Cadence Minerals

Major project update

Amapá optimisation adds value

Metals and mining

This year will be important for Cadence Minerals' major asset, the Amapá iron ore project in Brazil. Cadence recently announced the results of an optimisation study that points to the potential to increase production by 4.8% and lower processing plant commissioning costs by 33%. An updated pre-feasibility study (PFS) level NPV will be published in the near future and we explore some of the sensitivities in this report. We have adjusted our valuation to reflect portfolio changes and the rise in Cadence's stake in Amapá, although we have yet to include the value uplift of the optimisation of Amapá.

Year end	Revenue (£m)	PBT* (£m)	EPS* (p)	DPS (p)	P/E (x)	Yield (%)
12/20	0.0	7.8	6.9	0.0	N/A	N/A
12/21	0.0	(0.1)	(0.1)	0.0	N/A	N/A
12/22	0.0	(5.5)	(3.4)	0.0	N/A	N/A
12/23e	0.0	(1.8)	(1.1)	0.0	N/A	N/A

Note: *PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

Capex and product optimisation

Cadence's principal asset is its 33.6% interest in the Amapá iron ore project in Brazil, which is an ex-operating mine at the PFS stage of redevelopment. On 22 March 2024, Cadence announced some of the results of a mine optimisation study, which has resulted in improvements in capital spending at the beneficiation plant (a reduction of US$63.2m, or 33%) and an increase in forecast production levels (of 4.8% to 5.5Mt/y, of which 4.51Mt/y will be 65% Fe product and 0.99Mt/y will be 62% Fe product). Cadence also announced that it is redesigning the mine plan with its partners to reduce mining costs. These factors (lower capex, higher production and mine plan changes) will all feed into a new economic assessment at PFS level.

We have not changed our base-case valuation of Amapá (US$978m, US$154m adjusted for stage of development), but the rise in Cadence's stake from 32.6% to 33.6% increases our attributable value from US$50.3m to US$52.5m. The reduction in capex at the plant (which would cut overall capex from US$371m to US$307.8m, a 17% reduction) would be largely directly accretive to NPV as the spending is at the start of valuation. The revisions include a bump-up in production at existing grades, but Cadence and its partners are continuing to study a change in the flow sheet to produce a 67% grade product.

Valuation: Still does not make sense

We have reduced our valuation slightly to 27.6p/share from 29.5p/share as a result of changes in equity prices in Cadence's public portfolio. In addition, we have removed Cadence's stake in Hastings Technology Metals, which has now been sold. Our valuation of its stake in Amapá is unchanged at 23.9p/share as Cadence's continued earn-in rate (up from 32.6% to 33.6%) in the project was offset by foreign exchange rate changes. Our valuation remains significantly above the market price (5.1x), with the implied valuation of Cadence's non-public assets, at just £6.9m, well below where we see fair value.

4 April 2024

Price	**5.4p**
Market cap	**£11m**
	US$1.26/£, £0.52/A$
Net cash (£m) at 30 June 2023	0.58
Shares in issue	180.7m
Free float (as at end September 2023)	93.5%
Code	KDNC
Primary exchange	AIM

Share price performance

%	1m	3m	12m
Abs	20.0	(1.8)	(48.6)
Rel (local)	16.4	(4.8)	(50.4)
52-week high/low		10.4p	4.5p

Business description

Cadence Minerals is an early-stage investment and development company in the mining space. Its public equity holdings include rare earths and lithium developers, and its non-listed interests include lithium in Mexico and a 33.6% interest in the Amapá iron ore restart project in Brazil.

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Investment summary

Cadence's principal asset is its stake in the Amapá iron ore project in Brazil. It also holds minority stakes in a range of exploration and development assets, principally in energy transition metals such as lithium. We have updated our portfolio valuation of Cadence to reflect is current stakes in public entities, as well as our view of the value of its stake in Amapá.

Our base case valuation of Amapá (US$978m, US$154m adjusted for stage of development) is unchanged, but the rise in Cadence's stake from 32.6% to 33.6% increases our attributable value from US$50.3m to US$52.5m. In its announcement of 22 March, Cadence stated that it was continuing to invest in the project. According to our previous research, we understand that Cadence is buying into this project at a current rate of c US$1m/1pp (its early purchases were at a far lower rate, but that was when the project had significant additional uncertainty). An additional seven months of spending could place this percentage in the region of 33.6%.

Exhibit 1: Valuation of Cadence Minerals (on a portfolio sum-of-the-parts basis)

	Cadence stake	Cadence stake (m shares)	Stock price (A$)	Stock price (£)	Market cap (£m)	Value to Cadence (£m)	Cadence share (p/share)
Major listed investments							
European Metals Holdings	5.80%	11.75		0.13	27	1.6	0.9
Hastings Technology Metals	0.00%	0.00	0.61	0.32	41	0.0	0.0
Evergreen Lithium	8.70%	15.76	0.11	0.06	10	0.9	0.5
Miscellaneous						0.1	0.1
Total of major listed investments						**2.6**	**1.5**
Cadence Minerals market valuation						9.5	5.5
Implied value of non-listed investments						6.9	4.0
Amapá valuation	**NPV (US$m)**	**Discount**	**Risk adjusted (US$m)**	**Risk adjusted (£m)**	**Cadence stake**	**Value to Cadence (£m)**	**Cadence share (p/share)**
Amapá PFS NPV_{10} (Edison)	978	84.2%	154	123	33.6%	41.2	23.9
Sonora valuation (base case)						3.9	2.3
Value of listed and unlisted investments						**47.7**	**27.6**

Source: Edison Investment Research. Note: Prices as 26 March 2024. Exchange rates used: US$1.26/£, £0.52/A$.

Amapá optimisation

On 22 March, Cadence announced some of the results of an optimisation study, which has resulted in potential flow sheet and economic improvement concentrating on the beneficiation plant at its Amapá project. The announcement focused on two potential improvements.

Option A: A reduction in beneficiation plant capex

One option that has come out of the optimisation study is the potential to produce the planned mix/grade of products, but at a lower capital cost. The optimisation study resulted in improvements in capex at the beneficiation plant (a reduction of US$63.2m, or 33%) and an increase in forecast production levels (of 4.8% to 5.5Mt/year, of which 4.51Mt/y will be 65% Fe product and 0.99Mt/y will be 62% Fe product). Cadence also announced that it is redesigning the mine plan with its partners to reduce mining costs. These factors (lower capex, higher production and mine plan changes) will all feed into a new economic assessment at the PFS level.

The study resulted in a forecast increase in production of:

- A rise of 4.8% to 5.5Mt/year of iron ore concentrate (up from 5.12Mt/y in the PFS).
- 4.51Mt/y is 65% Fe grade (up from 4.23Mt/y at 65.4%).

- 0.99Mt/y is 62% Fe grade (up from 0.89Mt/y at 62%).

If we incorporate only the production change in our NPV calculation of the mine, our base NPV calculation of US$977m rises by 10% to US$1,084m (an increase of US$106m). If we incorporate only the capex change, our base NPV calculation rises by 5.3% to US$1,029m (an increase of US$52m).

Together, these changes have the potential to increase the NPV of Amapá by approximately 15%, although we highlight that this is based on our estimate and a fully revised PFS-level NPV calculation is likely to incorporate a number of other changes that are likely to affect the net change. As a general guide to sensitivities, below we show the variance in NPV for varying levels of upfront capital spending and C1 cash costs FOB.

For now, we are not changing our NPV assumption for Amapá as these other factors need to be taken into account, although the improvement in production and reduction in capex are clear and material improvements in inputs into a revised model.

Exhibit 2: Capex versus operating costs (NPV of Amapá)

			Capex (US$m)								
			-20%	**-15%**	**-10%**	**-5%**	**Base**	**5%**	**10%**	**15%**	**15%**
			297	315	334	352	371	390	408	427	445
Operating cost (US$/t)	-20%	28.4	1,234	1,218	1,203	1,188	1,173	1,158	1,142	1,127	1,112
	-15%	30.2	1,185	1,170	1,155	1,139	1,124	1,109	1,094	1,078	1,063
	-10%	32.0	1,136	1,121	1,106	1,091	1,075	1,060	1,045	1,030	1,014
	-5%	33.8	1,087	1,072	1,057	1,042	1,027	1,011	996	981	966
	Base	35.5	1,039	1,023	1,008	993	978	963	947	932	917
	5%	37.3	990	975	959	944	929	914	899	883	868
	10%	39.1	941	926	911	895	880	865	850	835	819
	15%	40.9	892	877	862	847	831	816	801	786	771
	20%	42.6	844	828	813	798	783	768	752	737	722

Base case

Reduced capex scenario

Source: Edison Investment Research

Option B: An improvement in the quality of the product

In its 22 March announcement, Cadence also mentioned that it remained ‘fully committed to advancing the development of a 67% “green iron” Fe product flow sheet at a production rate of 5.5Mtpa’. No further details were included in the release, but we understand that these studies would look at changes to the process flow sheet to achieve a 67% Fe grade. The operation had previously been able to produce 66.5% Fe product by using a reverse flotation cell (ie a flotation cell that floats the low-grade/waste part of the product and results in higher iron product). The plan to take the product to 67% could involve additional grinding and magnetic separation capacity and we understand this could be used for the entire output (at 5.5Mt/year).

The advantage of this option is that the market rewards high-iron concentrate, not only due to the additional iron units per tonne, but also because of the lower amount of impurities and waste. This product could be seen as ‘green iron ore’ and potentially be used as direct feed for direct reduced iron furnaces, which could open up customers in nearer markets (eg shipping ore to the United States rather than to China).

Naturally, a higher-grade product requires more throughput of ore at the start of the process and a higher mining rate, which Cadence will need to take into account in the overall revision of the PFS. More processing/testing of this potential flow sheet change is being examined, including the implications for water usage, tailings management and overall mass recovery. We understand this further work is likely to be at the level of scoping metrics when the updated PFS is released, but will eventually be upgraded to PFS standards over time.

We have not incorporated this potential change into our NPV valuation of Amapá due to a lack of complete information at present, but the strategy for producing a higher-grade product seems a logical step, particularly as licensing for the mine is likely to take up the rest of 2024, and this optimisation can be explored before construction commences.

Next steps

This year should see Cadence progress licensing for the project. In September 2023, the company announced that the expected timeline for licensing the mine, railway and port in Brazil had been shortened to 12–16 months and it expects licences to be granted over the course of 2024. We understand that the mine and beneficiation plant are relatively straightforward as they are ex-operating assets, but the port will require an additional environmental monitoring survey, with this report to be submitted between June and September 2024, with approval expected in the following three months. All licencing should be completed in calendar year 2024.

In October 2023, Cadence announced that the JV which controls Amapá had entered into an Memorandum of Understanding with Sinoma Tianjin Cement Industry Design and Research Institute (Sinoma). Under this agreement, Sinoma will provide a final proposal to complete a DFS and, on completion, submit a fixed-price engineering, procurement and construction contract for the Amapá project.

It is possible that the mine (given its relatively unusual status as an ex-operating mine) could skip the normal formal movement that projects undergo (from PFS to definitive feasibility study, DFS, to front end engineering and design, FEED, to financing and construction) and that Amapá could progress from PFS straight to FEED/financing.

We continue to believe that a potential equity partner at the project level is the most likely funding route for the equity portion of funding (which could be 20–30% of the capital required, with the balance provided though project debt). This could bring the project through rapid de-risking and be a catalyst for value realisation for Cadence.

Valuation

We value Cadence using a sum-of-the-parts methodology based on the value of its investment portfolio. We use current market valuations for its listed equity investments, a risk-adjusted (for stage of development) share of NPV for Amapá and a cost approach for its stake in Sonora (changed from a takeout multiple in this note as a result of political uncertainty, as discussed earlier). This results in a base case valuation of £47.7m or 27.6p/share. A full reconciliation of the changes in our valuation of the portfolio is outlined in Exhibit 3 below.

Exhibit 3: Changes to portfolio valuation

	Revised (£m)	Previous (£m)	Revised (p/share)	Previous (p/share)	Change (£m)	Comment
European Metals Holdings	1.6	3.7	0.9	2.1	-2.1	Market movement
Hasting Technology Metals	0.0	0.4	0.0	0.2	-0.4	Stake sold
Evergreen Lithium	0.9	1.6	0.5	0.9	-0.7	Market movement
Misc	0.1	0.1	0.1	0.1	0.0	
Total of major listed investments	2.6	5.8	1.5	3.3	-3.2	
Amapá	41.2	41.3	23.9	23.9	0.4	Stake raised from 32.6% to 33.6%
Sonora	3.9	3.9	2.3	2.3	0.0	Still carried at cost
Base-case valuation	47.7	51.0	27.6	29.5	-2.8	
Cadence market valuation	9.5	11.6	5.5	6.7	-2.1	
Implied value of unlisted investments	6.9	5.8	4.0	3.4	1.2	

Source: Edison Investment Research. Note: Exchange rate has changed from US$1.22/£ to US$1.26/£.

We apply an 84.2% discount to our NPV of Amapá to reflect its PFS stage of development. This reduces our valuation at the project level from US$978m (NPV) to US$154m (PFS adjusted). If the project gains full DFS status, the discount we apply would reduce to 55% and the project value would rise to US$440m (based on PFS metrics), with Cadence's share of the project worth 44p/share. This is assuming the project metrics are unchanged, and some metrics surrounding the project are likely to be better defined (including capex, operating costs, mine plan and development timelines) as the DFS advances during 2024.

Financials

Cadence is an investment company and its financial accounts represent its ongoing funding needs for general and administrative expenses, as well as investment spending for the advancement of its portfolio of mining assets. Its current strategy is to bring in a partner at the JV level to continue the advancement of Amapá, which naturally depends on price and timing.

Exhibit 4: Financial summary

Year end 31 December	£000s	2020	2021	2022	2023e
		IFRS	IFRS	IFRS	IFRS
INCOME STATEMENT					
Income		10,371	1,170	(4,041)	0.0
Share-based payments		(57.0)	(197.0)	(13.0)	0.0
Admin		(1,379.0)	(1,604.0)	(1,443.0)	(1,800.0)
Operating profit		8,935.0	(631.0)	(5,497.0)	(1,800.0)
EBITDA		8,935.0	(631.0)	(5,497.0)	(1,800.0)
Net Interest and finance expense		(292.0)	32.0	(3.0)	0.0
Forex		(820.0)	455.0	3.0	0.0
Profit Before Tax		7,823.0	(144.0)	(5,497.0)	(1,800.0)
Reported tax		0.0	0.0	0.0	0.0
Profit After Tax (reported)		7,823.0	(144.0)	(5,497.0)	(1,800.0)
Average Number of Shares Outstanding (m)		113.4	141.5	163.8	163.8
EPS - basic reported (p)		6.90	(0.10)	(3.36)	(1.10)
BALANCE SHEET					
Fixed Assets		2,885.0	5,660.0	11,365.0	13,365.0
Financial assets		2,885.0	5,660.0	11,365.0	13,365.0
Current Assets		19,722.0	17,346.0	10,273.0	6,473.0
Receivables		5,365.0	5,048.0	3,957.0	3,957.0
Cash		596.0	324.0	110.0	310.0
Financial assets		13,761.0	11,974.0	6,206.0	2,206.0
Current Liabilities		(514.0)	(853.0)	(317.0)	(317.0)
Payables		(295.0)	(853.0)	(317.0)	(317.0)
Borrowings		(219.0)	0.0	0.0	0.0
Long Term Liabilities		0.0	0.0	0.0	0.0
Net Assets		22,093.0	22,153.0	21,321.0	19,521.0
Minority interests		0.0	0.0	0.0	0.0
Shareholders' equity		22,093.0	22,153.0	21,321.0	19,521.0
CASH FLOW					
Operating profit		8,935.0	(631.0)	(5,497.0)	(1,800.0)
Adjustments		(10,296.0)	(120.0)	3,542.0	0.0
Net operating cash flow		(1,361.0)	(751.0)	(1,955.0)	(1,800.0)
Payments for non-current financial investments		(645.0)	(2,775.0)	(4,600.0)	(2,000.0)
Payments for current financial investments		(50.0)	(830.0)	(235.0)	0.0
Sale of current investments		2,052.0	3,787.0	1,926.0	4,000.0
Share issue		2,723.0	57.0	5,016.0	0.0
Other		(2,603.0)	(225.0)	(379.0)	0.0
Net Cash Flow		116.0	(737.0)	(227.0)	200.0
Opening net (debt)/cash		481.0	596.0	324.0	110.0
FX and other		(1.0)	465.0	13.0	0.0
Closing net (debt)/cash		596.0	324.0	110.0	310.0

Source: Cadence accounts, Edison Investment Research

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