EDISON

Renergen

Initiation of coverage

South African LNG and helium play

Oil & gas

Renergen represents a unique opportunity for investors. The company holds the first, and currently only, onshore petroleum production right in South Africa. While it is already producing and selling gas, production is set to accelerate in the next 18 months as it moves to liquefied natural gas (LNG) production, primarily serving the growing domestic heavy duty truck market. The move to LNG also unlocks the potential to extract and sell helium, adding material upside to economics (c 35% upside to NAV). With gross 2P reserves of 142 bcf of methane and c 2.2% of additional helium (Renergen 90% WI), our risked core NAV on a fully diluted basis is ZAR19.0/share. We estimate additional funding of c ZAR240m is required to become self-funding, in addition to a secured ZAR218m of term loan.

Year end	Total revenues (ZARm)	Adjusted EBITDA (ZARm)	Reported net income (ZARm)	Net (debt) cash (ZARm)	Cash from operations (ZARm)	Capex (ZARm)
2/17	2	(22)	(19)	12	(23)	(21)
2/18e	3	(34)	(37)	2	(23)	(12)
2/19e	24	(36)	(40)	(109)	(34)	(318)
2/20e	95	33	0	(164)	14	(69)

Note: EBITDA normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

In production, permits in place, major helium upside

Renergen's Virginia Project in the Free State of South Africa is the first and still only approved petroleum production right onshore in the country. EIA approvals are in place and early stage production is already underway; this will ramp up in 2019 when LNG production commences, targeting the growing domestic heavy duty truck market. With LNG comes the ability to isolate a highly lucrative 2.2% helium stream for which Renergen already has offtake agreements in place, adding c 35% to project economics. Edison's recently published Macro View on helium indicates a potentially tightening market that could further improve these margins.

Further wells required/macro uncertainties

More wells are required to fully understand the subsurface. Recent drilling success has been mixed (60%) although studies imply that this can be improved with inclined wells, while uncertainty remains in modelling decline rates. Long-term gas pricing also needs consideration as LNG becomes more established in South Africa potentially putting pressure on current high LNG prices. However, continued chronic electricity shortages should continue to support gas prices over time.

Valuation: Compelling gas economics, helium upside

Renergen has contingent access to a ZAR218m debt facility from the Industrial Development Corporation (IDC). In addition to debt we calculate a further ZAR240m is required to be self-funding, that we assume to come from equity. On a fully diluted basis, our risked valuation for the 2P reserves is ZAR19.0/share, of which ZAR13.8/share is from LNG. Our risked valuation for the 1P reserves alone is ZAR7.0/share, while contingent resources could add substantially to the valuation in time.

13 March 2018

Price	**ZAR9.05**
Market cap	**ZAR733m**
	USD/ZAR = 12
Net cash (ZARm) at end February 2018e	2.4
Shares in issue	81.0m
Free float	24%
Code	RENJ
Primary exchange	JSE
Secondary exchange	N/A

Share price performance

%	1m	3m	12m
Abs	(1.1)	(9.5)	(9.5)
Rel (local)	(6.1)	(12.1)	(21.6)
52-week high/low	ZAR13.95	ZAR7.81	

Business description

Renergen is an integrated alternative and renewable energy business that invests in early stage alternative energy projects across Africa and emerging markets.

Next events

GM to approve potential equity raise	March 2018
Additional GSAs	H118
Equity raise	Q218

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Edison profile page

Renergen is a research client of Edison Investment Research Limited

Investment summary

Company description: Wellhead to tank strategy

Renergen is a South African energy firm developing the Virginia gas project in the Free State. Building off a well inventory drilled for the gold mining industry, the company expects to ramp-up production from 2019 as it moves to LNG production, in turn opening up the opportunity to capture and sell high purity helium into a potentially tightening, illiquid market. LNG is primarily being targeted towards substituting diesel for long-range heavy duty trucks in South Africa, as well as replacing LPG in the industrial sector and potentially the power sector in the medium term.

Valuation: Significant upside with ZAR19.0 core NAV

Our base case valuation, based on gross methane 2P reserves of c 142bcf and gross helium 2P reserves of 3.16bcf, generates a core NAV on a fully funded (ie diluted) basis of ZAR19.0/share. This is a robust valuation that includes adjustments for both geological and commercial risk/ uncertainty, potentially conservative price assumptions for LNG and a relatively punitive discount rate of 15%. The same valuation approach based on 1P reserves of 40bcf methane/0.91bcf helium covers most of the current share price with a core NAV of ZAR7.0/share.

Financials: Additional equity required

To rapidly exploit 2P reserves, Renergen needs to spend ZAR750m (US$62.5m) in capex over the next four years. The company has secured ZAR218m of debt from IDC and we estimate that to fund the balance and get to positive cash flows efficiently, the company needs to raise a further ZAR240m. We assume this additional funding will come from equity, which if raised in the next 12 months would propel Renergen towards being net cash positive in FY24. Additional equity would increase the diluted share count to 110.4m (from 80.7m) based on raising money at current prices (less a 10% discount). Investors should note the relatively expensive capital structure of Renergen. The IDC debt will be linked to South Africa prime rates that currently run at c 10.5% (we assume prime + 2%), hence why we base our valuations on a 15% discount rate.

Sensitivities: A number of key uncertainties

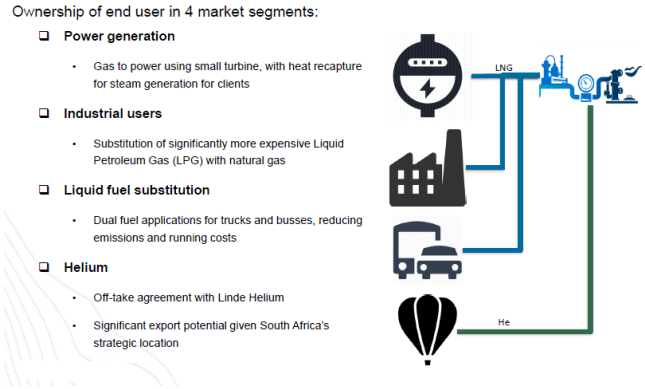
The Virginia Project has very attractive economics, although investors should consider the following uncertainties as they could be material to an investment decision:

- **LNG macro outlook:** Adoption of LNG among the South African long-haul truck market is uncertain, although a provision for pricing pressure has already been built into our models and the industrial and power sectors are recognised alternatives where we would expect Renergen to still enjoy healthy economics.
- **Technical issues:** Drilling success will rely on intersecting gas bearing faults, but while a number of the most recent wells failed to achieve this, subsequent studies indicate that inclined wells will increase the chance of success. Uncertainty remains around the decline rates of the wells and this will require longer-term production history to refine. At this stage it is not clear what the recharge rate of this renewable resource will be.
- **Fiscal issues:** Over many years, South African Energy policy has resulted in severe bureaucratic delays compromising promising hydrocarbon exploration and exploitation. Despite this difficult environment, Renergen is in prime position as it already has a production licence with agreed fiscal terms (that it can elect to extend on equivalent terms if required).

Company introduction: "Wellhead to tank"

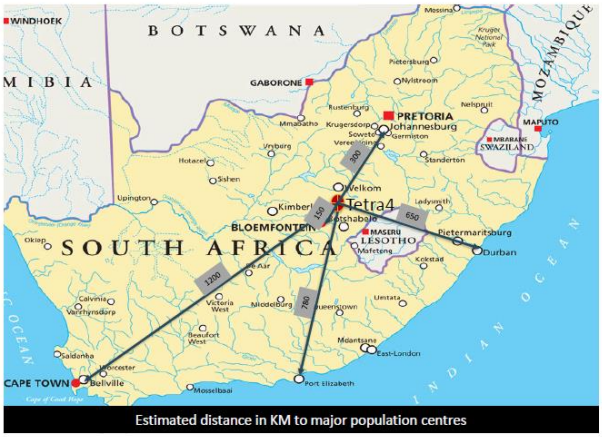
Renergen is building a natural gas development business to access four discreet market segments: power generation, industrial gas users, LNG and helium. With its "wellhead to tank" strategy (Exhibit 1) to beneficiate known gas accumulations from years of mining activity, the company has moved quickly to establish gas production and compressed natural gas (CNG) sales in May 2016. This is set to accelerate significantly in 2019 with the commencement of domestic LNG production, with the additional benefit of also unlocking a material helium stream for which Renergen already has offtake agreements in place.

Exhibit 1: Business model: "Wellhead to tank"



Source: Renergen

Exhibit 2: Location to key population areas



Source: Renergen

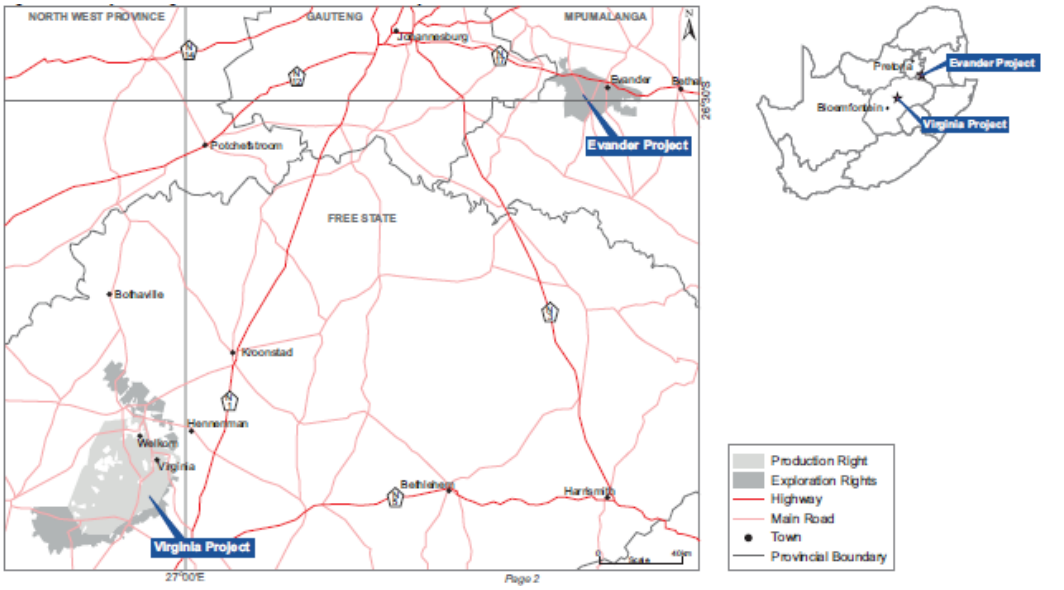
Renergen's assets are well located to access all the major population centres of South Africa as shown in Exhibit 2.

Technical and reservoir overview

Renergen's principal asset is Tetra4 which it acquired in December 2015 as Molopo South Africa Exploration and Production Proprietary. The company holds a 90% interest in the first and only onshore petroleum production right in South Africa, located in the Virginia area of the Free State and around 150km north of Bloemfontein. It also holds seven exploration rights across the area, with five located in the Virginia Project and the remaining two in the early stage Evander exploration project in Mpumalanga (Exhibit 3).

The region is known for the presence of gold, uranium and coal and in particular has been extensively mined for gold, which was discovered in the Welkom Goldfield in 1932. Gas was originally encountered in the Virginia Project area in a number of holes drilled as part of the gold mining process at Welkom, with 13 of these historical wells still blowing ie capable of producing, today. The gas is predominantly methane, but also has a high helium content of approximately 2%. The methane is believed to be biogenic in origin, while the helium is either mantle-derived or from the decay of radioactive minerals within the crust which moves up through large faults and mixes with the methane in the deep subsurface.

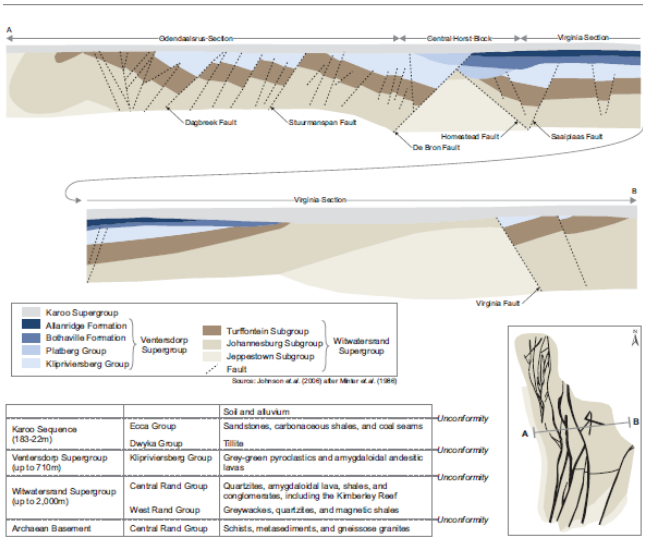
Exhibit 3: Assets map



Source: Renergen/Deloitte CPR

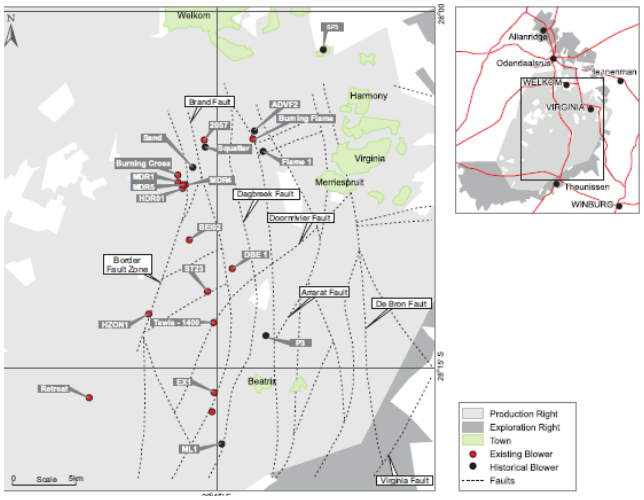
The source of the gas is the Witwatersrand Supergroup, a very hard rock consisting of quartzites, lava, shales and conglomerates which is usually deeply buried at depths of around 1.8–2km. Outcrops do however occur in places and one of these covers a 60km stretch across the Tetra4 assets where the Witwatersrand sits at a depth of only 300m, making it more accessible at this location. The Witwatersand is overlain by the volcanic Ventersdorp Supergroup which contains major faults together with fractures and fissures that provide natural pathways for the gas to flow. A 1-2m thick Doleritic plate and the Karoo Supergroup deposited on top of the Ventersdorp post faulting both act as a seal.

Exhibit 4: Virginia Project – stratigraphic cross-section



Source: Renergen/Deloitte CPR

Exhibit 5: Virginia Project – map with faults



Source: Renergen/Deloitte CPR

The understanding of the geological structure in the Virginia Project is based on 3,000 logs and a lithological database gathered during the drilling of wells, the majority of which were drilled by miners. The structure is North-South trending and is characterised by the presence of faults created during the tectonically active Ventersdorp period. These faults act as conduits that facilitate gas flow and so are actively targeted when drilling for gas production purposes. Borehole data have been

proven to be most effective in mapping these faults and fissures, as they are too small to be properly identified on seismic. Drilling at the Welkom Goldfield was historically designed to avoid faults, so that older wellbores were not optimally located for encountering gas. The faults tend to have a North-South orientation and are complemented by a series of dykes that run in an East–West direction. A dyke, in geological terms, is a sheet of rock that has formed in a fracture and in the case of the Virginia Project these dykes are almost vertical, creating unique continuous connections between the Witwatersrand and the Ventersdorp.

Methane isotope studies demonstrate that very little, if any, of the methane gas can be attributed to the Karoo coal beds or carbonaceous shales. This indicates that the methane is biogenic in origin and is therefore an ongoing renewable resource. The rate at which this is renewed, known as the recharge rate, is uncertain at this stage. However, this should not affect the Virginia Project since the planned development is not expected to deplete the volume in the reserves area.

Exhibit 6: Summary of Virginia Project wells drilled targeting gas

Year	Well name	Results
2009	HADV1	Low gas rate
2009	HADV2	Low gas rate
2009	HDR1	Significant gas rate
2010	HPAL1	No gas
2010	HZON1	Significant gas rate
2016	MDR1	Produced gas for short time
2016	MDR4	Produced gas for short time
2016	2057	Significant gas rate
2016	MDR5	Significant gas rate

Source: Edison Investment Research

Exploration drilling specifically targeting gas was first carried out in 2008 and 2010, when Molopo drilled five wells within the Virginia Project area, followed by a further four wells in 2015 and 2016. Of these, four wells (HDR1, HZON1, 2057 and MDR5) produced gas at significant rates, while two wells (HADV1 and HADV2) produced gas at low rates. HPAL1 did not encounter gas and MDR1 and MDR4 both produced gas initially but stopped after a short time, indicating that they encountered pockets of trapped gas, though not close enough to a fissure to sustain production.

All of these wells were drilled vertically and, with the exception of MDR5, without the benefit of a detailed study of the fault structure. Rates from the wells vary with for example, HDR1 originally produced at over 200mscfd and 2057 at up to 400mscfd, while some older wells produce closer to 30–40mscfd. Importantly, data from all wells have shown no decline in flow rates as a result of production. There is also scope for these rates to be higher in future inclined wells and for existing wells with the use of compressors. The low rate and low pressures in the wells means that friction between the gas and the wellbore restricts the flow. The use of compressors results in negative pressures at the wellhead which can increase flow from the well. In HDR1, the use of a compressor saw an increase in flow from 200mscfd to 250mscfd.

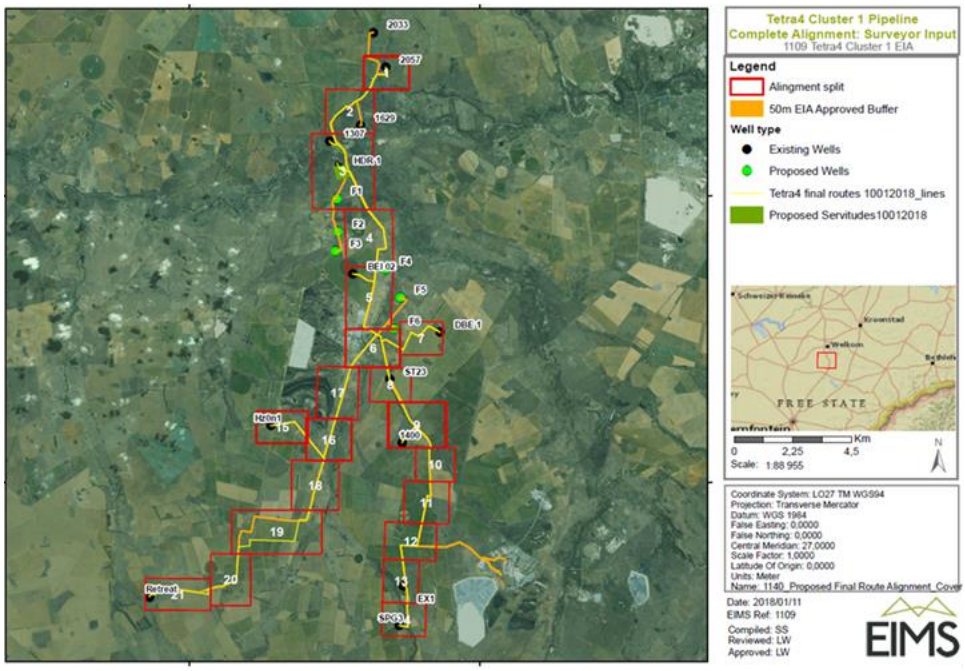
Recognising that the existing well design was sub-optimal in targeting gas bearing fractures, Tetra4 commissioned Shango Solutions to carry out a study in 2016 to investigate how to refine the company's drilling model to increase the likelihood of intersecting the steeply dipping structures. The study recommended that future wells should be drilled at an angle of 55^{o} and inclined to the southeast in order to ensure the intersection of steep E-W and westerly dipping N-S structures. The results of the study were available in time to change the surface location of the final 2016 well, MDR5. However, there was not enough time to complete the engineering required to change the design from vertical to inclined.

The company is targeting flow rates of 8-10mmscfd by 2022 and estimates that this will require a total of 66 producing wells (Edison's assumptions are a little below these figures due to assumed funding constraints, see Exhibit 11 and Exhibit 12). There are 18 existing wells, of which 13 are considered suitable for use initially, with the remaining four either located too far from the planned

pipeline location or with lower flow rates. The 13 suitable wells consist of nine historical wells originally drilled for gold mining purposes, together with four of the more recent wells targeting gas (HZON1, HDR1, MDR5 and 2057). The first inclined well is planned in May 2018 in order to prove the concept and, if successful, all subsequent wells will be drilled this way.

The company is currently assuming a well success rate of 60% in its planning, although this could increase with the refinement of the model as new well data are acquired. At present, Tetra4 has budgeted for 85 wells over the next three years (we assume 60 due to funding constraints).

Exhibit 7: Virginia Project Cluster 1 well locations and pipeline



Source: Renergen

Initial development will focus on the Cluster 1 area, which is designed to connect the high prospectivity areas in the north of the field with those in the south. Construction of the LNG plant commenced in Q417, with pipeline construction to follow in Q118 and first gas in Q119. The longest lead items, two gas liquefiers, were ordered in Q417.

Reserves & resources

Three independent reserves reports have been prepared on the Virginia Project, the first two from Venmyn Deloitte with effective dates of 31 May 2015 and 31 July 2016. Based on work carried out in the interim period, Deloitte was able to increase its 2P reserves estimate by 18% from 87.9bcf to 103.5bcf.

Exhibit 8: Reserves evolution (bcf) of Virginia Project (gross)

	Natural Gas			Helium		
Reserves	**1P**	**2P**	**3P**	**1P**	**2P**	**3P**
Deloitte 2015	27.1	87.9	245	-	-	-
Deloitte 2016	35.2	103.5	276.4	-	-	-
MHA 2018	40.4	141.6	299.0	0.91	3.16	6.56
Contingent resources	**1C**	**2C**	**3C**	**1C**	**2C**	**3C**
MHA 2018	286	548	847	9.09	17.2	25.9

Source: Venmyn Deloitte, MHA

In late 2017, Renergen engaged MHA to independently assess the Virginia Project. MHA estimated 2P gas reserves of 141.6bcf of natural gas (an increase of 57%), along with 2C contingent resources of 548 bcf and best estimate prospective resources of 1,278bcf. For the first time, MHA

also assessed the helium reserves (these had not been considered in the previous Venmyn Deloitte reports), awarding 2P Helium resources of 3.16bcf.

Helium

Alongside its LNG facilities, Renergen plans to build a plant to extract and sell helium at 300kg/day by Q119 and has signed a gas sales agreement (GSA) with Linde Global Helium (Linde) for the purchase of helium gas.

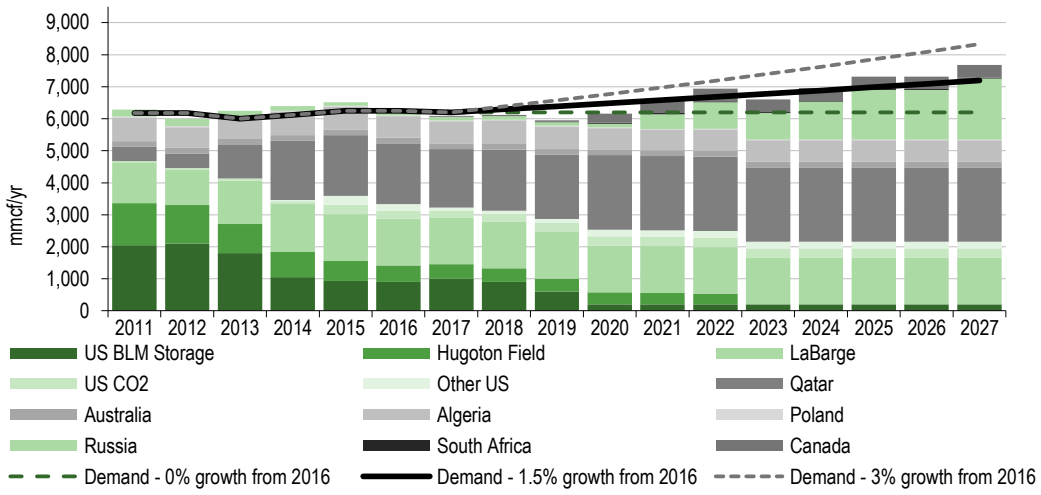
Based on the historical analysis of both blowers and legacy 2009/10 wells, Renergen has known for some time that the gas produced from the Virginia Project contains a significant quantity of helium. However, historical helium concentration data has been inconsistent, mainly because helium can diffuse out of inappropriate containers, such as steel canisters, and gas analyses need to be carried out as soon as possible after collection.

Renergen has recently carried out fresh helium analyses of the wells it intends to use as producers (under strict sampling and testing criteria), returning results that range from a minimum of 1.4% to a maximum of over 10% for the 2057 well. MHA's 2018 CPR has assumed a 3-4% concentration in the centre of the production licence and assigns 2P helium reserves of 3.16bcf on this basis (i.e. 2.23% helium). The gas composition is ideal for separating out helium as it contains no H_2S, H_2 or Neon and low levels of CO_2.

Helium market and pricing

During 2017, Edison carried out an independent review of the global helium market, assessing the likely evolution of the supply demand balance, different pricing mechanisms and the overall competitive landscape. This report was published in December 2017.

Exhibit 9: Estimated global supply/demand forecast, mmcf/year



Source: JR Campbell & Associates report for BLM Office of Minerals Evaluation, public and private company data, Edison Investment Research, various

In conclusion, Edison estimated that, despite an opaque picture making forecasting difficult, we believe the balance is weighted towards a tightening market, at least in the next two to three years (Exhibit 9). This is being driven primarily by the imminent exhaustion of the US Bureau of Land Management (BLM) domestic storage as well as little new supply coming online to offset declines elsewhere.

The longer-term outlook is more balanced (assuming relatively conservative demand growth) with large additions from mega projects in Qatar and Russia planned from 2020 onwards. However, we consider there is significant risk of delays to these mega projects which would push the market into a substantial deficit on a longer-term basis.

LNG markets and pricing

All natural gas in South Africa is currently imported via pipeline from Mozambique by Sasol. Renergen will be South Africa's first LNG producer and will represent an important early step into the uptake of LNG in the country. The country is dominated by coal and is seeking to move away from this both through the development of indigenous sources of gas and through LNG imports, with three potential, and important, LNG projects being considered with Richards Bay in KwaZulu-Natal Province reported to be the likely first project.[1]

Heavy duty truck market

Renergen initially intends to sell its LNG product to heavy duty trucks in South Africa (of which there are around 371,000 in South Africa according to the company). The company already has a gas sales agreement in place to sell compressed natural gas (CNG) to Unitrans Passenger (Megabus) at a price indexed to sulphur free diesel with a 22.5% discount. Based on this formula the company will be able to realise attractive prices of around $20/mcf. We expect Renergen to be roll out additional GSAs for CNG/LNG with further truck companies during 2018.

Heavy duty LNG trucks is a rapidly evolving market globally. China has led the way with LNG trucks now accounting for 4% of more than six million heavy vehicles (categorised as hauling 40-49 tonnes of goods) on the country's roads[2]. Shell has recently reported that 70,000 new LNG-fuelled trucks were added in China in 2017[3]. BP's most recent annual Energy Outlook (published on 20 February 2018) indicated that gas will account for 4.8% of all transport fuel globally by 2040 (up from 1.8% in 2015), with truck consumption growing well ahead of that of cars (0.8% CAGR vs 0.5% CAGR for cars).

Economics is also likely to be driving the global uptake of CNG/LNG for trucks. Iveco has reported 15% fuel efficiency savings vs diesel for its most recent fleet of single-fuel trucks with double LNG tanks, while extending its autonomy range to 1,600km.[4] Renergen's own trials (Autolytix, 13 October 2017) on dual fuel trucks (diesel-CNG) showed a 13-14% improvement in consumption and 25-26% reduction in direct fuel costs over diesel-only vehicles.

Although Renergen's LNG plant(s) will be producing meaningful quantities of product, this is unlikely to run into over-supply issues as 10mmcf/d of gas produced is enough to supply around 2,500 trucks. Our 2P modelling assumption is for production rates to rise to c 25mmcf/d by 2025, which would therefore supply around just 1.5% of South African trucks.

[1] https://www.icis.com/resources/news/2017/11/09/10162122/south-africa-delays-decision-on-lng-imports-to-next-year/

[2] www.reuters.com/article/us-china-pollution-gas-trucks/gas-trucks-boom-in-china-as-government-curbs-diesel-in-war-on-smog-idUSKBN1CC0T0

[3] www.shell.com/energy-and-innovation/natural-gas/liquefied-natural-gas-lng/lng-outlook/_jcr_content/par/textimage_864093748.stream/1519731131365/2d6b7c30c2c58f53c1d3571749d16c48c6e01fee2035dcb55490a2935b7ed272/shell-lng-outlook-infographic-overview-factsheet-final.pdf

[4] https://www.iveco.com/en-us/press-room/release/Documents/2017/NewStralisNP460.pdf

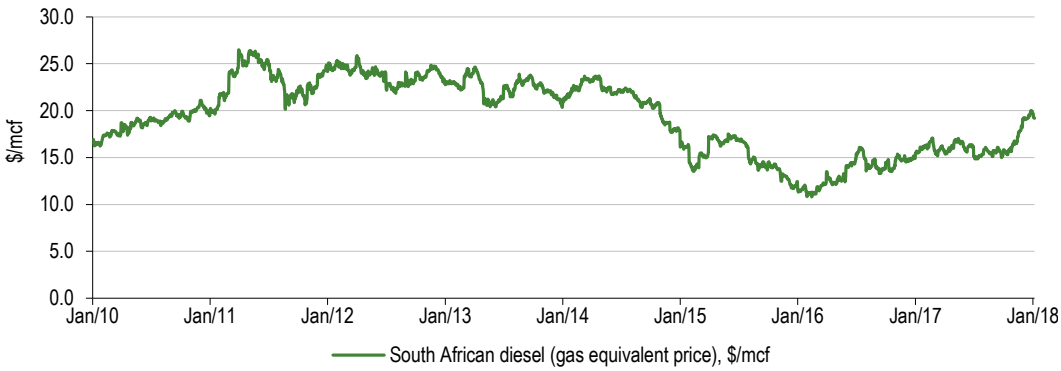
Industrial/ power markets

In addition to trucks, Renergen is offering its current CNG production to industrial users to replace liquefied petroleum gas (LPG). This is currently being sold in South Africa at c US$24/mmbtu so again, CNG/LNG at sub US$20/mcf is attractive.

Longer term, Renergen may also target the power sector as a market for its LNG. Eskom (South Africa's state electricity company) needs to continue to push through price hikes to support its weak balance sheet (prices have more than doubled in real terms over the five-year period between 2008 and 2013)[5]. Renergen management has indicated that at current electricity price increases of c CPI + 4% the company could get a better return than the power sector in as little as three to four years' time as it could get from the truck market.

Edison LNG price assumptions

Exhibit 10: Gas equivalent price for South African wholesale diesel ($/mcf)



Source: Bloomberg, Edison Investment Research. Note: Assumes a 30% discount to the diesel equivalent price, consistent with our modelling assumptions.

As indicated previously, Renergen already has a GSA in place with Unitrans to sell its CNG at the equivalent of diesel less a 22.5% discount. Given that there may be some pricing pressure to build sales in the truck sector we have subjectively increased the discount in our models to 30%, although this would continue to suggest a robust LNG price as shown in Exhibit 10. Based on our models the assumed LNG price would be US$16.2/mcf in 2018 with underlying Brent increasing at 2.5% thereafter.

We expect Renergen to announce further GSAs for its LNG product in 2018 and will update our price assumptions as appropriate.

Modelling the Virginia Project development

We model a number of scenarios, taking the most recent CPR as the basis for volumes, along with the following assumptions:

- Well capex: US$125k drillex plus US$80k connection
- IP for vertical well: 114mcf/d (methane only), or 120GJd, which assumes each vertical produces from one structure, with a 60% chance of commercial success with each well
- Well decline rate: 5% in line with MHA assumptions (albeit this could be conservative as some of Renergen's wells currently show no decline)

[5] http://www.eskom.co.za/Documents/EcoOverviewElectricitySA-2017.pdf

- Production period: all reserves are produced within the current production right, valid until September 2042 (although Renergen can elect to extend this at its own discretion)
- Helium plant modules capex: US$5m (each module can process up to 350kg/day)
- LNG plant module capex: US$14m (each module can process up to 3,000GJ/day (c 2.85mmcf/day))
- Variable opex costs of US$1.2/mcf with fixed costs of US$2m pa
- Helium price of US$200/mcf, based on Linde offtake agreement (also consistent with current US private deals) rising
- LNG price is based on a 30% discount to the gas equivalent price of wholesale diesel price in South Africa. This is a potentially conservative assumption given existing offtake agreements. We assume wholesale diesel prices move with Brent prices on a percentage basis
- All costs and prices are dollar denominated and inflate at 2.5% (note that we assume any ZAR depreciation is built into our discount rates)

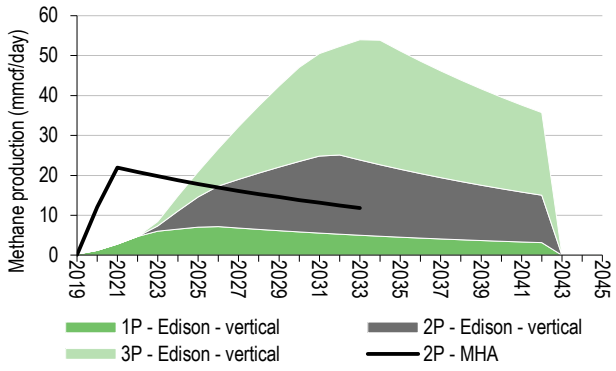
Our base case model is based on vertical wells only at this stage, although we would expect to update this for deviated wells once Renergen has sufficient well data to support an updated development plan.

Production plan

Renergen has indicated that, subject to finance, drilling will commence in July 2018, ramping up from an initial two wells/month to six wells/month (over two years), and then 10 wells/month. We assume no drilling in December and January due to weather. This would equate to 114 wells over the first three years.

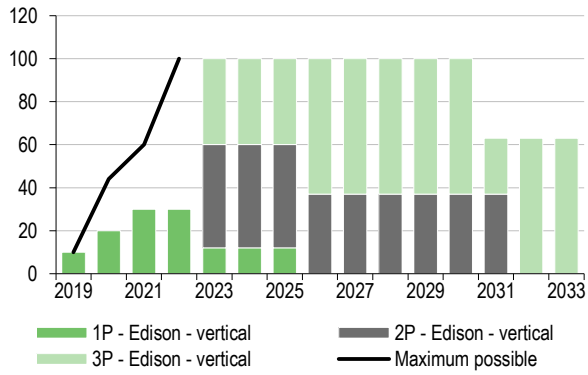
However, due to funding constraints (see our Financials section) we have modelled a drilling and production profile that is lower than the above. The balance sheet needs to support both drilling and additional LNG and helium modules over time which needs to be supported from cash flow. As such, our assumed drilling profile is lower than the maximum possible (Exhibit 12) and our production profile is well below that assumed by MHA in its recent reserves report (Exhibit 11).

Exhibit 11: Virginia production assumptions



Source: Edison Investment Research

Exhibit 12: Virginia drilling assumptions



Source: Edison Investment Research. Note: Assumes a 60% success rate of drilling.

Management

Stefano Marani (CEO) was part of the team which acquired Tetra4 Proprietary Limited from its previous owners (Molopo Energy Limited) and has been involved with the company in a management role since April 2013. Stefano has significant experience in the areas of structured finance and advisory. He was charged with building Morgan Stanley's sub-Saharan African fixed

income capital markets business and previously worked at Deutsche Bank. He holds degrees in actuarial science and advanced mathematics of finance.

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Risks and sensitivities

Funding: To access the ZAR218m term loan agreed with IDC, Renergen needs to raise a minimum ZAR145m in new equity. Based on our assumed drilling and production forecasts we estimate the company will require a minimum of ZAR240m in additional equity to be fully funded from existing cash flows. Furthermore, this will still constrain the drilling programme over the next four to five years unless additional, non-dilutive, funding can be secured.

Price risk: Renergen's economics will be heavily influenced by the price it can realise for its LNG. We assume a 30% discount to diesel equivalent, although this is more conservative than the current GSA it has with Unitrans. Medium term, there is an opportunity for Renergen to target the power sector (reflecting continued increases in electricity prices in South Africa) as well as the industrial sector. Further GSAs will help give investors comfort around the prices and volumes it will be able to secure as it ramps production. Exhibit 15 shows the effect the LNG price has on our valuation.

Fiscal regime change: South African energy policy is in need of finalisation, with severe bureaucratic delays compromising promising hydrocarbon exploration and permits taking years to be agreed. Despite this difficult environment, Renergen is in prime position as it already has a production licence with agreed fiscal terms (that it can elect to extend on equivalent terms if required) and positive authorisation on its Environmental Impact Assessment (EIA). While we do not expect any future legislation to affect Renergen's existing terms, investors should be aware of the uncertain wider regulatory environment.

Reservoir risk: As with any E&P company, the production of the reservoir is critical to cash flow generation. Although a number of wells have been open for decades and still flow, large scale development of the reservoir requiring over 500 vertical wells (including contingency) could easily produce well results very different from expected. Possible deviated wells should help increases flow rates per well and reduce well count (and capex), but results of deviated wells are not yet known.

Overhang: At present, 76% of Renergen's shares are held by the top six shareholders, with a 24% free float. Assuming that our assumed ZAR240m of fresh equity comes from new shareholders this would increase the free float to c 45% (depending on the price at which equity is raised).

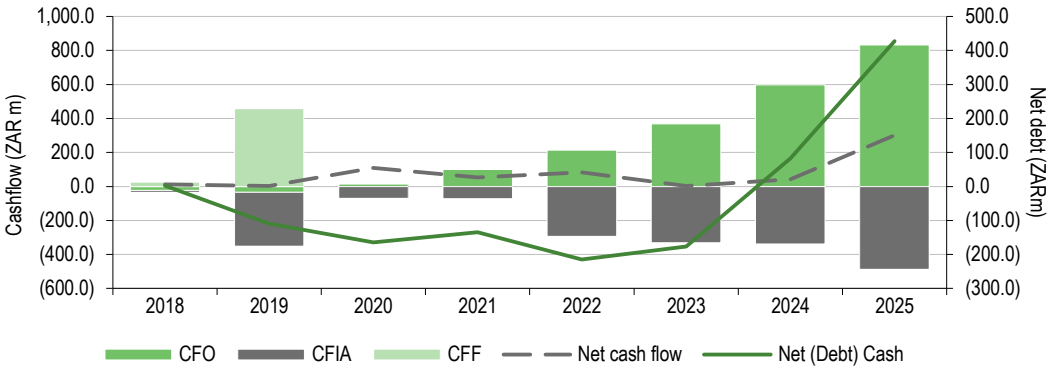
Financials

Renergen's financial year runs from 1 March, hence we are already in FY19.

As of 31 August 2017, Renergen held ZAR4.1m in cash and no debt. Given cash burn of c ZAR16m per half year, this was not enough to sustain the company and as a result, Renergen raised ZAR15m in September 2017. We estimate end FY18 cash of ZAR2.4m.

Cash flow is going to have to be carefully controlled over the coming years in order to build LNG production in an economically expedient manner, but without taking on too much equity dilution along the way. Edison has made its own assumptions of how this will build in Exhibit 11 and Exhibit 12 and the resulting cash flow movements reflecting the build in production is shown in Exhibit 13.

Exhibit 13: Cash flow and net debt evolution



Source: Edison Investment Research. Note: Years are financial years ending February.

In May 2017, Renergen announced a debt issuance of ZAR218m with the IDC to "develop the pipeline and associated installations, compression station and the power and steam plant" at Virginia. Set over an eight-year term, the funding terms have not been declared but we assume a 12.25% interest rate (2% above current South Africa prime rate).

In addition to the ZAR218m of debt, we estimate that Renergen will need a minimum c ZAR240m of additional funding to ramp up production in line with our assumptions which we include in our models as additional equity in FY19. A minimum of ZAR145m needs to be raised in equity in order for the ZAR218m IDC loan to be drawn. Renergen has called a General Meeting for 16 March 2018 to give the company permission to raise additional equity (above existing limits of 30% of the existing voting rights) to fund the development of the Virginia Project.

We model Virginia capex of ZAR750m over the next four years, covering initial LNG and helium processing modules, pipeline costs and production wells. Based on our base case assumptions, we see Renergen being net cash positive by FY24, although this will move depending on the pace of development (Exhibit 13).

Valuation

Our base case valuation for Renergen is ZAR19.0/share as shown in Exhibit 14. This is based on current estimated 2P methane reserves of c 141.6bcf gross and 2P helium reserves of 3.16bcf (implying a helium concentration of 2.23%). We assume a 15% cost of capital, reflecting Renergen's relatively expensive capital structure and a ZAR240m equity raise in FY19 to fund the remainder of the Virginia Project.

Exhibit 14: Renergen valuation – diluted reflecting ZAR240m equity raise

Fully diluted share capital (post equity raises)		107.9m		Recoverable reserves		NPV/mcf	Risked	Value per share (risked)		
Asset	Country	Diluted WI	CoS*	Gross	Net		NAV	ZAR/share		
		%	%	bcf	bcf	$/ mcf	US$m	Discount rate		
								15.0%	*12.5%*	*10.0%*
Net (debt) cash at end February 2018		100%	100%				0.2	0.0	*0.0*	*0.0*
SG&A - NPV_{10} of three years		100%	100%				(7)	(.8)	*(.8)*	*(.8)*
Equity raising of ZAR240m		100%	100%				20	2.2	2.2	2.2
Production/development										
Virginia (2P)	South Africa	90%	70%	144.0	129.6	1.8	162	17.6	24.0	33.1
Core NAV							**175**	**19.0**	25.4	34.5

Source: Edison Investment Research. Note: *Chance of Success (CoS) only reflects development uncertainty. NPV models contain assumption that only 60% of drilled wells will be economic, reflecting geological risk.

We have risked our model for development uncertainty by applying a 70% development/commercial chance of success. Geological risk is accounted for in our DCF calculations based on the assumption that only 60% of wells drilled will be commercial (and connected to pipe).

Running our models on a gross 1P case of 40.4bcf of methane and 0.91bcf of helium, our core NAV would be ZAR7.0/share ie most of the current share price is covered by 1P alone (and fully covered on an un-risked basis).

We currently do not ascribe any additional value for Renergen's substantial contingent resources. However, we have built an indicative DCF model reflecting accelerated development of the 2C resources that could (following initial exploitation of the 2P reserves) add a further c ZAR12/share to our core NAV.

Differences with the recent MHA reserves report

The MHA 'Independent reserve and resource evaluation report' published by Renergen has different valuations to Edison's valuation above ie NPV_{15} in the MHA report for 2P reserves is ZAR8,409m (c US$700m) vs our model of only US$162m. It is important to understand the differences with our base case valuation which we lay out below:

- MHA run its economics on a pre-tax basis. Impact on valuation c US$80-90m
- MHA applies a consistent 22.5% discount to diesel on gas prices vs Edison 30%. Valuation impact c US$20m
- MHA assumes a rapid escalation of gas prices (5.8% pa in line with South Africa CPI) but restricts costs to 2% p.a. increases – this generates significant margin expansion over time compared with our models. Edison standard procedures are to use consistent 2.5% inflation factors for both costs and prices. Effect on valuation c $80-90m.
- MHA does not account for balance sheet constraints and increases production unrealistically quickly in our view (two years to peak production in the 2P case, vs c 8-10 years in our models – see Exhibit 11). Effect on valuation c US$140-160m
- We apply a 70% commercial chance of success to our models. Impact on valuation c US$180-200m.

Edison's per share valuation also includes the impact of additional equity in FY19 that would not be reflected in MHA's numbers.

Commodity price sensitivities

At this juncture there remains a lot of uncertainty around the commercial exploitation of the Virginia Project. For example, as described earlier helium concentrations could be substantially different to the 2.23% calculated in the certified reserves (given issues with sampling and gas leakage). We present in Exhibit 15 the sensitivity of helium price and concentration on our 2P core NAV valuation.

Exhibit 15: Helium and oil price sensitivities on valuation

% Helium	Helium price ($/mcf)								FY19 realised LNG price ($/mcf)						
	150	175	200	225	250	275	300		20.8	18.5	17.9	16.2	13.8	11.5	9.2
1.0%	15.4	15.7	16.1	16.4	16.8	17.1	17.5		Discount to diesel (%)						
1.5%	16.2	16.7	17.3	17.8	18.3	18.9	19.4	Oil ($/bbl)	10%	20%	22.5%	30.0%	40%	50%	60%
2.0%	17.1	17.8	18.5	19.2	19.9	20.6	21.3	40	19.9	17.4	16.8	14.9	12.5	10.0	7.5
2.23%	17.5	18.3	**19.0**	19.8	20.6	21.4	22.2	50	22.5	19.7	19.0	17.0	14.2	11.4	8.6
2.5%	18.0	18.9	19.7	20.6	21.5	22.4	23.3	60	25.1	22.0	21.3	**19.0**	15.9	12.8	9.8
3.0%	18.8	19.9	21.0	22.0	23.1	24.1	25.2	70	27.7	24.3	23.5	21.0	17.6	14.3	10.9
3.5%	19.7	20.9	22.2	23.4	24.6	25.9	27.1	80	30.3	26.6	25.7	23.0	19.4	15.7	12.1

Source: Edison Investment Research

The largest impact on our valuation, however, is likely to be the long-term LNG price that can be realised. Our assumed LNG realised price is currently based on a 30% discount to diesel vs the 22.5% discount the company has in its agreements with Megabus. However, this may come under some pressure in the medium term with the evolution of the LNG industry in South Africa. Equally, Renergen sees the ever-increasing price of electricity in South Africa as being an effective fall-back and based on current electricity inflation (CPI + c 4%), this could be a more lucrative market for Renergen's gas in as little as three to four years' time.

Dilution sensitivities

Our valuation reflects equity dilution based on an assumed ZAR240m equity raise in the coming months. We consider this to be the minimum required (unless Renergen can raise additional debt) but additional equity would result in further dilution as per the table shown in Exhibit 16.

Exhibit 16: Equity dilution sensitivity

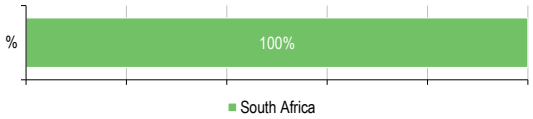
Equity price (ZAR)	Equity to be raised (ZARm)						
	180	200	220	240	260	280	300
6	17.9	17.5	17.1	16.8	16.5	16.2	15.9
7	18.7	18.3	18.0	17.7	17.4	17.1	16.8
8	19.3	19.0	18.7	18.4	18.2	17.9	17.7
9	19.8	19.6	19.3	**19.0**	18.8	18.6	18.4
10	20.3	20.0	19.8	19.6	19.4	19.2	19.0
11	20.6	20.4	20.2	20.0	19.8	19.6	19.5
12	21.0	20.8	20.6	20.4	20.2	20.1	19.9

Source: Edison Investment Research. Note: The equity price above refers to the market price – Edison assumes equity will be raised at a 10% discount to market price.

Exhibit 17: Financial summary

Accounts: IFRS, Yr end: February, ZAR: Thousands	2016	2017	2018e	2019e	2020e	2021e	2022e
Income statement							
Total revenues	0	1,722	2,858	23,803	94,649	223,226	385,683
Cost of sales	0	(2,127)	(3,714)	(27,178)	(28,731)	(37,483)	(48,381)
Gross profit	0	(405)	(856)	(3,375)	65,918	185,743	337,303
SG&A (expenses)	(17,889)	(21,589)	(32,756)	(32,756)	(32,756)	(32,756)	(32,756)
R&D costs	0	0	0	0	0	0	0
Other income/(expense)	0	0	0	0	0	0	0
Exceptionals and adjustments	(1,518)	0	0	(3,000)	(3,000)	(3,000)	(3,000)
Depreciation and amortisation	(88)	(1,025)	(1,645)	(3,112)	(11,037)	(25,366)	(42,699)
Reported EBIT	(19,495)	(23,019)	(35,257)	(42,243)	19,125	124,621	258,848
Finance income/(expense)	2,942	1,279	314	2,037	(4,701)	(6,746)	(7,130)
Other income/(expense)	0	0	0	0	0	0	0
Exceptionals and adjustments	(2,946)	(3,156)	(1,740)	0	0	0	0
Reported PBT	(19,499)	(24,896)	(36,683)	(40,205)	14,425	117,875	251,718
Income tax expense (includes exceptionals)	0	6,234	0	0	(14,346)	(45,616)	(83,685)
Reported net income	(19,499)	(18,662)	(36,683)	(40,205)	79	72,260	168,033
Basic average number of shares, m	53	78	81	110	110	110	110
Basic EPS	(0.4)	(0.2)	(0.5)	(0.4)	0.0	0.7	1.5
Adjusted EBITDA	(17,889)	(21,994)	(33,612)	(36,131)	33,162	152,987	304,547
Adjusted EBIT	(17,977)	(23,019)	(35,257)	(39,243)	22,125	127,621	261,848
Adjusted PBT	(15,035)	(21,740)	(34,943)	(37,205)	17,425	120,875	254,718
Adjusted EPS	(0.3)	(0.2)	(0.4)	(0.3)	0.0	0.7	1.5
Adjusted diluted EPS	(0.3)	(0.2)	(0.4)	(0.3)	0.0	0.7	1.5
Balance sheet							
Property, plant and equipment	7,145	21,756	32,416	347,004	405,155	450,706	701,676
Goodwill	0	0	0	0	0	0	0
Intangible assets	61,504	75,453	76,595	76,595	76,595	76,595	76,595
Other non-current assets	0	6,234	6,350	6,350	6,350	6,350	6,350
Total non-current assets	68,649	103,443	115,361	429,949	488,100	533,651	784,621
Cash and equivalents	41,721	12,401	2,366	108,573	53,502	83,210	3,273
Inventories	0	0	0	0	0	0	0
Trade and other receivables	4,134	8,933	3,928	3,928	3,928	3,928	3,928
Other current assets	6,503	0	0	0	0	0	0
Total current assets	52,358	21,334	6,294	112,501	57,430	87,138	7,201
Non-current loans and borrowings	0	0	0	218,000	218,000	218,000	218,000
Other non-current liabilities	26,612	30,113	31,853	31,853	31,853	31,853	31,853
Total non-current liabilities	26,612	30,113	31,853	249,853	249,853	249,853	249,853
Trade and other payables	3,490	5,503	9,968	9,968	9,968	9,968	9,968
Current loans and borrowings	0	0	0	0	0	0	0
Other current liabilities	0	0	0	0	0	0	0
Total current liabilities	3,490	5,503	9,968	9,968	9,968	9,968	9,968
Equity attributable to company	98,828	98,423	90,863	293,658	296,737	371,997	543,030
Non-controlling interest	(7,923)	(9,262)	(11,029)	(11,029)	(11,029)	(11,029)	(11,029)
Cash flow statement							
Profit before tax	(19,499)	(24,896)	(35,591)	(40,205)	14,425	117,875	251,718
Net finance expenses	(2,942)	(1,279)	(314)	(2,037)	4,701	6,746	7,130
Depreciation and amortisation	88	1,841	1,645	3,112	11,037	25,366	42,699
Share based payments	1,518	0	0	3,000	3,000	3,000	3,000
Other adjustments	5,921	4,453	2,024	2,037	(4,701)	(6,746)	(7,130)
Movements in working capital	(6,266)	(3,254)	9,470	0	0	0	0
Interest paid / received	0	0	0	0	0	0	0
Income taxes paid	0	0	(115)	0	(14,346)	(45,616)	(83,685)
Cash from operations (CFO)	(21,180)	(23,135)	(22,881)	(34,093)	14,116	100,625	213,731
Capex	49,512	(20,714)	(12,364)	(317,700)	(69,188)	(70,917)	(293,668)
Acquisitions & disposals net	0	0	0	0	0	0	0
Other investing activities	0	0	0	0	0	0	0
Cash used in investing activities (CFIA)	49,512	(20,714)	(12,364)	(317,700)	(69,188)	(70,917)	(293,668)
Net proceeds from issue of shares	72,957	13,427	24,946	240,000	0	0	0
Movements in debt	0	0	0	218,000	0	0	0
Dividends paid	0	0	0	0	0	0	0
Other financing activities	(60,186)	1,102	264	0	0	0	0
Cash from financing activities (CFF)	12,771	14,529	25,210	458,000	0	0	0
Increase/(decrease) in cash and equivalents	41,103	(29,320)	(10,035)	106,207	(55,071)	29,708	(79,937)
Cash and equivalents at end of period	41,721	12,401	2,366	108,573	53,502	83,210	3,273
Net (debt) cash	41,721	12,401	2,366	(109,427)	(164,498)	(134,790)	(214,727)
Movement in net (debt) cash over period	41,721	(29,320)	(10,035)	(111,793)	(55,071)	29,708	(79,937)

Source: Company accounts, Edison Investment Research

Contact details	Revenue by geography
1 Bompas Road, Dunkeld West, 2196 South Africa Phone Renergen.co.za	

Management team

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Principal shareholders	(%)
Tamryn Investment Holdings (Pty)	42.9%
Mazi Capital	4.9%
MATC Investment (Pty)	10.6%
CRT Investment Holding (Pty)	10.6%
Mergence Africa Investments	4.6%
Sanlam Investment Management	2.7%

Companies named in this report

Molopo Energy Limited, Linde, Unitrans, BP, Shell, Iveco, Eskom,

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