3 March 2011

Produced by: RBS Equities (Australia) Limited

Initiation of coverage

**Buy**

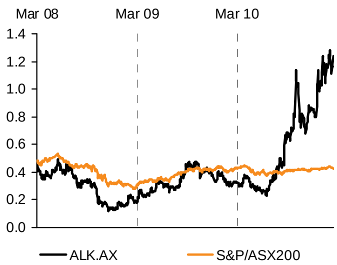
**Target price**
A$2.74

**Price**
A$1.235

**Short term (0-60 days)**
n/a

### Price performance

| | (1M) | (3M) | (12M) |
|---|---|---|---|
| Price (A$) | 1.13 | 0.87 | 0.33 |
| Absolute (%) | 8.8 | 42.8 | 274.2 |
| Rel market (%) | 8.7 | 39.0 | 266.3 |
| Rel sector (%) | 4.7 | 31.7 | 208.5 |




**Market capitalisation**
A$332.25m (US$337.71m)

**Average (12M) daily turnover**
A$0.85m (US$0.85m)

Sector: BBG AP Mining
RIC: ALK.AX, ALK AU
Priced A$1.24 at close 2 Mar 2011.
Source: Bloomberg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# Alkane Resources

## Overlooked and undervalued

**ALK's flagship asset is the Dubbo Zirconia Project in New South Wales. Commissioning in 2013 will produce zirconium, rare-earth and niobium products, each with independent supply/demand outlooks. After pricing in development risk, we believe substantial investment upside remains.**

### Key forecasts

| | FY08A | FY09A | FY10F | FY11F | FY12F |
|---|---|---|---|---|---|
| EBITDA (A$m) | -0.69 | 2.12 | 6.13 | -8.00 | -10.0 |
| Reported net profit (A$m) | -12.0 | 11.00 | 1.42 | -5.20 | -8.81 |
| Normalised net profit (A$m)[1] | -0.02 | 2.30 | 7.34 | -5.20 | -8.81 |
| Normalised EPS (c)[1] | -0.01 | 0.85 | 2.73 | -1.93 | -3.28 |
| Normalised EPS growth (%) | n/a | n/a | 219.3 | n/a | 69.50 |
| Dividend per share (c) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dividend yield (%) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Normalised PE (x) | n/m | 144.6 | 45.30 | n/m | n/m |
| EV/EBITDA (x) | n/m | 154.5 | 53.50 | n/m | n/m |
| Price/net oper. CF (x) | -687 | -1,022 | 49.30 | -53.7 | -38.3 |
| ROIC (%) | n/a | 5.26 | 11.00 | -14.5 | -18.9 |

1. Pre non-recurring items and post preference dividends
Accounting standard: GAAP
Source: Company data, RBS forecasts

year to Dec, fully diluted

### Dubbo Zirconium Project (DZP) – production for an undersupplied market

The DZP is a zirconium, rare earth, niobium-rich deposit located 400km northwest of Sydney. We expect ALK to deliver its definitive feasibility study (DFS) in July 2011 and first production by 2013. Development scenarios using 400ktpa or 1Mtpa plants are under consideration. Limited zircon supply, which is affecting the downstream zirconium chemicals market, looks likely to support a 1Mtpa development. On our numbers, opting for the larger plant has a substantial positive impact on project value and investment appeal.

### Diversified commodity and market exposures

ALK will benefit from a strong zircon market pushing up the price of its zirconium products. The balance of production will consist of heavy and light rare earth concentrates, as well as ferro-niobium. We believe ALK's HREO concentrate will be highly sought after as a comparable product will not be offered by its rare-earth peers. Niobium, used in high-strength-low-alloy steels, offers exposure to China steel production growth and quality improvement. We believe ALK's mix of commodity exposures reduces the risk surrounding future cash flows.

### Gold projects for free

ALK is progressing two gold projects in the central west of NSW. We ascribe an option value of A$55m to both, but we flag the 2.6Moz McPhillamys resource (ALK 49%) as having material longer-term upside potential, in our view.

### DZP not well understood, and undervalued

Our risked (70%) NPV of the DZP is A$2.31ps. We factor in a six-month delay to production and lower recoveries relative to ALK guidance to allow for commissioning risk. After applying these discounting factors, our group valuation of A$2.74ps remains at a substantial premium to the share price. We put this down to the DZP not being widely understood, and we would expect that valuation gap to narrow appreciably over the next 12 months.

## Investment view – information arbitrage an opportunity

**Zirconium and niobium are not mainstream commodities, but both have a positive supply/ demand outlook, in our view**

We believe the recent run in ALK's share price is largely on the back of its exposure to rare earths, which, relative to the DZP's other exposures, have the least appealing pricing outlook, in our view. As zirconium and niobium are not mainstream commodities, we believe ALK is trading below fair value due its metal suite not being widely understood. As ALK progresses the project into the DFS and financing stages, we believe it will attract greater scrutiny from equity and strategic investors, and that upside potential will be realised.

### Catalysts for share price performance

Development of the DZP has been 10 years in the making. We believe the company is finally approaching DFS completion, which should crystallise a development decision shortly thereafter. We see the following events as having a positive share price impact:

- Finalising test plant scale LREO separation, 2Q11.
- Completion of the DZP definitive feasibility study (DFS), 3Q11.
- Signing memorandums of understanding (MOU) for zirconia offtake, 1H11.
- Securing project financing for DZP development, 4Q11.
- Commencing DZP construction 1Q12.
- First production 3Q13 (our forecast lags the company's target by six months).

### Challenges for ALK

ALK is moving through the final stages of a long and complex DFS process. Despite a high level of conviction by the company, supported by two years of pilot-plant operation, we see a risk that lingering technical hurdles could delay the development timeline. Near-term challenges for ALK management include:

- testing of the light rare earth oxide (LREO) stage of the flow sheet at pilot-plant scale;
- completion and publication of the DFS by July 2011;
- signing MOUs for sale of offtake adequate to support development of the 1Mtpa project;
- securing project financing by 4Q11; and
- commencing construction in 1Q12.

### Valuation and target price

Our DCF valuation for ALK is based on developing a 1Mtpa operation at DZP and first production by 2013. We apply a 30% discount to our DZP valuation to reflect development risk. We do not factor in the development of the Tomingley or McPhillamy gold deposits, and we apply nominal option values for these. Upside risks to our valuation include lower capex and operating costs than we have forecast and higher commodity prices. Downside risks include delays in the finalisation of the DFS, securing project finance and lower commodity prices than we forecast.

**Table 1 : Valuation**

| Description | A$m | A$ps |
|---|---|---|
| Dubbo Zirconia Project | 621 | 2.31 |
| Tomingley | 5 | 0.02 |
| McPhillamys | 50 | 0.19 |
| **Total operations** | **676** | **2.51** |
| Net cash/(debt) | 24 | 0.09 |
| Corporate overheads | -8 | -0.03 |
| Exploration | 44 | 0.16 |
| **Total valuation** | **737** | **2.74** |

* See page 6 for commodity sensitivities.
Source: Company data, RBS forecasts

# The Dubbo Zirconia Project (ALK 100%)

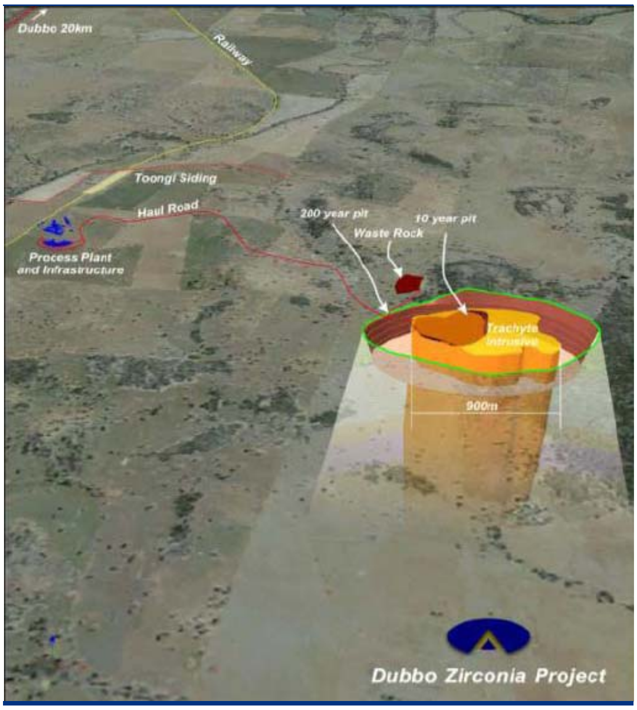
## Location and infrastructure

The Dubbo Zirconia Project (DZP) is about 400km northwest of Sydney and 30km south of the Dubbo township, which has a population of about 41,000. ALK proposes to construct a power line and gas pipeline that will link in to existing infrastructure at Dubbo. Water is to be sourced from the Macquarie River, about 10km to the north east of the project. The DZP lies downstream from the Burrendong Dam, which has helped stabilise flow rates for irrigation-dependant agriculture. A 2003 NSW government study into irrigation volumes estimates 352,600-372,500ML of water are sourced from the Macquarie catchment. On this basis ALK's requirements would represent less than 1% of water currently available for irrigation. Water permits for the DZP have not yet been secured, but are readily tradable.

**Figure 1 : DZP location and infrastructure**


Source: Company data

**Figure 2 : DZP pit shell and ore body**




Source: Company data

**Table 2 : Dubbo Zirconia Project resource**

| Category | Thousand tonnes | ZrO2 | HfO2 | Nb2O5 | Ta2O5 | Y2O3 | REO | Combined metal oxide grade | Contained metal (kt) |
|---|---|---|---|---|---|---|---|---|---|
| Measured | 35,700 | 1.96% | 0.04% | 0.46% | 0.03% | 0.14% | 0.75% | 3.4% | 1,207 |
| Indicated | | | | | | | | | |
| Inferred | 37,500 | 1.96% | 0.04% | 0.46% | 0.03% | 0.14% | 0.75% | 3.4% | 1,268 |
| Total | 73,200 | 1.96% | 0.04% | 0.46% | 0.03% | 0.14% | 0.75% | 3.4% | 2,474 |

Source: Company data

## Mining

**Mining will be similar to a quarrying operation; the strip ratio over life of mine is 0.2 (w/o)**

Mining at DZP will be conducted via standard truck-and-shovel methods. The grade of the trachyte intrusive, which hosts DZP mineralisation, is relatively homogenous, so mining will be almost akin to a quarrying operation. Mining will start in the western half of the mineralised zone, which outcrops at surface. No pre-stripping of waste material will be required for the first two years of mining. ALK estimates the life of mine strip ratio to be about 0.2 (waste/ore [w/o]). The ore is hosted in fresh rock, so will require drill and blasting from surface.

## Processing

### Flow sheet testing for two years

ALK has been developing and refining the flow sheet for DZP ore for over 10 years. For the last two years the company has been operating a warehouse-scale test plant at ANSTO in Sydney. The test plant has been used to optimise the costs, recoveries and product specifications.

### Processing steps

**We flag the flow sheet as an area of risk**

The flow sheet has had to be developed specifically for DZP-style ore, which we flag as an area of risk. However, two years of test plant operation does mitigate that risk to some degree.

**We expect commissioning to take 12 months and we allow for lower recoveries in our base case**

Processing requires crushing and dry grinding to about 50 micron, a selective acid leach to dissolve the ore minerals, filtering, then incremental precipitation stages for the various products. Limestone will be added to tailings to neutralise acidity before storage in an above-ground tailings dam facility. We see potential challenges in the scale up to full production from optimising liquor chemistry and precipitation stages, as well as achieving desired throughput through the filtering process. However, the test-plant results give us confidence that target throughputs, recoveries and product specifications are achievable. That said, in our numbers we allow a 12-month commissioning process before name-plate outputs are achieved and we factor in lower recoveries of 70% (ALK 75%) in our base case.

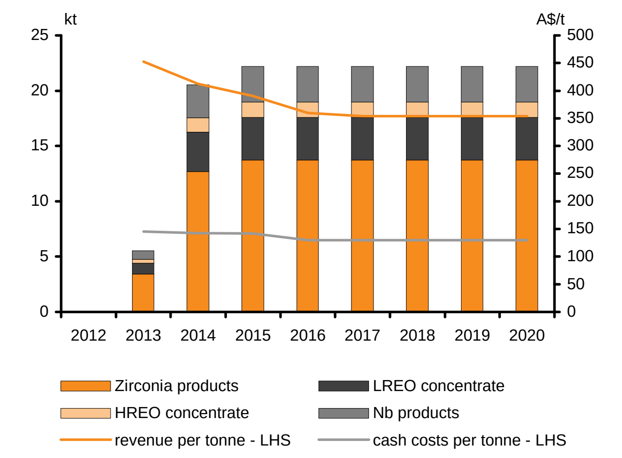
### Products

To date ALK has produced bulk samples of the follow products:

- **zirconium chemicals** – zirconium sulphate $Zr(SO_4)_2$, zirconium hydroxide $Zr(OH)_4$ and zirconium carbonate $ZrO(CO_3)_2$;
- **ferro niobium** – FeNb; and
- **heavy rare earth oxide concentrate (HREO)** – Y, Gd, Dy, Tb.

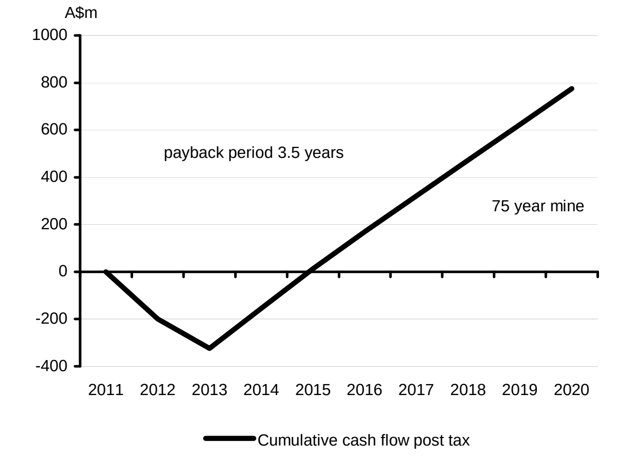
Light rare earth oxide (LREO) concentrate has been produced at the lab scale; ALK expects factory-scale production of LREO to be achieved by April 2011. Samples of zirconia and niobium concentrate have been sent to potential customers in Europe, Asia and the US. So far feedback on production quality has been positive. ALK expects to receive a number of MOUs to purchase in 1H11, which will be incorporated into the DFS. No HREO or LREO concentrate has been distributed to potential buyers as yet.

**Chart 1 : DZP production**




Source: Company data, RBS forecasts

**Chart 2 : DZP cumulative cash flow**

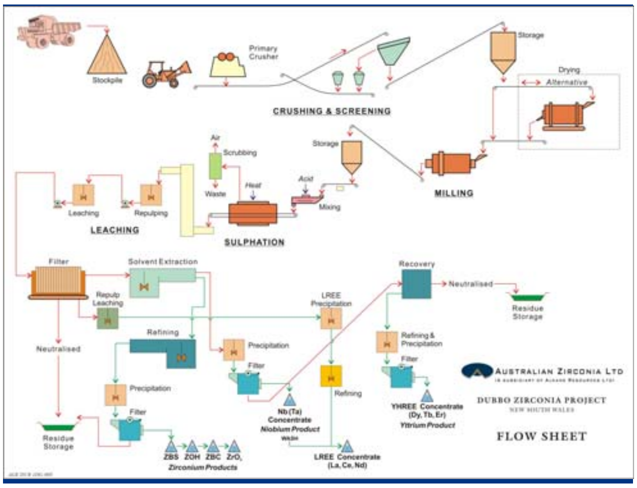



Source: Company data, RBS forecasts

### Uranium not an issue

The DZP resource contains about 140ppm uranium. ALK does not plan to extract uranium as part of its flow sheet. The uranium content of the tailings material will be slightly less than the primary ore due to dilution with limestone. ALK advises that the radioactivity of the tailings will be below Australian, NSW and International Atomic Agency limits for material considered radioactive. Therefore the company expects no impediments to permitting due to uranium-related concerns. This is supported by prior informal discussions with the relevant government bodies.

Figure 3 : DZP flow sheet




Source: Company data

Figure 4 : DZP test plant, ANSTO

Source: Company data

## Costs

ALK has published capital cost estimates of A$200m and A$400m for the 400ktpa and 1Mpta plants, respectively. These costs include power, water and gas infrastructure costs, as well as costs for an acid plant. ALK advises that the absence of any obvious capex benefit from greater economies of scale is due to the estimates being conservative and at the pre-feasibility level. More accurate capital costs will be released as part of the DFS in July.

Prefeasibility work suggests opex of US$60mpa, or US$150/t at 400ktpa and US$120m, or US$120/t at 1Mtpa. Opex costs are dominated by processing, which we estimate to be about 90% of the total production cost. Of the processing cost, about 20% is attributable to sulphuric acid. ALK plans to produce its own acid from raw sulphur. Longer term, ALK hopes to source sulphur from pyrite-rich (FeS) ore at its decommissioned Peak Hill gold mine located about 30km to the southwest of DZP. Helping the viability of this process is a gold credit from Peak Hill sulphides that will be recoverable once the sulphur has been roasted off for acid production. This may provide a cash-cost benefit in the longer term, but is not part of our base-case scenario.

**High margins reduce project sensitivity to an increase in operating costs**

On our long-term currency and commodity price forecasts, ALK should achieve revenue per tonne of ore mined of about A$354. This implies a long-term EBITDA margin of about 58%, suggesting the project will not be particularly sensitive to operating-cost increases.

**Table 3 : Comparison of RBS and ALK operating forecasts**

| | ALK (400ktpa) | ALK (1Mtpa) | RBS (400ktpa) | RBS (1Mtpa) |
|---|---|---|---|---|
| First production | 1Q13 | 1Q13 | 3Q13 | 3Q13 |
| Mine life (years) | 200 | 80 | 175 | 75 |
| Stripping ratio | 0.2 | 0.2 | 0.2 | 0.2 |
| Capex (A$m) | 200 | 400 | 200 | 400 |
| Processing cost (US$/t) | n/a | n/a | 140 | 130 |
| Total opex (US$/t) | 150 | 120 | 153 | 142 |
| Opex (US$m) | 60 | 120 | 61 | 140 |
| Recovery | 75% | 75% | 70% | 70% |
| **Production (tpa)** | | | | |
| ZR products | 6,000 | 15,000 | 5,488 | 13,720 |
| FeNb | 1,400 | 3,500 | 1,288 | 3,220 |
| LREO conc | 1,980 | 4,950 | 1,540 | 3,850 |
| HREO conc | 600 | 1,500 | 560 | 1,400 |
| Total | 9,980 | 24,950 | 8,876 | 22,190 |
| NPV (undiscounted) | | | 165 | 887 |
| NPVps (undiscounted) | | | 0.62 | 3.30 |

Source: Company data, RBS forecasts

## Potential impediments to development

### Hurdles

**Project financing is the key hurdle for ALK. Securing debt financing for the expanded project would be a major catalyst for the stock**

The key hurdle we see for ALK is securing financing for its project. ALK's capex forecast for the 1Mtpa plant is about 20% above the company's current market cap. The company is confident of securing a large proportion (+50%) of project finance from entities with a strategic interest in securing supply of its products. Media coverage of global, and particularly Japanese and US, concerns over the supply of rare earth elements has been widespread, so this funding proposal is not out of the question, in our view.

**We have allowed for an extended commissioning period in our numbers to reflect metallurgical complexity**

After financing, ALK will face the construction and development challenges inherent in all large-scale mining projects. We consider the risk of completing construction on time and on budget to be comparable with that for similar-sized Australia-based gold or base metal projects. We see commissioning as being higher risk than for similar mine developments and we have allowed for this in our numbers.

### Permitting

Based on precedent, ALK expects environmental and mining approvals to be granted about six months after submission. The permits will be submitted after completion of the DFS in 3Q11, implying completion of permitting in 1Q12.

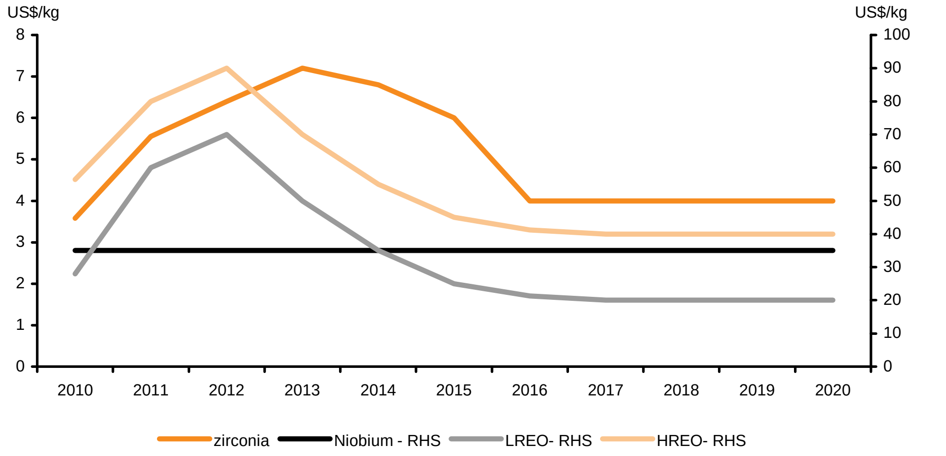
### Project sensitivities

**Table 4 : Sensitivity to long-term prices**

| Commodity | NPVps | Change | Change (%) |
|---|---|---|---|
| NPV (including DZP discount) | 2.74 | | |
| +10% in LT zirconia price | 2.82 | 0.08 | 3% |
| +10% in LT REO price | 2.86 | 0.12 | 4% |
| +10% in LT niobium price | 2.88 | 0.14 | 5% |
| +10% combined | 3.09 | 0.35 | 13% |
| +10% in LT AUD/USD | 2.29 | -0.45 | -17% |

Source: RBS forecasts

**Chart 3 : RBS price forecasts**




Source: RBS forecasts

# Dubbo zirconia project in a nutshell

**Table 5 : Operating specifics**

| Items | Units | |
|---|---|---|
| Share price | A$ps | 1.18 |
| Market capitalisation | A$m | 317 |
| Net cash | A$m | 24 |

| Listings | Ticker |
|---|---|
| ASX | ALK |
| ADRs | ANLKY |

| First production | | 2013 |
|---|---|---|
| Capex | A$m | 400 |
| Plant throughput | ktpa | 1000 |
| Mining method | | open pit |
| Mine life | years | 75 |
| Stripping ratio | w/o | 0.2 |
| Cash costs | A$/t | 130 |
| Resource | Mt | 70 |

| Production | (ktpa) | % of global supply |
|---|---|---|
| Zirconia and Zirconium compounds | 13.72 | 7% |
| Light rare earth concentrate | 3.85 | 3% |
| Heavy rare earth concentrate | 1.40 | 3% |
| Ferro niobium | 3.22 | 4% |

| Grade | (%) | Spot price (US/t) | Recovery | Revenue (US$/t) |
|---|---|---|---|---|
| Zirconium | 1.96% | 5,500 | 70% | 75 |
| REO + Yttrium | 0.89% | 70,000 | 70% | 436 |
| Nb2O5 | 0.46% | 40,000 | 70% | 129 |
| Cumulative metal grade | 3.31% | | **Total** | **640** |

| Grade | (%) | LT price (US$/t) | Recovery | Revenue (US$/t) |
|---|---|---|---|---|
| Zirconium | 1.96% | 4,800 | 70% | 66 |
| REO + Yttrium | 0.89% | 20,000 | 70% | 125 |
| Nb2O5 | 0.46% | 35,000 | 70% | 113 |
| Cumulative metal grade | 3.31% | | **Total** | **303** |

| | A$m | A$ps |
|---|---|---|
| DZP valuation (unrisked) | 887 | 3.30 |
| DZP valuation (risk weighted) | 621 | 2.31 |
| **ALK valuation** | **737** | **2.74** |

Source: Company data, RBS forecasts

## ALK gold projects

### Tomingley Gold project (ALK 100%)

**Based on our numbers, we believe the Tomingley project is unlikely to be developed and we attribute a nominal option value of A$5m**

Based on our numbers the Tomingley gold project appears marginal and would probably need a gold price above A$1,500/oz over the life of mine to justify development. In this regard, ALK is pursing options to hedge a large proportion of production to ensure a suitable margin is maintained. Until such a hedge facility is in place, we are of the view that the Tomingley project is unlikely to be developed and is not included in our earnings or capex forecasts.

#### Location and infrastructure

The Tommingley project is in the central west of New South Wales, about 400km northwest of Sydney and 50km southwest of the regional centre of Dubbo. The project consists of three deposits, Wyoming One, Wyoming Three and Caloma, all within 400m of each other. A regional highway runs in between the Caloma deposit and the proposed plant site. ALK intends to construct an underpass to allow truck access between the plant and pit. Grid power is to be sourced via a 16km power line to the town of Peak Hill. Water permits have been secured, allowing ALK to draw from an existing bore field in Narrowmine, 40km north of the plant site. The cost of power and water infrastructure is included in ALK's capex forecast of A$95m.

#### Mining

**The Tomingley reserve is 3.6Mt at 1.78g/t for 205koz**

Contract mining is to be conducted via standard truck-and-shovel methods. Drill and blast has been allowed for in mining costs, but may not be necessary through oxidised zones. Relatively narrow zones of mineralisation and shallow pit wall angles contribute to a stripping ratio of 7.6 (w/o) over the life of the open pits. ALK plans to commence underground mining of the Wyoming deposit in about year 5 of the mine plan. Currently, underground ore is not included in the reserve due to drilling to the required density being of limited cost-benefit. Underground resources of 87koz, or 42% of current reserves, are likely to grow, in our view, as resources are open at depth.

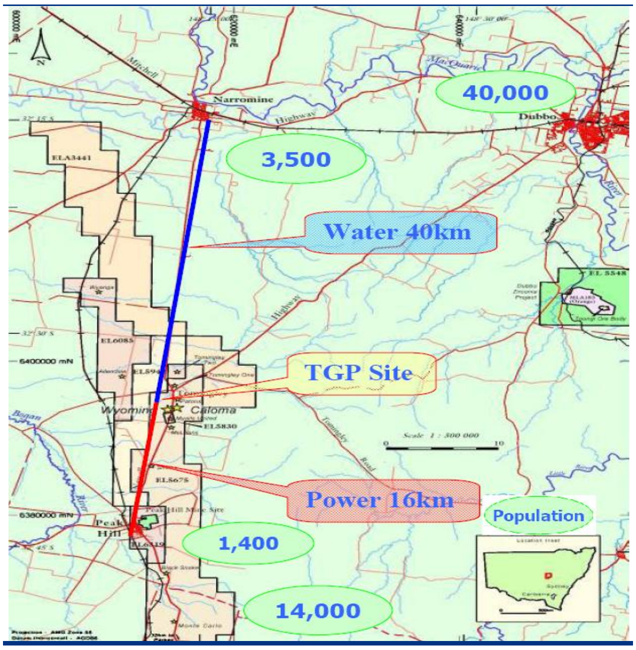
#### Processing

Processing of ore will be via conventional crushing, milling and gravity/carbon in leach (CIL) gold recovery. The plant design is for 1Mtpa of throughput, producing about 50kozpa of gold over a 7.5 year mine life. Metallurgical test work indicates recoveries should average about 93% over the life of mine.

**Figure 5 : ALK projects, regional location**


Source: Company data

**Figure 6 : Tomingley gold project infrastructure**




Source: Company data

### Costs

ALK estimates capital costs of A$95.4m for the project, including A$22m for power and water infrastructure, and A$30m for land acquisition costs. ALK's forecast plant capex is only A$43m, highlighting the capital-cost burden of project location. We forecast operating costs of about A$1,040/oz, 8% above ALK's forecast of A$940/oz. The relatively high operating costs reflect a high stripping ratio and limited economies of scale. We see some scope to optimise the pit shell and mine schedule to reduce operating costs, but ultimately we believe this project simply needs a higher gold price than our current forecasts to justify development.

## The McPhillamys Gold Project (ALK 49%)

The McPhillamys gold deposit is part of the Orange District Exploration Joint Venture (ODEJV) between Newmont and ALK. Newmont has thus far earned a 51% interest in the JV. In March of 2010 Newmont elected to proceed to 75% ownership by completing a bankable feasibility study (BFS) on the McPhillamys Project. If Newmont elects to withdraw from the BFS, ALK maintains its 49% interest. There is no deadline for the completion of the BFS, so crystallising the value of ALK's stake in the project may take some time. Due to the early stage of development, the absence of any published operating metrics and uncertainty of future ownership, we attribute A$50m in option value for ALK's stake.

### Location and infrastructure

The McPhillamys deposit is about 35km southeast of the regional centre of Orange in the central west of New South Wales. It is part of a 175sqkm of tenure that makes up the ODEJV. The deposit is on the top of a hill in a rural freehold property. Power and water options are yet to be formally investigated, although we believe it is likely that grid power will be accessible from a regional grid power line 500m to the south of the deposit. There is a possibility of sourcing water from the Rolan Dam via a pipeline, although this is the subject of ongoing development studies.

### Mining

Newmont has completed a series of desktop studies into the development of McPhillamys, which include both open-pit and underground block-caving scenarios. Either is possible, in our view, but further drilling is required to better define the resource before a decision can be made.

### Processing

Preliminary metallurgical testing on core samples indicated that standard carbon in leach (CIL) recoveries of 86-91% are achievable. These figure should be regarded as indicative only; ongoing metallurgical work is being conducted to explore the potential for the recovery of copper mineralisation.

### Costs

No operating of capital costs have been published for McPhillamys. Due to the low grade of the deposit we believe a large plant will be required, in the order of 4-6Mtpa, to achieve economies of scale and acceptable operating costs (A$500-600/oz). IGO recently released forecast capital costs of A$500m-540m for a 5.5Mtpa plant at its Tropicana project, 450km northeast of Kalgoorlie. This equates to A$90-98/t of throughput capacity. We would anticipate costs for McPhillamys to be cheaper on an A$ per tonne of capacity basis due to its proximity to road, rail and power infrastructure. We do not model an NPV for McPhillmays due to indicative scale and operating statistics not being available at this point of the development process.

**Table 6 : ALK gold resources**

| Deposit | Category | Tonnes (kt) | Au (g/t) | Cu (%) | Au ounces (koz) | Copper (kt) |
|---|---|---|---|---|---|---|
| MacPhillamys | Measured | | | | | |
| | Indicated | 43,429 | 1.24 | 0.08 | 1,731 | 34.74 |
| | Inferred | 17,435 | 1.50 | 0.08 | 841 | 13.95 |
| Total | | 60,864 | 1.31 | | 2,572 | 49 |
| Tomingley | Measured | 3,997 | 1.74 | | 224 | |
| | Indicated | 535 | 1.58 | | 27 | - |
| | Inferred | 1,351 | 1.38 | | 60 | - |
| Total | | 5,883 | 1.64 | | 311 | - |
| **Total** | | **66,747** | **1.34** | | **2,883** | **49** |

Source: Company data

**Table 7 : ALK gold reserves**

| Deposit | Category | Tonnes (kt) | Au (g/t) | Cu (%) | Au ounces (koz) |
|---|---|---|---|---|---|
| Tominley | Proven | 3,300 | 1.80 | | 191 |
| | Probable | 300 | 1.50 | | 14 |
| Total | | 3,600 | 1.78 | | 205 |
| **Total** | | **3,600** | **1.78** | | **205** |

Source: Company data

## Risks to central scenario

### Financing risk

We estimate capex for the 400kpta and 1Mtpa plant options to be A$200m and A$400m, respectively; both large amounts of money relative to ALK's market cap. We believe debt funding from a strategically interested entity is likely, but cannot be guaranteed. We see a risk that the time required to secure financing could delay construction, and the possibility of a large equity raising that could dilute value.

### Development risk

Construction of the DZP will be a unique combination of a lot of proven processes and equipment. We see a risk that the plant will not perform or that it will take a extended period to achieve design expectations, more so than would be the case for an equivalent-sized gold project. There is also a risk that the scale of the plant is less than the 1Mtpa we expect. Should ALK fail to secure market support for product volumes resulting from 1Mtpa of throughput, this would represent downside to our valuation.

### Operational risk

The DZP test plant at ANSTO has been operating for two years in order to optimise and prove the processes to be used in the full-scale DZP plant. However, the scale up from test plant to full scale is roughly 400 times, so we see a risk that the full-scale plant will perform slightly differently to the test plant and require time to optimise.

### Commodity price risk

ALK will be in a growth phase for the next three years. Should commodity prices fall sharply relative to our forecasts, it is possible that financing of the DZP may be delayed, which would have an adverse effect on our valuation.

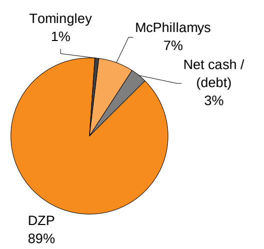
## ALK – financial summary

| Number of shares (m) | | | 269 |
|---|---|---|---|
| Market capitalisation (A$m) | | | 317 |
| Enterprise value (A$m) | | | 305 |
| Enterprise value (US$m) | | | 308 |
| | Tonnes | Grade | Ounces |
| **Resources** | **(kt)** | **(g/t)** | **(koz)** |
| Gold resources | 66,747 | 1.34 | 2,883 |
| Gold reserves | 3,600 | 1.78 | 205 |
| EV/oz Gold resource (A$/oz) | | | 106 |
| EV/oz Gold reserve (A$/oz) | | | 1,482 |

**Valuation**

| Description | A$m | A$ps |
|---|---|---|
| DZP | 622 | 2.31 |
| Tomingley | 5 | 0.02 |
| McPhillamys | 50 | 0.19 |
| **Total Operations** | **677** | **2.52** |
| Net cash / (debt) | 24 | 0.09 |
| Corporate overheads | -8 | -0.03 |
| Exploration | 43 | 0.16 |
| **Total Valuation** | **737** | **2.74** |
| P/NPV | | 0.43 |

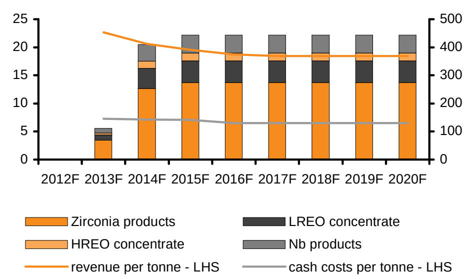
**Operational NPV split**




| Valuation inputs | |
|---|---|
| Rf rate | 5.3% |
| MRP | 6.0% |
| Equity beta | 1.43 |
| Ke | 14% |
| Kd | 7.5% |
| Gearing | 30% |
| Tax rate | 30% |
| WACC | 11% |
| DCF (A$) | 2.74 |
| Prem/disc | 0% |
| Target (A$) | 2.74 |

| Sensitivity (US$m) | NPV(A$) | 2012F | 2013F |
|---|---|---|---|
| NPV / NPAT | 2.74 | -8.8 | 21.6 |
| zr +10% increase ($m) | 2.86 | -8.8 | 23.4 |
| zr +10% increase (%) | 4% | 0% | 9% |
| nb +10% increase ($m) | 2.94 | -9 | 24 |
| nb +10% increase (%) | 7% | 0% | 10% |
| reo +10% increase ($m) | 2.92 | -9 | 25 |
| reo +10% increase (%) | 7% | 0% | 18% |
| AUD + 10% ($m) | -0.45 | 0.00 | -7.03 |
| AUD + 10% (%) | -17% | 0% | -33% |
| AUD + 1cent ($m) | -0.06 | 0.0 | -0.7 |
| AUD + 1cent (%) | -2% | 0.0 | 0.0 |

**Production and costs**




| Dec Year End | 2009A | 2010F | 2011F | 2012F | 2013F | 2014F | 2015F |
|---|---|---|---|---|---|---|---|
| NPAT Reported (A$m) | 11.0 | 1.4 | -5.2 | -8.8 | 21.6 | 145.8 | 153.7 |
| NPAT Normalised (A$m) | 2.3 | 7.3 | -5.2 | -8.8 | 21.6 | 145.8 | 153.7 |
| EPS (A¢) | 0.9 | 2.7 | -1.9 | -3.3 | 8.0 | 54.2 | 57.1 |
| CFPS (A¢) | -0.2 | 2.2 | -2.3 | -77.6 | -50.4 | 65.0 | 60.0 |
| DPS (A¢) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| P/E (x) | 138.2 | 43.3 | -61.1 | -36.0 | 14.7 | 2.2 | 2.1 |
| P/CF (x) | -715.9 | 54.6 | -51.3 | -1.5 | -2.3 | 1.8 | 2.0 |
| EV/EBITDA (x) | 145.2 | 50.2 | -38.5 | -30.8 | 4.6 | 1.3 | 1.3 |
| EPS Growth | n/m | n/m | -171% | 70% | -345% | 576% | 5% |
| Yield (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| **Production** | **2009A** | **2010F** | **2011F** | **2012F** | **2013F** | **2014F** | **2015F** |
| Zirconia (kt) | 0.00 | 0.00 | 0.00 | 0.00 | 3.43 | 12.69 | 13.72 |
| LREO (kt) | 0.00 | 0.00 | 0.00 | 0.00 | 0.96 | 3.56 | 3.85 |
| HREO (kt) | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 1.30 | 1.40 |
| FeNb (kt) | 0.00 | 0.00 | 0.00 | 0.00 | 0.81 | 2.98 | 3.22 |
| Total (kt) | 0.00 | 0.00 | 0.00 | 0.00 | 5.55 | 20.53 | 22.19 |
| **Costs** | **2009A** | **2010F** | **2011F** | **2012F** | **2013F** | **2014F** | **2015F** |
| DZP cash cost (A$/t) | 0 | 0 | 0 | 0 | 146 | 143 | 142 |
| DZP cash cost (US$/t) | 0 | 0 | 0 | 0 | 136 | 123 | 111 |
| **Assumptions** | **2009A** | **2010F** | **2011F** | **2012F** | **2013F** | **2014F** | **2015F** |
| Zirconia (US$/kg) | 0.0 | 3.6 | 5.6 | 6.4 | 7.2 | 6.8 | 6.0 |
| LREO (US$/kg) | 0 | 28 | 60 | 70 | 50 | 35 | 25 |
| HREO (US$/kg) | 0 | 56 | 80 | 90 | 70 | 55 | 45 |
| FeNb (US$/kg) | 0 | 35 | 35 | 35 | 35 | 35 | 35 |
| AUD/USD | 0.79 | 0.92 | 1.02 | 1.00 | 0.94 | 0.86 | 0.78 |
| **Profit & Loss (A$m)** | **2009A** | **2010F** | **2011F** | **2012F** | **2013F** | **2014F** | **2015F** |
| Sales revenue | 0 | 0 | 0 | 0 | 113 | 382 | 391 |
| Other revenue | 4 | 10 | 0 | 0 | 0 | 0 | 0 |
| Total revenue | 4 | 10 | 0 | 0 | 113 | 382 | 391 |
| Operating costs | -2 | -3 | -8 | -10 | -46 | -142 | -152 |
| EBITDA | 2 | 6 | -8 | -10 | 67 | 240 | 239 |
| Depreciation | 0 | 0 | 0 | 0 | -4 | -8 | -8 |
| EBIT | 2 | 6 | -8 | -10 | 63 | 232 | 231 |
| Net interest benefit / (expense) | 0 | 1 | 1 | -3 | -32 | -23 | -11 |
| Pre-tax profit | 2 | 7 | -7 | -13 | 31 | 208 | 220 |
| Tax benefit / (expense) | 0 | 1 | 2 | 4 | -9 | -62 | -66 |
| Profit after tax | 2 | 7 | -5 | -9 | 22 | 146 | 154 |
| Minorities | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NPAT (underlying) | 2 | 7 | -5 | -9 | 22 | 146 | 154 |
| Significant items | 9 | -6 | 0 | 0 | 0 | 0 | 0 |
| NPAT (reported) | 11 | 1 | -5 | -9 | 22 | 146 | 154 |
| **Profitability Analysis (%)** | **2009A** | **2010F** | **2011F** | **2012F** | **2013F** | **2014F** | **2015F** |
| EBIT margin | n/m | n/m | n/m | n/m | 55% | 61% | 59% |
| EBITDA margin | n/m | n/m | n/m | n/m | 59% | 63% | 61% |
| Effective tax rate | 0% | 10% | -30% | -30% | -30% | -30% | -30% |
| ROA - EBIT / (total assets - cash) | 5% | 15% | -20% | -4% | 15% | 55% | 55% |
| ROE - NPAT / equity | 5% | 17% | -10% | -21% | 268% | 69% | 38% |
| **Cashflow** | **2009A** | **2010A** | **2011F** | **2012F** | **2013F** | **2014F** | **2015F** |
| EBITDA | 2 | 6 | -8 | -10 | 67 | 240 | 239 |
| Operating cashflow | 0 | 7 | -6 | -9 | 43 | 183 | 169 |
| Capex | -1 | 0 | 0 | -200 | -179 | -8 | -8 |
| Free cashflow | -1 | 7 | -6 | -209 | -136 | 175 | 161 |
| Investing cashflow | -5 | 5 | 0 | -200 | -179 | -8 | -8 |
| Financing cashflow | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Net Change in cash | 2004 | 2021 | 2005 | 1803 | 1877 | 2189 | 2176 |
| **Balance Sheet Analysis** | **2009A** | **2010A** | **2011F** | **2012F** | **2013F** | **2014F** | **2015F** |
| Debt | 0 | 0 | 0 | 450 | 450 | 250 | 100 |
| Equity | 44 | 43 | 50 | 41 | 8 | 212 | 400 |
| Assets | 45 | 44 | 53 | 494 | 541 | 516 | 527 |
| Cash | 5 | 4 | 13 | 254 | 119 | 94 | 105 |
| Net debt | -5 | -4 | -13 | 196 | 331 | 156 | -5 |
| **Gearing - net debt/equity** | **2009A** | **2010F** | **2011F** | **2012F** | **2013F** | **2014F** | **2015F** |
| Gearing - net debt/ (net debt + equity) | -12% | -11% | -35% | 83% | 98% | 42% | -1% |
| Net debt / EBITDA | -228% | -67% | 161% | -1958% | 496% | 65% | -2% |
| EBIT / net interest | 9 | 11 | -14 | 4 | -2 | -10 | -21 |
| EBITDA / net interest | 9 | 11 | -14 | 4 | -2 | -10 | -22 |

Source: Company data, RBS forecasts

# Industry outlook

We believe a key source of appeal for ALK is its commodity exposures. The outlook for zirconium chemicals, niobium and the heavy rare earths are all robust, and we view the commodity price risk for these elements as conservative. We believe our price profile for light rare earths probably reflects the supply/demand outlooks of the sector.

## Zirconia – exposure to zircon-market tightness

### Zircon, zirconia and zirconium

Zircon, the often-referred-to product of mineral sands mining, is the source mineral for the element zirconium. The interim step in producing metal from mineral sands is zirconia, which is used in a growing number of chemical applications. The table that follows summarises the key differences between the products.

**Table 8 : Zirconium products**

| Industry name | Chemical formula | Production | Use | 2010 global demand (ktpa) | Price (US$/t) |
|---|---|---|---|---|---|
| Zirconium | ZR | High-end refining | Nuclear power plants | 5-10 | 150,000-200,000 |
| Zirconia | ZRO2 | Chemical manufacture | Multiple chemical applications | 200 | 5,500-6,500 |
| Zircon | ZRSIO4 | Mining | Tiles | 1200 | 1,300-1,400 |

Source: Industrial Minerals

## Supply

### Zircon production at capacity

**Zircon supply is more sensitive to titanium dioxide price than to zircon price**

Zircon is generally produced as a by-product of titanium dioxide (mineral sands) mining. Global zircon production in 2010 was about 1.2Mt, with production dominated by Australia (Iluka) and South Africa (BHP, RIO and Exxaro). Over 2010, a strong rebound in demand, particularly from China, resulted in zircon-producer stockpiles being effectively exhausted. Limited supply and enduring demand resulted in a 30% price rise over CY10, with a further 20% rise in early CY11. For most mineral-sands deposits, zircon is a minor portion of revenue, so the increase in prices to date has not justified a supply response, and appears unlikely to.

### Zircon shortage hampering increase in zirconia supply

China is the world's largest producer (90%) of zirconium chemicals. Shortages in zircon supply are limiting increases in zirconia production, to the extent that zirconia chemical manufacturers in some parts of China are being forced to shut down due to the inability to source raw product (zircon). As zircon supply seems unlikely to increase in the near term, growth in zirconia chemical production is likely to stagnate, in our view.

**Figure 7: Zircon end use (left) and demand growth**


Source: ILU

## Demand

### Zirconia demand increasing

The use of zirconia chemicals is increasing. Over 2000-08, zircon demand from zirconia chemicals saw an 11% CAGR, more than double the increase in demand for ceramics (4% CAGR). Demand growth reflects zirconia chemicals being used in an increasingly broad range of products. End-use products for zirconia and zirconium chemicals include superconductor magnets, antiperspirants, auto-catalysts, bio-ceramic hips and teeth, brake pads, flame retardants and nuclear fuel-rod cladding.

Its use in nuclear applications caused the Chinese nuclear industry to recommend stockpiling nuclear-grade zirconium in December of 2010. The industry body warned of the possibility of having to rely on imports, which it says will have serious consequences for the nuclear sector. As a result, China added zirconium to its list of strategically important materials (which includes rare earth elements).

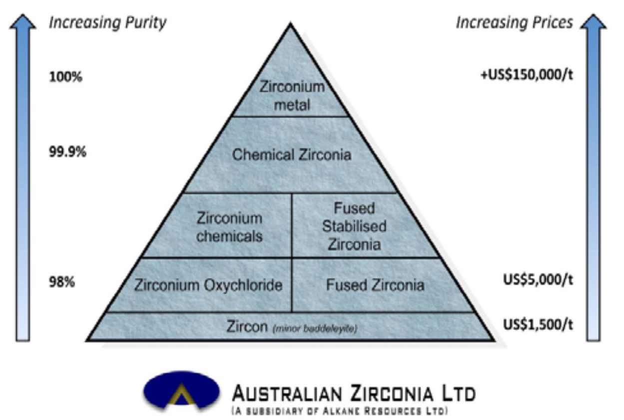
### Leveraged to global economic health

Due to its broad range of end-product uses, zirconia demand will be linked to global economic growth. However, it appears the zirconia chemicals are displacing a growing number of other products, resulting in demand exceeding global growth. Quantifying growth above GDP is difficult as it is a result of a number of discrete industry-specific developments. We believe this is likely to continue in the near term, although consumption is likely to be supply limited.

**Figure 8 : Zirconia increasing part of zircon demand**


Source: ALK

**Figure 9 : Zirconium materials pyramid**




Source: ALK

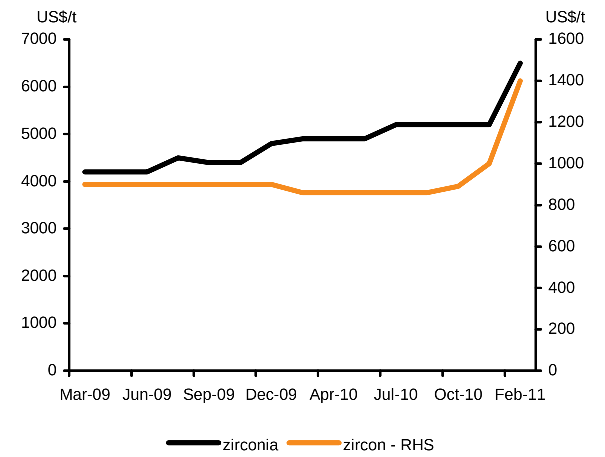
### Zircon price exposure

About 1.5t of zircon ($ZrSiO_4$) is required to make one tonne of zirconia ($ZrO_2$), representing about 50% of the production cost. This is also the case for most other zirconium chemicals, so the price of zirconia is directly linked to the price of zircon (Chart 9).

### Zirconia price forecasts

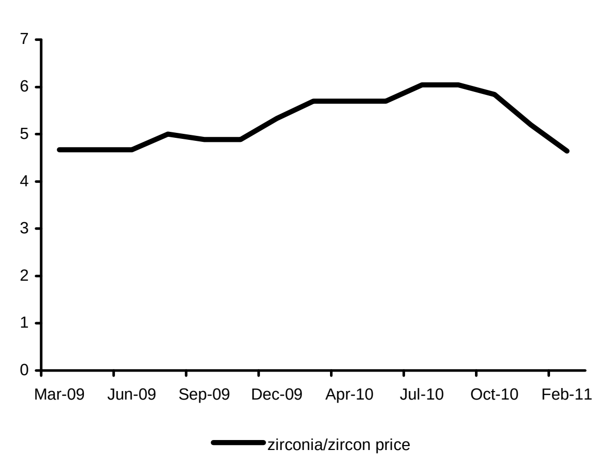
We use zirconia as a proxy for the wider suite of zirconium chemicals. We set our zirconia price forecasts at 4x our zircon price. This is supported by the above metrics. For example, based on our long-term zircon price of US$1,200/t, 1.5 tonnes of zircon required equals US$1,800/t, representing about half of the cash cost of production, implying a cash cost of US$3,600/t. We allow an additional 25% for depreciation and producer margin. Further, a multiple of 4x is supported by the price history of the two commodities.

**Chart 4 : Zircon and zirconia price**




Source: Industrial minerals

**Chart 5 : Zirconia/zircon price multiple**




Source: Industrial minerals

## Not so rare earth elements – production lags demand

**A rare earth supply response is limited by often complex metallurgy**

Rare earths aren't rare, but neither is iron ore. Like iron ore, new rare earth production lags pricing tension by two to three years. The difference between the two commodities is that while a supply response in iron ore is contingent on substantial infrastructure expansion, a rare-earth supply response is delayed due to the requirement for customising metallurgical processes for each new deposit.

## Supply

### China dominates

China supplies about 95% of rare earth demand. This is a result of an extended period of low prices globally, leading to under-investment and mine closures in the western world. Further, The Chinese have a long-standing policy of securing their own rare-earth supply, supporting domestic production.

China has been steadily restricting exports since 2005. In 2010 the Chinese government announced a cut to exports equivalent to 40% of 2009 levels. This was a step change in export restrictions and eventually resulted in rare prices spiking from about US$12/t to more than US$70/t now. There is a risk that China will reverse its export restrictions, but we don't believe this is likely in the medium term due to a long-term strategy of managing domestic supply and a longer-term shortage of the heavy rare-earth elements.

**Table 9 : Chinese rare-earth exports**

| Year | REE exported (t) | Change (%) |
|---|---|---|
| 2005 | 65,609 | |
| 2006 | 61,821 | -6% |
| 2007 | 59,643 | -4% |
| 2008 | 56,939 | -5% |
| 2009 | 50,145 | -12% |
| **2010** | **30,258** | **-40%** |

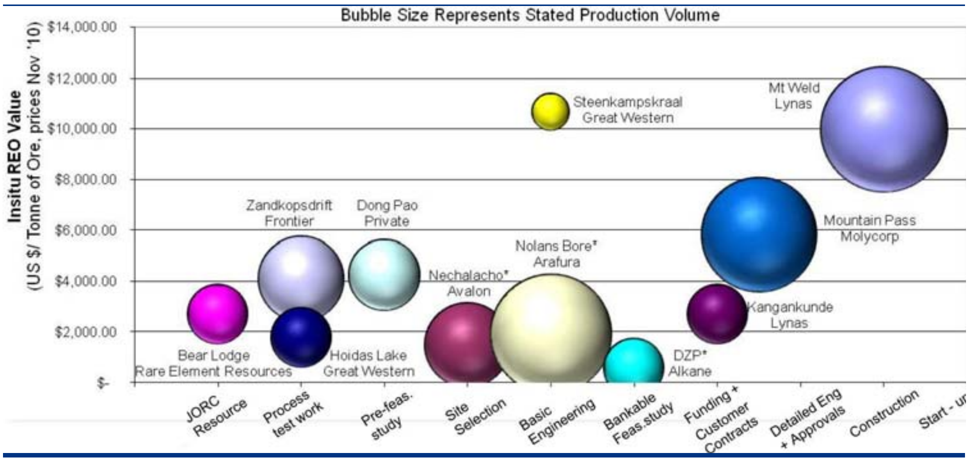
Source: Company data

### Metallurgy slows path to production

**The delay in bringing on additional rare-earth production stems from the requirement for customised metallurgical processes**

There are at least 20 separate rare earth projects at various stages of development. Cumulative production from the 11 projects included in the chart below represents about 147kt of new production, or 128% of 2010 supply. Not evident in the chart below is how long REE projects have taken historically to move through the development process. Lynas (LYC) and ALK took over 10 years to develop flow sheets for their respective projects. This is a function of the metallurgical complexity involved in extracting rare earths from host rock, which requires financiers that understand the process and are prepared to back such projects.

**Chart 6 : Development status and targeted REO production**




Source: LYC

**We expected the price reaction to new rare-earth supply to result in most early stage projects being deferred**

### First in, first served

Due to the boutique tonnages in the rare earth sector, individual projects have a significant effect on global supply. In our view, it would also be reasonable to expect that, as new production comes on line, there will also be a significant pricing impact. LYC expects first production from its advanced materials plant in late 2011, which will mark the commencement of 22kt or 20% of current global supply entering the market. We would expect light rare-earth oxide prices to trend down from current levels to about US$70/kg from 2012. With Mountain Pass, Mount Weld and DZP all due to come on between now and 2013, global production is set to increase by about 36% over the next three years. We believe the price impact of new production may result in the deferral of subsequent projects that are in the early stages of development.

**Table 10 : Rare-earth supply**

| Country | 2010A (kt) | 2014F (kt) | Increase (%) |
|---|---|---|---|
| China | 103.3 | 114.0 | 10% |
| India | 3.0 | 5.0 | 67% |
| Russia | 4.0 | 7.0 | 75% |
| Recycling | 1.5 | 1.8 | 20% |
| US | 3.0 | 20.0 | 567% |
| Australia | 0.0 | 22.0 | n/m |
| **Total** | **114.8** | **169.8** | **48%** |

Source: Roskill, LYC

## Demand

### The keys to new technology, small but necessary

**Electronic and green energy applications require rare earths for greater efficiency**

Rare-earth demand has grown on the back of demand for electronics, electronic motors, catalysts and metal alloys. More specifically, the inclusion of rare-earth elements in alloys and magnets in electric motors is being driven by the pursuit of, and in some cases the requirement for, improved efficiency, performance and reduced weight of end products.

**Rare earths react with glass to speed the polishing process**

A use of rare earths, in particular lanthanum and cerium, that receives less attention but accounts for about 15% of demand is use in polishing powders. Rare-earth compounds react with glass to produce rare-earth silicate oxides that are softer and polish to a smooth finish faster, speeding production.

**Numerous military products require rare earths; currently the US sources its rare earths from China**

As the bulk of rare-earth demand is as an alloy or small (although often essential) component of a much larger product, demand is not particularly sensitive to price. This is particularly apparent in military applications. Military equipment such as night-vision goggles, range finders, precision guided munitions, cruise missiles, lasers, infra-red and sonar sensors all require rare earths for manufacture. At present the US sources its rare earths from China, which the US government has deemed a risk to national security. Further, the importance to green-energy initiatives has led the US Department of Energy to develop a criticality matrix with a view to addressing its forecast rare-earth supply deficit.

**Table 11 : Rare-earth current demand by application and demand growth**

| Application | La | Ce | Pr | Nd | Sm | Eu | Gd | Tb | Dy | Y | Application demand growth to 2014 | Application demand 2014 (kt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Magnets | | | 23% | 69% | | | | | 5% | | 12% | 55.1 |
| Battery Alloy | 50% | 33% | 3% | 10% | 3% | | | | | | 15% | 32.5 |
| Metallurgy ex batt | 26% | 52% | 6% | 17% | | | | | | | 2% | 12.7 |
| Auto catalysts | 5% | 90% | 2% | 3% | | | | | | | 8% | 12.2 |
| Fluid cracking catalyst | 90% | 10% | | | | | | | | | 4% | 24.9 |
| Polishing powders | 32% | 65% | 4% | | | | | | | | 10% | 28.0 |
| Glass additives | 24% | 66% | 1% | 3% | | | | | | 2% | 0% | 7.8 |
| Phosphors | 9% | 11% | | | | 5% | 2% | 5% | | 69% | 8% | 10.8 |
| Others | 19% | 39% | 4% | 15% | 2% | | 1% | | | 19% | 8% | 6.1 |
| **Total** | | | | | | | | | | | **9%** | **190.1** |

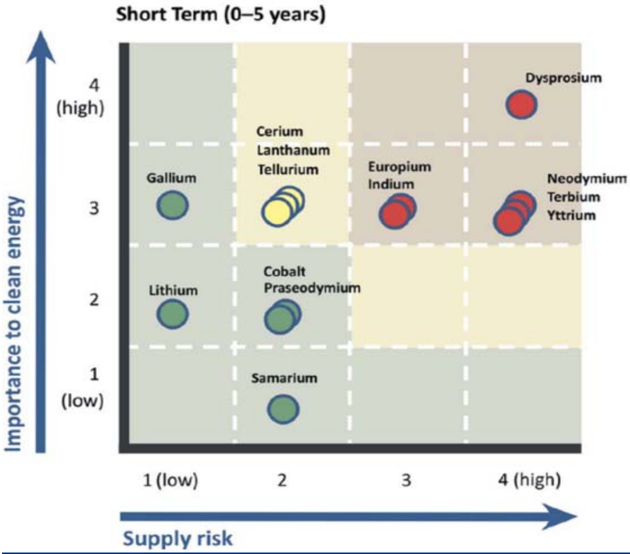
Source: Roskill, IMCOA

### Substitution unlikely

Due to the high magnetic moment of particular rare-earth elements (REE), high levels of magnetism are maintained for much longer at higher temperatures than in traditional iron-based or ferrite magnets. Permanent magnets are being used more often in electric motors as they negate the requirement for additional electric power to produce a secondary magnetic field.

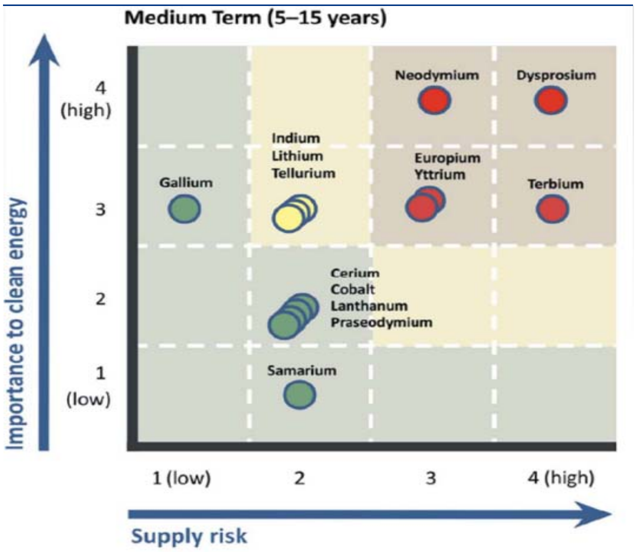
REE magnetic characteristics are a function of rare-earth element atomic structure (incomplete filling of the electron f-shell), which allows for spin-alignment of unpaired electrons. Similar to producing a magnetic field by running an electric current through a coil, the alignment of spinning electrons at the atomic scale produces a strong magnetic field strength. As these characteristics flow back to the atomic level, we believe substitution will be difficult and ultimately unnecessary as additional supply comes on line.

**Figure 10 : US DOE short-term criticality matrix**




Source: Molycorp

**Figure 11 : US DOE medium--term criticality matrix**




Source: Molycorp

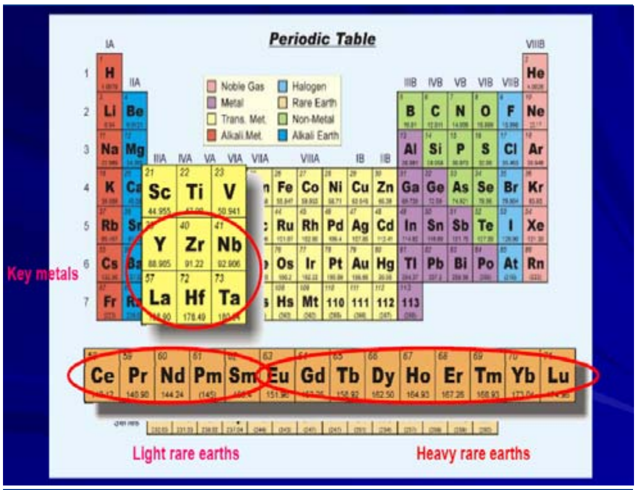
### The difference between light and heavy rare-earth thematics

The term rare earths covers 14 elements, increasing to 16 if hafnium and yttrium are included, which are not, strictly speaking, REEs but are chemically similar. The use and price of the different elements is diverse. Generally speaking, the heavier rare earths are more valuable. In particular europium, terbium and dysprosium, are priced at an order of magnitude (up to US$600/t) more than the lighter rare earths. The pricing differential reflects the scarcity. This is observed in the contained tonnages of the Mt Weld, Mountain Pass and DZP resources listed in Table 6.

**China's reserves of heavy rare earths could be exhausted in 15 to 20 years at current production rates**

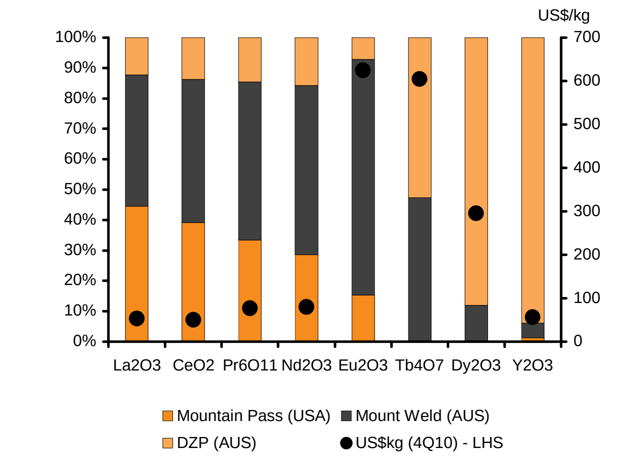
In 2009 the Chinese Ministry of Industry and Information Technology (MIIT) suggested the export of heavy rare earths be banned completely. At the time this was seen as testing world reaction, but it highlights the tension surrounding heavy rare earth demand. In late 2010 China's Ministry of Commerce said that its reserves of medium and heavy rare earths may last 15 to 20 years at the current rate of production, and that the possibility of imports could not be ruled out.

**Figure 12 : The rare-earth elements**




Source: ALK

**Figure 13 : Relative rare-earth content by element**




Source: Company data

**Table 12 : Rare-earth content and price of key deposits**

| | Mountain Pass (US) | Mount Weld (AUS) | DZP (AUS) | US$kg (4Q10) |
|---|---|---|---|---|
| La2O3 | 372.1 | 361.5 | 102.4 | 53 |
| CeO2 | 550.2 | 662.0 | 192.7 | 50 |
| Pr6O11 | 48.2 | 75.1 | 21.0 | 77 |
| Nd2O3 | 134.5 | 262.2 | 74.0 | 80 |
| Eu2O3 | 1.1 | 5.7 | 0.5 | 625 |
| Tb4O7 | 0.0 | 1.4 | 1.6 | 605 |
| Dy2O3 | 0.0 | 1.4 | 10.5 | 295 |
| Y2O3 | 1.1 | 4.3 | 83.0 | 56 |
| **Total** | **1107.2** | **1373.6** | **485.6** | |

Source: ALK, Molycorp, LYC,

### Interim and long-term price forecasts

As all rare deposits produce multiple different rare-earth elements, prices are usually quoted as a basket price on a US$/kg basis. The basket price represents the weighted-average price of rare-earth production and differs between each deposit. As most deposits contain higher grades of the lighter rare-earth elements (La, Ce, Pr, Nd), the basket price is usually weighted towards the price of these four individual elements.

We anticipate rare-earth prices will continue to climb in the short term on the back of enduring demand and a lack of new supply. As soon as production for the first of the next wave of rare-earth projects comes on line, we expect the current supply squeeze to ease and prices o trend down. LYC and Molycorp believe their Mt Weld and Mountain Pass projects combined will increase global supply by about 36%. So it is reasonable to believe prices will react quite sharply, in our view. However, we do not believe rare-earth prices will return to a historical average of about US$10/kg. Our view is supported by our incentive price analysis, which suggests a hypothetical rare-earth project, with a grade of 6% (in line with Mountain Pass deposit) and capex of US$450m (vs US$531m for Mountain pass and US$500m for Mt Weld) requires a long-term price of about US$20/kg to achieve an IRR of more than 20%.

# Niobium– an option on steel demand

Niobium is an alloying element predominantly used in high-strength, low-alloy steels (HSLA). Demand growth is a function of steel production and steel quality. Supply is dominated by a single company, resulting in historically stable supply and pricing.

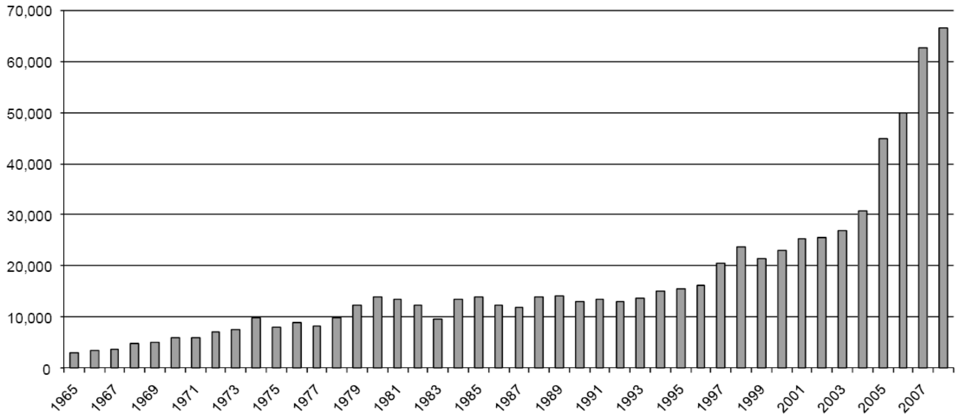
## Supply

Niobium supply is highly consolidated. Brazilian company CBMM dominates the market, with 76% of global production. Other major producers include Anglo American (7.5%) and Iamgold (6.3%). China's domestic production accounts for 3% of global supply.

Supply has risen sharply in the past 10 years in response to increased global demand for steels of similar strength, but at reduced weights to traditional mild steels. According to CBMM, the niobium market is worth about US$3bn pa, roughly double the size of the global zircon market.

CBMM has continuously expanded its ferro-niobium production to meet new demand. Installed capacity increased from 45kt in 2004 to 90kt in 2008 before reducing to 60kt in 2010. CBMM plans to increase production by 10% over 2010 levels in 2011. It is unclear whether CBMM is seeking to add further capacity in future years.

**Figure 14 : Global niobium production (tonnes)**




Source: Roskill, CBMM

## Demand

About 90% of niobium production is used in HSLA steel manufacturing, so niobium demand is predominately a function of global steel production. Alloying elements, such as niobium, are used in greater proportions in higher-grade steels (HSLA). Such steels are used in applications where a strength and light weight are desired. This includes bridges, crane booms, piping and automotive manufacture.

**Table 13 : Niobium demand by end use**

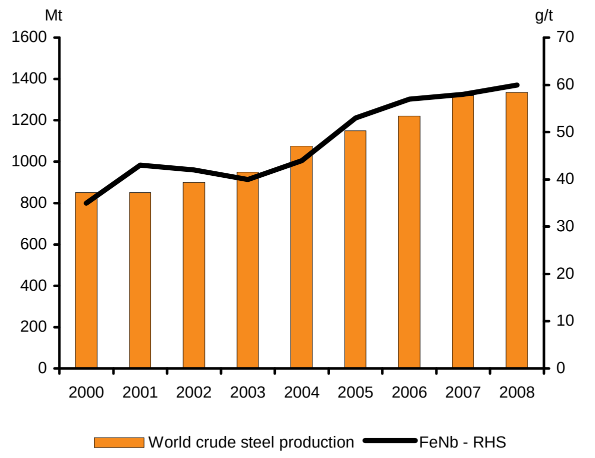
| Product | Proportion of niobium demand |
|---|---|
| Automotive | 23% |
| Stainless | 13% |
| Interstitial | 8% |
| Structural | 24% |
| Pipe | 25% |
| Other | 7% |

Source: CBMM

Over the past 10 years, the desire for improved efficiency and more aggressive architecture has increased the demand for higher-quality steel. The world's largest steel consumer and producer, China, uses significantly less niobium than more-advanced economies. However, this is changing as Chinese steel demand matures, requiring a greater proportion of high-quality product.

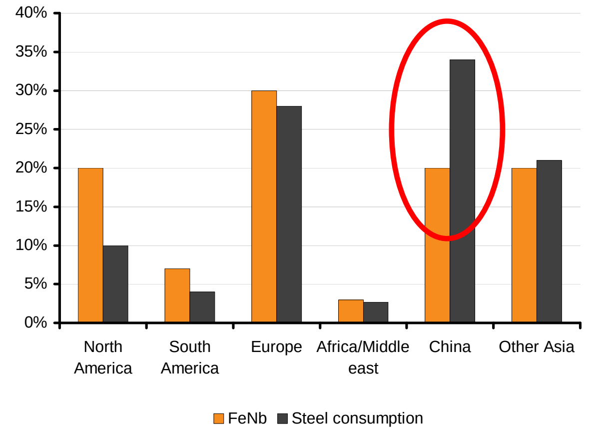
We would expect this trend to support niobium growth rates in excess of steel production for the foreseeable future. Currently China accounts for about 35% of all FeNb consumption and roughly 50% of consumption growth.

### Chart 7 : Niobium consumption intensity




Source: CBMM

### Chart 8 : Market share by region, 2007

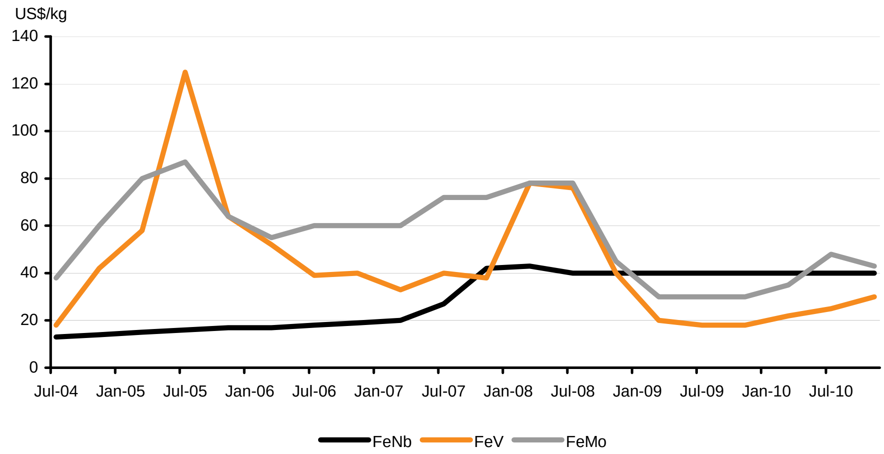



Source: CBMM

**Pricing and supply controlled**

Over the past 10 years, CBMM has increased production in line with demand. The result has been a stable price profile relative to other ferro-alloy metals. Hence, the ferro niobium price has not decreased in recent history. In our view, the history should be a reasonably reliable guide to future pricing. Outside of CBMM there are three projects (including ALK) moving towards production. We estimate the combined ferro-niobium output of these projects represent about 7% of global production.

### Chart 9 : Ferro-alloy historical prices




Source: metalpages, CBMM

## Recommendation structure

Absolute performance, short term (trading) recommendation: A Trading Buy recommendation implies upside of 5% or more and a Trading Sell indicates downside of 5% or more. The trading recommendation time horizon is 0-60 days. For Australian coverage, a Trading Buy recommendation implies upside of 5% or more from the suggested entry price range, and a Trading Sell recommendation implies downside of 5% or more from the suggested entry price range. The trading recommendation time horizon is 0-60 days.

Absolute performance, long term (fundamental) recommendation: The recommendation is based on implied upside/downside for the stock from the target price and, except as follows, only reflects capital appreciation. A Buy/Sell implies upside/downside of 10% or more and a Hold less than 10%. For research produced by Nedbank Capital, a Buy implies upside in excess of 20%, A Sell implies an expected return less than 10%, and a Hold implies a return between 10% and 20%. For UK-based Investment Funds research, the recommendation structure is not based on upside/downside to the target price. Rather it is the subjective view of the analyst based on an assessment of the resources and track record of the fund management company. For research produced by Nedbank Capital and for research on Australian listed property trusts (LPT) or real estate investment trusts (REIT), the recommendation is based upon total return, ie, the estimated total return of capital gain, dividends and distributions received for any particular stock over the investment horizon.

Performance parameters and horizon: Given the volatility of share prices and our pre-disposition not to change recommendations frequently, these performance parameters should be interpreted flexibly. Performance in this context only reflects capital appreciation and the horizon is 12 months.

Market or sector view: This view is the responsibility of the strategy team and a relative call on the performance of the market/sector relative to the region. Overweight/Underweight implies upside/downside of 10% or more and Neutral implies less than 10% upside/downside.

Target price: The target price is the level the stock should currently trade at if the market were to accept the analyst's view of the stock and if the necessary catalysts were in place to effect this change in perception within the performance horizon. In this way, therefore, the target price abstracts from the need to take a view on the market or sector. If it is felt that the catalysts are not fully in place to effect a re-rating of the stock to its warranted value, the target price will differ from 'fair' value.

## Distribution of recommendations

The tables below show the distribution of recommendations (both long term and trading). The first column displays the distribution of recommendations globally and the second column shows the distribution for the region. Numbers in brackets show the percentage for each category where there is an investment banking relationship. These numbers include recommendations produced by third parties with which RBS has joint ventures or strategic alliances.

### Long term recommendations (as at 03 Mar 2011)

| | Global total (IB%) | Asia Pacific total (IB%) |
|---|---|---|
| Buy | 768 (13) | 494 (3) |
| Hold | 429 (7) | 235 (1) |
| Sell | 117 (1) | 64 (0) |
| Total (IB%) | 1314 (10) | 793 (2) |

Source: RBS

### Trading recommendations (as at 03 Mar 2011)

| | Global total (IB%) | Asia Pacific total (IB%) |
|---|---|---|
| Trading Buy | 0 (0) | 0 (0) |
| Trading Sell | 0 (0) | 0 (0) |
| Total (IB%) | 0 (0) | 0 (0) |

Source: RBS

## Valuation and risks to target price

**Alkane Resources (RIC: ALK.AX, Rec: Buy, CP: A$1.235, TP: A$2.740)**: We value ALK using a DCF methodology. Upside risks to our target price include production and commodity prices exceeding our expectations. Downside risks include higher-than-forecast capex, commissioning and development delays, and lower-than-forecast commodity prices.

## Regulatory disclosures

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