

Renergen: valuable gas or just hot air?

In mid-June, we travelled to Johannesburg to attend an investor conference hosted by research firm, Avior. Apart from meeting with many of the JSE Top-40 management teams like Standard Bank, MTN, Vodacom and Sasol, we had the opportunity to meet with Renergen, an interesting small-cap company with exciting prospects within the liquified natural gas (LNG) and helium markets. CEO, Stefano Marani, believes that the world's largest helium reserve lies under a 187,000-hectare piece of land in the Free State to which they own the drilling rights. The company is listed on the JSE Alternative Exchange, with a secondary listing on Australia's ASX. Having just completed Phase 1 of the Virginia Gas Project to prove that helium and LNG extraction is possible in SA, the company is in the process of moving on to Phase 2 which will be almost 12 times larger in terms of production. It is thus very early days, so risks remain elevated due to the very nature and size of infrastructure projects and USD funding within SA. This article aims to merely highlight the potential LNG and helium opportunities given SA's historical reliance on energy imports, especially at a time when sentiment in SA's energy industry is at an all-time low.



**Nick
Rogers**

Natural gas accounts for c20% of global power, industry and transport energy requirements and it is one of the cleanest, safest and most useful forms of energy available, especially relative to CO₂-emitting fossil fuels like coal and oil. It has multiple uses, so let me first explore the SA logistics opportunity. I chatted to Babcock's transport sales director, Alec Jackson, to confirm the savings they are currently experiencing by combining

Sasol's compressed natural gas (CNG) with diesel, using a dual-fuel conversion kit. "Approximately 45-50% of total logistics costs are diesel related. Using the CNG mix, we can save R1.20/km at a diesel price of R22/litre. The upfront cost for the dual-fuel conversion kit is R200,000 so a truck should pay this off within 16 months. The average truck lifespan is 4 years and the kit can then be easily transferred to the next truck." Liquefied natural gas (LNG) is simply natural gas (94% methane & 6% nitrogen) that has been cooled to -162°C. By changing its form from gas to liquid, the volume of gas is reduced 600 times, thus the tank size required is much smaller. Methane has c17% more energy per kg than diesel and 74x more than an electric battery, making it the only viable alternative fuel for the trucking industry. With 360,000 trucks on our roads, the sheer amount of lithium batteries required to power such vast numbers, coupled

SPEED READ

- Renergen has proven reserves totalling c400 Bcf (billion cubic feet) of LNG, equivalent to 11 trillion litres of diesel. It aims to roll out LNG as a substitute for diesel in SA's trucking industry.
- Funding for Phase 2 requires \$1 billion - to date \$750 million of debt finance has been pledged by the US's IDFC (\$500 million) and Standard Bank (\$250 million), although with strict conditions.
- Helium is key for the production of advanced microchips used in modern defense weapons, artificial intelligence (AI) and space exploration, hence its strategic status.
- It costs NASA \$115,000 to launch 1kg into orbit versus Elon Musk's Space-X rocket at \$200/kg. 70% of the launch cost is helium.
- Fun Fact: Sound waves travel 3 times faster through helium than air, hence the comical sound of our voices when we inhale it.

with the required charging facilities, means that e-trucks are simply not feasible in SA. Renergen has just announced a partnership with Timelink Cargo, in Cape Town, where they will convert one of Timelink's depots to enable it to dispense LNG whilst Timelink is looking to fit their entire fleet of 120 trucks with LNG-enabled engines by early 2024. This will be

a big step in the right direction and no doubt other transport players will monitor their progress very closely.

Renergen's Virginia Phase 1 liquefaction plant will produce around 50 tons of LNG daily, while Virginia Phase 2 will see this increase to about 680 tons (equivalent to 940,000 litres of diesel per day). Due to the capacity required to have a meaningful impact on supporting SA's power generation issues, benefits will only happen once Phase 2 becomes operational in 2026, barring any project delays. Renergen has proven reserves of 407 billion cubic feet (bcf). For perspective, 1,000 bcf was enough to build the entire MOSGAS infrastructure and operate it for 3 decades. Through its subsidiary, Tetra 4, filling stations will be established across the main logistics routes. However, since LNG-powered trucks can travel up to 3 times further on a full tank, only 12 stations will be required to allow for regular refueling which is great news and further helps to reduce its carbon footprint.

Renergen's Virginia Project		
	Phase 1	Phase 2
Helium		
Capacity	350 Kg/day (1.5x SA's consumption)	5,000 Kg/day (7-8% of global production)
LNG		
Capacity	2,700 GJ/day	34,000 GJ/day
Capital Cost	\$60 million	\$1.05 billion

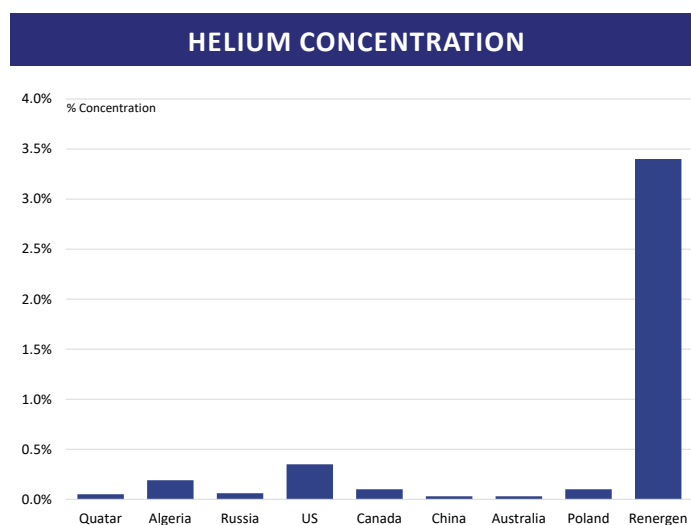
The second phase of the Virginia Gas Project illustrates the potential massive jump in production from this project. But will Renergen be able to deliver on time and on budget?

Secondly, let us explore the helium opportunity. Helium is the second most abundant element, after hydrogen, accounting for c25% of the atoms in the known universe. Given these statistics, one would assume it would be plentiful on Earth. However, being lighter than air, any helium on the earth's surface escapes into the atmosphere, often within a birthday balloon! Consequently, most of the helium available for extraction is the by-product of radioactive decay which occurs deep below the earth's surface and is typically extracted from natural gas (methane) deposits.

Why is helium so useful? Helium is an inert gas which means it does not react with other elements. When cooled to around -270°C it becomes the essential ingredient (the only element to remain a liquid at this temperature) which enables rockets to launch into space. Helium is used in the medical world to treat asthma and emphysema but mainly as a coolant for the large magnets used in MRI and NMR scanners. In the motor industry, it is used in 80% of car airbags since it does not produce heat nor react to flames like hydrogen. Helium is

indispensable in the manufacturing of fibre optic cables and semiconductors (advanced micro-chips used in cellphones/laptops/missiles/drones etc.). It is widely regarded as the unsung commodity of the digital revolution.

Renergen has the sole onshore petroleum production right in SA which allows it to drill for methane within the rim of the Vredefort Crater. What is so special about this deposit? It was formed by an asteroid strike 1.8 billion years ago and due to the resulting ultra-high uranium concentration, Renergen's helium is of the highest quality. Helium becomes economically viable to extract from natural gas at concentrations as low as 0.1%. Globally, the average concentration of helium within natural gas deposits is 0.5%. The Virginia Gas Project's average concentration of helium is 3.4%! Here, Renergen has proven helium reserves of 13.6 bcf. For perspective, the US government auctioned off 1 bcf for a value of \$286 million in 2018. These numbers underpin the potential opportunity of the Phase 2 project. Global demand is estimated to be around 6 bcf p.a. with China alone importing 1 bcf. Annual demand is expected to increase to 8.5 bcf by 2030. Over the last 20 years, helium pricing has increased at a CAGR of 8% reaching US\$375/mcf in late 2022. On the supply side, there is an ongoing crisis given the potential closure or sale of the US Federal Helium Reserve. Consequently, it is likely that most of Renergen's helium will be exported.



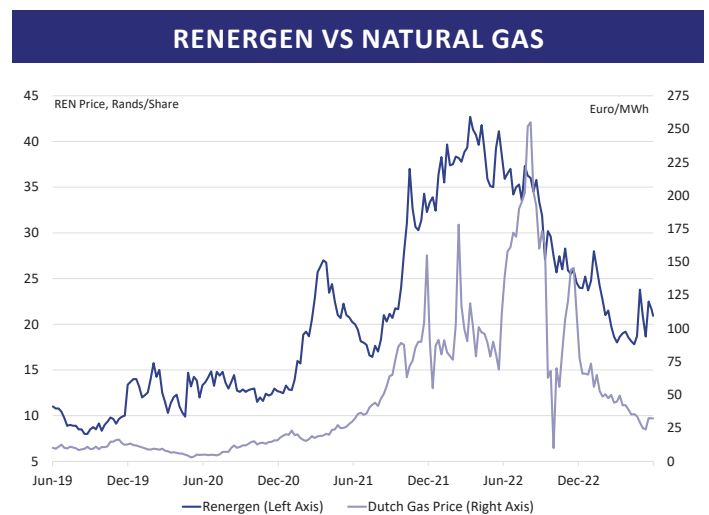
Renergen has discovered one of the richest concentrations of helium globally. Due to the strategic nature and 'rare earth' qualities of helium, the US will become the major funder for Phase 2 if all conditions are met.

This all sounds fantastic but what about the cost and risks of the project? Virginia Phase 2 is projected to require approximately R20 - R22 billion in capital expenditure. Compared to Renergen's current market value of just R2 billion that gives some perspective of the rather large task at hand. How is Renergen planning on funding this? The company has just received approval from the United States

International Development Finance Corporation for \$500 million of debt funding, subject to the completion of a mandatory Congressional notification period, and a further \$250 million debt facility from Standard Bank. Tied to the US's conditions is a successful share-listing on the US NASDAQ exchange later this year to raise a further \$150 million. The rationale is to access capital from a USD-based market where LNG & the strategic importance of helium are well understood and the valuations at which peers trade are far higher which implies less share dilution. Combined, these should allow for a re-rating to occur. Importantly, the SA Central Energy Fund is taking up a 10% stake in Tetra 4 for R1 billion. With US interest rates at record highs and the Rand just off record lows versus the US Dollar, risks remain elevated especially given the volatile global environment.

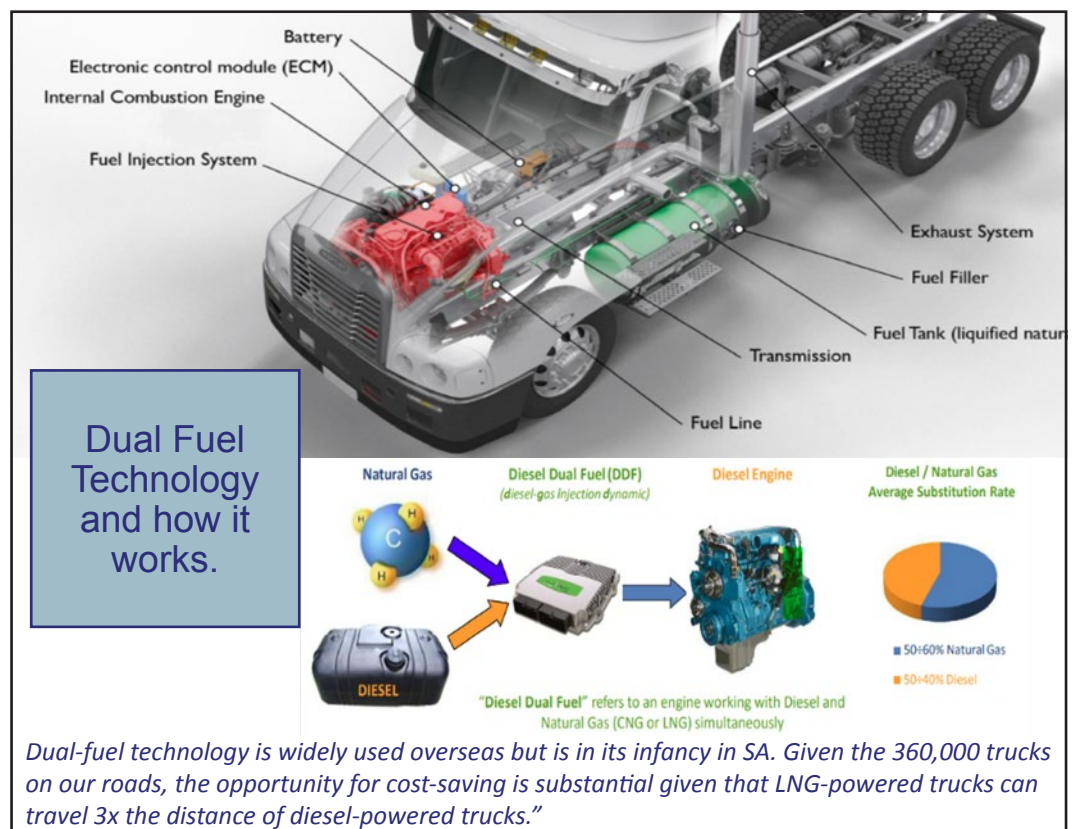
Finally, the recent FY2023 financial results saw a 381% jump in revenues to R12.7 million from R2.6 million in FY22. However, context is required. This is purely the result of the company evolving from the exploration phase (zero positive cashflows) to the initial commercialization phase now that it has product to sell. What is important is that the team have achieved 'proof of concept' by successfully drilling and extracting helium and LNG, vital for investor confidence. In the current high-inflationary environment, keeping input costs down is key. On this, CEO Marani said, "Mining companies send a lot of people underground to go and retrieve ore and bring it up to the surface. The beauty about gas is that you drill a hole and then the gas comes to you. That's it. That is your input cost." Here, I would caution that the LNG price is linked to the global oil price and thus there is far more to it having just witnessed global LNG prices hit record highs due to Russian sanctions, only to plummet well below pre-war levels as global suppliers came on board to relieve European reliance on Moscow. Nonetheless, for LNG to become part of the SA energy mix and help reduce our reliance on coal, massive port infrastructure is required to build LNG terminals. This is unlikely to happen anytime soon. Renergen, being the first successful onshore LNG producer, thus has a first-mover advantage.

In conclusion, I would like to re-iterate that this company is not yet fully established, having only reached Phase 1 of its project development.



Prior to the Ukraine invasion, Russian natural gas accounted for 45% of total EU gas imports. The sanctions imposed sent prices to record highs which "fueled" an explosion in Renergen's share price, but it has since retreated in line with gas prices.

Consequently, dividends are several years away given the debt profile and much work is required to harness the potential. It is a very high-risk investment at this stage. The Renergen story does, however, offer a glimmer of hope within the alternative energy space in SA and along with the explosion of solar, we are witnessing the resilience and entrepreneurship of the SA private sector as it fights aggressively to increase the energy mix and availability of power which is core to achieving the significant GDP growth required to get the economy off its knees.





Our next Insight seminar will take place in September in Howick and Johannesburg. The topic will be announced in due course.



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Topic: **TBC**

Natal Midlands

Date: 21st of September 2023

Venue: Oasis Conference Centre,
72 Main Road, Howick

Morning Time: 10am for 10.30am

Evening Time: 5.30pm for 6pm

Johannesburg

Date: 19th of September

Venue: Rosebank Union Church, Cnr
William Nichol and St Andrews
Road, Hurlingham

Time: 7am for 7.30am

Cape Town

Date: n/a

Venue: ABRU Motor Studio, Lourensford
Wine Estate, Somerset West

Time: 5.30pm for 6pm

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