

CORPORATE

Share Price **1.5p**

Ticker	CRCL
Index	FTSE AIM
Sector	Mining
Market Cap	£5.5m
Shares in Issue	441m
NAV	0.9p

Performance	All-Share	Sector
1 month:	(19)%	(17)%
3 months:	(16)%	(13)%
12 months:	(48)%	(22)%
High/Low	2.2p / 1.1p	



Source: © 2022, S&P Global Market Intelligence

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Marketing Communication

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Corcel

Advanced battery metal projects and pioneering Flexible Grid Solutions

With shovel-ready, flexible energy generation plus storage projects that would be connected to the UK National Grid and generating fixed minimum income, and the Mambare and Wowo Gap nickel-cobalt battery metal projects with potential near-term Direct Shipping Ore (DSO) production a real possibility, Corcel is ideally positioned to profit from increasingly aggressive decarbonisation goals and the growth of renewable power supply. We see fair value at 8p/sh, based on a sum-of-the-parts (SOTP) valuation.

Corcel has interests in two sides of the new energy economy with battery storage and gas peaker plants, which would smooth the transition to reliable renewable energy, and battery metal projects (nickel, cobalt, and vanadium). An investment in Corcel provides investors with:

- **A front-seat position:** Corcel has positioned itself to profit from the UK's transitional energy strategy with decarbonisation and electrification at its core.
- **Flexible energy generation and storage:** Corcel has established 150MW of shovel-ready battery storage and gas peaker plant projects that would be connected to the UK National Grid. If funded, these projects would generate fixed minimum income, which Corcel would use to fund other projects.
- **Exposure to advanced battery metal projects:** Corcel was ahead of the curve, establishing positions in compelling battery metal projects ahead of inevitable increased demand. Nickel demand, in particular, has come to the fore with disrupted supplies from Norilsk driving prices up. The Mambare and Wowo Gap nickel-cobalt laterite deposits in Papua New Guinea (PNG) have a large resource base and near-term production potential. The Dempster project in Canada is earlier-stage but potentially a significant source of vanadium for Vanadium Redox Flow Batteries (VRFBs), which look like being the key for effective grid-scale battery storage.
- **Significant upside potential:** Based on conservative assumptions, Corcel is significantly undervalued compared with its peers, in our view.
- **Potential for near-term cashflow:** Several avenues exist for near-term cashflow i) upon securing funding for gas peaker plants, ii) studies into Wowo Gap, and iii) awarding of Mambare Mining Lease and progress on the MOU for sale of DSO.

Flexible Grid Solutions (UK) - the final piece of the puzzle? Corcel has identified flexible energy generation and storage projects, which would be connected to the UK National Grid and would become critical to the UK's transitional energy strategy. These projects smooth the variability of supply from intermittent renewable power sources – batteries store and later distribute excess solar and wind energy; gas peaker plants power up on demand, giving rapid generation capacity as needed, removing the need for carbon baseload “always on” generation.

Nickel-cobalt laterite projects in PNG: Corcel has significant nickel and cobalt resources across two projects (Mambare (41% interest) and Wowo Gap (100% interest) in PNG. Environmental permits have been granted and a mining lease is sought for Mambare that would produce DSO. Corcel has entered into a non-binding off-take agreement for the sale of up to 0.5Mt/year of DSO material from Mambare and Wowo Gap, and this could be just the start.

Dempster vanadium in northern Canada: Corcel has a 50% interest in the Dempster vanadium project in northern Canada. Broad zones of mineralisation have been identified and drill core confirms mineralisation at depth. Over 20km of prospective strike is recognised within the project area.

We see fair value in Corcel at 8p/sh, based on an SOTP valuation.

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Investment case

Multiple near-term avenues for cash generation

Corcel is ideally positioned to profit from increasingly aggressive decarbonisation goals in the UK and the growth of renewable power supply. Several of Corcel's projects are at an inflection point whereby they could become cash-generative in the near future.

We see fair value in Corcel at 8p/share

Corcel has a range of projects to take advantage of the new energy economy. These range from mining and exploration projects in battery metals (nickel-cobalt at Mambare and Wowo Gap in PNG and vanadium in Canada) to reserve power plant solutions in the UK.

Shovel-ready reserve power projects that, when developed, would generate income for years to come

Reserve power projects a critical part of the energy mix. Corcel, and its partners in Flexible Grid Solutions (FGS), have identified three shovel-ready battery storage and gas-peaker plant projects that, if developed, would become critical parts of the UK National Grid as it moves over to more renewables where short-term, quick generation fills the gap in energy supply when the sun does not shine or the wind does not blow. These FGS projects will form part of the solution to enhance the reliability of renewable energy sources facilitating the transition away from baseload "always on" fossil fuel powered generation. This whole move to renewables becomes more acute as geopolitical changes make reliance on imported energy supplies increasingly precarious.

Pipeline of additional projects identified

Pipeline of projects identified. Once developed, the FGS projects would largely be run by Corcel's partners. Corcel would likely use cash generated from its interest in FGS to advance Corcel's battery metal projects adding further value to the company. FGS is conducting advanced due diligence on other projects to fit into its portfolio. We believe that once Corcel and its partners have demonstrated their ability to deliver, they will be in a position to attract funding for projects currently advancing through technical due diligence.

DSO production to kick-start PNG projects

Direct Shipping Ore (DSO) from the Mambare nickel-cobalt project – low capex and simple management operations. Environmental permitting has been granted and an application for a mining lease for a DSO operation at Mambare has been submitted. Beyond a DSO operation, there is scope to expand and upgrade the Mambare resource (potentially funded by income from FGS) that may support a more traditional mine and processing facility for Corcel on site. Mambare has rights to the DN_i (Direct Nickel) process, which, compared with traditional laterite recovery processes, is low cost, scalable and environmentally friendly.

If processing at Mambare is established, the economics of Wowo Gap are significantly enhanced

Enhanced production from the Wowo Gap nickel-cobalt project, in which Corcel has a 100% interest, could potentially supply ore to a processing plant, if established, at Mambare. Sharing of processing infrastructure and other operational and management synergies would significantly enhance the potential economics of Wowo Gap.

Positioned to benefit from anticipated demand for VFRBs

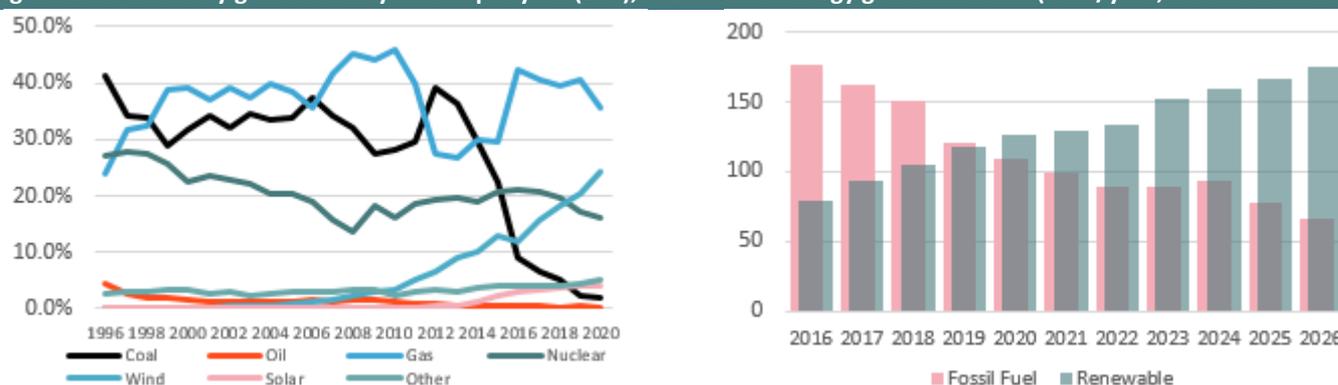
Vanadium Redox Flow Batteries (VFRBs) – are they the solution to grid storage? Although the Dempster vanadium project is at early stage of development, mineralised intervals comparable with similar vanadium projects under development in North America have been established. If VFRBs live up to their potential to transform baseload fossil fuel-based power grids to support reliable renewable power, demand for vanadium will rocket and Corcel is well placed to benefit from this.

We believe that Corcel is ideally positioned to benefit from increasingly ambitious and established UK goals for decarbonisation and electrification as well as increasing global demand for battery metals. **We see fair value in Corcel at 8p/share.**

What are reserve power projects?

Reserve power projects are a key part of the UK's energy security and will provide resilience to the grid over the coming years. With the seismic shift away from coal-fired power generation in the past decade, the desire to move away from carbon emissions to achieve "net zero" and the increasing use of renewable energy generation, there is inherently more variation in the system and a loss of "baseload" power. Nuclear will become a larger part of the mix – especially when Hinkley Point C and Sizewell C become operational and if the government achieves its aims of several new generations of smaller modular plants. However, this is still only expected to be 25% of demand long term, as older plants are closed while new ones come online with substantial net gain likely.

Figure 1: % electricity generation by source per year (LHS), UK forecast energy generation mix (TWh/year, nuclear not shown)



Source: ONS, Digest of UK Energy Statistics; Dept. for Business, Energy & Ind. Strategy (BEIS)

The long-term replacement for coal is offshore wind with substantial input from solar, but as the old adage goes, "the wind doesn't always blow and the sun doesn't always shine" – and certainly these sources are not consistent between night and day. So, to provide adequate reliable power to the national grid, to solve the issues of security of supply and to avoid overreliance on fossil fuels, there have to be new solutions.

You can't get away from the convenience of gas-powered generation; it can come online within minutes, it can run for days, and is cheap to construct – and is also the lowest carbon-emitting fossil fuel.

Batteries are more expensive and, as yet, not properly established at scale with limited operating duration but will inevitably be used to store excess renewable energy. They have the advantage in that they can be accessed in seconds should there be a requirement for additional power and so are superbly flexible and adaptive. In what format the battery banks will be established is not yet fully established, but vanadium batteries and lithium batteries remain the favourites at the current time.

The market is evolving in the UK, but there will be a need for more plants and so it is easy to see how Corcel's FGS business unit can grow and be of more importance to its future. The key to any of this is momentum, and with Corcel expecting financial closure on its Tring Road and Avonmouth peaker plants this year, we could see the company re-rate.

Key risks and other considerations

Like with all companies, investing in Corcel carries some risks. We have highlighted the most significant risks, as we see them, below.

Country risk: Corcel's UK energy generation and storage projects are aligned to established government decarbonisation and electrification goals and we consider UK country risk to be low. We consider that the Dempster vanadium project in the Yukon, Canada has low country risk. Because of recent resistance to some mining projects, and the sending out of untreated ores in the first stage, we associate moderate country risk with the nickel-cobalt projects in PNG.

Overall country risk is low.

Exploration risk: The exploration risk associated with nickel-cobalt projects in PNG is considered low as sizeable resources with demonstrated continuity of mineralisation has been established. The Dempster vanadium project is at an early stage of exploration and continuity of mineralisation has not been established; we associate a moderate level of exploration risk with the project.

Overall exploration risk is low.

Time risk: Permits and agreements entered into by Corcel for various projects are time limited. Corcel has successfully negotiated extensions to a number of agreements. If Corcel does not advance its projects, these permits and agreements, may expire.

Overall time risk is low.

Commodity price risk: Metal and electrical unit pricing are variable and may go up or down, affecting the value of Corcel. In the near to mid-term (one to 10 years), we expect commodity and electrical unit pricing to remain strong.

Overall commodity risk is low.

Exchange rate risk: Corcel has assets in jurisdictions outside the UK, foreign exchange rates fluctuate and can have an impact on profitability when translated into sterling.

Overall exchange rate risk is low.

Future funds: Fundraising for small cap companies is competitive. We believe that Corcel's flexible energy generation and storage projects are a compelling proposition that would advance the UK transitional energy strategy and become income-generating.

Overall Future Funds risk is low.

Although, as is normal, a number of risks are associated with Corcel's projects, we consider that overall risk is low with continued access to the capital markets as the key risk.

Valuation

Our fair value for Corcel is 8p per share

We see fair value in Corcel at 8p/share: Our fair value for Corcel represents a significant uprating from the current share price (1.5p). The fair value recognises Corcel's early strategic positioning ahead of anticipated supply crunches in increasingly important sectors.

Valuation approach

We have valued Corcel based on an SOTP approach, considering the following parts of the business with suitable risk weighting:

- Flexible Grid Solutions (FGS) battery storage and peaker plant generation (UK)
- PNG nickel-cobalt projects (Mambare and Wowo Gap)
- Dempster vanadium project (Canada)

We value Mambare and Wowo separately, as Corcel has different levels of interest in the projects and permitting for a mining lease is advancing at Mambare ahead of a similar process at Wowo Gap. Notwithstanding this, we recognise obvious synergies and the future potential to merge the two projects and/or operate as a synergistic unit.

Our valuations are summarised in Table 1.

Table 1: Corcel SOTP valuation

Project	Valuation approach	\$m	GBPm	Ownership	Risked *	Value GBPp/sh#
Mambare	DCF NPV ₁₀	84.6	62.6	41%	60%	3.5
Wowo Gap	DCF NPV ₁₀	84.6	62.6	100%	25%	3.6
Dempster	Peer	1.4	1.0	50%	100%	0.1
Mining division						7.2
Burwell	DCF NPV ₁₀	20.5	15.2	100%	20%	0.7
Tring	DCF NPV ₁₀	15.4	11.4	40%	30%	0.3
Avonmouth	DCF NPV ₁₀	15.4	11.4	100%	30%	0.8
FGS division						1.8
Corporate costs	3-year DCF WHIe	(3.4)	(2.5)			(0.6)
Net cash (debt)	WHIe **	(2.0)	(1.5)			(0.3)
Corcel fair value est.						8.0

Source: WH Ireland Research, S&P Capital IQ

*Risk is subjective, ** WHI estimates May 2022, #441m shares in issue

Flexible Grid Solutions

Our valuation of FGS is based on both the expected annual average per MW hour estimated by Corcel but also on the value in Mast Energy (LSE:MAST, market cap £7m), which has similar energy projects (i.e. land lease, grid connection and planning have been secured) connected to the UK National Grid, albeit at a lower projected size than Corcel. A recent award to MAST's Bordesley plant valued its connection at £31/kW/year (£31k/MW). Valuations far in excess of £100k/MW can occur given the right circumstances; however, we consider such values do not reflect normal market conditions. When valuing FGS, we have assumed a conservative £30k/MW for Tring and Avonmouth and £40k/MW for Burwell but consider this to be a new baseline as ever-increasing scrutiny is placed on the reliability of the grid.

The combined FGS portfolio has over 150MW of defined storage/generating capacity; including estimates of the future pipeline. We have ignored the potential to make use of

the additional 50MW connection capacity at Burwell as this is subject to additional permitting and permissions and have also ignored the potential for an additional 15MW connection at Avonmouth. Having taken into account Corcel's interest in each project, we estimate the risked shovel-ready value of FGS is 1.8p/sh (£7.9m), which is roughly equivalent to MAST's current market capitalisation. Despite its smaller projects, MAST is already connected to the grid and generating electricity on demand in some of its projects.

Corcel would receive a "development fee" equivalent to £30-£40k/MW, or minimum £2.1m on financial closing of the Tring Road and Avonmouth peaker plants after financial closure (i.e. financing of ~£25m to build the 50MW unit). Burwell would generate a larger development fee after its expected £22m construction financing. Once the FGS portfolio is realised, project management will be left to proven partners and Corcel intends to invest income towards developing its battery metal projects.

To indicate the potential of Corcel's FGS business, we highlight FGS peer MAST, which, with 20MW generation capacity six months after listing, has an EV of £8m equivalent to £0.4m/MW. If the same ratio was applied to the FGS portfolio, the value of the fully realised FGS portfolio would be £60m.

Project	Capacity	Interest	Shovel-ready value/MW	DCF10% **	Risked*	Generating value £
Burwell	50MW	100%	£40	£15.2m	20%	£3.0m
Tring	50MW	41%	£30	£11.4m	30%	£1.4m
Peaker plants						
Avonmouth	50MW	100%	£30	£11.4m	30%	£3.4m
Battery Storage						
Total	150MW			£38.0m		£7.8m

Source: WH Ireland Research, * Subjective risk based on stage and permitting ** DCF over 15 years

PNG nickel-cobalt laterite projects

We choose to value the Ni-Co laterite projects in PNG using a synthetic DCF, based around the model inputs for a nearby peer in the Solomon Islands – Pacific Nickel's (ASX:PNM, market cap \$14m) Kolosori nickel laterite project, which is expected to produce 1.3Mt/year DSO saprolite ore grading 1.6% nickel.

This is a low-capex, low-opex operating model and involves stripping off the limonite layer of the weathered profile (to be stockpiled), and mining the saprolite layer for export. Minimal processing, barging to bulk ore carrier offshore and then shipping to China.

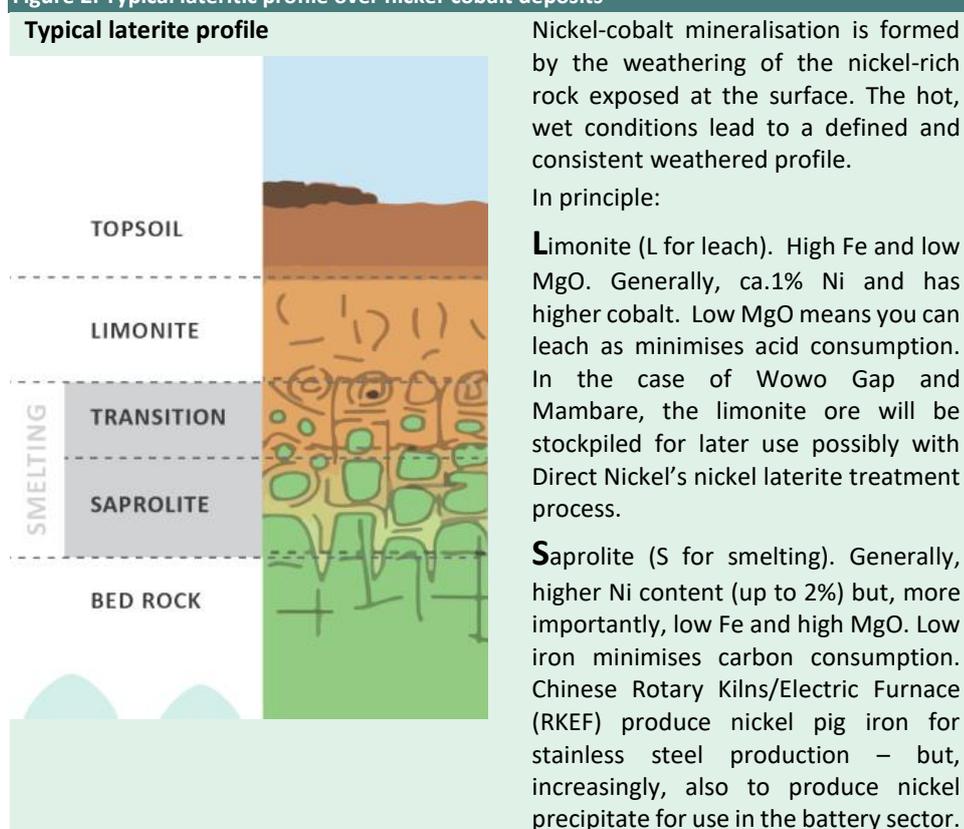
China is hungry for raw materials and has been relying on laterite ore from the Philippines after an Indonesian ban on raw ore exports. However, grades and accessibility of Philippine ore are falling and we understand that Chinese companies are looking to maintain supply and grade and improve diversity of sources and are looking, therefore, wider afield at other similar deposits in the vicinity. The Solomon Islands (Pacific Nickel) and PNG (Corcel) would seem to fit these criteria well. Corcel has signed an MOU with Shandong New Powder COSMO AM&T (NCP) on offtake to define how Mambare and Wowo Gap ore can meet the specifications for NCP's nickel cathode plant.

We have used the economic inputs from Kolosori to produce a DCF for Mambare. We expect that the economics of both will look very similar as the operation is quite simple and can mostly be managed by contractors, if required. We have increased production from an initial 0.5Mt to 1.0Mt in year 5 and given the project a 15-year mine life. This under uses the higher-grade portions of the Mambare resource (which we understand

from Corcel to be 18.3Mt grading 1.6% nickel or 23.2Mt grading 1.5% nickel at a lower cut-off grade) and there will be both the potential to increase production further or add in production from Wowo Gap.

We expect that, eventually, Direct Nickel's atmospheric hydrometallurgical processing route (designed to treat all types of nickel laterite ores, in a single flow sheet to produce a number of final saleable products) will be constructed to process the stockpiles of limonitic laterite ore and the rest of the lower-grade Wowo and Mambare resources. We do not include this potential in our fair value estimate at this stage.

Figure 2: Typical lateritic profile over nickel-cobalt deposits



Source: WH Ireland Research, Pacific Nickel

Our DCF is shown in Table 3. This is the DCF for Mambare, but we expect Wowo Gap to have a very similar operating and cost structure and so take our DCF fair value for Wowo Gap from that for Mambare.

Our inputs are:

- Capacity of 0.5Mt/year rising to 1.0Mt/year in year 5 (wet metric tonnes - wmt)
- 30% moisture in the ore
- Capital expenditure \$20m initially to begin operation with a \$10m capex in year 5 to expand production to 1Mt/year
- Operating costs of \$15/wmt with \$5//wmt to barge the ore to ship
- Ocean freight costs of \$25/wmt
- Royalty of 2% NSR and a 30% tax rate (after capital recovery)
- Nickel saprolite price of \$90/wmt (\$70/dry metric tonne - dmt) for material grading 1.6% nickel. There is a benefit from the higher-grade material and we are led to understand by talking to industry experts that the current prices are

on a sliding scale based on grade: ~\$75/dmt for 1.6% nickel; ~\$35/dmt for 1.2-1.4% nickel and; ~\$20/dmt for 1% nickel. The “price” paid by the Chinese is linked to a percentage of the LME nickel price as Figure 4 shows.

Table 3: Direct Shipping Ore discounted cashflow

		Yr-1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 10	Yr 15	Yr 20
Nickel Laterite (sap)	wmt		0.5	0.5	0.5	0.5	0.8	1.0	1.0	
Grade Ni	%Ni		1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	
moisture	%		30%	30%	30%	30%	30%	30%	30%	
FOB Price	\$/wt		95.0	95.0	95.0	95.0	95.0	95.0	95.0	
Gross revenue	\$m		33.3	33.3	33.3	33.3	49.9	66.5	66.5	
Ocean Freight PNG - China	\$/wt		(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	
Net revenue	\$m		24.5	24.5	24.5	24.5	36.8	49.0	49.0	
OP costs	\$m		(7.5)	(7.5)	(7.5)	(7.5)	(11.3)	(15.0)	(15.0)	
Barge costs	\$m		(2.5)	(2.5)	(2.5)	(2.5)	(3.8)	(5.0)	(5.0)	
royalty	\$m		(0.5)	(0.5)	(0.5)	(0.5)	(0.7)	(1.0)	(1.0)	
EBITDA	\$m		14.0	14.0	14.0	14.0	21.0	28.0	28.0	
Depreciation	\$m		(1.0)	(1.3)	(1.3)	(0.8)	(2.9)	(3.3)	(3.3)	
EBIT	\$m		13.0	12.7	12.7	13.2	18.1	24.8	24.8	
Interest	\$m									
Tax	\$m			(3.8)	(3.8)	(4.0)	(5.4)	(7.4)	(7.4)	
Operating profit	\$m		13.0	8.9	8.9	9.3	12.7	17.3	17.3	
Add back depreciation	\$m		1.0	1.3	1.3	0.8	2.9	3.3	3.3	
Sustaining capex	\$m		(0.2)	(0.5)	(0.5)	-	(0.7)	(0.7)	(0.7)	
Expansion capex	\$m	(20.0)				(10.0)				
Cashflow	\$m	(20.0)	13.8	9.7	9.7	0.0	14.9	19.9	19.9	

Source: WH Ireland Research estimates, note missing years

Figure 3: Direct Shipping Ore free cashflow

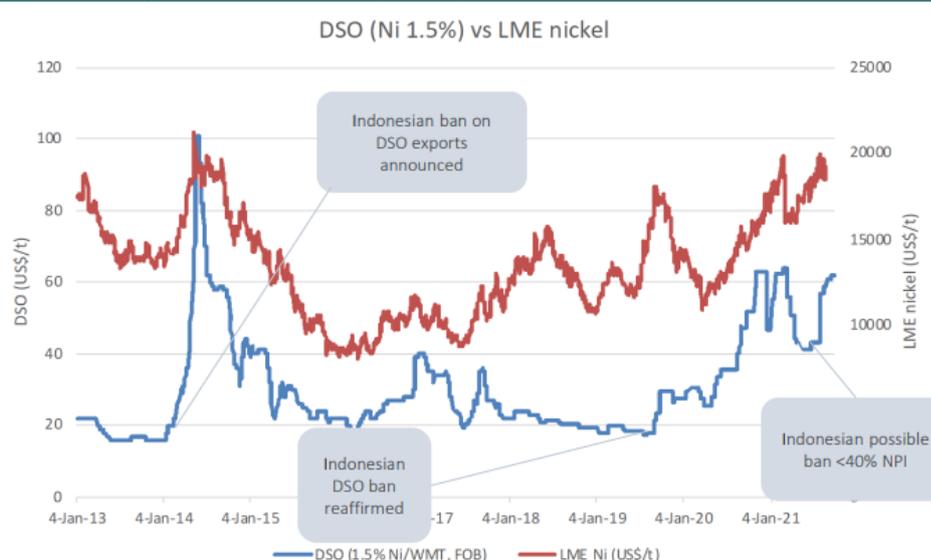


Source: WH Ireland Research

The DCF as presented (Table 3) produces a free cashflow (FCF) of ~\$20m/year with an NPV₁₀ of \$85m over the modelled 15-year time horizon and returns an IRR of 58%. While not fully capturing the value of the nickel and not gaining any benefit for cobalt, this

simple and low-tech mine site might be just the model for Corcel to adopt in the early stages of its evolution to a producer.

Figure 4: Pricing for nickel laterite ore (1.5% Ni)



Source: WH Ireland Research, Pacific Nickel

Dempster vanadium project

Corcel has a 50% interest in the Dempster vanadium project, which it acquired for CAD\$450k in stock in January 2019, since when there has been growing excitement around the potential of VRFBs (for which vanadium is a critical component). Initial exploration at Dempster has returned grade and thickness intervals comparable to other vanadium exploration projects in North America.

We consider that Vanadium Energy (TSX-V:VEC), with the Huzyk property, to be a good comparator for Dempster. VEC has other properties but at a much earlier stage of exploration. Both Huzyk and Dempster are in northern Canada and they have generated similar drilled intercepts. VEC has an enterprise value of £1.2m, so we consider Corcel's 50% interest in Dempster to have a value of £1.0m.

Upsides and further drivers for Corcel

Our valuation of Corcel is based on aggressive discount factors and we have identified multiple factors that could further drive our fair value estimate upwards, including:

- use of the additional 50MW of grid connection at the Burwell battery storage project;
- use of the additional 15MW grid connection at Avonmouth peaker plant;
- addition of other power storage and generation projects to the FGS portfolio – we see this sector as one of growing importance in the UK energy sector;
- up classifying and growing the Mambare resource with additional exploration;
- granting of mining lease permits, funding and commencing DSO production from Mambare and then Wowo Gap; and

- installing a plant based on the Direct Nickel process to capture the full value of the *in situ* Mambare nickel (and get by-product credits from cobalt).

Corcel background

Corcel PLC has traded as CRCL on the alternative investment market of the London Stock Exchange since 2005. Corcel benefits from an experienced management team with extensive sector and AIM expertise.

With a highly attractive mix of blue-sky battery metals exploration and flexible grid solutions, Corcel has embraced the climate challenge and is ideally placed to benefit from the decarbonisation and electrification of the global economy.

Corcel is focused on the exploration and development of battery metal projects (nickel, cobalt, and vanadium) and has interests in advanced flexible energy generation and storage projects connected to the UK National Grid.

Flexible Grid Solutions (FGS)

On 23 December 2019, Corcel (known as Regency Mines at the time) announced a memorandum of understanding (MOU) to enter into a strategic partnership with Ion Ventures Ltd (Ion) an investor in, and developer of, energy storage and flexibility assets. The partnership is known as Flexible Grid Solutions (FGS). Under the MOU, the parties agreed to partner to identify and prioritise the most commercially attractive storage and flexibility assets, and to secure funding and then moving quickly to first cashflow.

The partnership would see Ion generate earnings through yield from carried interests and management fees earned by having a continuing role as project manager and operator of flexible generation and storage assets. Corcel would be free to advance its battery metal projects while benefiting from profits generated.

Subsequently, the Tring Road and Avonmouth gas peaker plants have been added to the FGS fold. We consider that, under the Corcel & Ion Ventures partnership, the FGS projects are in good hands and, if funding can be secured and the projects developed, they will become long-term cash generators with government guaranteed minimum levels of income with upside potential dependent on prevailing market conditions over their lifetimes.

The company continues in active discussions with several potential investors and sources of funding for the gas peaker projects and will update the market on further developments in due course. Should Corcel secure funding for its FGS projects, they will become long-term cash generators with government-guaranteed minimum levels of income and upside potential dependent on prevailing market conditions. We note the difficulty in securing funding for gas-powered peaker plants given recent investor ESG initiatives. However, there are no viable alternatives that can be brought online over a short period that would accelerate the transition away from “always on” baseload fossil fuel generation. In our view, and in the view of the UK National Grid, gas peaker plants are a key stepping stone towards reliable carbon-free power generation.

FGS is seeking to develop a large asset base that would generate reliable long-term earnings for Corcel. As the energy mix in the UK transitions from coal and nuclear to renewable power generation, demand is created for flexible grid solutions to smooth the inherently variable power generation of renewable power. FGS has identified, and advanced, VRFB storage and gas peaker plants that would be connected to the UK National Grid. If developed, these projects would smooth the variability of supply from intermittent renewable power sources: batteries store and later distribute excess solar

and wind energy; gas peaker plants power-up on demand giving rapid generation capacity as needed and, if adequately scaled, could remove the need for baseload “always on” carbon-based generation.

The projects identified by FGS fit neatly with the UK’s Net Zero 2050 initiative, which concerns greenhouse gas emissions and increasing pressure on the UK grid. Corcel has a 100% interest in the Burwell Battery Storage – a 50MW project (100MW grid connection) in Cambridgeshire, which FGS is rapidly advancing to shovel-ready status. More recently, FGS acquired interests in two gas peaker projects; it now owns 40% of the Tring Road 50MW site and 100% of the Avonmouth 50MW installation. Tring and Avonmouth are fully shovel ready.

Burwell (battery storage)

Burwell is a 50MW battery storage project located outside of the town of Burwell, Cambridgeshire, and has potential for a further 50MW photovoltaic solar energy production. Corcel has a 100% interest in the Burwell project. As with similar projects, Burwell is competing in a congested market for connection capacity to the UK National Grid.

On 22 September 2020, Corcel announced receipt of a formal Grid Connection offer from UK Power Networks, which includes undertaking the "non-contestable" works necessary to connect the Burwell site to its UK energy network. The offer covers a site capacity of 100MW (split 49.9MW of energy storage and 49.9MW of photovoltaic solar energy production), a 132kV power input and an import/export capacity of 49.9MW and 99.8MW, respectively.

The Burwell energy storage project is currently being advanced towards shovel-ready status, with the grid connection in place, site planning at a very advanced stage and the land lease under negotiation. Upon securing financing, it is estimated that Burwell would come online within 14 months, dependent mostly on Chinese battery suppliers.

Figure 5: Burwell sub-station – location of proposed battery storage site



Source: WH Ireland Research, Corcel

The Burwell battery storage site would make use of grid-scale lithium ion batteries; the company has had ongoing conversations with Tesla, BYD, SYL Risen and others to supply them in quantity.

Battery energy storage projects such as Burwell are increasingly in demand as the UK moves to renewables and removes carbon baseload energy generation from the grid. Grid level batteries support the UK's Net Zero 2050 initiative and decarbonisation goals.

Tring Road (gas peaker plant)

On 10 May 2021, Corcel announced the acquisition of a 40% interest in the Tring Road 50MW gas peaker project from Arlington Energy (AE), located outside of the town of Aylesbury, England.

Corcel and AE have formed an industry standard joint venture to operate the project and will look to jointly arrange funding for the project over the coming months. Corcel and AE will explore and discuss the potential to develop additional energy storage, gas peaking and solar assets in the United Kingdom with a view to Corcel participating in future AE projects in the UK flexible energy sector.

Third-party estimates of annual gross margins are between £103k and £147k per MW/per annum, once the project is operational.

The joint venture partners intend to procure a development fee at financial close as well as an equity carry as part of ultimate arrangements negotiated. In addition, Corcel is expected to receive a 3% fee covering all equity funding arranged.

Figure 6: Tring Road – location of proposed gas peaker plant



Source: WH Ireland Research, Corcel

Avonmouth (gas peaker plant)

On 28 May 2021, Corcel announced that it had acquired a 100% interest in the shovel-ready, 50MW Avonmouth gas peaker plant located outside of Bristol. The acquisition includes rights over an additional 15MW of potential grid connection capacity and associated land at the same site. Rights to connect to the grid connection are established along with the gas connection, planning permission and land rights. FGS also has exclusivity over an additional 15MW grid connection and associated land at the site, giving it the rights to take on the connection for use in a potential generation or battery project on similar terms.

On 24 February 2022, Corcel announced that the project SPV had been provisionally awarded a 15-year Capacity Market contract by National Grid Electricity System Operator

("National Grid" or "NGESO"). The final results of the T-4 Auction were published by NGESO on 4 March 2022. The T-4 CM auction cleared at a record high of £30.59/kw/annum, potentially providing guaranteed income of £1.5m/year if Avonmouth was funded and constructed, independently from actual trading revenues from operating the site.

Third-party estimates put gross annual margins between £67k and £101k/MW per year, once the project is operational.

Figure 7: Avonmouth – location of proposed gas peaker plant



Source: WH Ireland Research, Corcel

Battery metals development projects

Mambare nickel-cobalt (PNG)

Corcel has a 41% interest in Mambare, one of the world's largest nickel-cobalt laterite deposits. Despite its significant size, only 3% of Mambare has been explored and there is undoubtedly potential to increase Mambare's resource base.

Mambare's joint venture partners are currently pursuing a mining lease at the site, which would ultimately allow for a DSO operation. This DSO installation would be a simple operation consisting of excavating, screening and drying, and then loading ore on a ship for export. DSO operations avoid the need for capex-intensive processing plants, chemical handling, major infrastructure or tailings storage and are therefore lower cost and quicker to commission compared with operations with processing facilities.

On 10 January 2022, Corcel announced the signing of a non-binding offtake agreement with Shandong New Powder COSMO AM&T ("NPC"). The MOU considers the sale of up to 0.5Mt of DSO to NPC per year from Corcel's Mambare and Wowo Gap projects. Environmental permitting has been awarded for Mambare and a mining lease for a DSO operation has been submitted.

An initial, cash-generative DSO operation could pave the way for a subsequent larger processing operation based on the Direct Nickel (DNi) process and technology, which the Mambare project retains the rights to utilise.

Property description and location

Mambare is located in southeast of PNG, 90km northeast of Port Moresby and near the town of Kokoda.

Ownership

Exploration Licence EL1390 is 100% owned by Oro Nickel – a joint-venture between Corcel Plc (41%) and Battery Metals Pty Ltd (59%). The process to renew EL1390 is ongoing; we understand that it is typical in PNG for licences to expire prior to renewal.

On 7 April 2020, Corcel (known as Regency Mines at the time) announced details of an agreement with its JV partner whereby Corcel's interest would be reduced if the partner secured the mining lease from the relevant PNG government agency within 19 months (ending 19 October 2021). This metric was subsequently not met.

Property history and near-term objectives

Mambare has been explored with various geophysical methods, pits, trenches, auger, wacker and drill holes.

An application has been submitted for a 60 km² mining lease to produce DSO and environmental permitting has already been granted.

Geology and exploration

Weathered ultramafic rocks hosts significant layered nickel and cobalt in saprolite and laterite. Up to 6m of volcanic ash has been deposited over the ultramafic host rock. Laterites are rich in iron and aluminium and are a rusty-red colour due to the high iron oxide content and are caused by tropical weathering. Saprolites are also chemically weathered rocks but form a lower zone and represent deep weathering of the bedrock surface.

With <5% of Mambare's 80km² main target (plateau) drill tested, there is significant scope to expand the resource as the JV partners might deem desirable. The pairing of massive scale and low-cost processing makes a highly compelling value proposition.

There have been 477 core holes (average 16.3m depth) 297 auger holes, 45 wacker holes, 61 test pits and one costean drilled and dug over the years. In addition, there has been extensive ground mag, ground penetrating radar, airborne mag and radiometrics analysis, along with a satellite topography survey. The resource at Mambare could be far, far larger than the current estimate, which considers just 2km² of the 80km² of the plateau. Approximately 3% of the main target has been drilled tested.

Resources

Four hundred and seventy-seven (477) core drill holes have tested the main target at Mambare to an average depth of 16.3m. Further auger drilling, wacker holes, pits and a trench have also been used to evaluate part of the Plateau target.

A JORC 2012 mineral resource estimate (MRE) has been prepared for Mambare, in which Corcel has a 41% interest. It is significant to note that less than 5% of the primary target has been investigated.

Table 4: Mambare Resource (JORC 2012)

Resource category	MT	Nickel %	Cobalt %
Indicated	3.3	1.00	0.07
Inferred	159.2	0.94	0.09
Total	162.5	0.94	0.09
Contained metal (KT)	-	1,528	146.25

Source: WH Ireland Research, Corcel.

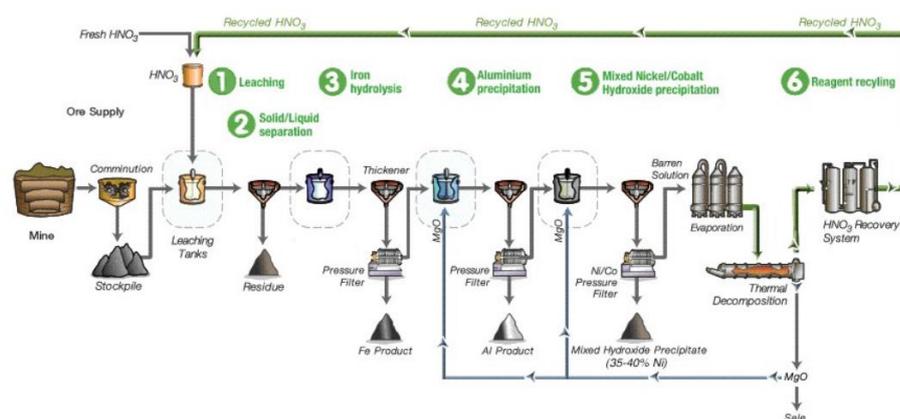
Processing

Proposed DSO operations are independent of establishing a processing plant.

Corcel and its partners have secured the licence to use the Direct Nickel (DNi) processing technology at Mambare to produce up to 40ktpa. DNi uses environmentally safe nitric acid as the leaching agent and facilitates the recovery of nickel and cobalt from all types of ore. The DNi process is saleable with significantly lower capital cost than traditional High-Pressure Acid Leach Plants (HPAL).

The DNi Process™ is an atmospheric hydrometallurgical route designed to treat all types of nickel laterite ores, in a single flow sheet to produce a number of final saleable products. Direct Nickel believes that the DNi Process™ is the only process available that can treat the whole limonite/saprolite profile (from 90% limonite to 100% saprolite) to maximise economic recovery of deposits such as those at Mambare and Wowo Gap.

Figure 8: Simplified schematic of Direct Nickel (DNi) process



Source: WH Ireland Research, Direct Nickel

Wowo Gap nickel-cobalt (PNG)

Corcel has a 100% interest in the 94.4km² Wowo Gap nickel-cobalt project and has recently completed a major upgrade of the mineral resource estimate to the much more stringent and relevant JORC 2012 standard.

Property description and location

Wowo Gap is 200km from Port Moresby, the capital city of Papua New Guinea and some 150km southeast of the Mambare project.

Ownership

Corcel has a 100% interest in Exploration License EL1165

Property history and near-term objectives

Exploration of the project began in the 1950s with diamond drilling, wacker holes and ground penetrating radar having been utilised over the years. Corcel acquired a 100% interest in the project in 2021 and has recently upgraded the resource to the 2012 standard and is currently conducting a Gap Analysis in preparation for a Bankable Feasibility Study and Mining Lease application.

Geology and exploration

Wowo Gap is in the Papuan Ultramafic Belt, a complex of peridotite, pyroxenite and gabbro that forms the prominent east-west trending Didana Range.

Mineralisation is associated with a laterite weathering profile, which has developed over underlying ultramafic geology, typically between 10m and 15m thick. This has served to create an enrichment of nickel, cobalt, iron, chromium, magnesium and magnesite. The depth of lateritic weathering is controlled by rock type and fragmentation.

A nickel-cobalt resource has been established within the laterite profile based on drilling along the 12-kilometre strike length.

Resources

Based on 458 core holes (diamond and tungsten carbide), 125 Auger holes, and 153 wacker holes, a mineral resource estimate (JORC 2012), within the laterite profile, has been prepared for Wowo Gap Table 5.

Table 5: Wowo Gap mineral resource (JORC 2012)

Type	Resource category	Mt	Nickel %	Cobalt %
Limonite/Saprolite	Indicated	63	0.85	0.07
	Inferred	9	0.84	0.07
Rocky Saprolite	Inferred	38	0.75	0.02
Total	Indicated	63	0.85	0.07
	Inferred	47	0.77	0.06
	Total	110	0.81	0.06

Source: WH Ireland Research, Corcel.

There are higher-grade zones within this, which would support a DSO operation, in our opinion.

Dempster - vanadium (Canada)

The Dempster project was previously explored for nickel and, at the time, the potential for vanadium was not prioritised. The emergence of Vanadium Redox Flow Batteries (VRFBs) and their potential for grid-scale battery storage and ability to smooth of the delivery of renewable power has reignited interest in vanadium exploration and the project was converted to a vanadium-centric focus.

Initial exploration of Dempster indicates that black shales host vanadium mineralisation. Vanadium-rich black shale deposits are amenable to low-cost mining/processing methods.

Property description and location

The property consists of 196 claims with a combined footprint of approximately 41km².

The entirety of the property lies alongside the Dempster Highway, some 65km north of the Eagle River Lodge, in the Northern Yukon, Canada.

Ownership

Corcel has a 50% interest in the Dempster vanadium project.

Property history and near-term objectives

Dempster has previously been explored for nickel. Corcel submitted historical drill core for vanadium analysis that confirmed significant intervals of V₂O₅ mineralisation comparable with other projects being explored in Canada and the US.

2022 exploration program planning is currently under way.

Geology and exploration

The primary exploration target is vanadium-rich Black Shale deposits (BSV) that occur at the contact between two distinct sedimentary formations. In BSV deposits, vanadium

accumulates at the base of sedimentary units as a discrete layer of metal-bearing, organic-rich black shale.

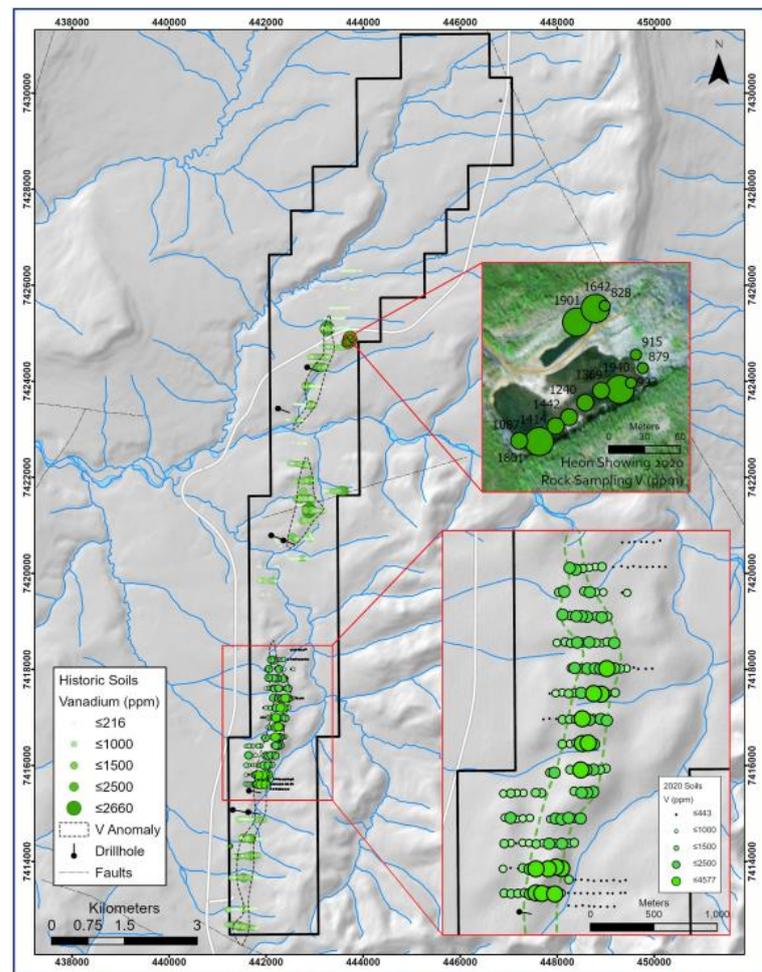
Superficial exploration defined broad zones of anomalous vanadium:

- Soil results generated peak values of 0.82% V_2O_5 , 18 samples generated values over 0.4%.
- Vanadium values in rock samples yielded V_2O_5 values between 0.12 and 0.35%. 13 of 14 rock samples returned anomalous Zn and Ag.

Mineralisation occurs at a regional scale contact between two distinct sedimentary units. Vanadium is hosted in black shales, implying processing would be straightforward.

Up to 20km of strike along the prospective contact have been defined in the Property.

Figure 9: Dempster vanadium – Surface geochemistry



Soil and rock chip sampling results from the Dempster Vanadium Project. Source: Company

Source: WH Ireland Research, Corcel

Battery metals outlook

Mass electric vehicle (EV) adoption is an ever-closer reality as major hurdles such as range anxiety, cost competitiveness, and access to charging stations are overcome.

Governments around the world are ushering in regulations that promote EV use. The UK and other European nations are leading the way with upcoming bans on the sale of new diesel cars.

In 2021, Tesla sold over 6.5 million EVs globally and major “traditional” automotive brands have committed to produce only EVs in the near future. The die has been cast; investors now recognise that demand for battery metals is set to increase significantly.

Big changes to EV economics, along with technical innovations, are serving to disrupt the metals markets. Critical battery metals include lithium, nickel, cobalt and vanadium, where there are now increasing concerns that a supply crunch from the mid-2020s onwards across all these four key metals will cause upward pressure on prices. Corcel has established interests in nickel, cobalt and vanadium projects; offering meaningful exposure to these trends.

Nickel market overview, outlook and price

Nickel is an important battery component, its use in batteries improves energy density

Nickel is one of the critical metals for use in batteries because it improves energy density. Alternatives to nickel are available but at significantly greater cost. In the recent past, the use of batteries with nickel components was confined to consumer electronics. The rapid adoption of EVs, which require much larger batteries with greater nickel content, has focused increasing attention on nickel. Industry analysts forecast a significant increase in global nickel consumption for batteries in both the EV and energy storage markets.

Concerns about pollution and environmental benefits are driving the rapid adoption of EVs globally. Rapidly rising demand for EVs is also fuelled by the adoption of green legislation by many countries, including the UK, India, Germany, France, Norway and China. Morgan Stanley believes that, by 2050, four out of every five cars sold will be a battery-electric vehicle. The uptake of EVs and increased demand for nickel is reflected in pricing over the past five years.

Figure 10: Nickel price



Source: WH Ireland Research, S&P Capital IQ

In response to increasing scarcity of supply, EV manufacturers are acquiring upstream deposits and offtake agreements, with Tesla even making noises about going into mining key minerals itself.

Vanadium market overview, outlook and price

Vanadium is a key component of Vanadium Redox Flow Batteries

In a 2019 report, The World Bank said that vanadium would be one of the top five minerals and anticipated a significant increase in demand by 2050 on the back of a forecast 500% increase in demand for battery metals.

Demand for vanadium is projected to increase substantially as VRFB technology is embraced more widely. VRFBs offer the potential to store and later distribute excess energy generated from renewable sources.

As renewable energy production increases, grid energy storage facilities using VRFBs is projected to become an increasingly important part of energy infrastructure.

VRFBs are bulky and are not yet compatible with consumer electronics; however, where size is not a restraint, VRFBs offer significant advantages:

- no limit on energy capacity;
- can remain discharged indefinitely without damage;
- mixing electrolytes causes no permanent damage;
- single charge state across the electrolytes avoids capacity degradation;
- safe, non-flammable aqueous electrolyte;
- wide operating temperature range, including passive cooling;
- long charge/discharge cycle lives: 15,000-20,000 cycles; and
- vanadium from VRFBs can be repeatedly recycled into new batteries.

Climate change and the energy transition

To mitigate climate change, major global economies are increasingly committed to electrification and decarbonisation. Battery metals and advanced flexible energy storage and production projects are essential if ambitious goals are to be achieved.

After COP21, nations around the globe committed to controlling and reducing greenhouse gas emissions. Nations agreed to reduce emissions of carbon dioxide, methane and other greenhouse gasses, accelerating the drive towards net-zero, including the wider adoption of renewable energy sources and electric vehicles (EVs).

The Energy Research & Consultancy Group, Wood Mackenzie, considers that, by 2032, renewables will overtake conventional power sources. The electrification of transport, homes and industry requires substantial investment into renewable electricity generation and distribution over the coming decades.

Power supplies from renewable sources can be intermittent and not necessarily aligned to demand. The ability to store excess electricity production for distribution in times of increased demand is a key factor in making renewables a reliable power source, battery storage using VREBs provides this ability.

Battery storage offers a viable solution for storing intermittent energy generation associated with some renewable sources.

As wind and solar generated power reduces in cost and is more widely adopted, we consider that battery storage facilities connected to national grids will grow significantly. Global battery storage capacity is expected to increase to 44GWh by 2024.

Wood Mackenzie believes that, in 2018, the market expanded to record levels with 147% year-on-year growth in GWh terms. In the coming four years, it expects to see growth in all directions as the storage markets balloon. Global battery storage capacity was estimated at 29GWh in 2020. Forecasts suggest that, by 2024, the global market will increase to 44GWh.

Battery metals

Demand for battery metals such as nickel, cobalt and vanadium is rocketing in line with the adoption of EVs. All electric car brands are winning over an ever-increasing share of auto sales, with more traditional automakers increasing the speed of their transition to battery-centric line-ups.

Legislative bans on the sale of new combustion engines are looming and many traditional car manufacturers have committed to “go electric” by the end of this decade, including; Jaguar Land Rover (by 2025), Alfa Romeo (2027), Lotus (2028), Bentley (2030), Cadillac (2030), Lexus (2030), Mercedes Benz (2030), Mini (2030), Rolls Royce (2030), and Volvo (2030).

Shareholders

Table 6: Corcel – Shareholders with >3% Interest (1 February 2022)

Major shareholder	Number	%
Aurora Nominees Limited*	37,310,310	9.70%
Hargreaves Lansdown (Nominees) Limited	31,103,999	8.08%
Interactive Investor Services Nominees Limited	28,305,713	7.36%
Hargreaves Lansdown (Nominees) Limited	27,301,547	7.10%
Interactive Investor Services Nominees Limited	27,018,465	7.02%
Align Research Ltd**	24,567,692	6.38%
Barclays Direct Investing Nominees Limited	23,998,442	6.24%
JIM Nominees Limited	18,365,545	4.77%
Hargreaves Lansdown (Nominees) Limited	13,304,568	3.46%
HSDL Nominees Limited	12,462,619	3.24%
Monecor (London) Limited****	12,296,999	3.20%
Barnard Nominees Ltd***	12,026,168	3.13%
	268,062,067	69.68%

Source: WH Ireland Research, Corcel

Corcel team

Board members

James Parsons – Executive Chairman: In addition to his role as Executive Chairman of Corcel Plc, James is currently Chairman of Ascent Resources Plc, Coro Energy Plc and Echo Energy Plc. James has over 20 years' experience in the fields of strategy, management, finance and corporate development in the energy industry. He started his career with the Royal Dutch Shell Group where he spent 12 years with Shell working in Brazil, the Dominican Republic, Scandinavia, the Netherlands and London. James was previously Chief Executive at Sound Energy Plc for eight years, is a qualified accountant and has a BA Honours in Business Economics.

Scott Kaintz – Chief Executive Officer: Scott Kaintz has a degree in Russian Language and Russian Area Studies from Georgetown University and MBA degrees from London Business School and Columbia Business School. He started his career as a US Air Force Officer and analyst working across Europe, the Middle East and Central Asia. Scott has held operational and managerial roles in the defence industry and worked in corporate finance and investment funds in London, focusing primarily on capital raising efforts and debt and equity investments in small-cap companies. While Scott is currently the Corcel Executive Director, he is also a Non-Executive Director of Red Rock Resources Plc, listed on AIM, and an Executive Director of Curzon Energy Plc listed on the Standard List of the London Stock Exchange.

Ewen Ainsworth – Independent Non-Executive Director: Ewen is an experienced AIM company director. He is CFO of Coro Energy Plc and CEO of Discovery Energy Limited, an advisory, consultancy and investment company. Ewen has worked in a variety of senior and board-level roles in the natural resource sector for over 30 years, most recently as a Non-Executive Director of Ascent Resources Plc and as Finance Director at San Loen Energy and at Gulf Keystone Petroleum Ltd. He qualified as a chartered management accountant, before moving into leading commercial roles. He holds a degree in Economics and Geography from Middlesex University and is a member of the Energy Institute.

Lord Henry Bellingham – Independent Non-Executive Director: Lord Bellingham has enjoyed a distinguished parliamentary career of almost 40 years and held a number of senior positions, including Foreign Office Minister for Africa, The UN, Caribbean, Overseas Territories and Conflict Issues; Chairman of the Westminster Foundation for Democracy; Chairman of the All-Party Group on the Commonwealth; and the Prime Minister's Trade Envoy to Libya. In 2016, he was Knighted in the New Year Honours list for Parliamentary and Political Service. He sits in the House of Lords after being awarded a Life Peerage in 2020. In addition to his parliamentary career, Lord Bellingham has held several non-executive roles on AIM companies and, until recently, was Non-Executive Chairman of Pathfinder Minerals Plc since 2014. Prior to entering Parliament, Lord Bellingham practised as a barrister having graduated from Magdalene College, Cambridge with a master's degree in Law.

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As at the quarter ending 30 April 2022 the distribution of all our published recommendations is as follows:

Recommendation	Total Stocks	Percentage %	Corporate	Percentage %
Corporate	63	96.9	63	100.0
Buy	2	3.1	0	0.0
Speculative Buy	0	0.0	0	0.0
Outperform	0	0.0	0	0.0
Market Perform	0	0.0	0	0.0
Underperform	0	0.0	0	0.0
Sell	0	0.0	0	0.0
Total	65.0	100.0	63.0	100.0

Valuation and Risks

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Time and date of recommendation and financial instruments in the recommendation

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Company/Issuer Disclosures

Company Name	Table of interest number	12-month recommendation history	Date
Corcel (CRCL)	1,2,4,5	Corporate	10.01.22

<https://www.whirelandplc.com/capital-markets/research-recommendations>

Companies Mentioned

Company Name	Recommendation	Price	Price Date/Time
MAST Energy Developments PLC	Corporate	GBP 0.04	16/05/2022 16:30
Pacific Nickel Mines Limited	No Rec	AUD 0.08	16/05/2022 16:30
Vanadian Energy Corp.	No Rec	CAD 0.05	16/05/2022 16:30

Headline	Date
Advanced Battery Metal Projects and Pioneering Flexible Grid Solutions	18.5.2022

Recommendation	From	To	Analyst
Corporate	10.1.2021	present	CA

Current Analyst (CA), Previous Analyst (PA)

The WH Ireland Research & Corporate Events Portal is available at <https://www.whirelandplc.com/research-portal>

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