

Vulcan Energy Resources Ltd

Australia | Basic Resources | MCap EUR 419.1m

12 April 2024

UPDATE



LEOP starts LiCl production and delivers solid results

What's it all about?

Vulcan Energy started the production (SOP) of the first Lithium Chloride (LiCl) at Vulcan's demo plant (LEOP) in Landau. The production is non-commercial and is intended to facilitate Vulcan's commercial operational readiness, as it will be utilized for optimization, operational training and product qualification. However, it marks a major milestone as it already replicates efficiency data from the pilot plant, showing over 90% (up to 95%) lithium extraction efficiency. Meanwhile, Vulcan is awaiting a decision on the proposed European Investment Bank (EIB) financing. Pending completion of due diligence, Vulcan could obtain a financing up to EUR 500m. With the financing currently under way, the company is preparing for construction of the commercial sites. Our recommendation remains BUY with a PT of EUR 9.90

BUY (BUY)

Target price	EUR 9.90 (9.90)
Current price	EUR 2.10
Up/downside	371.4%

 ResearchHub 



MAIN AUTHOR

Alexander Zienkowicz

a.zienkowicz@mwb-research.com
+49 40 309 293-56

Vulcan Energy Resources Ltd

Australia | Basic Resources | MCap EUR 419.1m | EV EUR 345.0m

BUY (BUY)

Target price EUR 9.90 (9.90)
Current price EUR 2.10
Up/downside 371.4%

MAIN AUTHOR

Alexander Zienkowicz
a.zienkowicz@mwb-research.com
+49 40 309 293-56

LEOP starts LiCl production and delivers solid results

LEOP commences non-commercial production. Vulcan Energy announced the start of production (SOP) of the first Lithium Chloride (LiCl) at Vulcan's demo plant (LEOP) in Landau, Germany. The production is non-commercial and is intended to facilitate Vulcan's commercial operational readiness, as it will be utilized for optimization, operational training and product qualification. According to Vulcan, the LEOP is showing strong early results with consistently over 90% (up to 95%) lithium extraction efficiency. This replicates the company's efficiency data from its pilot plant in Insheim. In the future, the LiCl will be converted to a battery-grade lithium chemical in Vulcan's downstream optimisation plant (CLEOP) at the industrial park Frankfurt Höchst, where Vulcan is currently completing its CLEOP. There, Vulcan will convert the LiCl into battery grade Lithium Hydroxide Monohydrate (LHM). The completion of the CLEOP is planned for mid 2024.

Waiting on EIB financing decision. Meanwhile, Vulcan is awaiting a decision on the proposed European Investment Bank (EIB) financing. Pending completion of due diligence, Vulcan could obtain a financing up to EUR 500m. The European Investment Bank is the lending arm of the European Union, and one of the largest providers of climate finance. The EIB financing would mark a cornerstone. Currently, Vulcan is in the middle of its financing process for Phase 1. Vulcan aims to complete its finance program in H2, 2024. So far, Vulcan has received an AUD 200m (~EUR 120m) non-binding Letter of Support from Export Finance Australia (EFA), and indication of strong ECA support from Canada, Italy, and France during 2023.

Milestones in 2024. Apart from financing, Vulcan has a number of milestones planned for 2024. The company will drive progress on drilling additional well sites for Phase1, and land acquisition for its planned pipeline system, which will connect the well sites and the future central lithium extraction plant (LEP). Ultimately, the construction of the LEP is targeted to commence by the end of FY24.

Conclusion: The production of LiCl marks a major milestone for Vulcan towards commercialization, which will be complemented once the CLEOP is operational. With the financing currently under way, the company is preparing for construction of the commercial sites. Our recommendation remains BUY with a PT of EUR 9.90

Vulcan Energy Resources Ltd	2021	2022	2023	2024E	2025E	2026E
Sales	0.0	3.8	6.8	7.3	9.0	204.9
<i>Growth yoy</i>	na	na	78.5%	8.3%	22.5%	2,176.7%
EBITDA	-6.7	-14.9	-22.3	-44.7	-67.8	107.3
EBIT	-6.8	-17.5	-28.8	-56.0	-100.5	55.1
Net profit	-6.7	-18.7	-24.7	-137.0	-185.4	-16.3
Net debt (net cash)	-72.1	-172.4	-74.3	-473.4	183.6	769.5
Net debt/EBITDA	10.8x	11.6x	3.3x	10.6x	-2.7x	7.2x
EPS reported	-0.08	-0.15	-0.16	-0.69	-0.86	-0.07
DPS	0.00	0.00	0.00	0.00	0.00	0.00
<i>Dividend yield</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Gross profit margin	nm	131.2%	340.1%	18.3%	-344.4%	68.5%
EBITDA margin	nm	-392.3%	-328.9%	-608.6%	-753.9%	52.4%
EBIT margin	nm	-461.5%	-425.0%	-762.3%	-1,116.7%	26.9%
ROCE	-8.3%	-7.0%	-10.4%	-3.2%	-6.0%	3.3%
EV/EBITDA	-51.8x	-16.6x	-15.5x	1.2x	-8.9x	11.1x
EV/EBIT	-51.2x	-14.1x	-12.0x	1.0x	-6.0x	21.6x
PER	-27.2x	-14.0x	-13.5x	-3.1x	-2.4x	-28.5x
FCF yield	0.2%	-4.3%	-7.1%	-6.0%	-1.0%	-4.5%

Source: Company data, mwb research



Source: Company data, mwb research

High/low 52 weeks 3.76 / 1.21
Price/Book Ratio 1.2x

Ticker / Symbols

ISIN AU0000066086
WKN A2PV3A
Bloomberg VUL:GR

Changes in estimates

		Sales	EBIT	EPS
2024E	old	7.3	-56.0	-0.74
	Δ	0.0%	na%	na%
2025E	old	9.0	-85.5	-0.85
	Δ	0.0%	na%	na%
2026E	old	204.9	75.1	0.05
	Δ	0.0%	-26.6%	na%

Key share data

Number of shares: (in m pcs) 199.57
Book value per share: (in EUR) 1.68
Ø trading vol.: (12 months) 16,160

Major shareholders

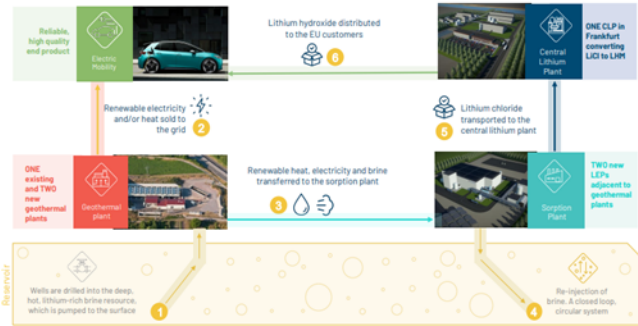
F. Wedin 9.8%
Stellantis Group 6.8%
Hancock Prospecting 5.6%
Free Float 72.5%

Company description

The Australian lithium chemicals & renewable energy company Vulcan Energy Resources Ltd. has been developing a project in the Upper Rhine Valley in Germany that combines the use of thermal water as an energy source (hydrogeothermal energy) with the extraction of the lithium contained in the geothermal brine without polluting the environment with emissions, waste material or toxic substances. With a CO2 footprint of "zero", the project is predestined to mark the beginning of the decarbonization of the battery industry.

Investment case in six charts

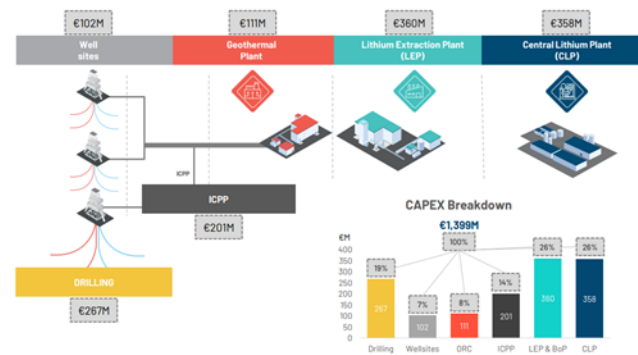
Products & Services



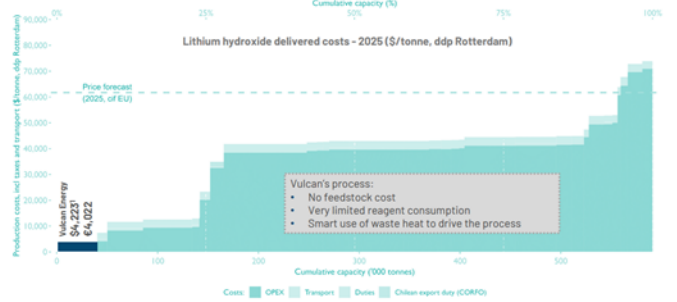
Footprint in Germany and France



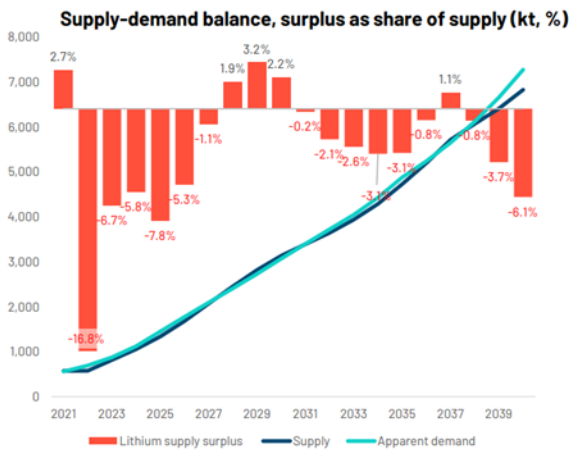
CAPEX Breakdown Phase 1



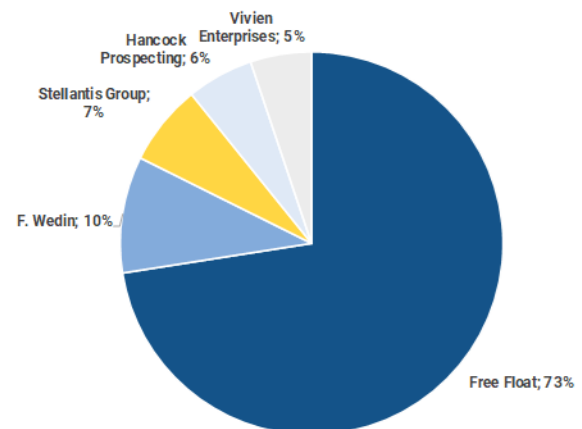
Global cost curve LHM (projected 2025)



Supply-demand balance, surplus as share of supply (kt, %)



Major Shareholders



Source: Company data; mwb research

Company Background

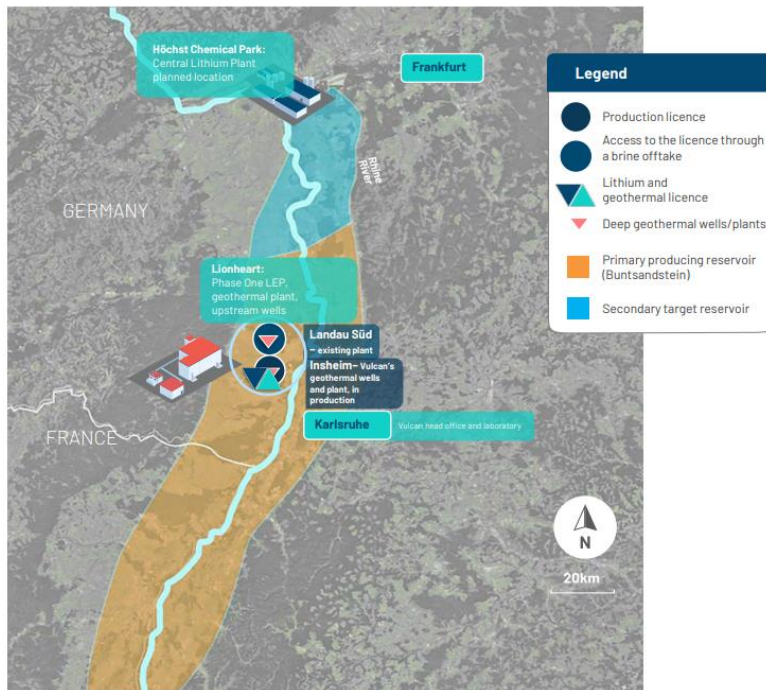
Vulcan in a nutshell:

Battery grade lithium hydroxide from brine sources in Germany – Vulcan has been on target for becoming a leading supplier of a material that is central to the electrification strategies of the automotive industry. And by operating geothermal plants, the company plans to provide renewable energy and heat to public and commercial customers in Germany.

Vulcan's Zero Carbon Lithium Project combines operations of extraction in the lithium-rich geothermal brine of the Upper Rhine Valley, of upgrading lithium to a high purity hydroxide (LiOH) as well as the production of hydrogeothermal energy (renewable electricity and heat). Thermal water will be used as energy source, and thus the extraction of lithium contained in the brine will run without polluting the environment with emissions, waste material or toxic substances. With a **CO₂ footprint of "zero"**, the project is predestined to mark the beginning of the decarbonization of the battery industry.

Estimated resources of Vulcan's Upper Rhine Valley Project have reached a total of approx. 27.7 million t LCE in JORC-compliant terms (Measured and Indicated Resource: 11.2 million t LCE). A portion of 4.16 million t LCE has been classified in the Measured category.

Phase 1 area

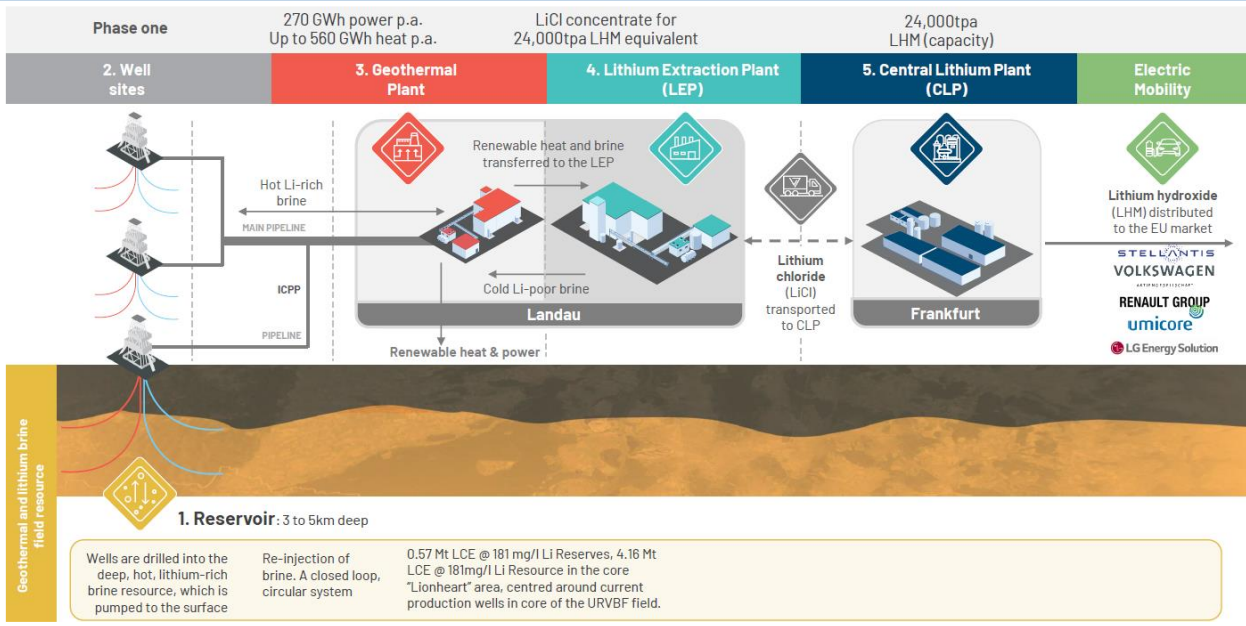


Source: Company data

How Vulcan's system works:

The system consists of extraction wells, drilled into the deep, hot, lithium-rich brine resource, which is pumped to the surface. Reinjection wells are used to feed the water back into the reservoir after part of the thermal energy stored in it has been cooled and lithium from brine has been extracted in the Lithium Extraction Plant (LEP). The lithium in the form of lithium chloride will be transported to Vulcan's Central Lithium Plant (CLP) at Frankfurt Höchst Chemical Park, where it will be converted to battery grade lithium hydrate monohydrate (LHM) using electrolysis.

Vulcan's system

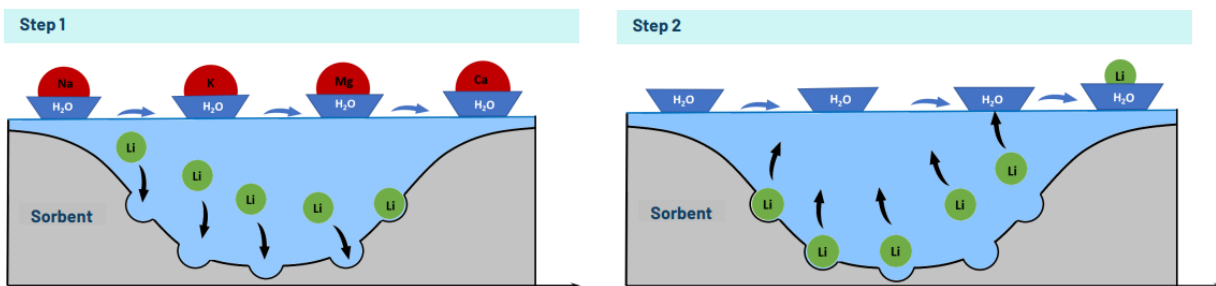


Source: Company data

Technology:

In Vulcan's project areas, a staged development will implement a process, which is known as **Adsorption-type Direct Lithium Extraction (A-DLE)**. This technology bases on proven effective for more than 20 years in industrial lithium carbonate production, while offering a higher lithium yield and very low environmental impact compared to traditional methods such as evaporation or hard-rock mining. A-DLE provides lower operating cost and less waste as this method requires the use of water instead of acid to recover lithium, and naturally heated sub-surface brines do not have to be pre-treated. Also, production times are much shorter. Vulcan's produced lithium can be adapted to meet specific requirements and serve as a precursor product in different forms. Vulcan can extract lithium of high purity relative to hard rock and evaporative lithium, meeting very high product quality standards, particularly in the battery electric vehicle industry.

A-DLE process



- Brine has a high salinity - it contains ions of various sizes and electric charges.
- Water molecules surrounding the ions make up a hydration shell.
- Small lithium ions require a double hydration shell to stabilise their electric charge in the solution.
- In brines with high salinity this is not possible due to the competition for water molecules with the other ions.
- Thus, lithium chloride adsorbs to the surface of the sorbent material.
- During loading, lithium chloride is adsorbed on the sorbent while all the other ions stay in the brine.
- When the loaded sorbent is washed with water, an excess of free water molecules becomes available to the lithium ions.
- Formation of a double hydration shell is an energetically favoured process, which drives the desorption of the lithium chloride from the surface of the sorbent material.
- This process is called elution and the collected wash water that contains the lithium chloride is called the eluate.
- Eluate has a high concentration of lithium chloride and low concentration of impurities, enabling conversion to lithium hydroxide.

Source: Company data

Pre-commercial stage:

Vulcan's first pilot plant has been operating since April 2021, using live geothermal brine from existing wells. To train staff in a pre-commercial environment prior to the start of commercial production for targeted operational readiness in 2026, Vulcan is setting up demonstration plants for the extraction and the electrolysis. In September 2023, Vulcan completed its in-house designed Lithium Extraction Optimisation Plant (LEOP) at the GeoX geothermal plant in Landau. Start of operations occurs in November 2023. The Central Lithium Electrolysis Optimisation Plant (CLEOP) in Frankfurt's Höchst industrial park will be completed in late 2023.

Optimization plants



Source: Company data

Phase One – Commercial stage:

The upstream area for Phase One comprises the Lionheart district, consisting of three licence areas. Vulcan plans to drill additional production and reinjection wells, and to build a new geothermal plant with a planned output of 275GWh of renewable power and 560GWh of heat. For lithium extraction, a large LEP is planned with a total targeted capacity of 24,000 t per year LHM equivalent. Vulcan is targeting the start of production in H2 2026, followed by a ramp up phase during 2027. According to the BES, OPEX was estimated with c. EUR 4,000 per t LHM. The CAPEX for Phase One is currently estimated with EUR 1.4bn.

Commercial LEP

Phase One commercial: Lithium Extraction Plant (LEP)

- **Building permit submitted in November 2023**, in line with Vulcan's timeline.
- Will be constructed next to new Phase One Geothermal Plant in Landau.
- Total **targeted capacity to be 24,000tpa LHM equivalent in LiCl form.**
- From the LEP, **LiCl solution will be transported** to the CLP at Industrial Park Höchst (Frankfurt).
- **Modular build allows** for further phased development across other phases in Upper Rhine Valley Brine Field (URVBF).



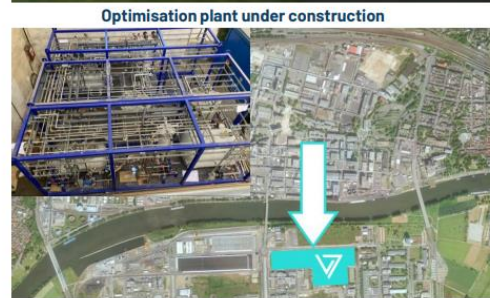
Planned new commercial Phase One Geothermal Plant and Lithium Extraction Plant (LEP) in Landau

Source: Company data

Commercial CLP

NEW CENTRAL LITHIUM PLANT (CLP)

- CLP planned to be located in Frankfurt (Höchst Industrial Park). Close to 100,000sqm secured.
- **Targeted 24,000tpa LHM capacity with space for further modular expansion.**
- Conversion of LiCl to battery grade LHM using electrolysis. By-products HCl and Sodium Hypochlorite. Significant synergies with existing chlor-alkali producers in the same chemical park, e. g. Nobian.
- Höchst is one of Europe's largest industrial estates and is home to around 90 chemical and pharmaceutical companies.
- Targeting late 2025 for commercial start of operations.
- Optimisation plant under construction, planned to start operation in H2, training staff in pre-commercial operational setting, will send significant volume of product to offtakers for pre-qualifications. Intended to ensure **commercial operational readiness.**



Secured plot at Höchst

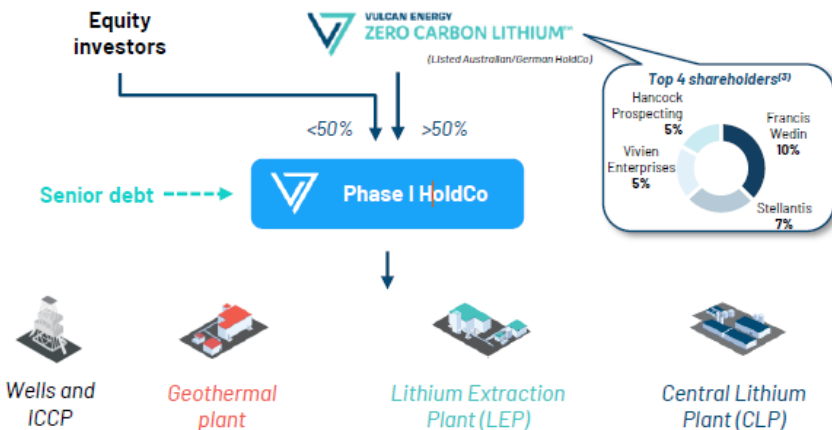
Source: Company data

Financing:

Vulcan has released its bridging engineering study (BES), which focuses on Vulcan's Lionheart area. The BES provides favorable project economics while also further de-risking potential. Completing the bridging study marks the kick-off for financing of phase 1. Overall, Vulcan is targeting a debt-to-equity ratio of 65:35 for the overall funding of Phase 1. The company intends to raise the needed funds via debt and equity financing, while also applying for public funding. The equity investments are planned on project level. By doing that, Vulcan sees opportunities to bring investors aboard while minimizing dilution.

Meanwhile, Vulcan has received a conditional, non-binding Letter of Support from Export Finance Australia (EFA) for up to AUD 200 million (~EUR 120 million) for the upcoming financing of Phase One. Additionally, Vulcan has already secured substantial in-principle government-backed ECA support, subject to customary conditions, from Bpifrance Assurance Export, the French ECA, SACE, the Italian ECA, and EDC, the Canadian ECA. Currently, the EIB is considering a financing up to EUR 500m.

Contemplated financing structure



Source: Company data

Valuation

DCF Model

The DCF model results in a **fair value of EUR 9.93 per share**:

Top-line growth: We expect Vulcan Energy Resources Ltd to grow revenues at a CAGR of n.m.% between 2024E and 2031E. The long-term growth rate is set at 2.0%.

ROCE. Returns on capital are developing from -3.2% in 2024E to 18.2% in 2031E.

WACC. Starting point is a historical equity beta of 1.65. Unlevering and correcting for mean reversion yields an asset beta of 1.19. Combined with a risk-free rate of 3.0% and an equity risk premium of 6.0% this yields cost of equity of 13.6%. With pre-tax cost of borrowing at 7.0%, a tax rate of 25.0% and target debt/equity of 0.6 this results in a long-term WACC of 10.3%.

DCF (EURm) (except per share data and beta)	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	Terminal value
NOPAT	-84.5	-132.9	36.2	277.9	378.1	388.3	393.8	426.9	
Depreciation & amortization	11.3	32.7	52.2	81.7	81.3	81.0	80.7	80.4	
Change in working capital	-25.1	-4.6	-22.0	-54.0	-38.0	-50.0	0.0	95.9	
Chg. in long-term provisions	0.0	0.0	0.9	1.4	0.5	0.0	0.0	0.0	
Capex	-150.1	-750.1	-642.0	-74.8	-75.9	-75.9	-75.9	-75.9	
Cash flow	-248.4	-854.9	-574.7	232.1	346.1	343.4	398.6	527.3	6,458.9
Present value	-231.2	-720.1	-438.1	160.2	216.5	194.8	205.6	249.1	3,024.2
WACC	10.5%	10.5%	10.5%	10.5%	10.5%	10.4%	10.4%	10.2%	10.3%

DCF per share derived from	
Total present value	2,660.9
Mid-year adj. total present value	2,796.0
Net debt / cash at start of year	-74.3
Financial assets	22.1
Provisions and off b/s debt	0.3
Equity value	2,892.1
No. of shares outstanding	220.8
Discounted cash flow / share	9.93
upside/(downside)	373.0%

DCF avg. growth and earnings assumptions	
Planning horizon avg. revenue growth (2024E-2031E)	n.m.%
Terminal value growth (2031E - infinity)	2.0%
Terminal year ROCE	18.2%
Terminal year WACC	10.3%

Terminal WACC derived from	
Cost of borrowing (before taxes)	7.0%
Long-term tax rate	25.0%
Equity beta	1.65
Unlevered beta (industry or company)	1.19
Target debt / equity	0.6
Relevered beta	1.77
Risk-free rate	3.0%
Equity risk premium	6.0%
Cost of equity	13.6%

Share price	2.10
--------------------	-------------

Sensitivity analysis DCF							
Change in WACC (%-points)	Long term growth					Share of present value	
	1.0%	1.5%	2.0%	2.5%	3.0%		
2.0%	5.8	6.2	6.6	7.0	7.5	2024E-2027E	-46.2%
1.0%	7.1	7.6	8.1	8.6	9.2	2028E-2031E	32.5%
0.0%	8.7	9.3	9.9	10.7	11.5	terminal value	113.7%
-1.0%	10.7	11.5	12.4	13.4	14.6		
-2.0%	13.3	14.3	15.6	17.1	18.8		

Source: mwb research

FCF Yield Model

Due to the fact that companies rarely bear sufficient resemblance to peers in terms of geographical exposure, size or competitive strength and in order to adjust for the pitfalls of weak long-term visibility, an Adjusted Free Cash Flow analysis (Adjusted FCF) has been conducted.

The adjusted Free Cash Flow Yield results in a fair value between EUR -3.11 per share based on 2024E and EUR 27.53 per share on 2028E estimates.

The main driver of this model is the level of return available to a controlling investor, influenced by the cost of that investors' capital (opportunity costs) and the purchase price – in this case the enterprise value of the company. Here, the adjusted FCF yield is used as a proxy for the required return and is defined as EBITDA less minority interest, taxes and investments required to maintain existing assets (maintenance capex).

FCF yield in EURm	2024E	2025E	2026E	2027E	2028E
EBITDA	-44.7	-67.8	107.3	357.9	444.2
- Maintenance capex	11.2	32.6	52.2	81.6	81.0
- Minorities	42.5	57.5	5.0	-70.8	-105.9
- tax expenses	-31.5	-42.6	-3.7	52.4	78.5
= Adjusted FCF	-67.0	-115.4	53.8	294.6	390.7
Actual Market Cap	361.4	361.4	361.4	361.4	361.4
+ Net debt (cash)	-473.4	183.6	769.5	658.0	454.6
+ Pension provisions	0.0	0.0	0.0	0.0	0.0
+ Off b/s financing	0.0	0.0	0.0	0.0	0.0
- Financial assets	22.1	22.1	22.1	22.1	22.1
- Acc. dividend payments	0.0	0.0	0.0	0.0	0.0
<i>EV Reconciliations</i>	-495.5	161.5	747.4	635.9	432.5
= Actual EV'	-134.2	522.8	1,108.8	997.3	793.9
Adjusted FCF yield	49.9%	-22.1%	4.9%	29.5%	49.2%
base hurdle rate	7.0%	7.0%	7.0%	7.0%	7.0%
ESG adjustment	1.0%	1.0%	1.0%	1.0%	1.0%
adjusted hurdle rate	6.0%	6.0%	6.0%	6.0%	6.0%
Fair EV	-1,116.0	-1,922.5	896.9	4,910.8	6,512.0
- <i>EV Reconciliations</i>	-495.5	161.5	747.4	635.9	432.5
Fair Market Cap	-620.5	-2,084.0	149.5	4,274.9	6,079.5
No. of shares (million)	199.6	215.8	220.8	220.8	220.8
Fair value per share in EUR	-3.11	-9.66	0.68	19.36	27.53
Premium (-) / discount (+)	-248.0%	-559.8%	-67.8%	821.9%	1,211.0%

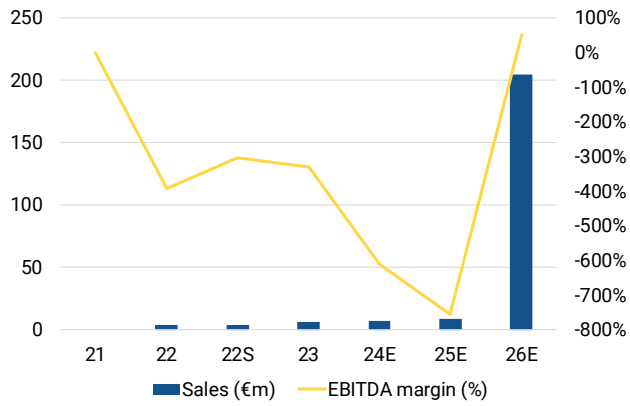
Sensitivity analysis fair value						
Adjusted hurdle rate	4.0%	-5.9	-14.1	2.7	30.5	42.3
	5.0%	-4.2	-11.4	1.5	23.8	33.4
	6.0%	-3.1	-9.7	0.7	19.4	27.5
	7.0%	-2.3	-8.4	0.1	16.2	23.3
	8.0%	-1.7	-7.4	-0.3	13.8	20.2

Source: Company data; mwb research

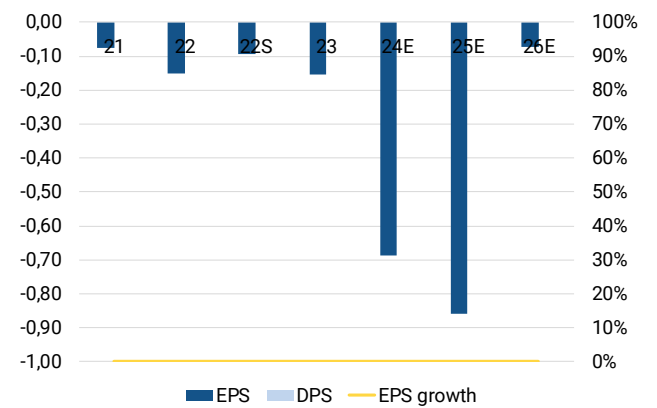
Simply put, the model assumes that investors require companies to generate a minimum return on the investor's purchase price. The required after-tax return equals the model's hurdle rate of 7.0%. Anything less suggests the stock is expensive; anything more suggests the stock is cheap. **ESG adjustments might be applicable. A high score indicates high awareness for environmental, social or governance issues and thus might lower the overall risk an investment in the company might carry. A low score on the contrary might increase the risk of an investment and might therefore trigger a higher required hurdle rate.**

Financials in six charts

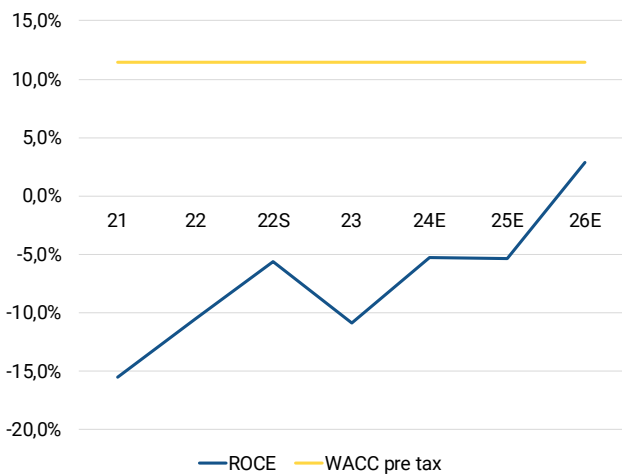
Sales vs. EBITDA margin development



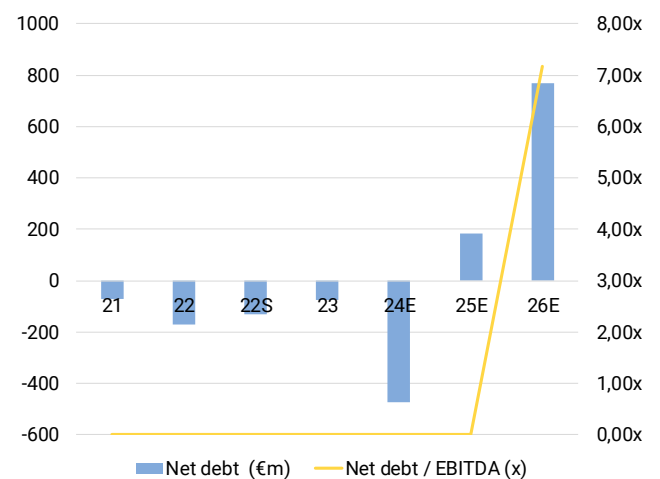
EPS, DPS in EUR & yoy EPS growth



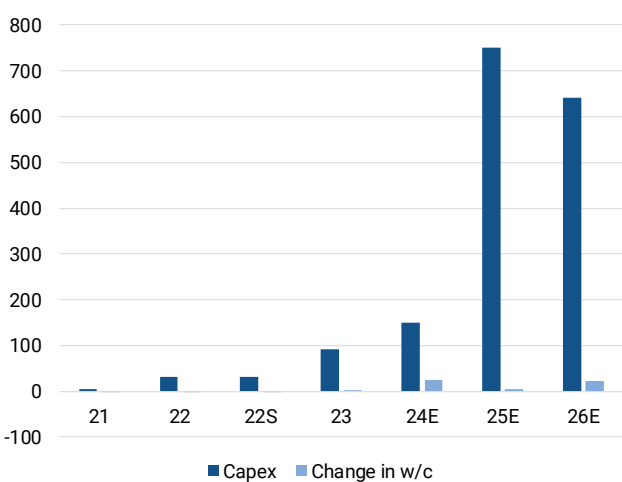
ROCE vs. WACC (pre tax)



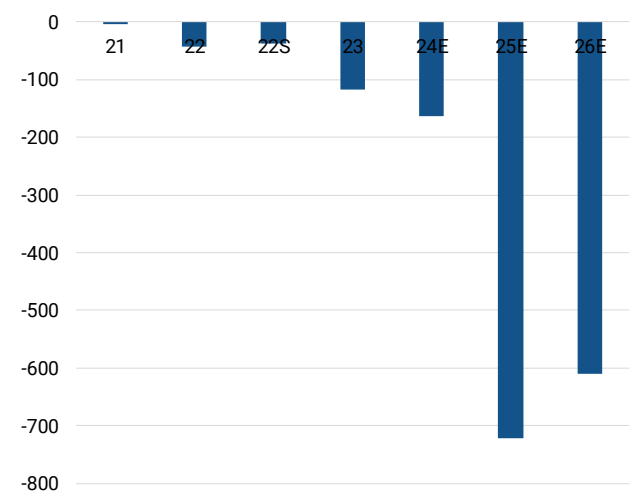
Net debt and net debt/EBITDA



Capex & chgn in w/c requirements in EURm



Free Cash Flow in EURm



Source: Company data; mwb research

Financials

Profit and loss (EURm)	2021	2022	2023	2024E	2025E	2026E
Sales	0.0	3.8	6.8	7.3	9.0	204.9
Sales growth	na	na	78.5%	8.3%	22.5%	2,176.7%
Cost of sales	0.0	-1.2	-16.3	6.0	40.0	64.6
Gross profit	0.0	5.0	23.1	1.3	-31.0	140.3
SG&A expenses	6.9	21.2	31.8	50.0	65.0	75.0
Research and development	0.0	0.0	0.0	0.0	0.0	0.0
Other operating expenses (income)	-0.2	-1.3	20.1	7.3	4.5	10.2
EBITDA	-6.7	-14.9	-22.3	-44.7	-67.8	107.3
Depreciation	0.1	2.1	5.9	11.2	32.6	52.2
EBITA	-6.8	-17.1	-28.2	-55.9	-100.4	55.1
Amortisation of goodwill and intangible assets	0.0	0.5	0.7	0.1	0.1	0.1
EBIT	-6.8	-17.5	-28.8	-56.0	-100.5	55.1
Financial result	0.0	-0.8	3.4	-70.0	-70.0	-70.0
Recurring pretax income from continuing operations	-6.7	-18.3	-25.4	-126.0	-170.5	-14.9
Extraordinary income/loss	0.0	0.0	-1.1	0.0	0.0	0.0
Earnings before taxes	-6.7	-18.3	-26.6	-126.0	-170.5	-14.9
Taxes	0.0	0.4	-1.8	-31.5	-42.6	-3.7
Net income from continuing operations	-6.7	-18.7	-24.7	-94.5	-127.9	-11.2
Result from discontinued operations (net of tax)	0.0	0.0	0.0	0.0	0.0	0.0
Net income	-6.7	-18.7	-24.7	-94.5	-127.9	-11.2
Minority interest	0.0	0.0	0.0	-42.5	-57.5	-5.0
Net profit (reported)	-6.7	-18.7	-24.7	-137.0	-185.4	-16.3
Average number of shares	87.20	124.67	159.33	199.57	215.82	220.82
EPS reported	-0.08	-0.15	-0.16	-0.69	-0.86	-0.07

Profit and loss (common size)	2021	2022	2023	2024E	2025E	2026E
Sales	na	100%	100%	100%	100%	100%
Cost of sales	na	-31%	-240%	82%	444%	32%
Gross profit	na	131%	340%	18%	-344%	68%
SG&A expenses	na	558%	469%	681%	722%	37%
Research and development	na	0%	0%	0%	0%	0%
Other operating expenses (income)	na	-34%	296%	100%	50%	5%
EBITDA	na	-392%	-329%	-609%	-754%	52%
Depreciation	na	57%	87%	153%	362%	25%
EBITA	na	-449%	-415%	-761%	-1,116%	27%
Amortisation of goodwill and intangible assets	na	13%	10%	1%	1%	0%
EBIT	na	-461%	-425%	-762%	-1,117%	27%
Financial result	na	-20%	50%	-953%	-778%	-34%
Recurring pretax income from continuing operations	na	-481%	-375%	-1,715%	-1,894%	-7%
Extraordinary income/loss	na	0%	-17%	0%	0%	0%
Earnings before taxes	na	-481%	-392%	-1,715%	-1,894%	-7%
Taxes	na	10%	-27%	-429%	-474%	-2%
Net income from continuing operations	na	-491%	-365%	-1,286%	-1,421%	-5%
Result from discontinued operations (net of tax)	na	0%	0%	0%	0%	0%
Net income	na	-491%	-365%	-1,286%	-1,421%	-5%
Minority interest	na	0%	0%	-579%	-639%	-2%
Net profit (reported)	na	-491%	-365%	-1,865%	-2,060%	-8%

Source: Company data; mwb research

Balance sheet (EURm)	2021	2022	2023	2024E	2025E	2026E
Intangible assets (excl. Goodwill)	0.0	3.6	1.7	1.7	1.7	3.7
Goodwill	0.0	0.0	0.0	0.0	0.0	0.0
Property, plant and equipment	10.0	74.9	187.1	325.9	1,043.3	1,631.1
Financial assets	0.0	2.9	22.1	22.1	22.1	22.1
FIXED ASSETS	10.0	81.5	210.8	349.6	1,067.0	1,656.9
Inventories	0.0	0.1	0.3	8.0	16.0	30.0
Accounts receivable	0.8	4.1	6.9	8.1	12.3	28.1
Other current assets	0.0	0.0	0.1	0.1	0.1	0.1
Liquid assets	72.5	175.4	78.7	1,473.4	816.4	230.5
Deferred taxes	0.0	0.0	0.0	0.0	0.0	0.0
Deferred charges and prepaid expenses	0.0	0.0	0.0	0.0	0.0	0.0
CURRENT ASSETS	73.3	179.7	86.1	1,489.6	844.9	288.7
TOTAL ASSETS	83.3	261.1	296.9	1,839.2	1,911.9	1,945.6
SHAREHOLDERS EQUITY	81.5	247.3	268.3	228.8	165.9	179.7
MINORITY INTEREST	0.0	0.0	0.0	507.5	507.5	507.5
Long-term debt	0.3	2.6	3.3	1,000.0	1,000.0	1,000.0
Provisions for pensions and similar obligations	0.0	0.0	0.3	0.0	0.0	0.0
Other provisions	0.0	1.5	4.2	0.1	0.1	1.0
Non-current liabilities	0.3	4.1	7.8	1,000.1	1,000.1	1,001.0
short-term liabilities to banks	0.0	0.4	1.1	0.0	0.0	0.0
Accounts payable	0.0	6.2	17.2	3.3	11.0	17.7
Advance payments received on orders	0.0	0.0	0.0	0.0	0.0	0.0
Other liabilities (incl. from lease and rental contracts)	0.1	0.8	2.4	0.0	0.0	1.0
Deferred taxes	0.0	1.5	0.1	0.1	0.1	0.1
Deferred income	1.3	0.8	0.0	0.0	0.0	0.0
Current liabilities	1.4	9.7	20.8	3.4	11.1	18.8
TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	83.3	261.1	296.9	1,739.8	1,684.6	1,707.1

Balance sheet (common size)	2021	2022	2023	2024E	2025E	2026E
Intangible assets (excl. Goodwill)	0%	1%	1%	0%	0%	0%
Goodwill	0%	0%	0%	0%	0%	0%
Property, plant and equipment	12%	29%	63%	18%	55%	84%
Financial assets	0%	1%	7%	1%	1%	1%
FIXED ASSETS	12%	31%	71%	19%	56%	85%
Inventories	0%	0%	0%	0%	1%	2%
Accounts receivable	1%	2%	2%	0%	1%	1%
Other current assets	0%	0%	0%	0%	0%	0%
Liquid assets	87%	67%	27%	80%	43%	12%
Deferred taxes	0%	0%	0%	0%	0%	0%
Deferred charges and prepaid expenses	0%	0%	0%	0%	0%	0%
CURRENT ASSETS	88%	69%	29%	81%	44%	15%
TOTAL ASSETS	100%	100%	100%	100%	100%	100%
SHAREHOLDERS EQUITY	98%	95%	90%	12%	9%	9%
MINORITY INTEREST	0%	0%	0%	28%	27%	26%
Long-term debt	0%	1%	1%	54%	52%	51%
Provisions for pensions and similar obligations	0%	0%	0%	0%	0%	0%
Other provisions	0%	1%	1%	0%	0%	0%
Non-current liabilities	0%	2%	3%	54%	52%	51%
short-term liabilities to banks	0%	0%	0%	0%	0%	0%
Accounts payable	0%	2%	6%	0%	1%	1%
Advance payments received on orders	0%	0%	0%	0%	0%	0%
Other liabilities (incl. from lease and rental contracts)	0%	0%	1%	0%	0%	0%
Deferred taxes	0%	1%	0%	0%	0%	0%
Deferred income	2%	0%	0%	0%	0%	0%
Current liabilities	2%	4%	7%	0%	1%	1%
TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	100%	100%	100%	95%	88%	88%

Source: Company data; mwb research

Cash flow statement (EURm)	2021	2022	2023	2024E	2025E	2026E
Net profit/loss	0.0	0.0	0.0	0.0	0.0	0.0
Depreciation of fixed assets (incl. leases)	0.0	0.0	0.0	11.2	32.6	52.2
Amortisation of goodwill	0.0	0.0	0.0	0.0	0.0	0.0
Amortisation of intangible assets	0.0	0.0	0.7	0.1	0.1	0.1
Others	0.0	-11.3	-24.3	0.0	0.0	0.9
Cash flow from operations before changes in w/c	0.0	-11.3	-23.7	11.3	32.7	53.2
Increase/decrease in inventory	0.0	0.0	-0.2	-7.7	-8.0	-14.0
Increase/decrease in accounts receivable	0.0	0.0	0.0	-1.2	-4.3	-15.7
Increase/decrease in accounts payable	0.0	0.0	0.0	-13.9	7.7	6.7
Increase/decrease in other w/c positions	0.4	0.5	0.0	-2.4	0.0	1.0
Increase/decrease in working capital	0.4	0.5	-0.2	-25.1	-4.6	-22.0
Cash flow from operating activities	0.4	-11.3	-23.8	-13.8	28.1	31.1
CAPEX	-4.5	-32.2	-92.6	-150.1	-750.1	-642.0
Payments for acquisitions	0.0	-32.7	-0.1	0.0	0.0	0.0
Financial investments	0.0	-0.7	0.3	0.0	0.0	0.0
Income from asset disposals	0.0	0.0	0.0	0.0	0.0	0.0
Cash flow from investing activities	-4.5	-65.6	-92.5	-150.1	-750.1	-642.0
Cash flow before financing	-4.1	-76.9	-116.3	-163.9	-722.0	-610.9
Increase/decrease in debt position	-0.0	-0.2	-1.7	995.6	0.0	0.0
Purchase of own shares	0.0	0.0	0.0	0.0	0.0	0.0
Capital measures	75.1	176.2	67.3	563.0	65.0	25.0
Dividends paid	0.0	0.0	0.0	0.0	0.0	0.0
Others	-3.8	-4.0	-2.9	0.0	0.0	0.0
Effects of exchange rate changes on cash	0.7	6.6	-1.3	0.0	0.0	0.0
Cash flow from financing activities	71.9	178.6	61.4	1,558.6	65.0	25.0
Increase/decrease in liquid assets	67.8	101.7	-54.9	1,394.7	-657.0	-585.9
Liquid assets at end of period	72.5	175.4	218.8	1,613.5	956.5	370.6

Source: Company data; mwb research

Ratios	2021	2022	2023	2024E	2025E	2026E
Per share data						
Earnings per share reported	-0.08	-0.15	-0.16	-0.69	-0.86	-0.07
Cash flow per share	0.00	-0.09	-0.15	-0.13	-0.02	-0.10
Book value per share	0.93	1.98	1.68	1.15	0.77	0.81
Dividend per share	0.00	0.00	0.00	0.00	0.00	0.00
Valuation						
P/E	-27.2x	-14.0x	-13.5x	-3.1x	-2.4x	-28.5x
P/CF	478.1x	-23.1x	-14.0x	-16.8x	-100.4x	-22.1x
P/BV	2.2x	1.1x	1.2x	1.8x	2.7x	2.6x
Dividend yield (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FCF yield (%)	0.2%	-4.3%	-7.1%	-6.0%	-1.0%	-4.5%
EV/Sales	na	64.9x	50.9x	-7.4x	67.0x	5.8x
EV/EBITDA	-51.8x	-16.6x	-15.5x	1.2x	-8.9x	11.1x
EV/EBIT	-51.2x	-14.1x	-12.0x	1.0x	-6.0x	21.6x
Income statement (EURm)						
Sales	0.0	3.8	6.8	7.3	9.0	204.9
yoy chg in %	na	na	78.5%	8.3%	22.5%	2,176.7%
Gross profit	0.0	5.0	23.1	1.3	-31.0	140.3
Gross margin in %	na	131.2%	340.1%	18.3%	-344.4%	68.5%
EBITDA	-6.7	-14.9	-22.3	-44.7	-67.8	107.3
EBITDA margin in %	na	-392.3%	-328.9%	-608.6%	-753.9%	52.4%
EBIT	-6.8	-17.5	-28.8	-56.0	-100.5	55.1
EBIT margin in %	-na%	-461.5%	-425.0%	-762.3%	-1,116.7%	26.9%
Net profit	-6.7	-18.7	-24.7	-137.0	-185.4	-16.3
Cash flow statement (EURm)						
CF from operations	0.4	-11.3	-23.8	-13.8	28.1	31.1
Capex	-4.5	-32.2	-92.6	-150.1	-750.1	-642.0
Maintenance Capex	0.0	0.0	0.0	11.2	32.6	52.2
Free cash flow	-4.1	-43.5	-116.5	-163.9	-722.0	-610.9
Balance sheet (EURm)						
Intangible assets	0.0	3.6	1.7	1.7	1.7	3.7
Tangible assets	10.0	74.9	187.1	325.9	1,043.3	1,631.1
Shareholders' equity	81.5	247.3	268.3	228.8	165.9	179.7
Pension provisions	0.0	0.0	0.3	0.0	0.0	0.0
Liabilities and provisions	0.4	4.5	8.9	1,000.1	1,000.1	1,001.0
Net financial debt	-72.1	-172.4	-74.3	-473.4	183.6	769.5
w/c requirements	0.8	-1.9	-10.0	12.8	17.4	40.4
Ratios						
ROE	-8.3%	-7.5%	-9.2%	-41.3%	-77.1%	-6.2%
ROCE	-8.3%	-7.0%	-10.4%	-3.2%	-6.0%	3.3%
Net gearing	-88.5%	-69.7%	-27.7%	-206.9%	110.6%	428.2%
Net debt / EBITDA	10.8x	11.6x	3.3x	10.6x	-2.7x	7.2x

Source: Company data; mwb research

Conflicts of interest

Disclosures regarding research publications of mwb research AG pursuant to section 85 of the German Securities Trading Act (WpHG) and distributed in the UK under an EEA branch passport, subject to the FCA requirements on research recommendation disclosures. It is essential that any research recommendation is fairly presented and discloses interests of and indicates relevant conflicts of interest. Pursuant to section 85 of the German Securities Trading Act (WpHG) a research report has to point out possible conflicts of interest in connection with the analyzed company. Further to this, under the FCA's rules on research recommendations, any conflicts of interest in connection with the recommendation must be disclosed. A conflict of interest is presumed to exist in particular if mwb research AG

- (1) or its affiliate(s) (either in its own right or as part of a consortium) within the past twelve months, acquired the financial instruments of the analyzed company,
- (2) has entered into an agreement on the production of the research report with the analyzed company,
- (3) or its affiliate(s) has, within the past twelve months, been party to an agreement on the provision of investment banking services with the analyzed company or have received services or a promise of services under the terms of such an agreement,
- (4) or its affiliate(s) holds a) 5% or more of the share capital of the analyzed company, or b) the analyzed company holds 5% or more of the share capital of mwb research AG or its affiliate(s),
- (5) or its affiliate(s) holds a net long (a) or a net short (b) position of 0.5% of the outstanding share capital of the analyzed company or derivatives thereof,
- (6) or its affiliate(s) is a market maker or liquidity provider in the financial instruments of the issuer,
- (7) or the analyst has any other significant financial interests relating to the analyzed company such as, for example, exercising mandates in the interest of the analyzed company or a significant conflict of interest with respect to the issuer,
- (8) The research report has been made available to the company prior to its publication. Thereafter, only factual changes have been made to the report.

Conflicts of interest that existed at the time when this research report was published:

Company	Disclosure
Vulcan Energy Resources Ltd	2

Important disclosures

1. General Information/Liabilities This research report has been produced for the information purposes of institutional investors only, and is not in any way a personal recommendation, offer or solicitation to buy or sell the financial instruments mentioned herein. The document is confidential and is made available by mwb research AG, exclusively to selected recipients [in DE, GB, FR, CH, US, UK, Scandinavia, and Benelux or, in individual cases, also in other countries]. A distribution to private investors in the sense of the German Securities Trading Act (WpHG) is excluded. It is not allowed to pass the research report on to persons other than the intended recipient without the permission of mwb research AG. Reproduction of this document, in whole or in part, is not permitted without prior permission mwb research AG. All rights reserved. Under no circumstances shall mwb research AG, any of its employees involved in the preparation, have any liability for possible errors or incompleteness of the information included in this research report – neither in relation to indirect or direct nor consequential damages. Liability for damages arising either directly or as a consequence of the use of information, opinions and estimates is also excluded. Past performance of a financial instrument is not necessarily indicative of future performance.

2. Responsibilities This research report was prepared by the research analyst named on the front page (the "Producer"). The Producer is solely responsible for the views and estimates expressed in this report. The report has been prepared independently. The content of the research report was not influenced by the issuer of the analyzed financial instrument at any time. It may be possible that parts of the research report were handed out to the issuer for information purposes prior to the publication without any major amendments being made thereafter.

3. Organizational Requirements mwb research AG took internal organizational and regulative precautions to avoid or accordingly disclose possible conflicts of interest in connection with the preparation and distribution of the research report. All members of mwb research AG involved in the preparation of the research report are subject to internal compliance regulations. No part of the Producer's compensation is directly or indirectly related to the preparation of this financial analysis. In case a research analyst or a closely related person is confronted with a conflict of interest, the research analyst is restricted from covering this company.

4. Information Concerning the Methods of Valuation/Update The determination of the fair value per share, i.e. the price target, and the resultant rating is done on the basis of the adjusted free cash flow (adj. FCF) method and on the basis of the discounted cash flow – DCF model. Furthermore, a peer group comparison is made. The adj. FCF method is based on the assumption that investors purchase assets only at a price (enterprise value) at which the operating cash flow return after taxes on this investment exceeds their opportunity costs in the form of a hurdle rate. The operating cash flow is calculated as EBITDA less maintenance capex and taxes. Within the framework of the DCF approach, the future free cash flows are calculated initially on the basis of a fictitious capital structure of 100% equity, i.e. interest and repayments on debt capital are not factored in initially. The adjustment towards the actual capital structure is done by discounting the calculated free cash flows with the weighted average cost of capital (WACC), which takes into account both the cost of equity capital and the cost of debt. After discounting, the calculated total enterprise value is reduced by the interest-bearing debt capital in order to arrive at the equity value. Detailed information on the valuation principles and methods used and the underlying assumptions can be found at <https://www.mwb-research.com>.

mwb research AG uses the following three-step rating system for the analyzed companies:

- **Speculative (Spec.) BUY:** Sustainable upside potential of more than 25% within 12 months, above average risk
- **BUY:** Sustainable upside potential of more than 10% within 12 months
- **SELL:** Sustainable downside potential of more than 10% within 12 months.
- **HOLD:** Upside/downside potential is limited. No immediate catalyst visible.

NB: The ratings of mwb research AG are not based on a performance that is expected to be "relative" to the market.

The decision on the choice of the financial instruments analyzed in this document was solely made by mwb research AG. The opinions and estimates in this research report are subject to change without notice. It is within the discretion of mwb research AG whether and when it publishes an update to this research report, but in general updates are created on a regular basis, after 6 months at the latest. A sensitivity analysis is included and published in company's initial studies.

5. Date and time of first publication of this financial analysis
12-Apr-24 12:28:46

6. Risk information

- Stock exchange investments and investments in companies (shares) are always speculative and involve the risk of total loss.
- This is particularly true in respect of investments in companies which are not established and/or small and have no established business or corporate assets.
- Share prices may fluctuate significantly. This is particularly true for shares with low liquidity (market breadth). Even small orders can have a significant impact on the share price.
- In the case of shares in narrow markets, it may also happen that there is no or very little actual trading there and that published prices are not based on actual trading but have only been provided by a stockbroker.
- In such markets a shareholder cannot expect to find a buyer for his shares at all and/or at reasonable prices. In such narrow markets there is a very high possibility of manipulating prices and in such markets there are often considerable price fluctuations.
- An investment in shares with low liquidity and low market capitalization is therefore highly speculative and represents a very high risk.
- There is no regulated market for unlisted shares and securities and a sale is not possible or only possible on an individual basis.

7. Major Sources of Information Part of the information required for this research report was made available by the issuer of the financial instrument. Furthermore, this report is based on publicly available sources (such as, for example, Bloomberg, Reuters, VWD-Trader and the relevant daily press) believed to be reliable. mwb research AG has checked the information for plausibility but not for accuracy or completeness.

8. Competent Supervisory Authority mwb research AG are under supervision of the BaFin – German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), Graurheindorfer Straße 108, 53117 Bonn and Marie-Curie-Straße 24 – 28, 60439 Frankfurt a.M. This document is distributed in the UK under a MiFID EEA branch passport and in compliance with the applicable FCA requirements.

9. Specific Comments for Recipients Outside of Germany This research report is subject to the law of the Federal Republic of Germany. The distribution of this information to other states in particular to the USA, Canada, Australia and Japan may be restricted or prohibited by the laws applicable within this state.

10. Miscellaneous According to Article 4(1) No. i of the delegated regulation 2016/958 supplementing regulation 596/2014 of the European Parliament, further information regarding investment recommendations of the last 12 months are published free of charge under <https://www.mwb-research.com>.

Contacts

mwb research AG
Mittelweg 142
20148 Hamburg
Germany

Tel.: +49 40 309 293-52
Email.: contact@mwb-research.com
Website: www.mwb-research.com
Research: www.research-hub.de

Research

HARALD HOF
Senior Analyst
Tel: +49 40 309 293-53
E-Mail: h.hof@mwb-research.com

LEON MÜHLENBRUCH
Analyst
Tel: +49 40 309 293-57
E-Mail: l.muehlenbruch@mwb-research.com

LEVENT YILMAZ
Senior Analyst
Tel: +49 40 309 293-151
E-Mail: l.yilmaz@mwb-research.com

THOMAS WISSLER
Senior Analyst
Tel: +49 40 309 293-58
E-Mail: t.wissler@mwb-research.com

DR. OLIVER WOJAHN, CFA
Senior Analyst
Tel: +49 40 309 293-55
E-Mail: o.wojahn@mwb-research.com

ALEXANDER ZIENKOWICZ
Senior Analyst
Tel: +49 40 309 293-56
E-Mail: a.zienkowicz@mwb-research.com

Sales

HOLGER NASS
Head of Sales
Tel: +49 40 309 293-52
E-Mail: h.nass@mwb-research.com

Team Assistant

HANNAH GABERT
Team Assistant
Tel: +49 40 309 293-52
E-Mail: h.gabert@mwb-research.com

mwb fairtrade
Wertpapierhandelsbank AG
Rottenbacher Straße 28
82166 Gräfelfing

Tel: +49 89 85852-0
Fax: +49 89 85852-505
Website: www.mwbfairtrade.com
E-Mail: info@mwbfairtrade.com

Sales / Designated Sponsoring / Corporate Finance

ALEXANDER DEUSS
Institutional Sales
Tel: +49 40 36 0995-22
E-Mail: adeuss@mwbfairtrade.com

SASCHA GUENON
Head of Designated Sponsoring
Tel: +49 40 360 995-23
E-Mail: sguenon@mwbfairtrade.com

JAN NEYNABER
Institutional Sales
Tel: +49 69 1387-1255
E-Mail: jneynaber@mwbfairtrade.com

DIRK WEYERHÄUSER
Corporate Finance
Tel: +49 69 1387-1250
E-Mail: dweyerhaeuser@mwbfairtrade.com

Locations

HAMBURG (Research)
Mittelweg 142
20148 Hamburg
+49 40 309 293-52

HAMBURG (Corporates & Markets)
Kleine Johannisstraße 4
20457 Hamburg
+49 40 360 995-0

FRANKFURT A.M.
Unterlindau 29
60323 Frankfurt am Main
+49 40 360 995-22

MUNICH
Rottenbacher Str. 28
82166 Gräfelfing
+49 89-85852-0

BERLIN
Kurfürstendamm 151
10709 Berlin

HANNOVER
An der Börse 2
30159 Hannover

Our research can be found at

ResearchHub
Bloomberg
FactSet
Thomson Reuters / Refinitiv
CapitalIQ

www.research-hub.de
www.bloomberg.com
www.factset.com
www.refinitiv.com
www.capitaliq.com