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HALLGARTEN + COMPANY

Initiation of Coverage

Christopher Ecclestone
cecclestone@hallgartenco.com

D3 Energy

(ASX: D3E | OTCQX: DNRGF)

Strategy: LONG

Price (AUD)	$0.35
12-Month Target Price (AUD)	$1.10
Upside to Target	219%
High-low (12 mth)	$0.215 - $0.60
Market Cap (AUD mn)	52.13
Shares O/S (mns)	**151.1**
Performance Rights (mns)	14.3
Options (mns)	13.9
Fully Diluted (mns)	**179.3**

D3 Energy

In Helium´s Latest Hotspot

- + D3E is the prime up & coming helium/natgas/methane developer in South Africa after the recent takeout of Renergen by ASP Isotopes
- + Helium´s fragile supply situation came back into public (and moreover, political) focus with the focus on the blockade of the Strait of Hormuz and the loss of 50% of global supply
- + The travails of Qatar (and the vulnerability of Asian helium consumers (Taiwan, South Korea, Japan and, dare we say, China) leave an open goal for South African players.
- + The onset of the company's natgas output will be particularly timely as South Africa is facing a "gas cliff" due to declining imports from Mozambique
- + The ER315 license has a resource/reserve and a potentially a short timeline to production
- + Exploration is underway to prove up reserves across more of the company's extensive claim holdings
- + The company does not have a BEE (Black Empowerment) partner but would require one prior to production
- + The ongoing energy challenges for South Africa put new providers of natgas/methane in a strong position as the country really needs more energy independence to spur growth
- + The recent addition of highly prospective gas territory in South Australia provides geographical and jurisdictional diversification
- × There is scarcely any domestic demand for Helium in South Africa so the eventual production will be dependent on export markets
- × The threat of peace breaking out in the Persian Gulf conflict tempts a return to "business as usual" thinking that led to over-concentrated vulnerable supplies out of Gulf states
- × South Africa's storied history in the resources sector has been somewhat tarnished in recent years with a negative impact upon investor perceptions

Exploiting Noble Gases

There have been two catalysts to stir the waters of the long placid helium space in the last ten years. The first was the wind-down and sale of the US government's Helium reserve late last decade which essentially "created" a listed Helium sector amongst juniors. Hitherto the space had been dominated by the Gas Giants (Air Liquide, Linde etc), not so much as producers but as distributors/vendors/traders.

A certain quiescence ensued as investors sorted out which companies would survive (Royal Helium meeting its demise after merging with Imperial Helium) and which would fail to produce due to logistics getting the better of them (notably Helium One in Tanzania).

Years of torpidity followed but in recent times (even before the Gulf War) a few new names set their sights upon entering the markets.

The outbreak of war in the Persian Gulf initially rung alarm bells around this element in elevated circles and took the element out of obscurity and onto the front pages. The major supplier from the Gulf, Qatar Energy, declared force majeure on March 4th, raising concerns that helium disruptions could affect semiconductor production, according to Reuters. But things have only gotten worse since that date.

This is highlighted by a tight global helium market due to major supply disruptions and strong pricing potential, with a recent contract reportedly above $600 per Mcf.

The investing public, unaware of the key role that Qatar played in Helium space were still envisaging it as linked to party balloons, when the noble gas is, in fact, vital in chip manufacture and medical and data applications. Now the scramble is on to find other sources of supply. South Africa is one of these new frontiers.

D3E Enters the Fray

When the company initially came to market its focus was South Africa, and still is, but in most recent times the company added a second string to its bow when it expanded into Australia through the strategic acquisition of highly prospective helium and hydrogen permits in the Arckaringa Basin.

In this Initiation of Coverage, we shall look at how an ASX-listed company came to be pursuing natgas, helium and methane in South Africa, hitherto, not a well-travelled jurisdiction for gas prospection and/or production. We shall look at current progress, the state of the helium market (particularly in light of the war in the Persian Gulf, the state of natgas in South Africa and the company's recent add-on of a presence in South Australia's Arckaringa Basin.

The Strategy

The company was admitted to trading on the ASX in May of 2024, raising AUD$10mn through the issue of 50 million shares at 20cts each.

From the get-go, D3E was focused on natural gas and Helium discovery in South Africa. With the model having three product lines:

> **NatGas**: the driver being that South Africa faces a shortage of natural gas supply in 2028 as it loses its primary source from Mozambique's Pande-Temane field. The field which is operated by Sasol is in decline and at the end of its life. Industrial gas uses and traders are searching for replacement gas and D3 are in commercial negations with many customers for the supply of CNG and or LNG to replace the Mozambique supply.
>
> **Helium**: the driver here is exports, as the internal market in South Africa is limited in size and growth prospects, thus it would be likely that all helium is exported. ASP Isotopes has recently

signed a 5-year contract to supply helium into Asia at US$600 per Mcf, so that would be an obvious place as Asian end-users look to secure supply following the issues with the Qatar plant being damaged. It is worth noting that Asian pricing is normally around 20% higher than the US market.

Methane: Sasol (the state hydrocarbons entity) has already started communicating to some of their customers that they may not be able to supply them from 2028. This reality is now starting to push the "smarter" customers to start seriously look at alternative supplies, some however still hope that the "cliff" won't occur.

The Background

The company acquired its exploration right ER315 (previously known as the Motuoane License) which had been granted on 19 October 2018 and at the time of the IPO was in its First Renewal Period (of 2 years) expiring on 14 March 2024.

In addition to ER315, D3 holds multiple permits in South Africa, including ER386, TCP 273, ER391, ER392 and ER393 bringing its total landholding in the region to just under 2000 km². These assets are defined by their low-cost nature and high prospectivity, making exploration and development economically competitive.

In February of 2025 the company was granted three new Technical Cooperation Permits (TCP258, TCP259, TCP260), adding 5,798 hectares of prospective ground near ER315.

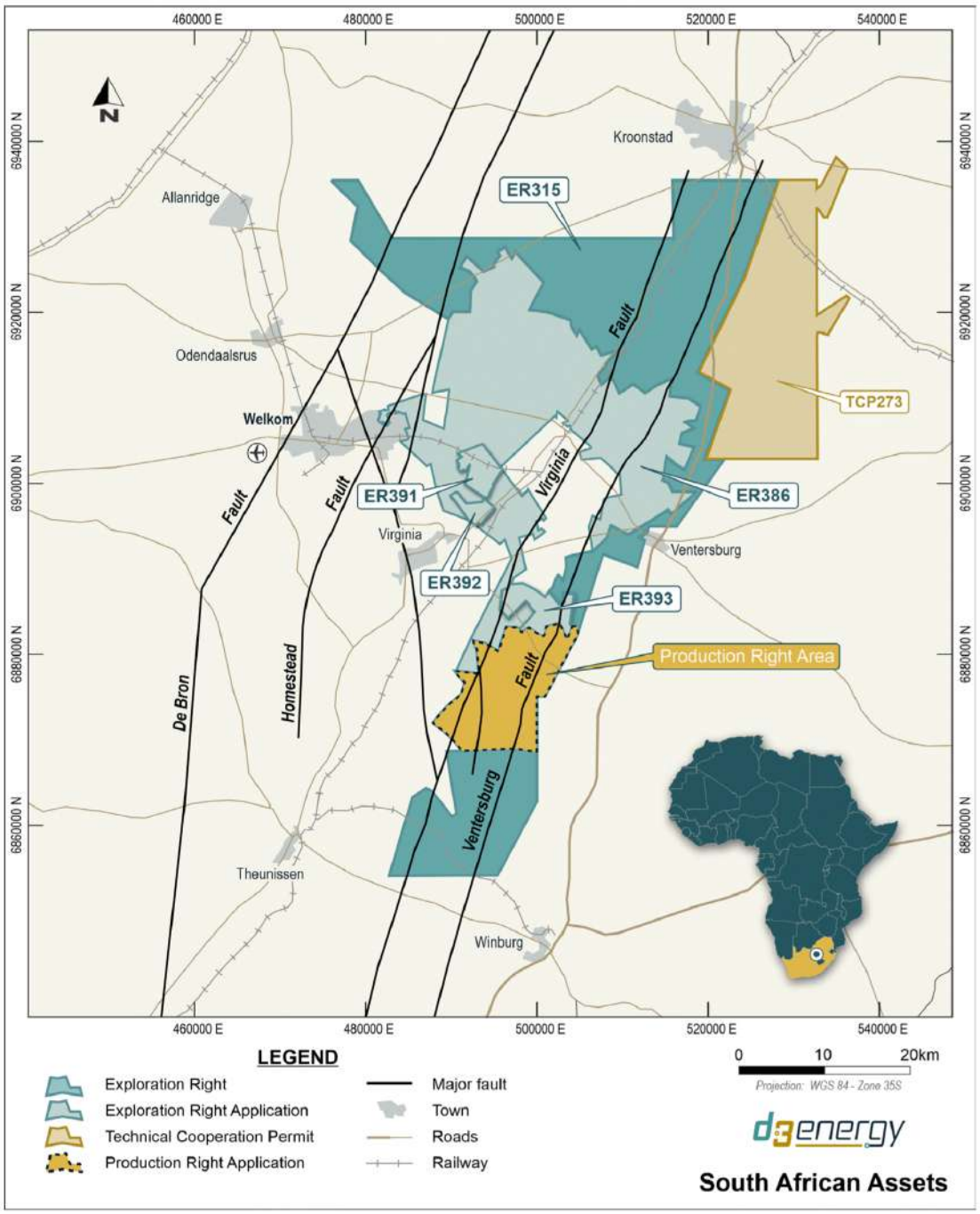
Position in the Free State

The land position of D3 Energy now extends to 479,409 acres across the Free State Province of South Africa, comprising ER315, PR016, Exploration Right Applications ER386, ER391, ER392 and ER393 and Technical Cooperation Permit TCP273.

D3 Energy now owns a 100% working interest in 191,000 hectares (1,910 km^2) which are shown on the map on the following page. The concessions currently have eight active blowers and six inactive blowers.

The flagship ER315 permit has delivered independently-verified helium concentrations of up to 8% and is the subject of a Production Right Application (PR016) currently under assessment by South Africa's Petroleum Agency SA (PASA). The initial Production Right Application area covers 15% of ER315 and approximately 9% of the company's total exploration right acreage, with the balance of the land position, including ER386, representing the broader appraisal and development pipeline.

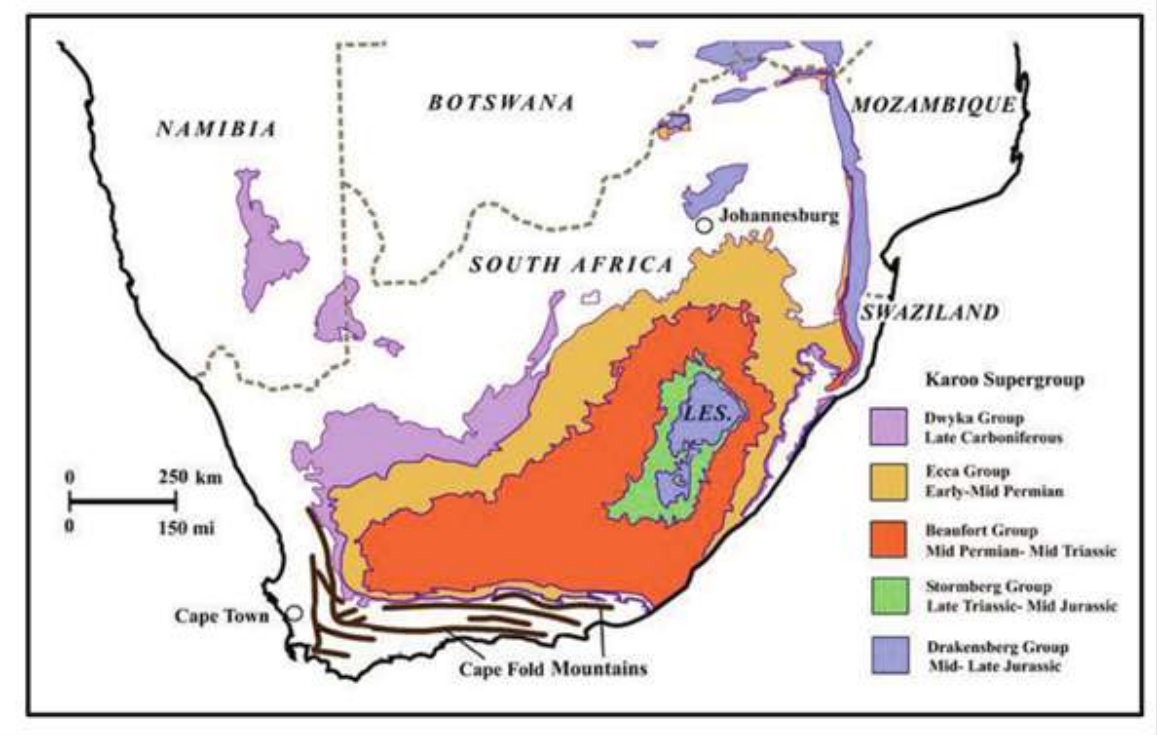
The historical prospectivity of the area stretches back several decades, particularly located near the historical Nooitgedacht Major borehole (which was originally drilled in 1990). Production testing on that borehole yielded an average flow rate of 95,000 standard cubic feet per day (Mscfd), with high concentrations of helium (5.6%) and methane (83.2%).



Exploration is now focusing on proving up the potential of block ER386, which is contiguous with ER315, and located within the same Virginia Fault structural corridor that hosts D3 Energy's certified reserves and contingent resources at ER315 and PR016.

Geology

The permits are situated in the eastern part of the Greater Karoo Basin, a Permian aged large terrestrial and glacial basin in eastern South Africa. Within the Karoo Basin is the Ecca Group coal sequence which contains multiple thin-bedded coal seams that have some coal seam gas potential.



The Precambrian Witwatersrand Basin unconformably lies below the Karoo Basin, which contains the Free State Gold Field Welkom. The Free State Gold Field is a major graben structure that is bounded on the west by the Border fault and on the east by the deBron fault.

Displacement, to the west, of the order of 1000 meters is encountered along the strike of the deBron fault. In certain areas the fault zone amounts to 150m in width and is partly filled with secondary quartz and calcite with the resulting in permeability along the strike distance of the fault although this can vary considerably. These 'basement' lithologies have been tectonically flexed into a large east to west trending anticline that is in turn bisected by a large extensional graben (low area) and many faults with significant throw (offset) that extend deep into the earth's crust.

The Ventersdorp Supergroup, of primarily volcanic lithologies, unconformably overlies the Witwatersrand Supergroup. Many of these faults do not extend upwards beyond the upper Ventersdorp Supergroup. Above this unconformity lies the Karoo Supergroup, a Permian aged sedimentary section composed of sandstones, coal seams and carbonaceous shales. There is almost always a basal glacial deposit on top of the unconformity that separates the Karoo from the Ventersdorp known as the Dwyka Tillite. The Witwatersrand and Ventersdorp Supergroups experienced greenschist

metamorphism and are both extensively fractured, due to sustained tectonic activity.

The primary source of the methane gas is microbial in origin from deep within the Witwatersrand Supergroup with groundwater circulating through the large faults and coming in contact with bacteria living deep within the Archaean crust. Methane isotope studies demonstrate that very little, if any, of the methane can be attributed to the Karoo coal beds or the carbonaceous shales. Thus, the methane is a biogenic and a continuing regenerating resource.

Interestingly, there is anecdotal evidence of historic blowers within the area of ER315 producing methane gas for over forty years without any discernible pressure drop, however there are no quantified studies to date.

Specific Geology of ER315

The permit area of ER315 is situated towards the east of de Bron fault. In the northern part of ER315, a major horst structure i.e. de Bron horst is present between the de Bron and Homestead faults respectively. Detailed drilling defined the eastern limit of this horst structure along the Homestead fault. East of the Homestead fault, gold bearing sediments were intersected again.

Two major fault systems, i.e. the Virginia and Ventersberg faults, occur in the eastern part of ER315. The displacement again was towards the west. Despite this major north-south striking structures several east-west faults are also present or could be extended into the Motuoane License. The east-west structures are the oldest structures in the Witwatersrand basin.

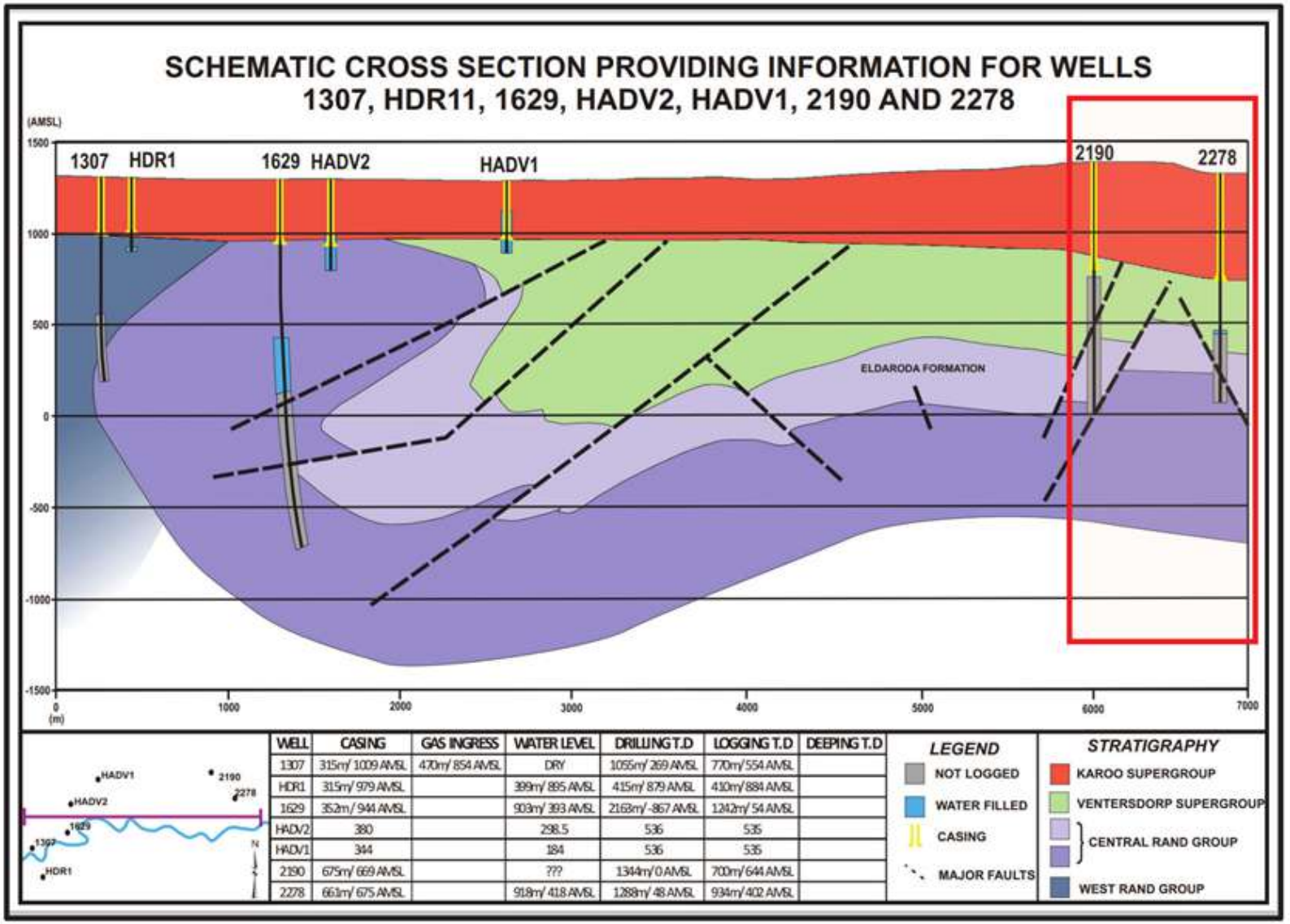
Many kimberlite fissures and Karoo age dolerite dykes intruded into the younger strata along these structures. The east-west structures were right laterally displaced by north-south striking structures resulting in a very complex tectonic environment. The importance of these structures is vested in the presence of methane gas occurrence associated in, or in close proximity to, the structures.

On the page that follows can be seen a schematic cross-section for a number of wells and giving a general idea of the general nature of the formation:

Helium at ER315

The Technical Report, prepared by the consultants, Sproule, which was integrated into the prospectus of D3E makes interesting reading. It notes that the helium, as with almost all helium around the world, is largely mantle-derived, that is from deep within the earth or from radioactive decay of radioactive minerals within the crust, and as the helium moves up along the faults, it mixes with the microbial methane in the deep subsurface.

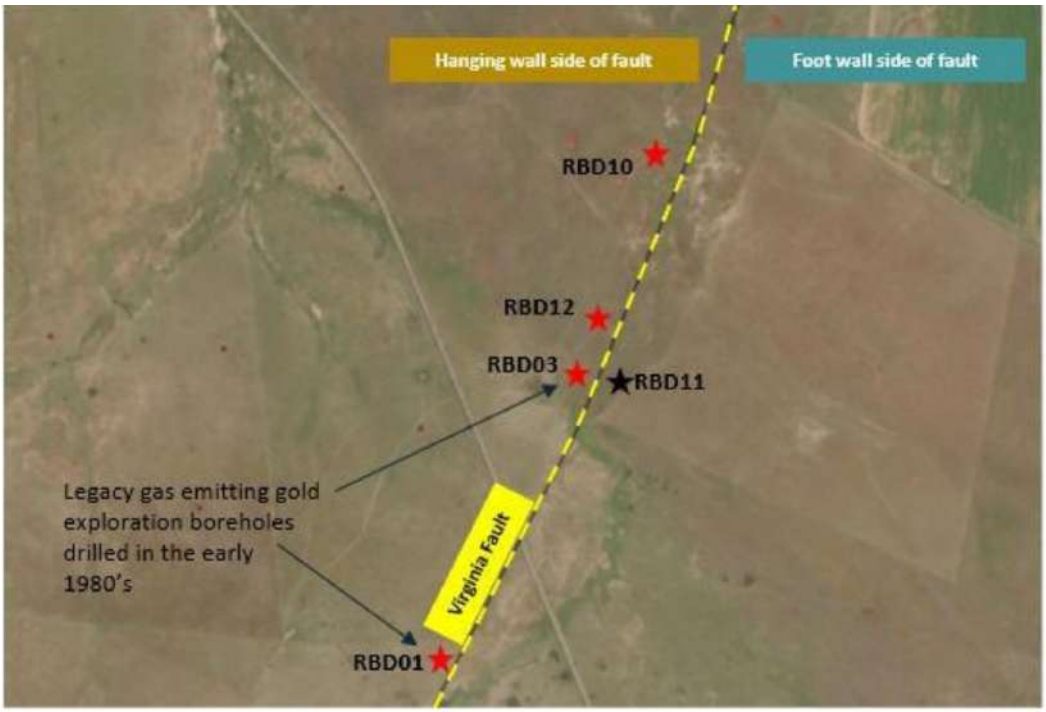
The formation and resource estimates of the helium were detailed in the Sproule 2020 report: ”Evaluation of Certain Helium Prospective Resources on the Tetra4 Virginia Gas Project, Free State, South Africa”, and in the Gilfillan and Stuart Report, 2020, which examined the origin of the helium at the Virginia Gas Field.



WELL	CASING	GAS INGRESS	WATER LEVEL	DRILLING T.D	LOGGING T.D	DEEPING T.D
1307	315m/ 1009 AMSL	470m/ 854 AMSL	DRY	1055m/ 269 AMSL	770m/ 554 AMSL	
HDR1	315m/ 979 AMSL		399m/ 895 AMSL	415m/ 879 AMSL	410m/ 884 AMSL	
1629	352m/ 944 AMSL		903m/ 393 AMSL	2163m/ -867 AMSL	1242m/ 54 AMSL	
HADV2	380		298.5	536	535	
HADV1	344		184	536	535	
2190	675m/ 669 AMSL		???	1344m/ 0 AMSL	700m/ 644 AMSL	
2278	661m/ 675 AMSL		918m/ 418 AMSL	1288m/ 48 AMSL	934m/ 402 AMSL	

Reinterpreting & Reviving the Past

In the mining sector we are accustomed to companies having to twin old holes to update or expand historic resources. However, the modus operandi in the oil & gas sector is different in that old wells can be uncapped and immediately yield results or become the basis for future production. In mid-2025, in the run up to the production of its resource/reserve the company resolved to workover some of the old boreholes on its concessions that provided a cheap and fast way to add to the knowledge base on the field. It was, for instance, known that the legacy boreholes (RBD01 & RBD03) had potentially been producing gas since the early 1980's.



In June of 2025, the company undertook around of testing at RBD03 followed a well clean-out operation aimed at removing legacy drilling materials and improving borehole integrity. The well, originally drilled in 1982, delivered D3E with valuable insights into the reservoir's long-term productivity.

Once unclogged, RBD03 produced at total of 2,700 Mscf at an average gas rate of 194 Mscfd over a 14-day period. This represents a 32% increase in the stabilised flow rate at RBD03 when compared with results gained from the previous testing prior to the clean out of detritus/junk from the historical drillholes.

Then in August of 2025 the results of the re-testing of RB010 were announced. This borehole was re-tested following observations of reservoir pressure increasing to levels higher than that recorded previously while it was shut in to conduct testing on nearby boreholes. The production re-test commenced on 21 July 2025 with the most recent testing recording an average flow rate of 264 Mscfd,

representing a 38% increase over the initial test in 2024, which averaged 191 Mscfd for an equivalent 14-day period.

Total gas produced over the 14-day testing period was 3,695 Mscf and the well has once again been shut in to analyse the pressure buildup data.

This increased flow rate at RBD10 along with the excellent result recently seen at RBD03 was deemed by management to bode "very well" for increased well spacing and therefore reduced development costs. The 32% increase experienced at RBD03 along with the outstanding results of a 38% increase at RBD10, meant the reservoir deliverability and connectivity is notably better than first believed.

These results will mean that development wells will be able to be spaced further apart and result in less wells being drilled to produce the same volume of gas.

The increase in reservoir pressure in both RBD03 and RBD10 above previous levels can only be explained by recharge of helium and biogenic methane from source rocks at depth migrating towards the surface via what is a very extensive fault system at this location. This will result in negligible if any initial, and much slower decline rates overall than would normally be the case in a conventional reservoir that doesn't experience recharge.

Form the commercial point of view, this will ultimately result in the drilling of less wells to meet and maintain sales gas contracts throughout the production phase of the project.

Resources & Reserves

The Maiden Resource/ Reserve certification was for the ER315 permit was undertaken by the independent global consultancy, Sproule ERCE, and dates from July of 2025. It is shown below:

ER315 Project
(bns of cubic feet)

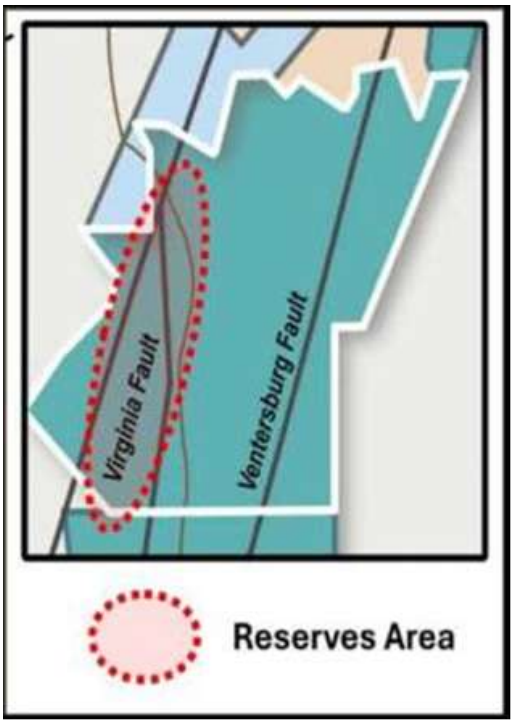
Reserve	1P	2P	3P
Gross Reserve	7.21	14.43	22.97
Net Methane Researve	5.45	10.91	17.36
Net Helium Reserve	0.353	0.706	1.124

Within the Production Right Application area (PRA) the reserve volumes only cover the planned development of the first 16 wells along the western Virginia fault line, which conservatively represents only 37% of the currently planned wells in the production right application area. The project has over 100 shallow wells drilled into the Permian Karoo section but are not considered for the Contingent Resources portion as they did not penetrate the deeper Witwatersrand Formation and the basement

faulting.

Then the most recent Resource/Reserve Estimations for D3E date from early May 2026. The latest addition was prepared by Sproule ERCE, is a global energy consulting firm with a 70-year history as consultants in the oil & gas space. The estimate was under the supervision of Jeffrey B Aldrich, Mark Stouffer and Meghan M. Klein, each of whom are qualified petroleum reserves evaluators and reserves auditors and members of the Society of Petroleum Engineers.

These added an estimate of Contingent Resources and Prospective Resources for ER386 to the numbers already prepared for ER315. ER386 is contiguous with D3's flagship ER315 permit and is located to the north of D3's initial Production Right Application and sits within the same Free State helium province that has delivered independently verified helium concentrations of up to 8% at ER315.



ER386 Project
(bns of cubic feet)

Contingent Resource	1C	2C	3C
Recoverable Gas Resource	86.0	275.8	617.4
Recoverable Mehane	71.1	228.1	555.4
Recoverable Helium	4.4	14.0	34.00

The independently certified Prospective Resource (that follows) has a helium 2U best estimate of 25.4 BCF. This is a 94% increase on the ER315 and PR016 standalone figure.

Prospective Resource for ER386
(bns of cubic feet)

	1U	2U	3U
Recoverable Gas Resource	156	500.2	1217.8
Recoverable Mehane	129	413.7	1007.2
Recoverable Helium	7.9	25.4	61.7

In this Prospective Resource, the estimated quantities of hydrocarbons and helium that may potentially be recovered by the application of a future development project relate to undiscovered accumulations. These estimates have both a risk of discovery and a risk of development.

The combined reserve and resource base across ER315, PR016 and ER386 is as follows:

Contingent Resource for ER315, PR016 & ER386
(bns of cubic feet)

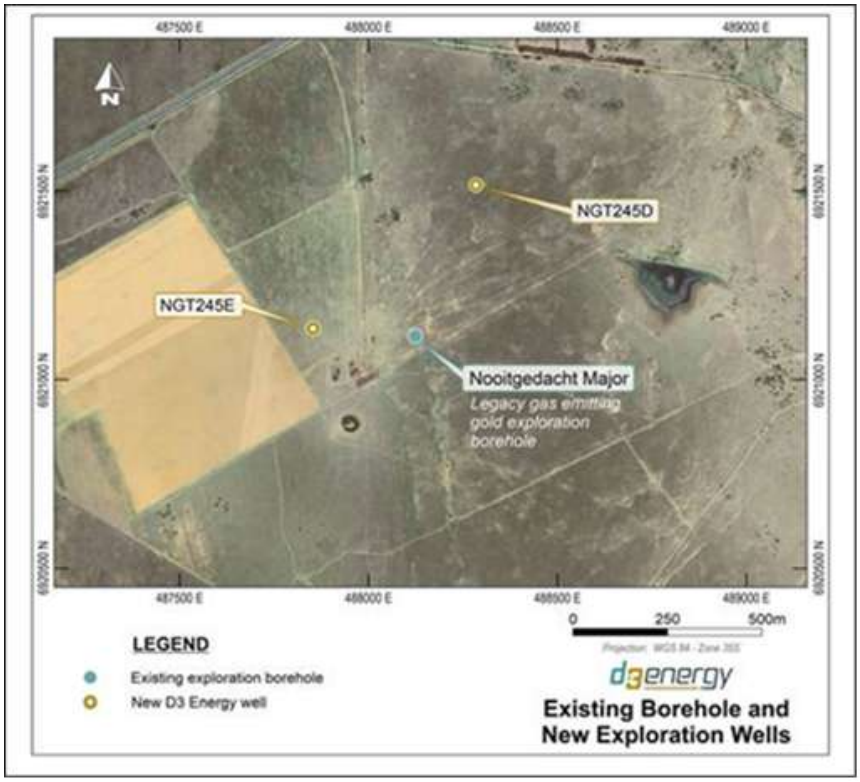
	1C	2C	3C
Recoverable Gas Resource	415.4	808.8	1506.5
Recoverable Mehane	356.8	690.3	1279.4
Recoverable Helium	17.8	35.6	67.9

Exploration

In May of 2025, it was reported that production testing at the Nooitgedacht Major borehole confirmed helium concentrations of 5.6% and methane at 83.2%, with average flows of 95 thousand standard cubic feet per day over a 14-day period.

The results extended ER315's prospective resources to its northern area and are especially notable for the shallower depth of mineralisation, which implies lower development costs.

In recent weeks the company announced that it had spudded the first of two planned wells at Nooitgedacht, located within the ER315 permit. The Nooitgedacht area is located approximately 43 km to the north of the Bloemskraal area where D3E has already booked reserves to underpin



a Production Right application lodged last year and is positioned along the Homestead Fault that traverses through the northern section of ER315.

This spudding has the goal of increasing the reserve base in ER315 and converting additional exploration right areas into production rights.

The program consisted of two wells, NGT245 E and NGT245 D, and has been undertaken by the same contractor that completed the initial drilling program. The wells are located near the Nooitgedacht Major historical borehole that when production tested in January 2025 flowed at an average rate of 95 Mscfd with helium concentrations of 5.6% and methane at 83.2%.

The two wells are targeting the faulting and associated fractures in the Witwatersrand formation to further assess the reservoir's deliverability and to collect additional data on helium and methane concentrations.

NGT245 E is located near the previously tested Nooitgedacht Major borehole and is budgeted to cost approximately AUD$200,000 to drill and complete.

The first of two wells, NGT245 E was drilled to a total depth of 363 m on time and budget and successfully intersected the target gas zone. The well flowed gas to surface prior to the rig moving off to the next drilling location to allow logging to commence. The drill rig will return to install the intermediate casing following the completion of drilling at NGT245 D.

The aerial view (below) of the drill pad gives an idea of the general landscape of the exploration area:

Meanwhile NGT245 D was spudded on the 30th of July 2026. On the 10th of August, the company announced it had successfully reached total depth in the second of two planned wells at Nooitgedacht This second well was drilled to a total depth of 348m, on time and budget. The rig then moved back to the first well, NGT245 E to install the production casing and allow logging to commence at NGT245 D. The drill rig will return to NGT245 D to install the production casing in this well once this activity is completed at NGT245 E.

The installation of production casing will allow both NGT245 E and NGT245 D to be further evaluated including flow testing and gas sample compositional analysis once the production casing has been installed in both wells.

The management comments provided with the announcement of the second hole included the observation that given the, as expected, exceptionally low reservoir pressure in this area, the flow of gas to the surface in the first well while drilling was an encouraging, albeit unexpected surprise. It is expected that both wells will need some time after the casing has been installed for the reservoir to stabilize ahead of production testing in the coming weeks.

The production testing will provide critical insights into the ongoing development of ER315. The results will inform key decisions regarding well interference, spacing, and the future submission of additional Production Right applications to the South African authorities.

CapEx

The capital costs for D3E are conservatively around US$200,000 for a tied in-well, including gathering system to the plant. A full LNG and liquified Helium plant to process 6 MMscfd of feed gas might be around US$60-80 million, with CNG being less expensive. This would produce around 5 TJ/day of natural gas and 280 M cfd of helium.

Such numbers do not take into account the economies of scale, which would be significant in a full development scenario.

Transport

A decision to be made will be whether the Helium will be trucked to port using its own the truck fleet or that of third parties. Management at D3E is in discussions with third parties for the truck fleet but hasn't ruled out operating the trucking themselves.

Then there is the issue of how many trucks might be required? This depends on the distance to market, but management advised that it would be around eight trucks for the 5 TJ/day case outlined above. And the distance travelled would, in this case be for a customer ~250 km away from the plant.

Delivery costs depend on the distance travelled and the type of gas as one can fit five times more LNG (1000 GJ) into a trailer then CNG (200 GJ) but this equates to an ex-plant cost in the range of US$9-$20 per GJ.

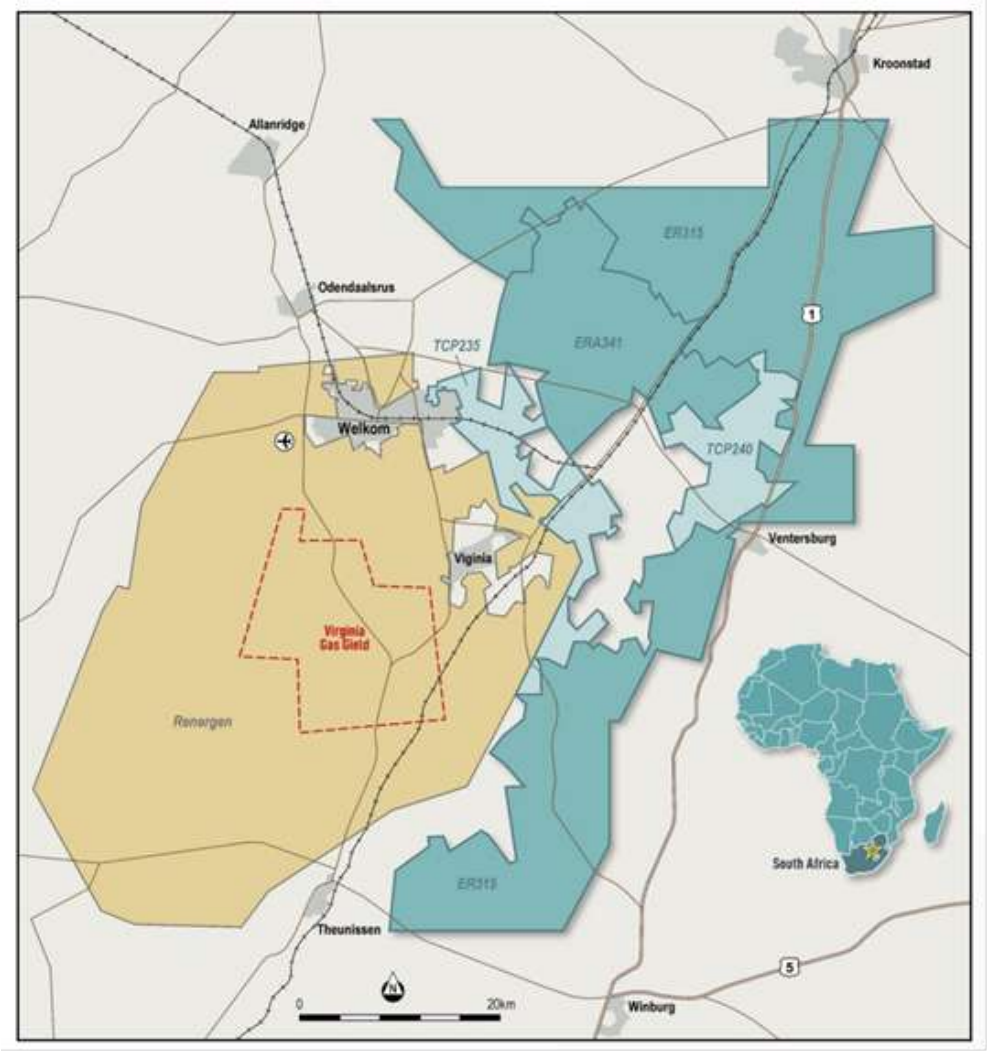
Tax Situation

The ER315 License is subject to a 5% government tax as described in the Mineral and Petroleum Resource Development Act of 2002.

On ASP Isotopes & Renergen

An important comp for D3 Energy is the formerly ASX-listed Renergen Limited (ASX: REN). It also had a JSE listing until its takeover in late 2025 for around US$110mn.

This company is/was a South African alternative energy company that produces liquefied natural gas (LNG) and liquid helium. Its primary asset is the Virginia Gas Project in the Free State, holding the country's only onshore petroleum production right. The Virginia Gas project has also recorded significant Helium concentrations. The Renergen concessions lie to the west of those of D3E, as shown on the map below:



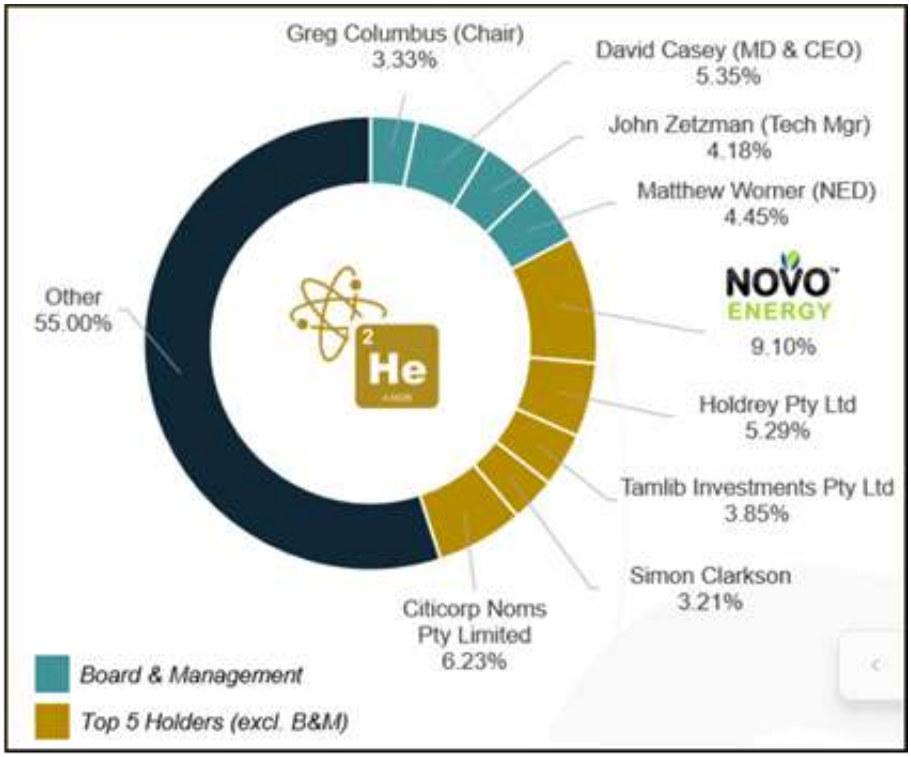
In early January of 2026, Renergen was acquired by the advanced materials company, ASP Isotopes (Nasdaq: ASPI) in an all-stock transaction. The details of the transaction, the implications and the interesting twist in strategy subsequently are detailed in Appendix III of this Initiation.

Implications of the Noble Africa RTO

With ASP Isotopes´ newly acquired helium assets headed back to market in a US-listed entity (Noble Africa) with sufficient cash to realise Phase 2, the equation of natgas/helium in D3E´s neighbourhood takes a dramatically different turn. Even a significant multiple to D3E´s current valuation, Noble Africa looks like a potential predator prowling the veldt and D3E looks like potential prey.

Shareholders

Below can be seen the state of the shareholder base of the company at the current time:



It is worth highlighting that the largest shareholder of record (with just under 10%) is NOVO Energy, an integrated energy and technology company and licensed gas trader with a focus on:

- Procurement and development of methane-rich gas sources
- Establishment and ownership of gas infrastructure (CNG/LNG/Pipelines)
- Provision of turnkey customer solutions (industrial, NGV, power generation and feedstock)

Financing

The company's most recent financing was in late March of 2026 when the company announced that it had secured firm commitments to raise gross proceeds of AUD$6.12mn through the issue of 17,000,000 new fully paid ordinary shares at an issue price of $0.36 per new share.

The placement saw substantial excess demand, was strongly supported by new and existing high net worth and institutional investors. This was the first capital raising undertaken by D3 Energy since listing on the ASX in May 2024.

The issue price represented a 15% discount to the 15-day VWAP of AUD$0.42 and an 80% premium to the IPO price of AUD$0.20 per share.

There were options attached to the financing with each option entitling the holder to subscribe for one share upon exercise of the option. The terms for the exercise price were:

- the amount payable upon exercise of each Option will be $0.54
- the expiry date of the options will be 5:00 pm (WST) on the date that is three years from the date of issue

Board & Management

The company´s board is currently quite small with only three members. This is not unheard of in Australia but certainly would need to change with a leap to a listing in a US market, for example. Forming board committees is very difficult with such small numbers and appointing a director who is also an officer (and thus executive) would unbalance the board in a way that would raise governance issues.

Interestingly, the board is a continuation of the team from Talon Energy and Warrego Energy.

Greg Columbus, Non-executive Chairman, has 15 years' experience as managing director and main board Director for Clarke Energy Limited, being a privately owned multinational company in the sale, engineering, installation and maintenance of power plants that utilise gas compressors and gas engines. Clarke Energy is a wholly owned company of the Kohler Group and operates in over 28 countries today.

He was Chairman of Warrego Energy (ASX:WGO), an oil and gas exploration company with assets in Western Australia and Spain. Warrego's main asset is a 50% interest in the West-Erregulla gas discovery in Western Australia. Warrego was acquired in 2023 by Hancock Energy for a cost of around $440mm. He was formerly Non-executive Chairman of Talon Energy (ASX:TPD) until its acquisition by Strike Energy Limited in December 2023.

David Casey, Managing Director & CEO, has over 30 years' experience in the oil & gas sector and was the former Managing Director and CEO of Eastern Star Gas (ASX: ESG) where he was instrumental in the appraisal, development and commercialisation of the Narrabri Gas Project in Northern NSW. ESG grew

to be an ASX 200 company until it was taken over by Santos for AUD$924 million. He was CEO Australia and Asia Pacific at Warrego Energy, and a former Managing Director and non-executive director of Talon Energy.

Matt Worner, non-Executive Director, is a former lawyer, with extensive experience in the oil and gas sector having worked in various legal, commercial and Company Secretarial positions with ASX listed companies. He was formerly a Non-executive Director of Talon Energy (ASX:TPD), Patriot Lithium Limited (ASX:PAT) and is currently a Non-executive Director of RBR Group (ASX:RBR) and Wolf Mining Pty Ltd. He is also a partner at VECTOR Advisors, a boutique corporate communication, investor relations and reputation management firm.

Risks

It is worth enumerating some of the risks that may be faced:

- ✕ The War on Iran is resolved in short order
- ✕ Helium prices collapse or just trend lower shaking investor confidence
- ✕ South Africa holds both enormous economic potential and a frequent ability to sabotage that potential

Helium prices have been driven since February by the war. But what happens should the war end? The most operative question is how much more destruction will be rendered upon Gulf helium production before the protagonists call a halt. One irony of the difficult situation of Qatar finds itself in is that US helium producers profit from the damage in the Gulf. This has not escaped the attention of the Qataris who appear, by quite a few accounts, to have cut a sotto voce deal with the Iranians to be spared any more destruction. Thus, even before the US eventually waves the white flag, the damage to Qatar will have been delimited. Reopening of the Strait will get their product moving again. However, helium prices may not retreat to pre-war levels as some production capacity has been knocked out.

The direction of Helium prices has been up in recent times due to the war and, secularly, as demand is strong in all markets and supply has been finite. At least in the US and Europe there appears to be a cartel in the space. That ensures orderly markets (as we saw for a long time in Lithium) or can degenerate into disorderly markets (as we saw when the Tin cartel collapsed last century.

South Africa has been expert at kicking own goals, economically and socially, since it freed itself from the apartheid shackles late last century. Reality has set in though in recent times and the political class (and the electorate) have realised that they cannot dine out on the grievances of the past any longer. The country needs energy and its is only by importing skillsets (and capital attached to those) that the country can avoid the threat of the “gas cliff” and actually drag its rather backward energy infrastructure into the 20th century, let alone the 21st century. That is not to say that the dead head of BEE may not be laid upon those companies eventually moving the energy space forward.

Investment Thesis

D3 Energy's project is a key chess piece in the game of moving South Africa's economy forward. To put it bluntly, the company's work is vital for a country facing severe energy shortages. Its focus on identifying and developing natural gas reserves supports the country's transition toward a more reliable and sustainable energy while its helium product line is an export earner and very much suits the needs/wants of Asian nations, not to mention fellow BRICS member, China.

Helium is hot (somewhat of an oxymoron). The US decision to sell down its stockpile late last decade was an ill-considered move that has provided the greatest sea-change in the helium space since the World War II. The rising use of Helium as a cooling agent in server farms (ergo linked to the rising Cloud) combined with its critical role in semiconductor manufacturing, medical and defense purposes make it a gas to be not only coveted but defended against potential shortages or Chinese domination.

The resource/reserves identified in the Free State, thus far, provide D3 Energy with one of the world's most significant new helium provinces. Who would have thought of South Africa as an important new contributor to global noble gas supplies? This development is entirely new and one which is becoming increasingly important given its Southern Hemisphere location and the geopolitical tensions in the Middle East, which are expected to constrain world helium supply for years to come.

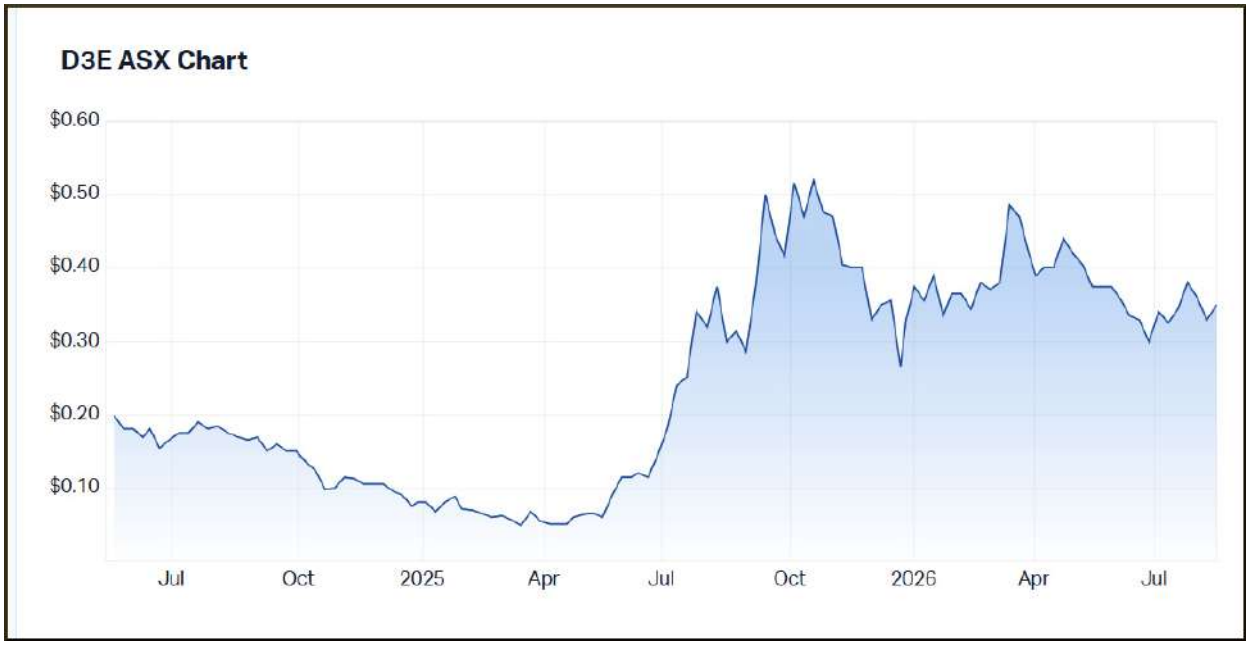
Rating & Target

The "Helium Crisis" of 2026 has done much to juice up the helium price and scant to propel the valuations of putative helium producers towards higher valuations. The fog of war has enshrouded investors in confusion as to how to play this move. Some naively think that all that is needed is an end to the current conflict and then we shall return to business as usual. With Qatar, the lead swing producer, being a wounded wildebeest at this point, there is no such thing as business as usual. The Gulf will never be the same again, just as Europe was "never the same again" after the First World War.

The (helium) earth will be inherited by those that can provide production from geographically untroubled jurisdictions. And when South Africa is recognized as untroubled then you know that a major sea change is upon us.

Frankly, D3 Energy is a tasty snack. A Chinese company could snap it up. Or one of the helium "mafia" making the almost inevitable decision that they need to be vertically integrated to protect their future supplies. With Renergen gone (for now) from public markets, D3E is the most bite-sized offering out there, that is not in North America. Its takeover is almost inevitable.

We are thus adding D3E to our Model Resources Portfolio with a **LONG** rating and a 12-month target price of AUD$1.13.


D3E ASX Chart
$0.60
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Jul
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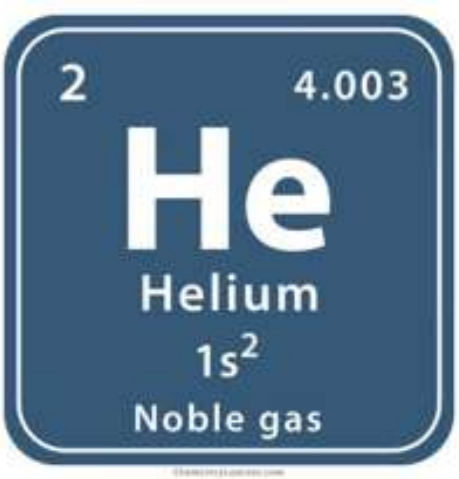
Sunday, August 16, 2026

APPENDIX I:

On Helium

Some Background

Helium is named for the Greek Titan of the Sun, Helios. It is a chemical element with the symbol He and atomic number 2. It is a colorless, odorless, tasteless, non-toxic, inert, monatomic gas, the first in the noble gas group in the periodic table. Its boiling point is the lowest among all the elements.



Helium was first detected as an unknown, yellow spectral line signature in 1868. The formal discovery of the element was made in 1895 by two Swedish chemists, Per Teodor Cleve and Nils Abraham Langlet, who found Helium emanating from the uranium ore, cleveite, a variety of uraninite.

Previously, terrestrial Helium—a non-renewable resource because once released into the atmosphere, it readily escapes into space—was thought to be in increasingly short supply. However, recent studies suggest that Helium produced deep in the earth by radioactive decay can collect in natural gas reserves in larger than expected quantities, in some cases, having been released by volcanic activity.

Uses

Helium's well-known, but actually quite minor use, is as a lifting gas in balloons and airships. Liquid Helium is used in cryogenics (its largest single use, absorbing about a quarter of production), particularly in the cooling of superconducting magnets, with the main commercial application being in MRI scanners. There is no substitute for Helium in cryogenic applications, where temperatures below –429°F are required.

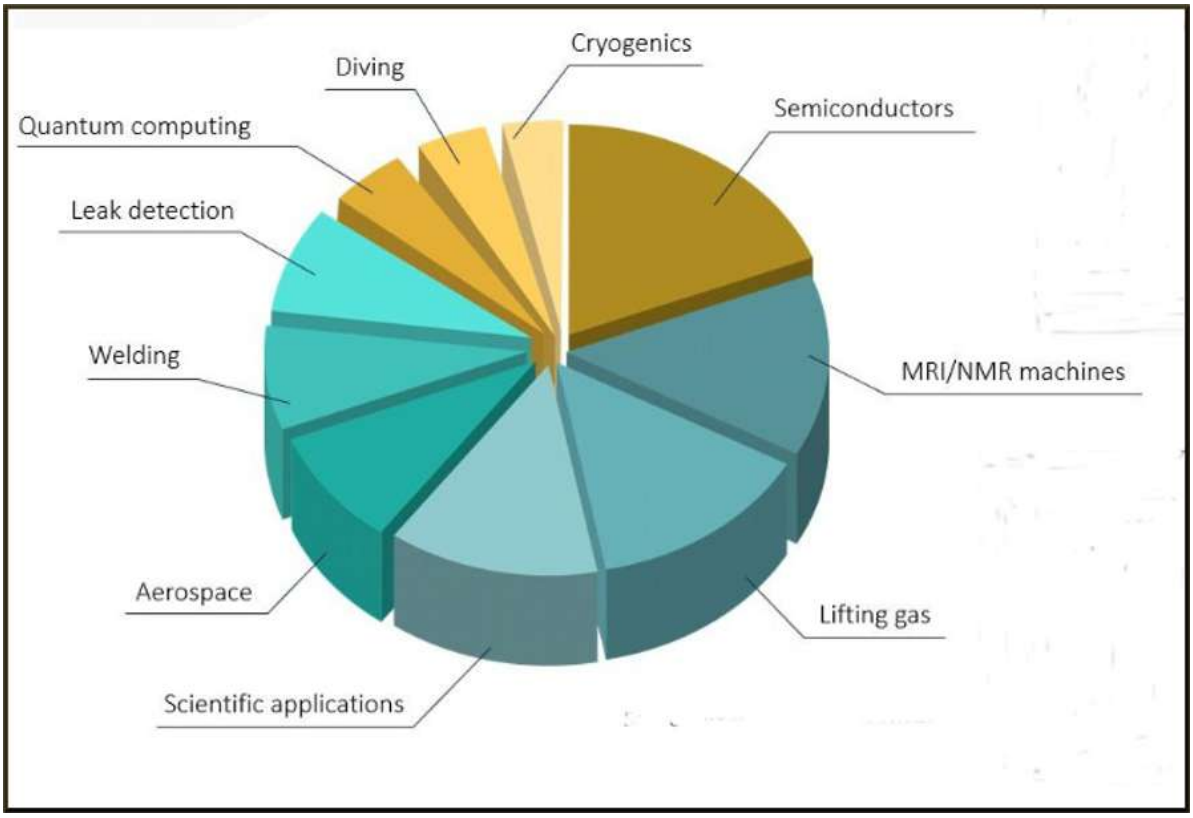
Hot on the heels of that application is the crucial role in microprocessor chip manufacture, creating and maintaining the environments for growing crystals to make silicon wafers. This is a battle ground for the

near future with the US tightening the screws on China with regard to access to chip technologies.

Helium's other industrial uses include, as a pressurizing and purge gas, as a protective atmosphere for arc welding and in fibre optic cables, microscopes and airbags.

Helium has uses in the space industry, where it is used to keep satellite instruments cool and clean out rocket engines. Helium is used as a cooling medium for the Large Hadron Collider (LHC). A mixture of 80% Helium and 20% oxygen is used by deep-sea divers.

At the global scale applications looks like:

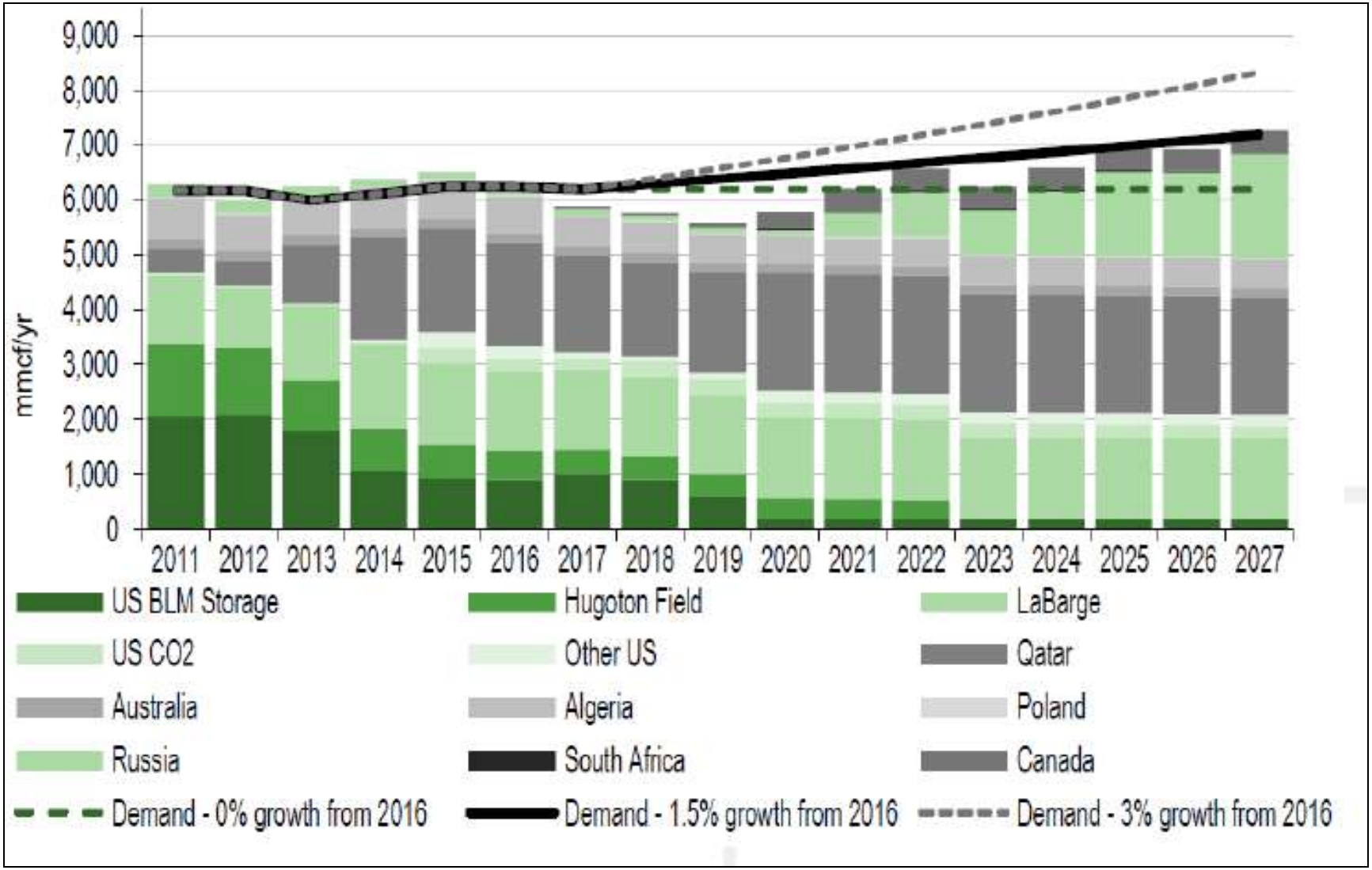


Source: Akap Energy (Feb 2024)

In scientific research, the behavior of the two fluid phases of Helium-4 (Helium I and Helium II) is important to researchers studying quantum mechanics (in particular the property of superfluidity) and to those looking at the phenomena, such as superconductivity, produced in matter near absolute zero.

Global Players

The USGS estimates that the various Helium-endowed gas fields in the US contain around 3.9 billion cubic metre^3 (140 billion cubic feet) of Helium. It then estimates that the Helium resources of the world, exclusive of the United States, were around 31.3 billion cubic metre^3 (1.13 trillion cubic feet).



Source: BLM/USGS

The global helium scene has been transformed since the US´s BLM got out of the business of Helium production. Although Helium was known in many other places (e.g. it had been produced in Poland since communist times) it was the BLM exit, coinciding with the surge in usage in semiconductor manufacture and other offshored tech adjacent activities, particularly in Asia, that opened the field dramatically. As the US turned inwards (or rather abandoned a role) in Helium production, storage and marketing the field was left open for new players.

The locations and volumes of the major deposits at the current time according to the USGS are:

- Qatar 10.1 bn m^3
- Algeria 8.2 bn m^3
- Russia 6.8 bn m^3
- Canada 2.0 bn m^3
- China 1.1 bn m^3

Beyond taking the USGS´s grasp of the Chinese internal situation with way more than a pinch of salt, we would note that other major natgas producing areas have scarcely looked at their own Helium potential. South Africa has clearly been underestimated, while Australia and, in particular, Argentina, may have sizeable potential as well.

In essence there has been no shortage of Helium reserves at the global level, until the War on Iran erupted on the scene. The main differences are access to markets, processing capability and grade of the Helium component within the broader natural gas resource

Players – an Oligopoly

The Helium space has long been dominated, according to Kornbluth Helium Consulting, by the same old, same old that rule the roost in the industrial gases industry, with Air Liquide, Linde (that merged with Praxair several years ago) and Air Products controlling something like 85% of the market (each reputedly having be-tween 17-35% of the market). Then it is said that Matheson Tri-Gas has around 5% market share and the other names of much less weight are the Japanese companies, Iwatani and Taiyo Nippon Sanso (both with strong positions in Asia, but weak globally) and Uniper (with HQ in Germany) with all three having small market shares at the global level.

Of Helium distributors, the global major industrial gas companies hold semiconductor trade rights, such as Air Liquide, Linde/Praxair and Air Products, and vie with each other for market shares. However, after Linde and Praxair merged, the merged entity was believed to have become by far the market leader.

The Japanese companies Taiyo Nippon Sanso and Iwatani also participate in this semiconductor market with an estimated total share of 20% to 30%.

Asia in the Spotlight

This brings us to the Asian situation. It is these markets that have lent more heavily upon Qatari output as the US, in a manner of speaking, abandoned the field.

The motor for Asian demand is clearly in semiconductor manufacture. It is estimated that South Korea and Taiwan each hold about 18% of global semiconductor capacity, and Japan about 15%, per Nikkei Asia.

China's share would be, at best, a guesstimate and, at worst, a delusion. However, to say that Asian semiconductor production share is close to 70% of global production would not be erring too far.

The Taiwan Factor

Obviously, Taiwan must be a large taker of high-purity Helium for its massive semiconductor industry, particularly for wafer cooling, purging, and EUV lithography. While major foundries like TSMC maintain three-months to six-months of buffer inventory and robust internal recycling systems, a heavy historical reliance on Qatari imports has exposed Taiwan to severe regional supply chain vulnerabilities.

As noted, the Iran War and blockades around the Strait of Hormuz have disrupted major Qatari natural gas and helium processing facilities, threatening a third of global output upon which Taiwan has hitherto been a major consumer (reportedly sourcing 88% of supply from Qatar).

This has prompted some diversification to the U.S.: To offset risks, local industries and trade bodies have actively shifted import streams away from the Gulf toward alternative suppliers like the United States and Australia. But the US has shown itself to not only be unreliable (dare we say fickle) in its relations with Taiwan, not to mention somewhat predacious.

As far as local infrastructure is concerned, the industrial gas majors have continued expanding local footing, such as Air Liquide opening advanced materials facilities in Taichung, to better allocate and manage regional volume.

As the scale of Taiwanese production is so massive, the actual raw consumption per chip layer remains relatively low and closed-loop recycling plants limit the need for continuous virgin gas replenishment.

For the chip majors, the physical supply disruptions/stoppages have been largely mitigated via alternative sourcing. However, spot-market price spikes remain an ongoing cost pressure for fabrication plants.

China & Helium

The Chinese Helium market is almost an alternative universe, but the country has been an importer of US-sourced Helium over the last decade and the Japanese companies have filling and distribution centres in China.

Ostensibly, it appears like global Helium production and China are non-intersecting sets. The USGS has China's current production marked as "not available". This raises questions about where their reserves numbers for China come from and how reliable they might be.

The 2024 estimate of US Intelligas Consulting was that China made up the largest share of Asian demand for Helium at around 40%. It also noted that in 2024 the Chinese market was growing at an annual rate of 5%. At that time most of Chinese demand was being met by Qatar and Russia.

According to a report in the South China Morning Post (SCMP) in mid-2020, China was using more than 4,300 tonnes of helium per annum. We would presume (not discounting for the pandemic) that at a 5% growth rate, this would be around 5,500 tons by the end of 2025.

In the deteriorated state of relations between the two countries, particularly when it comes to strategic materials, it begs the question as to how China can advance its Great Firewall ambitions in terms of servers, and the Helium to cool them. With things "hotting up" in microchip manufacture/trade, the Helium supply situation also has the potential to impact China.

Surprisingly, China only opened its first facility to produce Helium at a commercial scale in July 2020. It was located inside a natural gas processing plant in Yanchi county, Ningxia, according to a statement from the Chinese Academy of Sciences (CAS), which designed and built it.

The SCMP reported that scientists working on the project expect the annual output to reach 20 tonnes, in the form of liquid Helium. The cost of the plant was low, at around 30 million to 50 million yuan (US$4.3mn to US$7.1mn) thereby putting self-reliance in reach if such plants are replicated in other gasfields that are endowed with Helium.

It's worth noting though that it seems China's natgas is not as rich in Helium as the fields in the US.

However, a research team with the CAS's Technical Institute of Physics and Chemistry in Beijing found there was a considerable amount of helium in the waste product of Chinese natural gas plants.

When methane becomes a liquid at low temperature, the Helium stays in the air and concentrated, forming a waste substance known as boil-off gas. While Helium makes up only about 1% of that boil-off gas, it is enough to extract, according to the Chinese, at a relatively low cost. Separating the Helium from the boil-off gas required an extremely low temperature, and a cooling pump that previously had to be imported; it was the development of a domestic source for the cooling pump that gave the process viability despite its low grade. However, it sounds to be much, much lower margin than US production. However, we suspect the Chinese are prepared to tolerate poor (or no) margins for the resource dependence this process delivers.

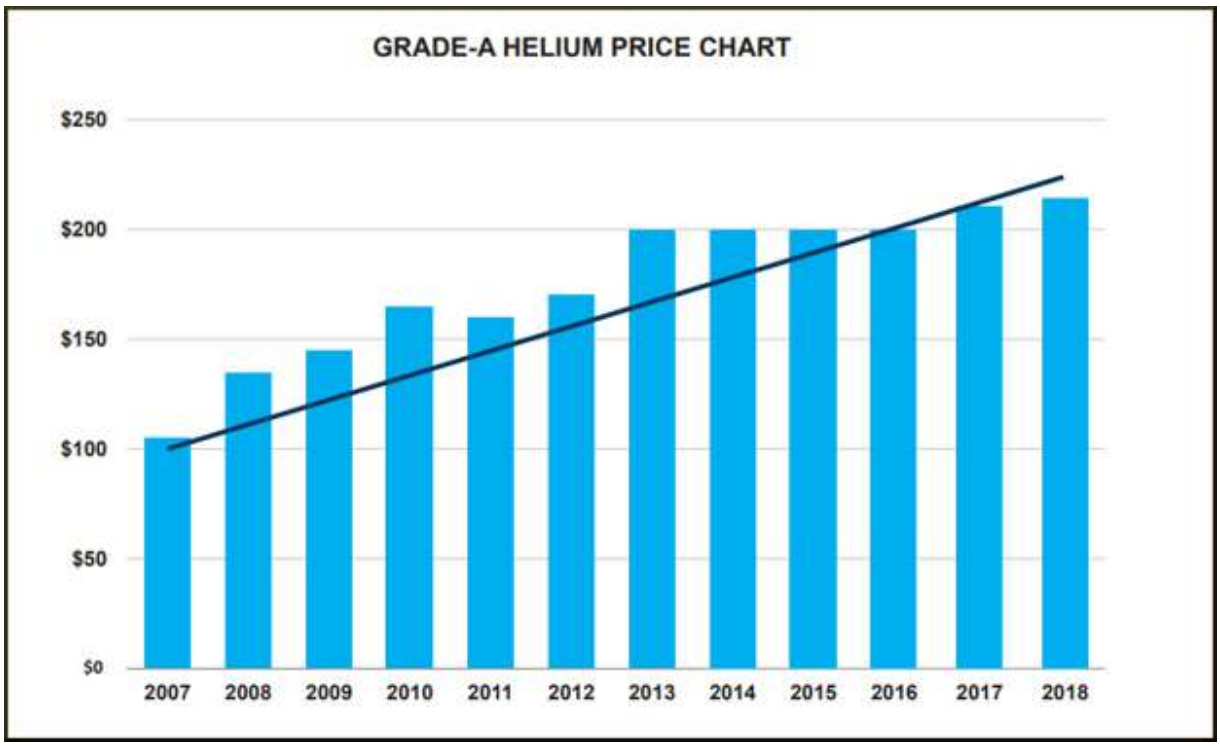
The fear for Chinese Helium users has been that in a tit-for-tat action when China blocked the export of Rare Earths to the US then the US would choke off Helium supplies to China. The start of the process of domes-tic extraction within China decouples the country (and its server farms to maintain the Great Firewall) from the global Helium market dominated by Western players and puts China at a further

remove from the US. However, buying from a fellow BRICS member like South Africa would definitely be a "good look" for China, not to mention being self-serving.

Pricing

The price of Helium in the US market is essentially the force that sets the price in the rest of the world (though the US government seems determined to abdicate holding in its hand this important lever).

The Helium Privatization Act (HPA) of 1996 outlined plans for the BLM to sell off the majority of its Helium reserves at a formula-driven sale price. This ended up being lower than the market price of Helium which consequently encouraged overconsumption and discouraged new Helium production.



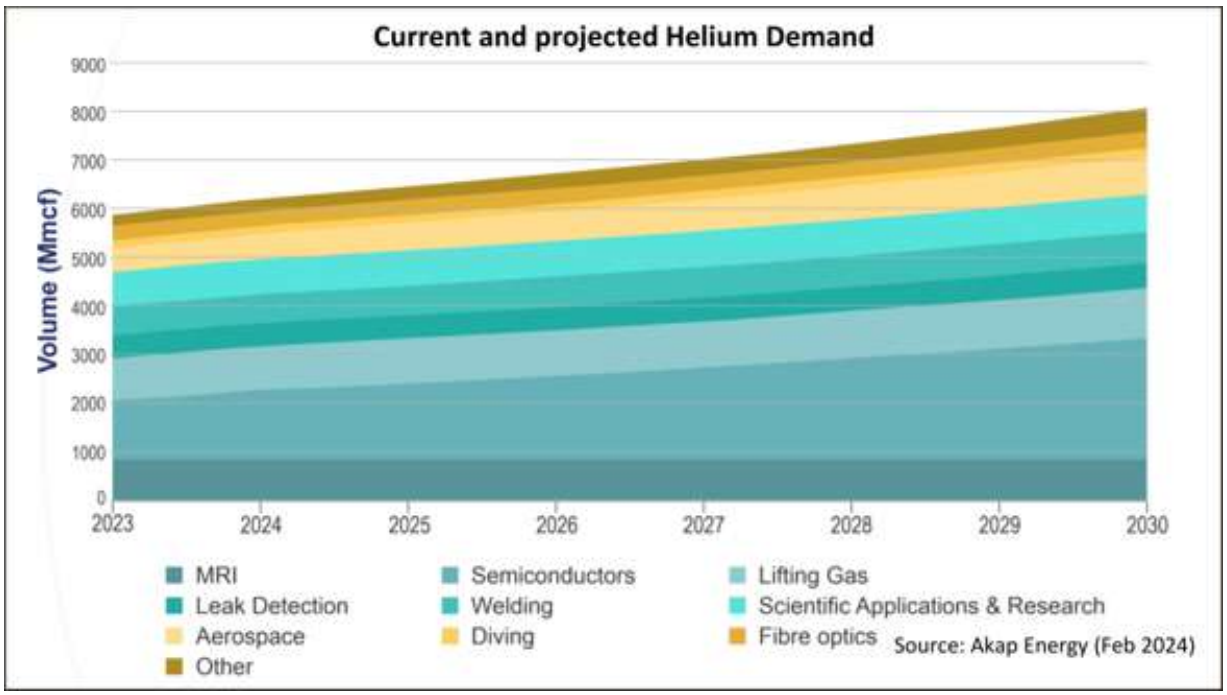
Source: USGS

The USGS reported that in FY19, the price for crude Helium to government users was $3.10 per m^3 and to non-government users was $4.29 per m3. The price for the government-owned Helium is mandated by the Helium Stewardship Act of 2013 (Public Law 113–40) and determined through public auctions and industry surveys. The last year Helium prices were posted by the Federal Government was in 2018. The estimated price for private industry's Grade-A Helium was about $7.57 per m^3, with some producers posting surcharges to this price.

Demand

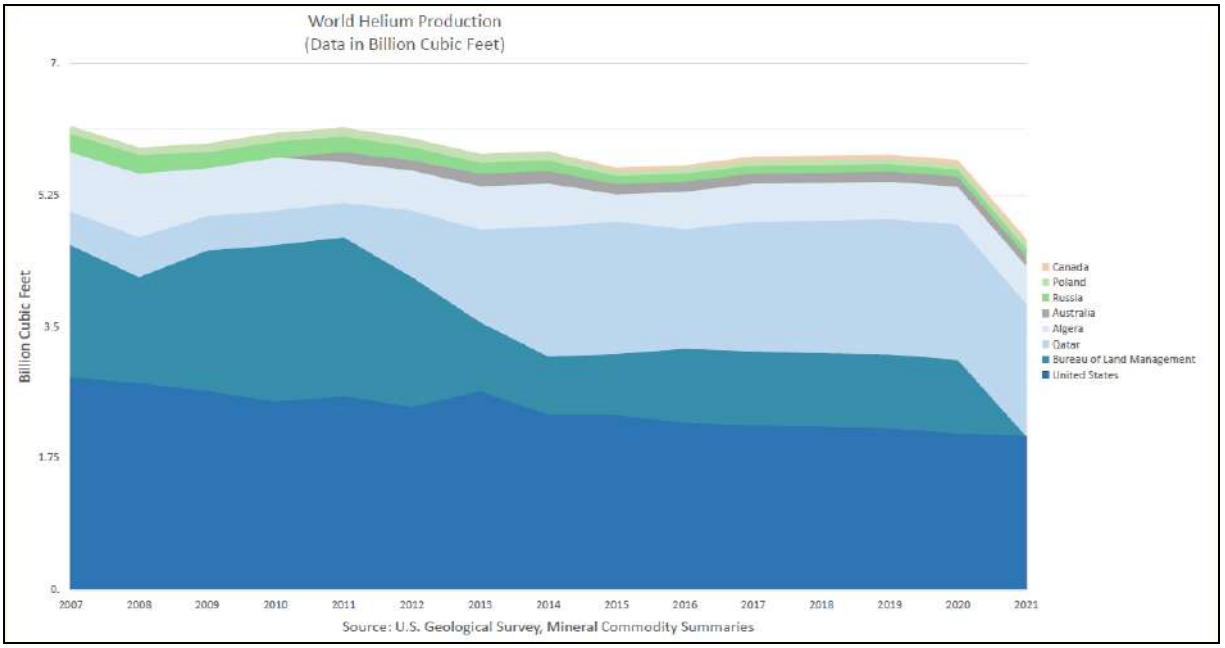
The least one can say it that the gradual rise in demand makes the current supply situation less bad than

it might be.



Source: Akap Energy – February 2024

Looking further back one can see (again USGS/BLM) that the global helium scene is responsive to greater forces.



As the preceding chart shows global production took a beating from the pandemic (and global microchip production retreat). What part of this was chicken and what part was egg, it still not clear even in retrospect.

A Political Football – Not Yet

Despite China's claims that "it is the West which started it", looking at the subject of export bans and restrictions, it is usually China that kicks off first. However, with a fairly weak positioning in Helium, the Chinese have no high ground here. There are no export bans on Helium from the extant global producers, that we know of, however the USGS reports that the European Union and the United States had imposed sanctions (effectively an import ban) on Helium from Russia which continued into 2025. One could however view this with a modicum of cynicism as this just helps the US, in particular, keep Russian production out of the reach of western consumers and underpins prices for US producers.

Substitutions?

It's worth noting that Argon can be substituted for Helium in welding, and Hydrogen can be substituted for Helium in some lighter-than-air applications in which the flammable nature of Hydrogen is not objectionable. Hydrogen is also being investigated as a substitute for Helium in deep-sea diving applications below 1,000 feet.

Final Thought

As we have noted elsewhere, things (economic, geopolitical or militarily) almost never return to their state of play before the military conflict of size. With 50% of Helium production, and an even greater share of the global helium trade, having been disrupted thus far by the Iran War, compounding the earlier effect of bans on Russian helium exports.

How the cards will fall when the conflict is over is difficult to project but we cannot see a situation where new producers in non-Middle Eastern locations will not be advantaged in some way or another. South Africa as a BRICS nation is sitting pretty to be viewed as a preferred supplier by consumers such as China.

APPENDIX II:

NatGas in South Africa

NatGas in South Africa – Running on Empty

Natural gas has historically contributed only in a relatively small way to the South African economy but has the potential to be transformative economically and socially. The current contribution of gas to the energy economy, according to Prime Africa Consult, is 155.3 PJ (5.1% of the energy economy). This market predominantly is supplied by natural gas, imported from Mozambique, and Methane Rich Gas (MRG) (a synthetic gas manufactured by Sasol). Other sources of gas, such as production landfill gas and biogas are estimated not to exceed 1PJ/a as of 2024.

Of the 155.3 PJ, approximately 64%, or 99.2 PJ, is used internally by Sasol Ltd, and the remaining approximately 36%, or 56.1 PJ/a, used by other markets.

The Challenges

The South African gas economy remains constrained by the supply of gas, both in volume (limited pipeline capacity) and geographically (limited pipeline distribution network). The energy economy is gas supply constrained due to the limited capacity and declining production of the Pande Temane gas resource in Mozambique, from where 86% of South Africa's gas is sourced. The remainder of gas is a synthetic gas, termed MRG, produced by Sasol. Other domestic gas resources are small or insignificant, likely less than 1 PJ/a.

South Africa has been suffering from an ongoing energy crisis as the result of:

- ✕ inability of the state-owned power utility Eskom to produce sufficient electrical energy
- ✕ steeply increasing electricity prices associated with multiple constraints in the electricity supply chain
- ✕ increased coal prices resulting in increased costs of thermal energy
- ✕ closure of four of its six oil refineries resulting in import of expensive final products

- ✕ severe currency depreciation exacerbating the costs of imported liquid fuels
- ✕ the inevitable approach of the end of life of the Pande Temane natural gas field

This “perfect storm” of factors coalesces to create a demand for new sources of gas supply.

It is estimated that current demand, outside Sasol, would require approximately 65 petajoules of natural gas per year, rising to about 185 petajoules per year if Sasol's own needs are included. The government's gas master plan forecasts gas-to-power demand of about 870 petajoules per year by 2032.

Pricing

Gas prices are regulated by the National Energy Regulator of South Africa. The regulatory regime enables safety, environmental, operational and price certainty in the market and has a precedent for domestic gas production.

Current retail gas prices in South Africa vary between US$7.30 – ca US$16.00 per GJ. The variations result from varying gas sources, varying transport costs and whether a CNG virtual pipeline application is involved. These prices compete well with the available alternatives.

The Upside

As noted, hitherto natgas in South Africa has been focused upon distribution to industrial users (where they are in proximity to the pipeline network) and NOT on the household market.

The current gas market is oriented towards the existing gas transmission and distribution pipeline system. Over the past 10 years an off-pipeline CNG market has also emerged. Together, these conventional and “virtual” pipelines provide sufficient gas logistics infrastructure for monetising domestic gas assets.

While South Africa’s oil and gas sector is in the early development phase, it nevertheless has the potential to create significant value for the country in the longer term. It is estimated that South Africa has potential resources of approximately 9 billion barrels of oil and 11 billion barrels oil equivalent of gas.

The Current Network

South Africa’s domestic gas pipeline network is largely localized and heavily reliant on a single cross-border pipeline. The cornerstone is the 865-km Mozambique-South Africa pipeline (ROMPCO), which delivers natural gas from the Pande and Temane fields to Secunda.

The current state of infrastructure and distribution is:

- Mozambique-South Africa Pipeline (ROMPCO): Jointly-owned by Sasol and the governments of South Africa and Mozambique, this cross-border pipeline transports gas to the Secunda hub.

From here, it supplies nearly 90% of South Africa's natural gas demand to industrial hubs across Gauteng, Mpumalanga, and the Free State.

- Sasol Gas Network: From the Secunda hub, Sasol operates an extensive internal pipeline grid stretching thousands of kilometers. This network delivers reticulated natural gas directly to hundreds of industrial and commercial clients in and around Johannesburg, Ekurhuleni, Pretoria, and Sasolburg.
- Lily Pipeline: This pipeline extends from Secunda down to the east coast in Richards Bay, primarily supplementing supply and feeding regional industrial users.

The existing network though is very Mozambique-oriented, and it is recognized that South Africa is facing declining supply from the mature gas fields in Mozambique that currently underpin most pipeline imports. This increases the focus on alternative supply arrangements, including liquefied natural gas imports.

Chief amongst these is a gas import and distribution network centred on Richards Bay, which could support industries in KwaZulu-Natal that rely on gas feedstock while creating the foundation for a broader regional gas economy.

Focus from the Top Down

In 2012, the Cabinet adopted the National Development Plan (NDP), which provided South Africa's plan to accelerate infrastructure development in order to address service delivery backlogs and facilitate economic growth and job creation. An initiative called Operation Phakisa was designed as a fast results delivery program, launched in July 2014, to help implement the NDP.

In mid-June of 2026, in a keynote speech at the Africa Energy Forum in Cape Town, the CEO of Eskom, the national electricity company, Dan Marokane, declared that South Africa was "closer than ever to getting gas-to-power projects off the ground". He posited that the country has a unique opportunity to use gas to strengthen energy security, support industrial growth and accelerate the expansion of renewable energy.

Of course, this is not the first time that the country has made a run at this challenge, such as Operation Phakisa. He said a combination of policy alignment, infrastructure planning and growing recognition of gas's role in modern electricity systems had created conditions that were more favourable than in previous attempts to establish a gas-to-power industry.

In the publication, Engineering News, it was reported that he said: "This is the closest we have ever been to having a perfect opportunity of landing gas-to-power in the country. "It has been tried many times, and the conditions and the thinking were not ideal. We really have a lot of things on our side this time, and we dare not lose the moment."

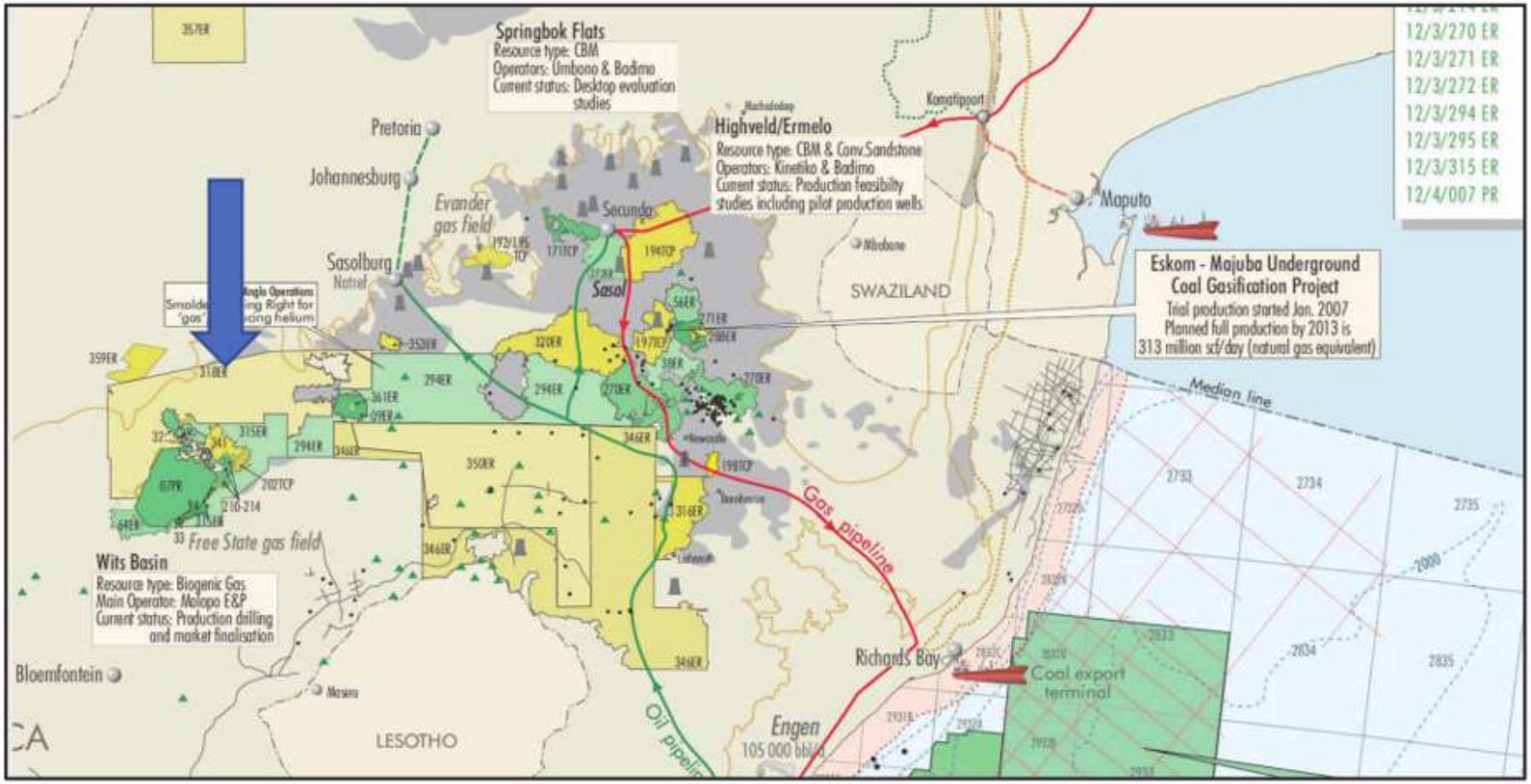
The Independent Power Producer Office claims that there has been strong investor interest in South Africa's inaugural gas-to-power procurement program, with the first procurement round having attracted four bids, representing 2813 MW of capacity against a target of 2000 MW.

Eskom currently relies on diesel-fired open-cycle gas turbines during periods of system stress, but gas offers a significantly cheaper and more sustainable long-term fuel source. Meanwhile, gas-to-power projects could unlock broader industrial and economic opportunities by creating anchor demand for gas infrastructure and supporting manufacturing activity.

Unlike renewable-energy projects, which primarily require generation facilities and grid connections, gas projects require an entire value chain to be developed simultaneously, including fuel supply arrangements, import and storage infrastructure, transportation networks, environmental approvals, grid access and long-term commercial agreements.

South Africa's Integrated Resource Plan 2025 calls for 6000 MW of gas-to-power capacity by 2030, with 3000 MW expected to come from independent power producers (IPPs) and a further 3000 MW from Eskom.

Eskom is advancing its own gas-to-power plans and recently signed a *heads-of-agreement* linked to the proposed Richards Bay gas development.


Springbok Flats
Resource type: CBM
Operators: Umbono & Badimo
Current status: Desktop evaluation studies
Highveld/Ermelo
Resource type: CBM & Conv.Sandstone
Operators: Kinetiko & Badimo
Current status: Production feasibility studies including pilot production wells
Eskom - Majuba Underground Coal Gasification Project
Trial production started Jan. 2007
Planned full production by 2013 is 313 million scf/day (natural gas equivalent)
Wits Basin
Resource type: Biogenic Gas
Main Operator: Molopo E&P
Current status: Production drilling and market finalisation
Evander gas field
Free State gas field
Gas pipeline
Oil pipeline
Coal export terminal
Engen
105 000 bbl/d
Median line
SWAZILAND
LESOTHO
Pretoria
Johannesburg
Sasolburg
Secunda
Sasol
Natref
Kimberley
Bloemfontein
Richards Bay
Maputo
Komatipoort
12/3/270 ER
12/3/271 ER
12/3/272 ER
12/3/294 ER
12/3/295 ER
12/3/315 ER
12/4/007 PR

The Richards Bay project is expected to become one of the country's most significant gas infrastructure developments. Eskom has previously indicated that electricity generation from the project could begin from 2031, but there is a need to move quickly on key procurement decisions, including the ordering of long-lead equipment such as gas turbines.

The project is expected to become one of the country's most important gas infrastructure developments and forms part of Eskom's plans to introduce gas-fired generation capacity over the coming decade.

In Summary

South Africa has big energy plans and needs such plans of size to deal with a long legacy of underinvestment. But such plans are dependent upon either domestic sources of natgas/methane or imported LNG (the latter having negative implications for the balance of trade).

The onset of production of natgas/methane from onshore producers such as Noble Africa and eventually D3 Energy goes some way to mitigating import needs and adding to self-sufficiency. And if the Iran War has proven anything it is the peril associated with long supply lines for LNG from some of the world’s most trou-bled regions.

The authorities in South Africa are now of the opinion that gas should not be viewed merely as a backup fuel for renewable energy. Instead, they are looking to the examples of Australia and Spain, where gas is the backbone of expansion of renewable energy in terms of penetration in the energy mix.

While technologies capable of providing long-duration storage and dispatchable capacity continued to evolve, many remained economically challenging at scale. Gas-fired generation could therefore provide the flexible, dispatchable power required to stabilise the grid as variable wind and solar generation expanded.

The government in South Africa has sometimes had trouble in getting out of its own way and the travails of Eskom are well-known and a subject of conversation in international industrial (and mining) circles.

The advancement of the domestic natgas industry is seen as a key steppingstone for the South African government to address key issues such as industrial development and job creation and as an outcome reducing poverty, unemployment and inequality.

APPENDIX III:

The Morphing of Renergen

On ASP Isotopes & Renergen

As noted before the most important comp for D3 Energy is the formerly ASX-listed Renergen Limited (ASX: REN). It also had a JSE listing until its takeover in early 2026 for around US$110mn.

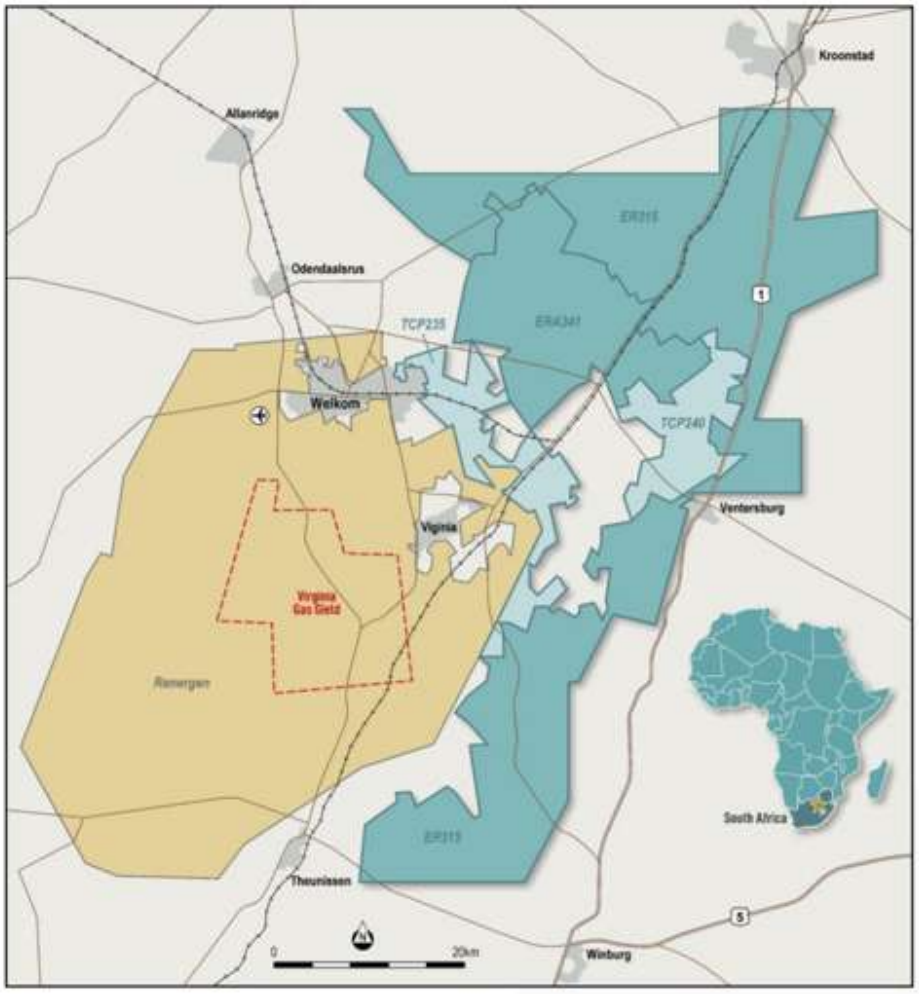
This company is/was a South African alternative energy company that produces liquefied natural gas (LNG) and liquid helium. Its primary asset is the Virginia Gas Project in the Free State, holding the country's only onshore petroleum production right. The Virginia Gas project has also recorded significant Helium concentrations.

Interestingly, at the early stages of D3's existence (and before proving up the potential of ER315) it was the successes and results at the Renergen projects nearby that fired the enthusiasm for the potential at D3's assets.

The Renergen Virginia Gas Field Production Right (07PR) lies immediately to the west of the ER315 license. The Virginia Gas Field was used as an analog for the style of gas trap and construction of type wells for ex-pected well performance within the Motuoane License. This exploration right covers a large area and con-tains multiple gas emitting boreholes drilled as part of mineral exploration activities. Several of these bore-holes are flowing gas at relatively high production rates and have been doing so for decades. Past work pro-grams involved the cataloging and sampling of the gas emitting boreholes, a soil gas geochemistry survey, and structural mapping. The gas emitting boreholes ("blowers") were drilled by mining companies to explore for gold in Witwatersrand formations which underlie the coal-bearing Karoo and Ventersdorp lavas. Some flowing wells were reportedly capped due to dangerously high gas emission rates.

As the report by Sproule (cited in the D3E prospectus) noted: "It is important to note that the number of his-torical boreholes drilled in or adjacent to the Motuoane License is by far outnumbered by the number of boreholes drilled towards the west. The Virginia fault in the Gold One area yielded large volumes of me-thane gas. The Virginia fault is present in the Motuoane License and constitutes a major gas target to be explored. The east-west striking gas-yielding fault on Gold One area can be extended into the Motuoane License. The gas potential of this fault and the one directly below it must be

considered as gas targets".



The map above shows Renergen's main holdings vis-à-vis those of D3E.

The Virginia field is noted for its high helium concentrations. It is notable that gas fields in the Middle East typically contain about 0.03% helium, U.S. fields about 0.3%, and Renergen's South African resource about 3% based on what the company has seen so far.

Renergen's project was assessed as having an independently-determined NPV of ~$1.7bn (minority stake-adjusted) by Sproule in 2021.

The Virginia Gas project has benefited from US$40mn of US government funding pursuant to a finance agreement with the U.S. International Development Finance Corporation (U.S. DFC) and is expected to fur-ther benefit from an additional US$500mn of senior debt funding from U.S. DFC and a US$250mn debt facili-ty from Standard Bank SA to expand plant production capacity in South Africa.

In recent years the U.S. DFC has partnered with the private sector to advance U.S. foreign policy and strengthen national security by mobilizing private capital around the world.

In early January of 2026, Renergen was acquired by the advanced materials company, ASP Isotopes (Nasdaq: ASPI) in an all-stock transaction. The acquisition of Renergen prompted thoughts that ASP Isotopes would thus become a global provider of liquid helium. This strategic acquisition integrated ASP Isotopes' ad-vanced enrichment technologies with Renergen's established helium and natural gas operations, which in their words positions “the combined company to address escalating demand in high-technology sectors”. The company has isotope enrichment facilities in Pretoria, South Africa, dedicated to the enrichment of iso-topes of elements with a low atomic mass (light isotopes).

The Next Iteration

Then in late June of 2026 it was announced that ASP Isotopes was planning to create a publicly-listed helium and LNG platform to be called Noble Africa. This is to be effected via the merger (an RTO) with ENDRA Life Sciences (NASDAQ: NDRA), with ASP expected to own about 89% of the combined company, while ENDRA's current float and a concurrent PIPE financing would own about 11%.

Management expects the deal to close in 4Q26 with completion depending on filing a Form S-4 with the SEC, SEC review, and shareholder votes on both sides.

ENDRA is effectively viewed as a shell and thus attractive as a merger partner. ENDRA has a clean capital structure, no debt, few warrants, few employees and limited long-term liabilities, making it suitable as a shell for a reverse merger. ENDRA's existing medical imaging-related businesses are non-core and would likely be divested, spun out or shut down so the combined company can focus on Renergen and Noble Afri-ca.

ASP Isotopes does not intend to spin out Noble Africa shares to ASP shareholders, saying the company views the asset as highly strategic and plans to maintain a large ownership position.

The Rationale

ASP’s stated goal is to maximise the value of Renergen's South African helium reserve. It described Phase 1 as nearly complete with a target of production in the third quarter.

- Phase 1 is expected to ship product by September and produce about 70 Mcf/day of helium plus 2,500 GJ/day of LNG
- Phase 2 is expected to be much larger, with expected revenue of about $370mn and support from government and bank funding

Phase 1 of the project is "almost complete" and expected to reach nameplate capacity during the third quarter. Renergen´s plant has produced liquid helium already, is shipping LNG already, and is in the process of connecting new wellheads to the plant through a gathering system.

Phase 1 is expected to produce about 70 Mcf per day of helium and about 2,500 gigajoules per day of LNG. The company expects to begin shipping product to customers by September of 2026.

Noble Africa will not be tied to historic agreements at earlier pricing levels and now has the ability to re-baseline contracts to current market conditions. Renergen recently concluded a new offtake agreement priced at more than $600 per Mcf and expects to lock up most Phase 1 helium molecules at similar pricing. This first signed contract is with an Asian customer and represents about 15% of Phase 1 output. The com-pany aims to contract about 75% of Phase 1 and about 15% of Phase 2 output.

Phase 2 is substantially larger, with expected production of about 900 Mcf per day of helium and about 34,000 gigajoules per day of LNG. The project is expected to take about 44 months to build and could begin commissioning in 2030, with the first full year of commercial revenue in 2031.

Using assumptions of $600 per Mcf for helium and $13 to $14 per gigajoule for LNG, Phase 1 would generate about $27 million in revenue and $10 million to $11 million in cash gross profit excluding depreciation and amortization. Under similar assumptions, Phase 2 would generate about $370 million in revenue and about $300 million in cash gross profit.

Phase 2 is expected to benefit from about $500 million of funding from the U.S. government and about $250 million from Standard Bank. Financing risk, construction risk and market risk are the key risks, with the com-pany expecting to mitigate construction risk through a turnkey contract with a plant supplier and market risk through long-term take-or-pay contracts.

LNG contracts are generally expected to run five to eight years, while helium contracts are expected to run 10 to 15 years. Both types of contracts are expected to include take-or-pay mechanisms at approximately 80% and price escalators tied to South Africa's Producer Price Index.

As noted earlier, current demand outside Sasol would require approximately 65 petajoules of natural gas per annum, rising to about 185 petajoules per annum if Sasol's own needs are included. He said the govern-ment's gas master plan forecasts gas-to-power demand of about 870 petajoules per year by 2032. To put this in perspective, Renergen's Phase 2 project would produce 12 petajoules per year.

Noble Africa will raise ~US$50mn of capital through the listing process.

Our Take

Noble Africa will most likely be on the prowl from the day it starts trading and the most obvious bite-sized target in close proximity will be D3 Energy.

APPENDIX IV:
Some Helium Comps

The Helium Comps

As can be seen from the table on the subsequent page there is such a thing as a "Helium Sector"; it is not exactly crowded, but it's not as empty as it was. However, if it was a phone booth there would be little room to move.

We can also note that there are a number of microcaps, which helps to discriminate the real from the unre-al, as investors have seemingly worked out which projects have lift-off ability and which do not.

The danger is always present of fakers entering a hot sub-space and they reared their ugly heads here in the first flush in 2020, but many went the way of all things.

We have seen some investors, who we thought knew better, rhapsodizing over some of the most flimsy and non-serious in the space, equating strong market caps with an actual intention to move to production. A souring of sentiment caused by the demise, collapse or embarrassment of one of these fakers is an ever-present danger. And this indeed is what happened with the collapse of Royal Helium and the eclipse of Heli-um One as a viable project.

The Low Barriers to Entry

There is little in the way of obstacles to getting into production in the Helium space. If one can build a pro-cessing/separation plant then one is potentially off to the races. It doesn't give one access to the Helium pipeline if one isn't in close proximity. Grade matters for the economics, but little else stands in the way.

The key determinant is going to be access to capital. One does not need a NI43-101 conjured up by mineral geologists, one instead needs reservoir engineers to opine on the potential size and grade of the gasfields under consideration. The separation itself is not rocket science.

Some of the new players are undoubtedly real (e.g. NASCO Energie & Rohstoff AG, Renergen) and the others are at various points along the spectrum from being merely a marketing "twinkle in the eye" of promoters to being at a point where they have secured concessions with proven reserves (e.g. D3 Energy) and just need to fund pro-cessing plants and then begin extraction.

The Helium Space

	Strategy	Ticker			Market Cap (mn)	Status	Project	Jurisdiction
Blue Star Helium	Neutral	BNL.ax		AUD	$33.84	Producing	Galactica Pegasus	Colorado, USA
Central Petroleum	Neutral	CTP.ax		AUD	$51.94	Producing	Southern Amadeus	Australia
Desert Mountain Energy	Neutral	DME.v		CAD	$20.74	Developer	Heliopolis	USA
Helium One	Neutral	HE1.L		GBP	£39.44	Developer	Rukwa	Tanzania
						Producing	Galactica Pegasus	Colorado, USA
Pulsar Helium	Neutral	PLSR.v	PLSR.L	CAD	$299.7	Developer	Topaz	Minnesota, USA
Avanti Helium	Neutral	AVN.v	ARGYF	USD	$63.41	Developer	Greater Knappen	Montana, USA
						Developer	Greater Knappen	Alberta, Canada
Helix Exploration	Neutral	HEX.L		GBP	£66.62	Developer	Rudyard	Montana, USA
D3 Energy	LONG	D3E.ax		AUD	$49.86	Developer	Free State	South Africa
Helium Evolution	Neutral	HEVI.v		CAD	$30.15	Developer	Mankota	Saskatchewan, Canada
Altura Energy	Neutral	ALTU.v	TTLHF	USD	$13.3	Developer	Holbrook	SW USA
First Helium	Neutral	HELI.v	FHELF	USD	$6.41	Developer	Worsley	Alberta, Canada
Rift Helium	Neutral	RIFT		GBP	£8.45	Explorer	Upepo	Tanzania
Unlisted								
NASCO Energie & Rohstoff	n/a					Producing	DBK	Texas,USA
Hotspur Helium	n/a					Developer		Jordan
Global Helium	n/a	HECO.cn		CAD		Developer		

As to which of the putative players with Helium in the name are dedicated to the gas in question or the mere production of hot air, only time will tell.

However, for those in production the kudos shall transfer to them at the point that “production is king” starts to be the motto in the Helium space. The takeover of Renergen being an example.

We are now in the midst of Helium 2.0. Let the best companies win.

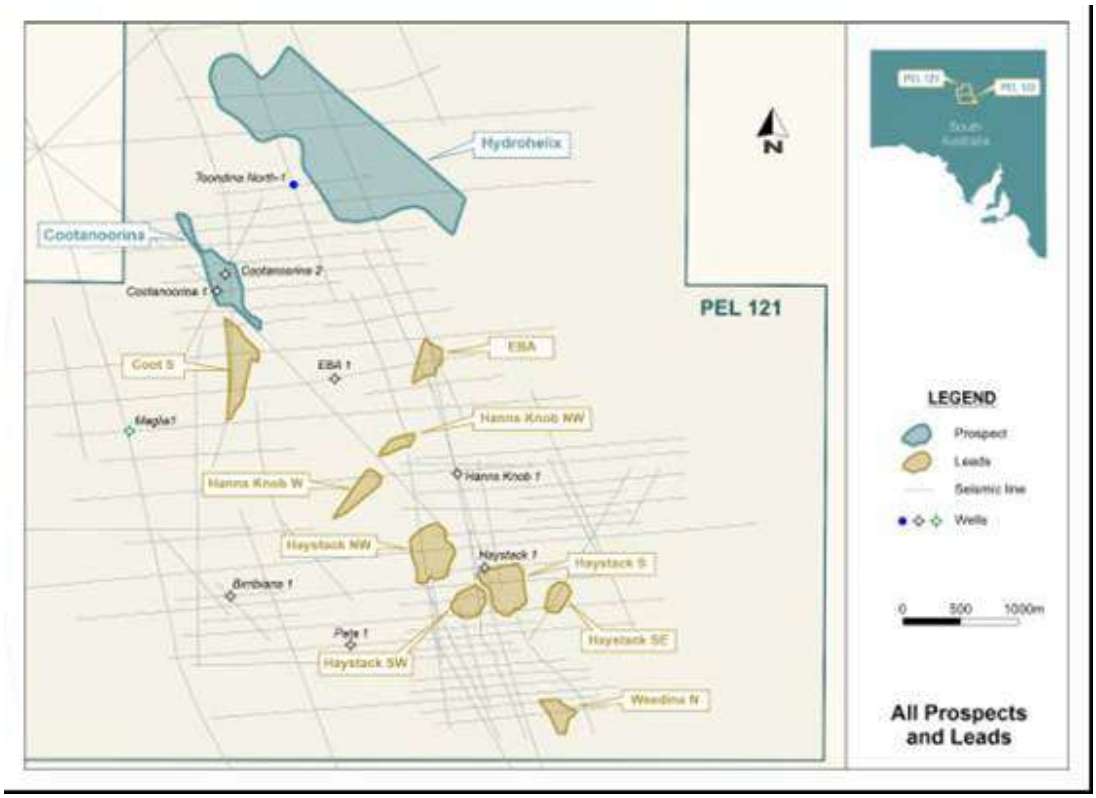
Sunday, August 16, 2026

APPENDIX V:

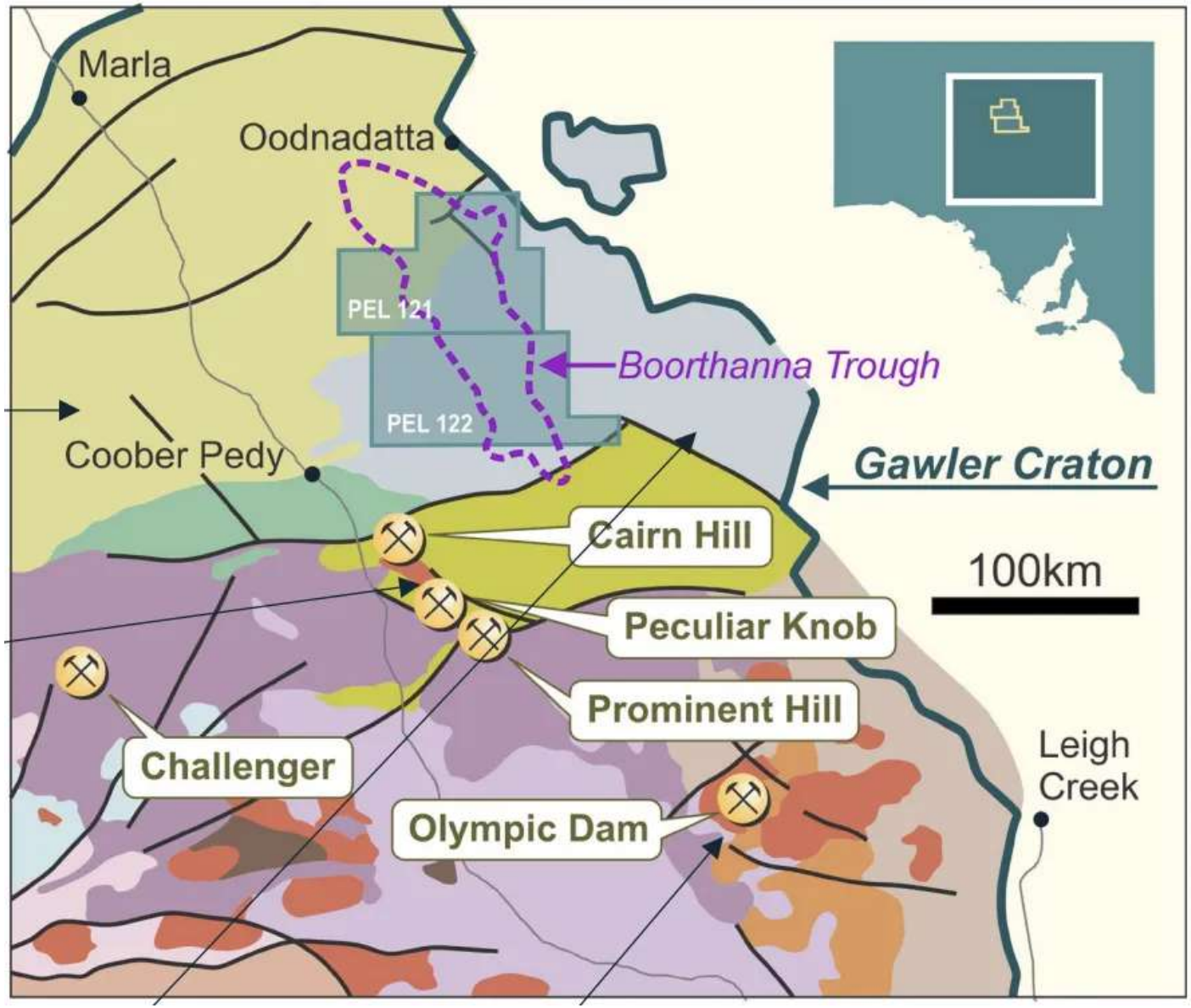
The South Australian Asset

Some Background

In June 2025, D3 Energy expanded into Australia, securing PEL 121 and PEL 122 in the Arckaringa Basin, South Australia. These permits are contiguous blocks with a combined area of 5,865 km2, situated in the Arckaringa Basin just south of Oodnadatta and to the north-east of Coober Pedy in South Australia.



The area around the permits in South Australia has become an exploration hotspot for helium and hydrogen in recent times, seeing a rush to acquire early-stage acreage positions as a result of positive regulatory changes, easy access to historical data and the identification of potential source rock ideal for the generation of both helium and hydrogen.


Marla
Oodnadatta
PEL 121
PEL 122
Boorthanna Trough
Coober Pedy
Gawler Craton
Cairn Hill
100km
Peculiar Knob
Prominent Hill
Challenger
Leigh Creek
Olympic Dam

Since the deal closed, D3 Energy has begun farm-out discussions for the Hydrohelix prospect to support future drilling activity.

On the Arckaringa Basin

The Arckaringa Basin covers an area of 80,000 km2 and is a lightly explored part of what some are terming “the emerging helium and hydrogen exploration region” in South Australia.

The Arckaringa Basin is similar to the Amadeus Basin, 250km to the north, where the Mt Kitty-1 well measured helium (9%), hydrogen (11.5%) and methane (13%). A second well, Magee-1 located further northeast, was drilled below the Gillen Salt and recovered helium (6%) and methane (39%). These two analogue wells are the only sub-salt penetrations in the region to date.

Key to the technical case in the Arckaringa Basin is the presence of a salt layer to provide an effective seal for helium and hydrogen. To date, the Arckaringa Basin has not had well penetrations deep enough to test the pre-salt sediments or fractured basement. Work undertaken by D3 Energy as part of project evaluation indicated the presence on seismic surveys of several salt structures thick enough to seal large offset faults.

The basement rocks underlying the Arckaringa Basin are part of the famed Gawler Craton. The craton is composed of three domains, each of which has the potential to be sources of helium and hydrogen.

These source rocks combined with a potential salt seal identified by seismic, provide early levels of confidence in the prospectivity of the Arckaringa Basin.

The Deal

The terms of the deal are that D3 Energy was to acquire 100% of the shares in Unleash Energy Pty Ltd free from encumbrances. The consideration for this transaction was:

- A one-off cash payment of $200,000, being equal to the financial security provided by Unleash to the regulator and which Unleash will retain the benefit of post completion
- 5,000,000 fully paid ordinary shares of D3 Energy

There is also a component of so-called Bonus Consideration Shares payable in two tranches to the shareholders of Unleash as follows:

- The first tranche is payable upon the announcement by D3 Energy of a contingent resource booking in respect of any regulated substance (i.e. helium or hydrogen) (as defined in the Energy and Resources Act, 2000 (SA)) within five years from the completion Date, D3 Energy shall issue Shares to the value of $250,000 calculated at the greater of $0.20 and the 5-day VWAP of D3E shares on the date the relevant condition is satisfied
- The second tranche becomes payable if a well targeting helium or hydrogen is spudded within

PEL 121 or PEL 122 within five years of the completion date. At that time D3 Energy shall issue Shares to the value of $250,000 calculated at the greater of $0.20 and the 5-day VWAP of D3E shares on the date the relevant condition is satisfied

The deal required approval by the Minister (since obtained) for the various assignments and transfers contemplated under the SPA. The SPA also includes terms and conditions including apportionment of liabilities, provision of representations and warranties, assignment of agreements and the like.

Exploration

The company's team has identified two early-stage exploration prospects, Hydrohelix and Cootanoorina. Both prospects sit within a system directly analogous to the Mt Kitty-1 well, which recorded helium concentrations of up to 9% and hydrogen concentrations of up to 11.5%, and have been matured on seismic data that maps the same combination of deep basement faulting, a high-quality Heavitree Sandstone reservoir and a regional evaporite seal that underpins the broader PEL121 and PEL122 acreage.

The relatively shallow Hydrohelix prospect, located within PEL 121, is a large fault and dip bounded structure in the middle of the Boorthanna Trough with an areal closure of 148km2.

Work completed by D3 Energy on Hydrohelix revealed several important characteristics in line with the aforementioned Mt Kitty-1 analogue well:

- similar structural depth to basement
- similar thickness of evaporites (salt)
- both appear heavily faulted
- both have structural closure controlled by faults

It is worth noting that, at 148km^2 Hydrohelix is significantly larger than the Mt Kitty prospect area.

Maiden Resource

In mid-July of 2026 the company announced an independently-certified Maiden Prospective Resource for the Hydrohelix and Cootanoorina prospects within D3's 100%-owned PEL121. This resource was prepared by Sproule ERCE, or under the supervision of Dr Adam Law, Principal Strategic Advisor of Sproule ERCE.

The resource showed a Total Prospective net 2U Resource of 54 BCF recoverable helium, 88 BCF recoverable hydrogen and 226 BCF of methane across the two prospects.

PEL 121 - Prospective Resource

BCF net

	1U	2U	3U
Helium	14	54	190
Hydrogen	21	88	331
Methane	58	226	803

In management's opinion, the certification of a maiden Prospective Resource at Hydrohelix and Cootanoorina in both the Heavitree Sandstone and Fractured Basement further validates the helium and hydrogen system identified across PEL121.

Further work will now be undertaken to mature the remaining leads identified across PEL121 and PEL122.

Summation

The South Australian buy is an interesting example of the company reimporting the skillset it has picked up in South Africa back to its country of origin, which in many ways is "still in short pants" in terms of cultivating the helium potential in Australian gasfields. It is still early days here in terms of exploration and strategy.

The key question will be whether it decides to find a partner to farm-in to Hydrohelix or pursue the opportunity in its own right, particularly now that helium is the word on so many lips.

Important disclosures

I, Christopher Ecclestone, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

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Web access at:

Research: www.hallgartenco.com

60 Madison Ave, 6th Floor, New York, NY, 10010