that meets the needs of the present without compromising the ability of future generations to meet their needs." It describes "a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations". This is what we all adhere to today.

For many years, WPC has worked with bodies such as the UN Global Compact to demonstrate best practice in the oil and gas sector and to get our member countries and companies (including all the Chinese oil and gas companies) to sign up to their principles. We also work with industry bodies such as OFID and the World Bank in this area.

Our industry has a cyclical nature, and it is particularly important during such downturns that the oil and gas sector maintains its role as an important part of a sustainable future. Good leadership, high standards and ethical business practices are required to ensure the sustainable supply and efficient use of the world's oil and gas resources for the benefit of all.

We invite readers to share your outcomes and continue the dialogue with our global membership at the 22nd World Petroleum Congress in Istanbul in 2017, when we will present the industry's view on 'Bridges to our Energy Future' and as always, we can rely on the fact that all the Chinese companies will be present in great numbers. **F**