

THE ART OF BETTER

PETRONAS' first floating liquefied natural gas (LNG) facility, PFLNG SATU achieved its first gas milestone on 14 November 2016 and the successful production of its first drop of LNG on 5 December 2016 from the Kanowit gas field, offshore Sarawak.

Now that the mechanics of oil prices have sunk in, it's time to move forward. Now's the time for Malaysian companies to jump right back into business with innovative ideas that will give them a competitive edge.

By Theresa Manavalan

THE innovation that the global oil and gas community is anxious for right now is the one that will immediately revise the USD100 per barrel business model to at least half of that. Now that, really, will be innovation but it's unlikely that any one single new idea will do the trick. Instead, it's more likely that a suite of innovations combined and entire systems hooked up to big data analytics and the internet is what may bring sea change. It's not as elusive as we think. There are innovations already at work, and more are emerging, that will become part of the arsenal which eventually will revise the business model.

The bigger question is: are we willing to change, and will our own ideas help us do our jobs better.

"We can see globally, industry players are reeling from the effects of missed opportunities," says Tengku Muhammad Taufik, PwC Malaysia Oil & Gas Leader. "Oil prices were flourishing four years ago, so much of the industry's effort was on extracting oil and on their financials. They didn't focus so much on improving their operational processes. In a buoyant business climate, the market naturally did not question these priorities. Now, with no price turnaround in sight, many companies are feeling the sting. But a few players stayed lean, and kept innovating on technology and on making their systems more efficient. They are starting to realise some significant gains now from their investments."

Like Shell's Parque das Conchas deepwater fields 120km off the coast of Brazil. For the first time, Shell used technology that gives a detailed picture of geology three to five metres away from the well while it is being drilled. This innovative technology allows engineers to steer the path of the well as they drill, in response to a continuous flow of geological information. Another industry first: machines separate oil and gas on the seabed 2km down, instead of on the surface. Without separation, the electric pumps – designed for liquids – would struggle to force oil to the surface. Gas entering the pumps causes damage and pump failure.

It is the combined effect of several innovations which has made the Parque das Conchas field a worthy investment.

Closer to home, PETRONAS' floating LNG plant is an innovation. It was a clever move at the right time. Instead of thinking conventionally that such a job is the work of service providers, PETRONAS, a major gas player in the world, took ownership of the idea. The world's first floating LNG production facility is in the Kanowit field, some 180km offshore Sarawak, uneconomical for pipelines. The 365m-long Korea-made structure commissioned in 2016 will produce 1.2 million tonnes of LNG annually and is designed for depths between 70-200m. PFLNG SATU is an engineering marvel that brings together the liquefaction, production, storage and offloading processes of LNG to the offshore gas field. Floating production units are expected to be game changers in LNG as they will unlock gas reserves in remote and marginal gas fields which would otherwise be uneconomical to develop.

The life of this plant is beyond that field because it can sail to another location on demand but the big event is that PETRONAS is now the world's go-to authority for floating LNG work.

"There is a case for continuous innovation," says Tengku Muhammad Taufik. "Innovation on its own comes naturally to the oil and gas industry, with its focus on exploring the frontiers in search of a resource that is ultimately finite. The real game changer is ownership. Owning innovative technology changes everything."

In 2014, the Malaysian Petroleum Resources Corporation formed the Oil & Gas Innovation & Technology Cluster (OGITeC), a caucus of individuals who could enable an innovation culture. It was found that more than 3,000 Malaysian companies are agents for, or do business with, innovative products but are not owners of those technologies, a scenario that denies Malaysia a strategic advantage.



Tengku Muhammad Taufik, PwC Malaysia



While that's true, some Malaysian companies have made bold technology moves. "I do expect to see a slew of innovations coming soon from Malaysian companies, especially in EOR," says Tengku Taufik. "The key opportunity for these players lies in how well they identify their competitive edge through these innovations."

Malaysian oil and gas giant Sapura Kencana Group acquired Total Marine Technology (TMT) Pty Ltd of Australia and became owners of innovative ROV technology. In 2013, they completed the deepest known dive by a non-military ROV system in the region and as a result, according to TMT's website, qualified for a job in Brazil. Underwater drones reduce dangers associated with diving and working in hazardous locations.

Other Malaysian companies are churning out from scratch innovations that will get world attention, and the companies with R&D units working on both sides of the cycle – exploration and production – are likely to do well.

Like Scomi Chemicals which has taken on nanotechnology to develop products which will be useful, no matter what phase the industry may be ploughing through. Even when drilling has slowed down, production still goes on. Any useful product that raises efficiency is welcome. As more and more operators around the world are reporting that wells are declining faster than anticipated, any tool or technology that falls into the realm of Enhanced Oil Recovery will be noticed.

When Scomi launched its nanotech products, trademarked and ready to roll, the market responded with surprise. No one expected Scomi to be on the cutting edge with nanotechnology; some assumed that Scomi was just producing something for a foreign company. But Scomi is the developer and the owner of that new technology and continues to innovate by engaging in research collaborations here and abroad. Three proprietary products already in the market have opened an infinite number of possibilities – and their own R&D team continues to generate ideas and creative applications.

Ongoing research into graphene compounded into latex and into rubber is highly promising for use far and away from Scomi's oil and gas heritage. And, there are potentially many world-firsts emerging from this research.

It's a poignant thought, given this country's historical relationship with latex and rubber, and the fact that until the 1960s, Kuala Lumpur's Jalan Ampang was the world centre of rubber research. This brave new technology is drawing on elements from Malaysia's own economic history.

"Innovation is not just about things," says Syed Redzal, Country Lead for GE Oil & Gas. "It's also about people. Collaboration is the next change. Partnerships with customers, other companies and academia will change the landscape."

In October 2016, GE supported an MDeC initiative to collaborate on growing Malaysia's Internet of Things (IoT) contribution to the country's economy. The plan is to identify focus areas and create an industrial application developer ecosystem for the industrial internet. In real terms, it will transform selected Malaysian enterprises by helping them in digitally enhancing their productivity, innovative capacity,

competitiveness, and potentially be part of the Predix ecosystem, the operating system for IoT by GE Digital. Predix connects industrial equipment, data analysis and delivers real-time insights. These Malaysian start-ups will be exposed to regional and global opportunities, and not just GE.

The oil and gas industry is more likely to be disrupted by digital innovations than by physical or hardware enhancements – in particular, technology that digitises every part of the business and collectively shaves off costs, waste, time and raises efficiency. In October 2016, a PwC global study of the energy space revealed that years of limited technology innovation have left E&Ps with a long cash recovery cycle. This is mainly due to the time it takes to produce, transport, measure, invoice, and receive payment for their product. In some cases, the time from production to payment receipt is as high as 120 days! Just cutting that in half would unlock a lot of cash.

The best outcome will be mindset change. PwC Malaysia's Tengku Muhammad Taufik thinks that the way contracts are drawn up is likely to change. "The days of the gold-plated contract are over," he says, "and now, contracts need to suit the individual circumstances of fields or even wells with novel approaches to the work."

Syed Redzal thinks that on a personal level, individual Malaysians are upping their game. "People don't sit back and let things happen anymore," he says. "We're embracing new tech and new ways to work. Malaysians are willing to change."

People upstream now look at downstream and vice versa, which is way past traditional comfort zones. "That multi-skilled open-mindedness will transform the industry," he says. "People who understand more than one dimension, both technical and the business, will be the agents of transformation. They have deep insight into how things work and are connected."

As promising as that is, some commentators have called attention to an inadequate culture of innovation, and that Malaysians tend to work in silos.

"Clearly, there's a big space for change on all fronts," says Vickneswaran Veloo, chief technology officer at Scomi Chemicals. "I feel things need to change at a much earlier phase in life. Our current education environment doesn't encourage a strong enough culture of innovation. Teachers are bored, or simply unable to bring excitement to schoolchildren."

That's why Vickneswaran, his brothers and some friends founded the Association of Young Innovators, an NGO which gets rural and semi-rural schoolchildren into pop-up workshops where they learn science differently. On some days, the children get to visit Scomi's facilities which, says Vickneswaran, is especially inspiring for young ones because they see real people at work.

Says GE's Syed Redzal: "With the maturity we have now, we will come out stronger, safer, greener, more efficient, with less emissions and a higher recovery of resources. I think the oil and gas industry has a bright future because of innovation at every level." ■

