KEFI Gold and Copper

Rose gold

Maiden Hawiah resource & PEA

Metals & mining

Since our last note, KEFI has continued to advance towards its goal of achieving production in FY22. Among other things, this has included raising £3.7m in equity in May and establishing early-stage mining specialist, RAB Capital, as a cornerstone investor. More recently, it has also announced a maiden mineral resource at Hawiah (in Saudi Arabia) of 19.3Mt at a grade of 1.86% copper equivalent containing 359kt CuE (or 1.2Moz AuE) and a corresponding preliminary economic assessment (PEA), which confirms it as a high priority target. The company has consistently maintained its goal of formally agreeing its full funding structure with all participants in October 2020, ahead of construction in FY21 and first gold in FY22 and, to this end, development activities have continued unabated, despite COVID-19.

Year end	Revenue (£m)	PBT* (£m)	EPS* (p)	DPS (p)	P/E (x)	Yield (%)
12/18	0.0	(4.6)	(1.0)	0.0	N/A	N/A
12/19	0.0	(3.5)	(0.6)	0.0	N/A	N/A
12/20e	0.0	(3.4)	(0.2)	0.0	N/A	N/A
12/21e	0.0	(4.6)	(0.1)	0.0	N/A	N/A

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

Gold price gearing and 'next level' projects

Earlier this year, Edison increased its long-term gold price expectations from a flat real level of US$1,350/oz from CY22 to US$1,494/oz from CY25 (see A golden future, published on 11 June 2020 and page 10 for more detail). Among other things, this had the immediate effect of increasing our then valuation of KEFI by 63.9% (see Exhibit 8). In addition to Hawiah (estimated value 0.46–6.59c/share – see Exhibit 4), KEFI also has a range of other 'next-level' projects in its portfolio, albeit at different stages of development (eg Guji-Komto and Jibal Qutman), that have a similarly high gearing to the gold price and the potential to increase KEFI's valuation by multiples, rather than increments, of its Tulu Kapi valuation.

Valuation: 4.05p rising to 5.62p; potentially 8.18p

We calculate that Tulu Kapi is capable of generating free cash flow of c £65.2m a year (cf £48.8m previously) for seven years, from 2022 to 2028 inclusive. This, in turn, drives average (maximum potential) dividends of 1.62p/share for the four years from 2025 to 2028, which values KEFI at 4.05p/share when discounted back to FY20 at a 10% discount rate. This confirms a current value for KEFI of £75.6m or US$97.0m (cf £46m and US$59m previously), based on Tulu Kapi alone. However, it excludes any beneficial interest for KEFI in TKGM above the originally planned 45% and also the value of the pipeline of targets in the KEFI portfolio. In the event that KEFI is ultimately successful in increasing its beneficial interest in TKGM or leveraging its cash flow from the open-pit mine into the underground deposit and its other assets in the region, our valuation increases to up to 8.18p/share. We estimate that Saudi Arabian and other 'next level' assets potentially add a further 5.38–17.8c (4.19–13.87p) to this. In the meantime, investing in KEFI at 1.99p should generate an IRR to investors of 25.6% pa over nine years in sterling terms.

30 September 2020

Price	**1.99p**
Market cap	**£37m**
	US$1.2832/£
Net cash (£m) at 30 June 2020	2.1
Shares in issue	1,867.1m
Free float	94.8%
Code	KEFI
Primary exchange	AIM
Secondary exchange	N/A

Share price performance

%	1m	3m	12m
Abs	(13.5)	101.0	109.5
Rel (local)	(12.1)	110.0	159.1
52-week high/low		2p	1p

Business description

KEFI Gold and Copper is an exploration and development company focused on gold and copper deposits in the highly prospective Arabian-Nubian Shield – principally the Tulu Kapi project in Ethiopia, as well as Hawiah Copper and Gold and Jibal Qutman Gold in Saudi Arabia.

Next events

Construction start	Q420
Start of commissioning	Late 2022
Commercial production	Q422

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Edison profile page

KEFI Gold and Copper is a research client of Edison Investment Research Limited

Investment summary

Specialist Arabian-Nubian Shield operator

KEFI Minerals is a gold junior that, to date, has specialised in discovery and acquisition on either side of the Arabian-Nubian Shield (ANS). The ANS spans the African and Arabian plates and is the source of some of man's earliest known mining activities, including the Mahd adh Dhahab ('Cradle of Gold') mine, which is the leading gold mining area in the Arabian peninsula. Currently, KEFI's flagship Tulu Kapi project (1.7Moz in resources) is Ethiopia's only 'ready-to-start' industrial mining project, located away from security hotspots and in a country on a continent that has been among the least affected in the world by COVID-19. It also has 34% interests in its discoveries on the other side of the ANS, namely Jibal Qutman and Hawiah (together 1.9Moz AuE) in Saudi Arabia, which is in the process of liberalising its mining legislative framework.

Valuation: 4.05p rising to 5.62p; potentially 8.18p

Assuming that KEFI executes its development according to plan at Edison's long-term gold price assumptions, we calculate that Tulu Kapi is capable of generating free cash flow of c £65.2m per year for seven years, from 2022 to 2028 (inclusive). With average (maximum potential) dividends of 1.62p/share for the four years from 2025 to 2028, this implies a valuation for KEFI of 4.05p/share when discounted back to FY20 at a rate of 10% per year. This valuation then rises to a maximum of 5.62p/share in FY24 on the cusp of KEFI's first material dividend and to 8.18p/share if KEFI is successfully able to leverage its cash flow from the mine into its other assets in the region.

Sensitivities

Gold price

In the event that the gold price remains at its current level of US$1,884/oz (in real terms) over the course of Tulu Kapi's productive life, our valuation of KEFI increases by 68.9% from 4.05p/share to 6.84p/share. In this case, an investment in KEFI shares at 1.99p on 1 January 2020 would generate an internal rate of return to its investor of 39.6% in sterling terms over the ten years to 2029.

Other assets

In addition to Hawiah and Tulu Kapi, KEFI has a number of other 'next level' assets that we estimate could add a further c 4.92–11.21 (3.83–8.74p) in value to its shares. These are described on pages 11–13 of this report.

Financials

KEFI had £2.1m in net cash on its balance sheet as at 30 June 2020 (cf net debt of £0.8m as at 31 December 2019), after strengthening its balance sheet by raising £3.7m in equity in May and also after £3.8m in operating and investing cash outflows before working capital in H1 (cf £5.3m in FY19 and £2.2m in H119). To date in FY20, the company has instituted a programme of disciplined capital management, which we estimate has the ability to reduce its underlying cash burn rate to an annualised rate of £1.0m pa. Henceforward, as Tulu Kapi shifts from project development to project execution, KEFI plans to finance its US$188.5m capex funding requirement principally via a bank loan of US$110–120m and project-level equity (US$58m in addition to the US$60m in equity already invested) and a subordinated working capital (ore stockpile) banking facility (US$17.7–27.7m). If all funding sources are considered, we forecast a maximum net debt funding requirement overall of £102.0m (US$130.9m) in FY21, which (according to our calculations) equates to a net debt:equity ratio of approximately 54:46 at the project level.

Recent developments

Since our last note, KEFI has continued to advance towards its goal of achieving production in FY22. Recently, this has included:

- Raising £3.7m in May by issuing 569.2m shares at a price of 0.65p/share; among other things, this fund-raising established long-term shareholder RAB Capital as a cornerstone investor, with a substantial 12% shareholding in the company and the right to appoint one board director.
- Changing its name to KEFI Gold and Copper (from KEFI Minerals).
- Announcing a maiden mineral resource for the Hawiah project, located in Saudi Arabia.
- On 22 September, announcing the results of a PEA on the Hawiah project indicating that its maiden resource potentially supports a production rate of 2.0Mtpa for seven years and generating operating cash flow of c US$70m pa ‘at current metals prices’ after initial capital expenditure of c US$222m and has ‘clear potential’ for the expansion of these resources.

Throughout this time, the company has consistently maintained its goal of formally agreeing its full funding structure with all consortium participants in October 2020, ahead of construction in FY21 and first gold production in FY22. As such, development activities have continued as planned, despite COVID-19. For items on the critical path, such as the integration of interconnecting roads and power infrastructure:

- This long-lead activity remains on schedule, so that it does not hold up on-site construction over the next two years when new roads and electricity are required.
- In addition, a road has been built into new host lands to facilitate the resettlement of Tulu Kapi residents.

For ore processing infrastructure:

- Process plant front-end-engineering-and-design (FEED) has been completed by the principal contractor, Lycopodium, after updating pricing from the plant fabricators and integrating the results of recent geotechnical drilling into the final designs for the plant foundations and dams.

Within this context, KEFI’s goals have remained unchanged, despite its previously planned Ethiopian partner’s (ANS) inability to meet its 30 June deadline for its initial investment into the project. As a result, KEFI’s subsidiary, TKGM, has served notice that it may replace ANS, either in part of in full, with other investors, including the potential for an expanded role for specialist mining financiers. Among other things, this might involve reducing the number of shares in the project issued to third parties and increasing the funds raised by TKGM from specialist financiers. Consequently, along with its partner, the Government of Ethiopia, KEFI has made it clear that it is now focusing on retaining a much higher ownership position in TKGM (perhaps as high as 60%) in order to maximise returns to its shareholders.

In the meantime, from early 2020, KEFI implemented a programme of disciplined capital management. Among other things, this has involved:

- Adjusting parts of the TKGM budget, while preserving key business targets;
- Diluting its interest in its Saudi joint-venture company Gold and Minerals Limited (G&M) from 38% to 34% by not contributing its pro rata share of expenses to G&M in H120 to cover the past two years’ running costs (NB KEFI still nevertheless expects to fund its pro rata share of expenditure in the future);
- A decision by the KEFI board and senior executives not to draw any salaries in the year to date; and
- Ongoing salary reductions by senior management of 25% from 1 January 2020, pending progress reviews.

Hawiah maiden resource estimate and PEA

In addition to developments at Tulu Kapi, KEFI has consistently reiterated its goal that it would report a (maiden) mineral resource estimate at Hawiah in August – a goal that it achieved, when it announced a 19.3Mt resource on 19 August.

Whereas KEFI had initially indicated that it anticipated the total resource to be in the order of 12Mt, in July it increased its estimate to 20Mt. This compared with Edison's prior estimate (made in March) of 13.3Mt.

The entire deposit comprises three separate zones, which may be summarised as follows:

- The 'Camp Lode': 1,200m long, with an average true width of 7m and confirmed to a depth of 300m below surface.
- The 'Crossroads Lode': 1,000m long, with an average true width of 5m, but confirmed to a depth of only 170m below surface.
- The 'Crossroads Extension Lode': 800m long, with an average true width of 5m and confirmed to a depth of 350m below surface.

A comparison between the maiden resource announced by KEFI on 19 August and Edison's prior estimate of the potential resource inventory at Hawiah based on the results of the assays already disclosed to the public in March is as follows:

Exhibit 1: Hawiah* maiden mineral resource estimate

Material type	Category	Tonnage (kt)	Cu (%)	Zn (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Zn (kt)	Au (koz)	Ag (oz)
Oxide, open pit	Inferred	0.1	0.1	0.03	1.7	3.9	0.1	0.04	7	16
Transition, underground	Inferred	2.0	1.1	0.8	0.7	12.0	21	16	45	763
Fresh, underground	Inferred	17.2	0.9	0.8	0.5	10.1	147	141	297	5,595
Total	**Inferred**	**19.3**	**0.9**	**0.8**	**0.6**	**10.3**	**168**	**157**	**349**	**6,373**
Prior Edison estimate	N/A	13.3	1.4	1.0	0.8	11.5	187	133	341	4,925
Uplift of actual vs expected (%)		**45.1**	**-35.9**	**-20.0**	**-24.8**	**-10.6**	**-10.1**	**18.0**	**2.3**	**29.4**

Source: Edison Investment Research, KEFI Gold and Copper. Note: *KEFI 34% beneficial interest; reported in accordance with the Australasian Code for the Reporting of Exploration Targets, Mineral Resources and Ore Reserves, The JORC Code (2012).

In general, it can be seen that, while Edison's tonnage estimates proved conservative, they were tolerably accurate in terms of metal content (given that, from experience, Edison places a level of accuracy of ±75% on its resource estimates). At prevailing metals prices (US$6,579/t Cu, US$2,424/t Zn, US$1,884/oz Au and US$23.69/oz Ag), the resource contains total metal to a value of US$2.3bn, or the equivalent of 349kt of contained copper or 1.2Moz of contained gold.

The 95km^2 Hawiah exploration licence is located in the south-west of the Arabian Shield on the 120km Wadi Bidah Volcanogenic Mineral belt (which is three times as long as the Bisha belt in Eritrea – see Nevsun), on which BRGM and the USGS[1] documented approximately 24 volcanogenic massive sulphide (VMS) deposits and historical workings. The Wadi-Bidah Mineral District is almost unique among the world's VMS belts in that it remains, to all intents and purposes, undrilled.

In its most recent two phases of exploration, KEFI determined that the Hawiah mineralisation is entirely open at depth, that the VMS style of mineralisation is continuously present directly beneath 4km of the gossanous ridgeline and that it is the source of an extensive and exceptionally strong geophysical anomaly. The massive sulphides intersected in its drill programme are reported to reflect a dominantly pyritic stratiform body containing a variable polymetallic blend of copper, zinc, gold and silver. Highlights of the drilling include:

- A maximum downhole interval of 29m of mineralisation.

1 BRGM: Bureau de Recherches Géologiques et Minières; USGS: US Geological Survey.

- A maximum intercept of 4.4% copper over a 6m true width interval, including 5.8% copper over a 3m true width in the supergene zone.
- A maximum zinc grade of 3.6%.
- A maximum gold grade of 7.78g/t.
- A maximum silver grade of 58.50g/t.

Nevertheless, there remains considerable blue-sky potential at Hawiah. To date, the orebody has only been drilled to 350m below ground and remains open at depth. The down-dip continuation of the Camp Lode is of particular interest in this respect, where drilling results to date have reported grade and thickness increasing significantly with depth. The deepest two holes (HWD_005 and HWD_059) returned 1.27% copper over a true width of 9m and 1.55% copper over a true width of 8.7m, respectively and, if intersected in line with expectations, would extend mineralisation to a depth of c 800m and may indicated that resources are nearing the source (vent) of the VMS, where higher grade and thicker massive sulphides and stockwork-style mineralisation may typically be found. Geochemical analysis and volcaniclastic textures within the lodes have also indicated increasing proximity with depth to a potential primary feeder source. Below the Central Zone may also have strong resource potential, as indicated by a strong induced polarisation (IP) anomaly, and planned drilling is targeting mineralisation at a depth of c 450m (cf c 80m tested to date via only a few scout drill holes). Finally, massive sulphides were reported to have been intersected in a drill hole 150m to the north of the Hawiah ridgeline, confirming that the mineralised horizon continues at depth even beyond the northern surface exposure (in the ‘Crossroads extension area’).

Similar potential exists in the upper levels of the deposit, where the gossan portion of the mineralised zone is challenging to sample by drilling by virtue of the weathering patterns and the numerous cavity zones encountered. BRGM drilled these gossans in the 1980s, as a result of which it delineated a resource of 1.2Mt at a grade of 6.4g/t, containing 254koz gold, and management confirms that this oxidised portion of the deposit, which has demonstrated high levels of gold mineralisation, will also be further investigated. To date, initial drilling of these areas has returned an average grade of 1.7g/t gold across seven drill holes with an average vertical depth of 35m.

Based on published literature, KEFI management believes that the Hawiah deposit appears analogous to (albeit already bigger than) the Al Masane polymetallic VMS mine in southern Saudi Arabia, which has reported proven and probable reserves of 7.21Mt at grades of 1.42% copper, 5.31% zinc, 1.19g/t gold and 40.2g/t silver, and a similar metal composition and structural and geological settings. The discovery of the stockwork zone that fed the structure now being drilled would also bring into focus a potentially larger bulk-mineable target analogous to the Jabal Sayid mine operated by Barrick to the north of Hawiah.

Hawiah PEA

The resource reported by KEFI in Exhibit 1 is the equivalent of 19.3Mt at a grade of 1.86% copper equivalent or 1.91g/t gold equivalent, such that each tonne of ore contains US$119 worth of combined metals (at the prices shown on page 4 after Exhibit 1).

Since announcing its maiden resource in August, KEFI has prioritised the completion of a PEA at Hawiah. The PEA was conducted by the KEFI planning team, supported by internationally recognised specialists, including SRK, and included technical analysis, high-level assessments and trade-off studies to establish the likely key components of the mine’s potential development. Among other things, these included:

- Underground mining using long-hole open stoping, using rib and sill pillars for support.

- Processing via two-stage flotation to produce separate copper and zinc concentrates, with a cyanide leach circuit to allow for the production of gold doré from the zinc concentrate and tailings stream.
- Tailings storage and required infrastructure.

The full details of KEFI's PEA announcement may be found here and Edison has used the operating details provided to construct Edison's own operating and financial model of the project, both to validate the financial conclusions of KEFI's model and also to adjust it to reflect Edison's own long-term assumptions regarding (for example) long-term metals prices. A comparison of the major differences between KEFI's assumptions and Edison's is as follows:

Exhibit 2: Comparison of KEFI and Edison assumptions regarding Hawiah

	KEFI assumption	Edison assumption
Metals prices		
Copper price (US$/t)	6,603	*6,410
Zinc price (US$/t)	2,315	*2,315
Gold price (US$/oz)	1,956	*1,494
Silver price (US$/oz)	27.50	*24.53
Other		
Sustaining capital expenditure	US$46m	Seven years at US$8m pa = US$56m

Source: KEFI Gold and Copper, Edison Investment Research. Note: *Long-term real prices.

Note that, unless specifically indicated to the contrary in the table above, readers may assume that Edison's assumptions are the same as those detailed in KEFI's PEA announcement. In addition, in constructing its model, Edison had to make the following assumptions, which were otherwise not specifically disclosed in KEFI's announcement:

Exhibit 3: Specific Edison assumptions regarding Hawiah

Item	Edison assumption
Estimated copper concentrate grade	35% Cu
Estimated zinc concentrate grade	55% Zn
Copper treatment charges (TC)	US$62.00/t
Copper refining charges (RC)	US$6.20/lb
Zinc treatment charges (TC)	US$245/t
Saudi Arabian income tax rate	20%

Source: Edison Investment Research

Saudi Arabian depreciation is typically conducted over 10 years. However, it may be as low as four to five years for certain machinery items. For the purposes of its model, Edison has assumed that depreciation is conducted over seven years (being the initial life of the proposed mine) and that assets remain fully depreciated at that point, even if the mine's life is then extended by up to 10 years (see below). We have also ignored accumulated tax losses that would be available.

In its own model, KEFI considers a 'base case' scenario, in which the mine operates at a throughput rate of 2.0Mtpa for seven years and an 'extended' scenario, in which an further 20Mt is added to the mining inventory 'at the average grade of the Camp Lode below the 1070m RL elevation'. In the absence of detailed knowledge about the average grade of the Camp Lode, Edison has assumed that this addition to the mining inventory will allow the mining operation to continue at Hawiah for a further 10 years at run-of-mine grades the same as those in the first seven years of the mine's life (namely 0.87% Cu, 0.78% Zn, 0.53g/t Au and 9.9g/t Ag – see KEFI's Hawiah PEA announcement).

On the basis of these assumptions, the financial outcomes generated by Edison from its model compare with those generated by KEFI, for both scenarios, as follows:

Exhibit 4: KEFI vs Edison financial model outcomes

Extended mine life scenario			Scenario	Base case scenario		
KEFI	Edison	Edison	Model	KEFI	Edison	Edison
KEFI	KEFI	Edison	Assumptions	KEFI	KEFI	Edison
	2.0	2.0	Ore processing rate (Mtpa)	2.0	2.0	2.0
	17	17	Life of mine (years)	7	7	7
	78	78	Average annual operating costs (US$m)	79	78	78
	155.5	141.8	Annual revenue (US$m)	153	155.5	141.8
	86	86	Average annual all-in sustaining costs (US$m)	85	86	86
	69.5	55.8	Annual steady-state net pre-tax free cash flow (US$m)	67	69.5	55.8
*362	*311.3	160.9	Post-tax NPV	*96	*99.8	25.2
28	26.6	21.1	Post-tax IRR	22	20	13.3
	222	222	Pre-production capital expenditure (US$m)	222	222	222
123.1	105.9	54.7	34% KEFI share of post-tax NPV (US$m)	32.6	33.9	8.6
6.59	5.67	2.93	Ditto (US cents per share)	1.75	1.82	0.46
5.18	4.46	2.30	Ditto (pence per share)	1.37	1.43	0.36

Source: Edison Investment Research, KEFI Gold and Copper. Note: *NPV calculation conducted at an 8% discount rate; otherwise, all other NPV's conducted at a 10% discount rate.

Several features of these outcomes are noteworthy:

- The similarity between the outputs of the KEFI model and the Edison model using KEFI assumptions for the 'base case' scenario confers confidence upon Edison's financial model relative to KEFI's.
- For the 'extended mine life' scenario, the difference between the NPV of the KEFI model and the Edison model using KEFI assumptions is 14.0% (US$311.3m cf US$362m); we regard this as being acceptable within the context of a PEA in which the operating and capital cost estimates are made to a ±50% level of accuracy. In the meantime, we suspect that much of the discrepancy is likely to be attributable to the depreciation of ongoing sustaining capital expenditure over the additional 10 years of mine life (in this case, Edison has assumed zero depreciation of ongoing sustaining capex, which is likely to prove conservative).
- They compare with Edison's earlier estimate of a cash margin of US$40/t and, at a mining rate of 1.0–1.3Mtpa over 10 years, a cash margin of US$40–52m pa or US$400–520m over the life of operations (undiscounted etc) after 15% mining dilution and 87% metallurgical recoveries and a posited all-in sustaining cost of US$70/t (see our note Tulu Kapi project started and financings improved, published on 4 March).

In consequence and owing to the tabular and continuous nature of the mineralisation, KEFI anticipates that Hawiah can be advanced to a development decision quickly and at relatively low cost. In particular, if the resource can be expanded to make the 'extended mine life scenario' a reality, then KEFI expects that 75% of the project funding could be eligible for debt finance, thereby increasing the project's (leveraged) post-tax IRR to in excess of 50%.

Next steps at Hawiah

Following completion of the PEA, KEFI's immediate priorities towards Hawiah are now as follows:

- Seeking to double the maiden mineral resource estimate via the next drilling phase to commence in Q420.
- Undertaking a metallurgical test-work programme.
- Undertaking an Environmental & Social Impact Assessment (ESIA) baseline and water resources study.
- Reporting updated PEA results as progress is made, culminating in updates to the PEA financial model prior to commencing a pre-feasibility study (PFS) study for a long-life mining operation.
- Extending exploration activities into the surrounding district as licensing warrants.

To these ends, the directors of KEFI's joint venture company in Saudi Arabia, G&M, have resolved to trigger the next stage of the project, comprising:

- Deeper drilling with a target of doubling the maiden resource in the next drilling phase.
- Infill drilling to upgrade the existing resources into the indicated category, so as to fully justify mine planning and the estimation of a maiden ore reserve (NB Drill spacing on the Camp and Crossroads Lodes is c 120–140m).
- Staged studies and surveys to complete a PFS in FY21.
- Scout drilling for a large stockwork, or 'feeder', zone to the massive sulphides already identified; note that this represents a separate, and probably much larger-scale, target than the existing Hawiah resource.

The gold price

In our last note on the gold price (see A golden future, published on 11 June 2020), Edison argued that the recent, sharp increases in the total US monetary base might be expected to support a (nominal) gold price of US$1,892/oz and potentially as high as US$3,000/oz. While there is a historically strong and statistically significant correlation of 0.909 between the gold price and the total US monetary base from 1967 to 2018 however, there is very little visibility as to how, or to what extent, the total US monetary base may be expected to evolve. Currently, we know that it is expanding at a rate of approximately US$110bn per month, which equates to an expected increase in the gold price (using the historical correlation) of approximately US$500/oz per annum. Anecdotally, the total US monetary base may probably be expected to continue to increase for a time until the COVID-19 crisis has been managed and then to flatten off for a discrete period until a period of tapering is attempted by the Federal Reserve (in a similar fashion to the aftermath of the global financial crisis). However, neither the extent of any increases nor the extent of any subsequent tapering nor the timing of either is easy to judge. In consequence, Edison's strategy now is to maintain a flat, nominal gold price of US$1,892/oz into the future from FY21. Note that this may be contrasted with our previous approach to gold price forecasts (see Portents of economic weakness: Gold – doves in the ascendant, published on 14 August 2019), the results of which were as set out in the table below:

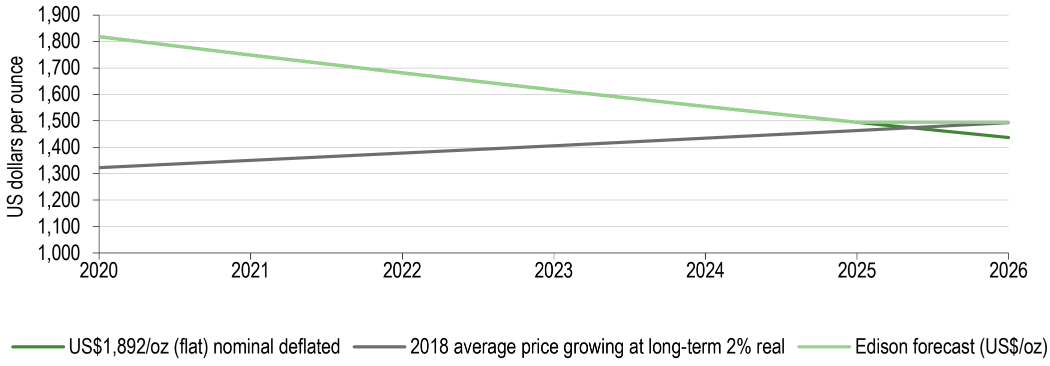
Exhibit 5: Previous Edison gold price forecasts* (US$/oz)

US$/oz	2021e	2022e	2023e
Nominal gold price forecast (US$/oz)	1,509	1,560	1,421
Real gold price forecast (US$/oz)	1,395	1,387	1,350

Source: Edison Investment Research. Note: *See Portents of economic weakness: Gold – doves in the ascendant.

In the absence of more general deflation, a flat, nominal gold price of US$1,892/oz is, self-evidently, a declining gold price in real terms, which is an unlikely long-term scenario, given that the gold price has historically increased by 2.0% per annum in real terms from 1914 to 2018 (see *Portents of economic weakness, Gold: Doves in the ascendant*). During the period 2013–18, the gold price was relatively flat, averaging US$1,270/oz. Its average price in 2018 was also US$1,271/oz – both of these levels arguably having been supported by the marginal cost of production. If this level is then increased at 2% per annum from 2018, it may be compared with the flat nominal (declining real) price scenario previously described, as shown in the exhibit below:

Exhibit 6: Edison updated real gold price pricing scenarios and forecast (US$/oz)



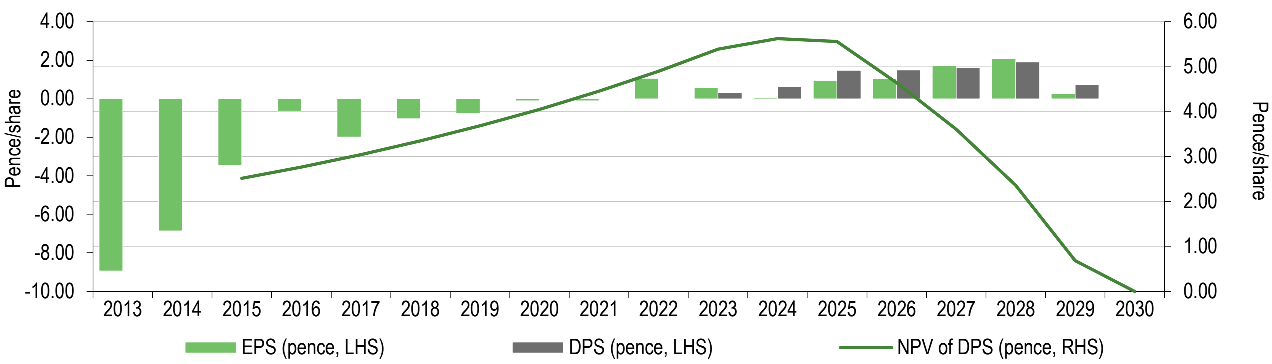
Source: Edison Investment Research

As may be seen from the chart above, the two lines cross between 2025 and 2026 at a level fractionally below US$1,500/oz. All Edison's gold company valuations are conducted in real terms. Consequently, and in the absence of much immediate visibility as to the evolution of the total US monetary base, Edison's new gold price scenario for valuation purposes is for the gold price to remain at US$1,892/oz in flat nominal terms (ie declining in real terms) until the price (in real terms) crosses with the increased US$1,271/oz 2018 price. At that point we assume that the price will flatten out (in real terms) at US$1,494/oz (note that this may be contrasted with our prior methodologies for gold price forecasting, which were set out in our report *Portents of economic weakness, Gold: Doves in the ascendant*).

Valuation

On the basis of the above assumptions, we calculate that Tulu Kapi is capable of generating free cash flow of c £65.2m per year (cf £48.8m previously) for seven years, from 2022 to 2028 (inclusive). With average (maximum potential) dividends of 1.62p/share (cf 1.51p/share previously; NB now using the higher number of shares since the May equity raising) for the four years from 2025 to 2028 inclusive (after deduction of a 55% 'minority' interest – see below), this implies a valuation for KEFI of 4.05p/share (cf 3.54p/share previously) when discounted back to FY20 at a rate of 10% per year. This valuation then rises to a maximum of 5.62p/share in FY24 on the cusp of KEFI's first material dividend in FY25:

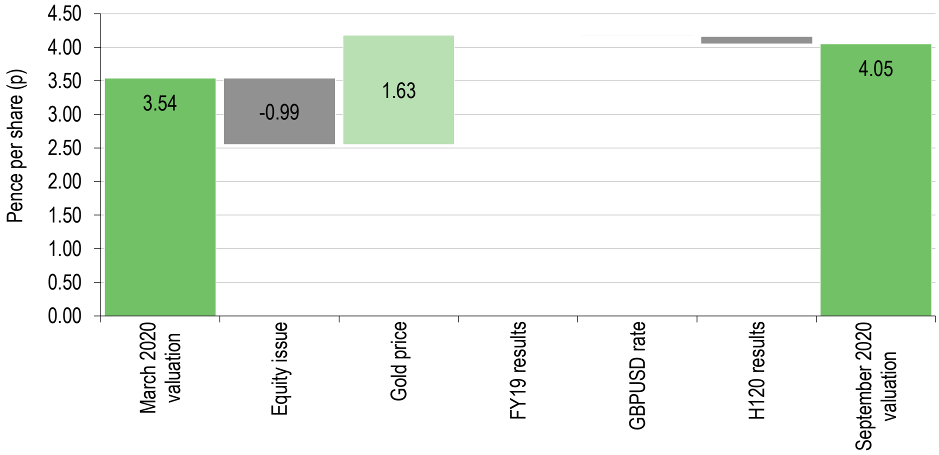
Exhibit 7: Edison estimate of life of mine KEFI EPS and maximum potential DPS (pence/share), FY13–30e



Source: Edison Investment Research

A summary, showing the major factors contributing to our updated valuation of KEFI (in sterling terms), is as follows:

Exhibit 8: KEFI valuation changes, September 2020 cf March 2020



Source: Edison Investment Research

Note, however, that this valuation is based on the projected dividend flow resulting from the execution of the Tulu Kapi project alone and does not include any value above 45% ownership of Tulu Kapi or any value for the exploration and development of the pipeline of targets in KEFI's portfolio (see below). If KEFI is successfully able to leverage its cash flow from the mine into its other assets in the region, then our updated valuation of 4.05p/share rises to 8.18p/share.

On this basis alone (ie excluding any 'next level' assets – see below), we estimate that an investment in KEFI shares on 1 January 2020 at a price of 1.99p could generate an internal rate of return to investors of 25.6% over the 10 years to 2029 (inclusive) in sterling terms.

Edison's valuations of KEFI, above (including central general & administrative expenses etc), compare with KEFI's project-based valuation of Tulu Kapi, at a range of different gold prices, as follows:

Exhibit 9: KEFI's project-based valuations of Tulu Kapi at varying gold prices

Gold price (US$/oz)	1,400	1,700	2,000
Internal rate of return (%)	29	52	70
All-in sustaining cost (US$/oz)	856	877	898
All-in cost (US$/oz)	1,066	1,087	1,108
Average EBITDA (US$m)*	79	111	148
NPV_8*			
US dollars (millions)	236	422	607
Pounds sterling (millions)	189	337	485
NPV_8 (45% basis)			
US dollars (millions)	105	180	273
Pounds sterling (millions)	85	152	218
NPV_8 (45% basis)			
US cents per share	5.62	9.64	14.62
Pence per share	4.55	8.14	11.68

Source: KEFI Gold and Copper, Edison Investment Research. Note: *100% basis.

Valuation sensitivities: Upside potential

Notwithstanding our valuation of KEFI based on its primary asset, there are a number of considerations that could cause this to increase, which are briefly summarised as follows.

Gold price

Trading close to US$1,900/oz currently under the influence of both a re-expansion of the US total monetary base plus the perceived threat from the coronavirus, the price of gold is self-evidently above our forecast real prices for all of the years from CY22 onwards when KEFI is expected to enter production (note that all of Edison's valuations in the mining sector are conducted on the basis of real prices, costs and interest rates). In the event that the gold price were to remain at US$1,884/oz (in real terms), our valuation of KEFI would rise by 68.9%, from 4.05p/share to 6.84p/share, in which case an investment in KEFI shares at 1.99p on 1 January 2020 would generate an internal rate of return to its investor of 39.6% in sterling terms over the 10 years to 2029 (cf 25.6% above).

Minority interest

Our valuation of KEFI is based on the net present value of (maximum potential) dividends payable to KEFI shareholders after the deduction of a 55% 'minority' interest to reflect the most recent equity funding arrangements for which detail was available. Recently however, KEFI has indicated that ANS's inability to meet its 30 June deadline for its initial investment into the project could result in its being replaced and KEFI reducing the number of shares in the project issued to third parties and increasing the funds raised by TKGM from specialist financiers. In this event, it has suggested that existing KEFI shareholders' ultimate interest in Tulu Kapi could be increased from the currently anticipated 45% perhaps to as high as 60%. If that were to be the case and all other things were to remain equal, then our valuation of the company increases by 33.3% (ie 60/45) from 4.05p/share to 5.40p/share.

Other assets

In addition to Hawiah and Tulu Kapi, KEFI has a number of other assets that we estimate could add a further c 4.92–11.21 (3.83–8.74p) in value to its shares and which are summarised below.

Guji-Komto (parallel to Tulu Kapi)

An area of over 1,000km^2 adjacent to Tulu Kapi has been reserved for exploration by KEFI upon commencement of development, with a view to adding satellite deposits to development and production plans. Within this, KEFI has one immediate, major exploration target, being the Guji-Komto belt, which is a parallel structure to Tulu Kapi.

The Guji-Komto belt represents a series of old gold workings on a parallel strike to Tulu Kapi extending continuously for over 9km to the west of the Tulu Kapi pit. The most extensive historical workings are located at the Komto 1 prospect and prior exploration drilling by Nyota had already extended the limits of mineralisation by up to 4km. At 1.3–1.5g/t in-situ, the grade of this mineralisation was considered too low to be included in the development plan for the mine. However, impressive widths and their oxide nature potentially qualify it as the basis of an incremental heap leach operation via the exploitation of a series of open pits in the style of a 'string of pearls'. Preliminary estimates by management indicate that c 250koz of gold could be amenable to exploitation, with low-grade material being directed to heap leach pads and high-grade material to the existing carbon-in-leach (CIL) plant at Tulu Kapi. Such an operation, based on preliminary management estimates, could produce c 40koz gold a year over five years for a relatively small incremental capital outlay of c US$30.4m (on account of infrastructure already being in place to service Tulu Kapi) and could have a net present value in the order of US$26–47m at the gold prices shown below (note that these are illustrative numbers and are subject to the results of exploration and development studies):

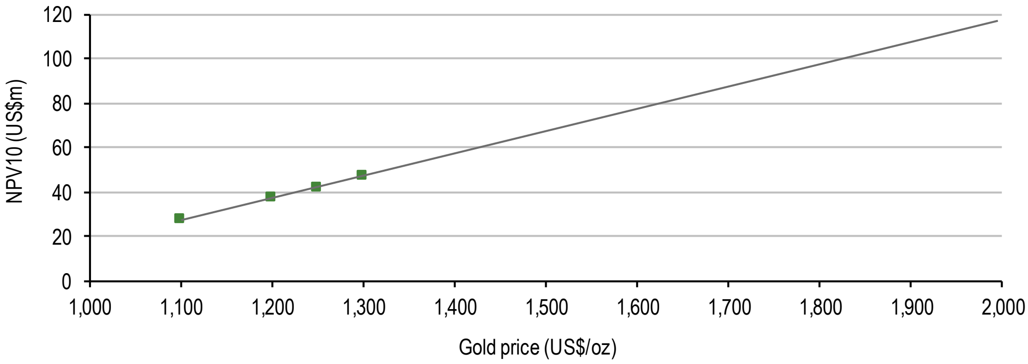
Exhibit 10: Guji-Komto indicative valuations

Gold price (US$/oz)	1,100	1,200	1,250	1,300
NPV_{10} (US$m)	26.9	36.8	41.8	46.8
NPV_{10} per KEFI share (US cents)*	1.37	1.87	2.13	2.38
IRR (%)	45	57	63	69

Source: KEFI management estimates, Edison Investment Research. Note: *Based on assumed 95% ownership.

The gold price range over which valuations were conducted suggests that these calculations were performed in the 'old' 2013–18 gold price environment. While the following analysis – comparing the calculated NPV_{10} with the gold price – is presented with a number of caveats (in particular that cost assumptions remain unchanged), it nevertheless serves to illustrate the fact that, at a gold price of US$1,494/oz, Guji-Komto could be worth in the order of US$66.1m (or 3.36 US cents per existing KEFI share) or potentially as much as US$104.9m (or 5.34 US cents per existing KEFI share) at a flat, long-term, real gold price of US$1,884/oz.

Exhibit 11: Guji-Komto NPV_{10} (US$m) vs (real) gold price (US$/oz)



Source: Edison Investment Research (underlying data KEFI Gold and Copper)

Jibal Qutman

Jibal Qutman comprises four licences covering c 100km² in the central southern region of Saudi Arabia, on the Nabitah-Tathlith fault zone of the Arabian-Nubian Shield (a 300km-long structure with multiple outcrops at surface) and along which BRGM mapped over 40 mineral occurrences and/or ancient mines. KEFI's management likens the area to Western Australia and, in particular, Kalgoorlie, before it was pegged, but without the attendant problems of a settled population and private land ownership. G&M (the local operating company in which KEFI has a 34% beneficial interest) was granted the Jibal Qutman exploration licence in June 2013 and it has subsequently lodged a mining licence application.

Gold mineralisation at Jibal Qutman itself is hosted in a series of quartz veins in six separate ore bodies, denoted the Main Zone, the South Zone, the West Zone, 3K Hill, 5K Hill and Pyrite Hill. The main vein dips to the east at an angle of c 45°, surrounded by parallel veins that form stringer zones around it. Jibal Qutman has now been drilled out and, during this process, the sulphide portion of its resource was found to be refractory on account of the presence of carbon. As a result, KEFI focused its exploration activities on the oxide portion of the resource and delineated a potential mineable resource of 6.6Mt at a grade of 0.95g/t, containing c 200koz gold, at a stripping ratio of 2.2 (cf grades of c 0.8g/t at comparable, nearby assets). Column leach tests conducted by metallurgical consultants ALS indicated gold recoveries of c 73%, as a result of which KEFI envisages developing the area via a string of pits mining oxidised material for heap leach processing.

In May 2015, a PEA on the deposit was completed on the basis of a 1.5Mtpa heap leach operation, producing 139koz gold over an initial 4.5-year mine life (average 30.9koz pa) at an average metallurgical recovery of 69% and capex and opex of US$30m and US$597/oz, respectively. A summary of the results of the PEA is provided in the table below for both the existing resource and a potentially trebled resource. In addition to the formal results, which are shown for gold prices of US$1,150/oz and US$1,300/oz, Edison has also included its estimates of the same results at long-term, flat, real gold prices of US$1,494/oz and US$1,884/oz (using the same methodology – and with the same caveats – as adopted in Exhibit 11):

Exhibit 12: Jibal Qutman May 2015 PEA results (plus Edison pro rata estimates)

	Existing resource				Trebled resource			
Gold price (US$/oz)	**1,150**	**1,300**	**1,494**	**1884**	**1,250**	**1,300**	**1,494**	**1884**
NPV_5 (US$m)	47.7	64.3	85.8	128.9	145	159	213	322.5
NPV_5 per KEFI share (US cents)*	0.87	1.17	1.56	2.35	2.64	2.90	3.88	5.87
IRR (%)	41	52			25	30		

Source: KEFI Gold and Copper, Edison Investment Research. Note: *34% basis.

In due course, it is anticipated that the addition of adjoining licences could support a proportionally larger production base using a modular development model (eg 2–4x that currently assessed) as well as reducing operational risk.

Note that the above analysis on the basis of a trebled resource also assumed a similar factor applied to capex whereas, in reality, there would probably be scope for capex savings as well as higher grades from alternative ore sources. In the immediate future, KEFI's objectives at Jibal Qutman include tenure confirmation under the new mining regulations via the grant of a mining licence, completing a pre-feasibility study and investigating the potential to develop heap leach operations to fund construction of a CIL processing plant for the deeper (albeit refractory) sulphide ore.

Financials

Including short-term debt, KEFI had £2.1m in net cash on its balance sheet as at 30 June 2020 (cf £0.8m in net debt as at 31 December 2019), after £3.8m in operating and investing cash outflows before working capital (cf £5.3m in FY19 and £2.2m in H119). This cash burn rate compares to comparable figures of £6.2m and £6.9m for the full 2017 and 2018 financial years, respectively.

At the start of the coronavirus crisis in early 2020, KEFI instituted a programme of disciplined capital management involving, among other things:

- Adjusting parts of the TKGM budget, while preserving key business targets;
- Diluting its interest in its Saudi joint-venture company Gold and Minerals Limited (G&M) from 38% to 34% by not contributing its pro rata share of expenses to G&M in H120 (NB KEFI still expects to fund its pro rata share of expenditure in the future);
- A decision by the KEFI board and senior executives not to draw any salaries in the year to date; and
- Ongoing salary reductions by senior management of 25% from 1 January 2020, pending progress reviews.

In the short term, we believe that these measures – plus judicious management of working capital – have the ability to reduce KEFI's underlying cash burn rate to c £0.5m in H220. In the meantime, the company has also strengthened its balance sheet by raising £3.7m in equity in May via the issue of 569.2m shares at a price of 0.65p/share.

As stated previously, KEFI now plans to finance its US$188.5m capex funding requirement principally via a bank loan of US$110–120m and project-level equity (US$58m in addition to the US$60m equity already invested) and a subordinated working capital (ore stockpile) banking facility (US$17.7–27.7m). If all funding sources are considered, we forecast a maximum net debt funding requirement overall of £102.0m, or US$130.9m (cf US$127.0m previously) in FY21, which (in our estimation) equates to a net debt:equity ratio of approximately 54:46 at the project level.

Exhibit 13: Financial summary

£'000s	2013	2014	2015	2016	2017	2018	2019	2020e	2021e
December	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS									
Revenue	0	0	0	0	0	0	0	0	0
Cost of Sales	(927)	(2,071)	(1,634)	(2,260)	(3,522)	(4,145)	(2,357)	(3,194)	(1,000)
Gross Profit	(927)	(2,071)	(1,634)	(2,260)	(3,522)	(4,145)	(2,357)	(3,194)	(1,000)
EBITDA	(927)	(2,071)	(1,634)	(2,260)	(3,522)	(4,145)	(2,357)	(3,194)	(1,000)
Operating Profit (before amort. and except.)	(927)	(2,189)	(1,724)	(2,315)	(3,546)	(4,155)	(2,367)	(3,196)	(1,002)
Intangible Amortisation	0	0	0	0	0	0	0	0	0
Exceptionals	(442)	(379)	(428)	1,944	(2,359)	(180)	(1,465)	1,323	0
Other	0	0	0	0	0	0	0	0	0
Operating Profit	(1,369)	(2,568)	(2,152)	(371)	(5,905)	(4,335)	(3,832)	(1,873)	(1,002)
Net Interest	4	(413)	(319)	(136)	(75)	(459)	(1,150)	(229)	(3,599)
Profit Before Tax (norm)	(923)	(2,602)	(2,043)	(2,451)	(3,621)	(4,614)	(3,517)	(3,425)	(4,601)
Profit Before Tax (FRS 3)	(1,365)	(2,981)	(2,471)	(507)	(5,980)	(4,794)	(4,982)	(2,102)	(4,601)
Tax	0	0	0	0	0	0	0	0	0
Profit After Tax (norm)	(923)	(2,602)	(2,043)	(2,451)	(3,621)	(4,614)	(3,517)	(3,425)	(4,601)
Profit After Tax (FRS 3)	(1,365)	(2,981)	(2,471)	(507)	(5,980)	(4,794)	(4,982)	(2,102)	(4,601)
Minority interests	0	115	0	0	0	0	0	1,802	2,530
Net income (normalised)	(2,151)	(3,469)	(2,778)	(3,177)	(3,907)	(4,775)	(4,108)	(2,797)	(2,070)
Net income (FRS3)	(1,365)	(2,866)	(2,471)	(507)	(5,980)	(4,794)	(4,982)	(300)	(2,070)
Average Number of Shares Outstanding (m)	29.0	56.0	92.8	194.9	315.3	476.1	719.0	1,388.8	1,867.1
EPS - normalised (p)	(7.4)	(6.2)	(3.0)	(1.6)	(1.2)	(1.0)	(0.6)	(0.2)	(0.1)
EPS - normalised and fully diluted (p)	(7.4)	(6.2)	(3.0)	(1.5)	(1.1)	(0.9)	(0.5)	(0.2)	(0.1)
EPS - (IFRS) (p)	(4.7)	(5.1)	(2.7)	(0.3)	(1.9)	(1.0)	(0.7)	(0.0)	(0.1)
Dividend per share (p)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross Margin (%)	-	-	-	-	-	-	-	-	-
EBITDA Margin (%)	-	-	-	-	-	-	-	-	-
Operating Margin (before GW and except.) (%)	-	-	-	-	-	-	-	-	-
BALANCE SHEET									
Fixed Assets	7,152	9,299	11,926	14,053	16,275	18,795	21,239	108,171	166,922
Intangible Assets	6,900	9,139	11,845	13,992	16,232	18,757	21,200	24,619	24,619
Tangible Assets	252	160	81	61	43	38	39	83,345	142,096
Investments	0	0	0	0	0	0	0	207	207
Current Assets	4,014	1,061	1,012	3,561	1,047	284	1,454	190	666
Stocks	0	0	0	0	0	0	0	0	0
Debtors	655	335	358	3,056	94	115	1,234	120	596
Cash	3,279	640	562	410	466	88	150	0	0
Other	80	86	92	95	487	81	70	70	70
Current Liabilities	(3,363)	(3,202)	(1,995)	(2,067)	(2,852)	(3,727)	(5,211)	(4,643)	(6,459)
Creditors	(3,363)	(3,202)	(1,995)	(2,067)	(2,852)	(3,112)	(4,247)	(3,679)	(5,495)
Short term borrowings	0	0	0	0	0	(615)	(964)	(964)	(964)
Long Term Liabilities	0	0	0	0	0	0	0	(39,022)	(101,034)
Long term borrowings	0	0	0	0	0	0	0	(39,022)	(101,034)
Other long term liabilities	0	0	0	0	0	0	0	0	0
Net Assets	7,803	7,158	10,943	15,547	14,470	15,352	17,482	64,695	60,095
CASH FLOW									
Operating Cash Flow	(1,424)	(2,006)	(2,729)	(2,211)	(51)	(3,291)	(624)	(2,286)	340
Net Interest	4	(413)	(319)	(136)	(75)	115	(1,150)	(229)	(3,599)
Tax	0	0	0	0	0	0	0	0	0
Capex	(877)	(3,133)	(3,507)	(3,014)	(2,625)	(2,835)	(2,690)	(87,071)	(58,753)
Acquisitions/disposals	(1,083)	(750)	0	16	0	0	0	0	0
Financing	4,735	3,663	6,480	5,192	2,807	5,128	1,640	50,413	0
Dividends	0	0	0	0	0	0	0	0	0
Net Cash Flow	1,355	(2,639)	(75)	(153)	56	(883)	(2,824)	(39,172)	(62,012)
Opening net debt/(cash)	(1,924)	(3,279)	(640)	(562)	(410)	(466)	527	814	39,986
HP finance leases initiated	0	0	0	0	0	0	0	0	0
Other	0	0	(3)	1	0	(110)	2,537	0	0
Closing net debt/(cash)	(3,279)	(640)	(562)	(410)	(466)	527	814	39,986	101,998

Source: Company sources, Edison Investment Research

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Management team

Executive chairman: Harry Anagnostaras-Adams	Head of operations: David Munro
Harry Anagnostaras-Adams qualified as a chartered accountant while working with PricewaterhouseCoopers and has an MBA from the Australian Graduate School of Management. He has overseen a number of business start-ups, both in the mining industry (eg KEFI and EMED Mining) and outside (eg Citicorp Capital Investors, Pilatus Capital and Cyprus-based Semarang Enterprises) in the capacity of chairman, deputy chairman and managing director.	David Munro has been in the metals and mining industry since 1977. He joined Gencor in 1981 and served variously as its executive director of new business and trading, MD of Billiton International, general manager of Samancor, vice president of strategy & business development, chief development officer and executive director of Aluminium. Since leaving BHP Billiton, other positions held include strategy director and executive officer of Kazakhmys and group CEO of CEMEX.
Advisor – exploration strategy: Jeff Rayner	**Finance director: John Leach**
Jeff Rayner is a geologist with more than 25 years' experience in gold exploration and mining in Australia, Europe and Asia. He started his career in Australia with BHP Gold and later Newcrest Mining. He was involved in the early exploration discovery of the Cracow, Gosowong and Cadia Hill deposits, as well as Monte Ollasteddu and Biely Vrch. He joined EMED in 2006 and became MD of KEFI in November 2006 and exploration director in October 2014. He is a member of the Australasian Institute of Mining & Metallurgy and of the Society of Economic Geologists.	John Leach has over 25 years' experience in senior executive positions in the mining industry internationally. He holds a BA (economics) degree and an MBA. He is a member of the Institute of Chartered Accountants (Australia), a member of the Canadian Institute of Chartered Accountants and a Fellow of the Australian Institute of Directors.

Principal shareholders	(%)
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RAB Capital Ltd	12
Management and contractors	12
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