Empire Energy - Pioneering Australian Shale Gas

Named after the 'Empire State', that is New York State, the US state where Empire made its first gas acquisition, this ASX-listed producer and frontier explorer has taken the long way home.

ALMOST TOTALLY transformed in balance sheet, management and region, Empire (ASX:EEG) is leading the escalating push into Australia's northern gas frontier and is drilling Carpentaria-1 a 2,900m vertical shale gas well in the Beetaloo Sub-basin portion of its vast Northern Territory acreage position.

That the Beetaloo is increasingly a household name in the Australian oil and gas sector, and the halls of Canberra, is in large part due to the pioneering efforts of Empire. Back when Empire was purely a US producer a decade ago, the company's director John Warburton, then a consultant, conducted early research identified the hydrocarbon potential of the Northern Territory's expansive Proterozoic basins in 2010, sequences once thought too old to be productive. Warburton's finding of the record of a gas-flaring mineral exploration well lead to Empire staking 58,000 square kilometres of open territory.

Carpentaria-1 is being drilled by Schlumberger and the company plans to conduct hydraulic stimulation, or fraccing, of the well in early 2021 season after the wet season.

The 2,900m well has been chasing the potential of the Kyalla Shale and thick Velkerri Shale formations for a potential multi-trillion cubic

foot (TCF) play. Earlier this year an independent assessment by Netherlands Sewell & Associates Inc assessed Empire's P50 potential resource at an impressive 13.46 trillion cubic feet of gas. That's a lot of gas – if realised – enough to supply three LNG trains.

Successful appraisal of the well will be transformational for the company, its shareholders and an encouraging lift for the Northern Territory, which is betting big on gas as a chemical feedstock, as an energy source for new onshore industries, and for the further expansion of Darwin as a global LNG export hub. The Morrison government is also betting long on gas as the energy source for its post-COVID recovery plans.

For Empire, it is betting on replicating the successes of American oil pioneers profiled in book *The Frackers* by journalist Gregory Zuckerman, who built oil and gas empires exploring unconventional acreage using new techniques.

The daring and courage exhibited by these hot-shot gas mavericks such as Chesepeake Energy founder Aubrey McLendon as he went about building this mainstream energy revolution in the US is the stuff of legends. McLendon had actually pencilled a heavy investment in Empire's Territory acreage on the eve of his untimely death in an unexplained motor accident in Oklahoma.

So how has such a major hydrocarbon province escaped attention is a fair question. A question with a one-word answer: age. The host sequence is Meso-Proterozoic (1.6 - 1.7 billion years ago) or four times the age of the US productive sequences.

Its discovery was by pure chance. In 1980 mineral explorer Amoco was looking for a lead-zinc deposit with a 500m core hole into black shale then produced gas which ignited. The rig had to be pulled away. A record of this event was found by Empire in its pioneering research and led to it staking 58,000 square kilometres of the McArthur Basin of which the Beetaloo is a sub-basin.

So-called 'black shales' were deposited at a time when the atmosphere of the Earth was oxygen-depleted or anoxic. The composition of the sea water changed completely and the oceans started depositing these black, carbonaceous, and sulphuric sediments. Abundant in these ancient seas were blue/green algae, cyanophyte bacteria and algal blooms that settled into the high-carbon sediments across vast areas and over very long periods forming shale sequences such as the 300m thick Velkerri Shale Empire is about to drill.

Preservation of these sediment sequences beyond the geological ravages of heat, metamorphism and deformation are also a signature of the Territory's 'shale gas' formations which cover much of its northwest quarter.

The Territory lifted its fraccing moratorium in 2018 following a rigorous judicial review, and the August election results have been seen by industry as offering a green light after a minor party planning to once again halt the practice of fraccing won no seats. There is hope longer term development of this large gas resource will stand its economy on footings at last independent of the Canberra lifelines.

Managing Director Alex Underwood wants to prove this work can be safe and beneficial. He is also interested in including traditional owners in project successes and prefers to conduct on-country meetings in person. All civil works for the Carpentaria-1 well site are being conducted by Top End contractors in accordance with the strong 'buy local' policy preferences of Empire.

Underwood offers a copy of the book to office visitors and is convinced that this is the scale of revolution shale gas offers Australia. He says the potential for Territory's shale formations to make Australia self-sufficient in liquid fuels, something the nation last came close to in 2000 before falling well away again, is very real. In particular, the Velkerri Shale has shown potential for higher liquids composition and sits in an ideal pressure depth window for high liquid fractions that would produce with the gas.

Although not hailed a 'tech' discovery, the cracking of a commercially attractive way to stimulate specific deep strata with hydraulic injection is a profound technological miracle with reverberating global impact.

The fraccing of shales has made the US once more self-sufficient in gas and oil, and pivoted US energy dependence, and therefore its political focus, away from the Middle East. It has also strongly cut US emissions, and re-energised the country's ailing manufacturing base with low cost gas for energy, and for chemical feedstocks into industries such as fertilisers, glass, hydrogen, building materials and plastics.

In August Empire topped up its coffers with a raising of $10 million to cover the end of its current program costs, those after the wet season into 2021 when it will re-enter Carpentaria-1 to conduct vertical frac testing, a preliminary testing method to assess productivity ahead of the drilling of lateral horizontal wells.

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